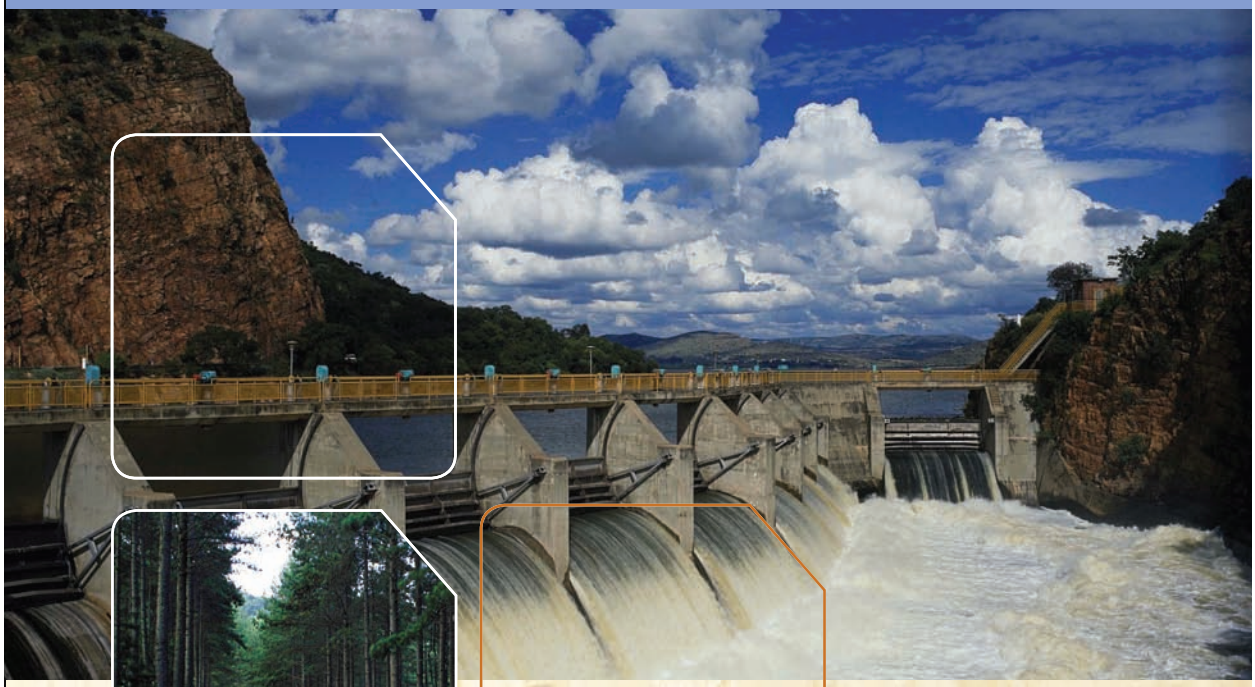

The Department of Water Affairs and Forestry is the custodian of South Africa's water and forestry resources. It is primarily responsible for the formulation and implementation of policy governing these two sectors. It also has to override responsibility for water services provided by local government.

The water sector promotes effective and efficient water-resources management to ensure sustainable economic and social development, while striving to ensure that all South Africans gain access to clean water and safe sanitation. The forestry programme promotes the sustainable management of the country's natural forest resources and commercial forestry for the lasting benefit of the nation.

The Department of Water Affairs and Forestry has a regional office in each province. These offices deal with the day-to-day water and forestry issues of provincial and local government. They support municipalities in their day-to-day water and sanitation service delivery by providing planning, guidance and crisis management.

The regional offices also provide support and oversee provincial institutions such as water-user associations (WUAs), water boards and catchment management agencies (CMAs). They are the first port of call when applying for a water-use or forestry licence. They monitor the quality of drinking water in co-operation with water services authorities (WSAs) and water boards.

Out of a total budget of R5,3 billion in 2007/08, R3,1 billion (58% of the budget) was allocated to regional offices.

Hydrological conditions

South Africa is located in a predominantly semi-arid part of the world. The country's climate varies from desert and semi-desert in the west to subhumid along the eastern coastal area, with an average rainfall of about 450 mm per year. This is well below the world average of about 860 mm per year, while evaporation is comparatively high.

South Africa's inland water resources include 22 major rivers, 165 large dams, more than 4 000 medium and small dams on public and private land, and hundreds of small rivers.

The country's water resources are, in global terms, scarce and extremely limited. The total flow of all the rivers in the country combined amounts to about 49 200 million cubic metres (m^3) per year. This is less than half of that of the Zambezi River, the closest large river to South Africa. Groundwater plays a pivotal role, especially in rural water supplies.

However, owing to the predominantly hard-rock nature of South Africa's geology, there are few major groundwater aquifers that can be used on a large scale.

The poor spatial distribution of rainfall means that the natural availability of water across the country is also highly uneven. This is compounded by the strong seasonality of rainfall over virtually the entire country, and the high within-season variability of rainfall, and, consequently, of run-off.

As a result, stream flow in South Africa's rivers is at relatively low levels for most of the time, with sporadic high flows occurring – characteristics which limit the proportion of stream flow that can be relied upon to be available for use, and which also have implications for water-related disasters such as floods and droughts.

To aggravate the situation, most urban and industrial development, as well as some dense rural settlements, have been established in remote locations away from large watercourses. As a result, the requirements for water already far exceed its natural availability in several river basins. Widespread and often large-scale transfers of water across catchments have, therefore, been implemented in South Africa.

To facilitate the management of water resources, the country has been divided into 19 catchment-based water-management areas. Eleven of these water-management areas share international rivers.

Over the years, water-resource development and management in South Africa have continuously evolved to meet the needs of a growing population and a vibrant economy, within the constraints imposed by nature. These developments have largely been made possible by recognising water as a national asset, thereby allowing its transportation from where it is available to where the greatest overall benefits for the nation can be achieved.

Sufficient water resources have been developed and are available to ensure that all current requirements for water can reasonably be met, without impairing the socio-economic development of the country.

Where feasible, special management techniques may be applied to improve water quality to appropriate standards for particular uses. The quality of groundwater varies according to hydrogeological conditions and anthropogenic impact. However,

most major aquifer systems contain potable-quality water.

Measures will also be introduced to ensure the most beneficial and efficient use of water in the country from a social and economic perspective.

Provided that South Africa's water resources are judiciously managed and wisely allocated and used, sufficient water of appropriate quality will be available to sustain a strong economy, high social standards and healthy aquatic ecosystems for many generations.

South Africa depends mainly on surface-water resources for the urban, industrial and irrigation water supplies in the country. In general, surface-water resources are highly developed over most of South Africa. Groundwater is also extensively used, particularly in the rural and more arid areas, contributing to some 60% of newly serviced households (since 1994).

In the northern parts of the country, both surface and groundwater resources are nearly fully developed and used. Some overexploitation occurs in localised areas, with little undeveloped resource potential remaining. The reverse applies to the well-watered south-eastern region of the country where there are still significant undeveloped and little-used resources.

The total mean annual run-off of water in South Africa under natural (undeveloped) conditions is estimated at a little over 49 200 million m^3 per year, including about 4 800 million m^3 per year of water originating from Lesotho, and about 700 million m^3 per year originating from Swaziland, which naturally drain into South Africa. Agricultural irrigation represents close to 60% of the total water requirements of the country, while urban requirements constitute about 25% as the second-largest user sector. The remaining 15% is shared by the other sectors (all standardised to 98% assurance of supply).

The total net abstraction of water from surface water resources amounts to about 10 200 million m^3 per year for the whole of South Africa, after allowing for the re-use of return flows. This represents about 20% of the total mean annual run-off of 49 200 million m^3 per year (all standardised to 98% assurance of supply). A further 8% is estimated to be lost through evaporation from storage and conveyance along rivers, and 6% through land-use activities. As a national average, about 66% of the natural river flow (mean annual run-off) therefore still remains in the country's rivers.

Water-resource management and development

Government is committed to ensuring that everyone in South Africa has access to functioning basic water-supply services and that everyone has access to a functioning basic sanitation facility by 2010.

By 2008, about a million more people had access to both water and basic sanitation services, contributing to government meeting the millenium development goals target of halving the population without water and sanitation. Households with access to water increased from 59% to 88% and basic sanitation from 48% to 73%. Between 1994 and June 2008, the Department of Water Affairs and Forestry served 18,7 million people with water and 10,9 million people had access to basic sanitation.

Government's goal is to ensure that all people in South Africa have access to potable-quality water, basic sanitation facilities and electricity by 2014. Much progress has been achieved since 1994 towards reaching this goal.

Government is also committed to eradicating bucket systems in formal settlements.

By the end of March 2008, 91% of the 252 254 buckets identified in February 2005 were removed in formal established areas throughout the country. Between April 2007 and March 2008, access to free basic water (FBW) increased from 73% to 77%.

In 2008/09, the department spent R1,2 billion on establishing new water-resource infrastructure and R415 million on the rehabilitation of existing infrastructure.

In addition, "off-budget" water-resources infrastructure projects to the value of R9,04 billion were implemented.

The substantial restructuring of the Department of Water Affairs and Forestry, which is expected to be completed by 2010/2018, includes:

- establishing CMAs to perform water-resource management functions
- transferring water-service delivery and operations to WSAs.

As WSAs are now providing water services, the department's role is to:

- act as custodian of the country's water resources
- provide water-services policy and guidelines
- provide ongoing support to the water sector
- act as a water-sector regulator.

The department remains focused on the phased implementation of the National Water Act, 1998 (Act 36 of 1998), with a particular emphasis on implementing a new organisational structure, which includes:

- establishing the National Water Resource Strategy (NWRS), which will set out the procedures, guidelines and overall strategy for managing water resources
- developing and testing a strategy for compulsory water-use licensing to facilitate equitable access to water resources for historically disadvantaged individuals
- enhancing water-use efficiency
- ensuring compliance with dam-safety regulations and enhancing public safety at water-resource installations
- investigating and implementing appropriate institutional arrangements for the optimal management of the Working for Water (WfW) Programme
- building national capacity to monitor the state of water resources, so that accurate information is used in decision-making about the use and management of water resources
- creating the National Water Resource Infrastructure Agency (NWRIA) to manage and develop national infrastructure and which will incorporate the work of the Trans-Caledon Tunnel Authority.

Major dams of South Africa

Dam	Full supply capacity (106 m^3)	River
Gariep	5 341	Orange
Vanderkloof	3 171	Orange
Sterkfontein	2 616	Nuwejaarspruit
Nuwejaarspruit Vaal	2 603	Vaal
Pongolapoort	2 445	Pongolo
Bloemhof	1 264	Vaal
Theewaterskloof	480	Sonderend
Heyshope	451	Assegaai
Woodstock	380	Tugela
Loskop	361	Olifants
Grootdraai	354	Vaal
Kalkfontein	318	Riet
Goedertrouw	304	Mhlatuze
Albert Falls	288	Mgeni
Brandvlei	284	Brandvlei
Spioenkop	277	Tugela
Mthatha	253	Mthatha
Driekoppies	250	Lomati
Inanda	241	Mgeni
Hartbeespoort	212	Crocodile
Erfenis	207	Groot Vet
Rhenosterkop	204	Elands
Molatedi	22	Groot Marico
Ntshingwayo	198	Ngagane
Zaaihoek	192	Slang
Midmar	175	Mgeni

In accordance with the international best practice of decentralising and democratising water-resource management, the Inkomati CMA (ICMA) has been established. It is the first of 19 CMAs to be formed by government and is responsible for the protecting, conserving, developing and managing the water resources in South Africa at water management area (WMA) level.

The central objective of the ICMA is to ensure that water is used to support equitable and sustainable social and economic transformation and development in South Africa.

Monitoring water resources

River flow is monitored at 1 200 flow-gauging stations and some 260 major reservoirs are monitored. The evaporation and rainfall station network comprises 360 stations.

The oldest flow-gauging station still in operation in South Africa is on the Mooi River near Potchefstroom in North West.

A new initiative to monitor precipitation in mountainous areas has been launched. There are 21 operational rainfall stations in the mountains of the Western Cape and five stations are operational in the Mpumalanga escarpment. Observations are relayed through the cellular short-message system. The data is updated daily on the Department of Water Affairs and Forestry's website at *www.dwaf.gov.za*.

Water levels are monitored at some 1 000 observation boreholes across South Africa. Particular attention is given to monitoring in dolomitic areas. In addition, a small network of rain gauges is in operation to monitor rainwater quality.

The importance of qualitative information on South Africa's water resources has led to an

increasing drive towards creating a national water-quality monitoring network.

National Aquatic Ecosystem Health Monitoring Programme (NAEHMP)

The NAEHMP, initially known as the National Aquatic Ecosystem Biomonitoring Programme, is responsible for managing aquatic ecosystems.

Until recently, the programme focused mainly on riverine ecosystems. The short name, River Health Programme (RHP), was adopted for this component of the NAEHMP. However, the original broader focus of the monitoring programme remains valid, namely, monitoring the ecological health of all aquatic ecosystems (estuarine and riverine ecosystems) managed by the department.

The NAEHMP focuses on the biological attributes of a river that serve as indicators of its ecological health. The rationale for initiating a biomonitoring programme is that the classic approach of monitoring only physical and chemical water-quality attributes was inadequate for generating information on the overall health of an aquatic ecosystem. Monitoring chemical attributes alone was found to be insufficient to detect, for example, the cumulative effects on aquatic ecosystems of extended exposure to multiple stressors.

Such stressors include habitat alteration, barriers that alter stream flow, water abstraction and alien species being introduced. Aquatic communities (for example, fish, riparian vegetation and aquatic invertebrate fauna), however, are adapted to live within a certain range of environmental conditions.

Rand Water's Water Wise Education Team (WWET) took home the International Water Association's Marketing and Communication Award at the gala dinner of the International Water Association World Water Congress, held in Vienna, Austria, in September 2008. The award is aimed at raising awareness among water utilities around the world of the importance of establishing professional and effective communication with users of water and about water services.

Over the past 11 years, Water Wise has established itself as a trusted source of educational material and fun workshops aimed at exposing youth to the meaning and importance of being "water wise". With four dedicated educational centres situated between Pretoria in the north and Vereeniging in the south, the programme has succeeded in reaching thousands of schoolchildren in Gauteng.

The year 2008 was declared the International Year of Sanitation by the United Nations. This saw South Africa engaging in a number of high-level initiatives to draw attention to issues of sanitation in this country and on the continent. Among these was the hosting of the Africa Sanitation Conference in Durban in February 2008 and the African Union Heads of State Summit in Sharm el Sheik, Egypt, in June 2008, where water and sanitation issues featured high on the agenda. These meetings produced ground-breaking declarations and decisions aiming to improve the lives of citizens.

These organisms' biological communities integrate, respond to and reflect the effects of chemical and physical disturbances that occur in aquatic ecosystems over extended periods, and provide a direct, holistic and integrated measure of the ecological integrity of a river.

If healthy and diverse biological communities inhabit a watercourse, the watercourse as a whole is considered to be ecologically resilient and healthy. However, from an RHP point of view, a healthy water resource does not guarantee the fitness of that resource for domestic, recreational, industrial and agricultural use.

The NAEHMP's main objectives are to:

- generate a national perspective of the health of aquatic ecosystems in South Africa
- develop the capacity and information base required to enable the department and other role-players to report on the status of and trends in the ecological health of South Africa's river systems, in an objective and scientifically sound manner
- generate information products and audit-management strategies that could assist in distinguishing between aquatic ecosystems exposed to sustainable use and those experiencing ecological deterioration.

The NAEHMP, and in particular the RHP, is regarded as the "flagship" for water-resource quality monitoring in South Africa. Products of the RHP have attracted wide attention and recognition, and provide strategic water-resource management information and training material for use in schools and universities, as well as in awareness creation.

The National Chemical Monitoring Programme assesses and reports on the chemical status of water resources in South Africa. Based on the report produced in 2002, the main water-quality challenges for domestic water users are high levels of dissolved salts and, in some places,

high fluoride concentration. The other challenges facing irrigated agriculture are the high sodium absorption ratio, high electrical conductivity, high pH and high levels of chloride.

Another global challenge affecting South Africa is eutrophication or excessive plant (including algae) growth in dams. This is due to high levels of nutrient input from point sources of pollution and diffuse sources of pollution from catchments. Annual reports indicate that 50% of dams in South Africa are seriously affected (hypertrophic), while the rest range in quality from good (oligotrophic) to poor (mesotrophic).

Another problem is the sporadic outbreak of cholera and other water-borne diseases, mainly due to poor sanitation and hygiene at household level. The Eastern Cape and KwaZulu-Natal are especially prone to cholera outbreaks.

The Department of Water Affairs and Forestry is designing water-resource monitoring programmes to assess and report on the radiological (radioactivity) and toxicological quality status of South African water resources. The National Toxicity Monitoring Programme also reports on the status of DDT (dichloro-diphenyl-trichloroethane) and other persistent organic pollutants. This information is reported internationally to the Stockholm Convention through the Department of Environmental Affairs and Tourism.

Drinking water-quality management is the responsibility of municipalities, and the Department of Water Affairs and Forestry has an oversight and regulatory role on the quality of tap water. Over the past few years, the department has implemented a countrywide system to assist with the overall management of drinking-water quality. On average, 3 000 samples are taken nationwide from water supply systems, and, by March 2008, more than 94% of the analyses complied with the health aspects of the national standard for drinking-water quality. The quality of drinking water from taps is one of the best in the world.

The department has introduced the electronic Water Quality Management System to WSAs.

Through the department's efforts alongside the Institute of Municipal Engineers and with the support of the South African Local Government Association (Salga), a challenging two-year project to monitor all 169 WSAs on their drinking-water quality has been successfully put in place. By June 2008, close to 90% of all WSAs submitted their drinking-water data on a timeous and ongoing basis. The result was an overall improvement in the quality of drinking water and the creation of an enabling environment to ensure the effective management of drinking water. Of those municipalities on the system, close to 95% reported that their water quality complied with the national drinking water standard.

Another international obligation is reporting on chemical water quality through the Global Environmental Monitoring System's Water Programme. The department started bringing the aspect of voluntary monitoring in the form of the adopt-a-river initiative.

Municipal Infrastructure Grant (MIG)

The MIG, a conditional grant from national government to local government to support investment in basic municipal infrastructure to eradicate backlogs, was implemented in April 2004.

The purpose of the MIG is to facilitate and ensure more effective and integrated service delivery by local government and the Department of Water Affairs and Forestry, working with the Department of Provincial and Local Government in seeking to ensure that funds are made available. (See Chapter 9: *Government system*.)

The department's support to municipalities comprises:

- planning support regarding integrated development plans (IDPs) and water-services development plans (WSDPs)
- monitoring the water-purification and wastewater treatment works' operations
- facilitating project selection, feasibility studies and service-level options
- supporting the implementation of a tariff structure and the FBW Policy

National Water Week is celebrated annually and hosted by the Department of Water Affairs and Forestry.

During National Water Week, the department aims to:

- raise awareness around the need to protect and conserve the country's water resources
- highlight the contribution that water makes to social and economic development
- highlight the role it plays in sustaining all forms of life in South Africa and the linkages between water services, water-resource management, water-quality management and water conservation and water-demand management.

- supporting the Section 78 process (division of powers and functions for water services between district and local municipalities) and selecting water-services providers
- training councillors and officials in water-services and water-demand management
- mobilising resources to support municipalities.

Policy and legislation

The Constitution of the Republic of South Africa, 1996, and the Bill of Rights enshrine the basic human right to have access to sufficient water and a safe and healthy environment. The two Acts that enable government to fulfil these rights through the Department of Water Affairs and Forestry are the:

- Water Services Act, 1997 (Act 108 of 1997), which created a regulatory framework within which water services could be provided. Schedule Four of the Constitution vests the responsibility for water and sanitation services in local government. National government, however, is responsible for the regulatory function.
- National Water Act, 1998, which aims to ensure that water resources are protected, used, developed, conserved, managed and controlled in a sustainable manner, for the benefit of everyone in South Africa.

National Water Act, 1998

The Act provides for:

- integrated management and sustainable use of surface water and groundwater
- devolution of surface and groundwater to catchment and local level
- government to play a support role through functions such as promoting awareness, providing information and building capacity.

The Act aims to control the use of water resources, protect them from being impacted on or exploited and polluted, and ensure that every person has equitable access to them.

The Act gives the Department of Water Affairs and Forestry the tools to gather the information it needs to optimally manage the country's water resources. The registration of water use is one of these tools.

All water users instructed to register have the statutory obligation to do so. There are strict penalties, prescribed in the Act, for those who do not comply.

All water users who do not receive their water from a service-provider, local authority, water board, irrigation board, government water scheme or other bulk supplier, and who use water for irrigation, mining purposes, industrial use, feedlots or in terms of a general authorisation, must register. This includes the use of surface and groundwater.

Other uses of water that must be registered include:

- Diversion of rivers and streams.
- Discharge of waste or water containing waste.
- Storage, which includes any person or body storing water for any purpose (including irrigation, domestic supply, industrial use, mining, aquaculture, fishing, water sport, aesthetic value, gardening, landscaping, golfing, etc.) from surface run-off, groundwater or fountain flow in excess of 10 000 m^3, or where the water area at full supply level exceeds one hectare (ha) in total on land owned or occupied by that person or body, and who is not in possession of a permit or permission.
- Stream-flow reduction activities (afforestation). All afforestation for commercial purposes, including communal forestry for commercial gain, that took place prior to 1972, must be registered. Forest owners who have permits issued under forestry legislation need not register.
- Local authorities and other bulk suppliers with their own water sources and purification works.
- Controlled activities such as irrigating with waste, power generation with water, atmospheric modification or recharging of aquifers.

An assessment of the environmental requirements of the rivers and streams concerned is conducted before a licence can be issued.

In March 2008, the European Union (EU) pledged R1,3 billion in support of a South African government programme that will harness the concept of water for growth and development.

The third phase of the Masibambane Water-Sector Support Programme will benefit from a R1,2-billion grant to be used for programme initiatives under the overarching theme of *Water for Growth and Development*. A total of R61 million will be used in funding international technical support.

Masibambane was first developed in 2001. Some of its achievements include the deployment of skilled professionals at municipal level to support local government, as well as service-delivery interventions that take issues such as gender and the environment into consideration.

The EU has contributed R1,5 billion to the programme since its inception.

The implementation of the National Pricing Strategy for Raw Water began in 2002 to ensure that, as far as possible, the costs of the management of water resources and water-supply infrastructure are borne by water users.

The majority of water users pay the water-resource charge or cost for which they are billed. However, underrecovery of costs remains considerable.

Action has been taken against a number of illegal water users across South Africa in response to growing concern about an apparent increase in the rate of illegal water use in some catchment areas.

National Water Resource Strategy (NWRS)

The NWRS describes how the water resources of South Africa will be protected, used, developed, conserved, managed and controlled in accordance with the requirements of the National Water Policy and the National Water Act, 1998.

Through the NWRS, South Africa reached one of the first recommendations of the Johannesburg Plan of Action (emanating from the World Summit on Sustainable Development) to develop national water-resource management plans.

The strategy contains estimates of present and future water availability and water requirements. It also proposes actions to be taken to achieve a sustainable balance between water availability and requirements. This is necessary to provide sufficient water, which is essential for human life, for participation in economic activity and for the progressive re-allocation of water to sectors of society that were previously excluded.

A vital element of the NWRS is the progressive decentralisation of the responsibility and authority for water-resource management to CMAs and, at a local level, to WUAs. These institutions, representing water users and other stakeholders, will facilitate effective participation in water-resource management in their areas. They will also enable the Department of Water Affairs and Forestry to move from its present multiple roles as operator, developer and regulator to become the sector leader, policy-maker, regulator and monitor.

The department will lead the creation of new institutions over a number of years, and will support and guide them in executing their tasks.

While the actions include the construction of new infrastructure such as dams, pumping stations and pipelines to meet increasing water demands, attention is mainly given to arrangements for the careful management, use and protection of water resources.

Water Services Act, 1997

The Act aims to:

- set out the rights of consumers, and the rights and duties of those responsible for providing water services
- provide for the right of access to basic water supply, and the right to basic sanitation necessary to secure sufficient water and an environment not harmful to human health or well-being
- allow the Minister of Water Affairs and Forestry to set national standards (including norms and standards for tariffs) to ensure efficient, equitable and sustainable water services
- promote the effective and sustainable use of financial and natural resources
- establish effective and financially viable statutory institutions to assist local government to fulfil its obligations
- ensure the production by WSAs of WSDPs required by municipal legislation within the framework of IDPs
- provide a comprehensive framework for the oversight and regulation of water boards under the authority of the Minister of Water Affairs and Forestry
- provide a framework for the collection and publication of information about water services.

Strategic Framework for Water Services (SFWS)

In 1994, the *White Paper on Community Water Supply and Sanitation* played a key part in creating an enabling policy framework for the delivery of water and sanitation services. However, since 1999, local government's responsibilities have changed significantly and the Department of Water Affairs and Forestry has transformed from being an implementer to a regulator. This necessitated the revision of the policy, which culminated in the SFWS.

The framework provides a comprehensive policy summary regarding the total water services sector in South Africa, and sets out the vision, targets and policy for the next 10 years. The key challenges are to address prevailing inequality and provide basic services, higher levels of service and sustainable service, including institutional sustainability.

In October 2003, following the approval of the SFWS, the department and Salga signed a joint declaration committing both parties to give effect to the SFWS.

The key policy themes of the SFWS are:

- eliminating the backlog in basic service provision
- providing higher levels of service
- providing free basic services (water supply and sanitation)
- credit control
- institutional reform of water-services providers
- a decentralised fiscal framework
- a long-term vision for regulation.

Existing policies on free basic services, the provision of basic household sanitation and the transfers of infrastructure from national to local government aim to ensure that:

- everyone in South Africa who has access to a functioning basic water supply is provided with FBW
- everyone who has access to a functioning basic sanitation facility is provided with free basic sanitation by 2010
- everyone has access to a functioning basic sanitation facility supply by 2010
- all assets of water-services schemes are transferred from the department to WSAs.

More detailed strategies to give effect to the implementation of the SFWS are the:

- Institutional Reform Strategy
- Regulatory Strategy
- Legislative Review (amendments to the Water Services Act, 1997)
- Sanitation Strategy
- Free Basic Services Strategy
- Transfer Strategy (of infrastructure assets to local government).

Water-resource management

Water-resource management in South Africa has undergone major revision along with the reform of water policy and legislation. The National Water Act, 1998 provides the principles for water-resource management. This policy aims to manage water resources in an integrated manner to ensure a healthy and stable water-resource base to meet the current and future needs of South Africa.

Water Allocation Reform (War) Programme

The War Programme is a proactive approach towards redressing race and gender inequities regarding water use – where "water use" refers to promoting access to water for productive purposes (and not to the provision of basic water services).

This includes actions ranging from promoting applications from historically disadvantaged individuals to supporting the licence-evaluation process to promote equity, as well as implementing the compulsory licensing process itself. Through this programme, the Department of Water Affairs and Forestry is developing and overseeing the implementation of frameworks (policies, strategies, guidelines and procedures) for compulsory licensing, and the allocation of water between and among users.

Awareness material on the programme has been developed and is available in the appropriate official languages where the programme is being implemented. The material includes pamphlets on compulsory licensing and understanding the verification and validation of water use, and a booklet on the productive use of water.

A toolkit of methodologies in support of War has also been developed. The toolkit uses the position paper as its basis, and outlines practical implementation methods that promote the goals of the War Programme. The department's intention is to speed up the process and to improve the efficiency with which licences are evaluated within the Batho Pele prescripts.

As key role-players in the programme, provincial and local governments, through their provincial growth and development plans (PGDPs) and IDPs, are central to informing, and being informed by, the way water allocations are made in their areas of jurisdiction. The awareness material and toolkit assist municipalities in determining water requirements in IDPs – in terms of WSDPs, and other plans, for example local economic development, land use, agriculture and the environment.

The Olifants Basin is one of the pilot projects of the War Programme, and aims to re-allocate water to deal with the imbalances of the past.

One of the major challenges for the Olifants Basin is the issue of water pollution owing to mining activities, power generation and other land-use activities. These challenges are worsened by limited capacity to monitor and intervene.

Water-management institutions

The National Water Act, 1998 sets the framework for the management of South Africa's water resources. This framework provides for the

establishment of water-management institutions, which include CMAs and WUAs.

Catchment-management agencies

CMAs aim to ensure equitable, efficient and sustainable water-resource management. They are required to establish governing boards, which are responsible for integrated water-resource management and developing a catchment-management strategy.

The boards have to represent the various sectors of society within their specific water-management areas and will consist of water users, potential water users, local and provincial government and environmental interest groups.

The Department of Water Affairs and Forestry aims to establish CMAs in South Africa's water-management areas, as required by the National Water Act, 1998.

The department will devolve administration to local water users and communities, accompanied by vigorous capacity-building, so that historically excluded communities can participate in water management.

Internal strategic perspectives have been developed for the WMAs.

These are the forerunners of the catchment-management strategies that will be prepared by the CMAs when they are established. They describe the water availability and water requirements in each area, and outline the approaches to be adopted for managing water resources. In particular, they provide general principles for the CMAs to authorise water use.

Water-related research

Being a water-stressed country, South Africa progressively needs to find innovative ways of managing water resources to ensure that the basic needs of its citizens are met, that social and economic development is not restricted by a lack of or a poor quality of water, and that sustainability of water resources and water-dependent ecosystems is achieved.

As reflected in the Water Research Commission's (WRC) mission and its various undertakings, the WRC functions as a "hub" for water-centred knowledge.

It is a networking organisation linking the nation and working through partnerships. The organisation continuously provides novel (and practical) ways of packaging and transferring knowledge into technology-based products for the water sector and the local and international community.

The WRC continues to play the leading role in building a sustainable water-related knowledge base in South Africa by:

- investing in water research and development
- building sustainable and appropriate capacity
- developing skills for the water sector
- being adept in forming strategic partnerships to achieve objectives more effectively while making optimal use of the latest global information and knowledge and other technologies available.

The Water Research Act, 1971 (Act 34 of 1971), provides for the establishment of the Water Research Fund, which derives income primarily from levies on water consumption.

In supporting the creation, dissemination and application of knowledge, the WRC focuses on five key strategic areas:

- water-resource management
- water-linked ecosystems
- water use and waste management
- water in agriculture
- water-centred knowledge.

The WRC also calls for specific mechanisms to address key strategic issues of national importance. These are dealt with in four cross-cutting domains:

- water and society
- water and the economy
- water and the environment
- water and health.

To ensure that research results are relevant to the broader objectives of water-resource management, the applicability of research in each key strategic area is maximised by addressing the relationships between water and society, the economy, health, and the environment.

The WRC's key objective is supporting the development of human resources in the water sector. Involvement in research is recognised as an important vehicle for building and developing expertise among water-resource practitioners.

South Africa won an international award for its electronic water-management system in September 2008.

The award-winning project is a software system, which 95% of municipalities use to submit data on the quality of drinking water. The 2008 International Water Association's Global Operations/Management Award was won jointly by the Department of Water Affairs and Forestry, the Institution of Municipal Engineering of South Africa and water-engineering company Emanti Management.

Every research project is required to incorporate a strong element of capacity-building, especially among previously disadvantaged individuals.

The Department of Science and Technology and the National Research Foundation are partners with the Department of Water Affairs and Forestry and the WRC in ensuring that approaches to water research are consistent with South Africa's broad policy on science and innovation.

Water boards

Water boards have been established as service-providers that report to the Minister of Water Affairs and Forestry. The boards manage water services in their supply areas and provide potable water at cost-effective prices.

These water boards include: Albany Coast Water, Ikangala Water, Overberg Water, Amatola Water, Lepelle Northern Water, Pelladrift Water, Bloem Water, Magalies Water, Rand Water, Botshelo Water, Mhlathuze Water, Sedibeng Water, Bushbuckridge Water, Namakwa Water and Umgeni Water.

The impact of their financial performance on the Department of Water Affairs and Forestry has been limited. Apart from providing seed funding to some of the newly formed water boards, and providing operating subsidies where they have undertaken specific functions on behalf of the department, the department has only had to provide financial assistance in exceptional circumstances.

Water-user associations

A WUA is a co-operative association of individual water users who wish to undertake water-related activities for their mutual benefit. The specific nature of the service that a WUA provides differs from case to case. A WUA serves its members and its design conforms to its members' specifications.

A WUA may be established for a range of activities, including stream-flow reduction, treatment of effluent and waste and its disposal and control of the use of water for recreational and/or environmental purposes. Upon establishment, a WUA carries out its principal functions as contained in its constitution.

Alongside its principal functions, a WUA may have a range of other functions that affect its structure and management. In terms of the National Water Act, 1998, such functions may be performed only if they do not limit the capacity to perform the organisation's principal functions or financially prejudice the institution and its members.

A common example of such an ancillary function is the provision of management services and training to water-services institutions and rural communities.

Working for Water (WfW) Programme

Invasive alien species are causing billions of rands of damage to South Africa's economy every year, and are one of the biggest threats to the country's biological biodiversity.

Invasive alien species are plants, animals and microbes that are introduced into countries, and then out-compete the indigenous species.

Invasive alien plants (IAPs) pose a threat not only to South Africa's biological diversity, but also to water security, the ecological functioning of natural systems and the productive use of land.

They intensify the impact of fires and floods and increase soil erosion. IAPs can divert enormous amounts of water from more productive uses and invasive aquatic plants, such as the water hyacinth, agriculture, fisheries, transport, recreation and water supply.

It is estimated that between 6% and 7% of South Africa's annual water run-off is being consumed by IAPs.

Of the estimated 9 000 plants introduced to this country, 198 are classified as being invasive. It is estimated that these plants cover about 10% of the country and the problem is growing at an exponential rate.

The fight against IAPs is spearheaded by the WfW Programme, which is administered through the Department of Water Affairs and Forestry. This programme works in partnership with local

October 2008 saw the launch of the annual Weed Buster Week Campaign, which aims to highlight the challenges South Africa faces in trying to manage and contain the spread of invasive alien plants and the work that is being done in the Working for Water (WfW) Programme to address these challenges and create employment opportunities.

The campaign involves a number of government departments and is led by the Department of Water Affairs and Forestry through the WfW Programme.

The WFW Programme was started in 1995 through a grant of R25 million from the then Reconstruction and Development Programme. It has grown over the past 14 years and during 2007/08 created 30 210 jobs, cleared 140 000 hectares (ha) of new areas and provided almost 550 000 ha of follow-up treatment on areas previously cleared.

communities, to whom it provides jobs, and also with government departments, including the departments of environmental affairs and tourism, agriculture, and trade and industry; provincial departments of agriculture, conservation and environment; research foundations; and private companies.

Natural mean annual run-off and ecological reserve (million m^3 per anum)

Water management	Natural mean annual run-off[1]	Ecological reserve[1,2]
Limpopo	985	156
Luvuvhu/Letaba	1185	224
Crocodile West and Marico	855	165
Olifants	2042	460
Inkomati [3]	3539	1008
Usutu to Mhlatuze [4]	4780	1192
Thukela	3799	859
Upper Vaal	2423	299
Middle Vaal	888	109
Lower Vaal	368	48
Mvoti to Umzimkulu	4798	1160
Mzimvubu to Keiskamma	7241	1122
Upper Orange	6981	1349
Lower Orange [5]	502	69
Fish to Tsitsikamma	2154	243
Gouritz	1679	325
Olifants/Doring	1108	156
Breede	2472	384
Berg	1429	217
Total	49228	9500

1) Quantities refer to the water-management area under consideration only (water that originates or is required in that water-management area).
2) Total volume given, based on preliminary estimates, impact on yield being a portion of this.
3) Includes Komati catchment in Swaziland (mean annual run-off = 517 million m^3/a).
4) Includes Pongola catchment in Swaziland (mean annual run-off = 213 million m^3/a).
5) Includes contributions from Sengu and Caledon rivers in Lesotho (mean annual run-off = 4 765 billion m^3/a).

Source: Department of Water Affairs and Forestry

WfW runs over 300 projects across South Africa. Scientists and field workers use a range of methods to control IAPs. These include:

- Mechanical methods: Felling, removing or burning invading alien plants.
- Chemical methods: Using environmentally safe herbicides.
- Biological control: Using species-specific insects and diseases from the IAP's country of origin. Some 76 biocontrol agents have been released in South Africa against 40 weed species.
- Integrated control: Combinations of the above three approaches. An integrated approach is required to prevent enormous impacts.

The core business of the programme is to contribute to the sustainable prevention and control of IAPs, thereby optimising conservation and the use of natural resources. In doing so, it addresses poverty relief and promotes economic empowerment and transformation within a public-works framework.

WfW is recognised internationally as one of the most effective programmes for addressing the problem of IAPs, combining environmental issues with social-development objectives.

Flood and drought management

The South African Disaster-Management Policy and ensuing legislation brought about a major shift in focus from reactive to preventative and mitigative disaster management.

From a flood-management perspective, the South African focus has shifted from primarily structural to non-structural, accentuating the value of, for example, floodplain zoning and flood warnings.

Draft regulations for support to resource-poor farmers were published, and support to these farmers was expected to be increased during 2008/09.

Dams and water schemes

The central objective of managing water resources is to ensure that water is used to support equitable and sustainable social and economic transformation and development.

Dams and water schemes form an integral component of the strategy to meet these objectives. The NWRS provides details on possible major water schemes to be developed in the next 25 years, amounting to about R21 billion at 2004 price levels.

The Department of Water Affairs and Forestry follows an integrated approach to managing South

Africa's water resources. Proposed new water schemes need to comply with the NWRS, requiring that water-demand management programmes be implemented before embarking on new infrastructure development.

Strict environmental-impact assessments must also be performed in accordance with laws and regulations administered by the Department of Environmental Affairs and Tourism. The guidelines issued by the World Commission on Dams must be followed.

The department is making progress in the development of new infrastructure. In this respect, the Berg River Water Project Supplement Scheme (Berg River Dam) had been completed and water was impounded. This dam increased the water supply to the City of Cape Town by 18%.

The construction of the De Hoop Dam in Limpopo aims to unlock the mineral wealth in the Middle Olifants River catchments while bringing relief to thousands of people who do not have safe and reliable water sources.

Project Lima, a new pumped storage scheme, which is part of the Olifants River Water Resources Development Project (phase two: De Hoop Dam) aims to provide an additional 1 500 megawatt of electricity to the national grid, and water to about 800 000 people on the Nebo Plateau in the Greater Sekhukhune District Municipality.

In May 2008, a Memorandum of Agreement (MoA) was signed between the department, individual mines and the Joint Water Forum on water-supply agreements with the mines. The MoA will provide the necessary secured revenue flow to make this project bankable for private-sector finance for the phases after the De Hoop Dam.

Other important water-resource infrastructure under construction are the Hluhluwe, Inyaka and Nandoni government water works, which will provide 2,4 million people with drinking water in rural communities in KwaZulu-Natal, Mpumalanga and Limpopo. Furthermore, the water pipeline from the Vaal Dam to Secunda, known commonly as the Vaal River Eastern Subsystem Augmentation Project (Vresap), commenced with the delivery of water in October 2008.

Other infrastructure projects that commenced in 2008 include:

- the Mdloti River Development Project
- raising of the Hazelmere Dam
- the Komati Abstraction Works and Pipeline for water supply to Eskom's Duvha Power Station
- the Mooi-Mgeni System, building of the Spring Grove Dam, and the augmentation of water supply to the Ethekweni Metro-Municipality.

The department's infrastructure-development programme has a multipronged objective. While it is building big infrastructure to improve water resources, it is also creating economic opportunities. For example, during the construction of the De Hoop Dam, about 460 jobs were created for historically disadvantaged individuals (HDIs) living in the area. About 600 jobs were generated for the local community around the Berg Water Project, which had more than a 95% HDI labour component. On the Vresap, an HDI labour target of 75% was exceeded by 15%.

In 2008, R310 million was spent on the Dam Rehabilitation Project; and a further R1 billion is expected to be spent on this programme during the Medium Term Expenditure Framework period.

The rehabilitation of the Vlakfontein Canal is proceeding well at a cost of R300 million. This canal is supplying water to Eskom's Thuthuka Power Station.

Groundwater resources

Groundwater, despite its relatively small contribution to bulk water supply (13%), represents an important and strategic water resource in South Africa, since it services between 52% and 82% of community water-supply schemes in the Eastern Cape, Limpopo, Northern Cape, North West and KwaZulu-Natal.

Owing to the lack of perennial streams in the semi-desert to desert parts, two thirds of South Africa's surface area are largely dependent on groundwater. Although irrigation is the largest user, the supply to more than 300 towns and smaller settlements is also extremely important. Through government's commitment to meeting the basic water needs of communities, groundwater has become a strategic resource for village water supply in the wetter parts of the country,

The Department of Water Affairs and Forestry established the Water and Forestry Academy with an intake of 122 graduates, who will benefit from workplace experience, and will register as professional engineers or technicians. The department, in partnership with nine Higher Education institutions and two professional bodies, has awarded 105 bursaries to students studying towards qualifications in the technical fields.

because of its cost-effectiveness in a widely scattered small-scale-user situation.

Groundwater also contributes a considerable portion to river flow. This requires reserving a significant share of groundwater resources to protect aquatic ecosystems in terms of the National Water Act, 1998. The maximum quantity of groundwater that can be developed economically is estimated at about 6 000 million m^3 a year, while some 4 000 million m^3 of groundwater (mainly in the dry season) contributes to surface-water flow annually.

Regional and international co-operation and initiatives

South Africa has signed co-operative agreements with a number of countries in the southern African region with which it shares water resources, such as:

- Mozambique and Swaziland on the Inkomati and Maputo rivers
- Botswana, Lesotho and Namibia on the establishment of the Orange Senqu River Commission
- Botswana, Zimbabwe and Mozambique on the establishment of the Limpopo Watercourse Commission
- Lesotho on the Lesotho Highlands Water Project (LHWP)
- Swaziland on the Komati River Development Project.

These co-operative agreements improve South Africa's bilateral and multilateral relations in the African Union. All the countries involved benefit, while sharing development costs.

South Africa is increasingly seen as a leader in addressing the pressing water and sanitation challenges faced by the poor and by people living in rural areas. This view was supported during the launch of the 2006 United Nations (UN) Development Programme's *Human Development Report* in the Western Cape.

In addition to participating in the African Ministers' Council on Water, South Africa has been active in watercourse commissions that were established to manage the rivers it shares with Lesotho, Swaziland, Namibia, Mozambique, Botswana and Zimbabwe.

In December 2008, Cabinet approved the second phase of the LHWP. Construction of a 2,3 million m^3 dam will start from 2011 in the Maluti mountains. The LHWP currently supplies about 46 million m^3 water a year. The second phase will raise this to 70 million m^3.

Forestry

Provincial and local government plays a crucial role in the national forestry agenda. Many provinces and municipalities are aware of the benefits of forestry, not just for the social and aesthetic benefits which trees and forests provide but more importantly for the livelihood support and economic benefits they provide.

In terms of the economic growth and development which forestry offers, the Department of Water Affairs and Forestry is working closely with other government structures in the Eastern Cape and KwaZulu-Natal to fast-track the afforestation licensing process, which involves support from a number of other provincial departments.

These new forestry areas will be singularly important in transforming and growing the forestry sector and, as such, afforestation forms an important part of the Forestry Broad-Based Black Economic Empowerment (BBBEE) Charter, which was signed in May 2008. The vision of the charter is that of:

- an inclusive and equitable forestry sector, in which black women and men fully participate
- a forestry sector that is characterised by sustainable use of resources, sustainable growth, international competitiveness and profitability for all its participants
- a forestry sector that contributes meaningfully to poverty eradication, job creation, rural development and economic value-adding activities in the country.

The department has been working closely with other departments on the process of reducing the administrative burden on forestry development. Applicants for afforestation have been increasing rapidly. Under the charter, government aims to process about 15 000 ha per year for the next 10 years to get a net increase in forestry of about 10 000 ha per year.

The department has almost halved the original time of nearly 18 months to process a licence application, and has plans in place to further reduce this timeframe. It also plans to use the progressive provisions of the National Forests Act, 1998 (Act 84 of 1998), to provide direct support to communities in this and other forest-enterprise areas. Strategic interventions such as the establishment of the special-purpose vehicle AsgiSA Eastern Cape (Pty) Limited will assist in driving the implementation of the forestry programme in these key areas.

Afforestation will take place in rural areas where there are few other viable opportunities for job creation and economic activity. The development of these additional raw material resources will attract greater processing capacity in the form of sawmills, board mills, chipping plants and treatment plants. All these will lead to broad economic growth. For example, through this afforestation an additional R500 million per year could be generated in plantations.

The Chief Directorate: Forestry has developed and adopted a new vision for forestry. South Africa needs to create an enabling environment for economic and social development through sustainable forestry, especially at local level.

Forestry encourages growth and development of the First Economy, thereby increasing its potential to create jobs. Following a published supply-and-demand study on softwood sawlogs in South Africa, the department commissioned a similar study for roundwood. The objective of this report was to establish the supply and demand at regional and national levels.

The forestry sector is an important contributor to gross domestic product and employment. It employs about 170 000 people (107 000 in forestry operations and a further 63 000 in downstream processing plants) and contributes almost R16 billion annually to the South African economy. The impact of the sector is felt particularly in rural areas and there is significant scope for this sector to expand and thereby contribute towards uplifting those in the Second Economy.

Over the past few years, much work has been done in the forestry sector to improve yields, restructure institutions, provide community access and redefine government's role. The Forestry BBBEE Charter recognises the link between the transformation and growth of the sector. Through the strategic environmental assessments that have been conducted, about 100 000 ha of new commercial forests can be planted over the next 10 years.

The real yellowwood is South Africa's national tree. There are different species of yellowwood trees that can grow higher than 40 m with a girth of 8 m, and can live for up to 800 years.

The Big Tree near the Storms River Bridge (46 m), the King Edward VII in the Knysna Forest (46 m) and the Eastern Monarch in the Amatola mountains (44 m) are the best-known giants.

The forestry programme also encompasses expanded greening and tree-planting projects. The programme prioritises work on firefighting programmes (for example, the Working on Fire Programme) and encourages the establishment of fire-protection associations (FPAs).

Forestry supports small growers and facilitates new afforestation, especially in the Eastern Cape and KwaZulu-Natal. Growing trees in these areas will add to the economy, and will provide employment and entrepreneurial opportunities to local people.

Fruit trees have multiple purposes: they help clean the air, reduce heat, provide nutrition and support good mental health and well-being.

The department has been involved in planning for the expansion of forest areas in the Eastern Cape, where most forestry opportunities are available and where the local rural economy needs stimulation. A strategic environmental assessment conducted in the Eastern Cape has identified areas for new afforestation, which are being pursued.

It is estimated that at least an initial 30 000 ha of land could be afforested and that this could be increased to more than 150 000 ha of land once the project gains momentum. The areas could accommodate small growers and community afforestation, if correctly planned, and could expand the broad base of black people engaged in forestry. In KwaZulu-Natal, options for new afforestation also exist, and conservative estimates show that between 30 000 ha and 40 000 ha are suitable for this purpose. This will create substantial employment opportunities.

This view is expressed in the *Genesis Report*, which looked at the costs and benefits of the forest sector. The report was commissioned by the Department of Trade and Industry. Following this report, government has identified forestry as one of seven "strategic industries" that was included in a comprehensive Industrial Development Strategy. The Department of Trade and Industry and the industry have produced the Forest Sector Growth and Development Strategy as part of this initiative.

Indigenous forests are indispensable to the country's heritage, beauty, wildlife and environment, while commercial forests provide jobs and economic opportunities for many people, especially in rural areas. Forestry represents a substantial investment in the country and plays an important role in the Integrated Rural Development Programme.

Plantations cover about 1,3 million ha of South Africa. Over 80% of them are found in Mpumalanga, KwaZulu-Natal and the Eastern Cape. They produced almost 22 million m^3 (or 19,6 million tons [mt]) of commercial roundwood, worth R5,2 billion, according to a study conducted in 2006. They provide direct employment for about 107 056 people, of whom 67 556 are in formal employment, 30 000 are contract workers and 39 500 are small growers and their helpers.

Including the processed products, the total industry turnover was about R15,7 billion in 2006, including R7,4 billion worth of wood-pulp.

A pulp and paper log intake of about 17 million m^3; mining timber of 733 000 m^3; charcoal of 279 000 m^3; 4,7 million m^3 of sawlogs; and veneer logs and poles of about 286 000 m^3 were transferred to processing plants in 2006. The sales of timber from primary processors by volume in 2006 were as follows: sawn timber, 2,0 million m^3; pulp, 2 mt; mining timber, 461 000 t; panel products, 726 000 m^3; poles, 273 000 m^3; charcoal, 13 000 t; chips/mill residues about 6 mt; and firewood, 23 000 t.

Between 390 000 and 560 000 people depend on plantation forestry for their livelihoods, particularly in the rural areas.

About half of the more than 1 700 indigenous tree and shrub species found in South Africa grow along the south and east coasts and on the southern and south-eastern slopes of inland mountains. The other half is spread over the interior plateaux.

The Department of Water Affairs and Forestry plans to transfer the management and control of all state natural (indigenous) forests to other competent management agencies, primarily to provincial government departments or national and provincial conservation agencies.

This includes the official handover to South African National Parks (SANParks) of about 97 000 ha of state forest land in the southern Cape and Tsitsikamma areas. SANParks, as a conservation agency, will manage natural forests in terms of the provisions of the National Forests Act, 1998.

Progress was made in releasing state forest land that was no longer required for forestry purposes as part of the process to deproclaim state forests in mountain-catchment areas. The total area released in the Western Cape, Sederberg and De Mond areas comprised 146 888 ha. In the Eastern Cape, the transfer of uncontested natural forests has begun. Agreement has also been reached on the transfer of contested areas.

Forestry initiatives

National Arbor Week is celebrated annually at the beginning of September to encourage the greening of South Africa. Two different trees of the year are nominated annually: a common variety and a scarcer, possibly endangered, species. The 2008 common tree of the year was the common wild plum (*Harpephyllum caffrum*) and the rare tree was the bladder nut tree (*Diospyros whyteana*).

The aim of Arbor Week is to promote awareness of the need for planting and preserving indigenous trees throughout South Africa. It highlights the opportunities for sustainable economic development, community participation, poverty alleviation and job creation in forestry to create a better life for all. The theme for 2008 was *Plant Trees – Save our Planet!*

The Arbor Week Campaign aims to:

- promote improved knowledge of trees, particularly indigenous trees, and their importance
- stress the necessity for everyone to contribute to the greening of South Africa by planting and caring for trees
- highlight the vital roles of trees in the natural environment
- contribute to the achievement of green, dignified and healthy environments in all parts of the country
- encourage the youth to participate in tree-planting activities and related environmental-education programmes.

It highlights the opportunities for sustainable economic development; community participation; poverty alleviation and job creation in forestry, thereby contributing towards growth, development and a better life for all. The target audience includes all South Africans but more specifically rural communities, municipalities and schools.

South Africa has a rich heritage of trees. The Champion Tree Project is aimed at identifying and protecting individual trees of national conservation importance under the National Forests Act, 1998. Trees can be nominated on the basis of their size, age, aesthetic value, cultural-historic value or importance for tourism. Only trees of national importance will be protected. In the long run, however, provincial and local authorities will be encouraged to develop their own local Champion Tree lists.

Individual and groups of trees were shortlisted as champion trees by a panel of experts from a list of proposed trees considered to be of national conservation importance and deserving national importance. Among the listed trees are:

- the famous Tsitsikamma big tree along the Garden Route
- the Post Office milkwood tree of Mossel Bay
- the Sagole baobab in Limpopo (one of the two largest trees in South Africa)
- camphor trees planted at Vergelegen Estate in the Western Cape three centuries ago.

Guidelines have been developed for the use of these trees to ensure their continued economic and ecological benefits to South Africans.

The Champion Tree Project led to the discovery of exceptionally large trees. In Aderne Gardens in Cape Town, officials measured an enormous Indian rubber fig with a trunk circumference of more than 11 m and a crown diameter of more than 44 m.

Applying the international formula for tree size that combines height, trunk size and crown diameter, it was discovered that this tree has a size index similar to the Sagole baobab in Limpopo. This means that the title for largest tree in the country is now shared by two trees at opposite ends of South Africa, one an indigenous tree in the far north and the other an exotic tree in the far south.

Contributing to socio-economic reform and growth

Government recognises that BEE will not be effective if it does not have the support of the private sector.

The BBBEE Charter for the Forest Sector, launched in May 2008, will be instrumental in achieving the objectives of the scorecard as suggested by the Department of Trade and Industry.

Forestry enterprise development (FED) relates to the concept of using forests and forest-based resources as a vehicle for economic growth, employment and socio-economic upliftment that takes people from a subsistence livelihood system into a market economy. The concept is also central to the department's pro-poor agenda and a key component of BBBEE in the forestry sector.

The Department of Water Affairs and Forestry supports FED. This includes transferring state forests, developing an afforestation strategy for the Eastern Cape and KwaZulu-Natal, and including forestry as a key sector in provincial growth and development plans.

The Directorate: Forestry Development supports the establishment of community projects through regional forestry staff.

An estimated R2 million from the Community Facilitation Fund has been spent to support the establishment of projects.

Current projects include beekeeping, which is a partnership with the Agricultural Research Council, and establishing medicinal nurseries in partnership with various stakeholders.

Following restructuring, the commercial plantation forests of South African Forestry Company Limited (Safcol) and the Department of Water Affairs and Forestry were combined and packaged into five stand-alone special-purpose vehicles, operating as wholly owned subsidiaries of Safcol.

Following an in-depth review by the Department of Public Enterprises, in consultation with other government departments, Cabinet decided to dispose of the last remaining Safcol subsidiary, Komatiland Forests (KLF). KLF's commercial operations will be aligned with the requirements of improved industry structure and operation of the saw-log market, and ownership of KLF will be transferred to the private sector.

The Department of Public Enterprises will be responsible for ensuring clear guidelines regarding government's objectives and will empower the Safcol Board to implement Cabinet's decision. The goal will be to ensure that, in future, the value of state-owned forests will contribute optimally to government's objectives for the forestry, timber, pulp and paper sector.

South African Forestry Company Limited (Safcol)

Safcol is a wholly owned state enterprise reporting to the Department of Public Enterprises. It was formed in 1992 and acquired the Department of Water Affairs and Forestry's commercial forestry assets and related business in April 1993.

Since 1993, Safcol has played a leading role in the forestry industry, especially by introducing new forest engineering and sawmilling technology to the local industry. Safcol was also the leader in the introduction of forest certification in South Africa. Its operations in KwaZulu-Natal were the first in the local industry to be certified by the Forest Stewardship Council (FSC).

Four of the five forestry packages under Safcol have been privatised since 2001. Safcol holds a minority interest in each of the four privatised entities. These holdings are earmarked to be used mainly to benefit employees and communities.

The fifth package, KLF, is under privatisation. KLF owns and manages about 125 000 ha of plantation, which are managed primarily for the prime softwood saw log production. The plantations are located in Mpumalanga, Limpopo and

KwaZulu-Natal, with a sawmill which is situated in Limpopo.

Safcol also holds the majority of shares in a forestry operation in Mozambique, the *Indùstrias Florestais de Manica* operation, which manages about 20 000 ha of plantations.

Industry and exports

The industry was a net exporter of almost R2,4 billion worth of goods in 2007, of which more than 98% was in the form of converted value-added products.

The forest-product industry ranks among the top exporting industries in the country, having contributed 2,48% to total exports and 1,74% to total imports in 2007. Capital investment in the industry amounted to some R37 billion in 2007.

The value of forest-product exports grew by 160% over the past decade, from R4,7 billion in 1997 to R12,2 billion in 2007. In real terms (taking inflation into account), this growth was 53% or a compounded real growth of 4,4% per year over that period. However, the net trade balance in foreign trade in forest products increased from 1997 by 51% in nominal terms (minus 11,3% in real terms) to R2,4 billion in 2007.

In 2007, paper products were the most important (R5 513 billion or 45% of the total), followed by pulp (R3 518 billion or 29%), solid-wood products (R2 836 billion or 23%) and other products (R320 million or 3%). Woodchip exports, which are exported mainly to Japan, accounted for 68% (R1 928 billion) of total solid-wood product exports.

As with other export-based industries, the recent weakness of the Rand has had a positive effect on the Rand-value of forest-product exports during the past year, with the total value of exports in 2007 being R2 280 billion more than in the previous year and some R984 million or 8,8% higher than its previous peak in 2002. Stringent environmental codes of practice are implemented in all plantation and processing activities. The Chief Directorate: Forestry of the Department of Water Affairs and Forestry promotes optimal development of forestry and arboriculture in South Africa.

The National Forests Advisory Council (NFAC) was established in terms of the National Forests Act, 1998. It advises the Minister of Water Affairs and Forestry on all aspects of forestry in the country. The NFAC is actively involved in developing local criteria, indicators and standards for sustainable forest management (SFM), and makes recommendations on how public access to state-owned forests can be improved.

Achieving sustainable forest management

Apart from ecological considerations in determining where it is appropriate to grow trees, there are other ecological, social and economic considerations that must be addressed when growing trees.

These criteria, indicators and standards form the basis for monitoring the sustainability of forestry operations in commercial and natural forests. Managers and owners are required to report against these criteria, which also form useful guidelines for new entrants to the sector.

The commercial forestry industry in South Africa is committed to practising SFM and is a world leader in forest certification. Over one million ha, or over 80% of the entire planted area of commercial forestry plantations in South Africa, is certified by the FSC and the ISO 14001 certification schemes as being sustainably managed. By March 2007, 1 555 901 ha of plantation forestry land (planted and conservation areas combined) in South Africa was certified by the FSC, the second-largest area in the southern hemisphere after Brazil. There were no certified plantations in 1996.

Although large forestry companies do not own all the certified forests, having their own specialist environmental departments has helped the rapid expansion of certification, as they ensure that land is managed according to their own stringent environmental codes of practice. To promote transparency, members of the public are invited to join company staff when regular audits are carried out.

There has also been a large increase in the number of non-corporate growers who have become certified. This can be attributed to factors such as the FSC's acceptance of group-certification schemes and the availability of local FSC auditors, both of which have reduced the cost of certification considerably.

The introduction of small, low-intensity managed forest audits enables small and community forestry schemes to be FSC-certified. As part of its commitment to the practice of SFM, the forestry industry is also involved in the NFAC's Committee for SFM, which develops criteria, indicators and standards for SFM, tailored to meet South Africa's specific conditions.

The industry is also involved in an FSC national initiative, the result of which will be the acceptance and use by FSC auditors of criteria, indicators and standards for SFM which take into account local South African conditions.

The indigenous forests of the southern Cape, previously managed by the Department of Water Affairs and Forestry, received FSC-certification – a first on the continent for high forests. It is a major step towards the sustainable management of the country's natural forests.

Legislation

The National Forests Act, 1998 reflects the vision for the future of forestry in South Africa. This vision emphasises SFM, and explains how people and communities can use forests without destroying them. The Act sets out rules for protecting indigenous forests, and ensures that the public has reasonable access to state-forest land for recreational, cultural, spiritual and educational purposes.

South Africa is richly endowed with more than 1 700 tree species. Some are threatened, and a total of 47 species is now protected under the Act. Protected trees may not be cut, damaged or sold without a licence. The listing of protected trees is not primarily aimed at preventing the use of such trees, but at ensuring sustainable use through licensing-control measures. A list of protected tree species is available on the Department of Water Affairs and Forestry's website at *www.dwaf.gov.za*.

The National Veld and Forest Fire Act, 1998 (Act 101 of 1998), bans open-air fires when the risk of veld blazes in an area is high. It also introduces the concept of voluntary FPAs formed by landowners. It further obliges the Minister of Water Affairs and Forestry to operate a national fire-rating system in consultation with the South African Weather Service (SAWS) and fire associations. The Act also allows the minister to impose minimum firefighting requirements on landowners.

Protection of life and property is a basic human need and the department has been moving ahead in implementing the National Veld and Forest Fire Act, 1998. Owing to the high incidences of fires during extreme weather conditions, it is a priority for the department to ensure registration of FPAs. The department advised and assisted FPAs in compiling business plans, including the principles of risk assessment. The department plans to review FPAs' performance regularly. There is also ongoing awareness-raising and information-provision on policy matters.

The department's *Veldfire Bulletin* is produced quarterly. Special bulletins are also produced occasionally, depending on the need, such as the special *Veldfire Bulletin on FPAs*.

The National Fire Danger Rating System is an early warning system for veldfires. The SAWS operates the system and issues daily veldfire warnings as it does with other weather information. Warnings are communicated to FPAs, the departmental fire advisers, Disaster Management, Department of Provincial and Local Government and other role-players. It was expected to be implemented late in 2008. By June 2008, 20 FPAs had been established.

Indigenous forests

There are around 530 000 ha of indigenous or natural forests in the country, which occur mainly along the southern and eastern escarpment, the coastal belt and in sheltered kloofs or ravines.

Natural forest cover is slow, which has led to the development of the commercial forest sector in South Africa over the last 100 years. Nonetheless, natural forests have continued to play a major role in the livelihoods and well-being of many rural communities.

There has been an increase in the use of natural forests as sources of medicine, building material, fuel wood and food. An estimated 80% of South Africa's population still uses medicinal plants, most of which are sourced from natural forests.

South Africa now has a detailed inventory of all its natural forests, which is used to accurately monitor changes in forest areas. The Department of Water Affairs and Forestry also completed a forest-type classification for natural forests, which are represented by 24 broad forest types. The Natural Forests Protected Areas System, completed for all forests in 2004, guides the setting aside and demarcation of natural forests as protected areas.

Systematic timber harvesting occurs in areas of the production-management class. Harvesting is concentrated on overmature trees, with logs being sold by tender and/or on public auction. On average, 3 750 m^3 of round logs are harvested annually (150 m^3 of stinkwood, 750 m^3 of yellowwood, 2 500 m^3 of Australian blackwood and 350 m^3 of other species).

Another valuable product of the indigenous forests of South Africa is the seven-week fern *(Rumohra adiantiformis)*, which is harvested in the Knysna and Tsitsikamma forests.

The South African market for this fern is considerable and reaches its peak in September, when sales exceed 420 000 bunches.

Woodlands

Woodlands can be defined as vegetation formation dominated by trees, but not to the extent that the canopies are continuous and overlapping. Woodlands cover 29 million ha, constituting 21% of land cover. This vegetation covers extensive areas in the low-lying, drier areas of Limpopo, KwaZulu-Natal and Mpumalanga. Woodlands have thousands of species (5 900 plants, 175 mammals, and 540 birds), of which the majority are used for one purpose or another.

Woodlands are the most extensive vegetation type in southern Africa and dominate Africa as a whole. Globally, woodlands cover between an eighth and a sixth of the Earth's land surface.

The woodlands are, however, a valuable source of fuel, building material, craft-timber and a variety of non-timber products. These include fruit, fodder, medicinal compounds, honey, meat and mushrooms, and form the backbone of the livelihoods of millions of people. The annual Marula-fruit *(Sclerocarya birrea)* harvest is worth some R1,1 million a year to rural communities.

Commercial forests

During the 1930s, government started establishing extensive plantations to make South Africa self-sufficient in its timber requirements, and to provide more job opportunities in a diversified economy during the depression. Commercial plantations of exotic species proved to be a sound investment and the private sector established large plantations of pine, eucalyptus and wattle trees.

By mid-2006, the private sector owned 978 300 ha (or 76%) of the total plantation area of 1 281 519 ha, as well as virtually all the processing plants in the country. The remaining 24% (303 219 ha) was under public ownership, although this figure includes four privatised Safcol packages. The extent of public ownership will decrease significantly because of restructuring.

In 2007, capital investment in these plantations stood at R18,6 billion, 53,2% of which was attributable to investment in trees. A further 21,7% was tied up in land, 15,8% in roads, 7,9% in fixed assets and 1,4% in machinery and equipment.

Plantation yields

Of the 1 281 519 ha of plantations in 2006, 54% were softwood species and 46% hardwood species. Some 38% of the plantation area was managed mainly for sawlog production, 55% for pulpwood and 4% for mining timber, while the balance of 3% was grown for the production of poles, matchwood (poplar) and other minor products. Plantation yields vary from an average of 16 m^3 per ha per year for softwood, to 21 m^3 per ha per year for eucalyptus and 10 m^3 per ha per year for wattle (timber and bark).

Likewise, the rotation ages vary from a maximum of 30 years in the case of pine sawlogs, to six to 10 years in the case of eucalyptus pulp and mining timber. Production from plantations amounted to almost 22 million m^3 (or 19,6 mt) in 2006.

Primary wood-processing

South Africa has 182 primary wood-processing plants, 177 of which are owned by the private sector and five of which are owned by local and state authorities. Of these, 99 are sawmills; 13 are mining-timber sawmills; 38 pole-treating plants; 22 pulp, paper and board mills; one match factory; and four charcoal plants. The total roundwood intake into these processing plants in 2006 was 23 million m^3 valued at R5,2 billion. The value of sales of timber products produced by these primary processing plants totalled R15 679 billion. Some R17,1 billion was invested in primary roundwood-processing plants (at book value). At market value, this increased to an estimated R37 billion.

The pulp industry in South Africa is dominated by two main pulp-and-paper manufacturing companies, Sappi and Mondi. They rank among the largest in the southern hemisphere, own assets in many parts of the world, and are internationally listed.

The saw-milling industry produces sawn timber, which is used in producing solid-wood products, such as lumber for roof trusses, flooring, etc., and consumer products, such as furniture. The furniture industry consumes about 315 000 m^3 of mainly industrial timber.

A large number of companies operate in this sector, with the five biggest companies contributing 51% of total production. Some 49% of total sawn timber is produced in Mpumalanga.

Research and training

South Africa has world-class forestry-research infrastructure and personnel, with almost 2% of the forestry industry's turnover (private and public sectors) devoted to research. The priority fields of research include tree-breeding through applied

silviculture, climate and soils, environmental impact and management solutions, forest biology, hydrology and forest protection.

The major institutes servicing the research needs of the industry are the Institute of Commercial Forestry Research in Pietermaritzburg, the Forestry and Agriculture Biotechnology Institute, and the Council for Scientific and Industrial Research in Pretoria. The South African National Biodiversity Institute also plays an important role in terms of species protection.

The total annual forest-sector research and development investment in South Africa is approximately R163 million, more than 80% of which is funded by the commercial forest industry.

The faculties of agricultural and forestry sciences at the universities of Stellenbosch, KwaZulu-Natal and Venda offer forestry degrees. The Nelson Mandela Metropolitan University (George Saasveld Campus) offers diplomas and limited degree courses in forestry disciplines. The Natal University of Technology offers a diploma in Pulp and Paper Technology, and the Fort Cox College of Agriculture and Forestry a diploma in Social Forestry.

Skills training is provided by a number of industry-sponsored and in-house training centres. Industry-sponsored bursaries are available, as are company-sponsored bursaries for study at these institutions.

The Forest Industries Education and Training Authority (Fieta) is, among other things, responsible for ensuring that the training undertaken by the industry meets certain quality standards. It also manages the distribution of training grants to employers and to Fieta-sponsored projects which will help meet the goals of the National Skills Development Strategy within the sector.

Over the past two years, the department, together with Fieta, has been offering bursaries to students who choose to study in the forestry field.

Community forestry

The *White Paper on Sustainable Forest Development* in South Africa states that community forestry is designed and applied to meet local social, household and environmental needs and to favour local economic development.

Community forestry is implemented by communities or with the participation of communities, and includes tree-centred projects in urban and rural areas, woodlots, and woodland management by communities and individuals. Community forestry has gained impetus through more focused core functions, particularly in urban greening and forest enterprise development.

Participatory Forest Management (PFM) of the Department of Water Affairs and Forestry is an integrated approach that contributes to achieving the SFM of South African forests.

Elements of PFM were initially developed for indigenous state forests. However, the aim is to use PFM as an approach to managing all forest types where feasible (indigenous forests, plantations, woodlots and woodlands) and where different types of ownership and management (state, provincial, communal, private and community) exist.

Food and Trees for Africa (FTFA)

The FTFA is the sub-Saharan African partner of Global Releaf, an international greening organisation.

The FTFA's mission is to contribute to a healthy and sustainable quality of life for all, through environmental awareness and greening programmes.

Since its inception in 1990, the FTFA has developed, managed and promoted numerous sustainable greening programmes, including land-use management and food security through permaculture.

The FTFA works in partnership with government, the private and public sectors, and civil society.

The FTFA attempts to provide trees to as many underserved communities as possible with the help of sponsors and certificate programmes.

The Urban Greening Fund is managed by the FTFA, the departments of water affairs and forestry and agriculture, and the Institute of Environment and Recreation Management. It was set up with donor funds, which included R1,2 million from the Department of Water Affairs and Forestry.

It is a collective fund that supports partnerships aimed at sustainable development through tree planting, parks, food-gardening projects and environmental education.

Organisations, companies and individuals can contribute to the fund to help disadvantaged South Africans to create a greener, healthier and more secure life.

Acknowledgements

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Forestry South Africa
South African Forestry Company Limited
Water Research Commission

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