



SA YEARBOOK 2007/08 | WATER AFFAIRS AND FORESTRY



The aim of the Department of Water Affairs and Forestry is to ensure the availability and supply of water at national level to facilitate equitable and sustainable social and economic development, to ensure the universal and efficient supply of water services at local level and to promote the sustainable management of forests.

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. In co-operation with water services authorities (WSAs) and water boards they monitor the quality of drinking water.

Out of a total budget of R5,3 billion in 2007/08, R3,1 billion (or 58% of the budget) was allocated to regional offices. The department employs over 16 000 people.

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 (m³) 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 m³ per year, including about 4 800 million m³ per year of water originating from Lesotho, and about 700 million m³ 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 m³ 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 m³ 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.

In 2006, 10,84 million households had access to water infrastructure, contributing to government's target of eradicating the backlog of people without access to water by 2008. In 2006, 9,05 million households had access to basic sanitation. Households with access to basic sanitation increased from 50% in 1994 to 71% in 2006.

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

By the end of August 2007, a little more than 100 000 households were still using the bucket system. The challenges to eradicate the bucket system include:

- community expectation to replace buckets with full waterborne systems
- insufficient water resources resulting in higher unit costs
- the need to construct new or upgrade bulk infrastructure to deal with additional load brought about by additional waterborne sanitation systems.

Government has set targets to eradicate:

- the bucket-system in formal settlements
- water and sanitation backlogs in clinics,
- the backlog in schools
- water-supply backlogs
- the general sanitation backlog.

In 2007/08, the department was expected to establish a special programme for bulk water-services infrastructure, which includes wastewater treatment plants. A grant of R1,4 billion has been allocated over the next three years.

To meet these targets, R1,9 billion has been allocated for water and sanitation services and substantial resources allocated to municipalities through the Municipal Infrastructure Grant (MIG) programme.

The substantial restructuring of the Department of Water Affairs and Forestry, which is expected to be completed in eight to 10 years' time, includes:

- establishing CMAs to perform water-resource management functions currently performed by the department's regional offices
- 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

Major dams of South Africa		
Dam	Full supply capacity (10 ⁶ 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	Assegai
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
Erferis	207	Groot Vet
Rhenosterkop	204	Elands
Molatedi	200	Groot Marico
Ntshingwayo	198	Ngagane
Zaaihoek	192	Slang
Midmar	175	Mgeni

Source: Department of Water Affairs and Forestry

(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 (NWRRIA) to manage and develop national infrastructure. The agency was expected to be established in 2008.

In accordance with the international best practice of decentralising and democratising water-resource management, the Inkomati CMA has been established, with more agencies to follow.

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. It celebrated a century of monitoring in August 2004.

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.

The National Aquatic Ecosystem Health Monitoring Programme (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 (e.g. fish, riparian vegetation and aquatic invertebrate fauna), however, are adapted to live within a certain range of environmental conditions.

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



The Department of Water Affairs and Forestry has implemented a drinking-water quality-management system which sees municipalities supplying data on drinking-water quality, which enables the department to identify possible problems and work with the affected municipality to resolve these problems. In addition to other capacity-building initiatives, the department has seconded a number of engineers to municipalities to provide support.

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 will be reported internationally to the Stockholm Convention through the Department of Environmental Affairs and Tourism.

In 2005/06, municipalities identified a number of challenges concerning drinking-water quality. Therefore, the department, in consultation with local government, has been working with the Department of Health on the collection, testing and management of drinking-water quality.

The department has introduced the electronic Water Quality Management System to WSAs. By mid-2007, more than a 100 WSAs were using this

system to ensure effective management of drinking-water quality. Water boards are also assisting municipalities in ensuring high standards of drinking-water quality.

In 2007, the department was revising the Framework for Drinking-Water Quality Management.

One of the biggest challenges faced by municipalities is the lack of bulk-water infrastructure and waste-water treatment capacity. The department therefore established a special programme for bulk water-services infrastructure. This programme is expected to be introduced in 2007/08, and a grant amount of R1,4 billion has been allocated over the next three years.

Another international obligation is reporting on chemical water quality through the Global Environmental Monitoring System's Water Programme.

Municipal Infrastructure Grant

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 1: *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 waste-water treatment works' operations
- facilitating project selection, feasibility studies and service-level options
- supporting the implementation of a tariff structure and the Free Basic Water (FBW) Policy
- supporting the Section 78 process (division of powers and functions for water services between district and local municipalities) and selecting water-services providers

The Minister of Water Affairs and Forestry has committed to the following:

- Ensuring that women are firmly in the driving seat in forestry and water, not only as recipients of water, but as empowered owners of their own enterprises, as leaders and as managers.
- Establishing an organisation for women in the water and sanitation sector to contribute to the empowerment and capacity-building of women in this sector.
- Driving the process of restructuring the department by establishing the National Water Resources Infrastructure Agency, the catchment-management agencies and the transfer of forests and water schemes.
- Ensuring that bucket toilets in formal settlements are eradicated, and that all schools and clinics have adequate water and sanitation.
- Ensuring that there are well-developed programmes to find the needed skills in the water and forestry sectors, now and in the future. The department will continue to drive the 2025 capacity-building programme for the water sector, working with all relevant players in the water sector towards a coherent, comprehensive and successful programme.
- Ensuring that the Forestry Broad-Based Black Economic Empowerment Charter is finalised and implemented and that the transformation of this sector benefits the poor and the marginalised in rural areas.

- 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 4 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 m³, 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.

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.

Of the 597 schools targeted for the provision of water during the 2006/07 financial year, 76% received water. More than 50% of 2 409 schools targeted for the provision of sanitation had been provided for.

National Water Resource Strategy

Cabinet approved the first edition of the NWRS in September 2004. 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, adopted at the 2002 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. It 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 to 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 the South African Local Government Association 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 free basic water
- 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 by 2008.

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.

By mid-2006, a document titled *Position Paper: Water Allocation in South Africa – A Framework for Water Allocation Reform*, under development since 2004, was being finalised. It outlines the high-level rules for allocating water to promote race and gender reform, while minimising potential negative impacts on existing lawful users and the economy. A draft position paper formed the basis for public consultation on reform, and was launched in April 2005.

Awareness material on the programme has been developed and will be 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 government, 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 materials and toolkit will 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 for the War programme, and aims to reallocate water to deal with imbalances of the past.

One of the major challenges for the Olifants 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.

By mid-2007, integrated catchment-management studies were also under way at the Thukela Basin, under the auspices of the Help Programme.

National Water Resource Infrastructure Agency

In August 2005, Cabinet approved the establishment of the NWRIA to ensure long-term water security for South Africa.

The NWRIA will develop and operate South Africa's major national dams and water-transfer schemes, which are currently managed directly by the Department of Water Affairs and Forestry. These include the Vaal Dam, the Tugela-Vaal transfer system, the Orange River Scheme and the Western Cape system.

The agency will also integrate the Trans-Caledon Tunnel Authority (TCTA), the parastatal organisation responsible for funding the Lesotho Highlands Water Project. It will not be responsible for domestic water supplies, which remain the responsibility of municipalities and regional water boards.

In March 2007, the second National Sanitation Week was celebrated and the National Health and Hygiene Strategy was launched. This strategy recognises the close relationship between the delivery of water and sanitation infrastructure and the improved health of a community. The strategy also informed the theme for 2007's National Sanitation Week, which was *Sanitation for Health and Dignity*.

The purpose of Sanitation Week is to highlight government's work to ensure that all South Africans have access to sanitation, to communicate the critical importance of looking after sanitation facilities, and to inform communities of the need to wash their hands after using the toilet and before preparing food.

There is an international movement to address the lack of sanitation. The United Nations' General Assembly, in adopting the millennium development goals in 2000, agreed to halve the global backlog in sanitation and water by the year 2015. Government has set its targets higher and committed itself to ensure that all buckets in formal settlements are eradicated, all clinics have safe and adequate water and sanitation, all schools have safe and adequate water and all households access to basic sanitation.

The Minister of Water Affairs and Forestry will be responsible for deciding what projects need to be built in terms of the NWRS. The agency will be required to make funding arrangements, and to ensure that projects are designed and built according to appropriate technical, social and environmental standards, and operated effectively and efficiently.

The NWRIA is expected to be operational by April 2008.

Water-management institutions

The National Water Act, 1998 sets out 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 aims to establish CMAs in South Africa's 19 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 water-management areas.

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 innovative 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 will continue 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. 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. By mid-2007, there were 15 water boards that have been set up as financially independent institutions, in terms of Section 34(1) of the Water Services Act, 1997, aiming to be financially viable.

These water boards are: 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.

Irrigation boards and water-user associations

WUAs are established in terms of Chapter 8 of the National Water Act, 1998 for localised users to manage their water use jointly and in a more integrated way. The Act requires that all irrigation boards formed under previous legislation must transform into WUAs.

In terms of sections 61 and 62 of the Act, the new policy framework for financial assistance to water-management institutions for irrigated agricultural development aims to promote initial

access to irrigated agriculture, and to improve sustainable irrigation development by subsidising emerging farmers.

Natural mean annual run-off and ecological reserve (million m³ per annum)

Water management	Natural mean annual run-off ⁽¹⁾	Ecological reserve ^(1,2)
Limpopo	985	156
Luvuvhu/Letaba	1 185	224
Crocodile West and Marico	855	165
Olifants	2 042	460
Inkomati ⁽³⁾	3 539	1 008
Usutu to Mhlatuze ⁽⁴⁾	4 780	1 192
Thukela	3 799	859
Upper Vaal	2 423	299
Middle Vaal	888	109
Lower Vaal	368	48
Mvoti to Umzimkulu	4 798	1 160
Mzimvubu to Keiskamma	7 241	1 122
Upper Orange	6 981	1 349
Lower Orange ⁽⁵⁾	502	69
Fish to Tsitsikamma	2 154	243
Gouritz	1 679	325
Olifants/Doring	1 108	156
Breede	2 472	384
Berg	1 429	217
Total	49 228	9 544

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 m³/a).

4) Includes Pongola catchment in Swaziland (mean annual run-off = 213 million m³/a).

5) Includes contributions from Sengu and Caledon rivers in Lesotho (mean annual run-off = 4,765 billion m³/a).

Source: Department of Water Affairs and Forestry

By mid-2007, all irrigation boards were being transformed into WUAs. Of the 279 irrigation boards, some 68 had been transformed into 38 WUAs. Some 23 new WUAs were established, most of which are focused on emerging farmers.

The new associations include the Lower Olifants Dam in the Western Cape and the Imfunda Yophongolo, KwaZulu-Natal. The Western Cape associations include commercial and resource-poor farmers, while Limpopo associations are made up of resource-poor farmers only. The transformed irrigation boards include Hex Valley and Kabous River, Western Cape; and Nkwalini, KwaZulu-Natal.

By mid-2007, a number of WUAs were using government-guaranteed loans worth R300 million.

Working for Water Programme

The WFW Programme is an Expanded Public Works Programme. Alien invasive plants (Aips) cause billions of rands of damage to South Africa's economy yearly, and are the single biggest threat to the country's biological biodiversity. The country's biological diversity also underpins the tourism industry and creates jobs. It is equally worrying that these species undermine ecological integrity when the land's ability to produce is compromised. Social issues such as poverty and unemployment inevitably follow.

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

The core business of the programme is to contribute to the sustainable prevention and control of Aips, 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 Aips, combining environmental issues with social-development objectives. It is estimated that Aips have invaded over two million ha of South Africa.

The programme, using community labour, removes Aips from South Africa's river courses and water sheds and cleared over 7 900 km² of land in 2006/07.

It also provided over 1,8 million days of employment for 29 000 people and, with a budget of R387 million, there are plans to expand the programme under the Jobs for Growth Programme.

Part of the programme is Operation Vuselela, where the Department of Water Affairs and Forestry has partnered with the Department of Defence to clear Aips from more than 5 500 ha of Defence Force land, and providing 44 000 days of employment to military veterans.

Campaigns such as Weedbuster Week provide the opportunity for WFW to raise awareness of its activities, and bring the importance of Aip control to the public's attention. While Weedbuster Week specifically highlights the problem within South Africa, it is linked bilaterally to Australia and New Zealand, and through multilateral agreements to the broader Global Invasive Species Programme.

Flood and drought management

The latest 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 2007/08. By mid-2007, rain-water harvesting tanks had been supplied to these farmers and plans

were under way to provide a further 200 rain-water tanks in Limpopo, Free State and Eastern Cape, and 1 000 of the smaller Jojo water tanks in Thaba Nchu in the Free State.

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 following major schemes are under construction or reaching the implementation stage:

- Berg River Project: The Minister of Water Affairs and Forestry has directed the TCTA to implement the R1,55-billion privately funded scheme comprising the Berg River Dam near Franschoek in the Western Cape, and the associated supplement scheme comprising a weir, pumping stations and pipelines to increase the water supply to the Western Cape. Construction of the dam by a private contractor started in June 2004 and was due for completion in 2007/08. Construction of the supplement scheme, using government and private resources, was expected to commence in 2005 for commissioning during 2007. At 70 metres (m) tall, the 990 m-long dam wall will be the highest concrete-faced, rock-filled dam wall in South Africa.
- Nandoni Dam Project: Water-treatment works for the Nandoni Dam, in Limpopo, were expected to be completed in 2007. The R389-million dam, which will benefit over 700 000 people, is expected to be completed in 2008.
- Vaal River Eastern Subsystem Augmentation Project: The Minister of Water Affairs and

The South African Government has started a massive campaign to reduce the high level of water loss in the country's water distribution system.

Some of the interventions being planned to curb wastage includes a national water-wise campaign, the investigation of the possible development of water-conservation and demand-management regulations and the possibility of introducing a national fund to support municipalities and other qualifying water users to implement water-saving technologies.

Ministerial awards will also be held in 2008 to recognise those who have excelled in the areas of water saving and management, while the National Water-Use Efficiency Information System will be set up to share ideas and approaches to improving the state of water use in the country.

The new pricing strategy for charges for water use, which came into effect on 1 April 2007, makes provision for the establishment of a waste discharge charge system that is based on a "polluter pays" principle.

Forestry directed the TCTA to augment the water supply to Sasol and Eskom by implementing abstraction and desilting works alongside the Vaal Dam shoreline, and a pumping station and a 120 km-long steel pipeline of 1 900 mm diameter to the Bosjesspruit and Trichardsfontein dams in Mpumalanga. Construction of the privately funded project was expected to be completed in 2007/08 at an estimated cost of more than R2 billion.

- The Olifants River Water Resource Development Project: This project was commissioned to achieve an increased assurance of water supply. It is part of government's aim to secure bulk water for domestic supply purposes to stimulate economic activity and promote the socio-economic development of the people of this part of Limpopo in line with the PGDS and the Spatial Development Framework. Phase one of the project was the raising of the Flag Boshielo Dam by five metres, which was completed at the end of 2006. The prosperity of this area is closely linked to the mining industry, which creates employment opportunities and economic growth; and water is the catalyst for this development. The local mining sector has spent millions of rand on the Lebalelo water pipeline from the Olifants River to the Steelpoort area. The mines have also carried the cost for the raising of the Flag Boshielo Dam.

The construction of this dam is the second phase of the Olifants River Water Resource Development Project, one of the flagship programmes of government's Accelerated and Shared Growth Initiative for South Africa (AsgiSA). The importance of this dam is twofold; the first is to supply water to the towns, industries and poorly serviced rural communities in the Sekhukhune District of Limpopo. Secondly, the dam will supply water to the mines that will help to unlock vast mineral deposits, mainly in the form of platinum-group metals (PGMs) found in the region. These PGMs are at present the largest known unexploited mineral wealth in South Africa.

The construction of the De Hoop Dam and the associated bulk water-distribution infrastructure will cost about R5 billion, and municipalities in

the area, supported by the national and provincial government, are preparing to invest an additional R3 billion on infrastructure to treat and distribute potable water to rural domestic and urban users. More than 800 000 people in the project area will benefit from improved domestic water supply when availability of water from the dam is secured. The construction of the dam was due to start in 2007 and be completed in 2009/10.

- Mooi-Mgeni River Transfer Scheme: Phase one of the water-transfer project comprising the new Mearns weir on the Mooi River near the town of Mooi River and the raised Midmar Dam near Howick on the Mgeni River was commissioned during 2003 to augment the water supply to the Umgeni area in KwaZulu-Natal. Phase 2A, to be completed towards the end of the decade, will include the construction of the Spring Grove Dam on the Mooi River near Rosetta. The Spring Grove pumping station (Phase 2B) will follow at a later stage to suit the demand requirements of Umgeni Water.
- In KwaZulu-Natal, the Hluhluwe regional water works is expected to be completed by the end of 2007/08. This project will provide rural communities in Northern KwaZulu-Natal with water for domestic use.
- In the Northern Cape, a R22-million water pipeline was being constructed from the Orange River to Colesberg.
- In Gauteng, government was rehabilitating the Vlaktefontein Canal as part of the Usutu Vaal Scheme, and rehabilitating and refurbishing water and waste water treatment works in the Vaal River system.
- The North West was expected to install early warning systems in the groundwater aquifers in the Vryberg area to detect levels of groundwater.

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 is 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, 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 m³ a year, while some 4 000 million m³ 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 Incomati 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
- 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.

During 2006/07, the department raised South Africa's profile in the international community by hosting an international conference on Earth observation technology for use in obtaining water-related information. The department's officials also presented papers at international conferences.

South Africa is increasingly seen as a leading light 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.

During 2007/08, the department planned to host two international events, the UN Educational, Scientific and Cultural Organisation symposium on hydrological issues in November 2007 in Gauteng and the African San Conference in KwaZulu-Natal in February 2008. The department was also expected to participate in the Water and Sustainable Development exhibition to be held in Zaragoza, Spain, during 2008.

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.

Forestry

Provincial and local government play 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 has been completed and agreed with the sector.

The department has worked closely with other departments on the process of reducing the administrative burden on forestry development. Applications for afforestation have increased dramatically from 800 ha in 2004 to 5 500 ha in 2007. 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) Ltd 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, which had a turnover of R32 billion in 2006, and in excess of R1,5 billion could be added per year in the value-adding processes.

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 recently 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 and contributes more than 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, improve community access and redefine government's role. The Forestry BBEE 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 forestry programme also encompasses expanded greening and tree-planting projects. The programme prioritises work on fire programmes and encourages the establishment of fire-protection associations.

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 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, the Government has identified forestry as one of seven "strategic industries" that will be 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 more than 22 million m³ of commercial roundwood, worth an estimated R5 billion, according to a study done in 2005. They provide direct employment for about 107 056 people, of which 67 556 are in formal employment, 30 000 are contract workers and 39 500 are small growers and their helpers.

Together with the processed products, the total industry turnover was about R15 billion in 2005, including R6,8 billion worth of wood-pulp.

A pulp and paper log intake of about 17,3 million m³, mining timber of 826 000 m³, charcoal of 258 000 m³, and almost 4,8 million m³ of sawlogs and veneer logs and poles of about 351 000 m³ were transferred to processing plants in 2005.

The sales of timber from primary processors by volume in 2005 were as follows: sawn timber, 2,2 million m³; pulp, two million tons (Mt); mining timber, 639 390 t; panel products, 512 802 m³; poles, 293 021 m³; charcoal, 46 790 t; chips/mill residues, about six Mt; and firewood, 13 251 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 plateau.

The Department of Water Affairs and Forestry plans to transfer the management and control of all state natural (indigenous) forests by the end of 2008/09 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 all 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.

A socio-economic impact analysis will inform the finalisation of an exit strategy for the Blyde state forest land. Findings are that there will be no job losses on the side of government for the duration of the rehabilitation process, lasting between five and 10 years; and that there will be a net increase in job opportunities in the medium to long term.

The Real Yellowwood (*Podocarpus latifolius*) 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.

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 2007 trees of the year were the common wild currant (*Rhus pyroides*) and the poison bride's bush (*Pavetta schumanniana*).

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 2007 was *Plant a Tree – Grow our Future*.

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.

The Minister of Water Affairs and Forestry, Ms Lindiwe Hendricks, proclaimed the first 21 champion trees as protected under the National Forests Act, 1998 in the *Government Gazette* in December 2006. These individual and groups of trees were shortlisted by a panel of experts from a list of proposed trees considered to be of national conservation 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 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 has entered an exciting phase, with new discoveries 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.

A new cycle of nominations for champion trees begins at the start of August each year, while the nominations of the previous cycle are then evaluated by the Department of Water Affairs and Forestry and its panel of experts.

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 will be instrumental in achieving the objectives of the scorecard as suggested by the Department of Trade and Industry.

The Forestry BBBEE Charter process was launched at the Forestry Indaba in April 2005.

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 PGDPs.

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 bee-keeping, which is a partnership with the Agricultural Research Council, and establishing medicinal nurseries in partnership with various stakeholders.

In 1997, Cabinet decided that the State should exit from commercial-plantation forestry.

Apart from Arbour Week, the Department of Water Affairs and Forestry organises Water Week, Sanitation Week and Weedbuster Week. The department also has youth-development initiatives such as Baswa le Meetse, the Water Allocation Reform Programme, which seeks to redress historical water allocations, a programme to support resource-poor farmers, and plans to establish a national water-resource infrastructure agency.

To allow the 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 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 the State-owned forests will contribute optimally to government's objectives for the forestry, timber, pulp and paper sector.

South African Forestry Company Limited

Safcol, a wholly owned state enterprise, was formed in 1992 and acquired the Department of Water Affairs and Forestry's commercial forestry assets and related business in April 1993. It also acquired the remaining commercial forestry assets of the Department of Water Affairs and Forestry to facilitate the privatisation of the State's forestry assets. 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).

After completing the privatisation transactions, 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, offering:

- up to 9% for an Employee Share Ownership Programme (Esop).
- 10% for communities, directly or through the National Empowerment Fund.

By March 2007, the Esops for two of the privatised entities had been implemented, with a third close to implementation. The fourth Esop will be substituted with a cash settlement for eligible employees.

The disposal of contributions to the communities is awaiting policy guidelines.

The remaining Safcol interest, after the disposals to the Esops and the communities, together with any other assets held by Safcol, will be disposed of by 31 March 2009, in line with existing policy guidelines on the disposal of non-core assets as part of the process of winding up the affairs of Safcol.

Industry and exports

The industry was a net exporter of almost R1,9 billion worth of goods in 2006, more than 98% of which was in the form of converted value-added products. Had it not been for this trade surplus in forest products, the country's trade deficit of R69 billion in 2006 would have been almost 3% higher.

The forest-product industry ranks among the top exporting industries in the country, having contributed 2,51% to total exports and 1,74% to total imports in 2006. Capital investment in the industry amounted to some R35 billion in 2006.

The value of forest-product exports has grown by 115% over the past decade, from R4,6 billion in 1996 to R9,9 billion in 2006. In real terms (taking inflation into account), this growth was 25% or a compounded real growth of 2,3% per year over that period. However, the net trade balance in foreign trade in forest products increased from 1996 by only 12% in nominal terms (minus 35% in real terms) to R1,9 billion in 2006.

In 2006, paper products were the most important (R3,699 billion or 37% of the total), followed by solid wood products (R2,989 billion or 30%), pulp (R2,910 billion or 30%), and other products (R309 million or 3%). Woodchip exports, which are exported mainly to Japan, accounted for 68% (R2,045 billion) of total solid-wood product exports.

As with other export-based industries, the strength of the Rand has had a negative effect on

South Africa has identified the Eastern Cape and KwaZulu-Natal as key for development in the forestry, wood and paper sector, with reforestation a vital part of the strategy.

The Government envisages between R20 billion and R30 billion of investment by the private sector, including the Industrial Development Corporation, over the next five years to develop the economies of the two provinces.

Forestry is one of the sectors identified as a key growth area in terms of the Accelerated and Shared Growth Initiative for South Africa, which aims to reduce poverty and unemployment and help the country achieve an economic growth rate of 6% per year.

the Rand-value of forest-product exports during the past several years, with the total value of exports in 2006 being only R382 million more than in the previous year, but some R1,3 billion or 12% less than when at its 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 will form the basis for monitoring the sustainability of forestry operations in commercial and natural forests. Managers and owners will be 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, 1 630 418 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 done.

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. Currently, the FSC auditors have to use generic measures.

After extensive consultation, the Institute of Natural Resources, which was contracted by the Committee for SFM to develop these criteria, has developed a draft set which was tested in 2004 and accepted in 2005. A manual was produced with guidelines, standard operating practices and checklists for reporting on criteria and indicators for plantations. A training course was developed and staff in the cluster were trained to use the manual.

Through the Forestry Industry Environmental Committee, a set of environmental guidelines was published in 1995 to encourage and facilitate timber growers to practise SFM, implementing best environmental practices.

These guidelines were widely used in South Africa and abroad. A second updated and more comprehensive, user-friendly edition of the guidelines was published in July 2002. These are used by certification agents in completing the physical environment component of their FSC audits.

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 fire-protection associations (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. Due to the high incidences of fires during extreme weather conditions, it is a priority for the department to ensure registration of FPAs. By mid-2006, 59 FPAs were registered. The department advised and assisted FPAs in compiling business plans, including the principles of risk assessment. By mid-2006, 36 FPAs had been assisted with their business plans. 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 (NFDRS) was launched during Arbor Week 2005. The NFDRS is an early warning system for veldfires. The Department of Water Affairs and Forestry has delegated the operation of this system to the SAWS. The SAWS will operate the system and issue daily veldfire warnings as it does with other weather information. Warnings will be communicated to FPAs, the departmental fire advisers, Disaster Management, Department of Provincial and Local Government and other role-players.

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 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.

For the first time, South Africa now has a detailed inventory of all its natural forests, which will be 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 m³ of round logs are harvested annually (150 m³ of stinkwood, 750 m³ of yellowwood, 2 500 m³ of Australian blackwood and 350 m³ 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, and only slightly fewer in December.

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 1 021 390 ha (or 77%) of the total plantation area of 1 333 563 ha, as well as virtually all the processing plants in the country. The remaining 23% (312 173 ha) was under private ownership. The extent of public ownership will decrease significantly due to restructuring.

In 2006, capital investment in these plantations stood at R16 billion, 55% of which was attributable to investment in trees. A further 23,3% was tied up in land, 13% in roads, 7,2% in fixed assets and 1,4% in machinery and equipment.

Plantation yields

Of the 1 333 563 ha of plantations in 2005, 54% were softwood species and 46% hardwood species. Some 38% of the plantation area was managed mainly for sawlog production, 56% for pulpwood and 3% 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 m³ per ha per year for softwood, to 21 m³ per ha per year for eucalyptus and 10 m³ 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 some 22 million m³ in 2005.

Primary wood-processing

South Africa has 211 primary wood-processing plants, 206 of which are owned by the private sector and five of which are owned by local and state authorities. Of these, some 115 are sawmills; 16 mining-timber sawmills; 49 pole-treating plants; 25 pulp, paper and board mills; one match factory; and five charcoal plants. The total roundwood intake into these processing plants in 2005 was 23,6 million m³ valued at R5 billion. The value of sales of timber products produced by these primary processing plants totalled R15,025 billion. Some R16,3 billion was invested in primary roundwood-processing plants (at book value). At market value, this increased to an estimated R35 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 250 000 m³ of mainly industrial timber.

A large number of companies operate in this sector, with the five biggest companies contributing

51% of total production. Some 52% 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 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)

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

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, FTFA has developed, managed and promoted numerous sustainable greening programmes, including land-use management and food security through permaculture.

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

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 of 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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