

Proposed National Water Resource Strategy 2 (NWRS 2): SUMMARY

Managing Water for an Equitable and Sustainable Future



Summary July 2012



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Acronyms

CMA – catchment management agency

DEA – Department of Environmental Affairs

DWA – Department of Water Affairs

DWM – developmental water management

GDP – gross domestic product

MAR – mean annual runoff

NGP – New Growth Plan

NWRS-1 – National Water Resources Strategy (first edition, 2004)

NWRS-2 - National Water Resources Strategy (second edition 2012)

SADC – Southern African Development Community

WMA – water management area

WUA – water user association

Water for equitable growth and development

1 Introduction

This document presents a summary of the second edition of the National Water Resources Strategy (NWRS-2), as required under the National Water Act (Act 36 of 1998). The first edition of the (NWRS-1) was published in 2004 and set out the 'blueprint' for water resources management in the country for the first time.

This NWRS-2 sets out the strategic direction for water resources management in the country over the next 20 years, with a particular focus on priorities and objectives for the period 2013 – 2017. It provides the framework for the protection, use, development, conservation, management and control of water resources for South Africa, as well as the framework within which water must be managed at catchment level, in defined water management areas. It is binding on all authorities and institutions exercising powers or performing duties under the National Water Act (Act 36 of 1998).

The water sector has been in a state of major change since 1994, with substantial new policy and legislation which defines the framework for water management in the country.

While the policy and legislation have been globally recognised for their progressive response to water management, implementation has been slow, for a number of reasons. One of the key areas where the aims of the policy and the NWRS-1 have not been effectively achieved is in relation to equity and redress in access to water. While the provision of safe domestic water supplies has reached 95% of the population, showing remarkable strides since 1994, the allocation and reallocation of raw water to historically disadvantaged communities for productive purposes has not progressed as it should.

The NWRS 2 also addresses concerns that the socio-economic growth of South Africa potentially will be restricted if water security, resource quality and associated water management issues are not resolved in time. The NWRS 2 must ensure that water serves as an enabler for economic and social development and not a stumbling block.

The strong emphasis being placed on equity in access to water takes place in a context in which South Africa's water resources are under increasing pressure in terms of abstraction, habitat destruction and pollution. Climate change adds another dimension of stress to the pressure on our water resources. The effective management of our scarce water resources in this complex physical, social and economic matrix requires appropriate strategies, skills and capabilities. This NWRS-2 sets out the strategies for achieving such effective water resources management, with a particular, but not exclusive, focus on the role of the state, and specifically the Department of Water Affairs (as water sector leader), associated Sector Departments (impacting water resources and its management), Catchment Management

Agencies, water services authorities, water boards, and other organs of state with a responsibility for water management. It also focuses on the importance of water use sectors to become involved in and commit to effective water resource management.

A key issue is that this strategy is developed against the backdrop of South Africa being a water scarce country, and that water security and associated equity must be achieved within specific spatial, physical, technological, financial and governance constraints and challenges.

South Africa potentially has sufficient water resources, but this can only be secured through the effective and timeous implementation of extended and smart water management options. These options are, however, subject to spatial, economic and physical constraints.

Structure of the NWRS-2

This document provides a summary of the NWRS-2, and is structured as follows:

Chapter 2, sets out some basic facts around the hydrological cycle, the South African water context, and the contribution of water to the South African economy. This is included to inform those who do not clearly understand the hydrological cycle, and how this underpins the management requirements for water resources, particularly in the South African context.

Chapter 3 focuses on the key strategic direction of water for human needs and equitable growth and development, alignment of the NWRS with national development strategies and making water available for growth and development by 'stretching' our water resources.

Chapter 4 deals with water economics, the value of water, and allocation priorities.

Chapter 5 sets out the new paradigm for water management in South Africa – Developmental Water Management (DWM).

Chapter 6 deals with water governance while chapter 7 deals with the core values underpinning the NWRS.

Chapter 8 sets out the core strategies of the NWRS-2, chapter 9 sets out the key strategic actions required to implement the core strategies.

Chapter 10 sets out the new water management area boundaries, chapter 11 deals with water resource assessment information.

Chapter 12 deal with implementing the NWRS-2, while chapter 13 deals with the key elements of the new paradigm.

Chapter 14 provides a short summary of each of the supporting strategies of the NWRS-2.

The full NWRS-2 consists of eleven core strategies, supported by technical and enabling strategies. These strategies together address the different goals of the NWRS-2 and respond to the various challenges identified in water resources management in South Africa.

2 Understanding water resources

Effective water resources management is dependent on all water users and water managers playing their part. Government alone cannot do it.

In order to implement the NWRS-2, it is important that South Africans generally understand how the water cycle works, and how their actions create impacts in this cycle. It is equally important to understand the context of water resources in South Africa, and the specific challenges that we face as a country. This section, therefore, sets out some important facts about the water cycle and the specific water challenges in South Africa.

2.1 The water (hydrological) cycle

“...water is a scarce and unevenly distributed national resource which occurs in many different forms which are all part of a unitary, interdependent cycle” (National Water Act, Act No 36 of 1998).

Unlike oil, which is a non-renewable resource, water is a renewable resource which operates in a closed loop system (Figure 1). Heat results in water evaporation from the land and water resources. As the water vapour rises, it cools and condenses to form clouds. When conditions are appropriate, the water in the clouds is released as precipitation (rain, hail, snow or sleet). This precipitation evaporates back into the atmosphere, infiltrates the ground to become soil moisture or groundwater or runs off into surface water resources such as rivers, estuaries and wetlands. Plants take up water from the soil and transpire some of it into the air, contributing to the return of moisture into the atmosphere, and back into the cycle of evapotranspiration and precipitation.

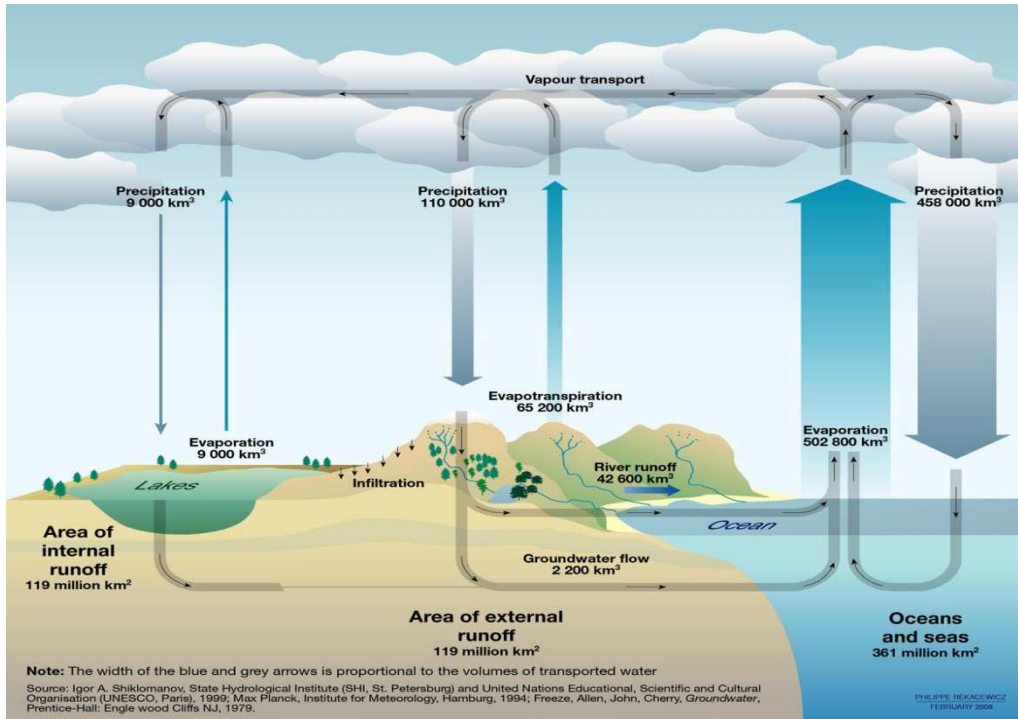


Figure 1: The water cycle (Source: Sarni, W.2011. Corporate Water Strategies. Earthscan LLC, Washington DC: 31.)

Groundwater either seeps (discharges) into streams, rivers, and oceans, or is released back into the atmosphere through plant transpiration.

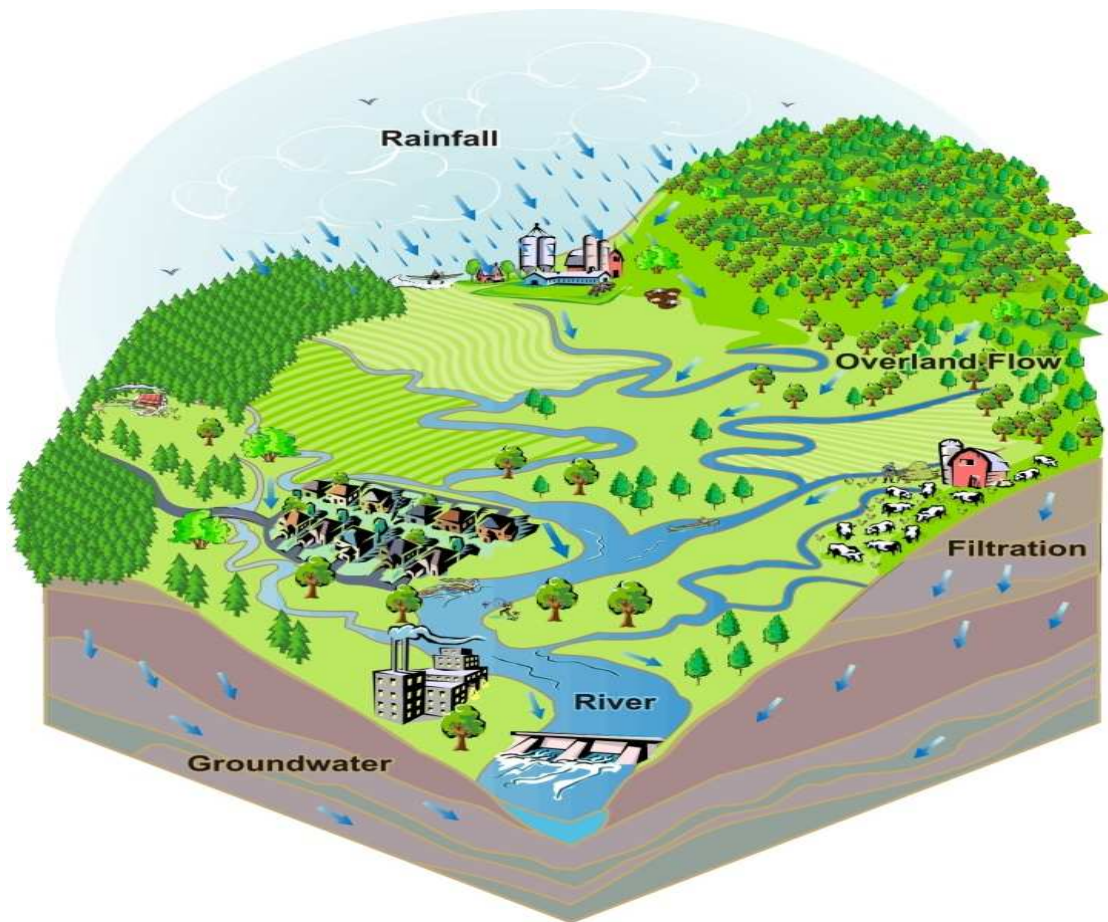


Figure 2: Diagram of a catchment area (Source: <http://prairierivers.org/tag/watershed-planning/>)

Infrastructure, such as dams, enables the provision of a reliable supply of water, and to increase the amount of water available for use, by storing water that would otherwise run into the sea. Storage of water in dams enables a reliable supply of water even during a drought. Other technologies are also available for increasing water availability, such as desalination, although such technologies are still relatively expensive.

The challenge is, however, that dams and general use of water for social and economic purposes have negative impacts on aquatic ecosystems, which provide important goods and services. The challenge, therefore, is how to balance the use of water with the protection of aquatic ecosystems. The NWRS-2 provides strategies that aim to achieve this.

2.2 Basic Facts about Water

Examining some of the facts about water use and scarcity in a global context helps to underpin the case why governments and companies are now addressing water as a strategic

issue. This case becomes more compelling when one examines the specific water context in South Africa. This section sets out this picture as a context within which the NWRS is set.

More than one-third of the world's population – roughly 2.4 billion people – lives in water-stressed regions and this number is expected to rise. 3,6 billion people die each year from water-related disease and 98 per cent of water-related deaths occur in the developing world. 884 million people lack access to safe water supplies – approximately one in eight people. Poor people living in the slums often pay five to ten times for water than wealthy people living in the same city.

Less than 1 per cent of the world's fresh water (or about 0.007 per cent of all water on earth) is readily accessible for direct human use. Figure 3 below shows the volume of all water on earth, relative to the size of the earth (large water drop), The middle size blue drop represents the volume of the world's liquid fresh water (including in swamps and groundwater), while the tiny bubble represents surface fresh water¹

While water is the most abundant resource on Earth, 97.5 per cent of it is too salty for human consumption and crop production. Much of the fresh water, an estimated 35 million cubic kilometres, cannot be accessed for use since it is locked either in the ice cover of the Arctic or Antarctic or in deep aquifers. Thus, the physically accessible fresh water potential of the world is only 90 000 cubic km per year.

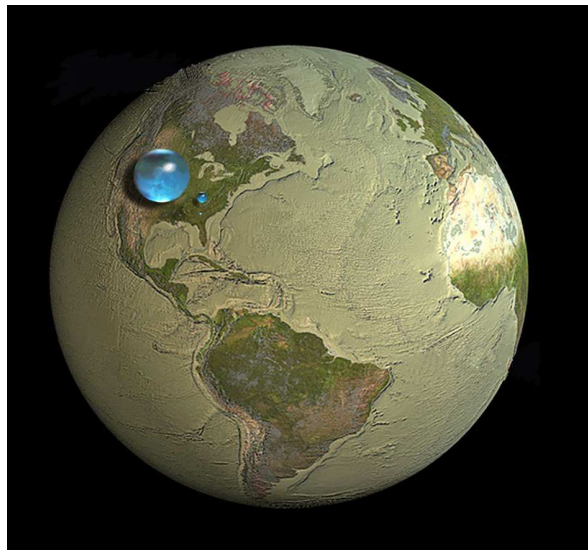


Figure 3: Volume of total water and freshwater relative to the size of the earth

¹ Credit: [Howard Perlman](#), USGS; globe illustration by [Jack Cook](#), Woods Hole Oceanographic Institution (©); [Adam Nieman](#). Data source: Igor Shiklomanov's chapter "World fresh water resources" in Peter H. Gleick (editor), 1993, *Water in Crisis: A Guide to the World's Fresh Water Resources* (Oxford University Press, New York).

Available water is described as blue water (water in rivers, dams, groundwater, etc) and greenwater (soil moisture). Greenwater is important in dryland agriculture. Not all blue water can be used due to economic, technological, and environmental limitations, spatial and temporal mismatch between fresh water availability and demand, and pollution-induced quality deterioration.

Desalination and water recycling can increase water supply, but these options are relatively costly, and only relevant in specific contexts.

Improving water use efficiency is a promising avenue for supply augmentation in view of the extensiveness of water losses and resource underutilization. Since this option helps to realize hidden resource potential within the existing supply limits, it augments supply even in the absence of new water development projects and also prevents further ecological impacts arising from new infrastructure development or increased abstraction.

Water quality is a significant problem in most countries. Pollution-induced quality deterioration not only reduces the benefits of available supply but also leads to a harmful environmental and health hazards. Water-related natural disasters such as floods and droughts are potential threats to human life, both directly and indirectly. In addition to the human costs, there are also economic losses from crop and property damage

2.3 Facts about South African water

This section gives some key facts about the South African water context as background to the strategies put forward in the NWRS-2.

Understanding water scarcity

South Africa has low levels of rainfall relative to the world average with high variability as well as high levels of evaporation due to the hot climate, and increasing challenges from water pollution. All of these pose constraints on the amount of water available for use.

Although the regulatory framework and the institutional arrangements have changed since the advent of democracy, one aspect remains constant: water scarcity – whether quantitative, qualitative or both – which originates as much from inefficient use and poor management as from real physical limits. South Africa is the 30 th driest country in the world and has less water per person than countries widely considered to be much drier, such as Namibia and Botswana. Water run-off is highly variable and unevenly spread in space and time. High variability of water flow is the norm, and the base flow varies from very low to zero. At present, there is a well-developed infrastructure, with more than 4395 registered dams in South Africa, of which 2528 are water supply related. However, In many parts of the country we have either reached or are fast approaching the point at which all of our financially viable freshwater resources are fully utilised. Despite the good infrastructure, the occurrence of floods and droughts are part of the “normal” water cycle and water restrictions and flood management are a critical part of the water business. And despite the

good infrastructure, the poor and marginalised experience water scarcity most intensely, particularly in under-developed rural areas and areas such as the former homelands.

In many parts of the country, we are fast approaching the point at which all of our easily accessible freshwater resources are fully utilised. All South Africans must recognise this situation so that necessary steps are taken to assess current and future demands for water. This will not be an easy task, but with the necessary resolve to plan and implement the required interventions, a secure water future can be achieved.

It is important to recognise, however, that there are very different experiences of water scarcity for different groups in South Africa. In particular, water scarcity is experienced on a daily basis by the rural poor, many of whom still do not have access to potable water supply, and who also do not have access to reliable water supply for productive purposes. These communities are also the most vulnerable to droughts and floods. When dealing with water scarcity, therefore, the plight of those who experience water scarcity most intensely must take priority.

The present water supply situation has created a false sense of water security within the privileged sectors of South African society. Marginalised and poor communities have, on the other hand, have always experienced high levels of water insecurity.

It must be noted that, as at 2012, South Africa has had 16 consecutive years of above-average rainfall in the majority of summer rainfall areas and in these areas the last major drought was more than two decades ago. This trend is unlikely to continue. Other areas such as the Western Cape and parts of the Eastern Cape suffered from drought. The potential for drought in other areas and the impacts of climate change place a particular imperative on the effective management of water resources, within the framework of this NWRS-2.

For the NWRS-1 in 2004 DWA undertook a number of studies to develop Internal Strategic Perspectives for each Water Management Area. Subsequent to this, a number of further studies have been done to update the information supporting the reconciliation of supply and demand. In this, DWA has taken a strategic approach to focus the updating of water situation assessments on the areas where this is most urgent. There have also been studies to assess the water situation in terms of quality (DWA, 2011).

Water quantity

The South African water situation is characterised by low levels of rainfall, erratic runoff, high levels of evaporation due to high temperatures and shallow dam basins as well as sedimentation problems and large scale inter basin water transfers.

The NWRS-1 showed that the majority of the water management areas (WMA) have water deficits (i.e. the water requirements exceed availability with current infrastructure) despite significant transfers from other catchments. Only a few selected WMAs such as parts of the Eastern Cape had surplus water. There were, already, concerns that more WMAs would have fresh water deficits by the year 2025.

There are a number of options for reconciling water supply and demand, which are dealt with in the technical strategies, including improved water use efficiency, development of new infrastructure, re-use and recycling, desalination, and the removal of water hungry alien invasive plants.

Surface water

For the purpose of water planning, the Department of Water Affairs (DWA) plans with 'available water' and uses a 98% assurance of supply (DWA, 2004). This means that water can be abstracted at the determined 'yield', 98 out of 100 years on average. There is about 10 000 million cubic metres per year available with this level of assurance. In most areas where there are water deficits or where the system is considered 'in balance', the probability is that water shortages are experienced more than 2 out of 100 years. Water shortages have become part of life in South Africa.

Approximately 25% of the mean annual runoff (MAR) of 49 000 million cubic meters per annum needs to remain in the rivers and estuaries to support ecological functioning of the catchments, depending on the specific river systems. In many water management areas the ecological portion of the Reserve is not yet fully implemented.

Most of the economically available yield from surface water resources over large parts of the country has been fully developed and utilised. More than two thirds of the country's MAR is already stored in dams. Where additional water is still available, such as in the uThukela, Mzimvubu and Pongola basins, it is located in relatively remote areas far from existing centres of demand. Opportunities for economically viable new dams are few and far between (DWA, 2010), and the costs of transfer of water per cubic metre to locations where water is needed are also rising with longer distances.

Surface water from dams and direct abstraction from rivers, accounted for 9 500 million cubic metres per annum, with a significant volume of the surface water yield (3000 million cubic metres per annum) moved via inter-basin transfers to areas in the country where requirements exceed supply. An example is the Lesotho Highlands Water Scheme which supplies water to Gauteng through transfer from Katse and Mohale Dams in Lesotho to the Upper Vaal WMA. The Mzimvubu to Keiskamma WMA is currently the only WMA not subject to inter-basin transfers.

Many dams and associated water resources infrastructure were built more than 40 years ago. While the main structures may have an extremely long life, spillways, gates, pumps, pipelines and canals and associated infrastructure, need regular maintenance and occasional major rehabilitation to extend the lifespan of these assets for which funding is required. There are also backlogs in the rehabilitation of water infrastructure owned by the municipalities.

Groundwater

Groundwater is a significant resource in many parts of the country although local yields are usually quite low. The most recent estimate of sustainable potential yield of groundwater resources at high assurance is 7 500 million cubic metres per

annum, while current groundwater use is estimated at around 2 000 million cubic metres per annum. Allowing for an underestimation on groundwater use, potentially about 3 500 million cubic metres per annum is available for further development. This resource is, however, sparsely distributed and often not readily available at points of demand. This is exacerbated by the levels of knowledge and information on the groundwater resource.

Some of the most favourable areas/ aquifers regarding groundwater availability include: the Dolomites of the West and Far West Rand; Table Mountain Group Aquifers of the Western and Eastern Cape; Coastal sand aquifers in the Western and Eastern Cape, and northern KwaZulu-Natal. Other high yielding aquifers include basement granites in the Polokwane-Dendron-Coetzerdam area, alluvial deposits along sections of major rivers such as the Limpopo, and parts of the Karoo Sequence associated with dolerite dykes and ring structures.

Water resource quality

There are significant water quality challenges in South Africa. The main contributors to water quality problems are mining (acidity and increased metals content); urban development (salinity, nutrients, microbiological); industries (chemicals, toxins); and agriculture (sediment, nutrients, agro-chemicals, salinity through irrigation return flows). Rural communities in parts of the country that are dependent on ground water are negatively affected because of the natural mineral content exceeding recommended levels. Untreated or poorly treated waste water is severely affecting the quality of water in many areas.

Our water ecosystems are not in a healthy state. Of the 223 river ecosystem types, 60% are threatened with 25% of these critically endangered. Less than 15% of river ecosystems are located within protected areas, many of which are threatened and degraded by upstream human activities.

Of 792 wetland ecosystems, 65% have been identified as threatened and 48% critically endangered. Furthermore, 31% of fresh water fish species indigenous to South Africa are threatened. This is of enormous concern, given the crucial role of wetlands in delivering ecosystem services such as water purification, flood regulation and drought mitigation.

This situation has negative impacts on human health, on rural communities directly dependent on water-related ecosystems such as wetlands for their livelihoods and on the mainstream economy and demands drastic intervention.

Water resource quality and water quantity issues and solutions are interrelated and need to be addressed in an integrated manner. Although it is technically possible to treat water of poor quality to a potable standard, this can be very costly. Water of bad quality also impacts negatively on farming, recreation, ecosystems and the economy.

Shared water resources

South Africa shares four major river systems with six neighbouring states (Zimbabwe, Botswana, Mozambique, Swaziland, Lesotho and Namibia). International agreements on water sharing are in place in all of these river basins, in line with the Revised SADC Protocol on Shared Watercourses. These shared river basins raise the importance of water in the regional integration agenda in SADC.

South Africa's policy and legislation recognises international obligations in allocation protocol, which is dealt with in the support strategies.

3 Water management issues

Ethical and Cultural Value of Water

Apart from the quantitative and qualitative pressures on its physical dimensions, water demand is also growing due to the broadening perspective of water and its ecological, ethical, and cultural roles.

Inadequate financing and poor financial management

Inadequate financing remains a key challenge. Investment in water needs to double if the required outcomes are to be achieved. A recent study by DWA reveals that the capital requirement for the entire water sector over the next 10 years, in real terms, is in the region of R670 billion, and that the funding gap is R338 billion over this 10 year period.

Operation, maintenance and refurbishment are also underfunded. And there is insufficient funding available for programmes such as water demand management and conservation, research, information management, skills development and effective planning.

A key issue is the lack of effective financial management in water management. This includes the ring-fencing of the water 'business' and the need to be able to measure the actual cost of water delivery, ensuring cost recovery with appropriate protection for the poor, appropriate tariff setting, effective and long-term financial planning as well as business and project viability and the application of basic water economics. Cost recovery is essentially based on three sources of revenue – tariffs, taxes and transfers (generally from international donors). These three sources of income must be used to cover capital and operational costs.

It is also critical that the policy should guide the allocation of financial resources so that sufficient resources are dedicated to achieving priority outcomes. Although performance-oriented budgeting is hard to implement, and requires extensive analytic and operational changes in practice – its potential value cannot be underestimated. A comprehensive performance-oriented budget is the best option.

Shortage of human resources

The lack of appropriate skills and capability in the right places has been identified as a critical challenge in the sector, from engineers, scientists and artisans, to project and programme management, as well as leadership, governance and oversight.

In addition to the shortage of critical and scarce skills in the right places, the water sector lacks capability to perform optimally because of the loss of institutional knowledge, experience and competency. This is of particular importance when considering the increased skills and capacity required for improved water management and governance.

It must be recognised, however, that if one looks across the entire water sector, including government, the private sector and civil society, there is a range of skills, knowledge and capability in some areas that can be drawn on for the implementation of the NWRS-2. The challenge lies in mobilising these skills and resources to a common end whilst urgently building more capacity in other critical areas.

4 Contribution of water to the South African economy

The reliable supply of water in sufficient quantities and required quality is a crucial input to economic growth and job creation. The contribution of water to the major economic sectors is highlighted below. The water use per sector is shown in figure 4².

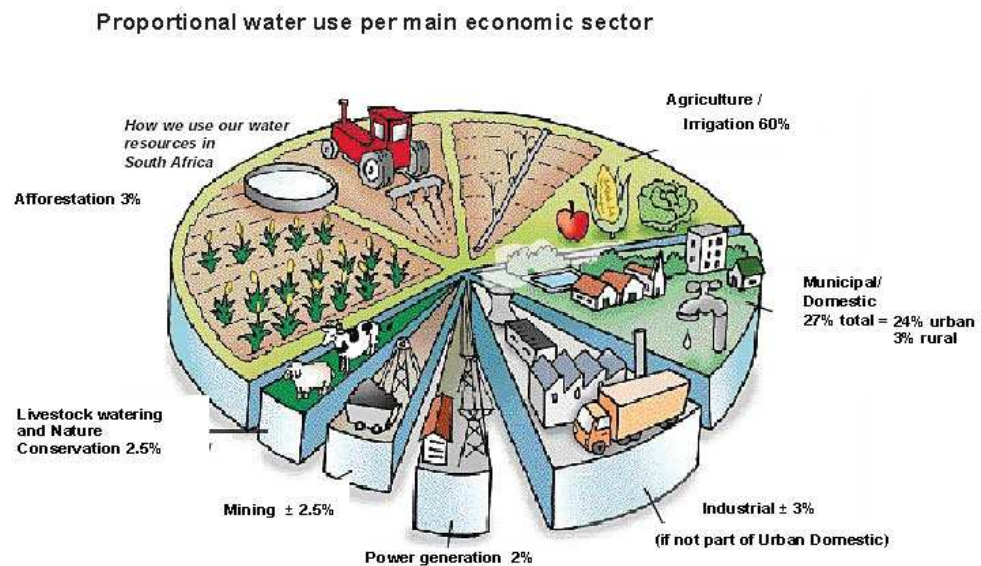


Figure 4: Estimated volume of water per sector

² Figure 4 to be updated with latest information from Water Authorization and Registration Management System (WARMS)

Agriculture

About 8.5 million people are directly or indirectly dependent on agriculture for employment and income (GCIS, 2011). The sector contributes about 3% to the GDP and 7% to formal employment. The agricultural sector is made up of commercial farmers and subsistence farmers: about 1.3 million hectares are irrigated. The New Growth Path has set a target of 300 000 households in smallholder schemes by 2020 and 145 000 jobs to be created in agro-processing by 2020 (DED, 2010). Irrigated agriculture is the largest single use of water in South Africa (60%) and it has a huge potential socio-economic impact in rural communities. Water is the major limiting factor to the growth of this sector and poor water quality has a negative impact on agricultural exports and associated foreign income.

Energy Sector

The energy sector although only using 2% of water, contributes about 15% to the GDP of South Africa and creates jobs for 250000 (GCIS, 2011). It generates about 95% of the electricity in South Africa and also exports it to countries in Africa. The energy sector, including Eskom, the national power generator, is highly dependent on reliable supplies of water for the generation of electricity (steam generation and cooling processes), and an elaborate and sophisticated network of water transfer and storage schemes have been developed specifically to support this sector and ensure high levels of reliability. The water sector is on the other hand highly dependent on a constant and reliable supply of electricity to “move water”

Mining Sector

According to the Chamber of Mines of SA, the mining sector contributed 8.8% directly and 10% indirectly to the GDP of SA in 2009 (GCIS, 2011). It creates about 1 million direct and indirect jobs. The sector accounts for approximately one third of the market capitalization of JSE and it is also the major attractor for foreign investments. The NGP has set a potential employment target of 140 000 new jobs by 2020 for the mining sector (DED, 2010). Mining and related activities require significant quantities of water whilst also impacting on the environment with associated potential pollution. The development of new mines in water scarce areas requires forward planning to make arrangements for the transfer of water and development of new sources.

Manufacturing Sector

The manufacturing sector contributed 15.5% to the GDP and 13.3% to jobs in 2009 (GCIS, 2011). The NGP has set a target of 350 000 new jobs for this sector by 2020. Water is an input in the manufacturing processes and it also used for cooling.

Tourism Sector

In 2009, the tourism sector directly and indirectly contributed 7% to the GDP and it created 575 000 jobs (GCIS, 2011). This sector is earmarked for high economic growth, which is expected to generate a huge number of new jobs. The NGP has set a target of 225 000 new

jobs by 2015 (DED, 2010). Drinking water quality that match international standards as well as a reliable water supply and sanitation services are critical to the success of this sector.

Food and Beverages Sectors

The food and beverage sectors are highly dependent on water for the production of their products, however, the precise contribution of the food and beverage industries to the South Africa economy has still to be reckoned.

4.1 Committing Water Use Sectors to sustainable water management

A major gap in the management model is that water resource management is not effectively institutionalised in water sector business management. This has resulted in water related sectors and industry not giving water the attention and priority it deserves, and a lack of ownership, commitment and self-regulation in the private sector. A recent study revealed that many South African businesses are not prepared for managing potential water risks.

Water-dependent businesses can no longer take water for granted regardless of the industry sector they operate within. One of the earliest and most comprehensive discussions of the risk water represents to businesses was published by the Pacific Institute (Morrison and Gleick, 2008). Business opportunities accompany these risks, for those companies that can deliver their products and services efficiently (low water use or no water use), or can develop technological solutions to provide clean water to the public and private sectors.

First, there is physical risk to a business, which arises from decreasing water availability (water scarcity) and the reliability of supplies. The first driver of physical water risk is increased population and its resultant demand from urban and agricultural uses, coupled with water availability. The second driver is poor operation and maintenance of water systems that business is dependent on.

Increased water scarcity will increase competition between business and local communities, particularly between business and poor and historically marginalized communities. This potential competition and associated conflict must be effectively resolved by improved management and planning.

With declining water quality, the physical risks to businesses can become acute. A decline in water quality can result in the need for pre-treatment, which is an additional cost to businesses. This can be especially true when high-quality water is required in the pharmaceutical, beverage and food processing sectors. Companies can expect increased regulation of water quality, and along with increased regulation come potential constraints on availability and higher costs for quality control.

Water supply-chain disruptions represent a real and to a large degree unqualified threat. Businesses are just coming to terms with the realization that they must quantify water use and risk within their supply chain. They have been grappling with this challenge with regard

to their carbon risk and seem to have made real progress in quantifying and reducing carbon in this portion of their footprint. Managing water risk within a company's supply chain will be no small task, as most companies that outsource manufacturing can only influence, and not control the behaviour of up-stream suppliers.

Business and commitment to water management

Water risk to business is real. Companies across several industry sectors should start to take the lead in quantifying their exposure to water risk, and should develop plans to mitigate these risks.

There is a strong commitment from a number of significant enterprises and organisations to work closely with DWA to improve water management across the country. Some industries and business have not only initiated actions in this regard, but have set world class examples in terms of developing water footprints, water master plans and committing themselves to effective and smart water management.

Business, Stakeholder Management and Partnerships

Partnerships with the public sector, NGOs, research institutions and other key stakeholders must be part of any corporate water provision programme. The importance of stakeholder management and partnerships with NGOs and communities cannot be overemphasized. A number of factors drives the need for truly collaborative partnerships. Neither government nor businesses alone can solve water issues, such as climate change and water scarcity. As a result, government and companies increasingly have to forge new types of partnerships, and rethinking relationships with traditional stakeholders. Leadership now demands a transparent engagement with stakeholders, including water users from poor communities, that includes establishing priorities and setting measurable goals and actions. Apart from poor communities, stakeholders should include investors, regional, national and global NGO's, intergovernmental organizations, and employees.

As stakeholders, employees are critical in building and implementing a water strategy. Besides developing and implementing a water strategy, employees will also help communicate access and performance to other stakeholders. In the strategy process, the importance of employees cannot be overestimated. In this regard, it is important to deliver simple, relevant, personal messages tailored to the needs of employees and local communities.

Water use authorization has become a critical business risk which has to be managed, and is no longer a routine matter of business license or permits; license to operate can be given and withdrawn by a variety of stakeholders important to a business. The emerging issue of the human right to water will only make the competition, in turn, increase the risk to a company's license to operate unless water stewardship is a key aspect of business strategy, governance, and operations for both direct and indirect water use.

4.2 Water for human needs, equitable growth and development

“Of all natural resources, water permeates perhaps most deeply into all aspects of our life. It is as essential as the air we breathe for our survival; its presence determines the nature of the natural environment in which we live; the majority of our economic activities depend on it. The achievement of South Africa’s development vision will thus only be possible if water resources are managed in a way which is sensitive to and supportive of the many demands we place on them.” (White Paper on a National Water Policy for South Africa 1997)

The NWRS-2 is centred around a recognition of water as a basic human need, and a recognition of its critical role to ensure equitable socio-economic development. The principle of equity means that special attention must be given to the needs of those that were historically denied access to water or to the economic benefits of water. Equity implies a concept of fairness, which allows for different practices in the management of water in response to different social, economic and environmental needs.

In order to bring equity to a practical level it is important to distinguish between equity in access to water services, equity in access to water resources and a thirdly, equity in access to benefits from water resource use through economic, social and environmental development and management.

Equity in access to water services

The Water Services Act (Act 108 of 1997), and its accompanying regulations, translated the Constitutional right of “access to sufficient water” into firm definitions in terms of quantity, quality and assurance of supply. Since 1994 impressive progress has been made in providing millions of South Africans with access to a safe water supply as the backlog was reduced from 41% to 5% over the period 1994 to 2012. While major investment in water resources infrastructure has enabled the provision of reliable water supplies to large urban areas, in large parts of the rural areas and to commercial water users, and to the economic sectors described above, there are still many South Africans who suffer from water insecurity and lack of access to reliable water supplies for domestic and productive purposes. The NWRS-2 recognises the need to address equitable allocation as envisaged in the policy and legislation, which has not been fully realised yet.

Equity in access to water resources

Equity in access to water resources deals with the concept of direct access to water for productive purposes such as water for irrigating crops or water for a business or an industry. Critical, therefore, to the NWRS-2, is the requirement to address equity in water allocation, and to ensure the beneficial use of water to create jobs, contribute to poverty eradication, and reduce the major inequality of South African society. It is however not practical nor possible to divide South Africa’s water resources so that each person has access to the same amount of water.

Equity in access to the benefits from water resource use

The third equity principle is equity in access to the benefits from water resource use. This means that water must be allocated in such a way that it brings maximum benefit to all whether directly or indirectly.

Achieving this will require placing emphasis on emerging opportunities such as renewing infrastructure, investing in human capabilities, stimulating innovation and technological development, redressing historical inequalities, and increasing participation in the governance and management of water. It also requires an appreciation of emerging challenges such as climate change and how they might influence current and future strategies.

Conflating Means and Ends

It is critical that the strategies presented in the NWRS-2 support the ends as set out in the national policy:

“The objective of managing the quantity, quality and reliability of the nation’s water resources is to achieve optimum, long-term, environmentally sustainable social and economic benefit for society from their use”.

This is premised on principles of equity, sustainability and efficiency. The NWRS-2 is, therefore, aimed at managing our water resources in a manner that will achieve optimum, long-term, environmentally sustainable and equitable social and economic benefit for society. These aims and values must remain central and conscious in the interpretation and implementation of the NWRS-2.

Since water management is in itself complex, and is operating within a complex social, economic and ecological environment, it is uncertain that specific activities will necessarily lead to particular outcomes. It is therefore critical that the NWRS-2 sets clear outcomes, that progress towards these outcomes is monitored and assessed regularly, and that adaptive management approaches are used to ensure that changes can be made where sufficient progress towards the outcomes is not being achieved.

Equally important is the participation of people in water management. In particular, the participation of the poor is critical in eliminating poverty and ensuring the political legitimacy of policies and strategies. Participation has evolved over the last eighteen years from a passive model to a more action-oriented concept. Top-down consultation, has been replaced by citizen participation. This is a critical approach underpinning and supported in the NWRS-2.

4.3 Alignment with national development strategies

It is important to recognise that, in most cases, water is only one of a number of inputs required for economic growth and development. At the household level, access to a relatively small amount of water for productive purposes can make a substantial difference to the quality of life of the poor, but without access to other resources such as markets and transport infrastructure, it is unlikely that such access will enable people to truly escape from poverty.

It is now being realised by most sectors as well as in most national and sector strategies that water is important and that no development can happen without water planning, development and the corresponding budget allocations.

However, for water to play an optimal role in poverty eradication, growth and development, and building a just and equitable society, water resources planning must be integrated into national, provincial and local planning, and must be addressed in all growth and development strategies. This section highlights some of the key strategies and plans that must be integrated with water planning to achieve national development objectives and outcomes.

National Planning Commission Vision 2030

The National Planning Commission has paid particular attention to water issues and how they impact and influence our development pathways and opportunities.

New Growth Path (NGP)

Water has a role to play in four out of five of the job drivers identified in the NGP and the NWRS-2 supports the NGP in the following areas:

Jobs Driver 1: Infrastructure for employment and development – The NWRS-2 includes a sub-strategy that focuses on infrastructure development and management which will create new job opportunities over the next 5 years. The sub-strategy outlines a plan for funding infrastructure development needed to support economic growth in South Africa.

Jobs Driver 2: Improving job creation in economic sectors - The NWRS includes reconciliation strategies for balancing water supply and demand in high growth areas. It also provides a framework for strong sector leadership, streamlined water use authorisation processes and an economic regulator. The NWRS also prioritizes water conservation and water demand management (WC/WDM) in all sectors in order to increase productivity per unit of water. This enables the possibility of the water saved being used in new or expanded enterprises.

Job Driver 3: Seizing the potential of new economies – The NWRS makes provision for the recycling and re-use of wastewater, and for water to be used in supporting the green economy and the creation of jobs in this area.

National Government Outcomes

The Cabinet Lekgotla in January 2010 adopted 12 government outcomes which are the key indicators for the national government's programme of action for the period 2010-2014.

The following national government outcomes are intricately linked with availability of water resources:

Outcome 2: A long and healthy life for all South Africans – Water is fundamental requirement for human health. The NWRS makes provision for allocation of water to meet basic human needs and includes a sub-strategy for protection of water resources.

Outcome 5: A skilled and capable workforce to support an inclusive growth path - The NWRS recognize the importance of a technically competent workforce in the sustainable management of water resources and it includes a sub-strategy for water sector capacity building.

Outcome 6: - The NWRS makes provision for investment in water infrastructure to support economic development through a strategy for infrastructure development and management and the National Water Sector Investment Framework.

Outcome 7: Vibrant, equitable and sustainable rural communities with food security for all - The NWRS adopts the principle of 'source to tap and back to source' and maximization of local water resources to improve access to adequate water for domestic and productive use in rural communities in particular. The equity and redress focus of the NWRS-2 is particularly in line with supporting outcome 7.

Outcome 8: Sustainable human settlements and improved quality of household life, and Outcome 9: A responsive, Accountable, effective and efficient local government system– The NWRS-2 provides options for water resource development to meet water supply and sanitation services for a growing population and for the provision of higher levels of service.

Outcome 10: Environmental assets and natural resources that are well protected and continually enhanced – Protection of water resources and associated aquatic ecosystems is one of the strategic goals of the NWRS and a sub-strategy for protection of water resources and regulatory framework for water resources are included.

Industrial Policy Action Plan 2

The Industrial Policy Action Plan 2 (IPAP 2) is a central tool in the NGP job creation strategy (DTI, 2011). The NWRS-2 is in line with the IPAP2 support for job creation through the promotion of rainwater harvesting, water recycling and the production of water and energy efficient appliances.

Rural Development Strategy

Water availability is a crucial input to the Rural Development Strategy. The NWRS-2 makes provision for supporting rural development through the multiple use of dams, investment in

appropriate water infrastructure, water allocation reform, and a programme of support to small scale water users.

National Biodiversity Management Strategy

This strategy falls under the auspices of the Department of Environmental Affairs, and is aimed, inter alia, at the integrated management of terrestrial and aquatic ecosystems (DEAT, 2005). Protection of aquatic ecosystems is addressed in a specific strategy in the NWRS-2.

Irrigation Strategy

The Irrigation Strategy, developed by the Department of Agriculture, Forestry and Fisheries, aims to increase the contribution of agriculture to the GDP, reduce poverty and create employment (DAFF, 2010). It also aims to increase water use efficiency and redress imbalances in access to irrigated agriculture for historically disadvantaged groups. The NWRS-2 makes provision for infrastructure development to support the implementation of this strategy, sets targets for water use efficiency by the agriculture sector, and sets targets for water reallocation to historically disadvantaged water users.

National Energy Efficiency Strategy

This strategy has set a target for energy efficiency improvement of 12% by 2015 (DE, 2010). This will contribute to a reduction in CO₂ and also reduce water use which is a key input to energy generation. The NWRS-2 addresses water demand management initiatives for the energy sector in the WC/WDM sub-strategy.

National Tourism Strategy

The National Tourism Sector Strategy (NDT, 2011) has set a growth target of 3.5% in 2015 from a rate of 3.2% in 2009. The NWRS-2 has made provision for infrastructure development in high growth centres, which will ensure that there is adequate water for meeting the needs of tourists to South Africa. The NWRS also promotes the use of water resources for recreation, and the protection of water resources, which will support jobs and income generated from tourism.

Mineral Beneficiation Strategy

The government objectives with respect to mining focus not only on the mining of primary commodities, but also on significant contribution to the economy through beneficiation (manufacturing) and on mining tourism (services). The NWRS-2 makes provision for infrastructure development to support the implementation of this strategy and it also sets targets for water use efficiency by the mining sector.

5 There is potentially sufficient water available for development

To date, South Africa's water security has mainly been reliant on surface (fresh) water and its development. Based on water reconciliation studies, it is clear that surface water availability and its remaining development potential will be insufficient to support the growing economy and associated needs in full. Surface water development potential only exists in a limited few water management areas, whilst serious challenges remain in the majority of water management areas.

Where additional water is still available, such as in the uThukela, Mzimvubu and Pongola basins, it is located in relatively remote areas far from existing centres of demand. The limits to the development of surface water sources have almost been reached and the opportunities for economic siting of new dams are few and far between (DWA, 2010). The costs of transfers per cubic metre to locations where water is needed are also rising with longer distances and escalating energy costs. In addition, the development of new water resources infrastructure is a complex and time-consuming process that typically takes more than a decade from inception to commissioning (DWA, 2010). For larger and more complex projects with environmental and political sensitivities, the lead times may be more than two decades. This highlights the need for careful planning with long time horizons. To meet growing demands, therefore, South Africa will need to exploit alternative resources.

The good news that by adopting a more holistic approach towards water management, its availability and its use, water resources can be defined in a much broader context. Despite being a water-scarce country, South Africa faces high levels of water wastage and inefficient use.

In municipalities, non-revenue water sits at more than 37% on average although it is not measured in many municipalities where losses are estimated to be close to 50%. In many irrigation and domestic schemes it is worse, with losses of up to 60%. In terms of loss in revenue, these losses account for more than R11 billion a year in the municipal sector alone

Many municipalities, water user associations and farmers do not meter water use and are unable to assess their water losses. This is exacerbated by a lack of infrastructure asset management, operation and maintenance. The result is that demand is exceeding supply in many areas. The catchments that supply water to the Durban-Pietermaritzburg area for example are already in deficit in terms of water provision. Other large water supply systems will soon face a similar situation.

It is essential that such water losses must be accounted for and curtailed, especially in terms of the need to provide for the growing water demands of new socio-economic development.

By including water loss reduction, water use efficiency and demand management, improved water governance, optimisation of existing water resources including groundwater, rainwater harvesting and water systems management, re-use of water, resource protection and recharge, as well as desalination in the resource pool, South Africa has adequate water resource potential to serve its requirements for many years to come.

Groundwater is a significant and under-utilised resource in many parts of the country although local yields are usually quite low. The most recent estimate of sustainable potential yield of groundwater resources at high assurance is 7 500 million cubic metres per annum with potentially about 3 500 million cubic metres available for further development. This resource is, however, widely distributed and often far from centres of demand.

In ensuring sufficient water, spatial and local challenges remain, where the format (characteristics) of these specific resources, the associated cost of supply, user specific footprints, competing demand and the critical need for reallocation to marginalised groups, will dictate particular development solutions and allocation criteria.

6 Water economics and allocation priorities

6.1 Water economics

One of the principles that informed the White Paper on a National Water Policy states that the objective for management of water resources is “to achieve optimum, long term, environmentally sustainable social and economic benefit for society from their use.”

This recognises. In essence, that water has social, economic and ecological value. The White Paper also recognises that weighing up the social and/or economic benefits of competing water uses is not easy, and becomes more complex when the ecological costs and benefits must be considered as well. This means that the decision on how best to allocate water between competing uses requires a complex and difficult assessment, which includes the ability to assess social, economic and ecological values arising from various water uses.

Overall, however, there is an insufficient appreciation of the value of water, the challenges of the water situation, and the effort required to make water available on a sustained basis. This is reflected in the way water is wasted, water resources are polluted, and aquatic habitats degraded. These same factors reveal weaknesses in the current governance arrangements, and the priority accorded to water in the social agenda.

The three dimensional value of water has implications for water financing, and how to determine the cost of water. Several elements make up the cost of providing reliable supplies of water, which include:

- Direct infrastructure and management costs, which include the capital, operation and maintenance costs of infrastructure, and the costs of managing water which include planning, monitoring, regulating and so on.
- Economic costs which include opportunity costs which reflect the scarcity value of the resource, the cost of depriving a potential user of water and economic externalities. The economic externalities consist of two elements: positive externalities, such as the groundwater recharge benefits from irrigation; and negative externalities, such as downstream pollution impacts from industrial discharge...

- Full costs. These are the sum of the supply and economic costs, plus environmental and social externalities such as costs to public health and ecosystems arising from, for example, pollution of water resources.

This then leads to the question of who pays the costs of managing and providing water, who pays for aquatic ecosystem protection, and how the price of water is determined.

There are three sources of funding for water development and management: taxes, tariffs, and transfer of funds from aid agencies and international donors. While there can be no argument that the full costs of developing, managing and providing water must be covered, the question is how best to utilise the options of taxes, tariffs and transfers of funds to cover these costs. In consideration of this, issues of equity and affordability must be taken into account, as well as using pricing as a tool for driving water use efficiency and pollution reduction.

A sustainable water price in South Africa is one that will:

- Reflect true costs (including infrastructure, management and environmental costs) and incentivise efficient water use and reduced pollution;
- Promote least-cost solutions to providing water;
- Achieve equity in terms of incorporating cost-sharing practices as needed, to enhance affordability for poor water users;
- Enhance the long-term viability of water institutions.
-

6.2 Allocation priorities

Equally important is how an understanding of the social, economic and ecological value of water influences the allocation of water. Based on the limited availability of fresh water for further development, and the need, therefore, to choose between competing uses for water it is necessary to put in place clear priorities for allocation of water, whether by DWA or CMAs.

In line with the Constitution and the National Water Act, the highest allocation priority is afforded water for the purposes of the Reserve. The first objective is to ensure that sufficient quantities of raw water are available to provide for the basic water needs of people who do not yet have access to potable water. In terms of current policy, a quantity of 25 litres per person per day has been incorporated in the reserve determination. There is a general trend to increase the basic human needs provision above this, with 50 litres per person per day considered by some as a more appropriate amount. However, the total amount required to provide for this remains insignificant in the context of water resource allocation, and can be readily provided for.

The second objective is ensuring sufficient water of an appropriate quality to sustain healthy aquatic ecosystems. Comprehensive work is continuing in this regard, but challenges remain in the implementation of the reserve requirements.

South Africa is committed managing shared river basins in line with the revised Protocol on Shared Watercourses in the Southern African Development Community (SADC) and in terms of specific agreements with riparian states. The second highest priority, therefore, is the meeting of international water requirements in terms of the agreements with riparian states.

The third highest priority is accorded to the allocation of water for poverty eradication, the improvement of livelihoods of the poor and the marginalised, and uses that will contribute to greater racial and gender equity.

The fourth highest priority is accorded to the allocation of water for uses that are strategically important to the national economy.

Application of these priorities requires the development of advanced tools and criteria to guide and enable effective and consistent decision-making.

Addressing the challenges

7 Enhanced water governance and developmental water management

The vision underpinning this NWRS-2 is of:

- A democratic, people-centred nation with equitable social and economic development enabled through equitable, sustainable and effective water management;
- Water valued and recognized as a strategic national asset and fulfilling its central role in society and the economy;
- A prosperous society enjoying the benefits of clean water and hygienic sanitation services;
- A healthy, ecologically sustainable and protected water environment;
- A Department of Water Affairs and related water management institutions that serve the public effectively and loyally, meet their responsibilities with integrity, transparency, energy and compassion;
- A committed and dedicated water sector, actively co-operating and contributing towards sustainable water management and associated outcomes.

This vision reflects and builds upon the principles of equity, efficiency and environmental sustainability that underpin the National Water Policy and National Water Act. The policy and legislation are founded on the principles of integrated water resources management (IWRM). However, it is necessary to reinterpret these principles within the context of a developmental state, and recognising the linkages across the entire value chain from resource to tap and back to resource. This gives rise to the concept of developmental water management (DWM) which takes, as a central premise, that water plays a critical role in equitable social and economic development, and that the developmental state has a critical role in ensuring that this takes place.

The core objective of this strategy is to introduce, facilitate and lead South Africa into a new era of smarter and Developmental Water Management.

The new approach builds on successes from the post 1994 period, incorporates the lessons learned over this period (in South Africa and internationally) and draws on the development and equity imperatives of the government. It addresses both short-term challenges and longer-term sustainability and equity objectives. Key elements are:

- A rigorous focus on implementation of policy and legislation, applying basic principles of good governance (“do the basic things right”). This includes good planning, effective organising, leadership, control and programme management;

- Extending water governance to include integrated planning, governance and sector partnerships, looking outside the water box to work with other critical sectors such as agriculture, mining, land reform, industrial development and environment;
- Ensuring the involvement of stakeholders and sector partners in planning and management of water resources, including the marginalised and the poor;
- Continuing to extend the water management model to include options such as water use efficiency, local resource optimisation (ground water), re-use, desalination, systems optimisation, improved regulation and control;
- Taking a comprehensive view of water management across the entire value chain from resource to tap and back to resource;
- Applying smart solutions by focussing on functionality, sustainability, technology, accountability, sector involvement and ownership, and harnessing the considerable research and development capability in South Africa behind this programme;
- Mobilising the extensive capacity and knowledge in South Africa, including at the community level and in the NGO and private sectors, and drawing from a range of knowledge sources including indigenous knowledge systems;
- Building a capacitated sector and workforce;
- Applying effective management principles such as life cycle management, sound asset and financial management, customer care and communication;
- Ensuring the speedy establishment and transformation of the necessary water sector institutions to achieve implementation of the national water resource strategy and the aims and objectives of national water and development policy;
- Measuring impact by a focus on the achievement of outcomes, not just outputs.

It is essential that commitment to the new DWM approach is obtained from all stakeholders and that compliance to this approach is actively monitored and managed. It requires strong leadership to motivate and direct stakeholders along the transformation process and to manage their performance in a constructive cooperative and outcomes-based manner.

It also requires diligent risk management to ensure that the transformation is effected in full compliance with legislation and consideration of environmental circumstances.

The main challenge is to ensure that water managers across the board understand what is required, and commit to implementation and ensuring achievement of goals.

While there has to be realism in terms of ability and available resources of what can be achieved, the challenges demand brave and bold action and commitment to raise water management to a higher level.

7.1 Water governance

Water Governance can be referred to as the range of political, social, economic, organisational and administrative processes through which interests are articulated, input is absorbed, decisions are made and implemented, and decision makers are held accountable in the development and management of water resources and delivery of water (and sanitation) services at different levels of society (*Modified from Nowlan and Bakker, 2007*).

According to UNDP, Water_Governance:

- Is about developing and managing water resources and delivery of services;
- Includes a range of issues intimately linked to water - from health and food security to economic development, land use and the preservation of the natural world on which water resources depend;
- Is concerned with drawing up and adopting the right laws, policies and institutions – also how these are established, enforced & implemented

Governance in the water sector has political, administrative and economic dimensions and includes both the activities of government, as well as the interaction of civil society with these processes. Good water governance requires predictability, participation, transparency, equity, accountability, coherence, responsiveness, integrated and ethical decision making. This must be built around open policy-making, a professional bureaucracy and a strong engaged civil society.

While the regulatory framework and institutional arrangements have changed since the advent of democracy, the water sector is still facing challenges. Such diagnosis raises our hope that the crisis can be averted by improving water use and management. But the task is extremely difficult, as it involves significant changes in the way water resources are developed, allocated, and managed. At the heart of the NWRS-2 is how to design, and sustain these changes on a durable basis within the economic, ecological, and capacity constraints.

Although much has been achieved since 1994, the performance of the sector has fallen short of expectations in three important respects:

The **outcomes** of the sector relative to sector goals have been disappointing. Although substantial progress in increasing access to water and sanitation has been made, this progress has slowed in recent years and the number of people without adequate services is still too large, particularly amongst the poor. Secondly, progress in allocating water for productive purposes to promote transformation has been very slow and water use patterns are still highly skewed and unequal. Thirdly, the stresses on water are increasing and water is not being managed in a sustainable manner. In other words, service delivery has fallen short of expectations.

Uncertainty and a lack of clarity with respect to institutional roles and responsibilities have contributed to poor performance. Proposed institutional reforms such as the creation of catchment management agencies and an entity to manage national water infrastructure have not taken place.

In addressing this poor performance, it is necessary to address legal, institutional and implementation issues. The National Water Act and the Water Services Act are currently under review in order to address a number of challenges currently faced in the water sector.

Promoting a deliberative and participatory agenda will also require adjustments in the structure and functions of water institutions. Issues related to expertise, accountability, and democratic authority must be addressed in an integrated way at the highest level in the Department of Water Affairs. There is therefore the need to strengthen the capacity of the Department at local, regional, and national levels to integrate the consolidation of democratic practices across the sector. But the intensity and scope of consolidation needed to advance democratic practices exceeds the mandate of any one department. All departments and non-governmental entities that have a direct relevance to water should be involved. Aligning all such departments and organizations to focus on water requires the use of political capital.

The NWRS-2 addresses the proposed institutional arrangements to improve water resources management, within a governance framework that ensure that all water management institutions serve the national developmental agenda.

7.2 Core values

Sustainability and equity are identified as central guiding principles in the protection, use, development, conservation, management and control of water resources.

These guiding principles recognise the basic human needs of present and future generations, the need to protect water resources, the need to share some water resources with other countries, the need to promote social and economic development through the use of water and the need to establish suitable institutions in order to achieve the purpose of the Act. (summary of Chapter 1 of the NWA)

8 Making it happen: The core water strategies

“We have to think about the big things while you are doing small things, so that all the small things go in the right direction” (Toffler)

The National Water Resources Strategy encompasses the following critical thrusts:

- Building an efficient water administration by fostering innovation and knowledge management, investing in people’s capabilities, cultivating a more water educated and literate society, as well as increasing economic growth and social development;
- Promoting an equitable water sector by eliminating unequal access to water and reducing imbalances within and among groups as well as regions, perpetuated largely by pervasive administrative inefficiencies;

- Sustaining high water infrastructure investment and development by strengthening the sources of growth, the financial, corporate and water institutions as well as investing in pro-poor local level infrastructure;
- Enhancing Indigenous Knowledge Systems to meet the challenges of globalization, focusing on the role of women and the youth. The Water Research Commission should be required to conduct research on indigenous knowledge systems, focusing on the role of women and youth.
- Developing a knowledge-based water sector as a strategic move to raise the value added of all water initiatives and optimizing the brain power of the nation. In this regard, also, the Water Research Commission has a special role to play;
- Strengthening human resource development to produce an efficient, effective and knowledgeable workforce; and
- Pursuing water security and environmentally sustainable development to reinforce long-term growth.
- Pursuing sound infrastructure management, and ensuring prudent investment policies as well as enhancing efforts to develop a knowledge-based water economy;
- Strengthening and streamlining redress strategies and mechanisms to ensure balanced participation among and within cultural and income groups as well as enhancing performance of water institutions through improvement in user's knowledge, skills and expertise as well as upgrading innovation, science and technology;
- Increasing efficiency and economic growth through accelerating the shift of the work-force towards more efficient performance processes and high-value added activities. However, this should not be done at the expense of jobs; and the growth must have a job creation as its basis and rationale;
- Expanding the usage of ICT and across and within the water sector to accelerate the growth process;
- Strengthening the human resource base to ensure the availability of person power with higher levels of knowledge, technical and analytical skills;
- Adopting an integrated approach in addressing water quality and environmental issues to attain sustainable development;
- Enhancing further the quality of life through improving accessibility to quality water as well as developing the aesthetic and spiritual dimensions of water; and
- Intensifying efforts to nurture and inculcate positive values and attributes among users through the education system, social and religious organizations and the media.

To address the water challenges and accommodate management interventions in a structured manner, the various identified interventions have been clustered into logical and meaningful overarching strategies. These "core" strategies give effect to the objectives of developmental water management, as reflected in the National Water Act, namely "to provide a framework for the protection, use, development, conservation, management and control of water resources for the whole country". They also form the framework and provide context for specific technical, enabling and support strategies.

The core strategies cover four specific business areas, consisting of socio-economic, functional management, tactical, and governance strategies, each setting a different dimension to developmental water management.

Core strategy 1: Implementation of Equity Policy

South Africa's water policy and legislation has been hailed as advanced in respect of addressing equity issues. Central to this is the issue of progressive realisation of the equity goals. However over the past 14 years significant challenges have been identified.

The pro-poor focus of the NWRS-2 is based on several considerations:

- The need to invest in appropriate infrastructure to serve the needs of the poor;
- The need for appropriate water resource strategies to be developed and implemented to assist poor communities to mobilize themselves so as to strengthen their voice in policy and implementation processes.
- The development and implementation of a pro-poor regulatory framework
- The need for ongoing monitoring to establish what is working and what is not, as well as learning from effective practices in selected countries;
- Extensive engagement between policy makers, administrators, experts, civil society, grassroots movements, and the private sector.

The NWRS 2 set as a goal to review the extent to which the equity policy as reflected in policy principles has been implemented and will develop an equity protocol which may lead to proposals for legislative amendments.

This protocol will distinguish (as discussed above) between the three concepts namely access to water services, direct access to water resources for productive uses as well as the concept of equity of access to the benefits from water resource use (by another user).

Equity in access to water resources deals with the concept of direct access to water for productive purposes such as water for irrigating crops or water for a business or an industry. Critical, therefore, to the NWRS-2, is the requirement to address equity in water allocation, and to ensure the beneficial use of water to create jobs, contribute to poverty eradication, and reduce the major inequality of South African society.

The third equity principle is equity in access to the benefits from water resource use. This means that water must be allocated in such a way that it brings maximum benefit to all whether directly or indirectly.

Core Strategy 2: Putting water at the centre of integrated development planning and decision-making

As has been raised earlier, while water plays a pivotal role in everyday life and in socio-economic development, the management of water resources does not receive the attention and status it deserves. Despite its strategic role, water is:

- Not properly acknowledged and reflected in macro and sector strategies. Water needs to be placed at the centre of all integrated planning and decision-making;
- Not adequately provided for in national budget allocations. To ensure water security and minimize negative impact on growth and development, the current budgets need to be doubled;
- Not valued and appreciated as a scarce resource. Current financial values do not reflect the real value of water. This requires a new value system across all sectors and stakeholders;
- Not embedded in business and sector management. Water management must be formally embedded in sector businesses with associated accountability.

It is imperative to raise the profile of water at all levels of government and decision-making. Water must be placed at the centre of integrated planning and decision-making with a specific aim to respond to and support the achievement of national development and sector goals.

Core strategy 3: Ensuring water for equitable growth and development

Government has set clear goals and programmes to create prosperity for and improve the well-being of those living in South Africa. This is reflected in the National Development Plan (Vision 2030), New Growth Path, sector specific strategies, Ministerial Performance Agreements, and specific Cabinet decisions.

Water plays a central role in most of these national planning initiatives, such as agricultural development, energy security, tourism and recreation, mining, industry and municipal water supply. However, water is not adequately appreciated and reflected in most of these development plans. Although water resource options are available, there are spatial, economic and viability constraints, which will have major affects planning, decision-making and outcome in certain areas. These considerations must be included in all the planning processes, from national to local levels, to influence and direct appropriate development solutions.

This partnership has implications:

- Planning processes must be proactively informed on the water situation and opportunities to ensure appropriate solutions;
- Similarly, the water sector needs to be informed of development objectives to proactively reconcile water balances and inform water resource management plans at catchment and systems level; and,

- These partnerships and multi-dimensional development require effective facilitation and leadership. The National Planning Commission can play a key role in this regard.

Economic growth has to be planned in context of sector-specific water footprints, which include the water use footprints, the various water and environmental impact footprints, as well as the relevant socio-economic impacts and contributions.

The country's economic growth targets cannot be achieved at the expense of the ecological sustainability of water resources or the obligation to meet people's basic needs. Economic growth implies that more water will be required. However, water is not always in surplus and growth will only be possible through optimized use of existing water resources.

In areas where there is a surplus of water, or where there are viable water resource development opportunities, water can be used as a stimulus for development. Such an opportunity exists, for instance, in the Eastern Cape with the proposed development of the Mzimvubu Dam and associated economic and social development opportunities.

Core strategy 4: Contributing to a just and equitable South Africa

Government has committed itself to meeting basic human needs, improving the lives of all South Africans, particularly the poor and marginalised and building a more equitable and just society. This is entrenched in the Constitution of South Africa, the Bill of Rights and in national programmes such as the Universal Access to Basic Services, Health, Poverty Alleviation, Job Creation, and other programmes.

As reflected in the New Growth Path and National Development Plan, economic development is a key enabler for social development and job creation. On this premise, the role of water in social development is not only based on direct water provisioning, but also through the support of economic and social development and job creation.

Water is a public good, and is both a social and economic good. The National Water Act requires that it is used beneficially and in the public interest. Meeting basic human needs, creating jobs and eradicating poverty all fall squarely within this paradigm. This strategy builds on the water for growth and development strategy outlined above, pulling out some more specific elements for the water sector to focus on.

This means that water must be allocated in such a way that it brings maximum benefit to all whether directly or indirectly.

Job creation through water infrastructure development, operations and water management

Job creation is a key intervention in water on poverty, and the water sector is a key role-player in this regard. The potential for job creation can be grouped in the following categories:

Job creation through water infrastructure development: This includes major water infrastructure, regional bulk infrastructure and municipal infrastructure. However, apart from jobs related to operation and maintenance of infrastructure, most of the jobs created in the construction of water infrastructure are temporary in nature (from a few weeks to a maximum of 5 years).

Water infrastructure jobs, however, have the potential to employ local workers, and to provide skills development and work experience at a number of levels, from the highly technical to manual labour. It is important that, where possible, labour intensive methods of construction are used. In this regard, managers and design engineers must be trained to understand the potential for and requirements of labour intensive construction methods.

Job creation through water functional management: This involves more sustained job opportunities in areas such as operations and maintenance, alien vegetation removal (e.g. Working for Water). Specific opportunities exist in the intervention actions required to address water demand and conservation management, wastewater turn-around programmes, infrastructure asset management, integrated catchment management and resource protection.

Job creation through water provisioning to economic sectors: The greatest job creation opportunities, however, lie within the different economic sectors such as agriculture, mining, industry and tourism. Water is a key enabler in the expansion of these sectors, whether it be in relation to large enterprises, small-scale, or even micro-enterprises. Without reliable water supplies, many of these jobs would not be viable or created.

This again emphasizes the importance of integrated planning and the central role of water in economic development.

Protecting human rights and well-being

The Bill of Rights in the Constitution guarantees the right to a healthy and safe environment. The quality of our resources is a key element of this, as degraded and polluted water resources have negative impacts on human health, on benefits derived from ecosystem goods and services, and on the cultural, spiritual and aesthetic value of water resources.

Protecting our water resources includes managing water quality and the protection of water habitats to support functioning ecological systems. Water resources, including rivers, dams, lakes, estuaries and wetlands, are an important support to rural livelihoods in particular, through, for example, fishing, harvesting of plant material, cultural and spiritual activities, and tourism).

It is of utmost importance that water is not only managed for quantity of supply, but also for the required quality of water and the health of the water environment, to ensure this human right.

Another important area in the protection of human rights and well-being is disaster management, especially the management of floods which have a direct impact on human safety and economic security. The present management systems and processes are inadequate and need to be enhanced across government, the private sectors and civil society.

We must empower citizens to participate in water governance. Our institutional framework provides the basis for this, but without structured activities and forums, the ability of civil society to engage in water management issues is weak. This will also require capacity building initiatives that will be driven through the various institutions such as CMAs and WUAs.

Core strategy 5: Protecting water ecosystems

The already substantial pressures on freshwater and estuarine ecosystems are expected to be exacerbated by climate change and include:

- Over-abstraction of ground and surface water especially in the dry months of the year
- Extensive areas of water hungry invasive alien plants, particularly in riparian zones;
- Water quality problems, associated with non-point-source pollution from fertilizers, point-source pollution from mining, industry and failed waste water treatment works, and saline intrusion;
- Habitat destruction, including from impoundments, bulldozing in riparian zones, sand-winning from river beds, mining developments, urban sprawl, invasive alien aquatic plants, and expanding agricultural cultivation;
- Development in the estuarine functional zone; and,
- Impacts of invasive alien aquatic plants and animals.

Of particular concern is the impact of development on the water generating capability of a catchment and associated impacts on water availability, groundwater recharge and downstream water quality;

Core strategy 6: Implementing water use efficiency, conservation and demand management

Despite being a priority strategy in the NWRS-1, and critical in ensuring sufficient water for South Africa's needs, water conservation and demand management has not been effectively implemented to date. This is a non-negotiable performance area and, based on recent reconciliation studies, must be implemented immediately.

Water conservation and demand management (WCDM) can be implemented in a shorter time span than new infrastructure development and can significantly postpone the need for new water resources infrastructure and new water and waste water treatment works. It is also more cost effective than new water infrastructure development.

Arising from the NWRS-1, a water protocol was established under which the development of new water resources infrastructure will only be considered only if sufficient WCDM measures have already been implemented. The NWRS-2 builds on this with a further suite of actions.

Core strategy 7: Optimising and stretching our water resources

South Africa has limited opportunities for further development of fresh surface water resources. Maximising the use of local resources through groundwater development, water re-use, rainwater harvesting and desalination of seawater, improved systems management and the control of illegal water use will "stretch" our already limited and scarce water resources.

Based on national groundwater studies, this resource is presently underutilized and provides development opportunities in specific areas. This is very relevant for small rural communities and areas where surface water is not readily available. This development is subject to proper planning, monitoring, abstraction management and resource protection.

At present, up to 14% of water use is re-used, mostly through water use return flows into rivers, which are then abstracted downstream for indirect re-use. This resource is directly linked to water use and will increase with new development. This is a logical choice of resource but is subject to water quality management and control with associated introduction of advanced treatment technology and operating capacity.

Water can further be optimized by improved control over illegal use and river systems management.

Stretching our water resources has become even more important in the light of South Africa's variable climate and expected climate change impacts on water resources. Appropriate use, allocation and re-allocation of available water resources are part of this Strategy.

A possibility to decrease the stress on South African water resources is to import water intensive goods, such as agricultural crops, from other countries where there is sufficient water. DWA has done a study on the potential of crop production in neighbouring countries,

and in physical terms (soil, climate) the potential is high (DWA, 2010). This approach fits well with the drive towards regional economic integration in SADC.

Water facilities represent an important portion of the net national and regional infrastructure necessary for food security, agricultural innovation, and agriculture based economic development. The department must develop a comprehensive infrastructure investment strategy that recognizes how each sector and region is linked to the next, and instruments must pool regional resources and numerous international borders.

Water infrastructure is critical for inputs to farms; widespread and efficient irrigation is essential to increasing fields and crop growth; energy, inconceivable without water, is a vital input, particularly for value- added food processing; and telecoms, powered by both energy and water, are critical for the exchange of farming, market, and weather information.

National and regional water investment strategies will be needed to pool resources, share risks, and promote the private sector often critical to substantial investments in such ventures. It seems obvious that water will play a critical role in agricultural development, but it has often received inadequate investment.

Core strategy 8: Achieving effective water governance and developmental water management

Good water governance depends on strong and accountable sector leadership, a robust regulatory framework, and effective water management institutions with clear roles and responsibilities and capacity to perform these.

The Department of Water Affairs' capacity in terms of leadership must be enhanced to enable co-ordinated implementation of the NWRS-2 across the water sector.

The implementation of DWM requires a review of existing policies and legislation. This applies to both the water and associated sector policies.

Both technical and economic regulation are critical to successful governance and must be strengthened. Addressing the water challenges demands an effective and targeted regulatory approach with adequate resourcing.

Collaboration of diverse stakeholder groups in water resources management is crucial to effective water governance. This requires an efficient institutional framework, which not only addresses formal water institutions, but also extends into total sector mobilisation and involvement. It also needs to address creative solutions to enhance service delivery in specific functional areas.

The extended water governance model demands enhanced integrated governance between the DWA, relevant sector departments and institutions. This specifically includes the Department of Environment Affairs (DWA), the Department of Minerals (in term of mining

licences), the Department of Cooperative Governance (in terms of municipal interventions such as wastewater pollution and integrated development planning), the National Treasury, financing agencies, and other sector departments involved with water related growth and development.

Catchment Management Agencies (CMAs) are a critical element of water governance and management. The original 19 proposed CMAs are to be reduced to 9 CMAs are outlined in section 9 of the NWRS-2.

In the face of limited human and financial resources, a targeted approach to the regulation of water use must be adopted. A “one size fits all” regulatory approach is not appropriate in the South African context; rather, regulation should focus on high impact uses where the most gains can be achieved with limited resources, with a parallel process of support and development for small water users.

In addition, the allocation of financial resources is an important part of ensuring effective water governance. In this regard, the following fundamental prerequisites for effective budgeting and financial management call for urgent attention:

The primacy of policy and mandate – water institution budgets must promote the policy objectives of government and the priorities determined in the NWRS

Transparency – water sector institutions must make information about their budgets available to the public.

Publicly expressed preferences – water institutions must collect information on the preferences of the people in order to inform their strategies and budgets. In the absence of reasonable information on the people’s preferences, it is very difficult for resources to be allocated efficiently.

Internal audit capacity – water institutions must have the capacity to ensure financial accountability through effective internal auditing.

Financial management capacity – water sector institutions must have capacity to develop and manage their finances effectively.

These are the basics which must be in place if budget reforms are to be implemented. Without these basics; the chances are slim that a successful marriage of policy, mandate, performance information, and the budget can be carried out.

Core strategy 9: Embedding sustainable business principles and practices

Unsustainable water management translates into to risks to human health, service delivery, the environment, employment and social and political stability. This NWRS-2 introduces four

business principles that will form the foundation of sustainable water resources and infrastructure management.

The first principle is striving for efficiency from source to tap and back. This principle implies that the value chain from river or groundwater to wastewater should be considered in its totality when making water resource management decisions.

The second principle is implementation of life cycle planning and sustainable management of assets and services. The problem of lack of operation and maintenance has been generally acknowledged throughout the water sector, in particular for wastewater treatment plants, reticulation systems and water resources infrastructure. It is a growing concern that there is too little provision for the replacement or refurbishment of aging infrastructure. This must be addressed through rigorous asset management.

The third principle is that of sustainable financial management. Clear decisions are needed on who should pay for what, and where transparent subsidisation is to be used and why. Sound financial management also includes financial planning, viability assessment, funding and financing models, revenue management (including ring-fencing of water revenue, charge and tariff setting, and billing and revenue collection) and budgeting.

The fourth principle is applying sound management principles and practices within a developmental framework. This includes effective communication and consultation, ongoing investment in skills, capacity and education (short and longer term), as well as investment in knowledge, information and monitoring systems.

Core strategy 10: [Implementing a water sector investment framework](#)

To facilitate effective and pro-active investment in both water infrastructure and water management, DWA has already initiated the development of a comprehensive investment framework and strategy. The objective of the investment framework and strategy is to inform budgeting and integrated planning for water infrastructure and management. A key element is the application of the life-cycle approach, which includes all costs from planning to construction and sustainable management, as well as financing and management costs.

To meet the outcomes set for the water sector and to put water to work to achieve the national objectives, improved ways of financing and managing must be sought and implemented. The development of a water financial and funding model is of utmost importance.

The framework must also address the whole value chain (source to tap to outcome – waste to source to impact).

Core strategy 11: Engaging the private and water use sectors

Water risk to business is real. There is need for the water sector in South Africa to take cognisance of the increasing water risk, and to take the appropriate actions to reduce their exposure to risk. There are several aspects to this, depending on whether the risk impacts on the company or the supply chain, and whether the management of the risk is within the authority of the company or lies outside the company authority. As per figure 6, different actions should be initiated to deal with water risks according to the location and nature of the risk.

		Location of risk management	
		Within company/supply chain	External to company/supply chain
Location of risk:	In-house	<p>Step 1: Get your own house in order</p>	<p>Step 3: Work with local role players around operations</p>
	External supply chain	<p>Step 2: Work with supply chain operatives to reduce their risk</p>	<p>Step 4: Work with stakeholders within catchments</p>

Figure 5: Matrix of water risk facing the private sector

What is important in South Africa at this time is an increased awareness in the public sector of the water risk, and of the actions that they should be taking to minimise this risk. Taking the lead from the UN based CEO Mandate, and the experience of several large corporations in managing water risk, the private sector in South African needs to mobilise to manage water risk effectively. In this process, there is the opportunity for partnerships with government and civil society in order to manage shared water risk.

This is a critical role that South African members of the *United Nations CEO Mandate* and the members of the *South African Strategic Water Partners Network* should take forward.

A critical place to begin to manage water risk is with the employees of a company. Besides developing and implementing a water risk management strategy, employees will also help communicate this action to other stakeholders. The importance of employees in managing water risk cannot be underestimated. In this regard, it is important to deliver simple, relevant, personal messages tailored to the needs of employees and local communities.

9 Key strategic actions

Arising from the core strategies, the following have been identified as key strategic actions that must be undertaken across the water sector and related sectors in the next five years. The actions will involve and be driven by a range of players across the spectrum, not just DWA, although DWA, as sector leader, will play a critical role in driving and co-ordinating many of the actions, and monitoring implementation.

1. DWA will co-ordinate, with key government departments, municipalities, SALGA, the private sector and civil society, the development and implementation of an equity strategy for the water sector, setting out and quantifying how to practically achieve significant equity goals in access to water and the benefits (direct or indirect) derived from water;
2. The water use and impact sectors, with the support of the WRC and DWA sector, will develop water footprints for their specific sectors;
3. Water sector institutions, the private sector and civil society must improve awareness around water and its strategic role at all levels of business and society, and promote awareness of the role of water as a critical and strategic natural resource amongst politicians, decision-makers, planners and the public;
4. DWA will work with the Department of Basic Education and the WRC to enhance water education in the school curriculum;
5. Water use and impact sectors will raise the level of awareness around water risk and responsibility, and drive improved water management in the each of the sectors;
6. DWA and CMAs will appoint appropriate staff, in both leadership and technical positions, to ensure that is can play this leadership role;
7. DWA and CMAs will proactively engage with relevant national and provincial departments and the National Planning Commission to ensure that water is included in all relevant sector strategies at national and provincial levels;
8. DWA will continue to develop and update reconciliation strategies as an information platform for inter-sectoral water planning and integrated solutions and for the development of catchment management strategies;
9. DWA will drive a sector wide monitoring and data collection improvement programme which will include a number of elements: DWA will work jointly with SAWS and the ARC to ensure improved investment in rainfall monitoring to turn around the decline in rainfall monitoring stations across the country; DWA, in partnership with water sector institutions, will develop and implement a national monitoring plan to turn around the decline in the number of monitoring stations over the past 20 years and to ensure an appropriate information base for effective water resources planning. The WRC is a critical partner in the monitoring and information management programme;
10. Water use and impact sectors will develop and maintain sector specific water footprints to form an input to integrated planning and strategic decision-making. This includes spatial views on sector-specific socio economic profiles, water needs, water use, benefits (value chain) and impacts (i.e. social, economic, as well as environmental and water resource quality impacts);

11. DWA, in consultation with water sector institutions, other government departments, and water users, will prepare a 20 year programme to meet the growing water needs that will include traditional solutions such as new infrastructure development, as well as “smart” solutions such as water use optimisation, water re-use, “stretching” the water resource and associated water infrastructure, as well as investment in new technology and research;
12. DWA and CMAs will work with water services authorities to promote and implement the multiple use systems approach which addresses both the domestic and productive water needs of communities;
13. DWA will clear the backlog in water use licensing by 2016 and will put in place streamlined processes to ensure that licence applications are dealt with in a reasonable time. DWA will also make greater use of General Authorisations to reduce the burden of license applications on the Department. In order to support the processing of licence applications, DWA will fast track the reserve determinations so that this does not become a bottle neck in the water use authorisation process;
14. Over the next 3 years, DWA will delegate water use licensing to at least 4 CMAs as they are progressively established and develop capacity;
15. The WRC will support, promote and co-ordinate investment in the development of “smart” solutions for water use efficiency, research of appropriate technologies, management solutions and appropriate institutional arrangements.
 - *Strengthen and support the basic water supply programme:*
16. DWA and CMAs will do ensure that effective water resources planning and financing are in place to provide reliable and affordable raw water for basic water supply projects. DWA will also revise the basic water services policy to ensure planning for a multiple use services approach that takes into account the need for water for productive purposes as well as for domestic purpose;
17. DWA will work with National Treasury and water sector institutions to develop appropriate financing models to address the viability of projects and the affordability of services to the poor;
18. DWA, with water boards and regional water services institutions will focus particularly on ensuring the development and financing of regional bulk infrastructure to ensure that there is sufficient water to meet the basic human needs;
19. DWA and CMAs will engage with provincial departments of agriculture and relevant NGOs to support and guide water-dependent social development programmes such as the household food security (vegetable gardening) and rural development initiatives. The availability of water and the viability of sustainable supply will be addressed in this process.
 - *Water Allocation Reform:*
20. The implementation of the Water Allocation Reform programme will be given high priority by DWA and will be addressed through a number of programmes, including compulsory licensing (which will be completed in 3 catchments by 2014), the use of General Authorisations, and the promulgation of regulations on BEE and gender requirements for issuing of water use licences. The reduction of assurance of supply for existing water users as well as reduction of water losses will be critical components of making more water available to historically disadvantaged, small scale users;
21. The water allocation reform programme will be closely aligned with the land reform programme and the rural development programme. DWA will work closely with the relevant

national departments to ensure the alignment and integrated implementation of these three programmes.

- *Job Creation:*

22. Where possible, labour intensive construction methods will be applied in all water infrastructure construction, operation and maintenance projects. SAICE and the WRC will assist DWA in investigating the potential for the use of labour intensive methods, and DWA will develop guidelines for the sector in this regard. The addressing of existing water challenges, such as the backlog in infrastructure maintenance, water use efficiency and infrastructure asset management, must be utilized as job creation opportunities. Partnerships with the economic sectors must be strengthened to optimize job creation;
23. Social reform and equity must be part of the protocol of all integrated development initiatives and actions, such as electricity security, and must be reflected as part of the water related performance; and,
24. Areas with water surplus and potential to facilitate socio-economic development will be identified by DWA, building on work already done in this regard, and potential projects will be prioritized, budgeted for and implemented.

- *Water for social livelihoods:*

25. DWA and CMAs will enhance their engagement with other relevant government departments, community based organisations, and NGOs to ensure that sufficient water can be provided to enhance livelihoods, particularly in under-developed rural areas. DWA will also continue to roll out its programme of providing rainwater harvesting tanks;
26. Determination of ecological reserves must be accelerated by DWA, along with a structured programme to implement Water Resource Classification, and determination of Resource Quality Objectives at a catchment scale. A programme for monitoring the status implementation of the reserve and for monitoring the impacts on ecosystems will be developed jointly by DWA, DEA and the WRC. Implementation of this monitoring programme will begin by 2015;
27. Catchment management strategies will be developed by CMAs once they are established and must address the protection of water ecosystems and water resources in the water management area;
28. DWA will intensify its compliance monitoring and enforcement activities to reduce illegal activities that impact on the health of aquatic ecosystems. The compliance monitoring and enforcement will be focused on high impact activities in order to achieve the optimal use of limited state resources;
29. DWA and CMAs will work with DEA, SANBI, SANParks and provincial conservation authorities as well as relevant civil society structure to take forward the work already done through the Freshwater Ecosystems Priority Areas (FEPA) programme into an implementation plan to be jointly implemented and monitored;
30. DWA, in partnership with the Department of Mineral Resources, the Chamber of Mines, the CSIR and the WRC will implement short and medium term programs to deal with acid mine drainage (AMD) whilst finalising the long term strategy to deal in a sustainable and cost effective way with this national problem;
31. DWA and CMAs will work with the national and provincial departments of agriculture to ensure the implementation of the Conservation of Agricultural Resources Act (CARA) to

protect riparian and wetland buffer zones, critical groundwater recharge areas, and estuaries;

32. DWA and CMAs will strengthen the River Health Programme and establish a Wetland Health Programme by 2015;
33. DWA and CMAs will establish a ten year water quality management programme focusing on priority interventions such as wastewater treatment works and acid mine drainage. This includes the restoration of polluted rivers and lakes;
34. DWA will support the building of capacity of institutions that are responsible for water quality management;
35. DWA will maintain and improve the water quality information system to support effective water quality management and regulation;
36. DWA, DEA and CMAs will work together to improve regulation and enforce compliance;
37. DWA will intensify the existing WC/WDM programme across all sectors, and will identify targets for critical water use sectors in stressed areas where targets have not already been set;
38. Water Services Authorities will drive intensive WC/WDM programmes in order to achieve the Outcome 10 target for the reduction of water losses in municipal distribution systems from the current average of 30% to 15% in 2014;
39. Where targets have been set, DWA will monitor progress against targets, will support WC/WDM interventions, and will ensure that a review of relevant water use licences is done to reflect the required impact of the WC/WDM interventions;
40. DWA will promulgate regulations requiring the measuring and reporting of raw water use;
41. DWA will work with National Treasury and SALGA to develop an incentive programme to promote water saving, including smart technology and rebates for water savings;
42. DWA, with the Department of Agriculture, will drive a programme of water conservation and demand management in the agriculture sector, with water savings to be reallocated to both male and female historically disadvantaged farmers;
43. All water management and services institutions will conduct public awareness campaigns on the need for water conservation and water demand management;
44. The WRC will develop a programme for investment in research and development of water efficient technologies and management systems;
45. The review of the Raw Water Pricing Strategy by 2013 will address the issue of water scarcity and how best to use water pricing as a tool for driving improved water use efficiency without impacting negatively on small scale or poor water users;
46. DWA will continue to ensure that the potential for using groundwater and alternative water resources is thoroughly explored in all reconciliation and water resources planning studies and that capacity is built in DWA to assess and implement these alternative solutions;
47. In the water sector investment strategy DWA will incorporate the costs of reuse of water (including mine water drainage), water conservation and demand management, and use of alternative water resources where cost effective and appropriate, including desalination of sea and inland water;
48. DWA will work with municipalities and water boards to improve the development and implementation of operating rules for water supply systems;
49. All water sector institutions will invest in building their institutional capacity, including around water conservation and demand management and water reuse;

50. DWA will work with sector partners to improve investment in infrastructure operations and maintenance, and to improve infrastructure asset management within DWA and in the sector;
51. DWA and CMAs will put in place improved regulation of water abstraction, including through increasing capacity for compliance monitoring and enforcement. In this regard DWA will work in close partnership with the DEA 'green scorpions'. -
52. DWA will establish an intergovernmental forum to facilitate improved inter-sectoral water-related governance and planning between relevant departments;
53. DWA will appoint and train 5 water resources planning interns per annum as part of a ten year programme to ensure the building and strengthening of DWA's planning capacity;
54. DWA will fill vacant SMS posts with appropriate staff by December 2012 and will fill any newly vacant posts with appropriate staff within 2 months of Strengthen the DWA leadership with associated capacity;
55. DWA will establish an effective economic regulator for the water sector by 2014. One of the functions of the economic regulator will be to ensure that budgetary allocations support government policy and priorities;
56. DWA and CMAs will develop and implement a targeted regulatory strategy focused on ensuring compliance from high impact water users as a priority, with a parallel strategy of support for small scale water users;
57. DWA and CMAs will ensure inclusive stakeholder participation in water governance through catchment forums and other appropriate consultative forums and processes, and
58. DWA will revise the National Water Act, the Water Services Act and the Water Research Act by the first half of 2013;
59. DWA will implement sustainable water resource management principles its own work, and will develop guidelines for the implementation and monitoring of such principles in other water institutions. These guidelines will include;
60. All water sector institutions will ensure that the planning, financing, and management of new infrastructure apply the principle of "source to tap and back" and the availability of a life cycle management plan;
61. All water sector institutions will ensure the application of systems operations and maintenance, including infrastructure asset management;
62. The Minister will establish a National Water Resources Infrastructure Government Component by 2013 to for the development and management of on-budget national water resource infrastructure. The TCTA will continue in its current role of financing and project managing the construction of off-budget water resources infrastructure;
63. DWA will work with National Treasury to source funds to reduce the backlog in maintenance of water infrastructure;
64. DWA will improve its billing and revenue collection through updating the information on WARMS, developing improved revenue management and reporting systems, and putting in place a national programme for collecting outstanding water charges from water users; CMAs will take over the billing of the water resources management charge to water users in their water management area and the associated revenue collection;
65. DWA will develop a programme which prioritises investment in the refurbishment and upgrading of wastewater treatment plants in order to prevent pollution of water resources;

66. -The WRC, with DWA and tertiary education institutions, will co-ordinate a skills development programme to build capacity in water and infrastructure management. This will include investment in education and youth development programmes;
67. DWA will work with sector partners to finalise the integrated water investment framework and will review it at least every five years;
68. DWA will develop innovative water financing models by 2013, in consultation with sector institutions and National Treasury;
69. DWA will work with water sector institutions to align the prioritisation and delivery of projects across the water value chain and to ensure the development of viable project proposals and to rectify possible gaps or omissions in planning and implementation schedules;
70. DWA will establish 9 CMAs by 2015 as follows:
 - 2013: Inkomati/Usuthu; Breede/Gouritz; Phongola/Umzimkulu
 - 2014: Vaal; Olifants; Limpopo; Berg/Olifants
 - 2015: Orange; Mzimvubu/Tsitsikamma
71. DWA will establish a dedicated high level team to drive the establishment of the 9 CMAs by 2015;
72. There will be the development of a detailed programme for each CMA of the progressive delegation of functions from DWA;
73. DWA will ensure clear communication to sector institutions and stakeholders of the establishment programme and the powers and functions of CMAs;
74. The revision of the guidelines on the development of Catchment Management Strategies to reflect the strategies in this NWRS 2 , and the need for value chain management will be done by DWA;
75. The development of the oversight and regulatory processes of DWA including actions to be taken in the case of non-compliance or poor performance by CMAs will be done by DWA by 2013;
76. by 2019, DWA will put in place a system for the effective collation of data from a range of water institutions including CMAs into an easily accessible national water resources information system, will develop a data sharing protocol and will set national data standards;
77. DWA, in partnership with StatsSA and relevant water use sectors, will initiate the development of national and WMA level water accounts during 2013 in preparation for NWRS-3;
78. DWA will work with SAWS to develop a programme to ensure sufficient rainfall monitoring stations around the country to provide the necessary information for effective water resources planning and management;
79. DWA will ensure the necessary resources are available to improve the current water monitoring infrastructure over the next five years to achieve an effective monitoring network across the country.

10 Revising the water management area boundaries

The decentralization of water resources management – a key factor to accelerate the implementation of DWM and to achieve equity in access to water – is an unmistakable feature of the NWRS-2. South Africa has recognized the functional distinction between the centralized mechanisms needed for coordination and enforcement and the decentralized arrangements needed for participatory management - a key feature of the ongoing process of decentralization is the importance assigned to broad-based participation in all water institutions.

The NWRS-1 established 19 water management areas, and proposed the establishment of the 19 Catchment Management Agencies (CMAs) to correspond to these areas. Since 1999, 8 CMAs have been gazetted, of which two are operational, namely the Inkomati CMA in Mpumalanga and the Breede-Overberg CMA in the Western Cape.

In rethinking the management model, and based on viability assessments with respect to water resources management, funding, capacity, skills and expertise in regulation and oversight, as well as to improve integrated water systems management, it is proposed that the 19 WMAs be consolidated into 9 as follows: Limpopo; Olifants; Inkomati-Usuthu; Pongola-Mzimkulu; Vaal; Orange; Mzimvubu-Tsitsikamma; Breede-Gouritz and Berg-Olifants.

The boundaries of these water management areas take into account catchment and aquifer boundaries, financial viability, stakeholder participation, and equity considerations and are, as a result, not aligned with provincial or local government boundaries.

The advantages of the proposal of nine water management areas are:

- It provides for improved management of integrated systems which were previously split across the WMAs;
- It enables the distribution of scarce technical skills over a smaller number of institutions;
- It provides for an improved balance in revenue streams supporting more sustainable institutions;
- It facilitates the faster establishment of CMAs, and
- Larger CMAs enables improved cooperation and coordination on regional, provincial, and international levels.

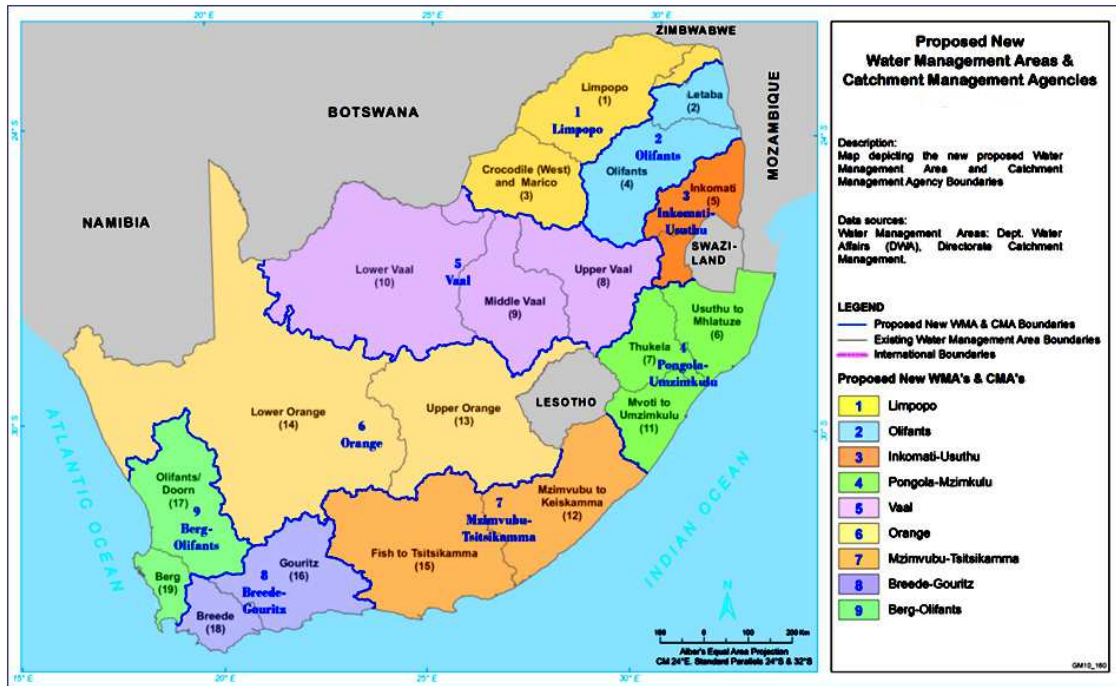


Figure 6: Map of the Proposed 9 Water Management Areas

In order to be able to fast track the establishment of the nine CMAs, the boundaries of the proposed nine water management areas will be published in the Government Gazette as part of the NWRS 2 review.

Strategic perspectives on the water resources situation in each of the WMAs are presented in Section C of the NWRS-2.

A critical implication of these new boundaries is the issue of facilitating sector involvement and community participation (participatory management). Increasing the size of the water management areas has an impact on the ability to engage effectively with stakeholders on the ground. Key objectives of the CMAs are the promotion of equity through more effective water resource management, greater responsiveness to the needs of poor and marginalized communities, and closer links with stakeholder groups in the water management area. The proposed CMA model will facilitate the involvement and empowerment of stakeholders and communities through structures such as catchment committees, catchment forums and water user associations.

11 Water resource information

In terms of the requirements of the NWA, the NWRS must contain estimates of present and future water requirements; state the total quantity of water available within each water management area; and state water management area surpluses or deficits.

Unfortunately, due to a lack of resources and the proposed changes in the water management area boundaries, the national and water management area level information provided in the NWRS-1 has not been updated.

Nonetheless, considerable work has been done on reconciliation studies for priority areas, selected hydrological studies, validation and verification of water use, and strategic assessments like the All Towns Studies. Over and above these studies, several groundwater studies, water resource modelling (WR 2005 updates), as well as water resources quality and sector specific research projects, were undertaken. Although these studies do not facilitate updated national or WMA water accounts, they provide sufficient insight to develop and present strategic perspectives of the national and WMA water situations.

The water information reflected in this NWRS-2 is, as a result, based on the comprehensive water balance studies (hydrology and water use) from the NWRS-1, with the addition of the information generated from the studies referred to above. The combined information was used to develop updated strategic water perspectives for the country.

12 Implementing the NWRS-2

Many of the challenges faced in the water sector arise are related to poor implementation of good policies and strategies. An important question, therefore, is how to ensure implementation of the NWRS-2.

Firstly, officials in all water management institutions must give effect to the NWRS-2. To achieve this, DWA will need to exercise strong leadership, and work with the relevant water management institutions to ensure that the relevant elements of the NWRS-2 are incorporated into their strategic and business plans. Water officials must lead the way.

Water institutions must be strengthened by building their capacity and making them accountable to ordinary people. But that will not work without strong executive leadership and material support from the private sector.

Finally, this will only work where a government has a clear, realistic implementation plan in place – and where the budget system is open, transparent, and outcomes driven. The implementation plan must be developed co-operatively with key stakeholders and government departments, and must allocate clear actions and targets not only for DWA, but for all water management institutions, relevant government departments, and water-use sectors.

13 The New Paradigm: Key Elements

There are several key elements to the NWRS-2 that are critical in the implementation of a new paradigm for water management. Firstly, the new paradigm is value driven, and driven by the concept of Developmental Water Management, as defined in Chapter 5.

Promoting the equity-oriented agenda will entail adjustments in the structure, functions, priorities and budget of DWA and CMAs. More fundamentally, issues related to enforcement, transition to and consolidation of democracy, changes in behaviour and attitude, will need to be addressed in an integrated way across the sector under the leadership of DWA.

In the same way, promoting a deliberative and participatory agenda will require adjustments in the structure and functions of water institutions. Issues related to expertise, accountability, and democratic authority must be addressed in an integrated way at the highest level in the Department of Water Affairs. There is therefore the need to strengthen the capacity of sector institutions to integrate the consolidation of democratic practices into their work. All departments and non-governmental entities that have a direct relevance to water should be involved. Aligning all such departments and organizations to focus on water requires the use of political capital.

Central to the successful implementation of the NWRS-2 are three factors: the importance of gathering adequate and reliable information; adherence to policies and procedures; and the deployment of the finest people available. The implementation of the NWRS-2 will depend on the quality and sensibility of human resources across the sector, much more so than on material resources.

Senior management in water sector institutions must play a strategic leadership role, inspiring a sense of meaning amongst staff, ensuring that all employees understand and support the spirit and substance of the Constitution and the water policy, and ensuring that all employees understand and implement the NWRS-2.

The Department of Water Affairs must drive the implementation of the NWRS-2, with a focus on all dimensions of water – physical, institutional, economic, social, and ecological. The private sector and other social partners should support this as it is in the public interest to ensure that water management support a more equitable, prosperous and sustainable society. The private sector, civil society, and the international community, will contribute to the implementation of the NWRS-2 and the achievement of policy objectives in different ways – strong leadership by DWA is needed to align these different ways and to ensure synergy amongst the various processes to create the right conditions for water management to support growth, development and equity.

The Department of Water Affairs requires the support of business and financial institutions whose shareholders should ensure that they now develop a people-oriented vision and take the steps to become the pre-eminent equity-supporting institutions in South Africa. It is these organizations which, together with the Department, must develop the “agenda for equity” which is the people’s hope. None-the-less, responsibility for these equity reforms lies with DWA, which must ensure that water institutions, in the context of the new institutional environment, are more efficient and publicly accountable.

With the cooperation of affected government departments, trade unions, the media, and the business community – water equity can be achieved in the next few years. Civil society and grassroots action can make a profound difference.

Water risk can be managed effectively only with stakeholder's deliberation and participation. The reliability of water delivery to public and private sectors can only be ensured through public–private partnerships and long-term planning, processes that must include historically marginalized and poor communities. However, with water risk comes opportunity. Just as the need to control carbon emissions has been a driver for environmental innovation so are the water challenges – but in the last eighteen years, innovation on the water industry has been underfunded and adopted slowly;

Strengthening the national innovation system and improving water management will need to take into account indigenous knowledge systems. Farming communities have existed for centuries, and long before there were modern water innovations, these communities had to develop ways to manage their limited resources. They developed indigenous leadership and management structures to encourage participation and the most effective use of limited resources. Since the seventeenth century, colonial intervention and the push for modern methods have often caused these structures to fail as a result of neglect or active destruction. However, these indigenous organizational mechanisms can be an effective way to reach communities and cause their members to use innovations or sustainable water techniques.

Partnerships between universities, research institutes, industries, and local communities are crucial to encourage increased research and promote innovation. Water innovation has the potential to transform South African water, but only if strong structures are put in place to help create and disseminate critical best practices and effective technologies. To promote innovation, the water sector could further support interactions, collective action, and broader public-private partnerships.

Government and educational institutions should treat water as a skill to be learned, valued, and improved upon from early childhood through adult careers. Valuing water and trying to improve our management of it it takes advantage of South Africa's existing systems and capabilities. In this way, the country could provide significant benefits for its citizens and its economy.

The challenges facing South African water will require fundamental changes in the way universities train their students. Most South African universities do not specifically train students to work in water in the same way law schools train students to work in courts. This needs to change so that water education can contribute to other sectors such as agriculture, mining, energy, transportation, and tourism.

The importance of technological innovation in the water sector raises serious political questions. Technology in the water sector, as in all other sectors, is one of the major sources of public power. So far as decisions affecting the daily lives of water users are concerned, political democracy is largely overshadowed by the enormous power wielded by captains of technical systems: corporate leaders, and professional associations and groups

such as engineers and hydrologists. They have far more to do with the management of infrastructure, the design of dams and irrigation systems, the selection of innovations, our experience as water users, than all the government water institutions put together. Water democracy must be extended from the political domain into the world of technology and work. This is the underlying demand behind the idea of a people-centered water system.

14 Support strategies

A number of technical and enabling strategies that will guide the implementation of overarching core strategies and associated key strategic actions support the NWRS 2. These technical and enabling strategies respond to the various concerns identified from the water perspective for South Africa.

14.1. Technical Strategies

Protection of water resources

A significant proportion of South Africa's usable water resources, including aquatic ecosystems, have been degraded and most exploitable water resources are being used. Protection of water resources encompasses management of quality and quantity of both surface water and groundwater and protection of the habitats. Apart from the intrinsic value of environment, protection of water resources is necessary for securing ecosystem services for economic development and growth and protection of human and animal health.

There is also a critical need to understand how poor communities can use aquatic ecosystems, such as wetlands, for sustainable livelihoods and to ensure that the protection of water resources does not impact negatively on the rural poor.

Core objectives of this strategy are:

- Prioritisation of pollution prevention, treatment and restoration of polluted water bodies;
- Establish eco-systems management as a core water business area. This includes proactive management and rehabilitation of water resources (mountain catchments, rivers, wetlands, aquifers and estuaries);
- Enhanced capacity of institutions that are responsible for water quality management and compliance enforcement;
- Incorporate Freshwater Ecosystem Priority Areas (FEPAs) into planning and decision-making processes that impact on aquatic ecosystems;
- Strengthening collaboration around managing and conserving freshwater ecosystems between DWA, DEA, DAFF and other key government departments

- Support sustainable use of aquatic ecosystems for sustainable livelihoods in poor rural communities

Water Conservation and Demand Management

Water Conservation and Demand Management (WC/WDM) is the foremost reconciliation strategy to balance water supply and demand. WC/WDM targets must be met in a number of priority water supply systems to reduce demand and thus 'stretch' the available water resources up to the date when the new augmentation projects will be implemented. If this is not achieved, earlier and more severe water restriction will have to be implemented when droughts are experienced. A dedicated national programme is required to deal with water wastage and losses, which will have additional job creation and small business development benefits.

At the same time, it is important to recognise that many poor communities in South Africa still do not have access to sufficient reliable water supplies, particularly to meet their productive needs. Demand management in these communities should actually be looking at increasing rather than decreasing water use.

Specific actions and targets are set for different water use sectors, which include:

- Implement effective water metering and monitoring system;
- Set and implement realistic targets for water use reduction;
- Development of incentive schemes;
- Implement targeted regulation and ensure effective control;
- Obtain sector commitments;
- Focus on improved technology;
- Improve associated water management, especially in priority risk areas;
- Support effective water use for productive purposes in rural and peri-urban communities

Infrastructure Development and Management

Infrastructure development remains a critical component of water security and the developmental water management paradigm. The required infrastructure development applies to macro infrastructure (dams and transfer system), alternative water resource development such as re-use and desalination. Furthermore, it also focuses on waste management, systems management and governance as well as functionality (refurbishment and maintenance), as well as small and micro infrastructure for rural development and sustainable livelihoods

The aim is to apply the value chain approach of source to tap and waste to source management approach, implying the integrated development and alignment of projects along the chain.

The core intervention areas are:

- Infrastructure development and investment;
- Securing water for future through effective planning and preparation;
- Improved reservoir systems operations;
- Dam safety rehabilitation and rehabilitation of canals;
- Multipurpose and multi-stakeholder use of infrastructure;
- Economic opportunities from development and management of infrastructure;
- Infrastructure for social development, including job creation and small and micro infrastructure;
- Focus on functionality and infrastructure asset management;
- Development and maintenance of a water investment framework and strategy;
- Increased funding and financial investment.

Climate change

South Africa is a water scarce country with a highly variable climate - a situation that will be exacerbated by the effects of climate change (46). The required response to climate change consists of a suite of approaches, measures and actions, ranging from research to planning and implementation, to mitigation, as well as to reducing impacts through effective adaptation to the expected changes. The climate change strategy provides an integrated framework for the response to minimise the overall detrimental impact of climate change and to maximise any beneficial impact. Climate change will impact most significantly on poor and marginalised communities who are already vulnerable to water insecurity.

Core objectives of this strategy are:

- Integrating climate change considerations in the short-, medium- and long-term water planning processes;
- Implementing the best catchment and water management practices to maximise the degree of water security and resource protection under changing climatic conditions;
- Reducing the vulnerability and enhancing the resilience to water-related impacts of climate change in communities/sectors at greatest risk;

- Providing human, legal, regulatory, institutional, governance and financial resources and capacity to deal with the long-term effects of climate change;
- Undertaking focused monitoring and research in order to ensure the efficacy of water adaptation approaches over the long-term.

Disaster management

Water-related disaster management is an important part of the South African developmental water management framework. In terms of the National Water Act, disaster management includes the management of floods and droughts, the prevention of pollution and degradation of water resources and the promotion of dam safety. Failure of water supply has also been identified as a critical risk area for water security. Water-related natural hazards and disasters are, to a very large extent, attributable to extreme climatic events which are manifestations of climate variability, either natural or climate-change induced. These disasters can threaten life, health and livelihoods, especially for the poor and vulnerable.

The key objectives are as follows:

- Reduction of the water-related disaster risk by responding appropriately to drought and flood hazards, prevention of pollution and degradation of water resources and promotion of dam safety;
- Enhancement of disaster resilience through ensuring the preparation and implementation of the water sector disaster management plan within the National Disaster Management Framework to ensure coordinated actions by all role-players within government and outside;
- Facilitation of inclusion of water-related disaster management planning and allocation of associated resources (HR skills and budgets) in strategies and business plans of all water management institutions;
- Extended focus and improved management on regional and local levels.

Groundwater development and management

Groundwater in South Africa is an important resource for all sectors ranging from agriculture to domestic water supplies. Groundwater will make greater contributions to the nation's water supplies in future as surface water gets closer to the limits of its development and availability.

There is extensive potential available for further development of groundwater resources in South Africa (10). The development of this resource will be crucial for sustaining water security of small towns and villages, as well as augmenting water supplies to larger urban centres and agricultural development.

This strategy has the following objectives:

- Groundwater is recognised as an important strategic water resource in South Africa, within a developmental water management approach;
- The knowledge and use of groundwater is increased along with the capacity to ensure sustainable management;
- Better groundwater management programmes are developed and implemented at required water resource management levels, tailored to local quantity and quality requirements.

Specific actions include improved policy, regulation and licensing, improved groundwater knowledge base and research, improved planning, groundwater management, institutional capacity as well as communication, awareness and attitude management.

Water Resources System Operations

Water resource systems management is a key area for optimising and stretching the limited available water resource, as well as to ensure fair and equitable water availability within specific and shared water systems.

Key objectives of this strategy are:

- The systematic development and implementation of operating rules for all water supply systems in South Africa, including those shared with other countries.
- Review of the guidelines on a regular basis based on the national oversight over the operation of all water supply systems.
 - Provision of support to municipalities to develop and implement operating rules for municipal water resources infrastructure
- Adequate monitoring and data collection to support the operation of the systems, auditing their operations and to review the adequacy of the guidelines.
- The development of an adequate and well-staffed establishment with the required skills to execute and supervise the various actions required in the operational plans.

Desalination

National government recognizes that desalination will play an important role in South Africa's future water security. The DWA will ensure that desalination is properly considered as an option for meeting future water requirements in its integrated water resource planning processes, and will actively promote and support the development and implementation of desalination projects where these projects compare favourably to other

alternative options, taking into account the benefits of the diversity of water supply in the context of increased climate change risk.

Key objectives and actions of this strategy are:

- Integrating energy and water planning;
- Improved water quality regulations;
- Streamlining regulatory approval processes;
- Research and development;
- Financing desalination projects;
- Implementing large-scale sea water desalination projects;
- Desalinating and treating acid mine water;
- Development of skills and local capacity;
- Increasing public awareness and acceptance;
- Developing guidelines.

Water Re-Use

The implementation of water re-use can take place at different scales or levels: at a local level involving a single facility such as a building or a factory, for a group or cluster of facilities, at a treatment facility level (for example, such as a municipal treatment works) or at a river system level (natural drainage areas/catchments). Decision-making will vary across these applications and could involve individual or groups of households or businesses, municipalities and national government (including entities owned by government).

The intent of the water re-use strategy is to encourage wise decisions relating to water re-use for all of these different decision makers. There are three important factors that can enable and support good decision making:

- A sound and clear policy and legislative framework, that is, decision-makers and water users know what their rights and obligations are, and what they can and cannot do.
- The benefits and costs are clearly understood, and prices and costs accurately reflect the relative benefits and costs between alternatives so that incentives are clear.

Decision makers have access to relevant information and support to make informed decisions, with the necessary support and backup to implement water re-use projects.

Key objectives and actions of this strategy are:

- Creating a clear policy and legislative environment;

- Reviewing water quality standards;
- Development of incentives;
- Information to support sound decision making and implementation;
- Develop methodologies for evaluating water resource development options;
- Development of guidelines for implementing water re-use projects;
- Facilitate technology selection;
- Public education and awareness;
- Technology innovation and development;
- Develop institutional capacity to implement and to operate re-use systems;
- Financing water re-use projects.

14.2. Enabling Strategies

Water finance and funding

Without adequate funding for the development and management of water infrastructure and improved revenue collection from water users, it will not be possible to achieve the national development goals, such the job creation targets of the New Growth Path which are heavily dependent on water availability (Agriculture, Mining, Manufacturing, etc.). The water finance and funding strategy underpins all the strategic goals of NWRS 2.

The National Water Act of 1998 makes provision for the three types of water use charges, namely, water resource management charge, water resource development and use charge, and charge for achieving equitable and efficient allocation of water. The objective of the water pricing strategy is to promote financial sustainability and economic efficiency in water use. The Act also makes provision for financial assistance in the form of grants, loans or subsidies.

The need to maximise the benefits arising from the use of existing water resources, to reduce losses and wastage, to increase efficiency of use, to develop new and more expensive sources (including, for example, the desalination of sea water), to re-use treated wastewater much more extensively, and to manage water quality more actively will increase both infrastructure and ongoing management and operating costs significantly in future. At the same time, however, it is critical that the pricing strategy takes into account the equity requirements of South Africa and the need to develop a more inclusive economy. This may require targeted subsidies to historically disadvantaged and marginalised groups.

Strategic actions include:

- Improve revenue collection to meet the operating expenses;

- Review of the pricing strategy to address price capping, implementation of the waste discharge charge system, introduction of the economic charge and to ensure that pricing meets equity and social development requirements;
- Include a charge for operation and maintenance and infrastructure expansion in the raw water tariffs so that a dedicated fund for asset management can be established;
- Pilot the implementation of the waste discharge system in highly polluted catchments;
- Improve financial management systems;
- Improve customer database management;
- Establish economic regulator;
- Develop appropriate funding models for the development of infrastructure, lifecycle management and governance;
- Implement appropriate economic instruments to promote water conservation and water demand management in all major sectors;
- Prioritise the investment in the refurbishment and upgrading of wastewater treatment plants in order to prevent pollution of water resources;
- Invest in lifecycle and infrastructure asset management.

Water sector capacity building

The successful implementation of the developmental water management approach will not be achieved without the drive and support of a professionally competent and dedicated cadre of engineers, academics (natural and social sciences), technicians, managers and administrators. The water sector capacity building strategy is a cross-cutting strategy and is central to the achievement of all the strategic goals of the NWRS 2. It provides a basis for:

- Coordinated processes and initiatives with short, medium and long-term approaches that will result in a drastic decrease in skills shortage in critical technical and management areas;
- A responsive and flexible capacity building framework that will respond to an ever-changing and dynamic socio-economic and natural environment;
- A developmental orientation to water resource management that relates to the demands for growth, development, sustainable livelihoods and human security in support of a stable democracy and an equitable economy.

Key objectives and actions of this strategy are:

- Strengthening of the existing mechanisms and processes for DWA to provide strategic sector leadership;
- Establishment of a sector supported institutional model for the effective coordination of institutional capacity building, education, training and skills development;
- Establishment of a skills/business intelligence hub for skills planning coordination, quality assurance and knowledge management;
- Expansion of the scope of DWA Learning Academy to include training of water professionals for other water management institutions;
- Development of an education, training, and capacity framework that conceptually and practically integrates the various elements of the water-value-chain-pipeline approach;
- Development of an inclusive strategy for the professionalisation of water institutions and practitioners;
 - Integration of indigenous knowledge systems into the knowledge base supporting developmental water management;
- Development and implementation of public awareness campaigns to make everyone aware of the value of water and the developmental water paradigm.

Monitoring and Information

Information on water is indispensable and will certainly be critical in future as more water is required to foster socio-economic development in South Africa. This is also important in the face of increasing population, complexities and uncertainty brought about by impacts of climate change, and competing needs of different water users including the environment or aquatic ecosystems. The accuracy and reliability of information on availability, distribution, quantity and quality of water is dependent on appropriate, efficient and relevant monitoring systems, strategies, policies, legislation, processes and governance structures.

The objectives and associated actions of this strategy are:

- Awareness raising on the importance of investing in collection and management of high quality water-related information for supporting water resource management;
- Development and implementation of a national monitoring and information management plan for the entire water sector;
- Establishment of an integrated water information management system that is easily accessible to government institutions and other sector users;
- Ensuring that the largest possible collection of high quality data and information for supporting scientific research, regulation, monitoring and compliance enforcement are identified and made accessible to public and private institutions;

- Investment in building technical expertise needed to collect, analyse the water information and to produce reports for decision-makers;
 - Building of a network of data collection by water users, scientific institutions, and members of the public;
- Allocation of appropriate budgets for monitoring infrastructure and information management.

Research and innovation

The NWRS 1 acknowledges that research has been a fundamental contributor to understanding South Africa's water resources and developing many of the techniques and tools used for water management, and it has also informed the development of national water policy and enabling legislation. However, the NWRS 1 did not include any strategic objectives and actions for water research and innovation (R&I).

Currently, the water sector in South Africa faces new and urgent challenges. Of these, the most pressing are the scarcity of the resource, inequitable access, and the deterioration of resource quality. These challenges leave us with no alternative but to invest R&I in the water sector.

R&I creates and activates the knowledge that South Africa needs to compete in the global economy. It leads to new, exciting products and processes that help the country prosper, raise our standard of living and address challenges within the water sector. R&I are not like any other solutions for the future. They are the main - and sometimes the only – tools available to build tomorrow's world. We must therefore create the necessary conditions and incentives to generate enthusiasm for it across our nation.

The core objectives and actions of the strategy are as follows:

- Lead and direct solution-orientated research and innovation targeted towards challenges experienced within the water sector;
- Align the water sector R&I strategy, national science and technology, the national R&D strategy and the National System of Innovation;
- Promote maximum research impact, by providing mechanisms for support and uptake of innovative solutions within the water sector;
- Ensure inclusive, coherent and well-coordinated participation by all role players in water-related R&I;
- Ensure that water sector R&I is adequately resourced and that resources are used efficiently and effectively;
 - Draw on indigenous knowledge systems for R&I in the water sector

14.3. Governance Strategies

Water allocation reform and equity

Equitable access to water or to the benefits derived from using water are critical to eradicating poverty and promoting equitable economic growth. Little substantive progress on the Nation Water Act pillar of equity (redress of race and gender water allocations for productive economic use) has been achieved since its promulgation. Proactive steps are required to meet the water needs of historically disadvantaged individuals (HDIs) and the poor and ensure their participation in productive use of water. To elevate the public and political profile of the Water Allocation Reform (WAR) programme it requires linkages to broader government and private sector programmes of redress in land, agriculture and business. Compulsory licensing is required in stressed catchments to ensure that water is made available for HDIs. General Authorisations can also form an important tool in achieving redress and making water available to small water users. This requires implementation plans.

To fast-track the water sector reform agenda in South Africa to create and ensure sector stability in support of socio-economic development and sustainable water resource use, the following strategic objectives are set:

- Elevate the public and political profile of the programme and its linkages to broader government and private sector programmes of redress in land, agriculture and business and promote the idea of an integrated land, water and agrarian reform programme;
- A better understanding of the water use situation and water availability in different catchments in the country;
- Establishing partnerships with key role-players and ensuring effective involvement of relevant stakeholders in the implementation of the WAR.

Key actions include:

- Promote the development of an integrated land, water and agrarian reform programme;
- Endorse and publish WAR Implementation Plans and ensure the consequent mobilisation of materials, resources and finances to realise programme implementation;
- Establish and ensure linkages with other government and private sector initiatives, especially local and provincial development planning, land and mining reform projects and agricultural development support;
- Set up memorandum-of-agreements, publicise the need for compliance to economic sector transformation charters, facilitate water user institutional collaboration and transformation and engage with individual and collective HDI beneficiation initiatives;

- Roll-out WAR in selected areas, prioritise in terms of the current water situation (especially demand) and prospects for future development.

Regulation of water resources

An effective water resource regulatory framework is a fundamental requirement for a water secure future for South Africa and the achievement of all strategic goals of the NWRS 2. DWA's role as a sector leader and regulator is central to the achievement of effective water resource regulation. In the next five years, however, CMAs will take on the primary role in water management regulation, within the framework set by the NWRS-2. The regulation strategy outlines how the water sector is currently regulated and identifies key issues that should be addressed to implement effective regulation of a very complex sector.

Key strategic actions include:

- Clear separation of regulation branch from policy development and operational activities within DWA to promote transparency and "arms length" independence of the regulator;
- Development of a targeted regulatory strategy in order to make the most effective use of limited financial and human resources. This strategy will focus strict regulation on high impact users, while ensuring support for effective water use by small water users, particularly those from poor communities;
- Development of all regulatory instruments and institutional capacity needed to implement regulation of water resources;
- Establish 9 CMAs by 2015 and ensure that they become fully functional within 3 – 5 years of establishment. Transfer regulatory responsibility to CMAs and ensure that they have access to WARMS so that they can take on the billing and revenue generation function;
- The DWA regulatory branch to oversee effective regulation by CMAs at catchment level as well as execute performance of national water infrastructure branch
- Accelerate and streamline the issuing of licenses to water users in order to support equitable economic growth and improve regulation of compliance with license conditions by all water users;
- Support the establishment of fully functional monitoring and information management systems to enable the regulator to have access to high quality information for regulating water use by all sectors;
- Strengthen cooperation between DWA and DEA in the implementation of water resource regulations in areas of convergence to optimise use of limited regulation capacity;
- Raise credibility of DWA as regulator by immediate action against transgressors; make key rulings public, by being objective and through short turn-around times;

- Involve the public and civil society as partners for regulation.

Water Sector Institutional Arrangements

Appropriate institutional arrangements are critical to ensure effective water resources management. Successful implementation of the NWRS-2 depends on effective, well-resourced institutions and a strong regulatory framework and oversight function. It is also critical that these institutions are informed by the values underpinning the NWRS-2: equity and human dignity.

Key focus areas include:

- Management of water resources at a catchment level;
- Managing National Water Resources Infrastructure;
- Managing local water infrastructure (water boards and water user associations);
- The management of regional water infrastructure and the future role of water boards.

Priority actions include:

- Fast track the establishment of the CMAs in priority catchments and delegate water resource management functions to two CMAs by 2014 and to a further two CMAs by 2015;
- Build the capacity of CMAs and develop decision support tools to enable them to play their role in regional development planning and decision-making processes;
- Delegate local water resource management functions to WUAs that have capacity to perform these functions;
- Support the establishment of new WUAs as vehicles for building capacity of emerging farmers;
- Ensure the transformation of all Irrigation Boards into Water User Associations by 2014 with a required equity transformation plan in place;
- Amalgamate current water boards into a reduced number of viable regional water boards;
- Allocate resources for supporting the establishment of Catchment Management Forums (CMFs) to facilitate stakeholder engagement in water resources management with a particular focus on ensuring the active participation of poor and marginalised communities;
- Develop a policy framework for coordinated and structured approach to the provision of financial and technical support to CMAs;

- Develop a water governance framework for effective oversight and support of CMAs;
- Promote awareness of the role of water as a strategic resource amongst politicians, other decision-makers and planners, the private sector, and the general public;
- Ensure that the integrated planning of water for development is implemented at all levels of the hierarchy of planning processes and develop effective coordinating structures to enable DWA to exercise its leadership role in integrated development planning in all spheres of government;
- Ensure effective management of National Water Resources Infrastructure which will develop, manage and operate DWA infrastructure
- Develop a comprehensive regulatory and oversight framework for the NWRI to ensure efficient operation and financial sustainability;
- Develop and implement a turnaround strategy for the management of the National Trading Account to improve billing and revenue collection.

International Water Management and Cooperation

The strategy on International Water Management and Cooperation outlines how South Africa will cooperate with its neighbouring countries in management of shared river basins for the benefit of all people. It also sets objectives and actions to be implemented to influence the African and global agenda on water management.

The South African government cooperates on water management issues with several countries within the SADC region, the rest of Africa and international water management agencies. Issues of cooperation range from water sharing agreements in international river basins shared with neighbouring SADC countries to participation in multilateral forums and engagement through bilateral arrangements for sharing technical resources with developing and developed countries.

The South African government pursues its interest in water management within the continent through its participation in the African Ministerial Council in Water (AMCOW) and other key strategic water forums. South Africa is a signatory to the SADC Revised Protocol on Shared Water Courses, therefore it has an obligation to fulfil its obligations through cooperation with its neighbours in the management of international waters.

South Africa shares four major river systems (Figure 9) with six neighbouring countries, namely, the Orange/Senqu system shared with Lesotho, Botswana and Namibia; Limpopo system shared with Botswana, Zimbabwe and Mozambique; Incomati system shared with Swaziland and Mozambique; and the Usutu/Pongola-Maputo system shared with Mozambique and Swaziland.

Key strategic actions include:

- Utilising the SADC platform as a preparatory process for AMCOW participation, including key global multilateral engagements;
- Continue participation and coordination of the water sector in key strategic global water issues;
- Ensure that regional water management approaches support regional economic integration processes;
- Prioritise multilateral water related engagements;
- Prioritise strategic partners through mapping of RSA water priorities and re-establish relationships with traditional donors where cooperation has been happening on an ad hoc basis;
- Establish strategic RSA/EU water sector partnership and Memorandum of Understanding;
- Develop donor engagement strategies and related guidelines for the purpose of approaching the donors in a focused manner;
- Enhance cooperative management of the shared watercourse for the purpose of economic growth and improvement of lives of ordinary people in SADC region;
- Continue with the enhanced sustainable management of the aquatic and terrestrial environment; integrate management and development of the region's water resources;
- Fund water resources management and development in the region for the benefit of the South African water sector;
- Strengthen governance and capacity in SADC and regional water institutions and enhance relations on shared watercourses