

Market Intelligent Report: Water



greencape 

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Introduction and background

The aim of this report is to provide a brief overview of the water sector in South Africa (with a focus on the Western Cape), the main applicable regulations and policies, how the sector operates and potential areas of focus for the country. The above provides an indication of opportunities available to the private sector.

The water market is understood in the context of this report as all players/service providers/sectors playing a role in the water value chain i.e. water supply, water management and wastewater treatment and discharge.

South Africa is ranked as the 30th driest country in the world with extreme climate and rainfall fluctuations. South Africa's water usage typically consists of 77% surface water, 9% groundwater, and 14% re-use of return flows. Management of South Africa's water resources involves catchment management, river systems, water storage, water abstraction and return-flow management. There are 1286 municipal and privately owned wastewater treatment works in South Africa, of which 826 are municipally owned (Department of Water Affairs, 2013). The bulk of the water usage in South Africa is used for agricultural and irrigation purposes as illustrated in Figure 1 below.

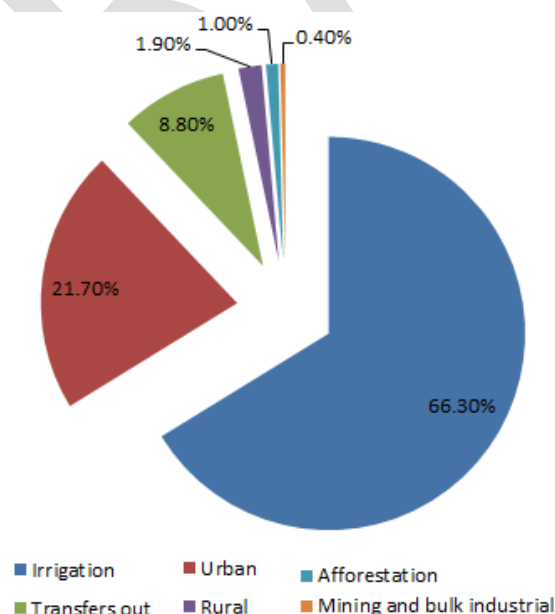


Figure 1: Total surface water used per sector in 2000 for the Western Cape (Department of Water Affairs and Forestry, 2004)

The quality standards/requirements of potable water in South Africa are listed in the *South African National Standard (SANS) 241-1: 2011, 241-2: 2011 Drinking Water*. Generally, the Presidential targets for drinking water quality are to achieve:

- 99% drinking water quality compliance by 2013 and,
- Reduce water losses by half by 2014 (The Blue Drop and No Drop Handbook, Water Services Regulation, DWA; 2013)

The average 2011/12 Municipal Water Tariffs varied from R2.74 to R10.98/kl for domestic use, R7.31 to R10.68/kl for commercial use, and R7.98 to R10.85/kl for industrial use, while the average tariff for raw water was R1.37/kl, R5.41/kl for bulk water and R100.00/month for municipal sanitation (Department of Water Affairs, 2013).

At national level, water management remains a key focus for the Government of South Africa. In 2011, South Africa promulgated the Green Economy Strategy which identified water management as one of the eight key focus areas (Minister Edna Molewa, Green Economy National Youth Summit, June 2013). Moreover, the National Development Plan (NDP) 2030 (<http://www.info.gov.za/issues/national-development-plan/>) has set ambitious water related projects for completion between 2017 and 2020 within the investment programme for water resource development. These projects are related to water-reuse and groundwater use in the Western Cape; strengthening management of water services, the establishment of regional water and wastewater utilities to support municipalities by 2017, as well as the completion of Phase 2 of the Lesotho Highlands Project to supply the Vaal system by 2020. It is noteworthy that The Lesotho Highlands Phase 2 (a key focus of the Trans-Caledon Tunnel Authority ^a) has been approved and will commence in the near future.

In 2008, the Department of Water Affairs introduced two incentive-based regulations which are: the *Blue Drop* certification programme for drinking water quality management regulation (Department of Water Affairs, 2012.), and the *Green Drop* certification programme for waste water quality management regulation (Department of Water Affairs, 2012). For example, critical performance indicators for the Green Drop include:

- The design and operating capacity of the wastewater treatment works,

- The compliance of the effluent to agreed standards,
- The technical skills of the management authority and the condition of infrastructure (i.e. asset management practices).

The Blue Drop, on the other hand, allows proactive management and regulation of drinking water quality management through the introduction of excellence requirements based regulated norms and standards and international best practice.

The Blue or Green Drop are therefore rating tools of municipal water supply or wastewater systems performance scored against a set requirements across the nine provinces in South Africa. These reports highlight the problem areas and required actions to improve the quality of potable water/effluent water in municipalities. Moreover, the programme has created an incentive for municipalities to improve their performance annually. These reports are publically accessible on the DWA's website at: www.dwa.gov.za.

One of the main challenges experienced in water management for South Africa is non-revenue water. Non-revenue water is defined as 'all the water lost through physical leakage or commercial losses i.e. meter under-registration, billing errors, theft etc as well as any unbilled authorised consumption, etc' (McKenzie et al., 2013). According to the latest Water Research Commission (WRC) study, non-revenue water constitutes approximately 36.8% of the water supplied in South Africa. Findings from a recent DWA assessment of the 8 Metros () which constitute 46% of the country's urban water use, showed that Cape Town had the lowest ILI Infrastructure Leakage Index (ILI) of 2.1 compared to the highest ILI of 8.3 for Johannesburg (Department of Water Affairs, 2013).

Another major challenge in the water sector is the lack of adequate skills in the sector. For example, a recent municipal demarcation study [The Municipal Demarcation Board, 2011] indicated that only 72% of municipal posts were filled and only 76% of municipal organogram posts were budgeted for.

An estimated R360 billion, or about 15% of South Africa's present GDP, is needed within the next 15 years to secure South Africa's water future, primarily for maintaining and increasing water treatment plant capacity (de Villiers, S and de Wit, M., 2010). These figures again underline the importance to address the skills shortage in this country.

Appendix 1 presents a list of training courses in South Africa available.

The main databases used to access water related data in South Africa are:

- **WARMS**-The Water Authorisation and Registration Management System, for water use and registration (<http://www.dwaf.gov.za/Projects/WARMS/default.aspx>)
- **WSNIS** (Water Services National Information System): The WSNIS's website contains data on a National, Provincial and WSA level regarding Demography, Basic Services Backlogs & Progress, Financial Perspectives, Projects and Free Basic Services (http://www.dwaf.gov.za/dir_ws/wsmenu/)

Water governance structure and regulatory framework in South Africa

In South Africa, the Department of Water Affairs (DWA) is governed by two Acts i.e. the National Water Act (1998) and the Water Services Act (1997). The National Water Act (NWA, Act 36 of 1998) redefined water rights in SA and established a new framework to mandate and regulate water resources. While the Water Services Act (WSA), promulgated in 1994, defined the role of DWA as regulator, the role of Water Boards as bulk providers and the role of municipalities as service providers.

The DWA's main roles are to lead and regulate the water sector, develop policies/strategies and provide support to the sector. The DWA operates at the three spheres of government i.e. **national, provincial and local** levels across the water value chain (i.e. water resource management; water abstraction; water processing and distribution of potable water; wastewater collection, its treatment and discharge). The DWA does however not execute all of these functions as some are constitutionally assigned to appropriate sector partners.

The second National Water Resource Strategy (NWRS2) published in 2012 has been developed to inform the implementation of the National Water Act. The NWRS (2012) has three key objectives, which are to: (i) increase the contribution of water to the economy and job creation; (ii) protect, develop and control water resources in a sustainable and equitable manner as well as (iii) support the elimination of poverty and inequality.

Regional bulk water distribution is managed by water boards, municipalities and the DWA. Water boards and some of the larger metropolitan municipalities (metros) are also responsible for purifying water to potable standards, while provision of water services (water supply and sanitation) is the constitutional responsibility of **local** government (e.g. metros, local or district municipalities). These local authorities act as water services authorities (WSAs) and sometimes also as water service providers (WSPs) for all communities in their areas of jurisdiction. There are only 152 designated WSAs out of the 278 municipalities across the country. In the Western Cape, the Cape metro and 24 municipalities are all designated WSAs.

The DWA is currently developing an Infrastructure Asset Management Strategy (AMS), tools and processes to assist WSAs maintain and manage their water-related assets. This is because since every WSA is required legally to develop an Asset Management Plan (AMP) by the DWA. Some WSAs have contracted out the management of their wastewater to bulk WSPs; however, the responsibility still rests with these WSAs to ensure an effective service delivery.

The responsibility and authority for water resources management rests with catchment management agencies (CMAs) and, water user associations at a local level as illustrated in Figure 2 and 3. There are nine planned water management areas (WMAs), whose management will be shared between CMAs across the country namely Limpopo, Olifants, Inkomati-Usuthu, Pongola-Mzimkulu, Vaal, Orange, Mzimvubu-Tsitsikama, Breede-Gouritz and Berg-Olifants. Currently only the Inkomati-Usuthu and Breede-Overberg are operational as CMAs.

Figure 2 and 3 present an overview of the water governance structure and regulatory framework in South Africa, as well as how the different bodies are interlinked.

Water Governance Structure in SA

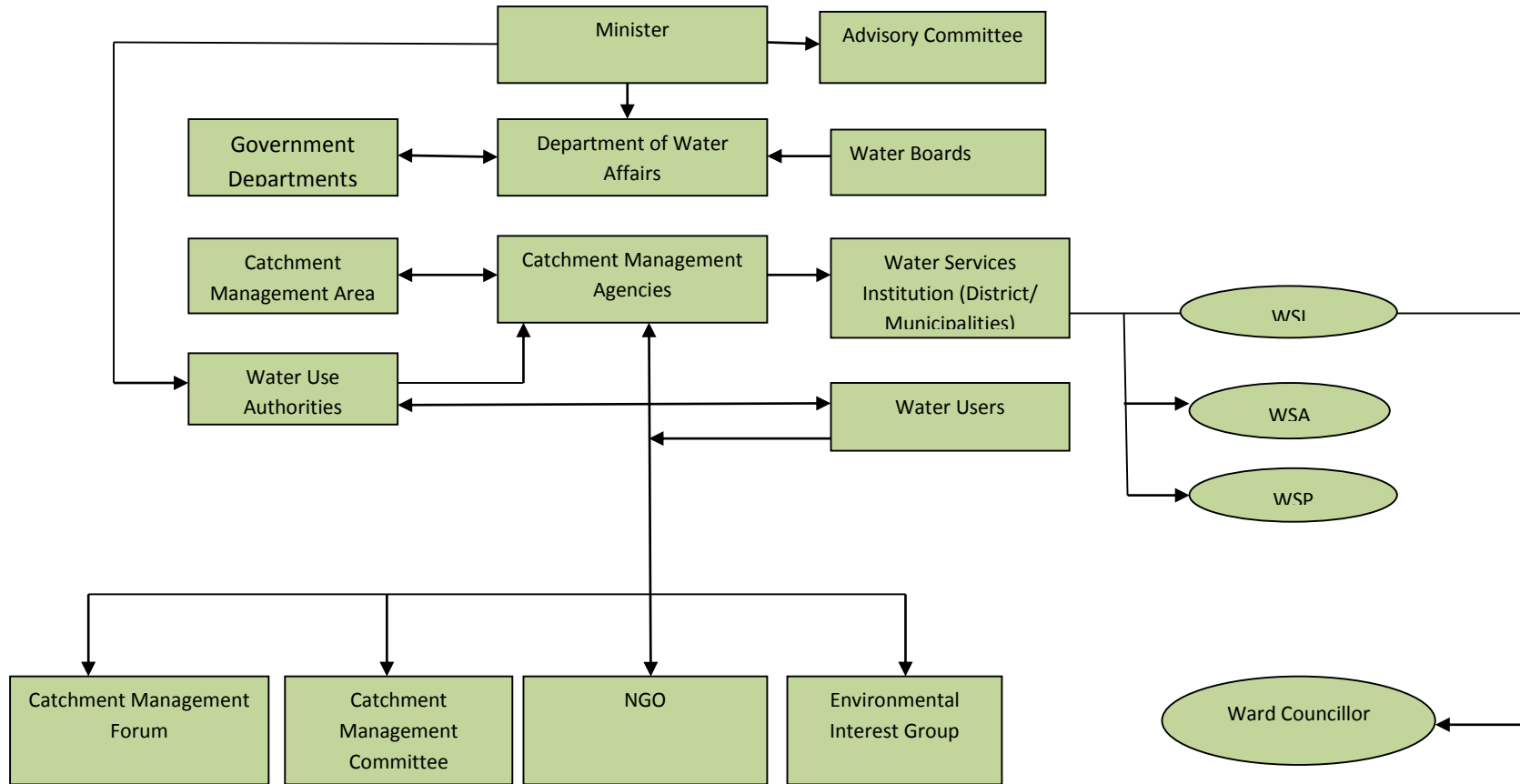


Figure 2: Overview of the water governance in South Africa (Department of Water Affairs, 2013)

Water Value Chain

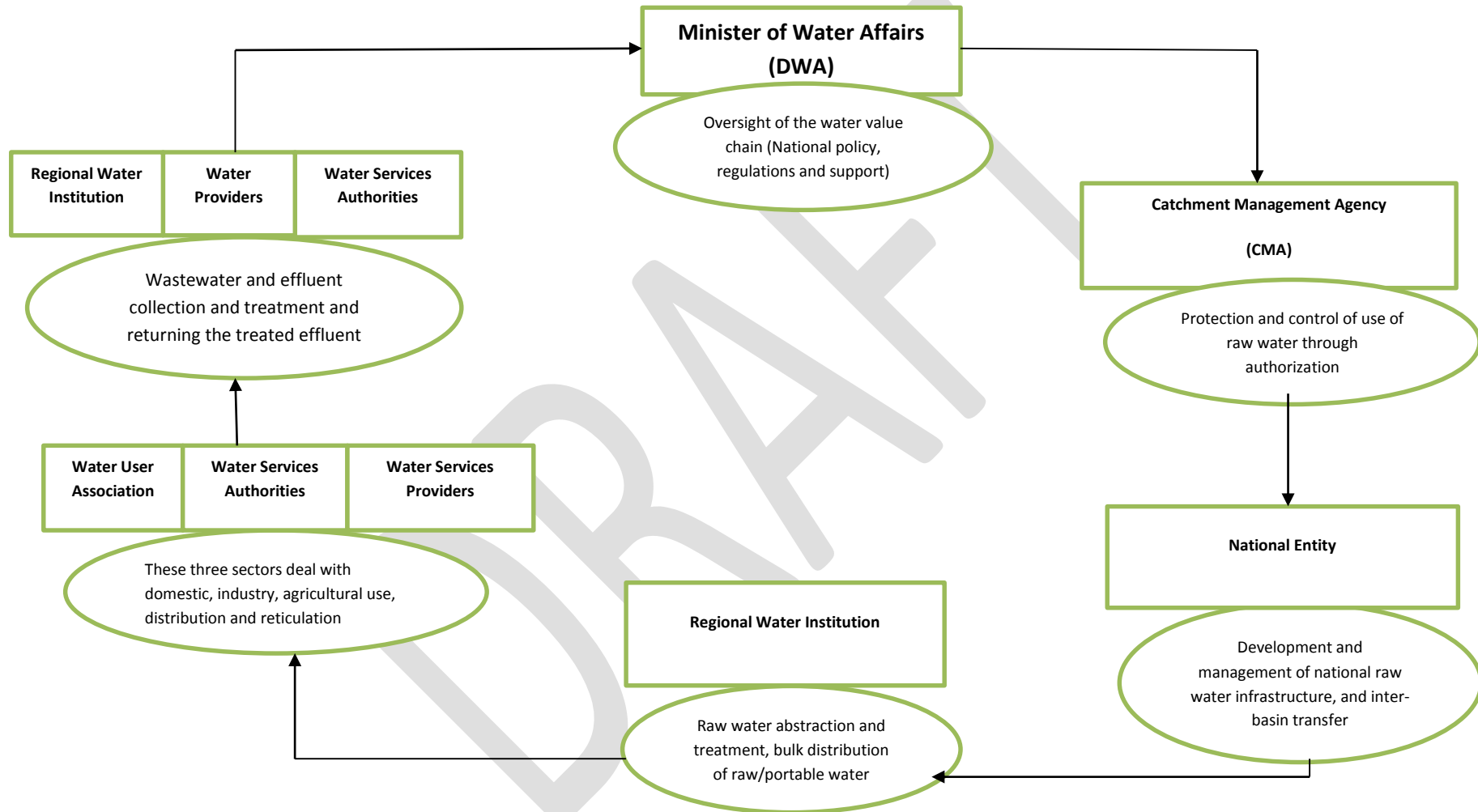


Figure 3: Value chain of water infrastructure in South Africa (Mazibuko & Pegram, 2006a; DWAF, 2001)

Western Cape Context

The average forecasted growth in the Western Cape regional economy is estimated at 4.2% per annum over the next 5 years (Western Cape's Provincial Economic Review & Outlook for 2011). The current breakdown of water usage in the Western Cape is presented in Figure 4.

The Western Cape is a water stressed region. The total water demand is estimated at $2047 \times 10^6 \text{m}^3$ per annum (de Villiers, S and de Wit, M., 2010), and this demand is met mainly through the six major dams in the province as presented in Appendix A. There is genuine understanding at provincial government level that water could be a significant constraint on the region's economic development **if not well managed**, particularly for the economic/industry growth as well as the provision of potable water for the growing urban population. At the same time, the make-up of our regional economy directly influences our total "water footprint".

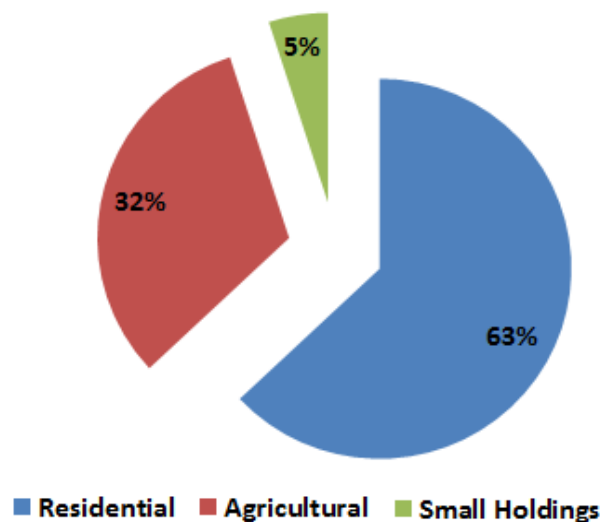


Figure 4: water usage in the Western Cape

Figure 5 below presents the six catchment areas in the Western Cape:

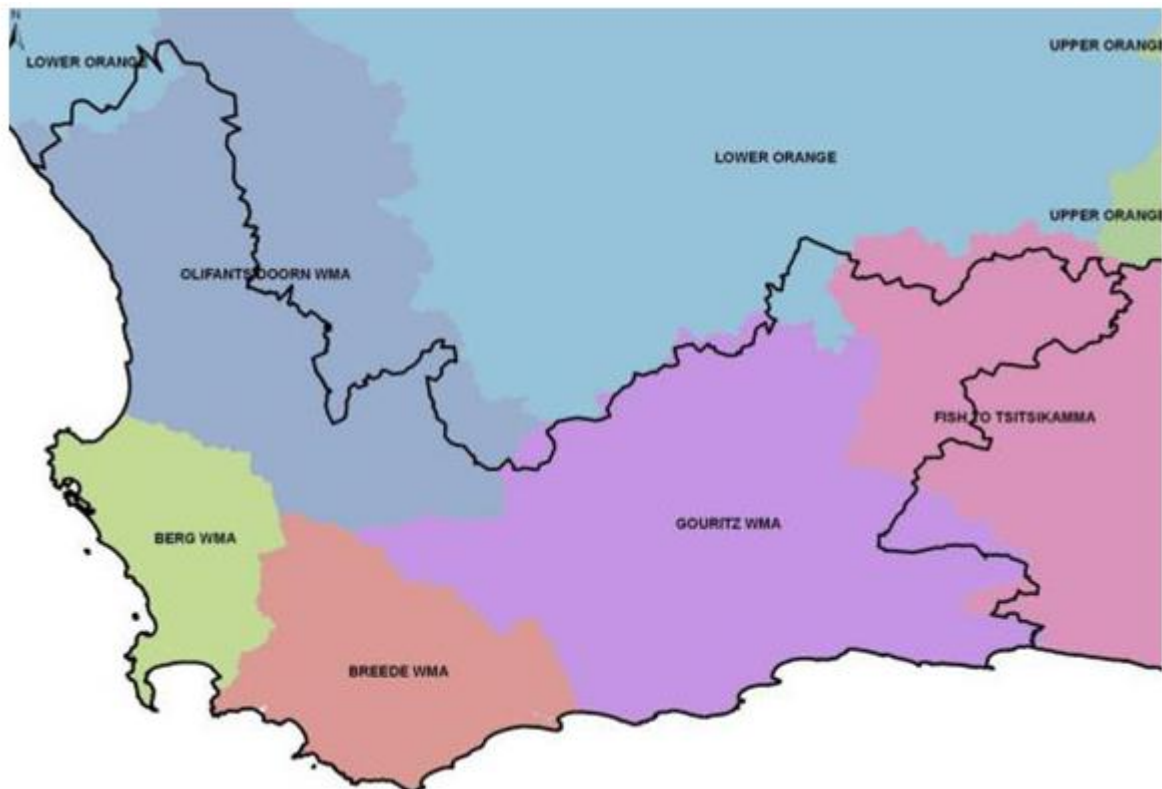


Figure 5: waste management areas in the Western Cape

The Western Cape has an existing artificial recharge scheme based in Atlantis that uses storm and waste water. The Atlantis water resource management scheme has recharged and recycled water for almost three decades thus far. This artificial recharge supplies approximately 30% of Atlantis' groundwater supply (Groundwater Strategy, 2010). The Western Cape currently comprises six desalination plants. Reverse osmosis is currently preferred, and hence its use has become more widely practised in South Africa (Water 25 Degrees in Africa/ Volume 7, Number 5 - September/October 2012). There are also two feasibility studies underway to investigate the viability of a desalination plant to supply water for the City of Cape Town and Lamberts.

Future outlook and opportunities for the water sector

This section presents some of the key water resources interventions identified for the water sector to meet future demand.

Water supply

Desalination/ Artificial recharge of aquifers or artificial storage and recovery (ASR)

South Africa's DWA foresees that by 2030 up to 10% of the country's urban water supply could come from water desalination plants. It is anticipated, based on the Draft NWRS (2) that desalination will play an important role in South Africa's future water security. The NWRS states that the DWA will ensure that desalination is properly considered as an option for meeting future water requirements in its integrated water resource planning processes. DWA will therefore actively promote and support the development and implementation of desalination projects where these projects compare favourably to other alternative options in the context of increased climate change risk. Another key objective will be to insure that energy and water planning are well integrated.

The DWA and Water Research Commission (WRC) developed an Artificial Recharge Strategy, which was completed in 2007 with the vision to 'use natural sub-surface storage as part of Integrated Water Resource Management wherever technologically, economically, environmentally and socially feasible'.

Water Re-use

The potential for water re-use in South Africa has not been thoroughly explored to date. However, there are initiatives across the country. For example, the City of Cape Town is currently reviewing bids received after an open call to develop a water reclamation scheme for potable use with a capacity of 150 MLD.

Infrastructure maintenance and new Infrastructure

The blueprint for a growing South African economy heavily depends on providing and maintaining adequate infrastructure (via public buildings, roads, **water and sewerage systems**, electricity and other services). The Accelerated and Shared Growth Initiative for South Africa (ASGISA), places the maintenance of existing infrastructure high on the developmental agenda as a key to sustainable development and economic growth. Wastewater treatment works are of particular concern. Other sectors of concern include water and sewer reticulation, on-site sanitation, some provincial and municipal roads, and some provincial health and education facilities.

Although most municipalities have limited budgets, and number of technical staff members, the opportunity to provide technical and expert support for maintenance of water related infrastructure remains a gap which needs to be filled.

Berg River Improvement Plan

The Western Cape Government undertook in 2012 to develop the Berg River Improvement Plan (BRIP) to address the water quality concerns in the Berg River. The BRIP highlights the current status of sources of pollution and the various interventions that have been or are currently being undertaken by municipalities and different departments in the Western Cape. It identifies short (\leq five years) and long term (5 – 30 years) interventions, and their financial implications. The BRIP is to be reviewed and updated every 5 years.

A Water Stewardship Programme (WSP) for the Berg River was proposed. This WSP has six main tasks towards meeting the identified objectives (Berg River Improvement Plan, 2012):

- Task 1: Establish a Berg River Water Quality Monitoring Programme
- Task 2: Upgrade Wastewater Treatment Works and Train Process Controllers
- Task 3: Upgrade Informal Settlements
- Task 4: Advocate Best Practice in Agricultural, Industrial and Domestic Land-use
- Task 5: Riparian Zone Rehabilitation and Management (Buffer Zone)
- Task 6: Pricing Water Management in the Berg River Catchment

Municipal Grant Funding Available

The yearly Division of Revenue Act sets out various government grants available for water related projects. These are presented in this section.

Municipal Infrastructure Grant (MIG)

The MIG is the largest conditional capital grant which provides funding for a basic level of municipal infrastructure, principally for extending access to water and sanitation to poor households.

It is estimated that the total capital expenditure on water and sanitation for 2012/13 will be R8.77billion on basic water supply projects and R4.94billion on basic sanitation projects. The MIG allocation for water and sanitation for 2014/15 for the Western Cape is R 0.2 billion.

There is also an unconditional grant called the Equitable Share, which is provided to all municipalities to assist with operation and maintenance requirements and free basic services provision. The Equitable Share 2014/15 allocation for water and sanitation for the Western Cape is estimated at R 32.98 billion.

Regional Bulk Infrastructure Grant (RBIG)

The RBIG Programme was established in 2007 to support capital funding of the social component of new bulk infrastructure. All projects must be implemented before funds are allocated. To initiate the programme R1.4billion was made available by National Treasury over three years. To date a further R5.2billion has been made available, with an additional R2.9billion accessible from the Division of Revenue Act for 2013/14.

The South African Government adopted a National Infrastructure Plan in 2012 that to transform our economic landscape. This plan intends to integrate and coordinate the long-term infrastructure build and will be coordinated by the Presidential Infrastructure Coordinating Commission (PICC).

The plan has identifies 18 Strategic Integrated Projects (SIPs) which have been approved to support economic development and address service delivery in the poorest provinces.

Municipal Water Infrastructure Grant (MWIG)

The purpose of the MWIG will supplement other existing grants where there are gaps. The MWIG will address functionality related problems as well as new infrastructure requirements by 30th of June, 2015. The total budget allocation over the next three financial years (starting from the 2013/2014 year) is R 4 332 millions, and will be allocated annually as follows:

- 2013/14 – R 602 million
- 2014/15 – R1 059 million
- 2015/16 – R2 671 million

Human Settlements Development Grant (HSDG)

This grant supports the creation of sustainable human settlements through the facilitation and provision of access to basic infrastructure, top structures and basic socio-economic amenities.

It is also intended to provide employment and skills development during the delivery of infrastructure. R16.9 million has been allocated for the 2013/14.

Rural Households Infrastructure Grant (RHIG)

This grant is managed by the Department of Human Settlements (DOHS) and was introduced in 2010/11, following the transfer of the sanitation function from the DWA to the DOHS. It is intended to supplement existing funding of sanitation programmes by providing for the rapid rollout of on-site water and sanitation infrastructure e.g. rainwater tanks and toilets), for rural households whose remote location does not enable easy access piped water and sanitation services. A total of R106.7 million has been allocated for 2013/14.

Skills development and industry bodies in the water sector

Generally in South Africa, municipalities suffer from an on-going chronic shortage of engineers and a high management turnover with 25% of management posts being vacant for more than three months. It is estimated that one in six managers exits the municipality in the course of the year (Department of Water Affairs. 2013).

Research carried out for the publication of “Numbers and Needs in Local Government” (Lawless, 2005) shows that the civil engineering capacity, (expressed as civil engineering professionals per 100 000 people), in local government is too low to deliver, operate and maintain local government infrastructure in a sustainable manner. For example, South Africa had 20 engineers per 100 000 people pre 1994, this has now dropped to 3 per 100 000. Appendix C presents a list of courses available in South Africa.

Water Industry Bodies

The industry associations for the water sector and some non-governmental organisations (NGOs) are listed below:

Table 1: List of industry association in the water space

Name	Role	Contact
WISA	Water Institute of South Africa. WISA is a forum for the information exchange to improve water resource management in Southern Africa with focus on South Africa.	Website: http://www.wisa.org.za/Content_page.aspx
SAAWU	South African Association of Water Users SAAWU was established in 2001 and evolved from what was previously the South African Association of Water Boards. SAAWU represents, promotes and	Website: http://www.saawu.org.za/

	co-ordinates the interests of all public sector institutions involved in the provision of water services.	
WESSA	Wildlife and Environment Society of South Africa. WESSA's mission is to implement high impact environmental and conservation projects which promote public participation in caring for the Earth.	Website: http://www.wessa.org.za/
WSA Foundation	Water and Sanitation for Africa. The foundation is responsible for mobilisation of resources to facilitate the implementation of water, sanitation and hygiene programmes to poor and unserved communities in Africa.	Website: http://www.wsafrica.org/
AWARD	The Association for Water and Rural Development. AWARD works on issues relating to water supply in South Africa's Lowveld region.	Website: http://www.award.org.za/ Assistant Director: Derick du Toit, e-mail: derick@award.org.za)
SANCIAH	The South African National Council of the International Association of Hydrologists	

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10. McKenzie, R; Siqalaba,ZN and Wegelin, WA. (2013). COUNTING THE LOST DROPS – Study into non-revenue water shows we can do more .*The water wheel*. 12 (1), 15.
11. The Provincial Economic Review and Outlook (PERO), 2011.
12. de Villiers, S and de Wit, M. (2010). AEON Report Series No. 2.
13. Presidential Infrastructure Coordinating Commission: A summary of the South African National Infrastructure Plan, 2012.

Annexure 1: Other governmental role players in the Water sector

Acronym	
DWA	Department of Water Affairs
DEA	Department of Environmental Affairs which ensures that environmental impact assessments for water services projects are carried out, while promoting conservation, cleaner technologies and waste minimization
DoHS	Department of Human Settlement which sets national housing policy aligned to local government's water services policies and is responsible for the eradication of water services backlogs in informal settlements and has taken over the responsibility for sanitation from DWA from 2009.
DoCG	Department of Cooperative Governance , which ensures that local government provides water services, regulates municipal services partnerships, develops an integrated approach for municipal development planning, allocates funds to local government, regulates municipal affairs and intervenes in cases of non-performing WSAs with collaboration of the Provincial Government.
DRDLR	Department of Rural Development and Land Reform. Its focus is on agrarian transformation of agricultural systems and patterns of ownership and control especially

	in terms of irrigation schemes for small scale farmers.
DoH	Department of Health (ensures that all hospitals and clinics are provided with adequate water and sanitation facilities).
DoPW	Department of Public Works, which is responsible for implementing the community based public works programmes and often acts as the owner and operator of public buildings, including schools, hospitals, etc..
DoE	Department of Education, which is responsible for identifying schools that have no access to water services.
DoA	Department of Agriculture (Provincial Government)
DEDT	Department of Economic Development and Tourism (Provincial Government)
DEADP	Department of Environmental Affairs and Development Planning (Provincial Government)
TCTA	Trans Caledon Tunnel Authority (management services (Project Implementation); financial services (Structuring and raising project finance, debt management and tariff setting); training; and other support services)
WSPs	Water Service Providers (provide water and/or sanitation services for municipalities and perform contractual duties as specified by the WSA. WSP entities can be made up of

	public, private or mixed entities or municipal government itself).
RWU	Regional Water Utilities (or Water Boards)
SALGA	South African Local Government Association (is an autonomous political association of municipalities to assist/guide municipalities through the implementation of water-related projects.

Appendix A: Major raw water storage dams and capabilities (Topic 9: Water Resources – City of Cape Town)

Main raw water storage dams and capacities

MAJOR DAMS 99.6% of the total system capacity	BULK STORAGE ON 28 November 2007 - 2011					
	CAPACITY MI	% 2007	% 2008	% 2009	% 2010	% 2011
Wemmershoek	58 644	87.3	93.4	98.3	92.2	79.2
Steenbras Lower	33 517	95.7	95.3	95.8	64.9	79.9
Steenbras Upper	31 767	102.1	99.2	98.1	98.1	98.2
Voelvlei	164 122	99.3	98.0	96.7	96.2	84.8
Theewaterskloof	480 250	103.3	101.5	100.9	89.1	81.2
Berg River	130 000		100.7	100.0	98.3	94.9
TOTAL STORED		774 780	897 314	894 436	820 760	757 082
TOTAL STORAGE		768 300	898 300	898 300	898 300	898 300
% STORAGE		100.8	99.9	99.6	91.4	84.3

It is important to note that the dams capacity as presented above represents the total capacity of the infrastructure rather a true reflection the annual yield which is a more accurate indication of the available water or supply and management.

Appendix B: Presents the main projects under the Department of Water Affairs, as well private sector initiatives in the Western Cape

Department of Water Affairs Project		
	Description	Custodian/Developer
Berg River Improvement Plan (BIRP)	The project started in September 2012 to address the current water quality concerns and their effects around in the Berg River area. BRIP highlights the current status of sources of pollution and the various interventions that have been or are currently being undertaken/planned by municipalities and Departments in the Western Cape. The project is spread over a number of short (≤ 5 years) and long term goals (5 – 30 years). It identifies short and long term interventions, and its financial implications.	<p>The Department of Water (DWA) The Western Cape Government (WGC)</p> <p>A task team has been put together lead by Joy Leaner (DEA&DP). There are 6 tasks within the BRIP. Annabel Horn is a task manager on Task 6 (water pricing).</p> <p>GreenCape’s water project team is carrying out a project which is linked to the BRIP, addressing integrated water and economic planning for development in the Berg catchment.</p> <p>More information about the project is available directly from the DEA&DP team (e-mail: Joy.Leaner@westerncape.gov.za; tel: 021 483 2798)</p>
Management and Clearing of		Working for Water (www.dwaf.gov.za/wfw/Controlwebsite), a

Invasive Alien Vegetation		<p>programme set-up by the Department of Water Affairs (DWA).</p> <p>LandCare, a programme run through the Department of Agriculture (DoA).</p> <p>Cape Nature</p>
Adopt a River	<p>The aim of this programme is to raise awareness and encourage communities to look after their water source. The programme is currently in its pilot stages in Knysna, Paarl, Grabouw in the WC.</p>	<p>DWA</p>
<p>Private Sector Initiatives</p>		
	<p>Description</p>	<p>Project developer</p>
<p>Bellville waste water treatment works (WWTWs) upgrades</p>	<p>Project value: R187-million.the Bellville WWTW will feature the largest membrane bioreactor (MBR) in the country and the facility's capacity will increase by 20 MI/d to 70 MI/d after the upgrades.</p>	<p>The City of Cape Town's Department of Water and Sanitation is the client, which appointed Veolia Water Solutions & Technologies South Africa</p>

	<p>With this capacity increase, the strain on the existing Bellville facility will reduce significantly and the effluent quality will improve. The plant is due for commissioning in 2013.</p>	
<p>Construction of Berg River Dam</p>	<p>The capacity of the dam will be increased by 523 million cubic meters a year.</p> <p>The dam construction team moved some 3 100 000m³ of earth, most of which formed part of the 900m long, 60m high and 200m wide earth-fill embankment. Aveng Grinaker-LTA also carried out the drilling and grouting for the project (10/12/2011)</p> <p>Project location: Franschoek, Western Cape, South Africa</p>	<p>The Trans Caledon Tunnel Authority appointed Aveng Grinaker-LTA</p>
<p>Meulwater WWTW</p>	<p>The new facility will treat water from the two dams</p>	<p>Aurecon</p>

	(Nantes and Bethel bulk storage dams) on the mountain, and the plant will be located on the boundary of the Paarl Mountain Nature Reserve.	
Malmesbury WWTW	The existing WWTW is being upgraded to a 10 MI per day membrane bioreactor (MBR) plant.	Aurecon
Wemmershoek WWTW	The R70-million project entails the construction of an upgraded five-million-litre-a-day sewage treatment works, a new main transfer sewer pipeline from Franschoek to Wemmershoek and an outfall pipeline to the Berg river	Royal HaskoningDHV
Plettenberg Bay WWTW	Plettenberg Bay Water Treatment Works in the southern Cape featuring DAF and Ozone technologies	Royal HaskoningDHV

<p>Beaufort West Water Reclamation Plant</p>	<p>This is the first Direct Water Reclamation Plant in South Africa. The plant was meant commissioned in January 2011 and is providing water of excellent quality.</p>	<p>Water & Wastewater Engineering</p>
<p>Citrusdal WWTWs upgrades</p>	<p>Relocate WWTW & upgrade capacity Additional 3ML reservoir Upgrade water & sewer network, pump stations and rising mains The project is currently undergoing</p>	<p>Water & Wastewater Engineering</p>
<p>Water efficiency programme- Leak detection</p>	<p>Senior Secondary High School Motherwell – Pilot Project.</p>	<p>Aqua Trip</p>
<p>Natural Water Treatment</p>	<p>A 5 year project on biomimicry for water treatment supported by the Water Research Commission</p>	<p>Biomimicry</p>

	<p>The Naturally Knysna and Discovery Challenge Park projects</p> <p>The Genius of Place projects - starting in the Western Cape</p>	
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Training Courses

Energy and Water Sector Education and Training Authority (EWSETA) – Energy Sector Education and Training Authority (ESETA) is one of 23 Sector Education & Training Authorities (SETAs) established in South Africa in terms of the Skills Development Act of 1998.

Appendix C: Presents different institutions which are providing water training courses

INSTITUTION	TRAINING COURSE/PROJECT DESCRIPTION
FET Water	A programme that supports training and capacity building networks in integrated water resource management in the water sector in South Africa
Water Institute of Southern Africa (WISA)	Professional Process Controller Training NQF
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit, WISA, and the Western Cape Process Controllers Division developing a water and wastewater Process Controller programme

<p>The Water Academy</p>	<p>An accredited water service sector and training provider for vocational training to water and wastewater treatment process controllers as well as to water and wastewater reticulation and distribution servicemen.</p> <p>National Technical Certificate: Engineering Studies (NI-N3) and Plumbing (Duration: 1 year)</p>
<p>Continuing Education at University of Pretoria Trust (CE at UP)</p>	<p>Accredited provider of more than 500 short certificate courses across 20 industry fields</p>
<p>Terra Firma Academy</p>	<p>Green Career Training</p>
<p>Terotechica Maintenance College</p>	<p>Water Treatment Plant and Maintenance Courses</p>
<p>Water & Wastewater Engineering</p>	<p>Pierre Marais (Managing Director) presented to the final year civil engineering students at the University of Stellenbosch. In conjunction with the US WWE hosted a bi-annual course on water and wastewater treatment, which contributed to Continued Professional Development points for engineers as prescribed by ECSA (Engineering Council of South Africa)</p>
<p>CPUT</p>	<p>Prof Alvin Lagardien – put together a course for Process Controllers (still to be confirmed)</p>
<p>Biomimicry</p>	<p>The Learning Journey projects of individuals and teams - growing capacity of biomimicry practitioners in a variety of fields including waste management and wastewater treatment</p>