



TOGETHER  
INVESTIGATING  
THE FUTURE OF  
SOUTH AFRICA'S  
WATER SUPPLY

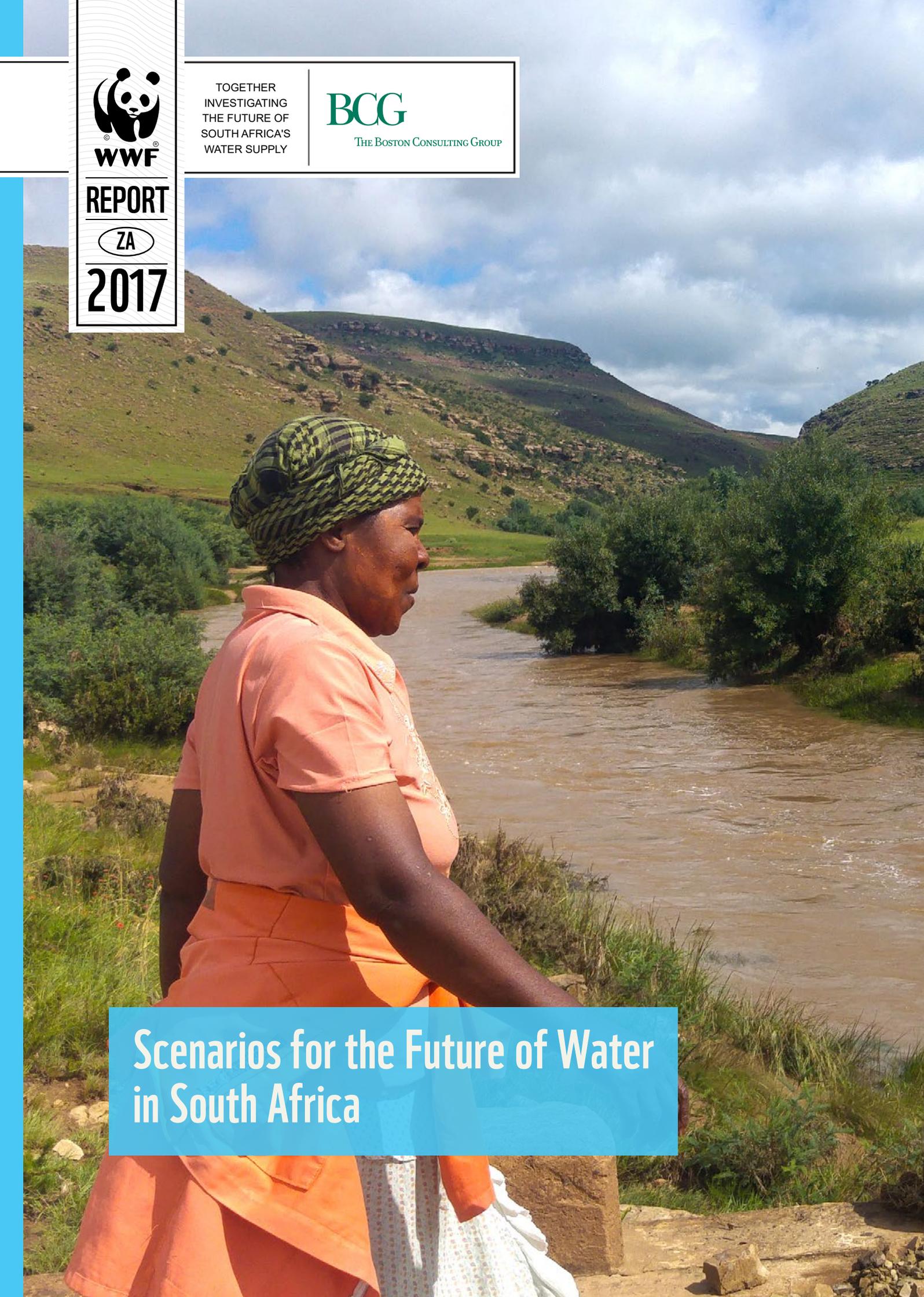
**BCG**

THE BOSTON CONSULTING GROUP

**REPORT**

ZA

**2017**

A woman in a peach-colored dress and a green and black patterned headscarf is looking across a river in a hilly landscape. The river is brown and flows through a valley with green hills in the background. The sky is blue with white clouds.

# Scenarios for the Future of Water in South Africa

This report is a result of a joint initiative by the World Wide Fund for Nature – South Africa (WWF-SA) and the Boston Consulting Group (BCG).

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WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

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# FOREWORD FROM ALAN INY

Today's leaders are forced to grapple with so many threats and uncertainties coming from all different directions, it can be tempting to bury our heads in the sand, ostrich-style.



**Alan Iny**

Associate Director & Senior Global Specialist for Creativity and Scenarios

The Boston Consulting Group

But contrary to popular belief, ostriches do not actually bury their heads in the sand. This myth comes from the bird's strategy of lying low when trouble approaches, and pressing their long neck to the ground in an attempt to become less visible. Their plumage blends well with sandy soil, and so from a distance, this gives the impression that they have buried their heads in the sand. For the ostrich, this strategic decision is an instinct which serves them well, because most of the time their environment is predictable and the threats are foreseeable.

But leaders in our society can and must do better at tackling the uncertainty all around us, and scenarios are a terrifically underused tool to help. Take the water challenge facing South Africa: of course it's critical to tackle this challenge with a solid understanding of supply, demand, and the complex circumstances at play, which is how this report will begin. But the fact base alone is not sufficient. There can be many valid ways to interpret these facts and a range of reasonable tactics and strategies can ensue. We must go beyond the predictive mindset upon which we have been trained. After all, no matter how robust our forecasts, there will always be surprises around the bend. Scenarios will help us bring a more prospective mindset to the challenge, allowing us to better prepare for what we humbly acknowledge we cannot precisely predict.

It has been a pleasure, as BCG's global leader for the scenarios topic, to partner not only with my South African colleagues, but with the World Wide Fund for Nature and the key stakeholders they have brought to the table. I am excited about the 2030 scenarios that we have developed, and the process of thinking through how we might prepare has already broadened perspectives and allowed us to define a series of very specific action items. This will make South Africa's future more robust, whatever lies ahead.

And so, dear reader, the challenge before you is clear: understand the water context, which we cover in section 1 of this report. Look at the potential scenarios, which we have developed in sections 2 and 3, and for each one, immerse yourself in that potential reality before beginning to ponder how you might prepare. And most critically, tie your own potential action items to the specific suggestions outlined in section 4. What part can you play to help South Africa overcome the current crisis – to prepare for and even shape the future? Let us allow our future strategies to be as robust and deliberate as possible – as opposed to instinctively burying, or even appearing to bury, our heads in the sand.

# WATER FUTURE SCENARIOS WORKSHOP

Water directly affects South Africa's socioeconomic development, but it is becoming an increasingly scarce resource.

Based on current usage trends, South Africa is expected to face a water deficit of 17% by 2030, and this shortage will only be worsened by climate change. Because water is a shared resource, we are all at risk; therefore, it is critical to understand our impact on water and incorporate water management into our daily lives.

To address these issues, the World Wide Fund for Nature – South Africa (WWF-SA), supported by The Boston Consulting Group (BCG), hosted a “Future of Water” workshop in South Africa on January 31, 2017. A diverse group of key stakeholders from the public, private, and social sectors gathered to discuss specific scenarios. Workshop participants proposed four primary goals:

## FOUR MAIN GOALS FOR THE FUTURE OF WATER IN SOUTH AFRICA

### MAIN GOALS

- 1** *Become a **water-conscious country** with sufficient knowledge and skills in the water sector*
- 2** *Implement **strong water governance** with resilient stakeholder partnerships that advance the more explicit second phase of the National Development Plan to achieve water security under climate change*
- 3** *Manage **water supply and demand** regulations more rigorously and protect water resources*
- 4** *Become a **water-smart economy** and a leader in Africa in commercializing low-water technologies for industry and agriculture*

## NO REGRET ACTIONS WITH HIGH IMPACT AND FEASIBILITY

Six “no regret” actions that will have high impact and be feasible to implement have emerged from discussions. These actions could significantly shape the future of water in South Africa:



### ACTION 1:

Improve social awareness on the criticality of water scarcity, at schools, business, and communities, through campaigns and social media platforms



### ACTION 4:

Implement the water pricing model to strategically differentiate tariffs in the face of continuous water demand growth, urbanization, and population growth



### ACTION 2:

Develop skilled jobs, new enterprises and capabilities to effectively maintain green and grey water infrastructure across South Africa, and reduce losses



### ACTION 5:

Commercialize and implement at scale water re-use and improved irrigation efficiency technologies



### ACTION 3:

Pilot innovative co-financing to maintain and protect ecological (green) infrastructure e combating further unnecessary water loss from alien vegetation



### ACTION 6:

Increase access to information to share clearer understanding of water users' impact on water and to advance collective action

*Collective action plays a vital role in building a sustainable water future for all stakeholders. By collaborating to mitigate risks, seize opportunities, as well as preserve and maintain this valuable shared resource, we can create a water secure future for South Africa. These action focus on what can be achieved in partnerships between civil society, the public and private sectors. A massive drive is also required to improve performance in public sector water institutions and local government.*

# INTRODUCTION

How can we prepare for and take action to reverse South Africa's water crisis?

This question should be on the mind of every responsible leader in the public, private, and social sectors. As a critical human need and essential to our economy, water concerns every South African.

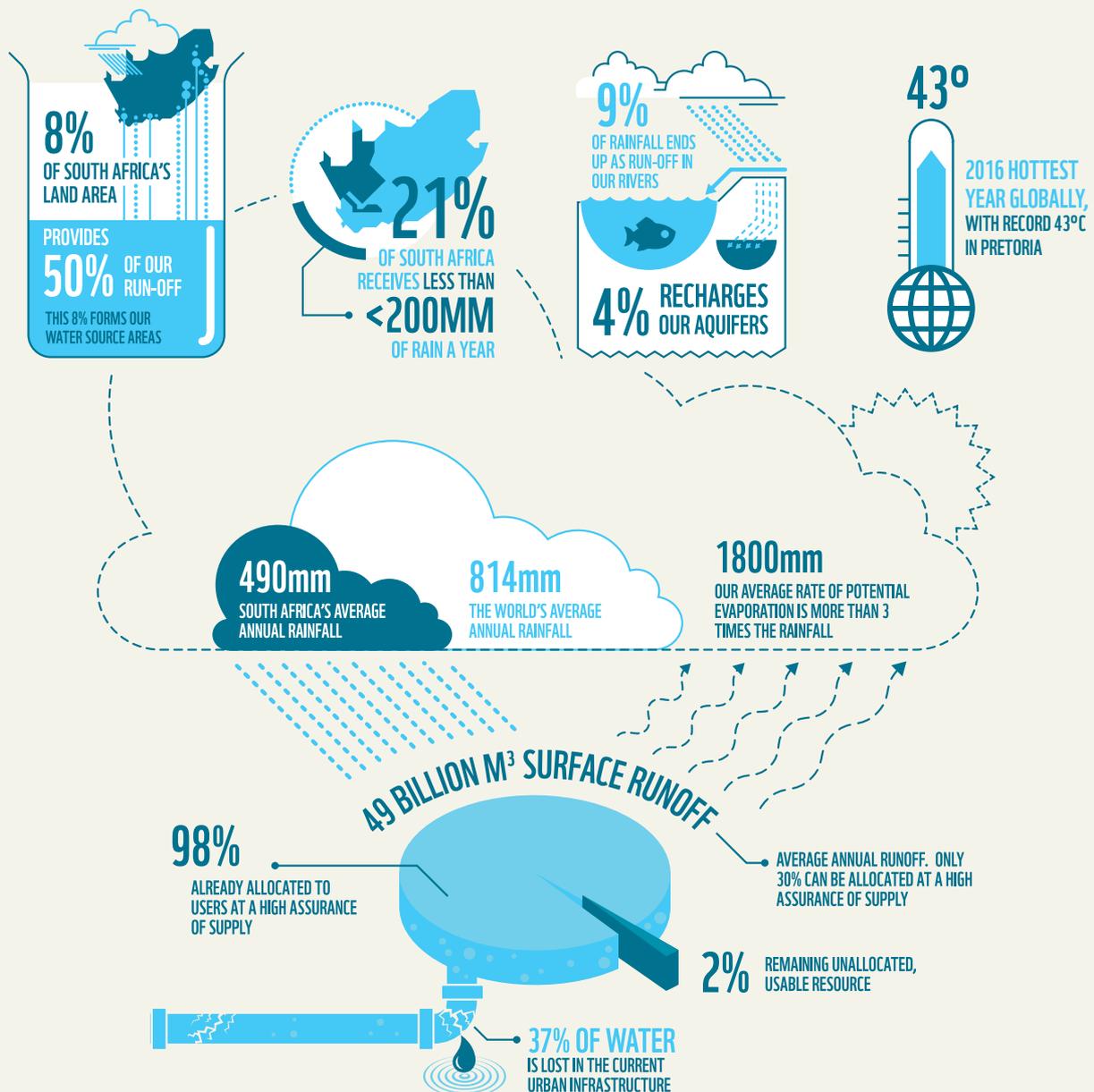
The aim of this report is to raise awareness about the threat of water scarcity in South Africa and crystallize key actions needed to build a water secure future in South Africa. This discussion was initiated with the support of stakeholders from the public, private, and social sectors on January 31, 2017, at the WWF's "Future of Water" workshop. Workshop participants addressed current and future challenges, discussed potential solutions, and mapped out a sustainable path forward.

# WATER CONTEXT

South Africa is approaching physical water scarcity by 2025, and its socioeconomic development has been directly hampered by the recent drought. The drought has taken its toll on the agriculture sector, widening the trade deficit due to losses in maize exports. As a result, in the fourth quarter of 2015, the agriculture sector lost 37,000 jobs, which pushed an additional 50,000 people below the poverty line and accelerated consumer inflation driven by rising food prices. This

in turn shaved off 0.2 percentage points from South Africa's economic growth in 2015. SA's water crisis is not a future problem. It's an urgent challenge today:

FIGURE 1: WATER FACTS



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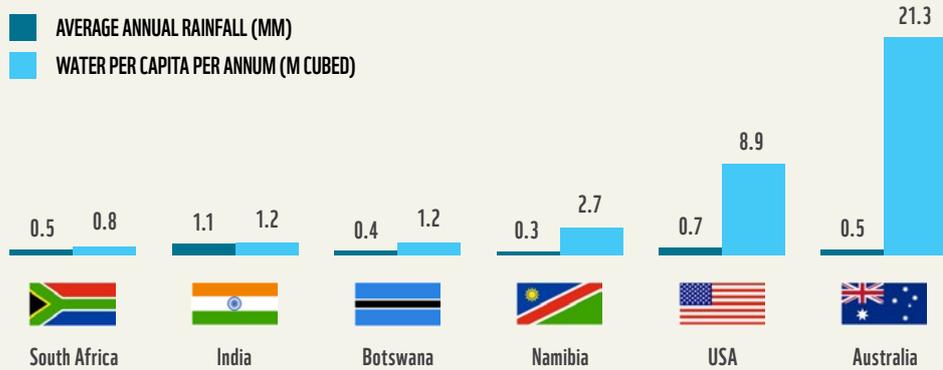
## WATER SUPPLY

**490mm**  
SOUTH AFRICA'S ANNUAL RAINFALL IS HALF THE WORLD AVERAGE

Rainfall is the predominant origin of freshwater, yet SA has low rainfall and low per capita water availability in comparison to other countries: ~500 mm average annual rainfall, and 843 m<sup>3</sup> water per capita per annum. Approximately 30% of annual runoff becomes allocated supply, mostly from surface water.

The majority of our water supply comes from dams. Whilst only 10% comes from groundwater, this is a critical resource at times of the year when surface water is not available and during droughts. Finally, there's desalination, which is also a highly costly and energy-intensive process.

FIGURE 2: WATER AVAILABILITY IN SELECTED COUNTRIES (000 OF M<sup>3</sup>)



Source: Department of Water and Sanitation 2015 Strategic Overview of the Water Sector in South Africa, WWF 2016 Water: Facts and Future report

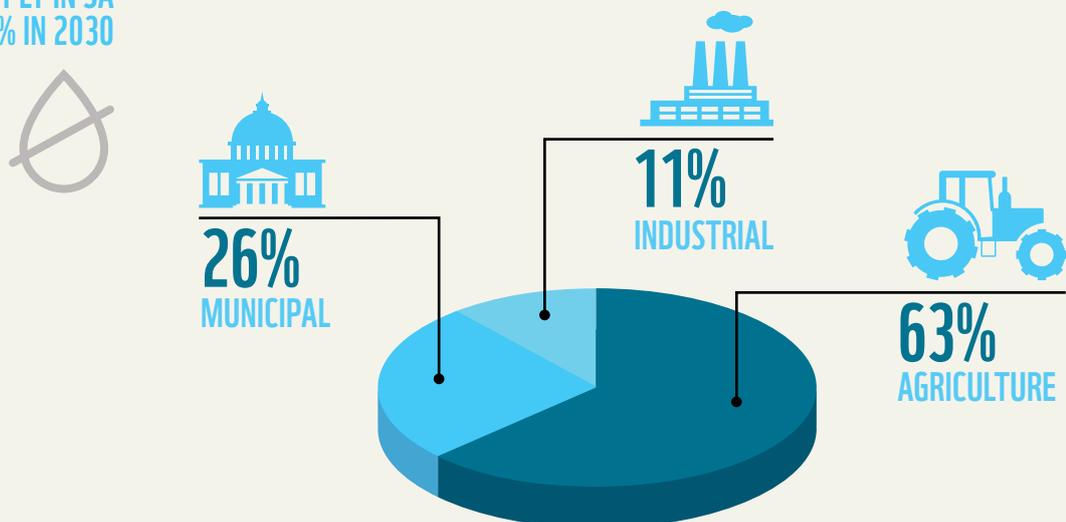
## WATER DEMAND

**17% DEFICIT**  
WATER DEMAND IS EXPECTED TO EXCEED SUPPLY IN SA BY 17% IN 2030

Water demand in South Africa has been witnessing a steep increase, with three major sectors driving the demand. The agriculture sector is the highest at around 63%, followed by the municipal and industrial sectors at 26% and 11% respectively.

This demand is expected to further grow at around 1% annually to reach ~18 bn m<sup>3</sup> in 2030 from 15 bn m<sup>3</sup> in 2016.

FIGURE 3: DRIVERS FOR INCREASING WATER DEMAND



## AGRICULTURE



### Overview

Agriculture is the largest user of water at 63%. Major water uses include:

- Irrigation of crops
- Land used for water-intensive grazing of livestock

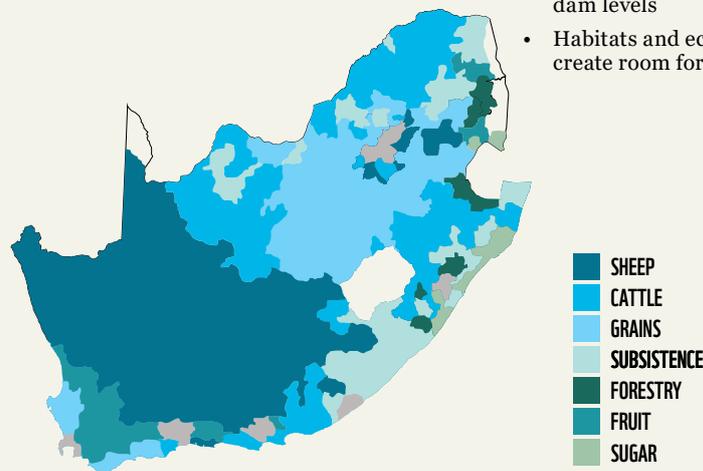
### Key drivers for water supply and demand

- Weather variation: More surface water used in droughts, which depletes stores
- Population growth: More food and liquids consumed from rising number of residents
- Labour intensive sector: Government supports sector growth due to job creation
- Dietary shifts to fats/oils: Livestock requires significant water usage

### Impact on water

- Fertilizer contributes to water pollution
- Over-use of stored water leads to low dam levels
- Habitats and ecosystems destroyed to create room for agricultural land

FIGURE 4: AGRICULTURE PRODUCE BY REGION



## MUNICIPAL



### Major water uses

Municipal sector uses 26% of water supply and is expected to grow mostly due to demographic drivers. Major uses include gardening, toilets, and personal hygiene, accounting for 84%.

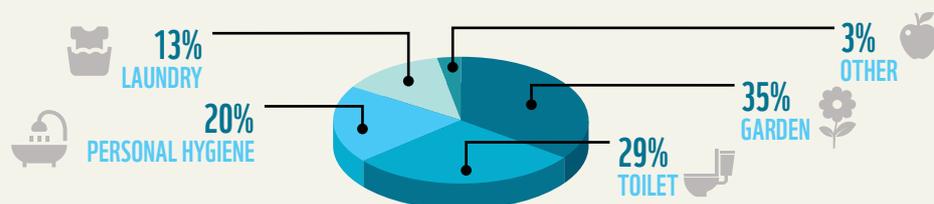
### Key drivers for water supply and demand

- Population growth: Increased urbanization and standards of living
- Urbanization: Increased total water usage per household with increased access to water for families living in cities

### Impact on water

- Untreated and poorly treated sewage and sewage leaks pollute the water, especially in urban areas with limited wastewater treatment
- Cummulative pollutant load from industrial areas

FIGURE 5: DISTRIBUTION OF HOUSEHOLD ACTIVITY BY WATER USE - 2009



## INDUSTRIAL



### Major water uses

Industrial sector uses 11% of water supply; manufacturing is the highest user of water at 53% and expected to grow to 70% in 2030

Water uses in the industrial sector:

#### Manufacturing applications:

- Processing of minerals and crops
- Textile, chemical refinement
- Component and auto supplies

#### Mining and power applications:

- Extraction, refining, and cooling

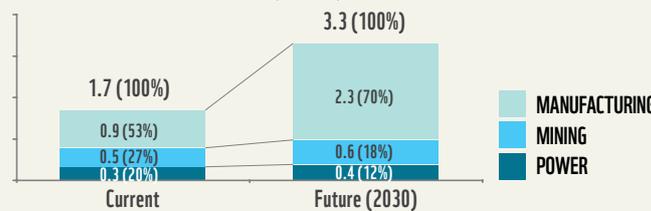
### Key drivers for water supply and demand

- Weakening rand: Creates demand for water-intensive exports
- Population growth: Higher demand for water, electricity, and consumer products
- Price of water: Higher water tariffs curb water wastage and promote water reuse
- Water governance: Legislation enforces reduced water consumption and pollution

### Impact on water

- Industrial spillages and acid drainage degrades water quality
- Warm water discharge disrupts surrounding biodiversity
- Large industrial disasters pollute entire water basin

FIGURE 6: WATER DEMAND (BN M<sup>3</sup>)



Source: Water Resources Group Report 2009, National Water Resource Strategy 2013, National Water Plan Diagnostic Report 2015

## WATER GOVERNANCE

Various state institutions, including Dept of Water and Sanitation, Catchment Management Agencies, and Water User Associations, are mandated to protect water resources and supply us with sustainable, safe water. Good governance of the full water value-chain, from water source areas, to taps, toilets and sewers, also requires responsible actions from the private sector and even individuals in households. Water governance is most effective when the government, private sector, NGOs, communities, and individuals coordinate efforts. Transparent processes, with high levels of shared information and coordinated action allows stakeholders to actively participate in planning and implementing water management activities, innovate in the face of climate change, and improve integration of water management efforts.

## COLLECTIVE ACTION

Water risk manifests across the entire value chain. For companies, having assurance of enough water, at the right quality, time and cost is vital for plant operations. Since water flows from catchments to the ocean, all stakeholders in a river basin are mutually dependent. Hence, collective action plays a vital role to secure the future of water for all stakeholders.

*'As water is a shared resource with many stakeholders, it is a shared opportunity and shared risk for everyone, whether in the public, private or social sectors.'*

WWF has been promoting water stewardship, which is not only about efficient use of water, but also about how the private sector strengthens good governance in collaboration with governments, NGOs, and communities to protect this valuable shared resource. It requires acting together towards a common goal.

Collective action requires not only an understanding of water supply and demand but also creative thinking by various stakeholders about what the future might hold and what can we do to shape it. For this reason, we developed widely varying scenarios for the future of water in South Africa and explored how we might prepare for each one.

# SCENARIOS

## WHAT DO WE MEAN BY SCENARIO PLANNING AND WHY DO WE USE IT?

To catalyze collective action by stakeholders, WWF's scenario exploration workshop gathered stakeholders with diverse backgrounds in water-related industries.

*“The Americans have need of the telephone, but we do not. We have plenty of messenger boys.” Head of the British Post Office (1876)*

The aim of the workshop was to better understand the current situation in South Africa and discuss the path towards a water secure future.

## WHAT DO WE MEAN BY SCENARIOS AND WHY DO WE USE THIS APPROACH?

In today's fast-moving and complex world, scenarios are a powerful tool that help individuals, companies, and government bodies stretch their thinking to imagine what the future may hold and learn how to prepare for multiple scenarios.

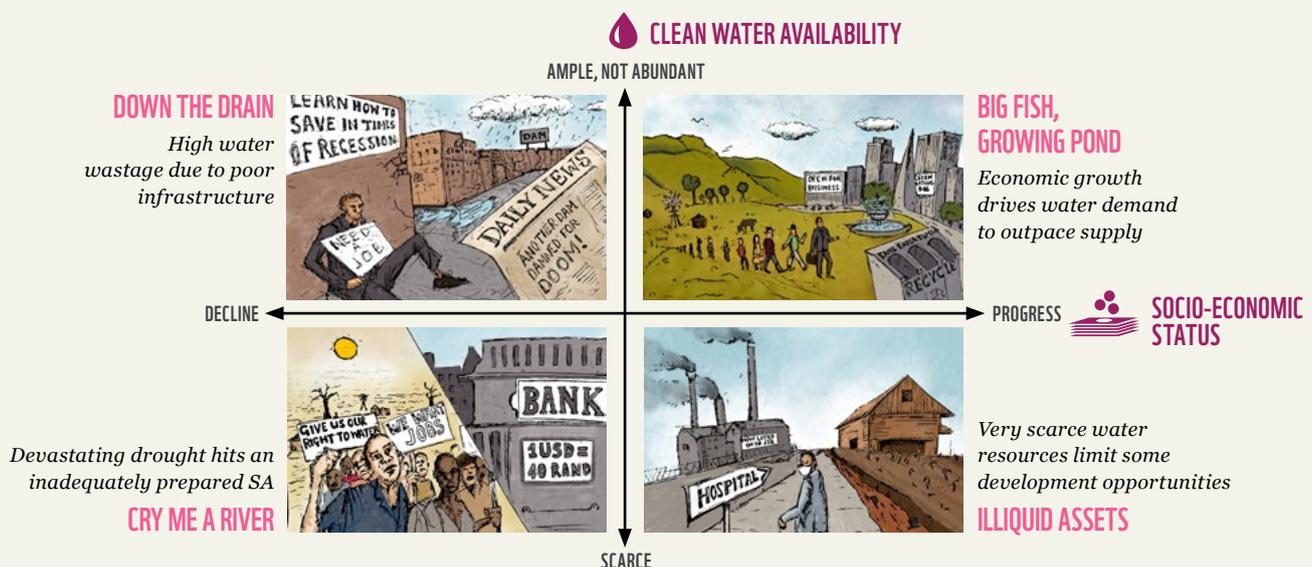
We used scenarios so that workshop participants could challenge their thinking, explore the implications of four different water scenarios in South Africa, and reflect on possible outcomes to clarify whether the current course of action is sustainable.

*“There's no chance that the iPhone is going to get any significant market share.” CEO of Microsoft (2007)*

## HOW DID WE DEVELOP THE SCENARIOS?

Our approach to scenario development used a methodology called ‘axes of uncertainty.’ We analyzed a range of mega-trends relevant to the future of water in South Africa, prioritized them based on impact and likelihood, and then developed two axes which collectively cover the full range of prioritized trends. The two key uncertainties chosen as most relevant to the future of water in South Africa are 1) the availability of clean water and 2) the country's ability to manage it.

While reading each scenario in the section that follows, it's important to immerse yourself in each world. How would each scenario affect your family, your business, and South Africa overall? How would you prepare for each scenario if you knew it would happen and what indicators would you monitor to detect whether that scenario was imminent? These are some of the questions the workshop participants explored, and their answers are summarized after each scenario.



## FOUR FUTURE SCENARIOS

# SCENARIO ONE: DOWN THE DRAIN



Imagine a world where there is **ample water availability** across SA, yet there are excessive levels of **wastage** due to poorly maintained water infrastructure in the face of a **depressed socio-economic state**. **What would that world look like?**

Political instability and indebted government have taken its toll on the economy, leading to a large disinvestment from SA. The weak economy has led to poor infrastructure investment, deteriorating roads, insufficient capture of rainfall and loss of water from dams.

De-prioritized environmental governance and lack of private sector incentivisation has formed a divide in public-private collaboration.

Higher rainfall levels did not boost the economy as expected, as heavy water leakages and poor infrastructure maintenance offset the increase in water availability; flushing money and opportunity down the drain.

### IMPLICATIONS AND RISKS

### OPPORTUNITIES

#### INDUSTRIAL



Rising frequency of production defects due poor quality water as an input

Improve self-regulation around water reuse and wastewater management

Higher costs to treat increased volumes of dirty water due to de-prioritized governance

Reduce costs of water treatment through inclusive planning & industry collaboration

#### AGRICULTURE



Increasing inequality gap for smaller farmers who cannot afford private infrastructure

Shift to low water-use crops in order to sustain crops during the dry season

Rising insurance costs due to higher flood risk damages profits and employment in agri.

Tap into self-sufficient water infrastructure (such as boreholes and rainwater harvesting)

Degradation of catchment land due to poorly managed agriculture

#### GOVERNMENT



Increased protests & social unrest due to poorly maintained municipal infrastructure

Improve allocation of municipality funds to sufficiently maintain water infrastructure

Riffs in public-private collaboration due to lack of incentives for collective action

Provide bursaries to educate and develop skills in water management and conservation

Low levels of enforcement

#### FINANCIAL



Increased cost of borrowing in the face of growing unemployment and government debt

Create an innovative business model to incentivise the funding of water investments

Higher frequency of defaults on payments during economic recession

Support investments in water projects through offering more competitive contractual terms

Bankrupt municipalities don't pay for water

This scenario's biggest challenge lies in the poor infrastructure maintenance and development. Most relevant indicators to monitor to be able to detect if such a future will more likely occur include observing whether there are delays in execution of water infrastructure projects, the percentage of unallocated water which measures the water lost due to water leakages along with the Water Poverty Index which measures access to water across the country. These indicators can prompt us in advance to re-prioritize infrastructure investments.

# SCENARIO TWO: BIG FISH, GROWING POND



Imagine a world where there is **adequate clean water available** in South Africa and the **socioeconomic environment is booming**. Growth is not tapering off in the near future and water demand is increasing at a fierce pace. **What would that world look like?**

South Africa has established a reliable regulatory environment and a reputation for good governance, resulting in an influx of investment across many industries, including some that are water-intensive. This growth has increased employment and reduced poverty levels.

Meanwhile, businesses have been operating with responsibility toward the environment, leading to more efficient water usage, improved waste management, and investments in water infrastructure.

However, economic growth has spurred urbanization, sharply increasing domestic water use. Water demand is at an all-time high, with supply unable to keep pace.

## IMPLICATIONS AND RISKS

## OPPORTUNITIES

### INDUSTRIAL



Increased competition, skills level and innovation due to large presence of MNCs  
Differentiated tariff pricing results in rising operational costs and product prices  
Local 'laggard' companies will be out-competed

Invest in water management and treatment due to rising water governance and tariffs  
Invest in importing and adopting new technology & innovation in water-efficiency

### AGRICULTURE



Accelerated urbanization results in a steep increase in water demand and food prices  
Degredation of catchment land due to poorly managed agriculture

Shift towards production of high quality and high calorie food due to rise in middle class  
Strong self-regulation of better production practices

### GOVERNMENT



Increased trade and foreign investment in infrastructure due to socio-economic stability  
Urbanization and immigration put strain on public supply and resources

Use private sector skills and agencies to maintain & implement water infrastructure  
Reduced wasteful expenditure and ROI from PPPs as well as government procurement

### FINANCIAL



Rising interest rates due to high demand for financing resources during economic boom  
Insurance industry is stable due to more certain economic environment

Strengthen innovative financing solutions to cater for the rising middle class  
Differentiate insurance services to maximize on urbanization and a growing target market

This scenario's looming challenge is that water demand is growing so fiercely that it's outpacing supply. The most relevant indicators to monitor whether we are heading toward this scenario include observing the rate of urbanization; the price change in water tariffs; and per capita water use, which measures the average consumption of water per person in SA as a benchmark in rating water-efficiency.

# SCENARIO THREE: ILLIQUID ASSETS



Imagine a world where South Africa's socioeconomic state is progressing and experiencing **high economic growth**, yet clean **water is increasingly scarce and costly** due to recurring drought and high levels of pollution. **What would that world look like?**

South Africa has adopted business-friendly policies and has become more welcoming to big multinational corporations (MNCs) around the world. Although this has resulted in an increase in labour productivity and economic growth overall, it has negatively impacted the availability of clean water, causing high water tariffs. This has created challenges for farms that produce water-intensive products, such as livestock, sugar, and fruit farming.

The prolonged political instability in Lesotho has slowed implementation of the Lesotho Highlands Water Project, leading to more limited water availability and strained regional relations. This dynamic, coupled with the state of the environment, has steadily inflated prices for water resources.

## IMPLICATIONS AND RISKS

## OPPORTUNITIES

### INDUSTRIAL



Rising pressure from environmental enterprises on polluters to act responsibly

Excessive treatment costs for companies that require high volumes & quality of clean-water

Invest in reverse-osmosis process treatment and use water as "fit-for-purpose"

Implement grey water reuse and a zero-liquid discharge strategy

Circular-economy collaboration in the private sector leading to high levels of re-use

### AGRICULTURE



Inflating tariffs result in the collapse of many emerging farmers who cannot afford water

Increased foreign competition from imported products that are produced more economically

Conversion of agriculture land due to shift away from water-intensive crops

Explore import opportunities in food taking in account the entire supply chain

### GOVERNMENT



Rise in water-borne diseases due to pollution requires more funds to provide health service

Rising strain on water resources across municipalities due to falling water quality

Incentivize investment in water management and treatment through strengthening policy

Wide-scale use of low-water sanitation

Inclusive planning for ecological and physical water infrastructure water projects

### FINANCIAL



Increased average lending due to economic growth & unrestrained industrial boom

Increasing insurance premiums due to steep rise in claims on health risks

Innovate health insurance to leverage the increased need for competitive medical plans

Invest in projects protected by environmental permits at the risk of new policy enforcement

*1. Water treatment process in which all wastewater is purified and recycled, leaving zero discharge at the end of the treatment cycle*

In this scenario, the deteriorating availability of water leads to excessively high water tariffs for mains supplies. The most relevant indicators to detect whether we are heading towards this scenario include observing the Water Quality Index; the percentage of wastewater treated; and the percentage access to drinking water, which measures the extent to which citizens have suitable access to clean water and sanitation.

# SCENARIO FOUR: CRY ME A RIVER



Imagine a world where SA is in a **severe drought** and the already poor **socioeconomic status of the country is unable to cope** with the destructive water crisis. **What would that world look like?**

SA is in an economic recession whereby the agriculture and mining sectors are quickly contracting, causing sky-rocketing unemployment and a fall in exports.

Despite recent political stability, SA is suffering the consequences of a prolonged lack of investment in infrastructure and technology.

Climate change has shifted rainfall patterns with widespread drought and intense cyclonic events causing wide-spread devastation across Southern Africa. As such, SA is in a desperate state of economic and physical water scarcity.

## IMPLICATIONS AND RISKS

## OPPORTUNITIES

### INDUSTRIAL



Rise in monopolies due to large company contracts with government to secure water  
Severe financial losses for water-intensive players due to unpredictable water cuts

Invest in new technologies in wastewater treatment and water demand management

Advance and grow new sectors in desalination and groundwater pumping

Circular-economy collaboration in the private sector leading to high levels of re-use

### AGRICULTURE



Destruction of properties occurs due to land grabbing of land with water supply  
Desperately low yields result in small-scale farmers to revert back to subsistence farming

Invest in drought-resistant GMO crops for the seed market to leverage their position

Provide small scale water solutions to rural areas through social enterprises

### GOVERNMENT



Violent protests break-out due to revoked right of water and rising inequality  
Large companies & MNCs secure water to sustain operations, while smaller companies migrate

Invest efforts in raising awareness of the value of water and conversation methods

Implement strict water governance to monitor and control domestic use

### FINANCIAL



Increased claims in the insurance industry result from severe El Nino weather conditions  
Rising pressure on financial institutions for loans in the period of economic recession

Form new financial models to cope with high risk circumstances

Focus on micro-financing to support small farmers from going bankrupt

In this scenario, the biggest challenge is South Africa's inability to effectively combat the harsh effects of the prolonged drought and intense floods under climate change, coupled with an unstable and depressed socioeconomic climate. The most relevant indicators to detect whether we are heading towards this scenario include observing the forecasted impacts of climate change, the employment and poverty rate, and changes in the free right of water, which points to the degree of inequality and respective social unrest in the country.

# WHAT DOES THIS MEAN GOING FORWARD?

*Whether we run businesses or households, work in companies, or lead governmental departments, our actions impact water, and in turn we are impacted by water. Each and every individual has a role to play in achieving a water secure future.*

Participants in the “Future of Water” workshop discussed and debated high-priority goals to address the problem of water scarcity in South Africa and proposed several actions that can be taken to achieve these goals.

## WHAT ARE THE BROAD WATER-RELATED GOALS?

Workshop participants discussed broad water-related goals for South Africa. Four goals emerged as essential:



### 1 WATER-CONSCIOUS COUNTRY

*Become a water-conscious country with sufficient knowledge and skills in the water sector*



### 2 STRONG WATER GOVERNANCE

*Implement strong water governance with resilient stakeholder partnerships that advance the more explicit second phase of the National Development Plan to achieve water security under climate change*



### 3 WATER SUPPLY AND DEMAND

*Manage water supply and demand regulations more rigorously and protect water resources*



### 4 WATER-SMART ECONOMY

*Become a water-smart economy and a leader in Africa in commercializing low-water technologies for industry and agriculture*

# WHAT ACTIONS CAN BE TAKEN TO ACHIEVE THESE GOALS?

The following actions were identified to support these water-related goals in South Africa:

## 1

### BECOME A WATER-CONSCIOUS COUNTRY WITH SUFFICIENT KNOWLEDGE AND SKILLS IN THE WATER SECTOR

#### EDUCATE AND SHARE BEST PRACTICES

- Educate on the value of water and water conservation in schools
- Use social media to share examples of best practices on water efficiency
- Promote and share best practices from water stewardship partnerships and programmes via an online platform aimed at protecting water resources

#### COMMUNICATE AND CAMPAIGN

- Communicate Department of Water and Sanitation's relevant policies and strategy documents that encourage district & municipality collaboration and the transition to a low water economy
- Engage new partners in water sector to showcase and present new technology
- Share experiences and knowledge acquisition on water challenges and opportunities from various provinces

#### DEVELOP SKILLS AND CAPABILITIES

- Develop skills and capabilities to effectively maintain water infrastructure by training in local communities to fix water leaks
- Transfer service delivery responsibilities to regional utilities where municipalities lack technical capacity (Dean to review)
- Develop skills and provide job opportunities in water management and wastewater treatment

## 2

### IMPLEMENT STRONG WATER GOVERNANCE WITH RESILIENT STAKEHOLDER PARTNERSHIPS THAT ADVANCE THE NATIONAL DEVELOPMENT PLAN

#### MONITOR COMPLIANCE AND ENFORCEMENT

- Establish water-use compliance and disclosure reporting requirements for Johannesburg Stock Exchange listed companies
- Strictly enforce punitive action for non-compliance with water use entitlements and wastewater treatment requirements
- Regulate, enforce and effectively collect water tariffs

#### ADVOCATE STAKEHOLDER PARTNERSHIPS

- Incentivize the private sector via water stewardship programs to plan, invest in and implement water management systems and infrastructure
- Develop public-private partnerships models to upscale maintenance and service delivery of utilities
- Develop a business case to advocate for prioritizing water in national budget
- Transparent access to information from government (eg on conditions for water-use )

#### DEVELOP INNOVATE FINANCING SOLUTIONS

- Co-finance clearing of alien species and convert alien plant biomass into a commercial bi-product to sell and finance the ongoing removal of this vegetation
- Strengthen regulatory framework to incentivize innovative financing (e.g. hydroelectric power sold and returns reinvested in water infrastructure)
- Explore innovative and off-budget financing mechanisms
- Look to successes and lessons learnt from financing models adopted internationally to fund infrastructure in the water sector
- Explore opportunities to invest in ecological infrastructure through blue or grey bonds, issued by government, municipalities, or multi-national banks

### 3

## MANAGE WATER SUPPLY AND DEMAND REGULATIONS AND PROTECT WATER RESOURCES

### IMPLEMENT DIFFERENTIATED TARRIFS

- Differentiate water tariffs across various industries and consumption levels
  - Charge increasing tariffs for water use over a certain consumption threshold
  - Include the full cost of water in the revised pricing model
  - Prepare for a pricing strategy in the face of a revoked right to water

### MANAGE WATER QUALITY

- Incentivise stakeholders to monitor and rectify contribution to water pollution
- Promote interdependencies of industries to trade and share water at different levels of cleanliness through water treatment agreements
- Establish a "fit for purpose" domestic water policy, where water is separated per quality based on usage needs

### MANAGE WATER INFRASTRUCTURE AND DEMAND

- Fast-track critical water infrastructure engineered and ecological projects by resolving bottlenecks identifying delays in the pipeline
- Benchmark water-use efficiency across industries compared to best practice
- Incentivize zero-liquid discharge in industrial sector through recycling and reuse
- Fix and develop hydro-power stations in dams to use water effectively for sustaining operations, productivity and economic growth

### 4

## IV. BECOME A WATER- SMART ECONOMY AND A LEADER IN AFRICA IN COMMERCIALIZING LOW-WATER TECHNOLOGIES FOR INDUSTRY AND AGRICULTURE.

### INVEST IN RESEARCH COMMERCIALIZATION AND TECHNOLOGY

- Adopt smart water technologies in irrigation techniques and water reuse to sustain the agriculture sector
- Stimulate commercialization and development of new technologies in water management and promote the implementation of new solutions
- Set up rule-based algorithms to calculate and control how much water should be utilized according to seasonal/cyclical patterns & refine water policy accordingly

### COLLECT SHARE AND MANAGE INFORMATION

- Enhance information sharing and spread awareness of water users' impact through using a centralized data-sharing platforms
- Incentivize major water-users to quantify and report on their water-footprint
- Engage district municipalities to collect information on water and sanitation services backlogs and consolidate data at a central point of access
- Enhance wide use of water assessment tools to improve stakeholder decision-making

# WHAT INDICATORS DO WE NEED TO MONITOR?

Stakeholders were encouraged to discuss the potential indicators we should monitor to detect that we may be heading towards a certain future.

## LEVEL OF WATER AVAILABILITY



### ENVIRONMENTAL

- Ecosystem health indicators
- Water Quality Index
- Level of dam capacity
- Forecasted impacts of climate change
- Levels of protection of Water Source Areas



### REGIONAL AGREEMENTS

- Delays in execution of water infrastructure projects
- Establishment of new trans-boundary agreements
- Increased regional trade in virtual water



### INNOVATION AND INFRASTRUCTURE

- Growth of local market for smart water technology
- Numbers of published papers and patents for water-smart technologies
- Progress on the water R&D roadmap
- Commercialisation of local water solutions
- % of wastewater treated

## DEMAND AND SUPPLY MANAGEMENT



### DEMOGRAPHIC AND ECONOMIC

- GDP growth
- Rate of urbanization
- Poverty rate
- Water Poverty Index
- Per capita water use
- % access to safe drinking water



### POLITICAL

- Changes in the free right of water<sup>2</sup> legislation
- Prioritization of water in National Development Plan
- Corruption Index
- Wasteful expenditure levels in water institutions



### LEGISLATION/GOVERNANCE

- Enforcement of environmental levy
- Price change in water tariffs
- Requirement for compulsory water licenses
- Wastewater<sup>3</sup> trading credits

1. Index measures SA's relative position in the provision of water, considering resources, access, capacity, use, and environment.

2. Right to access sufficient water, free 6kl per household per month.

3. Wastewater is any water that has been adversely affected in quality by anthropogenic influence.

Source: WWF water-risk filter and workshop stakeholder discussions.

# CONCLUDING REMARKS

South Africa has just survived its worst drought in over 20 years, and learned some harsh lessons along the way.



**Christine Colvin**

Senior Manager for Freshwater  
WWF-SA

Although the Cape is still in the grip of a deepening disaster, a greater danger may be that the floods in the rest of the country wash away the good resolutions to be better prepared and strengthen water governance. As one of the stakeholders in our workshop on the scenarios said “Our biggest fear is that this drought was a slap in the face and not a knock-out!” Was it enough to drive a systemic change in our view of the value of water and catalyse a real transition to a low-water economy?

Exploring scenarios on South Africa's water futures with the BCG scenario experts and water sector experts, helped to surface our assumptions about how we will cope with different potential futures. Scenarios are a powerful tool that enable us to think in different boxes. Some of us have a strong belief that government will be able to engineer solutions in the future via water pricing and new dams. Others have lost faith in the government's ability to implement and deliver under ever more challenging climate scenarios, and believe that more private sector involvement is the key to stronger governance of our water system.

In the complex, real world of unknown political, economic, and climate variables, we cannot predict with confidence where we will end up. However, our discussions showed that – whether we move towards strong governance and a growing economy (Big Fish, Growing Pond) or end up with supplies failing under climate change and crumbling governance (Cry Me a River) – there are actions we could take now that would prepare us better for all eventualities. We have already taken steps towards greater water consciousness as a nation during the 2016-17 drought. We need to understand more explicitly how partnerships can build the necessary skills and competence to do more with less, equitably and sustainably.

There are real opportunities for South Africa to lead Africa in the transition towards a water-smart economy, with new technologies and enterprise innovations that ensure our water security. But we need to take decisive steps now, and not wait until the next drought.

*“Uncertainty is the only certainty there is, and knowing how to live with insecurity is the only security.” John Allen Paulos.*

# South Africa's water situation in numbers

25%

Lost to leaks in municipal systems

50%

Surface water comes from 8% of our land area



46%

South Africans have a water source in their house

R 700 bn

Needed to upgrade engineered water infrastructure



**Why we are here**

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

[www.wwf.org.za/](http://www.wwf.org.za/)