





Water affairs and forestry

The Department of Water Affairs and Forestry's core function is to ensure that all South Africans have equitable access to water and sanitation, and that the country's water resources and forests are managed in a sustainable manner.

Hydrological conditions

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

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

Owing to the poor spatial distribution of rainfall, 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, as well as 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. Widely spread 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 water-management areas share international rivers.

Water-resource development and management in South Africa have, over the years, 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 appropri-

ate standards for particular uses. The quality of groundwater varies according to the hydrogeological conditions and anthropogenic impact. However, most major aquifer systems contain potable quality water.

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

Provided that the water resources of South Africa are judiciously managed and wisely allocated and utilised, 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 is mainly dependent on surface water resources for most of the urban, industrial and irrigation water supplies in the country. In general, the surface water resources are highly developed over most of South Africa. Groundwater, while also extensively utilised, particularly in the rural and more arid areas, is limited due to the geology of the country, much of which is hard rock. Large porous aquifers occur only in a few areas.

In the northern parts of the country, both surface and groundwater resources are nearly fully developed and utilised. 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, which includes 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 four 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 repre-

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
Umtata	253	Mtata
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
Vaal	2 603	Vaal

Source: Department of Water Affairs and Forestry

sents 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, development and water services

The Department of Water Affairs and Forestry facilitates the provision of access to basic water and sanitation to every South African household.

By the end of March 2005:

- Some 44,5 million people had access to an improved water supply.
- Basic water infrastructure had been supplied to 15 million people (over 10 million of this by the Department of Water Affairs and Forestry).
- Some 31,9 million South Africans (66,3%) had access to Free Basic Water (FBW).
- Basic sanitation infrastructure had been provided to over 8,2 million people.
- It was estimated that by 2008, the entire water supply backlog, and by 2010 that of sanitation will have been eradicated.
- The Strategic Framework for Water Services (SFWS) had been drafted through a consultative process to update sector policy.
- Local government had been established throughout South Africa and the division of powers and functions outlined. Local government had been capacitated to take on their rightful, constitutional water-services provision function.

The department was in the process of substantial restructuring, which is expected to be completed in eight to 10 years' time. The restructuring process includes:

- establishing catchment-management agencies (CMAs) to perform water-resource management

functions currently performed by the department's regional offices

- transferring the management of commercial plantations and indigenous forests to appropriate agencies and institutions
- transferring water-service delivery and operations to water-services authorities (WSAs).

WSAs are now responsible for water-services provision. The role of the department 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 water-sector regulator.

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

- establishing the National Water Resource Strategy (NWRS), which will set out the procedures, guidelines and overall strategy for managing water resources
- developing and testing a strategy for compulsory water-use licensing to facilitate equitable access to water resources for historically disadvantaged individuals
- enhancing water-use efficiency
- ensuring compliance with dam-safety regulations and enhancing public safety at water-resource installations



In October 2005, the Minister of Water Affairs and Forestry, Ms Buyelwa Sonjica, Sasol, Eskom and the Trans Caledon Tunnel Authority signed project agreements for the R2,5-billion Vaal Pipeline Project, a high-priority project designed to support the industrial needs of Sasol and Eskom in Mpumalanga, through the transfer of water from the Vaal River system.

The 115-km Vaal pipeline, which will transfer 160 million cubic meters of water per year through to a distribution structure at Knoppiesfontein, near Secunda, is expected to be completed by 2007.

- 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 thereof
- creating the National Water Resource Infrastructure Agency (NWRIA) to manage and develop national infrastructure.

Monitoring water resources

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.

River flow is being monitored at 1 200 flow-gauging stations. In addition, some 260 major reservoirs are being monitored. The evaporation and rainfall station network consists of 360 stations.

A new initiative to monitor precipitation in mountainous areas has been launched. Twenty-one rainfall stations are operational 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 being monitored at about 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.



In June 2005, the Department of Water Affairs and Forestry and the Department of Education signed a memorandum of collaboration in Pretoria.

This was in line with the water-education programme Vision 2020, which aims to educate learners about water and sanitation issues.

Vision 2020 promotes water-use efficiency, water-quality management, and awareness of alien invasive plants, health and hygiene.

The importance of qualitative information on South Africa's water resources led to an increasing drive towards the creation of a national water-quality monitoring network.

One of the current water-quality monitoring programmes is the National Aquatic Ecosystem Bio-monitoring Programme or, in short, the River Health Programme (RHP).

A key objective of the RHP is to generate and disseminate information on river health to ensure the ecologically sound management of the country's rivers, and to inform and educate South Africans about the health status of rivers. The RHP primarily uses biological indicators (e.g. fish communities, riparian vegetation and aquatic invertebrate fauna) to assess the health of river systems.

This programme is operational in all water-management areas focusing on rivers, but will be linked to wetlands/estuaries within the next five years to provide a holistic picture of the resources' condition.

Preliminary findings of the RHP indicate that 39% of South Africa's rivers (based on biological indices) are in a very good natural state, while 33% are fair and 28% are in a poor state. The main driving forces (stressors) on river health are water abstractions not based on reserve studies, the destruction of riparian vegetation, and invasion by alien species.

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 total dissolved salts and in some places, high fluoride concentration. The other challenge facing irrigated agriculture is the high sodium adsorption ratio, electrical conductivity, pH and chloride.

Another challenge, not only in South Africa, but globally, 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 impacted (hypertrophic), while the rest ranges from good (oligotrophic) to poor (mesotrophic).

Another problem facing South Africa is the sporadic outbreak of cholera and other water-borne diseases, which are mainly due to poor sanitation and hygiene at household level. The Eastern Cape and KwaZulu-Natal are generally 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 will also report on the status of DDT (Dichloro-Diphenyl-Trichloroethane) and other persistent organic pollutants in South Africa. This information will be reported internationally to the Stockholm Convention through the Department of Environmental Affairs and Tourism.

Another international obligation includes reporting on chemical water quality through the Global Environmental Monitoring Systems-Water Programme.

Funding

The department's budget grew rapidly between 2000/01 and 2003/04, increasing from R3 billion to R4,6 billion. This is an annual average increase of 15,1%. The increase in 2003/04 was due to costs related to the transfer of the water-services schemes to local authorities, with additional transitory costs being incurred related to the preparation, planning and implementation of the transfer; an increase in expenditure on the sanitation programme; and the writing off of water-user association (WUA) debt.

The expenditure declined from R4,6 billion in 2003/04 to R3,3 billion in 2004/05 due to the removal of capital and operating costs for the water-services schemes from the department's vote, as reflected in the reduced allocations to the water-services programme. These funds were transferred to the Municipal Infrastructure Grant (MIG), which is administered by the Department of Provincial and Local Government.

Water and sanitation for all

According to the Constitution of the Republic of South Africa, 1996 (Act 108 of 1996), everyone has a right to clean and safe drinking water and an appropriate and dignified sanitation service.

Water supply and sanitation programmes

Since 1994, there has been a dedicated programme to provide water and sanitation services to the previously unserved population, located mostly in the rural areas. In 1994, there were 15,9 million people without clean, safe water while 20,4 million people did not have access to adequate sanitation facilities.

The water and sanitation programme, initially the responsibility of the Department of Water Affairs and Forestry, began in 1994 as part of the Reconstruction and Development Programme. In 2002, the responsibility to implement the programme was transferred to the Department of Provincial and Local Government. The department now regulates, monitors and supports the programme.



National Water Week 2005 was celebrated from 21 to 27 March under the theme *Water for Life*. The Department of Water Affairs and Forestry used this opportunity to encourage South Africans to use water responsibly and wisely in their everyday lives.

As part of a national information and awareness campaign targeting schools, shopping centres and taxi ranks, the department distributed a series of useful hints on how to save water.

Other events that took place during the week included the Women in Water Awards; the handover of the Ngqushwa Sanitation Project in Peddie, Eastern Cape; the Western Cape Water Summit in Cape Town; the *Baswa le Meetse* (Youth in Water) Awards; the launch of the water-use efficiency strategies for the agricultural, water services, industry, mining and power-generation sectors; and the launch of the Nzelele Water User Association in Limpopo.

By March 2005, 3,6 million people still lacked access to clean safe water, while 16 million were without adequate sanitation facilities. Government remains on track to eradicate the backlogs by 2008 (water) and 2010 (sanitation) respectively. It has already exceeded the millennium development goals set by the United Nations in 2000 to reduce the population without access to basic water and sanitation by 50% in 2015.

The focus of water services broadened in 2001 to include the provision of free basic services to all indigent South Africans. By March 2005, 162 of the 170 WSAs provided FBW. The 2004/05 target of FBW being accessible to 75% of the population was achieved with 31,9 million people receiving FBW.

The department is actively eradicating all bucket systems and continues to collaborate with the departments of health and of education to improve sanitation in schools and clinics. Some R40 million will be spent on clinic-sanitation programmes and R150 million on schools.

Municipal Infrastructure Grant

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 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 12: *Government system*.)

Policy and legislation

South Africa's Constitution 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 Water Affairs and Forestry are:

- The 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.

- 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 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 reallocation 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-resources management to CMAs and, at a local level, WUAs. These institutions, representative of water users and other stakeholders, will facilitate effective participation in the management of water resources 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 support and guide them in the execution of 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 water-service development plans, within the framework of integrated development plans, required by municipal legislation
- 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.

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, information provision and capacity-building.

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 that 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 are using 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. This 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 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 an aquifer.

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 are paying the water-resource charge or cost for which they are accordingly billed. However, there is still a considerable underrecovery of costs.

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.

Strategic Framework for Water Services

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 had to transform from being an implementer to a regulator. This necessitated the revision of the policy, which culminated in the SFWS. The framework was approved by Cabinet on 17 September 2003 after extensive consultation with the relevant stakeholders.

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 inequality where it still persists and to provide basic services, higher levels of service and sustainable service provision (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 services provision

- providing higher levels of service
- 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 should have been provided with FBW by 2005
- everyone who has access to a functioning basic sanitation facility should be 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.

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 agency is the result of studies that began with the recommendations of the *1998 White Paper on a National Water Policy*.

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 organisations' assets are valued at nearly R40 billion and bulk water sales bring in more than R2 billion annually.

The agency will also integrate the Trans Caledon Tunneling 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.

The Minister of Water Affairs and Forestry will still 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 ensure that projects are designed and built according to appropriate technical, social and environmental standards, and operated effectively and efficiently.

To establish the NWRIA by the target date of April 2008, the following milestones will have to be achieved:

- promulgating the National Water Agency Act during 2006
- restructuring the Infrastructure Branch of the Department of Water Affairs and Forestry to facilitate transfer to the new agency
- preparing a detailed agency establishment plan
- establishing an effective utilities governance component in the department to maintain oversight of the new agency
- working with the TCTA, it will also be necessary to implement:
 - effective financial and organisational management systems

- a transformation plan to address change management, employment equity and service delivery.

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.

Natural mean annual run-off and ecological reserve (million m/a)

Water-management area	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 Mhlatauze ⁽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 m/a).

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

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

Source: Department of Water Affairs and Forestry

Catchment management agencies

CMA's 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 the development of a catchment management strategy.

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

The department aims to establish CMA's in all 19 water-management areas across South Africa, as required by the National Water Act, 1998.

The first CMA at Umkomati in Mpumalanga was established on 30 March 2004 and became operational in September 2005. Another five CMA's were awaiting financial feasibility studies. It will cost up to R3 million to establish each CMA.

The department will devolve administration to the 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 all 19 water-management areas.

These are the forerunners of the catchment management strategies that will be prepared by the

CMA's 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 CMA's to authorise water use.

Water boards

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

Irrigation boards and water-user associations

In 2003/04, subsidies worth R28,4 million were awarded to water irrigation boards and WUAs. These were increased to R30 million in the 2004/05 financial year.

The Department of Water Affairs and Forestry, in partnership with the Department of Agriculture, has developed a strategy to create opportunities for poor farmers on irrigation schemes, by providing them with access to water for high-value crops.

In 2005/06, the department was expected to extend financial support to resource-poor farmers, particularly women, for rainwater-harvesting tanks and other appropriate technologies. The department has secured the co-operation of the departments of land affairs and of agriculture, as well as the relevant provincial departments of agriculture to test the feasibility of developmental projects proposed for resource-poor farmers that will utilise the Orange River water reserved for them.

At least three projects were expected to start in 2005/06, namely the Karoo Irrigation Project near Hopetown, the Blocuso Trust Project between Upington and Keimoes, and the Tella Community Project near Pofadder. These projects will involve funding for infrastructure, as well as the training of participants.

Working for Water Programme

Alien plants have invaded over 10 million ha of South Africa – or 8% of the land – and their num-



A team of South African youngsters from the Free State won the first prize in the annual Stockholm Junior Water Prize. The prize, which forms part of the World Water Week activities, aims to encourage and interest young people in issues related to water and the environment.

South Africa has won the competition twice in the last three years, with a second place in 2004. In 2005, South Africa was among 27 countries entered into the competition.

The winning group from Setshaba Se Botshabelo High School developed the 'Nocturnal Hydro Minimiser', which is regarded as a revolutionary solution to problems of very low annual rainfall and high evaporation levels characteristic of dry countries like South Africa. The device is an electrically operated watering system designed to use water efficiently for irrigation.

ber is projected to double in as little as 15 years. These plants threaten the country's rich biodiversity by competing for water, light, space and nutrients – to the detriment of indigenous flora and water reserves.

The WfW Programme is a labour-intensive project to clear invasive alien plants. It is a multidepartmental initiative led by the departments of water affairs and forestry, of environmental affairs and tourism, and of agriculture. It started in 1995 with a budget of R25 million and has grown into one of government's key poverty-relief-fund initiatives.

During 2004, R440 million was spent and the programme employed about 32 000 people.

As an alien-clearing programme, WfW has made significant achievements in meeting its goals:

- it is estimated that over one million ha of invasive alien plants have been cleared over the past eight years
- this clearing yields an estimated release of between 48 m³ and 56 million m³ meters of additional water for alternative uses annually.
- more than 20 000 beneficiaries receive gainful employment and training through the programme annually
- over 15 million person-days of employment have been generated by WfW since its inception
- the cost-per-person day was assessed to be the most efficient of all the poverty-relief programmes of national government
- it provided 55% of wages to women, 20% to youth and 1% to the disabled, which is still slightly below its targets
- it has spearheaded a massive catchment-rehabilitation programme comprising 303 clearing sites, in addition to work on aquatic weeds and the use of biological control agents.
- it has established fire programmes in eight fire-prone regions of South Africa
- it is recognised and acknowledged as a global leader in the field, and has received 38 national and international awards
- it has established the fully fledged and successful Working for Wetlands Programme in all nine provinces
- WfW is aligned with the Global Invasive Species

Programme, which has chosen to locate its secretariat in South Africa.

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. During 2004/05, a number of localised flooding events occurred throughout the country. These mainly affected smaller river basins in the Western and Eastern Cape and KwaZulu-Natal, as well as a limited number of local authorities and farming communities, although no large area floods were registered.

In response to drought conditions seriously affecting many parts of the country since 2003, government allocated additional funds for emergency water supplies on three occasions. During 2003/04, R295 million was made available through two allocations. About R203 million of this amount went to municipalities for emergency water provision at local authority level, while around R92 million was used by the Department of Water Affairs and Forestry to supplement regional water supplies. During 2004/05, an additional R280 million was made available to municipalities for emergency water provision through the Department of Provincial and Local Government, while an additional R50 million was allocated to strengthen national and regional water supplies.

Although many of the larger dams and surface-water resources were substantially replenished during the 2004/05 summer rainy season, the overall water situation was a matter for concern. Dam levels in the Western Cape were at their lowest in many years, while the dam levels in the Free State, Limpopo and North West did not even reach their already low levels of the same time in the previous year. Water use was accordingly restricted in many areas in these provinces. As far as groundwater was

concerned, levels were generally very low and in many cases the situation was critical. Groundwater is an important source of water to many local authorities, communities and farms. The largest proportion of the funds earmarked for emergency water supplies to municipalities is to support problematic groundwater situations.

Dams and water schemes

The first edition of the NWRS describes how the water resources of South Africa will be protected, used, developed, conserved, managed and controlled in accordance with policy and legislation. 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 the management of 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 Franschhoek in the Western Cape and the associated supplement scheme comprising a weir, pumping stations and pipelines to augment the water supply to the Western Cape. Construction of the dam by a private contractor started in June 2004 and is

due for completion in 2007. Construction of the supplement scheme, utilising government and private resources, was expected to commence in 2005 for commissioning during 2007. At 70 m, the 990-m long dam wall will be the highest concrete-faced, rock-filled dam in South Africa.

- **Luvuvhu Government Waterworks:** This scheme, worth more than R900 million, funded by National Treasury and implemented by the Department of Water Affairs and Forestry, comprises the Nandoni Dam, pumping station and water treatment works (WTW), and the Xikundu weir, pumping station and WTW. The scheme will provide potable water to more than a million people in Limpopo. It will stabilise the water flow in the Luvuvhu River for irrigation and ecological flow requirements, and alleviate the water shortages in the Kruger National Park. The Nandoni pumping station and WTW will be completed during 2007 while the dam and other components were expected to become fully operational in 2005.
- **Vaal River Eastern Subsystem Augmentation Project:** The Minister of Water Affairs and 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 Bosjesspruit and Trichardsfontein dams in Mpumalanga. Construction of the privately funded project was expected to commence during the second half of 2005 for completion in 2007 at an estimated cost of more than R2 billion.
- **Olifants River Water Resources Development Project:** This development in Limpopo and Mpumalanga will enable considerable mining expansion (mainly platinum) and sustained water supply to local authorities and communities. The project is to be developed in two phases. Phase one comprises the five-metre raising of the Flag Boshielo Dam on the Olifants River near Marble Hall by the Department of Water Affairs and Forestry at an estimated cost of R234 million in a public-private partnership arrangement

with the Lebalale WUA. Construction started during 2004 and is expected to be completed in 2006.

The proposed second phase of the project will comprise the 70-m high De Hoop Dam located 40 km south of Steelpoort on the Steelpoort River and a substantial primary bulk distribution system from the De Hoop and Flag Boshielo dams. It is envisaged that the project, costing in excess of R3 billion, will be implemented by the department and the private sector in phases, starting during 2006.

- 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 the town of Rosetta. The Spring Grove pumping station (Phase 2B) will follow at a later stage to suit the demand requirements of Umgeni Water.

Groundwater resources

Groundwater, despite its relatively small contribution to bulk water supply (13%), represents an important and strategic water resource in South Africa.

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.

Underground water sources also contribute to river flow. This requires reserving a significant part of groundwater resources for the protection of 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.

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
- Botswana
- 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



A feasibility study for the second phase of the multi-billion Rand Lesotho Highlands Water Project (LHWP) started at the end of April 2005. The study – funded by the Lesotho and South African governments – is expected to take two years, after which a decision will be made on the future of the project by the two governments. The LHWP sells water to Gauteng.

Phase one of the project consists of the Katse Dam that supplies water to the Mohale Dam through a 32-km tunnel. In turn, Mohale Dam supplies water to the Muela Dam through an 82-km tunnel. From Muela, the water is delivered to South Africa.

Phase two of the project entails the construction of the Mashai Dam high up in the highlands of Lesotho. It will supply water to the Katse Dam through a 30-m tunnel.

African Union. All the countries involved benefit, while sharing development costs.

The African Ministers' Council for Water was established in December 2003. It has become a platform to share experiences on all water-related matters.

Forestry

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.

South Africa has developed one of the largest planted forests in the world. Production from these plantations amounted to more than 19,2 million m³, valued at almost R4,1 billion in 2003. Together with the processed products, the total industry turnover was about R14,6 billion in 2003, including R8,4 billion worth of wood-pulp.

More than 10,9 million tons (mt) of pulpwood, mining timber, matchwood and charcoal, and almost six million cubic metres of sawlogs, veneer and poles, were sold in this period.

Collectively, the forestry and forestry products sector employs about 151 000 people.

An equivalent of about 60 000 full-time staff are employed in the primary sector (growing and harvesting), while the remainder are employed in the processing industries (sawmilling, pulp and paper, mining timber and poles, and board products).

The organised forest industry claims that each job created within the sector results in four others in supporting industries, through the multiplier effect. The sector thus contributes about 600 000 jobs to the economy.

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 are spread over the interior plateaux.

The yellowwood tree (*Podocarpus*) is South Africa's national tree. Yellowwood trees can grow to

a height of more than 40 m with a girth of 8 m, and can live 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 Arbour 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 2005 trees of the year were the false cabbage tree (*Schefflera umbellifera*) and the baobab (*Adansonia digitata*).

The aim of Arbour 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 2005 was *Plant a Tree – Grow our Future*.

Contributing to socio-economic reform and growth

In January 2005, the Minister of Water Affairs and Forestry, Ms Buyelwa Sonjica, signed agreements which transferred the management of 140 000 ha of state forest land to new operators. This is part of government's ongoing restructuring of state-owned forests. One agreement relates to 25 000 ha in the Hogsback and Stutterheim areas of the Eastern Cape where Amathole Forest Holdings, and its Black Economic Empowerment (BEE) partner, Wildbreak Investment Holdings, will take over the running of the forests. The other covers forests in the southern and Western Cape, where the management of about 115 015 ha of state forest land will be taken over by the BEE company, Cape Timber Resources.

These agreements follow two others concluded in 2001 with Singisi Forests in the Eastern Cape and the Siyaqhubeka consortium in KwaZulu-Natal.

The restructuring process also has further benefits for government and the people of South Africa. This includes the annual lease rental payments of about R20 million, which is generated from land

leases, as well as various socio-economic undertakings that the successful bidders for the various packages have committed to as part of the restructuring transactions. The shareholding of each of the successful bidders includes significant black ownership, varying between 10% and 50% of the bidding vehicles.

The forest land is not sold as part of the packages, but leased to the successful bidders for 70 years with an option to renew for a further 35 years. The new owners will pay substantial lease rentals to the department, which will be used to compensate any successful land claimants or revert to the State.

These transactions are in line with government's policy of exiting from direct forest management activities while promoting BEE in the forestry industry. At the same time, land which is less suitable for forestry will be converted to other uses or reserved for conservation.

In the southern and Western Cape, 44 000 ha of marginal state forest land will be clear felled and handed over for other uses. These include 29 000 ha for conservation, 9 000 ha for agriculture, 6 000 ha for community forestry and 200 ha for settlement.

The minister also assigned management responsibility for the Tokai Cecilia state forests in Cape Town to South African National Parks. This follows Cabinet's decision in 1996 to develop the Cape Peninsula Protected Natural Environment. The Tokai and Cecilia forests are located in the protected environment area and contain important lowland and mountain fynbos, as well as pockets of Afro-montane forest, which need to be maintained. Eventually, the two forests will be incorporated into the Table Mountain National Park.

South African Forestry Company Limited (SAFCOL)

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 with effect from 1 April 1993.

SAFCOL's objectives are to enhance the development of the local forestry industry and to optimise

the State's forestry assets. This will be achieved through running the business according to accepted commercial management practices and sustainable forestry management (SFM) principles.

In 2001/02, SAFCOL's commercial forestry operations were transferred into five special-purpose vehicles to facilitate privatisation transactions.

A special restructuring dividend is payable to government as the sole shareholder of SAFCOL upon successful completion of each transaction. On 30 June 2004, R85 million was paid over in respect of transactions completed prior to that date.

Government's decision to restructure its commercial forestry assets, not only those managed by the Department of Water Affairs and Forestry, but also those managed by SAFCOL, has had a marked impact on the company and the local industry.

By April 2005, the disposal of state forests was in its final stages. The remaining key transaction was the sale of Komatiand forests, which was expected to go before the Competition Tribunal.

SAFCOL's remaining responsibilities included aftercare of the transactions, residual shareholding and various management obligations in certain areas.

SAFCOL also had to sell up to a 9% shareholding interest to the employees in the five forestry entities created after the restructuring. It was expected to be concluded by the end of 2005.



WeedBuster Week 2005 took place from 10 to 16 October under the theme *Stop the Invasion: Plant Indigenous*.

WeedBuster Week represents the annual culmination of the ongoing campaign aimed at managing and containing invasive alien plants. The campaign is a multidepartmental initiative led by the Department of Water Affairs and Forestry through the Working for Water Programme and supported by various partners and stakeholders.

The South African campaign is linked bilaterally to invasive-plant control initiatives by countries such as Australia and New Zealand and multilaterally to the broader Global Invasive Species Programme and other structures and frameworks.

Industry and exports

The industry was a net exporter to the value of over R3,9 billion in 2004, 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 in 2004 of R13 billion would have been 30% higher.

The forest-product industry ranks among the top exporting industries in the country, having contributed 3,09% to the total exports and 1,68% of total imports in 2004. Capital investment in the industry amounted to some R24 billion in 2004.

The value of forest-product exports has grown significantly over the past decade, from R2,3 billion in 1992 to R9 billion in 2004, a growth of 286%. In real terms (taking inflation into account), this growth was 73,6% or a compounded real growth of 4,7% per year over that period. As imports did not increase to the same extent as exports, the net trade balance in foreign trade in forest products increased even more, by 323% in nominal terms (90% in real terms) to R3,9 billion in 2004.

In 2004, paper exports were the most important (R3,204 billion or 35% of the total), followed by solid wood products (R3,032 billion or 34%), pulp (R2,460 billion or 27%), and other products (R326 million or 4%). Woodchip exports, which are exported mainly to Japan, accounted for 58% (R1,764 billion) of the total solid wood products exports.

As with other export-based industries, the strength of the Rand had a negative effect on the Rand-value of forest-product exports during 2004, with the total value being R898 million or 9% less than in 2003.

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 (Act 84 of 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 SFM and makes recommendations on how public access to state-owned forests can be improved.

Sustainable forest management

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

A comprehensive set of criteria indicators and measures, which addresses these considerations, has been developed. These criteria indicators will form the basis for monitoring sustainability of forestry operations both in commercial and natural forests. Managers/owners will be required to report against these criteria. They also form useful guidelines for new entrants into the sector.

The commercial forestry industry in South Africa is committed to practising SFM and is a world leader in forest certification. This is demonstrated by the fact that over one million ha, or over 80% of the entire planted area of commercial forestry plantations in South Africa, is certified by the Forest Stewardship Council (FSC) and the ISO 14001 certification schemes as being sustainably managed. By March 2005, nearly 1,7 million ha of forestry land in South Africa was certified by the FSC, the second-largest area in the southern hemisphere after Brazil.

This is a remarkable achievement considering that there were no certified plantations in 1996. Although not all these forests are owned by the large forestry companies, the rapid expansion in this certified area has been facilitated by the fact that all the large companies have their own specialist environmental departments. These ensure that their 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 the 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 various factors,

such as the acceptance by the FSC of 'group-certification schemes' and the availability of local FSC auditors, both of which have reduced the cost of certification considerably.

Another development has been the introduction of small low-intensity managed forest audits which enable 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 Institute of Natural Resources, which was contracted by the Committee for SFM to develop these criteria has, after an extensive consultative process, developed a draft set which was being tested in mid-2004. This process of in-field testing was expected to be completed in 2005.

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

These guidelines were not only highly acclaimed, but widely used both within South Africa and abroad. A second updated, and far more comprehensive and user-friendly edition of the guidelines was published in July 2002. These are being used by the certification agents for the auditing of 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, which is 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, which emphasises SFM. It explains how people and communities can use forests without destroying them and sets out rules for the protection of indigenous forests. The Act 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 species are threatened and a list 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 to ensure 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 formed by landowners. It furthermore obliges the Minister of Water Affairs and Forestry to operate a national fire-rating system in consultation with the South African Weather Service and fire associations. The Act also allows the minister to impose minimum fire-fighting requirements on landowners.

Indigenous forest

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.

The low natural forest cover 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.



The first steering committee meeting of the Forestry Broad-Based Black Economic Empowerment (BBBEE) Committee took place in June 2005.

Set up by the Minister of Water Affairs and Forestry, Ms Buyelwa Sonjica, the steering committee aims to drive the BBBEE process in the forestry sector. The committee was expected to complete the first draft of the charter before the end of 2005. The meeting also determined and agreed on the powers and mandate of the steering committee.

There has been an increase in the use of natural forests as sources of medicine, building material, fuel wood and food. It is estimated that around 80% of South Africa's population still use 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 into 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). Timber harvesting in Knysna amounts to 2 600 m³. 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.



In September 2005, the Minister of Water Affairs and Forestry, Ms Buyelwa Sonjica, launched the National Fire Danger Rating System for South Africa (NFDRSA) in Cape Town.

The NFDRSA, which is run in partnership with the South African Weather Service, is an early-warning system for predicting conditions conducive to veldfires.

The system will:

- help veldfire managers and decision-makers to decide on precautionary measures to take when managing veldfires
- identify conditions that could lead to high fire danger probability
- identify activities which are prohibited under prevailing conditions
- increase the state of veldfire readiness
- raise awareness among the general public.

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, making up 21% of land cover. This vegetation covers extensive areas in the low-lying, drier areas of Limpopo, KwaZulu-Natal and Mpumalanga.

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.

Commercial forests

During the 1930s, government started to establish 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 years. 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-2005, the private sector owned 1 028 877 ha (or 76%) of the total plantation area of 1 351 402 ha, as well as virtually all the processing plants in the country. The remaining 24% (322 525 ha) was under public ownership. The extent of public ownership will decrease significantly once the restructuring process is complete.

In 2004, 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 1 371 625 ha of plantations in 2003, 52% were softwood species and 48% hardwood species. Some 36% of the plantation area were managed mainly for saw-log production, 57% for pulpwood

and 4% for mining timber, while the balance of 3% was grown for the production of poles, matchwood (poplar) and other minor products. Plantation yields vary from an average of 16 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 saw-logs, to six to 10 years in the case of eucalyptus pulp and mining timber.

The production from plantations amounted to some 19,2 million m³ or 16,9 mt in 2003.

Primary wood-processing

South Africa has 194 primary wood-processing plants, 189 of which are owned by the private sector and only five of which are owned by local and state authorities. Of these, some 109 are sawmills; 15 mining-timber sawmills; 42 pole-treating plants; 22 pulp, paper and board mills; one match factory; and five charcoal plants. The total roundwood intake in 2003 was 20,4 million m³ valued at R3,3 billion. The value of sales of timber products produced by these primary processing plants totalled R14,591 billion. Some R18,96 billion was invested in primary roundwood-processing plants (at book value). At market value, this increased to an estimated R30 billion.

The pulp industry in South Africa is dominated by two main pulp-and-paper manufacturing companies, namely 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 the production of solid wood products, such as lumber for roof trusses, flooring etc. and consumer products such as furniture. 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 turnover (private and public sec-

tors) 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, and the Forestry and Agriculture Biotechnology Institute and the Council for Scientific and Industrial Research in Pretoria.

Degrees in forestry are offered by the Faculty of Agricultural and Forestry Sciences at the University of Stellenbosch, the University of KwaZulu-Natal and the University of Venda. Diplomas and limited degree courses in forestry disciplines are also offered at the Nelson Mandela Metropolitan University, George (Saasveld Campus). The Natal University of Technology offers a diploma in Pulp and Paper Technology, and the Fort Cox College of Agriculture and Forestry offers 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.

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.



The forestry industry is promoting rural development and economic empowerment through a small-grower afforestation programme. By mid-2004, there were more than 24 000 small emerging timber growers belonging to formal schemes and a further 5 000 to 10 000 independent growers. The schemes run under the auspices of Sappi Forests (Project Grow), Mondi Forests (Khulanathi) and the Wattle Growers' Association. Combined, these growers, most of whom are women, cultivated 48 000 hectares of plantations.

Community forestry is implemented by communities or with the participation of communities, and includes tree-centered 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 the management of 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 through the help of sponsors and certificate programmes. Over 2,2 million trees have been distributed to schools, clinics, old-age homes, hospices, police stations, streets and parks.

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.

Eduplant

Improving food security in impoverished communities is at the core of the Woolworths Trust EduPlant's activities. It is managed by FTFA in partnership with the Department of Water Affairs and Forestry, SABC Education and Landcare SA.

EduPlant is a schools food-gardening and greening programme that promotes and supports schools in the growing of food in a sustainable and natural way. It is aligned with the aims of government's National School Nutrition Programme.

Over the past 10 years, EduPlant has helped thousands of schools to enhance food security in their communities and to improve the nutrition of their learners.

In 2005, many EduPlant workshops were held in all provinces, providing instruction and resources to assist educators in developing food gardens at schools.

The Eduplant 2005 Awards ceremony took place on 30 September 2005. More than 400 schools with permaculture food-gardening projects entered the competition. This annual event recognises the achievements of all educators and learners who participate in the EduPlant Programme.

Acknowledgements

Department of Water Affairs and Forestry
Estimates of National Expenditure, 2005, published by National Treasury
Forestry South Africa
South African Forestry Company Limited
Water Research Commission
www.csir.co.za
www.dwaf.gov.za
www.forestry.co.za
www.gov.za
www.trees.org.za
www.southafrica.info

Suggested reading

Bate, R. and Tren, T. *The Cost of Free Water*. Johannesburg: Free Market Foundation, 2002.
Davies, B.R. and Day, J. *Vanishing Waters*. Cape Town: University of Cape Town Press, 1998.
Keith, P. and Coates Palgrave, M. *Everyone's Guide to Trees of South Africa*. 4th revised ed. Cape Town: Struik, 2002.
Lawes, M.J. et al. eds. *Indigenous Forests and Woodlands in South Africa*. Scottsville: University of KwaZulu-Natal Press, 2004.
McCullum, H. ed. *Biodiversity of Indigenous Forests and Woodlands in South Africa*. Maseru: Southern African Development Community/International Union for the Conservation of Nature and Natural Resources/Southern African Research and Documentation Centre, 2000.
Van Wyk, B. and Van Wyk, P. *Field Guide to the Trees of Southern Africa*. Cape Town: Struik, 1997.
Venter, F. and Venter, J. *Making the Most of Indigenous Trees*. Pretoria: Briza Publications, 1999.