

**DRAFT FOR CONSULTATION**



# NATIONAL WATER AND SANITATION MASTER PLAN

## VOLUME 1: CALL TO ACTION

(Version 9.2 )

*Ready for the Future  
and Ahead of the Curve*  
9 March 2018



**water & sanitation**

Department:  
Water & Sanitation  
REPUBLIC OF SOUTH AFRICA



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## List of Acronyms

AMD	Acid Mine Drainage
COGTA	Department of Cooperative Governance and Traditional Affairs
CMA	Catchment Management Agency
DPME	Department of Planning, Monitoring and Evaluation
DWS	Department of Water and Sanitation
DAFF	Department of Agriculture, Forestry and Fisheries
DoE	Department of Energy
DIRCO	Department of International Relations and Cooperation
DM	District Municipality
DMR	Department of Mineral Resources
DST	Department of Science and Technology
DTI	Department of Trade and Industry
DRDLR	Department of Rural Development and Land Reform
ELU	Existing Lawful Use
EWSETA	Energy and Water Sector Education and Training Authority
GWS	Government Water Scheme
IB	Irrigation Board
IUCMA	Inkomati-Usuthu Catchment Management Agency
LHWP	Lesotho Highlands Water Project
LWRMI	Local Water Resource Management Institution
MFMA	Municipal Finance Management Act
MISA	Municipal Infrastructure Support Agent
MuSSA	Municipal Services Self-Assessment
NAWASIA	National Water and Sanitation Infrastructure Agency
NDP	National Development Plan
NGO	Non-Governmental Organisation
NT	National Treasury
NWA	National Water Act
NW&SMP	National Water and Sanitation Master Plan
NWRS	National Water Resource Strategy
NWSRSS	National Water and Sanitation Resources and Services Strategy
PFMA	Public Finance Management Act
RDI	Research, Development and Innovation
RDP	Reconstruction and Development Programme
RWU	Regional Water Utility

SAAWU	South African Association of Water Utilities
SABS	South African Bureau of Standards
SALGA	South African Local Government Association
SANBI	South African National Biodiversity Institute
SAWS	South African Weather Service
SOE	State Owned Enterprise
TCTA	Trans Caledon Tunnel Authority
WRC	Water Research Commission
WSA	Water Services Authority
WSP	Water Services Provider
WUA	Water User Association
WTW	Water Treatment Works
WWTW	Waste Water Treatment Works

# CALL TO ACTION



**South Africa CAN avoid a projected 17% water deficit by 2030 by taking bold action today!**

## 1. Addressing the crisis

South Africa is facing a water crisis caused by insufficient water infrastructure maintenance and investment, recurrent droughts driven by climatic variation, inequities in access to water and sanitation, deteriorating water quality, and a lack of skilled water engineers. This crisis is already having significant impacts on economic growth and on the well-being of everyone in South Africa. These impacts will be exacerbated if it is not addressed.

**14.1 million people do not have access to safe sanitation**

Only **64 %** of households have access to a reliable water supply service

**56%** of waste water treatment works and **44%** of water treatment works are in a poor or critical condition. **11%** are dysfunctional

More than **50%** of South Africa's wetlands have been lost, and of those that remain, **33%** are in poor ecological condition

Only **5%** of agricultural water used is by black farmers

**41%** of municipal water does not generate revenue. **35%** is lost through leakage

Municipalities are losing about **1660 million m<sup>3</sup>** per year through non-revenue water. At a unit cost of **R6/m<sup>3</sup>** this amounts to **R9.9 billion** each year

**R33 billion** more is needed each year for the next 10 years to achieve water security

In April 2017 14,1 million people still used sanitation facilities below the Reconstruction and Development Programme (RDP) standard. Only 10,3 million households (64%) have access to reliable water supply.

Approximately 56% of the over 1 150 municipal wastewater treatment works (WWTWs) and approximately 44% of the 962 water treatment works (WTWs) in the country are in a poor or critical condition and in need of urgent rehabilitation and skilled operators. Some 11% of this infrastructure is completely dysfunctional.

Between 1999 and 2011 the extent of main rivers in South Africa classified as having a poor ecological condition increased by 500%, with some rivers pushed beyond the point of recovery.

South Africa has lost over 50% of its wetlands, and of the remaining 3.2 million hectares (ha), that is, one third are already in a poor condition.

Only 5% of the water that is used in the agricultural sector is used by black farmers.

Water is severely under-priced and cost recovery is not being achieved. To achieve water security, an estimated capital funding gap of around of R33 billion per annum for the next 10 years must be closed through, a combination of improved revenue generation and a significant reduction of costs.

The National Water and Sanitation Master Plan (NW&SMP): Call to Action seeks to rally all water sector stakeholders in South Africa to work together to address the challenges confronting the water and sanitation sector and to ensure that we get ahead of the curve in relation to both current and future challenges. This

includes ensuring that by 2030 we have a sufficient reserve of supply to take us safely into the future and that we meet Sustainable Development Goal 6: Ensure access to water and sanitation for all.

This Master Plan is driven by a sense of urgency. It sets out prioritised actions and investments the country must implement between now and 2030 to overcome challenges and ensure a water secure future supporting inclusive development across the country, and to ensure that universal sanitation coverage protects the health of our people. This Master Plan also sets out the roles and responsibilities, targets, timeframes and how performance will be monitored. As a plan, rather than a strategy or policy, it contains prioritised actions with responsibilities and timeframes, against which relevant players in the sector can be held accountable by Cabinet, Parliament and the public. To facilitate this, DWS will report annually on delivery against the plan. The actions have been prioritised according to the level of impact that they are expected to deliver in terms of driving towards a water secure future for all.

**As a plan, rather than a strategy or policy, the NW&SMP contains prioritised actions with responsibilities and timeframes, against which relevant players in the sector can be held accountable by Cabinet, Parliament and the public. To facilitate this, DWS will report annually on delivery against the plan. The complete document is available for download at [www.dws.gov.za](http://www.dws.gov.za)**

The NW&SMP consists of three volumes. Volume One is this *Call to Action*, which is divided into two sections, Water and Sanitation Management, and Enabling Environment, each having six sub-sections. Each section includes critical actions that, when implemented, will have a significant impact on addressing the crisis. These actions are collated at the back of the document for ease of reference.

Volume 2 is the *Plan to Action* which provides a more detailed analysis of the key issues contained in the twelve sub-sections of this report.

Volume 3 is a *Schedule of Actions* that provide a detailed and costed implementation plan covering all the actions required across the sector to achieve the objectives of the plan.

Implementation of the NW&SMP will be reviewed and reported on annually, and the NW&SMP will be updated accordingly in an adaptive management approach. The

NW&SMP is the implementation plan for the National Water and Sanitation Resources and Services Strategy (NWSRSS) which is reviewed every five years.

In addition, to address the issues confronting the water and sanitation sector in greater depth, a process of engagements with key sector players will be put in place, culminating in a mini-Operation Phakisa which will bring together the key players in the water and sanitation sector for in-depth planning in the second half of 2018. The results of this engagement process will be captured in updates to both the NW&SMP and the NWSRSS.

Action <sup>1</sup>	Responsibility	Completion date
<b>Mini-Phakisa on water and sanitation to be held</b>	DWS, DPME	August 2018
<b>Monitor, review, report on and update NW&amp;SMP</b>	DWS	Annual

<sup>1</sup> Where actions apply to more than one chapter, they have been duplicated in the action tables at the end of the relevant chapters. All actions are summarised in a table at the end of the Call to Action, *without this duplication*.



Figure 1: Overview of the NW&SMP Call to Action structure

## 2. Building a water secure future

The NW&SMP is based on five key objectives that define a ‘new normal’ for water and sanitation management in South Africa:

- Resilient and fit-for-use water supply
- Universal water and sanitation provision
- Equitable sharing and allocation of water resources
- Effective infrastructure management, operation and maintenance and
- Reduction in future water demand.

These five objectives enable the achievement of the National Development Plan’s (NDP) *Vision for 2030*, of affordable and reliable access to sufficient and safe water and hygienic sanitation for socio-economic growth and well-being, with due regard to the environment.

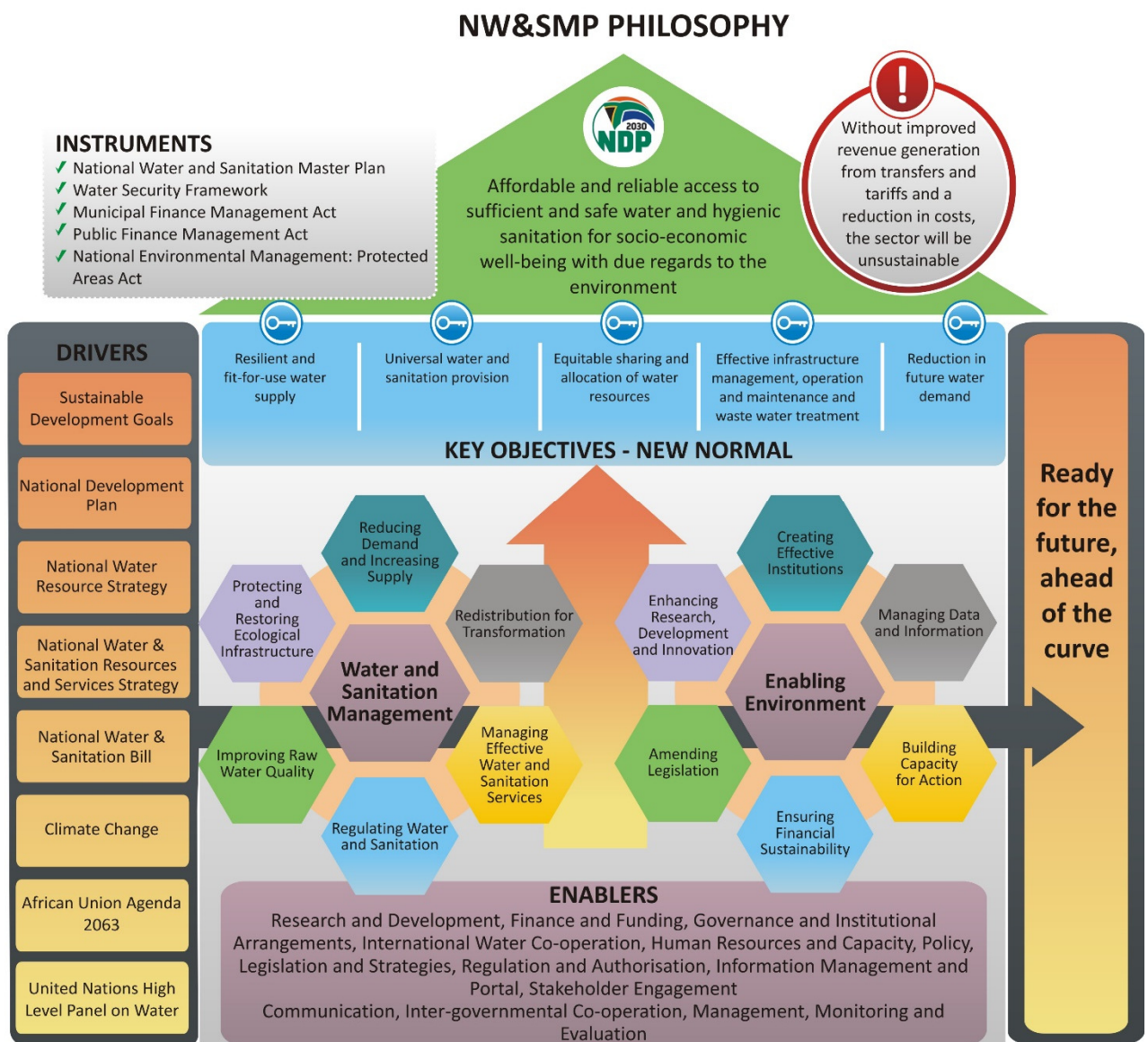


Figure 2: Philosophy of the NW&SMP

Achieving this NDP vision of a water secure future is one of the biggest challenges facing South Africa in the 21<sup>st</sup> century. It is a critical element of achieving social well-being and sustainable economic growth.

South Africa is facing increasing water demands to meet the needs of a rapidly growing and urbanising population, changing lifestyles, and economic growth. At the same time, climate change is driving the country towards a warmer and drier future, with predicted longer and more extreme droughts, and more intense floods. Climate change means that there will be less water available to meet water needs.

***Achieving water security in South Africa requires a new normal: a significant paradigm shift that***

- ***recognises the limitations of water availability***
- ***addresses the real value of water***
- ***ensures equitable access to limited water resources***
- ***delivers reliable water and sanitation services to all***
- ***focuses on demand management and alternative sources of water***
- ***considers the impacts of climate change and***
- ***addresses declining raw water quality.***

**The new reality:**

- **Water will become more expensive**
- **Everyone (except those without access to piped water) MUST use less water for the same activities**
- **Everyone - except the indigent - MUST pay for water and sanitation**

To achieve this, decision-making will be based on sound evidence, supported by rigorous research, innovation and appropriate technology development.

The water sector will enforce regulation through accountable and effective leadership, to ensure that the water sector meets the requirements of a current and future South Africa and that demand is brought in line with available water supply.

Working together, government departments, the private sector and civil society will implement the necessary actions to achieve financial sustainability, functional infrastructure and institutions, fair and sustainable water use, and universal water supply and sanitation provision.

Implementation of this plan will enable South Africa to become more resilient to climate change and the increasing intensity of droughts and floods, while meeting the water needs of a growing population and economy.

**To achieve water security, all water users in all sectors in South Africa must use water more efficiently, and water use must be addressed in the plans of the municipal, energy, agriculture, forestry, mining and industrial sectors. South Africa has no other option, if the country is to be *READY FOR THE FUTURE AND AHEAD OF THE CURVE*.**

**To achieve safe sanitation for all and protect the quality of our water resources, all institutions responsible for sanitation services provision must ensure rapid eradication of the backlog, informed choice of appropriate technologies, and effective operation and maintenance of infrastructure.**



## SECTION 1: WATER AND SANITATION MANAGEMENT

### 3. Reducing water demand and increasing supply

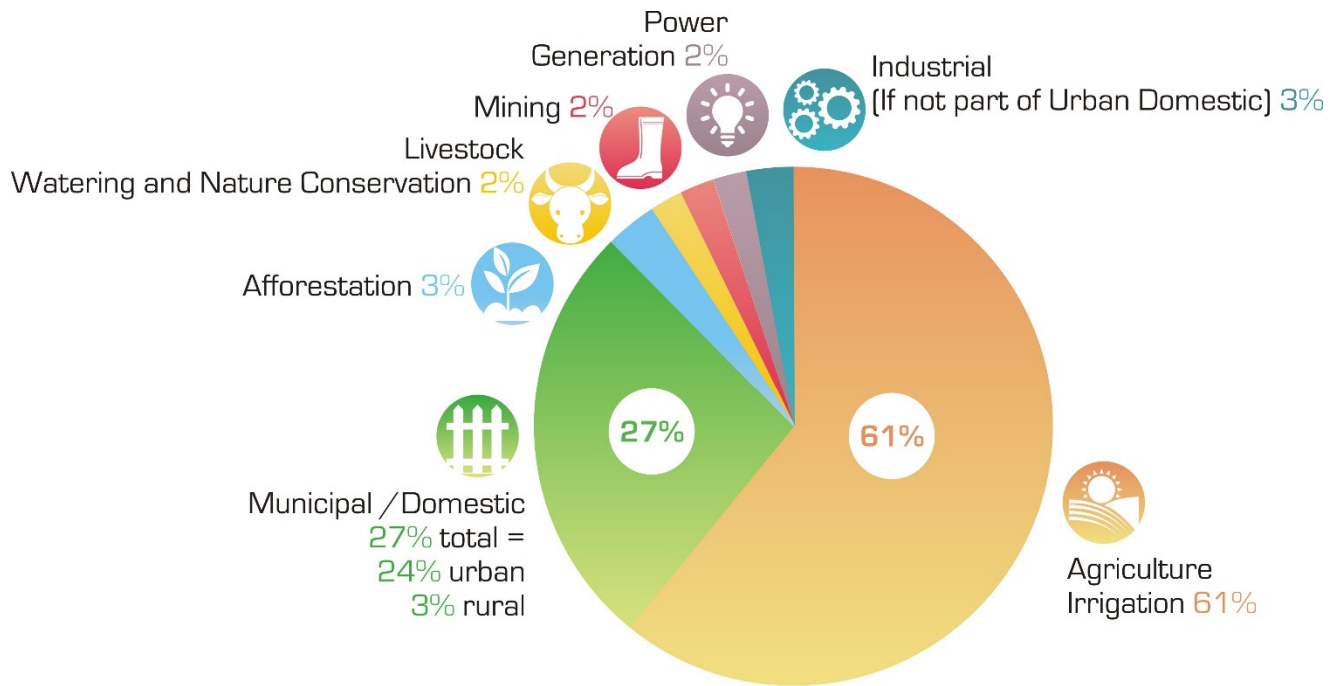
#### 3.1 Status quo

South Africa has an arid to semi-arid climate, with an average annual rainfall of 465 mm (half the world average), producing a total annual runoff of approximately 49 000 million m<sup>3</sup>/a. The current reliable yield of surface water at an acceptable assurance of supply is approximately 10 200 million m<sup>3</sup>/a nationally. Of this volume, around 70% is stored in the country's 252 largest dams.

**If demand continues to grow at current levels, the deficit between water supply and demand could be between 2,7 and 3,8 billion m<sup>3</sup>/a by 2030, a gap of about 17% of available surface and ground water.**

The total nationally accessible groundwater potential is about 4 500 million m<sup>3</sup>/a of which between 2 000 and 3 000 million m<sup>3</sup>/a is currently being utilised. Of the approximately 5 000 registered dams the vast number (3 832) are small dams (less than 12m) serving farms and municipalities. These smaller dams play a critical role in local water security and climate resilience.

Agriculture is the largest water user at 61% of total water use, followed by municipal use at 27% (including industrial and commercial users provided from municipal systems), with power generation, mining and bulk industrial use, livestock and conservation and afforestation jointly making up the remaining 12% (see Figure 3).



## How we use our water resources in South Africa

Figure 3: Current water use by sector

**Agriculture uses the most water in South Africa and pays the lowest tariff**

**On average, each person in South Africa uses 64 litres per day more than the global average**

**Municipalities are losing about 1.660 million m<sup>3</sup> per year through Non-Revenue Water. At a unit cost of R6/m<sup>3</sup> this amounts to R9.9 billion each year**

Agricultural consumption is largely unmetered, and there are concerns about unauthorised abstraction and water wastage in the sector. In addition, agricultural users pay a much lower tariff than other users of untreated water and the relatively cheap water has not incentivised the adoption of water efficient irrigation practices. However, the agricultural sector is important in terms of jobs and contribution to GDP. The value of primary agricultural production in South Africa was R263,2 billion in 2016.

Average domestic water use in South Africa is around 237 litres per person per day, 64 litres per person per day more than the world average of 173 litres per person per day. The high water use is partly due to municipal non-revenue water<sup>2</sup> which is currently at an unacceptably high 41%. While figures vary greatly between municipalities and services providers, average physical losses in municipal systems are estimated to be around 35%, against a global best practice in the order of 15%.

There is significant opportunity to reduce water requirements in the agricultural and municipal sectors, which are largest and second largest water uses in South Africa respectively. Any percentage reduction in water use in this sector will therefore

have a significant effect on total water requirements.

DWS, through the Strategic Water Partnership Network (SWPN) has implemented the Water

<sup>2</sup> Non-revenue water includes all water supplied that is not paid for, including physical water losses through leaks in the distribution system, illegal connections, unbilled consumption and billed, but unpaid for water use.

Administration System (WAS) Release Module at several irrigation schemes. With the WAS, it is possible to release the correct amount of water from a source according to demand, thereby reducing wastage.

59 out of 78 large government irrigation schemes submit monthly Water Use Efficiency Accounting Reports which indicate that average water loss in these schemes is around 27%. This is well above the unavoidable seepage and evaporation losses in concrete canals which are about 12% of the total loss.

Achievement of water demand targets in municipalities has been mixed. Figure 4 below indicates the targets and actual achievements for municipalities in eight large water supply systems for 2012 – 2016.

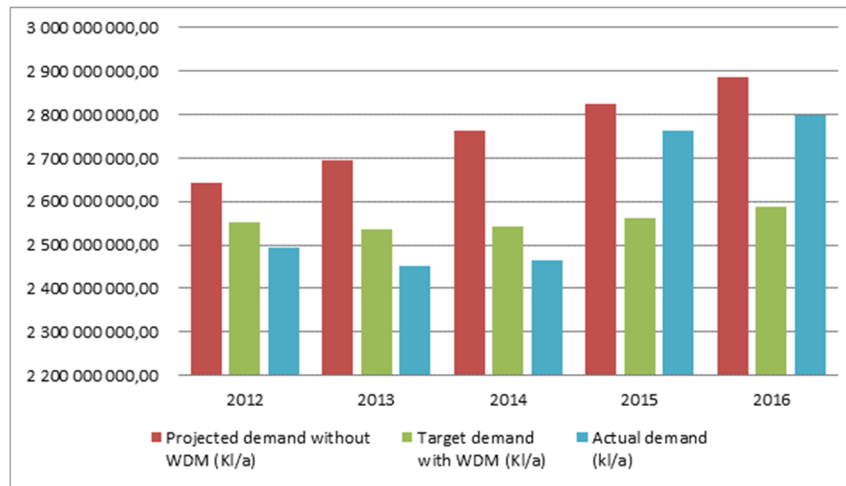


Figure 4: Municipal water use demand targets and actual in eight large water supply systems, 2012 - 2016

Re-use of effluent is becoming more cost effective with advances in technology, and treated effluent from wastewater and acid mine drainage (AMD) is being used to supplement water supply and this can be expanded considerably.

With the cost of desalination decreasing due to advances in technology, desalinated water (sea, brackish groundwater and waste water) is increasingly economically viable. While the utilisation of desalinated sea water is only financially feasible for coastal areas, it will free up surface and ground water for upstream and/or inland use where water is currently transferred or released for use in coastal areas. Desalination also has the potential to add jobs to the Blue Economy.

Water quality and quantity can be further augmented through planning for, restoring and maintaining ecological infrastructure such as strategic water source areas and wetlands, which are currently under-protected and often in poor condition. Investing in ecological infrastructure is often a cost-effective method for enhancing and supporting investment in built infrastructure.

### 3.2 Drivers

To balance requirements and supply, South Africa will need to **reduce water demand**, as well as **increase supply** for a growing population and economy. The Industrial Policy Action Plan (IPAP) sets out the intentions of South Africa in terms of expanding the manufacturing sector, which will increase water demand in this sector, and which has the potential to increase water pollution if not appropriately regulated.

The projected gap between requirements and supply is driven by low tariffs, inadequate cost recovery, over-consumption, inefficient use, wastage, leakage, inappropriate infrastructure choices (e.g. water borne sanitation in a water scarce country), inadequate planning and implementation, as well as

**The provision of waterborne sanitation is unsustainable and South Africa must adopt water-less sanitation technology**

population and economic growth.

Water availability and raw water quality will decline further if the degradation of aquatic ecosystems (including wetlands), poor land use practices, and high levels of water pollution continue.

In addition, climate change is projected to increase the variability of rainfall throughout the country, and to reduce average rainfall, particularly in the western part of the country. Climate change will result in more intense floods and droughts. Climate change may also increase the agricultural demand for water due to higher temperatures, and a reduced ability to rely on rain-fed agriculture.

The total requirements in the country will increase due to population and associated economic growth, but individual users' requirements should be reduced by improving efficiency, adopting new technologies, and reducing losses, especially in the agricultural and municipal sectors, through water awareness, and strict regulation, cost recovery and incentives.

As a target, average domestic consumption must be reduced to 175 litres per person per day by 2025. Further actions linked to reducing demand are addressed in the section on regulation. This must include a focus on water use efficiency, the quality of water and sanitation fittings (to ensure that they are low flow fittings and that they are robust and do not result in premature leakages), and the potential for rainwater harvesting in low income areas. The National Development Plan targets an average reduction in water demand of 15% below baseline levels in urban areas by 2030, where the baseline is taken as year 2012. This plan acknowledges and refers to the targets that have already been set for different catchments through the DWS-led Reconciliation Strategies and All-towns Studies<sup>3</sup>.

On the supply side, there is a need to optimise the water mix which is currently strongly dominated by surface water, with some groundwater and return flows to a water mix that includes increased groundwater use, re-use of effluent from waste water treatment plants, water reclamation, as well as desalination and treated acid mine drainage.

South Africa's dependence on surface water will decrease over the coming decades (see Figure 5). In the face of climate change, groundwater, which will not experience the increased evaporation that will impact on surface water as temperatures increase, will become increasingly important. Artificial recharge of aquifers will be an important element of water management.

**By 2040, treated acid mine drainage and desalinated seawater will make a significant contribution to South Africa's water mix, ground water usage will increase, and the over-reliance on surface water will reduce.**

<sup>3</sup> [http://www.dwa.gov.za/Projects/AllTownsRecStrat\\_NP/default.aspx](http://www.dwa.gov.za/Projects/AllTownsRecStrat_NP/default.aspx)

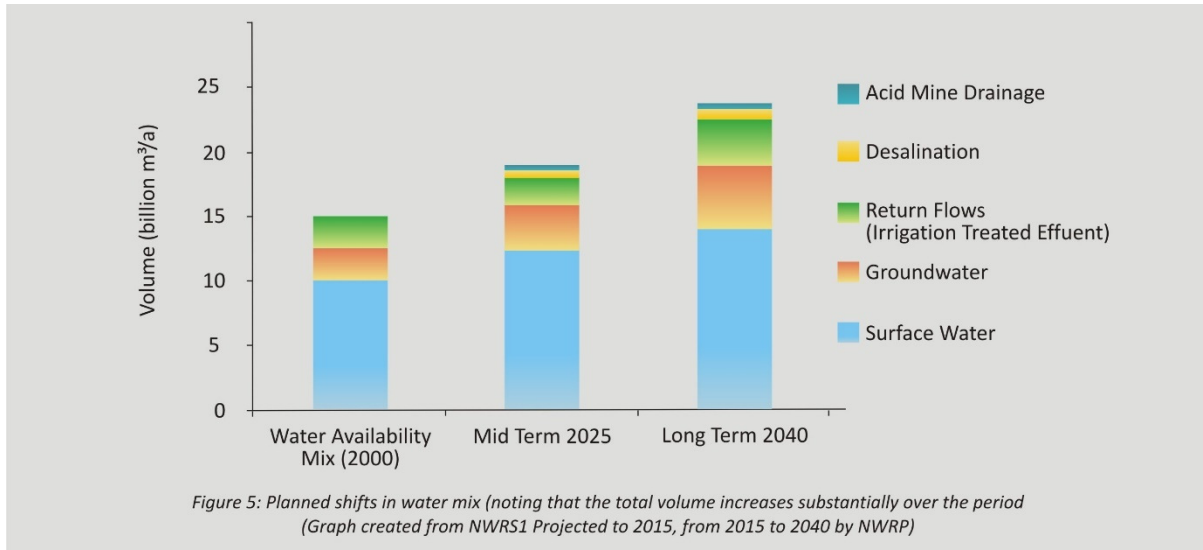


Figure 5: Planned shifts in water mix for short to medium term (noting that the total volume increases substantially over the period (Graph created from NWRS1 Projected to 2015, from 2015 to 2040 by DWS Directorate: National Water Resource Planning)

Delays in the implementation of Phase 2 of the Lesotho Highlands Water Project (LHWP) (to augment the Vaal River System for greater Gauteng), the uMkhomazi Water Project Phase 1 (to augment the Mgeni System for the KwaZulu-Natal Coastal Metropolitan Region) and the augmentation of the Western Cape Water Supply System have significantly impacted on the water security, and subsequently the socio-economies of these areas. The current water crisis in Cape Town serves as a stark reminder of the impacts of delayed action combined with extreme weather events.

In addition, South Africa has four internationally-shared river basins that contribute 45% of the country's total river flow. These resources must be shared equitably with neighbouring states who also have increasing water needs due to growing populations and economies.

**45% of the water in South Africa comes from rivers shared with neighbouring countries**

Table 1 below indicates how a range of infrastructure projects as well as demand management are needed if we are to build water security by 2030. Without demand management, currently planned infrastructure development and the broadening of the water mix will not be sufficient to balance supply and demand. However, if the targets of reducing physical losses in municipal systems are reached, as well as a reduction in the per capita consumption to the global average, in addition to the surface and groundwater supplies, and desalination, re-use and treated AMD, there will be a slight surplus available in 2030. It must be recognised, however, that achieving these targets will require significant investment and capacity. It must also be recognised, that these figures are national, and do not address specific areas where even bigger interventions will be required to address local shortages. These issues are addressed in more detail in *NW&SMP Volume Two: Plan to Action*.

Table 1: Provisional national water balance with and without critical interventions

Water use sectors	2030 water requirements projections (million m <sup>3</sup> )		
	Without demand management interventions	With urban losses reduced from 35% to 15%	Reduce domestic demand from 237 l/c/d to 175 l/c/d
Agriculture (irrigation and livestock watering)	9 700	9 700	9 700
Municipal (industries, commerce, urban and rural domestic)	5 800	4 941	3 696
Strategic/Power generation	430	430	430
Mining and bulk industrial	1 017	1 017	1 017
International obligations	178	178	178
Afforestation	434	434	434
<b>Total water requirements (2030)</b>	<b>17 559</b>	<b>16 700</b>	<b>15 455</b>
Total water available (2015)	13 949		
Increased surface water yield	874		
Increased groundwater use	405		
Desalination	588		
Re-use	110		
Treated AMD	0		
<b>Total water available (2030)</b>	<b>15 926</b>	<b>15 926</b>	<b>15 926</b>
Deficit/surplus	-1 633	-763	527
Deficit/surplus	<b>-10%</b>	<b>-5%</b>	3%

### 3.3 Key actions

Action	Responsibility	Completion date
<b>PLANNING</b>		
Update and maintain reconciliation planning studies to achieve optimal water mix (surface water, groundwater, re-use and desalination, and incorporate climate change into studies)	DWS	All major recon strategies updated annually
Integrate results of All Towns studies and reconciliation studies into sectoral plans (domestic, agriculture, energy, mining, industrial development, land reform and rural development)	DWS, DAFF, DoE, DMR, DTI, DRDLR	2022
Develop provincial W&SMPs	Provincial government	2019 and then five-yearly
<b>REDUCING DEMAND</b>		
Include water use efficiency and water loss reduction targets in the KPIs of municipal managers and municipal water services managers, and in municipal implementation plans.	DWS, COGTA, WSAs	2023

<b>Revitalise the No Drop Programme</b>	DWS	2018
<b>Revise regulations on municipal water tariffs and introduce a surcharge for high levels of use</b>	DWS	2020
<b>Implement the Water Administration System on all government irrigation schemes and reallocate savings to black applicants</b>	DWS, DAFF/PDAs	2023
<b>Develop centralised programme to drive municipal non-revenue-water improvements</b>	DWS, COGTA	2020
<b>Revitalise the No Drop programme and publish results</b>	DWS	2018, annually from then onwards
<b>Set a cap on water use per municipality</b>	DWS, SALGA, COGTA	2023
<b>Identify and prosecute major non-compliant abstractors (water thieves) across the country, with a national communication campaign to accompany the action</b>	DWS, DEA	10 by 2020 Additional 10 by 2023
<b>Establish Water Efficiency Labelling and Standards Scheme</b>	SABS, DWS	2026
<b>INCREASING SUPPLY</b>		
<b>Construct LHWP Phase 2 Water for the largest economic hub, Gauteng. System already in deficit.</b>	LHWC	2025
<b>Construct Western Cape Water Supply System Augmentation Project (Voëlvlei Dam) Water for the 2<sup>nd</sup> largest economic hub, Cape Town. System already in deficit.</b>	DWS	2024
<b>Construct Cape Town emergency desalination plants Water for the 2<sup>nd</sup> largest economic hub, Cape Town. System already in deficit.</b>	City of Cape Town	2018
<b>Construct uMkhomazi Water Project Phase 1 (81 m high Smithfield Dam, tunnel and pipeline) Water for the 3<sup>rd</sup> largest economic hub, eThekweni. System already in deficit.</b>	DWS and Umgeni Water	2025
<b>Construct desalination of AMD from the Wits mining basins in Gauteng ± 54,8 Mm<sup>3</sup>/annum Prevent pollution of critical Vaal System and provide need water</b>	DWS (TCTA)	In implementation
<b>Construct Thukela - Goedertrouw Emergency Water Transfer Scheme</b>	DWS	2019
<b>Construct Lower uMkhomazi Scheme South Coast in deficit with limited resources. Can also augment Mgeni System if needed.</b>	Umgeni Water	2022
<b>Increase groundwater use (including artificial recharge) and re-use of water</b>	DWS, Water Boards, WSAs	ongoing

#### 4. Redistributing water for transformation

#### 4.1 Status quo

Transformation is critical in three areas: ensuring that the use of water for productive purposes is equitable, making sure that the governance of water is representative, and ensuring access to decent water and sanitation services for all.

Despite both policy and legislative tools intended to enable the transformation of water allocation to redress the historical racial discrimination in access to water, little has been achieved since the National Water Act (NWA) was promulgated in 1998. This is particularly true in the agricultural sector, where around 95% of the water is estimated to be used by white commercial farmers.

Existing Lawful Use (ELU) was intended as a transitional arrangement. However, 20 years after the NWA was promulgated, ELUs authorise the biggest volume of water used in the country.

**More than 70% of commercial farms in South Africa are owned by white farmers, who also use 95% of the water allocated to the agricultural sector**

While the restitution of agricultural land has been slower than intended, the reallocation of water has not always even kept pace with the transfer of that land. In some instances, the previous owners traded away their existing lawful water use rights, so that the water allocation was not transferred to land reform beneficiaries. According to The Institute for Poverty, Land and Agrarian Studies, more than 70% of commercial farms in the country are owned by white farmers with about 39 000

white commercial farmers and 5 300 black farmers, according to the African Farmers Association of South Africa. Most of the black commercial farmers have relatively smaller farms.

Transformation of representivity in water governance has also been slow. Membership of water user associations generally reflects land ownership and water use, so that the governance of those associations is often focussed on white commercial farmers' interests.

The Irrigation Strategy developed by the Department of Agriculture, Forestry and Fisheries (DAFF) has identified water schemes where there is the potential for irrigation expansion. This expansion can contribute to access to water for black farmers.

#### 4.2 Drivers

The demand for land reform is high on the political agenda and will remain so until adequately addressed. Within the land reform programme, the transfer of some irrigable land without a water allocation has limited the ability of recipients to make productive use of the land. In addition, there are black farmers and entrepreneurs who have expressed their concerns about lack of access to water, and the challenges in getting water allocated for farming and enterprise development. The pressure to reallocate water to achieve more equitable water use thus remains high.

**To effect transformation, DWS will work with DAFF to identify available water to allocate to emerging black farmers**

#### 4.3 Key Actions

Action	Responsibility	Completion date
<b>Identify alternative sources of water and water that is not utilized (e.g. as mines are closing, resulting from War on Leaks etc) and allocate to black applicants</b>	DWS, CMAs	Initial mapping by 2019

Action	Responsibility	Completion date
Identify where water can be made available and allocates to black applicants	DWS, DAFF, CMAs	Allocation of water to begin in 2019
Identify areas where small dams or groundwater development can provide water for small scale black farmers	DWS, CMAs	Initial mapping by 2019
Align water, land and agrarian reform programmes and link to the Irrigation Strategy	DWS, DAFF, DRDLR	2018
Implement the Water Administration System on all government irrigation schemes and reallocate savings to black applicants	DWS, DAFF/PDAs	2023
Implement pilot project on voluntary contributions from farmers for water reallocation in prioritised catchments	DWS, IUCMA	2018
Use General Authorisation to enable and increase small scale water use by black farmers	DWS, DAFF	2019

## 5. Managing effective water and sanitation services

### 5.1 Status quo

Everyone living in South Africa has a constitutional right of access to at least basic water supply and basic sanitation services and the country has progressed well in delivering infrastructure to provide these services with 89% of households now having access to water supply infrastructure<sup>4</sup>. However, while service provision has advanced, reliability of these services remains a challenge. Only 64% of households are estimated to have a *reliable* water supply service – a lower figure than in 1996 (see Figure 6) with some 11% of water supply schemes being completely dysfunctional. In the 27 priority district municipalities the water reliability is only 42%, with the worst 10 WSAs below 30% reliability.

**56%** of waste water treatment works in South Africa do not work properly

**44%** of water treatment works do not work properly

The capacity of WSAs to operate, maintain and manage assets for existing infrastructure needs urgent attention.

Interruption in water supply (unreliability) and blocked and overflowing sewers are two of the key public frustrations leading to protests and vandalism.

Approximately 56% of the over 1 150 WWTW and approximately 44% of the 962 WTWs are in poor or critical condition and in need of urgent rehabilitation. Poor water and wastewater treatment has significant implications for public health.

Current access to sanitation services is around 80% nationally. However, delivery is uneven and, in some municipalities, only 50% of residents have access to adequate sanitation facilities.

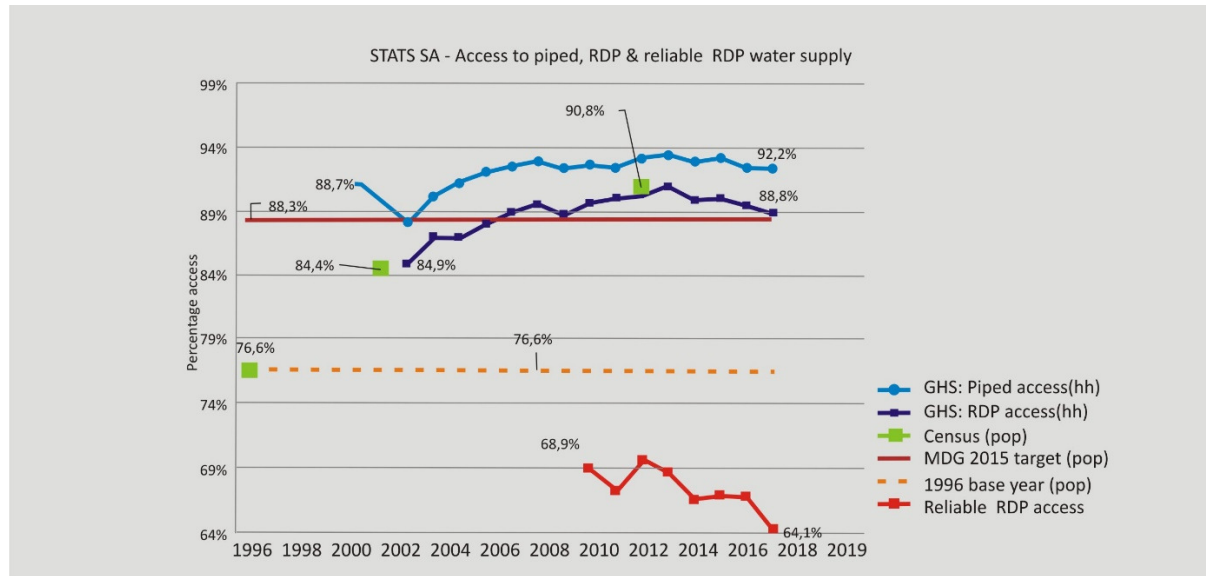
Over the years, several interventions have been put in place by national government, including interventions under section 196 of the Constitution, and, most recently, the Back-to-Basics campaign and the Municipal Infrastructure Support Agent (MISA)

<sup>4</sup> StatsSA General Household Survey

instituted by the Department of Cooperative Governance and Traditional Affairs (COGTA). Despite these interventions, as well as many water and sanitation specific interventions by DWS, in some cases repeatedly in the same municipality, failures in water supply and sanitation services continue, not least due to a lack of skilled and experienced technical staff.

There are also challenges in the effective operation and maintenance of bulk water supply and sanitation infrastructure by water boards, DWS and other government departments.

**Municipal water reticulation infrastructure includes more than 290 000 km of pipelines, an estimated 7,7 million house connections, over 5 million yard taps and more than 2,1 million street taps<sup>5</sup>.**



<sup>2</sup> Stats SA general household survey  
<sup>3</sup> Stats SA community survey 2016

Figure 6: Access to piped, RDP and reliable RDP water supply (Source: StatsSA)

The failure of some municipalities to provide reliable water and sanitation services is largely due to the lack of technical skills, institutional capacity and funding to operate, maintain and manage water and waste water infrastructure assets properly. Further contributors towards the poor reliability of water and sanitation services is the limited budget allocated by some municipalities for operations and maintenance relative to that allocated to new capital works, poor revenue management, and the failure of municipalities to employ appropriately qualified technical staff. In addition, the national infrastructure grant funding mechanisms incentivise the building of new infrastructure, rather than the maintenance of existing infrastructure.

The nature of internal decision-making systems and procedures in municipalities also make it difficult for water services managers to respond effectively to the need to provide reliable services. These systems are informed, inter alia, by the Municipal Financial Management Act (MFMA) and the Municipal Systems Act.

South Africa has several well performing municipalities that have been internationally recognised: eThekweni was awarded the Stockholm Water Industry Award in 2014.

<sup>5</sup> StatsSA Community Survey 2016

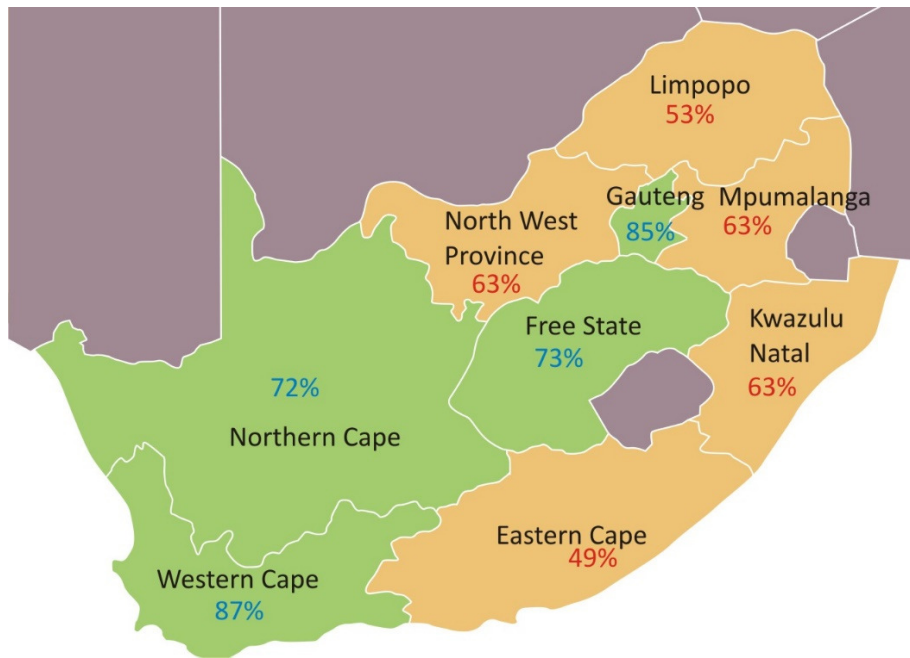


Figure 7: Reliability of water services per province

## 5.2 Drivers:

In line with the global Sustainable Development Goals, and the aspirations of the NDP, the national targets for water supply and sanitation are as follows:

Target	Date
<b>Achieve universal, sustainable sanitation provision</b>	2020: 90%
	2030: 100%
<b>Achieve universal, sustainable and reliable water supply provision</b>	2019: 90%
	2030: 100%

These targets must be met in a sustainable manner, with effective operation and maintenance, so that the services provided are reliable over time, and are accessible to all people, including those living with disabilities.

The constitutional water supply and sanitation responsibility lies with 144 municipalities that are water services authorities (WSA). At least 33% of these municipalities are regarded as dysfunctional and more than 50% have no or very limited technical staff. The 27 priority district municipalities have been identified as being particularly dysfunctional and requiring specific intervention.

Some **77%** of rural households are indigent and are not required to pay for municipal services

In addition, many of the smaller and/or rural municipalities are faced with financial challenges. The socio-economic profile of South Africa is highly variable with 63% of households earning less than R38 000 per year (and therefore classified as indigent). Municipalities with high levels of indigent households are dependent on national grants to provide reliable and affordable water and sanitation services. In rural and/or smaller municipalities, the proportion of indigent households averages 77%. It is consequently difficult for municipalities with a low revenue base to address their backlogs and to allocate sufficient funds for maintaining and operating existing works. In some areas, major water infrastructure runs through rural areas without supplying them (such as the Tugela-Vaal scheme).

**South Africa's population is rapidly urbanising, placing strain on service delivery in municipalities**

South Africa is currently in a low economic growth climate and the number of indigent households is not expected to decrease in the short term. In addition, high rates of urbanisation have a major impact on the demand for water supply and sanitation services. South Africa is currently 65% urbanised and the NDP estimates that urban populations will

grow by 10% every two decades. Increasing urbanisation will place more pressure on cities to deliver affordable and reliable water and sanitation services to larger numbers of poor households.

Aging, poor quality and poorly maintained infrastructure is contributing to high levels of water wastage and pollution of rivers and groundwater with sewage.

### 5.3 Key Actions:

The national capacity to operate, maintain and manage water supply and sanitation assets requires urgent attention. Key actions are:

Action	Responsibility	Completion date
<b>Establish a Municipal Intervention Unit for Water and Sanitation, in DWS, staffed with highly competent experts to drive a national programme of intervention at the municipal level</b>	DWS	2019
<b>Develop and implement a long-term plan for the turnaround of water supply and sanitation services in the country that:</b> <ul style="list-style-type: none"> <li>- Is based on a sector-wide approach;</li> <li>- Recognises the role of DWS as regulator of water and sanitation provision</li> <li>- Establishes, in DWS, a Municipal Intervention Unit for Water and Sanitation, staffed with highly competent experts to drive a national programme of intervention at the municipal level</li> <li>- Categorises municipalities according to the critical challenges that they are facing and adopts a differentiated approach in responding to such challenges;</li> <li>- Revisits the powers and functions of municipalities</li> <li>- Reviews the requirements of chapter 8 of the Municipal Systems Act and addresses the option of national level intervention in the appointment of a WSP where municipalities consistently fail to deliver universal reliable services;</li> <li>- Reviews the MFMA and the Municipal Systems Act to ensure that they provide an enabling environment for the provision of reliable water and sanitation services;</li> </ul>	DWS, COGTA, NT, SALGA,	Plan developed by March 2019 Review of plan bi-annually

Action	Responsibility	Completion date
<ul style="list-style-type: none"> <li>- Provides clear protocols for when support is to be given to municipalities and when strict regulation is in order</li> <li>- Draws on the capacity of regional water utilities, stronger municipalities, national government and the private sector to support the provision of reliable services,</li> <li>- Revisits levels of service for water supply and sanitation against issues of affordability, and</li> <li>- Assesses tariffs and addresses revenue generation potential</li> <li>- Investigates and promotes alternative service delivery models such as BOTT (build, operate, train and transfer), management contracts and concessions, and</li> <li>- Makes explicit the role of DWS in planning for regional bulk infrastructure.</li> </ul>		
<b>Develop and implement a long-term plan to provide reliable and sustainable water supply and sanitation to 3,4 million households in the 27 priority DMs</b>	DWS, COGTA, NT, SALGA, 27 DMs	2019: 90% 2030: 100%
<b>Restructure the grant funding mechanisms and conditions for water supply and sanitation</b> <ul style="list-style-type: none"> <li>• Focus to be on maintaining and restoring existing infrastructure rather than the construction of new infrastructure</li> <li>• Lifecycle planning (asset management) conditions to be set by DWS</li> <li>• Maintenance grants to be prioritised for social schemes</li> </ul>	DWS, National Treasury, COGTA	2020
<b>Standardise and enforce required O&amp;M budgeting and expenditure</b>	National Treasury, CoGTA, DWS	As from 2018/2019 Municipal Financial year
<b>Develop centralised programmes to obtain economies of scale and to ensure impact in, for example, driving municipal non-revenue-water improvements, and assessing the cost-effectiveness and appropriate systems for desalination</b>	DWS, COGTA	2020
<b>Turn around the functionality of five, currently dysfunctional, large waste water treatment works with an accompanying publicity campaign, followed by a programme addressing the rest</b>	DWS, WSAs, NT	2022 2030
<b>Include water use efficiency and water loss reduction targets in the KPIs of municipal managers and municipal water services managers, and in municipal implementation plans.</b>	DWS, COGTA, WSAs	2023
<b>Revise regulations on municipal water tariffs and introduce a surcharge for high levels of use</b>	DWS	2020

Action	Responsibility	Completion date
Revitalise the Green, Blue and No Drop programmes and publish results	DWS	2018, annually from then onwards
Set a cap on water use per municipality	DWS, SALGA, COGTA	2023
Establish Regional Water Utilities (RWUs) to manage regional bulk water supply; assist municipalities to perform their primary water services mandate where necessary, manage regional water resources infrastructure, manage regional bulk WWTW.	DWS, Water Boards	Rand Water RWU April 2018; KZN RWU April 2018 Sedibeng Magalies RWU April 2019 Lepelle RWU April 2020 Bloem RWU April 2020
Develop and implement a mandatory, modular hands-on qualification for municipal water managers to be run over 18 months and accredited by EWSETA to include aspects such as asset management, tariffs and revenue management, drought management, stakeholder engagement and customer relations.	DWS, EWSETA	First course to be run in 2020/21
Establish regulations on required qualifications and experience for senior and technical positions in water boards and municipal water services	DWS, COGTA	2020
Develop and implement a programme for recruiting and retaining experienced technical and managerial staff with technical qualifications in South Africa and externally	DWS, COGTA, DIRCO	2020
Ensure cost efficiency in municipal services through <ul style="list-style-type: none"> <li>• Benchmarking</li> <li>• Effective asset maintenance</li> <li>• Proper allocation of O&amp;M subsidies</li> <li>• Value for money procurement</li> </ul> Cost reflective tariffs for water services and sanitation	DWS, SALGA, National Treasury, COGTA	2023
Resolve the accumulated debt between water services authorities, water service providers and the DWS (exceeding R10 billion)	DWS, NT, CoGTA, SALGA, Portfolio Committee	2020

## 6. Regulating the water and sanitation sector

### 6.1 Status Quo

DWS is responsible for the regulation of the use of raw water across the country. This includes authorisation for water abstraction, waste discharge, and dam safety, and setting the charges for the use of raw water and the discharge of effluent. There are in the region of 80 000 water use

authorisations, either under the existing lawful use or through water use licences, with around 60 000 unique users. Of these, about only around 8 000 obtain their water from state-owned water resources infrastructure.

DWS also sets standards for water and sanitation services provision and associated tariffs, which are also governed by the Municipal Systems Act and the Municipal Finance Management Act. There are significant challenges in ensuring that WSAs set appropriate tariffs that cover costs, including operation and maintenance costs, and that promote water use efficiency.

WSAs are responsible for developing by-laws that, amongst others, enable regulation of water services provision and use within its area of jurisdiction.

The South African Bureau of Standards (SABS) sets several water quality standards for the water sector, including drinking water standards (SANS 241).

## 6.2 Drivers

Strong regulation is critical to achieve water security in South Africa, in terms of water quality (in rivers and taps), balancing demand and supply, ensuring the safety of dams, and being resilient to climate change impacts.

Despite strong regulatory tools in the legislation, the quality of raw water continues to deteriorate across the country, with high levels of water theft and water wastage continuing. The continued use of water under ELU of the National Water Act is hampering the redistribution of water and effective regulation of this water use. The need to use the courts to impose sanctions on those contravening the water legislation hampers the ability to get speedy resolution on such matters.

**DWS will revitalise the Green, Blue & No Drop programmes**

Dam safety regulation is under threat from limited qualified people in the country: currently there are less than 100 dam safety approved professional persons (APPs) in South Africa (approximately 1 qualified person for every 50 dams on the Dam Safety register), and more than 66% of these are older than 60 years of age.

There are less than 100 dam safety Approved Professional Persons in South Africa, and more than 66% of these are older than 60.

Some municipalities fail to deliver the requisite level of water supply and sanitation, including failing to meet drinking water quality standards. In the 2014 Blue Drop assessment, 86% of WSAs achieved good or excellent status for microbiological water quality compliance, but only 70% achieved good or excellent status for water quality operational compliance.

## 6.3 Key Actions

Action	Responsibility	Completion date
<b>Revitalise the Green, Blue and No Drop programmes and publish results</b>	DWS	2018, annually from then onwards
<b>Set a cap on water use per municipality</b>	DWS, SALGA, COGTA	2023
<b>Identify and prosecute major non-compliant abstractors (water thieves) across the country, with a national communication campaign to accompany the action</b>	DWS, DEA	10 by 2020 Additional 10 by 2023

Action	Responsibility	Completion date
<b>Establish Water Efficiency Labelling and Standards Scheme</b>	SABS, DWS	2026
<b>Replace all ELU with licences with enforceable water use conditions</b>	DWS, CMAs	2028
<b>Identify and prosecute big polluters across the country (including municipalities), with a national communication campaign to accompany the action</b>	DWS, DEA	10 by 2020 Additional 10 by 2023
<b>Establish a mechanism for applying administrative penalties</b>	DWS, Dept of Justice	2023
<b>Include water use efficiency and water loss reduction targets in the KPIs of municipal managers and municipal water services managers, and in municipal implementation plans.</b>	DWS, COGTA, WSAs	2023
<b>Revise regulations on municipal water tariffs and introduce a surcharge for high levels of use</b>	DWS	2020
<b>Standardise and enforce required O&amp;M budgeting and expenditure</b>	National Treasury, CoGTA, DWS	As from 2018/2019 Municipal Financial year
<b>Develop and implement a diffuse pollution source strategy that includes the regulation of land use</b>	DWS	Strategy to be implemented by Jan 2023
<b>Implement the Waste Discharge Charge Systems in the upper Crocodile, upper Vaal, and upper Olifants catchments</b>	DWS, CMAs	Revenue to be received in 2019
<b>Develop and implement municipal bylaws to protect raw water quality</b>	DWS, SALGA, municipalities	2020
<b>Declare strategic water source areas and critical groundwater recharge areas as protected areas</b>	DWS, DEA	2021
<b>Establish financially sustainable CMAs (or one CMA) across the country, and transfer staff and budget and delegated functions, including licensing of water use.</b>	DWS	Functional CMA(s) December 2019
<b>Establish regulations on required qualifications and experience for senior and technical positions in DWS, CMAs, water boards and municipal water services</b>	DWS, COGTA	2020
<b>Review the raw water pricing strategy and implement the waste discharge charge</b>	DWS	2019

## 7. Improving raw water quality

### 7.1 Status quo

Raw water quality, being the chemical, physical and biological characteristics of water bodies (rivers, dams, lakes, wetlands, estuaries and ground water) shows ongoing deterioration in many parameters. This deterioration poses a threat to economic growth, social development and aquatic ecological

functioning.

## Water quality problems across South Africa [Adapted from Ashton, 2009]

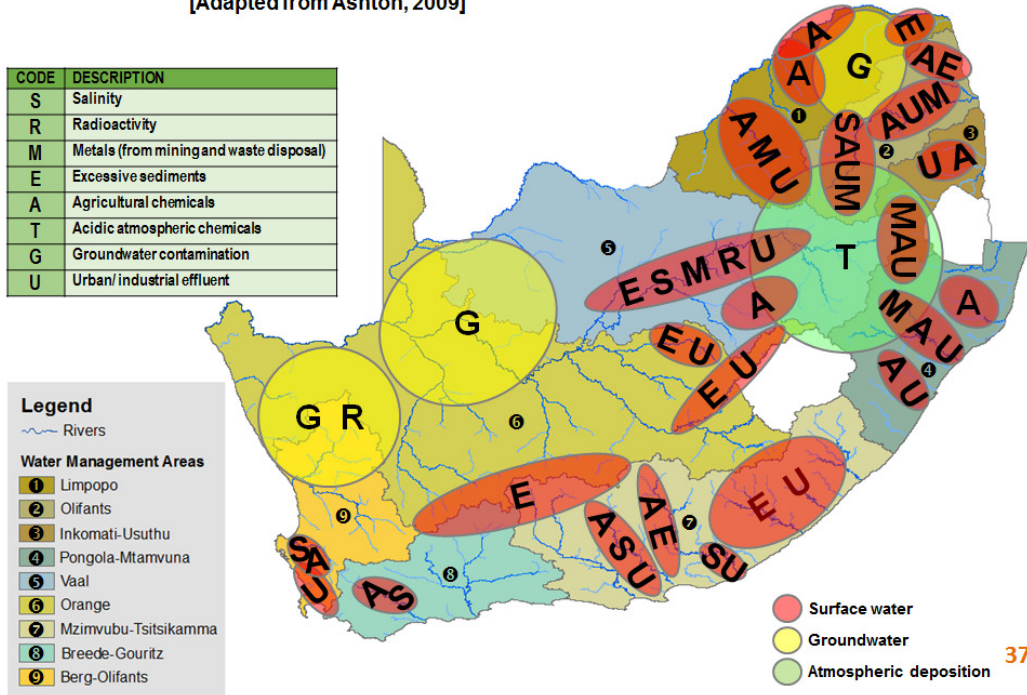


Figure 8: Map of key water quality issues across South Africa (adapted from Ashton 2009)

Raw water quality is altered by:

- point source discharges such as the effluent discharged from municipal and industrial wastewater treatment works, untreated effluent discharges by industrial users, inadequate on-site sanitation facilities, and polluted stormwater.
- diffuse pollution sources, such as runoff affected by atmospheric deposition or land use practices, including water either draining through or running off fertilized agricultural land, wash-off from industrial sites, mine residue deposits and mining areas, wash-off from settlements and built up areas, and erosion.
- Raw water quality is also dependent on the amount of water remaining in the source that is available to dilute the discharges. Current regulation focuses mostly on the control of point sources of pollution.

**Pollution of rivers results in poor raw water quality which is driving up the cost of municipal water treatment**

Poor raw water quality increases the costs of treatment for domestic and industrial use. Poor water quality also impacts negatively on agricultural production. It is generally cheaper to treat water at the point of discharge, where the pollution is still relatively concentrated and hence contained, than it is to treat water once the pollution has dispersed into a larger water body and mixed with multiple other pollutant types. The cost of pollution should be borne by the polluter and not externalised to down-stream water users or the state.

Poor raw water quality, together with sedimentation caused by elevated levels of suspended solids in water, and the damming of rivers, have significant impacts on the ecology of rivers, estuaries and

wetlands and their subsequent ability to provide services and benefits to people.

The discharge of water into a water source is classified as a water use and is governed by the National Water Act (NWA) and regulated by DWS to ensure that the water in receiving water resources is fit for use.

## 7.2 Drivers

South Africa is already experiencing significant impacts on water quality from mining, industry, agriculture, settlements, and poorly operated and maintained municipal wastewater treatment works, in many cases operated beyond design capacity. Without effective regulation, several “mega-trends”, in addition to the current challenges, can be expected to lead to new or accelerated water quality challenges. These include: climate change; hydraulic fracturing; further industrial development including the discharge of emerging pollutants, excessive use of fertilisers, insecticides and herbicides in the agricultural sector, and rural-urban migration and the growth of inadequately serviced densely populated settlements. Deteriorating water quality is putting human and animal health at risk, impacting negatively on aquatic ecosystems, and imposing significant costs on the economy.

## 7.3 Key Actions

Action	Responsibility	Completion date
<b>Develop and implement a diffuse pollution source strategy that includes the regulation of land use</b>	DWS	Strategy to be implemented by Jan 2023
<b>Implement the Waste Discharge Charge Systems in the upper Crocodile, upper Vaal, and upper Olifants catchments</b>	DWS, CMAs	Revenue to be received in 2019
<b>Implement programmes to rehabilitate and manage water quality in the upper Crocodile, upper Vaal, and upper Olifants catchments based on revenue from the WDCS</b>	DWS, CMAs	Planning during 2018 - 2020; Implementation to start from 2021
<b>Develop and implement municipal bylaws to protect raw water quality</b>	DWS, SALGA, municipalities	2020
<b>Construct desalination of AMD from the Wits mining basins in Gauteng ± 54,8 Mm<sup>3</sup>/annum Prevent pollution of critical Vaal System and provide need water</b>	DWS (TCTA)	In implementation
<b>Restructure the grant funding mechanisms and conditions for water supply and sanitation</b> <ul style="list-style-type: none"> <li>• Focus to be on maintaining and restoring existing infrastructure rather than the construction of new infrastructure</li> <li>• Lifecycle planning (asset management) conditions to be set by DWS</li> </ul> <b>Maintenance grants to be prioritised for social schemes</b>	DWS, National Treasury, COGTA	2020
<b>Standardise and enforce required O&amp;M budgeting and expenditure</b>	National Treasury, CoGTA, DWS	As from 2018/2019 Municipal Financial year

Action	Responsibility	Completion date
Turn around the functionality of five, currently dysfunctional, large waste water treatment works with an accompanying publicity campaign, followed by a programme addressing the rest	DWS, WSAs, NT	2022 2030
Identify and prosecute big polluters across the country (including municipalities), with a national communication campaign to accompany the action	DWS, DEA	10 by 2020 Additional 10 by 2023
Establish a mechanism for applying administrative penalties	DWS, Dept of Justice	2023
Secure financial flows for restoration and ongoing maintenance of ecological infrastructure through operationalising the water pricing strategy	DWS, DEA, SANBI	2022
Monitor and report annually on rainfall, streamflow, dam levels, key water quality parameters	DWS, SAWS	2019, then annually
Establish regulations on required qualifications and experience for senior and technical positions in DWS, CMAs, water boards and municipal water services	DWS, COGTA	2020
Develop and implement a programme for recruiting and retaining experienced technical and managerial staff with technical qualifications in South Africa and externally	DWS, COGTA, DIRCO	2020
Define (and reinstate in some cases) career paths with defined training and on the job experience to build cadre of sector professionals	DWS, WSAs, WBs, CMAs	2019

## 8. Protecting and restoring ecological infrastructure

### 8.1 Status quo

South Africa is known for its rich diversity of ecosystems. Our aquatic ecosystems include seven of the world's freshwater ecoregions, and are characterised by a wide range of river, wetland and estuarine ecosystem types. Together with their catchments, many of these aquatic ecosystems make up South Africa's ecological infrastructure (nature's equivalent of built infrastructure) that generates and delivers benefits in the water value chain. Ecological infrastructure is currently an under-realised asset that can play a significant role in enhancing returns on investment in built infrastructure (such as dams), especially if the maintenance of ecological infrastructure is explicitly incorporated into the planning and construction of built infrastructure.

Many of our high value aquatic ecological infrastructure assets are poorly protected, and in some areas of the country they are under severe pressure, for example from intensive agriculture, mining and urban sprawl that results in loss or degradation of ecosystems. Like built infrastructure, ecological infrastructure needs to be maintained, and in some cases restored, in order for its socio-economic benefits to be realised.

**Between 1999 and 2011 river health deteriorated across all South Africa's nine water management areas. The extent of main rivers in South Africa with a poor ecological condition increased by 500% between 1999-2011 with many rivers pushed beyond the point of recovery. The extent of tributaries with a poor ecological condition increased by 229% in this same period (see Figure 9). Healthy tributaries often play a critical role in maintaining flow and water quality in hard-working main rivers.**

**It is estimated that South Africa has lost over 50% of its wetlands, and of the remaining 3.2 million ha (less than 5% of SA's land cover) a third are already in a poor condition (see Figure 10), limiting their ability to, for example, regulate water flow and purify water.**

About **50%** of South Africa's water resources originate from **8%** of our land.

These strategic water sources ('water factories') must be protected and maintained through appropriate regulation.

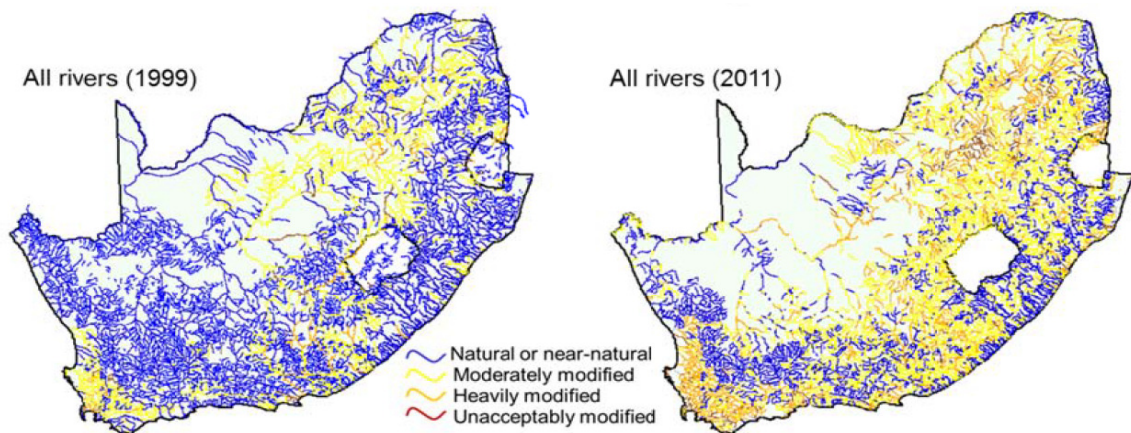


Figure 9: Deterioration of ecological condition of South African rivers, 1999 – 2011 (Source: Nel, J.L. & Driver, A. 2015. National River Ecosystem Accounts for South Africa)

The loss and degradation of ecological infrastructure negatively affects system yield and increases water-related risks. Degraded wetlands, for example, lose their ability to release water in times of drought, or to recharge groundwater supplies. Degraded ecological infrastructure increases the vulnerability of people and built infrastructure to floods and increases maintenance and repair costs on built infrastructure. It is often more cost effective to rehabilitate ecological infrastructure than to be faced with an ongoing need to repair or replace built infrastructure.

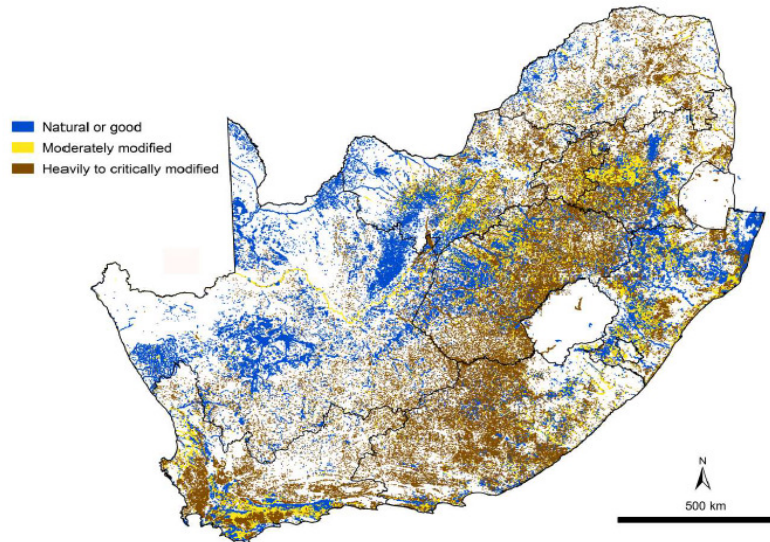


Figure 10: Ecological condition of South African wetlands, 2011 (Source: Nel J.L. and Driver A. 2012. South African National Biodiversity Assessment 2011: Technical Report. Volume 2: Freshwater)

## 8.2 Drivers

**Annual loss of water from Cape Town’s catchments due to invasive alien plants is at least equivalent to a dam the size of Wemmershoek.**

**The capacity of catchment-based institutions to harness the value of ecological infrastructure in the water value chain needs urgent attention.**

An increasing population, rapid urban expansion, widespread mining, increasing water storage and abstraction, the spread of invasive alien species and poor agricultural practices are the main drivers of degradation of water-related ecosystems and ecological infrastructure. Mining in strategic water source areas poses a threat to water security both in the short-term but also in the long-term.

The main pressures on river ecosystems arise from the alteration of flow through dams and abstraction, the destruction of natural vegetation along river banks, the growth and spread of invasive alien species, and pollution from point and diffuse sources.

The main pressures on wetland ecosystems are mining, construction, cultivation, urban development, and inadequate grazing management which causes erosion.

The South African Biodiversity Institute (SANBI), DWS and the Council for Scientific and Industrial Research (CSIR) have identified key strategic water source areas in the country which must be protected and maintained if water security is to be achieved (Figure 11 below). The Department of Environmental Affairs (DEA) and SANBI have received funding from the Global Environment Facility (GEF) for improving financial flows for restoring ecological infrastructure and for strengthening institutional capacity for this task.

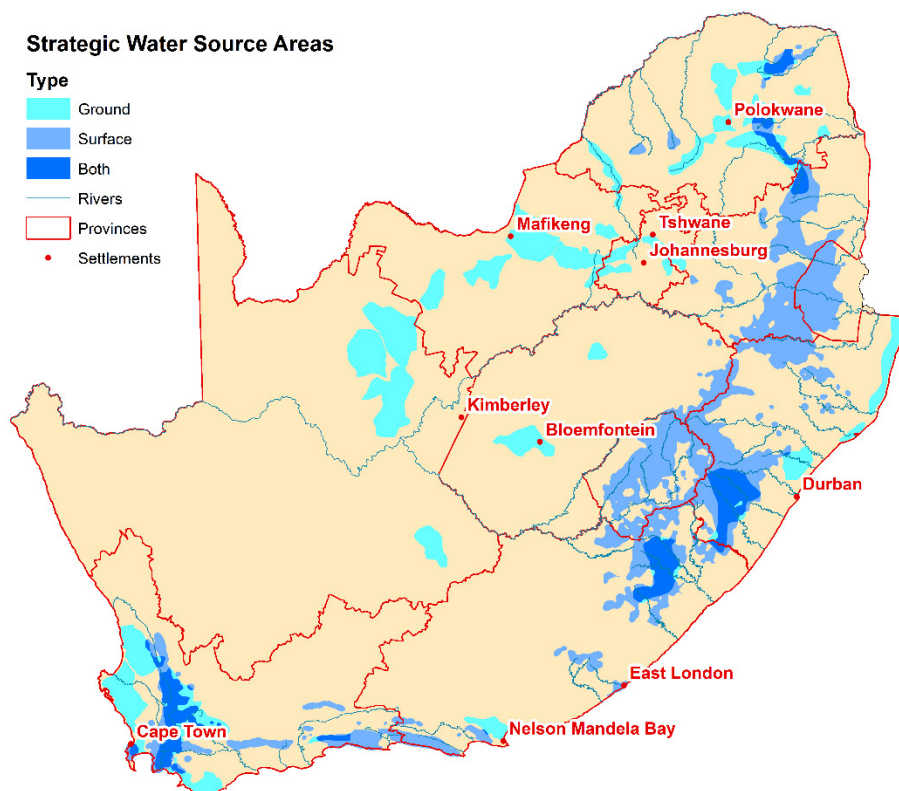


Figure 11: Strategic water source areas: the 8% of South Africa’s land that delivers 50% of our water

### 8.3 Key Actions

Action	Responsibility	Completion date
Declare strategic water source areas and critical groundwater recharge areas as protected areas	DWS, DEA	2021
Secure financial flows for restoration and ongoing maintenance of ecological infrastructure through operationalising the water pricing strategy	DWS, DEA, SANBI	2022
Improve institutional capacity for investment in ecological infrastructure	DWS, DEA, SANBI	2022
Develop and implement a diffuse pollution source strategy that includes the regulation of land use	DWS	Strategy to be implemented by Jan 2023
Implement programmes to rehabilitate and manage water quality in the upper Crocodile, upper Vaal, and upper Olifants catchments based on revenue from the WDCS	DWS, CMAs	Planning during 2018 - 2020 Implementation to start from 2021



## SECTION 2: ENABLING ENVIRONMENT

### 9. Creating effective water sector institutions

#### 9.1 Status quo

The state water and sanitation sector is currently comprised of a large number of institutions with a complex suite of functions divided amongst them, which creates an overly complex value chain. The Minister of Water and Sanitation and DWS are the executive arm of national government responsible, amongst other things, for water and sanitation policy, regulation of water supply and sanitation provision, oversight of water sector institutions, water resources planning, operation and maintenance of 342 large dams, regulation of water use and collection and assessment of water data.

COGTA is responsible for ensuring that all municipalities perform their basic responsibilities and functions consistently, including supporting the delivery of municipal services to the right quality and standard; promoting good governance, transparency and accountability; and ensuring sound financial management and accounting. However, in relation to water supply and sanitation, DWS is the accountable national department.

The South African Local Government Association (SALGA) is an autonomous association of all South African local governments, with the mandate to represent, promote and protect the interests of local governments and to raise the profile of local government.

National Treasury plays a critical role in the water and sanitation sector, not only through the provision of grants for water and sanitation provision, but also through their oversight of municipal finances. In 2017 they introduced a municipal standard chart of accounts (mSCOA) which enforces the uniform collection of local government transactional information including on asset management and maintenance. The Trans Caledon Tunnel Authority (TCTA) was initially established to fund the Lesotho Highlands Water Project (LHWP), but subsequently directed by the Minister to fund and implement a variety of water resource projects as an implementing agent for DWS.

Only two of nine envisaged catchment management agencies (CMAs) have been established in terms of the National Water Act. No functions have been delegated to these bodies which are therefore currently only responsible for the limited initial functions of a CMA as set out in the Act.

Water boards, established in terms of the Water Services Act, have a primary function of providing water services to other water services institutions and with secondary functions which could include supporting municipalities.

144 municipalities are designated as WSAs, responsible for the constitutionally mandated task of

supplying potable water and sanitation services, either as water service providers (WSPs) themselves, or externally through third party WSPs.

90 Water User Associations (WUAs) and 177 Irrigation Boards (IBs) exist to manage common water resources, in some cases including infrastructure for irrigation and some of these for government water schemes (GWS).

There are transboundary watercourse commissions in the Orange Senqu, the Limpopo and IncoMaputo basins, as well as KOBWA (Komati basin water authority) and the Lesotho Highlands Water Commission which are responsible for transboundary infrastructure.

The Water Research Commission (WRC) commissions research into water and sanitation issues, funded by a levy paid by water users. The WRC thus exists to drive research, development and innovation (RDI) strategy, fund research activities and organisations and synergise with partners to shift solutions to practice.

## 9.2 Drivers

There are several challenges associated with the current institutional arrangements that need to be addressed to create appropriate and effective institutions with clear mandates, not least the overly complex value chain of institutions currently in place. The possible future institutional arrangements are set out in Figure 12. Those with dotted lines around the boxes are currently under discussion and/or consultation, and have not yet been finally decided on, although the nine regional water utilities will replace the existing water boards, there are already 2 CMAs established, and the local water resource management institutions will replace existing WUAs and IBs.

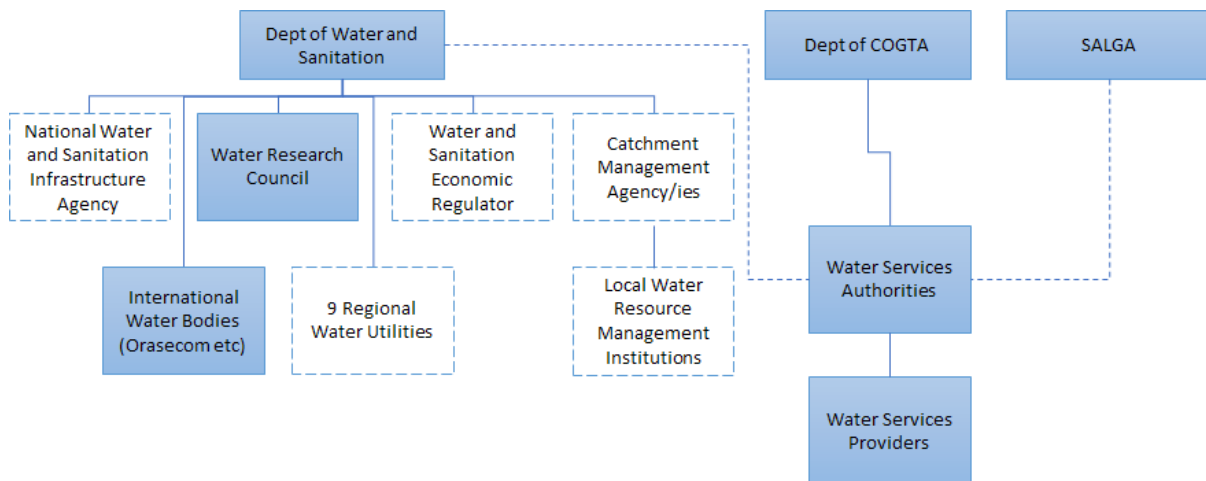


Figure 12: Planned institutional arrangements for the water sector

DWS is policy maker, regulator, implementer and operator of water resource infrastructure and acts as CMA in most of the country. Some of these roles have potential conflicts of interest, while, water resources regulation, which is local in nature, could be performed better by more decentralised institutions.

The TCTA funds off-budget infrastructure development, while DWS funds the social portion of schemes and plans and develops national infrastructure. The TCTA also acts as an implementing agent for DWS. A National Water and Sanitation Infrastructure Agency (NAWASIA) will be established which

will develop, operate and manage national water infrastructure and will develop new capability around bulk sanitation provision.

**The institutional landscape of the water sector in South Africa is overly complex resulting in inefficiency. A lack of transformation in certain areas must also be addressed.**

The establishment of CMAs has progressed slowly with only two of nine planned CMAs established and functional. As an alternative approach, DWS is currently consulting on the possible establishment of one single national CMA. To make this effective at the local level, stakeholder structures in the WMAs will be critical.

The water boards are of different sizes and capabilities, with only a few technically and financially strong, each serving one or more major cities, while the smaller boards are technically and financially stretched and are serving economically weaker and less dense areas. Rand Water and Umgeni Water together make up 75% of national water board capacity. A process is underway to amalgamate some of the boards to reduce the overall number to nine, and to transform these nine into Regional Water Utilities which will have an expanded mandate, including for regional bulk infrastructure.

All irrigation boards should have been transformed into WUAs by 1999. A policy position that all WUAs and IBs will cease to exist in future was approved by Cabinet in 2013. A roadmap has been developed to transform all IBs and WUAs into local water resources management institutions.

The challenges faced by WSAs are addressed under the section on water services and sanitation.

The possibility of an independent economic regulator to regulate tariffs, standards and performance in the water services sector has been proposed and processes are underway to consult on the appropriateness of such an institution. Should an independent economic regulator be established, it would require appropriate legislation to be promulgated.

Rationalisation of the institutional arrangements is urgently required and is supported by the Presidential review on State Owned Enterprises (SOEs). However, implementation of changes must not impact negatively on the implementation of other aspects of this plan.

### 9.3 Key Actions

DWS, as the leader of the water and sanitation sector, will lead a process, with other sector partners, to simplify and streamline the currently complex institutional arrangements in the sector. In addition, it will drive increased functionality and efficiency in institutional arrangements, as follows:

Action	Responsibility	Completion date
<b>Establish a business case for streamlined institutional arrangements in the water sector</b>	DWS	April 2019
<b>Establish financially sustainable CMAs (or one CMA) across the country, and transfer staff and budget and delegated functions, including licensing of water use.</b>	DWS	Functional CMA(s) December 2019
<b>Establish the National Water and Sanitation Infrastructure Agency (NAWASIA)</b>	DWS, NT	Table legislation 2019 Functional entity by 2022
<b>Establish Regional Water Utilities (RWUs) to manage regional bulk water supply; assist municipalities to perform their primary water services mandate where necessary, manage</b>	DWS, Water Boards	Rand Water RWU April 2018 KZN RWU April 2018

Action	Responsibility	Completion date
regional water resources infrastructure, manage regional bulk WWTW		Sedibeng Magalies RWU April 2019 Lepelle RWU April 2020 Bloem RWU April 2020
Determine the appropriate institutional arrangements for effective economic regulation of the water sector	DWS, NT, SALGA	2020
Establish a Municipal Intervention Unit for Water and Sanitation, in DWS, staffed with highly competent experts to drive a national programme of intervention at the municipal level	DWS	2019
Develop and implement a long-term plan for the turn-around of water supply and sanitation services in the country that: <ul style="list-style-type: none"> <li>- Is based on a sector-wide approach under DWS as regulator of water and sanitation provision</li> <li>- Categorises municipalities according to the critical challenges that they are facing and adopts a differentiated approach in responding to such challenges</li> <li>- Revisits the powers and functions of municipalities</li> <li>- Reviews the requirements of chapter 8 of the Municipal Systems Act and addresses the option of national level intervention in the appointment of a WSP where municipalities consistently fail to deliver universal reliable services</li> <li>- Reviews the MFMA and the Municipal Systems Act to ensure that they provide an enabling environment for the provision of reliable water and sanitation services</li> <li>- Draws on the capacity of regional water utilities, stronger municipalities, national government and the private sector to support the provision of reliable services</li> <li>- Assesses tariffs and addresses revenue generation potential</li> <li>- Investigates and promotes alternative service delivery models such as BOTT (build, operate, train and transfer), management contracts and concessions, and</li> <li>- Makes explicit the role of DWS in planning for regional bulk infrastructure.</li> </ul>	DWS, COGTA, NT, SALGA,	Plan developed by March 2019 Review of plan bi-annually
DWS, with COGTA, National Treasury, SALGA and relevant WSAs to develop and implement a long-term plan to provide reliable and sustainable water supply and sanitation to 3,4 million households in the 27 priority DMs	DWS, COGTA, NT, SALGA, 27 DMs	2019: 90% 2030: 100%

Action	Responsibility	Completion date
<b>Implement effective revenue management system in DWS</b> <ul style="list-style-type: none"> <li>• Fix billing and revenue stream with proper costing</li> <li>• Introduce strict “No payment - no water” approach</li> <li>• Restructure old debt to ensure payment</li> </ul> <b>Introduce regulations for metering across all ELU and licensed users</b>	DWS	2020
<b>Ensure cost efficiency in municipal services through</b> <ul style="list-style-type: none"> <li>• Benchmarking</li> <li>• Effective asset maintenance</li> <li>• Proper allocation of O&amp;M subsidies</li> <li>• Value for money procurement</li> </ul> <b>Cost reflective tariffs for water services and sanitation</b>	DWS, SALGA, National Treasury, COGTA	2023

## 10. Managing data and information

### 10.1 Status quo

Reliable data and information on the status of the country’s water resources is required for the proper analysis of hydrological trends, for the protection of water resources, for regulating water use, for the operation of water infrastructure, for the planning of new works, and for disaster management.

**Inadequate data and information resulting from a weak monitoring system poses high risks to decision making and planning and urgently needs to be addressed through the formalisation of an effective national hydrological monitoring centre**

Water resources data includes regular measurements of rainfall, streamflow, dam levels, and of chemical and biological determinants.

The coverage of rainfall and runoff gauging in the country has, however, been allowed to deteriorate and many rainfall measurements stations and gauging weirs are no longer functional. The Hydronet programme has been developed to bring together data from disparate systems to support decision-making.

Reliable data is also required on the performance of the water sector institutions and on the state of water and sanitation assets to monitor progress on the implementation of the NW&SMP, and progress towards the goals set out in the Second Edition of the National Water Resources Strategy (NWRS2) and the NDP. Current data on water authorisation and use, as captured in the WARMS database, is also critical for effective management of water use.

While ambitious regulatory and/or benchmarking data bases have at various times been initiated by institutions such as DWS, SALGA-WRC, and the South African Association of Water Utilities (SAAWU), these exercises never achieved full coverage and most have been allowed to lapse.

One of the more successful and informative regulatory programmes was the Blue Drop and Green Drop certification developed and operated for a few years by DWS, but which has now lapsed. The

same applies to the No Drop programme that focused on water conservation and demand management. The MuSSA programme is also an important tool.

Currently the most reliable information on municipal financial performance is maintained in the National Treasury data bases, but the water and sanitation financial information is not clearly ring-fenced.

## 10.2 Drivers

Without effective monitoring, and evaluation of the data, it is not possible to manage the implementation of actions, understand trends, adapt management plans appropriately, or plan effectively for the future. This is particularly critical in an environment facing significant change. The lack of data and information resulting from weak monitoring systems poses a high risk to the achievement of the goals set out in the NWRS2 and this NW&SMP. Improved data and monitoring systems must be developed in parallel with the implementation of the NW&SMP.

## 10.3 Key Actions

Action	Responsibility	Completion date
<b>Refurbish gauging stations</b>	DWS	2027
<b>Monitor and report annually on rainfall, streamflow, dam levels, key water quality parameters</b>	DWS, SAWS	2019, then annually
<b>Establish a monitoring, evaluation, learning and reporting system for implementation of the NW&amp;SMP</b>	DWS	2018 Report annually to Parliament and in annual report
<b>Address the functionality of the Water Authorisation and Registration Management System to ensure records of water use are correct and are kept up to date.</b>	DWS	2020
<b>Revitalise the Green, Blue and No Drop programmes and publish results</b>	DWS	2018, annually from then onwards

# 11. Building capacity for action

## 11.1 Status Quo

The NW&SMP sets out the challenges that must be addressed to ensure a secure water future. These will not be achieved without addressing the issue of capacity – the skilled people required to undertake the work.

A skills gap analysis conducted by the WRC in 2015, looking at numbers of staff and their skills relative to required skills, showed significant skills gaps in water sector institutions, including DWS, CMAs, water boards and municipalities.

On the positive side, the number of Civil Engineering graduates doubled between 2010 and 2015 from approximately 1000 to 2000 graduates per year. It is not clear how many of these graduates seek work in the water sector. Other graduate numbers with qualifications that apply to the water sector also increased dramatically in this period, with there no longer being a shortage of science graduates. However, the challenge of appointing qualified and experienced staff will remain, particularly in rural municipalities.

The Energy and Water Sector Education and Training Authority (EWSETA) is the skills development

authority serving the water sector.

## 11.2 Drivers

Implementing the NW&SMP Call to Action requires the right mix of skills and expertise in the water sector. This includes the capacity expressed as number of persons and skills expressed by qualification and experience required to fulfil the requirements in water resources and water services planning, management and operations.

A critical need is to use the expertise of experienced water managers to mentor and develop younger and less experienced managers in the water sector including, but not limited to, the municipal sector.

## 11.3 Key Actions

Action	Responsibility	Completion date
<b>Develop and implement a mandatory, modular hands-on qualification for municipal water managers to be run over 18 months and accredited by EWSETA to include aspects such as asset management, tariffs and revenue management, drought management, stakeholder engagement and customer relations.</b>	DWS, EWSETA	First course to be run in 2020/21
<b>Establish regulations on required qualifications and experience for senior and technical positions in DWS, CMAs, water boards and municipal water services</b>	DWS, COGTA	2020
<b>Develop and implement a programme for recruiting and retaining experienced technical and managerial staff with technical qualifications in South Africa and externally</b>	DWS, COGTA, DIRCO	2020
<b>Define (and reinstate in some cases) career paths with defined training and on the job experience to build cadre of sector professionals</b>	DWS, WSAs, WBs, CMAs	2019
<b>Improve institutional capacity for investment in ecological infrastructure</b>	DWS, DEA, SANBI	2022

## 12. Ensuring financial sustainability

### 12.1 Status quo

The water and sanitation sector is currently not financially sustainable. The sector has aging infrastructure with new infrastructure continually being constructed, some highly vulnerable municipalities, an increase in customer dissatisfaction, and rising levels of unpaid bills and tariffs which are insufficient to cover the costs. Some areas remain unbilled. A significant funding gap exists between funding needs and available funding from both fiscal transfers and revenue.

The capital replacement value of the existing water and sanitation infrastructure is estimated at R 1 362 billion, while the current book value of the infrastructure is R 584 billion. The current assets are thus 57% depreciated or valued at 43% of capital replacement cost.

South Africa is currently investing R 42 billion per annum into built water infrastructure, R 1.5 billion per annum into restoration of ecological infrastructure, and R 13 billion in sanitation infrastructure. Significant additional capital investment is required to address the remaining backlog in water and

sanitation services, the backlog in infrastructure refurbishment and renewals, and the need to expedite the implementation of large water resource schemes. The total estimated capital investment requirement is R89,9 billion per annum, being R 33 billion per annum more than the current spend.

The funding gap of R 33 billion per annum indicates the difference in expectations versus the financial capacity of the sector without interventions.

**Funding Gap over next 10 years**

<b>Funding Requirement</b>	-	<b>Funding Available</b>	=	<b>Funding Gap</b>
R 899 billion		R 566 billion		R 333 billion 37%

The indicated funding requirement includes a critical refurbishment backlog, caused by a lack of maintenance, of over R53 billion for water supply alone (excluding wastewater treatment works).

It includes a backlog in infrastructure renewals, due to continued “stretching” of ageing infrastructure. Proper life-cycle asset management is lacking. Most institutions have depleted their reserves and currently only about R12 billion per annum is allocated to renewal of infrastructure, which is about 1% of the capital invested.



Renewal backlog totals about R332 billion with R125 billion a priority need, which needs urgent intervention to prevent major water interruptions.

If asset management is not implemented, existing infrastructure will deteriorate further resulting in increasing service interruptions and a down-ward spiral of customer dissatisfaction, protest and vandalism. This picture is confirmed by various findings, particularly from the vulnerability assessment report where 78% of municipalities are between high and extreme in terms of vulnerability. The dire situation is confirmed by No-Drop and Green Drop Reports which shows high levels of non-revenue water and large number of wastewater treatment works not meeting the discharge standard.



Operating funds of R136 billion per annum is in principle adequate, but not applied correctly.

Annual operating expenditure in the water and sanitation sector is currently in the order of R124 billion per annum, with about R109 billion per annum needed by municipal services. Total available operational funding in the sector is about R136 billion per annum, comprising water services revenue of R 84 billion and additional operating subsidies of R 52 billion from the equitable share. However, these funds are not ring-fenced and thus not necessarily available for operation of water and sanitation services.



There is a significant underinvestment in infrastructure maintenance resulting in an accumulated backlog in refurbishment of about R53 billion. Guidelines target 8% of asset replacement value to be set aside for maintenance

Water tariffs are not cost-reflective resulting in short-fall on cost recovery from users, which requires implicit subsidies from the fiscus.

The irrigation sector benefits from under-priced water which places an increased responsibility on other sectors and the fiscus to balance the cost: revenue equation.

The current inequality through water pricing policies must also be reviewed whereby some systems benefit from existing infrastructure (mostly historically funded by the fiscus) and have a large established user base, lowering the unit cost of water to those users through economies of scale. Areas that have been neglected previously in terms of water and sanitation infrastructure, needs to

be developed at current cost of implementing infrastructure resulting in a higher unit cost of water.

Water quality is decreasing which increases the cost of purification and whilst the “Polluter Pays” principle has been used to develop a system of charging for waste discharges into water bodies, this has not yet been implemented.

The sector is faced with increasing in unpaid bills which have a knock-on effect along the value chain, negatively impacting on the entire sector. Government departments, businesses and domestic consumers owe municipalities over R128 billion, who in turn owe R10 billion to water boards and DWS.

Apart from the lack of regulation and enforcement, the sector lacks a strong, dependable revenue management system.

The governance of the water sector is fragmented between different institutions, which makes it difficult to resolve the financial challenges facing the sector, particularly at municipal level.

With a view to facilitating the raising of private sector funding, the Minister convened an Investor Summit to test the appetite of funders to invest in the water and sanitation sector and to brief them on investment opportunities. The sector in general is not conducive to attract investment at reasonable terms in its current shape. Various interventions have been identified throughout the Master plan which will be a pre-requisite to create an investor-friendly environment where value-for-money funding can be procured.

## 12.2 Drivers

Water and sanitation infrastructure is capital intensive and the sector is faced with increasing funding needs whilst fiscal funding is limited. The current dependency on the fiscus to develop the sector will to be addressed through purposeful interventions.

**To achieve financial sustainability, costs need to decrease, and revenue needs to increase.**

Although funding is a critical enabler to achieve the objectives of the Master Plan, the implementation of the plan in terms of regulation, anti-corruption, efficiencies, enforcement etc., will be the enabler to attract value-for-money funding, making the Master Plan critical to achieving financial sustainability.

It takes decades of investment and commitment to build a country’s water and sanitation network and continued investment is required to optimise return on investment. Any period of underinvestment will be felt decades to follow. The current underinvestment is already showing in decreasing levels of service and lack of water security. Equally, less-optimal and expedient decisions to address the impacts of underinvestment can bind the sector’s revenue for decades, limiting its ability to recover.

The demand for funding in the water and sanitation sector will continue to grow, both in terms of capital expenditure, and funding for operation and maintenance and refurbishments. The goal is to become a financially sustainable sector. To achieve financial sustainability, costs need to decrease, and revenue needs to increase. The sector needs to consider what it can do with the currently available funding.

The following drivers will play a key role to maintain positive cash flows and affordable service delivery:

- A mindset-shift is required by users with regards to the value of water. Scarcity increases the value of water and needs to inform future allocations between competing uses. In the same way, users need to acknowledge that water is severely under-priced, impacting on the level of services.
- Water and sanitation services need to be costed accurately. A critical review of the current pricing strategies from its very first principles, is required. The sector is currently not financially sustainable and increases in excess of inflationary targets will be required to address the historic undervaluation of water and sanitation services. Critical revenue enhancements must include:
  - cost-reflective tariffs based on full life-cycle costs
  - enhanced revenue collection through accurate metering and billing and enforcement
  - critical review of subsidized water uses (e.g. agriculture) in consideration of socio-economic impact and food-security
  - review of water allocations to turn “sterilized water” into “economic contributing water” (“use it or lose it” principles)
  - ring-fencing of water revenue where appropriate
  - implementation of waste discharge charges
- The sector needs to protect and maintain the value of the existing assets and optimize use from existing resources and infrastructure. Efficiency measures must be enforced and incentivized throughout the value chain. Critical cost-cutting interventions must include:
  - “sweating” of infrastructure through good maintenance and diligent operation
  - delay the need for future infrastructure augmentation through water demand management and reuse of water
  - improved institutional capacity and efficiency through improved structures and governance
  - skilled project and contract management capacity to be sourced
  - value-for-money procurement

Diligent project and contract management is a critical performance criterion to ensure cost-effective procurement and implementation.

- Tariff structures must be reviewed against socio-economic profiles of users to ensure that water remains affordable. The “user-pays” principle must be strongly imbedded with all users and subsidization of free basic water must not prevent introduction of payment when basic service levels are exceeded.
- Citizens are paying taxes and fiscal allocations are made to the sector via budget allocations, grants, equitable share etc. However, further investment in the sector from a fiscal point of view is also critical to address the funding needs of water as a critically important and strategic asset to any country.

Funding options are limited. There are essentially only two ways to pay for capital and operation of infrastructure, being either taxes (national) and/or tariffs (users). Economic infrastructure represents infrastructure where the investment can be recovered from users (tariffs), whereas social infrastructure is reliant on fiscal funding (taxes). Most schemes comprise of economic and social use and require a combined funding approach.

The balance of the funding requirement can adequately be addressed through loans and funding structures. However, loans should only be utilised to address the funding gap which can't be achieved through revenue enhancement and proven cost efficiency. In principle, inefficiencies should not be funded from loans and revenue from users should not be wasted on inefficiencies.

Loans do not constitute “new” funds but will be used to even out the cash flow mismatch between

immediate funding requirements and future revenues, but loans tie up future revenues to redeem such borrowings. Affordability of tariffs should therefore be carefully established before loans are committed. Loans provide immediate relief but increase pressure on future tariffs and debt obligations to future generations. Loan funding should be limited to capital investment and not be applied to fund operating costs. Although the sector has substantial physical asset value, it is confirmed revenue streams generated from such assets, that creates the surety to funders, not the value of the infrastructure itself.

Various funding structures are available to be explored. Whilst project finance will continue to be applied to fund large infrastructure projects, smaller projects could benefit from alternative funding options offered by the market.

The ability to raise funding is constrained by low credit ratings. Apart from TCTA and larger water boards and metropolitan municipalities, the sector is generally lacking capacity to raise long-term debt and appropriately manage the associated risks. Over 80% of municipal borrowings are held by metropolitan municipalities. Funding cost can exceed initial capital investment over a long-term repayment period and funding risks should be managed responsibly.

Funding for specific activities is also available from international donor sources such as the Global Environmental Facility, Adaptation Fund and Green Climate Fund. Dedicated funding will be required to implement the interventions identified in the entire Master Plan including project planning, programme management, sector coordination, implementation monitoring, and performance regulation. Current funding of water and sanitation services functions in national, provincial and local government institutions needs to be reviewed, adjusted and augmented where necessary to ensure that there is adequate capacity and resourcing to implement the NW&SMP. Institutional reform will be taking place and the new institutions will need financial support in the early post-establishment years.

The funding of implementation of the NW&SMP has been taken into account but will be reviewed annually as the plan itself is reviewed. In the 2018/9 financial year, the budget of the water sector is largely set, as are the actions for the various organs of state in the sector, through their annual performance plans. This NW&SMP will, therefore, begin to make most impact on the sector from the 2019/20 financial year onwards when it will substantially begin to influence reprioritisation of budgets, cost savings, and the identification of options for additional sources of money over time. Some of the actions proposed in this plan, such as the implementation of water conservation and demand measures, may require up-front investment which will contribute substantially to improved financial sustainability over time.

### 12.3 Key Actions

Action	Responsibility	Completion date
<b>Determine cost required to implement NW&amp;SMP and identify where reprioritisation or cost savings can be used to address the NW&amp;SMP priorities</b>	DWS, NT, CoGTA, SALGA, Water Boards	2018- 2019
<b>Resolve the accumulated debt between water services authorities, water service providers and the DWS (exceeding R10 billion)</b>	DWS, NT, CoGTA, SALGA, Portfolio Committee	2020
<b>Review the raw water pricing strategy</b>	DWS	2019
<b>Implement effective revenue management system in DWS</b>	DWS	2020

Action	Responsibility	Completion date
<ul style="list-style-type: none"> <li>Fix billing and revenue stream with proper costing</li> <li>Introduce strict “No payment - no water” approach</li> <li>Restructure old debt to ensure payment</li> <li>Introduce regulations for metering across all ELU and licensed users</li> </ul>		
<p>Ensure cost efficiency in municipal services through</p> <ul style="list-style-type: none"> <li>Benchmarking</li> <li>Effective asset maintenance</li> <li>Proper allocation of O&amp;M subsidies</li> <li>Value for money procurement</li> <li>Cost reflective tariffs for water services and sanitation</li> </ul>	DWS, SALGA, National Treasury, COGTA	2023
Revise regulations on municipal water tariffs and introduce a surcharge for high levels of use	DWS	2020
<p>Restructure the grant funding mechanisms and conditions for water supply and sanitation</p> <ul style="list-style-type: none"> <li>Focus to be on maintaining and restoring existing infrastructure rather than the construction of new infrastructure</li> <li>Lifecycle planning (asset management) conditions to be set by DWS</li> </ul> <p>Maintenance grants to be prioritised for social schemes</p>	DWS, National Treasury, COGTA	2020
Standardise and enforce required O&M budgeting and expenditure	National Treasury, CoGTA, DWS	As from 2018/2019 Municipal Financial year
Develop centralised programmes to obtain economies of scale and to ensure impact in, for example, driving municipal non-revenue-water improvements, and assessing the cost-effectiveness and appropriate systems for desalination	DWS, COGTA	2020
Implement the Waste Discharge Charge System in the upper Crocodile, upper Vaal, and upper Olifants catchments	DWS, CMAs	Revenue to be received in 2020
Determine the appropriate institutional arrangements for effective economic regulation of the water sector	DWS, NT, SALGA	2020
Determine cost required to implement NW&SMP and identify where reprioritisation or cost savings can be used to address the NW&SMP priorities	DWS, NT, CoGTA, SALGA, Water Boards	2018- 2019

## 13. Amending the legislation

### 13.1 Status quo

The water sector is governed primarily by two major pieces of legislation: The National Water Act (Act 36 of 1998), which governs the use, protection, development, management and control of raw water,

and the Water Services Act (Act 108 of 1997) which governs the provision of water and sanitation services. The National Water Act has been amended twice since it was promulgated: by Act 45 of 1999 and by Act 27 of 2014. The Water Services Act was amended by Act 30 of 2004. In addition, the Water Research Commission was established under the Water Research Act (Act 34 of 1971). The Municipal Financial Management Act (MFMA), the Municipal Systems Act (Act 32 of 2000) and the Municipal Structures Act (Act 117 of 1998) also govern water services at the municipal level. The Municipal Systems Act governs the powers and functions allocated to Water Services Authorities. The Public Finance Management Act (PFMA) governs financial matters at national and provincial government level.

### 13.2 Drivers

In the implementation of the National Water Act and the Water Services Act over the years since their promulgation, certain issues have been identified that require amendment. As a result, a National Water and Sanitation Bill is being developed which will amalgamate the National Water Act and the Water Services Act, and which will aim to:

- align the legislation to subsequent policy decisions including:
  - introducing mechanisms for the polluter pays principle
  - the 'Use-It or Lose-it' principle under which any water which is not utilised reverts to the state
  - the removal of temporary or permanent trading between authorised water users
  - equity as the primary consideration in water allocation
  - adopting a multiple water use approach in planning infrastructure
  - the role of DWS in planning for regional bulk water infrastructure
  - free basic water and free basic sanitation to be provided to indigent households only
  - the establishment, powers and functions Regional Water Utilities and Water Services Authorities
  - the establishment of one, national CMA, and
  - the alignment of appeal functions with NEMA and other appeal mechanisms.
- address issues pertaining to ownership of water and sanitation infrastructure, differential levels of service for sanitation, and appropriate technologies for sanitation
- empower the Minister to effectively regulate the water supply and sanitation sector
- address issues pertaining to water use authorisation
- enable the setting of tariffs for the whole value chain linked to levels of service and economic conditions,
- enable the protection of strategic water source areas and
- ensure linkages between spatial planning and the NW&SMP and create the mandate for a National Water and Sanitation Strategy.

In addition, the Water Research Act, now over 40 years old, must be amended to align to current governance best practice, contemporary institutional arrangements, and the PFMA. A Water Research Amendment Bill has been developed, which will be tabled before Parliament.

### 13.3 Actions

Action	Responsibility	Completion Date
<b>Conduct public consultation on National Water and Sanitation Bill and Water Research Amendment Bill</b>	DWS, Portfolio Committee, Standing Committee	August 2018

<b>Promulgate National Water and Sanitation Act</b>	DWS, Portfolio Committee, Standing Committee	November 2018
<b>Promulgate Water Research Amendment Act</b>	DWS, Portfolio Committee	October 2018
<b>Review chapter 8 of the Municipal Systems Act and addresses the option of national level intervention in the appointment of a WSP where municipalities consistently fail to deliver universal reliable services</b>	COGTA, DWS, SALGA	2020
<b>Review the MFMA and the Municipal Systems Act to ensure that they provide an enabling environment for the provision of reliable water and sanitation services</b>	COGTA, NT, DWS, SALGA	2020

## 14. Enhancing Research, development and innovation

### 14.1 Status quo

South Africa has received international recognition for its water and sanitation research and development with several internationally recognised products and solutions. Despite this, there is still much to be done in maturing how we shift new solutions into practise. Getting this right demands a highly coordinated system of institutions supporting innovation, demonstration, validation and deployment.

There is an active array of institutions engaged in different aspects of water research, development and innovation to start building from. The WRC is the leading funder of water research in South Africa. It is funded from water user charges and leverages additional resources from various partnerships and programmes. Various government departments are involved with funding and supporting research and innovation activities in different ways. There is also a range of science councils, tertiary academic institutions, non-profit organisations and private sector role players that are involved in developing and supporting water research and innovation.

Whilst there is a rich institutional and skills environment to draw from; water research, development and innovation continues to face a range of challenges including: poor coordination and synergising of activities between institutions; a weak understanding of the role of all water sector organisations in driving innovation and shifting solutions to practise, challenges in scaling up of solutions to be ready for the market, and highly limited funding for innovation (particularly in its scale up/ deployment stages). This results in many solutions that emerge from the research and development space not being implemented in practise. For South Africa to be ready for the future we must be able to address the innovation chasm where emerging solutions fail to be tested at scale or developed into viable business that are able to engage with different public and private sector role players.

To better synergise South African institutions involved in water innovation around the different gaps and opportunities of the sector, the Department of Science and Technology (DST) has collaborated with the DWS and the WRC to develop a Water Research, Development and Innovation Roadmap.

This Roadmap identifies RDI gaps and opportunities and orientates the sector towards addressing these opportunities in a more coordinated way through investments in research, high end skills development and actions that shift new solutions into practise. The plan focuses across six themes: i) Unlocking alternative sources of water (including reuse, improved groundwater utilization, desalination and harnessing of storm water); ii) Exploring ecological and built water infrastructure opportunities in relation to climate resilience (including supporting the alternative and water-less sanitation revolution) iii) Ensuring greater water efficiency and reduced losses and iv) water governance, planning and management for supply and demand; v) orientating the water sector towards more business savvy and bankable solutions; and vi) supporting monitoring, metering and water data innovation.

**This Roadmap, which forms the basis of the RDI aspects of this Master Plan, is also an important linker to the Industrial Policy Action Plan ambition to drive water industry in areas of sanitation, membranes and waste water treatment.**

A Water RDI Roadmap Implementation Unit has been put in place in partnership between DST and WRC to support intelligence gathering, sector tracking and facilitate aspects of coordinating the role players of the water innovation landscape.

The overall minimum investment required to achieve all aspects of the RDI master plan over a 10-year period is R 8.4 billion. In 2015 it was estimated that an average of R 300 million was spent on water research, development and innovation. This illustrates that that the current spend on Water RDI is woefully inadequate to address the countries' needs (an approximately R 500 million a year shortfall).

Traditional funders in this space, such as the WRC and DST, cannot be the sole investors in the RDI Roadmap. Sector wide ownership and investment will be needed to realise this RDI ambition, especially when it comes to the more costly issues of technology testing, demonstration, upscaling and solution deployment. If we are to develop a water industry in terms of localisation, manufacturing and job creation, it also requires investment from role players such as DTI and its entities, metros, and utilities.

## 14.2 Drivers

It is vital to recognise that RDI is an activity that has cross cutting linkages with all aspects and chapters of the NW&SMP. All aspects of the water sector have their own set of research, innovation and solutions requirements.

**RDI is an activity that has cross cutting linkages with all aspects and chapters of the NW&SMP**

Ongoing research, development and innovation, and the harnessing of international developments, is a critical element of delivering effectively on this Call to Action, as is the translation of research and innovation into implementation at scale. The RDI system is key to being 'ahead of the curve' as it supports the development of new solutions and technology, provides evidence to support robust decision making, and builds capabilities that enable South Africa to respond to challenges. This is critical in terms of shifting the country into a more proactive planning space that abates some of the more reactive activities that emerge when we are not properly prepared for droughts and other extreme events.

Innovation also offers a significant opportunity to develop a water sector industry which can contribute to job creation, and to the development of economic opportunities for the country.

### 14.3 Key Actions

Action	Responsibility	Completion Date
<b>Implement and regularly review/revise Research, Development and Innovation Policies, Plans and Roadmaps across the sector</b>	DWS, DST, WRC	Ongoing, with 5-yearly review
<b>Support the development of an innovation-based water and sanitation industry by building on existing innovation platforms and opportunities (such as the IPAP mechanisms, Water Technologies Demonstration Programme)</b>	WRC, DWS, SABS, DTI, DST	Plan with incentives developed by 2021, thereafter ongoing
<b>Unlock investment, procurement and other localisation barriers to reposition the sector to implement new/niche solutions and approaches</b>	DWS, National Treasury, COGTA, DST, Roadmap PMU	Agreed approach by 2020
<b>Collaborate and co-invest to systematically support the demonstration, scale up, deployment, and institutional learning linked to new solutions in niche areas (e.g. alternative and water-less sanitation solutions)</b>	DWS, DST, COGTA, SABS, DTI, SALGA, Utilities	Ongoing, with 5-yearly review
<b>Coordinate, and where needed establish new platforms, to enable a synergised set of institutions that enable the shifting of innovations into the market (including business development and SME support)</b>	DTI, DWS, Dept. Small Business, EDD, Incubators	Ongoing, with 5-yearly review

## READY FOR THE FUTURE AND AHEAD OF THE CURVE – LET'S DO IT!

The Constitution of South African contains several provisions that give direction to the water and sanitation sector.

Firstly, the values of the Constitution include those of human dignity, the achievement of equality and the advancement of human rights and freedoms.

Secondly, the Constitution states that everyone has the right to an environment that is not harmful to their health or well-being; and to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that (i) prevent pollution and ecological degradation; (ii) promote conservation; and (iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

Thirdly, the Constitution states that everyone has the right to have access to sufficient food and water.

Fourthly, the Constitution states that the property clause may not impede the state from taking measures to achieve land, water and related reform, in order to redress the results of past racial discrimination.

These constitutional imperatives, combined with the national water and sanitation policy papers, the National Water Act and the Water Services Act, give the mandate to the water sector to:

- Provide universal and equitable access to reliable water supply and sanitation services
- Protect, manage and develop the nation's water resources in a manner that supports justifiable and ecologically sustainable economic and social development
- Transform access to water to redress the racial imbalances created by apartheid.

Clearly, however, there are significant challenges in achieving this mandate, with declining reliability of water services and sanitation services, numerous WWTWs and WTWs in poor condition, some municipalities consistently failing to deliver adequate services, increasing water scarcity, and decreasing raw water quality. Over 3 million people still do not have access to a basic water supply facility and 14.1 million people do not have access to safe sanitation facility. At the same time, although access to water and sanitation services facilities have improved significantly, the reliability of services that have been provided since the advent of democracy is declining, with only 64 % of households now having access to a reliable water supply service. Climate change adds significant additional stress to an already stressed environment and is changing rainfall patterns in ways that we have yet to understand fully.

The NW&SMP has identified a number of critical actions that must be implemented to address the current crisis in the water sector and to achieve the constitutional and legal mandate given to the sector. It prioritises the actions that will deliver the greatest impact with limited resources, with a focus on reducing water demand, increasing supply, ensuring universal and reliable water supply and sanitation, protecting infrastructure through effective asset management, improving raw water quality, and ensuring equity in access to water.

Of critical importance is the issue of financial sustainability. Currently the sector is not financially sustainable and increases in excess of inflationary targets will be required to address the historic undervaluation of water and sanitation services. High levels of debt at municipal level reverberate up

the value chain, impacting on the financial sustainability of all institutions in the water sector, exacerbated by poor revenue collection by DWS itself. There are five legs to the financial sustainability issue that must be addressed:

- A strong message must be given that - apart from free basic water - all water users must pay for water;
- The significant subsidy provided to the agricultural sector through water use charges must be removed;
- Municipal tariffs must be revised to protect the rights of the poor to affordable water, ensure cost recovery (of true costs) and establish punitive tariffs for those wasting water;
- The grant system must be restructured to incentivise the life cycle infrastructure asset management approach, and
- The waste discharge charges system must be implemented immediately to provide funding for the reduction of pollution and the rehabilitation of polluted river systems.

Improved financial sustainability will enable the sector to turn around the currently poor levels of maintenance and refurbishment that are contributing to the decline in reliability of services and the high levels of wastage of water through leaks. Improvement in the condition of WWTWs will also contribute to improved water resource quality and the reduction of public health risks.

Addressing unacceptably high levels of water loss is a critical element of reducing water demand. Non-revenue water levels in municipalities are estimated at an average of 41%, which is unacceptably high. As a result, municipalities are losing some R 9.9 billion of potential revenue per year. The reduction of water losses and the introduction of water conservation and demand management measures in municipalities must be enforced to achieve the targets in the NDP. A national programme is proposed that will drive the reduction of non-revenue water levels to meet national and catchment targets. In addition, water conservation and demand management targets will be set for all municipalities and reflected in the KPIs of Municipal Managers and other senior staff.

At the municipal level, the current crisis will need the combined engagement of DWS, COGTA, National Treasury, SALGA, water boards and WSAs. The reintroduction of a sector-wide approach (SWAP) programme is proposed, led by DWS, to tackle the current challenges. In this programme, a differentiated (triage) approach will be adopted in which WSAs will be categorised according to the challenges that they are facing, and targeted responses will be developed and implemented for the various categories. A specialised municipal intervention unit for water and sanitation (MIUWS) will be established by DWS, staffed with a small team of highly competent experts, to run the diagnostic analysis necessary to categorise the WSAs, and to drive the national programme of interventions where required.

A national programme, driven by the MIUWS, is also proposed to support the adoption of alternative water sources such as desalination and water re-use. It is proposed that DWS lead a programme that will examine the costs and benefits of these technologies at a regional level to support WSAs in making decisions on the most appropriate water sources to use to increase supply. In addition, a national, targeted programme of refurbishing and turning around failing WWTWs to protect our natural resources and citizen health is non-negotiable. DWS will also, with effect from 2018/19, re-introduce the highly-respected Blue, Green and No Drop programmes.

At present, the constitutional water supply and sanitation responsibility lies with 144 municipalities that are WSAs. At least a third of these WSAs are regarded as dysfunctional and more than half have no, or very limited, technical staff. Twenty-seven priority district municipalities have been identified

as being particularly dysfunctional and requiring specific intervention (though not all are WSAs). High levels of corruption have impacted on service delivery in a number of municipalities.

Where WSAs show consistent inability to deliver effective water and sanitation services, a national intervention lead by the MIUWS will determine the appropriate water services provider to be used as well as the appropriate service delivery model such as management contracts and concessions. This will require a revision of Chapter 8 of the Municipal Systems Act which DWS will engage COGTA and NT on. In addition, a legislative review will be done to ensure that internal procedures and decision-making systems in local government support effective water and sanitation provision.

A national curriculum will be put in place for municipal water managers, which will become a mandatory qualification for all such water managers.

On the water resources side, the strategic water sources of the country, the 8% of the land which produces 50% of the nation's water resources, are under threat from development including mining. In order to ensure the water security of the country, these areas will be declared as protected areas as soon as possible. DWS will engage DEA on this. Metering of water use in the agricultural sector and the removal of the subsidy on agricultural water charges will drive water conservation in this sector.

DWS, working in partnership with DEA, will get tough on enforcement. A high-profile campaign of enforcement of water use licence conditions for both abstraction and waste discharge, accompanied by a public communication programme will see the prosecution of high-impact non-compliant water users with significant publicity around the campaign and the results. This is aimed at reducing non-compliant water use and creating an awareness of the work being done by DWS in this regard. This will be an important signal that this is 'business unusual' and that those who are non-compliant can no longer risk continued illegal activities.

The water sector research, development and innovation programme, driven by the DST and the WRC will support the implementation of the NW&SMP.

Finally, the water sector has, over the past 20 years, failed to deliver on its mandate for water allocation reform, or the reallocation of water to black water users. This, along with land reform, remains a major challenge facing the country, and one that must be addressed. It is proposed that a joint land, water and agrarian reform programme, to be led by the Department of Rural Development and Land Reform be established to ensure that the reallocation of both land and water are aligned and take place within a framework of agrarian reform and effective rural development.

This NW&SMP has been widely consulted on and has been developed with input from a range of stakeholders and organs of state and has been greatly improved and informed by these engagements and inputs. It remains a living document to be annually reviewed, updated and improved. To this end, a mini-Phakisa will be held in the latter part of 2018, where stakeholders will be invited to spend two weeks deepening, refining and focusing the NW&SMP.

South Africans share common interests and challenges in the pursuit of water security. Achieving water security requires sound evidence to inform policy and dialogue, good governance, advances in research and technology, the mobilisation of finance and investment, management of climate risks, and cooperation in managing transboundary water resources. It requires balancing supply and demand, redistributing water, managing water and sanitation services effectively, regulating water with a focus on high impact use, improving raw water quality and protecting and restoring ecosystems. These themes orient the NW&SMP and provide a rallying point for government, civil society, the private sector, researchers and innovators, the international community and ordinary South Africans.

## SUMMARY OF ACTIONS

	Action	Responsibility	Completion date
1.	Mini-Phakisa on water and sanitation to be held	DWS, DPME	August 2018
2.	Monitor, review, report on and update NW&SMP	DWS	Annual
3.	Update and maintain reconciliation planning studies to achieve optimal water mix (surface water, groundwater, re-use and desalination, and incorporate climate change into studies)	DWS	All major recon strategies updated annually
4.	Integrate results of All Towns studies and reconciliation studies into sectoral plans (domestic, agriculture, energy, mining, industrial development, land reform and rural development)	DWS, DAFF, DoE, DMR, DTI, DRDLR	2022
5.	Develop provincial W&SMPs	Provincial government	2019 and then five-yearly
6.	Include water use efficiency and water loss reduction targets in the KPIs of municipal managers and municipal water services managers, and in municipal implementation plans.	DWS, COGTA, WSAs	2023
7.	Revitalise the No Drop Programme	DWS	2018
8.	Revise regulations on municipal water tariffs and introduce a surcharge for high levels of use	DWS	2020
9.	Construct LHWP Phase 2 Water for the largest economic hub, Gauteng. System already in deficit.	LHWC	2025
10.	Construct Western Cape Water Supply System Augmentation Project (Voëlvlei Dam) Water for the 2 <sup>nd</sup> largest economic hub, Cape Town. System already in deficit.	DWS	2024
11.	Construct Cape Town emergency desalination plants Water for the 2 <sup>nd</sup> largest economic hub, Cape Town. System already in deficit.	City of Cape Town	2018
12.	Construct uMkhomazi Water Project Phase 1 (81 m high Smithfield Dam, tunnel and pipeline) Water for the 3 <sup>rd</sup> largest economic hub, eThekweni. System already in deficit.	DWS and Umgeni Water	2025
13.	Construct desalination of AMD from the Wits mining basins in Gauteng ± 54,8 Mm <sup>3</sup> /annum Prevent pollution of critical Vaal System and provide need water	DWS (TCTA)	In implementation
14.	Construct Thukela - Goedertrouw Emergency Water Transfer Scheme	DWS	2019
15.	Construct Lower uMkhomazi Scheme South Coast in deficit with limited resources. Can also augment Mgeni System if needed.	Umgeni Water	2022
16.	Increase groundwater use (including artificial recharge) and re-use of water	DWS, Water Boards, WSAs	ongoing
17.	Identify alternative sources of water and water that is not utilized (e.g. as mines are closing, resulting from War on Leaks etc) and allocate to black applicants	DWS, CMAs	Initial mapping by 2019

	Action	Responsibility	Completion date
18.	Identify where water can be made available and allocate to black applicants	DWS, DAFF, CMAs	Allocation of water to begin in 2019
19.	Identify areas where small dams or groundwater development can provide water for small scale black farmers	DWS, CMAs	Initial mapping by 2019
20.	Align water, land and agrarian reform programmes and link to the Irrigation Strategy	DWS, DAFF, DRDLR	2018
21.	Implement the Water Administration System on all government irrigation schemes and reallocate savings to black applicants	DWS, DAFF/PDAs	2023
22.	Implement pilot project on voluntary contributions from farmers for water reallocation in prioritised catchments	DWS, IUCMA	2018
23.	Use General Authorisation to enable and increase small scale water use by black farmers	DWS, DAFF	2019
24.	Establish a Municipal Intervention Unit for Water and Sanitation, in DWS, staffed with highly competent experts to drive a national programme of intervention at the municipal level	DWS	2019
25.	<p>Develop and implement a long-term plan for the turn-around of water supply and sanitation services in the country that:</p> <ul style="list-style-type: none"> <li>- Is based on a sector-wide approach under DWS as regulator of water and sanitation provision</li> <li>- Categorises municipalities according to the critical challenges that they are facing and adopts a differentiated approach in responding to such challenges;</li> <li>- Revisits the powers and functions of municipalities</li> <li>- Reviews chapter 8 of the Municipal Systems Act and addresses the option of national level intervention in the appointment of a WSP where municipalities consistently fail to deliver universal reliable services;</li> <li>- Reviews the MFMA and the Municipal Systems Act to ensure that they provide an enabling environment for the provision of reliable water and sanitation services;</li> <li>- Provides clear protocols for when support is to be given to municipalities and when strict regulation is in order</li> <li>- Draws on the capacity of regional water utilities, stronger municipalities, national government and the private sector to support the provision of reliable services,</li> <li>- Revisits levels of service for water supply and sanitation against issues of affordability, and</li> <li>- Assesses tariffs and addresses revenue generation potential</li> </ul>	DWS, COGTA, NT, SALGA,	Plan developed by March 2019 Review of plan bi-annually

Action	Responsibility	Completion date
	<ul style="list-style-type: none"> <li>- Investigates and promotes alternative service delivery models such as BOTT (build, operate, train and transfer), management contracts and concessions, and</li> <li>- Makes explicit the role of DWS in planning for regional bulk infrastructure.</li> </ul>	
26.	Develop and implement a long-term plan to provide reliable and sustainable water supply and sanitation to 3,4 million households in the 27 priority DMs	DWS, COGTA, NT, SALGA, 27 DMs 2019: 90% 2030: 100%
27.	Restructure the grant funding mechanisms and conditions for water supply and sanitation <ul style="list-style-type: none"> <li>• Focus to be on maintaining and restoring existing infrastructure rather than the construction of new infrastructure</li> <li>• Lifecycle planning (asset management) conditions to be set by DWS</li> <li>• Maintenance grants to be prioritised for social schemes</li> </ul>	DWS, National Treasury, COGTA 2020
28.	Standardise and enforce required O&M budgeting and expenditure	National Treasury, CoGTA, DWS As from 2018/2019 Municipal Financial year
29.	Develop centralised programmes to obtain economies of scale and to ensure impact in, for example, driving municipal non-revenue-water improvements, and assessing the cost-effectiveness and appropriate systems for desalination	DWS, COGTA 2020
30.	Turn around the functionality of five, currently dysfunctional, large waste water treatment works with an accompanying publicity campaign, followed by a programme addressing the rest	DWS, WSAs, NT 2022 2030
31.	Revitalise the Green, Blue and No Drop programmes and publish results	DWS 2018, annually from then onwards
32.	Set a cap on water use per municipality	DWS, SALGA, COGTA 2023
33.	Identify and prosecute major non-compliant abstractors (water thieves) across the country, with a national communication campaign to accompany the action	DWS, DEA 10 by 2020 Additional 10 by 2023
34.	Establish Water Efficiency Labelling and Standards Scheme	SABS, DWS 2026
35.	Replace all ELU with licences with enforceable water use conditions	DWS, CMAs 2028
36.	Identify and prosecute big polluters across the country (including municipalities), with a national communication campaign to accompany the action	DWS, DEA 10 by 2020 Additional 10 by 2023
37.	Establish a mechanism for applying administrative penalties	DWS, Dept of Justice 2023

	Action	Responsibility	Completion date
38.	Develop and implement a diffuse pollution source strategy that includes the regulation of land use	DWS	Strategy to be implemented by Jan 2023
39.	Implement the Waste Discharge Charge System in the upper Crocodile, upper Vaal, and upper Olifants catchments	DWS, CMAs	Revenue to be received in 2020
40.	Implement programmes to rehabilitate and manage water quality in the upper Crocodile, upper Vaal, and upper Olifants catchments based on revenue from the WDCCS	DWS, CMAs	Planning during 2018 - 2020 Implementation to start from 2021
41.	Develop and implement municipal bylaws to protect raw water quality	DWS, SALGA, municipalities	2020
42.	Declare strategic water source areas and critical groundwater recharge areas as protected areas	DWS, DEA	2021
43.	Secure financial flows for restoration and ongoing maintenance of ecological infrastructure through operationalising the water pricing strategy	DWS, DEA, SANBI	2022
44.	Improve institutional capacity for investment in ecological infrastructure	DWS, DEA, SANBI	2022
45.	Establish a business case for streamlined institutional arrangements in the water sector	DWS	April 2019
46.	Establish financially sustainable CMAs (or one CMA) across the country, and transfer staff and budget and delegated functions, including licensing of water use.	DWS	Functional CMA(s) December 2019
47.	Establish the National Water and Sanitation Infrastructure Agency (NAWASIA)	DWS, NT	Table legislation 2019 Functional entity by 2022
48.	Establish Regional Water Utilities (RWUs) to manage regional bulk water supply; assist municipalities to perform their primary water services mandate where necessary, manage regional water resources infrastructure, manage regional bulk WWTW.	DWS, Water Boards	Rand Water RWU April 2018 KZN RWU April 2018 Sedibeng Magalies RWU April 2019 Lepelle RWU April 2020 Bloem RWU April 2020
49.	Determine the appropriate institutional arrangements for effective economic regulation of the water sector	DWS, NT, SALGA	2020
50.	Refurbish gauging stations	DWS	2027
51.	Monitor and report annually on rainfall, streamflow, dam levels, key water quality parameters	DWS, SAWS	2019, then annually
52.	Establish a monitoring, evaluation, learning and reporting system for implementation of the NW&SMP	DWS	2018 Report annually to Parliament and in annual report

Action	Responsibility	Completion date
<b>53.</b>	Address the functionality of the Water Authorisation and Registration Management System to ensure records of water use are correct and are kept up to date.	DWS 2020
<b>54.</b>	Develop and implement a mandatory, modular hands-on qualification for municipal water managers to be run over 18 months and accredited by EWSETA to include aspects such as asset management, tariffs and revenue management, drought management, stakeholder engagement and customer relations.	DWS, EWSETA First course to be run in 2020/21
<b>55.</b>	Establish regulations on required qualifications and experience for senior and technical positions in DWS, CMAs, water boards and municipal water services	DWS, COGTA 2020
<b>56.</b>	Develop and implement a programme for recruiting and retaining experienced technical and managerial staff with technical qualifications in South Africa and externally	DWS, COGTA, DIRCO 2020
<b>57.</b>	Define (and reinstate in some cases) career paths with defined training and on the job experience to build cadre of sector professionals	DWS, WSAs, WBs, CMAs 2019
<b>58.</b>	Determine cost required to implement NW&SMP and identify where reprioritisation or cost savings can be used to address the NW&SMP priorities	DWS, NT, CoGTA, SALGA, Water Boards 2018- 2019
<b>59.</b>	Resolve the accumulated debt between water services authorities, water service providers and the DWS (exceeding R10 billion)	DWS, NT, CoGTA, SALGA, Portfolio Committee 2020
<b>60.</b>	Review the raw water pricing strategy and implement the waste discharge charge	DWS 2019
<b>61.</b>	Implement effective revenue management system in DWS <ul style="list-style-type: none"> <li>• Fix billing and revenue stream with proper costing</li> <li>• Introduce strict “No payment - no water” approach</li> <li>• Restructure old debt to ensure payment</li> <li>• Introduce regulations for metering across all ELU and licensed users</li> </ul>	DWS 2020
<b>62.</b>	Ensure cost efficiency in municipal services through <ul style="list-style-type: none"> <li>• Benchmarking</li> <li>• Effective asset maintenance</li> <li>• Proper allocation of O&amp;M subsidies</li> <li>• Value for money procurement</li> <li>• Cost reflective tariffs for water services and sanitation</li> </ul>	DWS, SALGA, National Treasury, COGTA 2023
<b>63.</b>	Conduct public consultation on National Water and Sanitation Bill and Water Research Amendment Bill	DWS, Portfolio Committee, Standing Committee August 2018
<b>64.</b>	Promulgate National Water and Sanitation Act	DWS, Portfolio Committee, November 2018

	Action	Responsibility	Completion date
		Standing Committee	
65.	Promulgate Water Research Amendment Act	DWS, Portfolio Committee	October 2018
66.	Implement and regularly review/revise Research, Development and Innovation Policies, Plans and Roadmaps across the sector	DWS, DST, WRC	Ongoing, with 5-yearly review
67.	Support the development of an innovation-based water and sanitation industry by building on existing innovation platforms and opportunities (such as the IPAP mechanisms, Water Technologies Demonstration Programme)	WRC, DWS, SABS, DTI, DST	Plan with incentives developed by 2021, thereafter ongoing
68.	Unlock investment, procurement and other localisation barriers to reposition the sector to implement new/niche solutions and approaches	DWS, National Treasury, COGTA, DST, Roadmap PMU	Agreed approach by 2020
69.	Collaborate and co-invest to systematically support the demonstration, scale up, deployment, and institutional learning linked to new solutions in niche areas (e.g. alternative and water-less sanitation solutions)	DWS, DST, COGTA, SABS, DTI, SALGA, Utilities	Ongoing, with 5-yearly review
70.	Coordinate, and where needed establish new platforms, to enable a synergised set of institutions that enable the shifting of innovations into the market (including business development and SME support)	DTI, DWS, Dept. Small Business, EDD, Incubators	Ongoing, with 5-yearly review