





chapter 23

Water affairs and forestry

South Africa is a water-stressed country and water planners and managers are being faced with increasingly complex issues.

The country is largely semi-arid and prone to erratic, unpredictable extremes in the form of droughts and floods. Water is most abundant in the geographically small escarpment areas, which run in a narrow strip from the north-east of the country down the eastern and southern seaboard, remote from the major demand centres in the hinterland. Many large storage dams have been constructed to regulate the natural variable flow of rivers and facilitate water transfers between catchments.

Rivers are the main source of water in South Africa. Countrywide, the average annual rainfall is about 500 millimetres (mm), compared with a world average of about 860 mm. On average, only some 9% of rainfall reaches the rivers as run-off. Sixty-five per cent of the country receives less than 500 mm per year, which is generally accepted as the minimum amount required for successful dry-land farming. Twenty-one per cent of the country, mainly in the arid west, receives less than 200 mm a year.

The Orange River Basin is the largest river basin in South Africa with a total catchment area of one million square kilometres (km²), almost 600 000 km² of which is inside South Africa, with the remainder in Lesotho, Botswana and Namibia.

On average, South African rivers receive about 50 billion cubic metres (m³) of water per annum with a further six billion m³ available from underground aquifers. This translates into 1 400 m³ on average per person per annum. Of this 56 billion m³, 21 billion m³ is utilised. Of this volume, 52% is used for agriculture and irrigation, 4% for forestry, 4% for industry, 10% for domestic use, with 19% allocated to ensuring a sustainable environment.

Apart from erratic rainfall and the low ratio of run-off, which affects the reliability and variability of river flow, the average annual potential evaporation is higher than the rainfall in all but a few isolated areas where rainfall exceeds 1 400 mm per year. Only about 32 000 million m³ of the annual run-off can be economically exploited using current methods. Usable run-off is further reduced by land uses such as commercial afforestation and sugar cane, and by high evaporative losses from the numerous storage dams throughout the country.

Farm dams, of which there are a large number, can seriously reduce the flow of

◀ The commercial forestry industry in South Africa is committed to practising sustainable forest management and has one of the largest areas of Forest Stewardship Council-certified plantations of any country in the world.

rivers and streams during the dry season and also delay the run-off water at the onset of the rainy periods.

Furthermore, rainfall, and to a greater extent run-off, is poorly distributed in relation to the areas of greatest economic activity. Accordingly, water is transported over great distances from areas of relative abundance to areas of increasing demand. For instance, water supplies in the populous and economically important industrial hub in Gauteng are supplemented by transfers from the better-watered east.

The aim of the Department of Water Affairs and Forestry is to ensure the availability and supply of water on a national level and to promote forestry development.

Major dams of South Africa		
	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
Erfenis	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

Some 6,2 million people have access to a basic supply, obtaining water from sources that are further than 200 metres (m) away. However, the service needs to be improved to meet Reconstruction and Development Programme standards. The focus of the Department is to bring water to within 200 m of these households.

The past few years have seen a number of achievements in the management of water resources in South Africa and the implementation of the internationally acclaimed National Water Act, 1998 (Act 36 of 1998).

Key achievements include:

- developing conservation and demand-management strategies for the industrial, agricultural and domestic sectors
- promoting water conservation and integrated water resource management
- developing resource learning and support material
- launching the Women in Water Awards
- integrating water-related issues in the outcomes-based curriculum
- a formal networking, consultation and communication strategy
- the pilot cholera education project
- continued participation in the United Nations Habitat Co-ordinated Water for African Cities project at various levels
- registering significant abstract uses of raw water for the proper management of scarce water resources and for the implementation of the national pricing strategy as promulgated in 1999
- developing the licensing system for all Section 21 water users
- introducing the new raw-water pricing strategy on government water schemes, and developing a pricing strategy for waste discharges
- developing strategies to deal with the impact on water quality of mining and industrial developments and dense settlements, and introducing an environmental-assessment tool



- creating 20 000 work opportunities through the Working for Water Programme, and developing strategies to provide general and financial support to small-scale and emerging farmers.

Water for all

According to the Constitution of South Africa, 1996 (Act 108 of 1996), it is every person's right to have access to clean water.

According to the 2001 Census, five million people still need access to a basic supply of water or are without the bare minimum supply. These are people who take water directly from dams, pools, streams, rivers or springs, or purchase water from water vendors.

Households with access to water increased from 80% in 1996 to 85% in 2001.

Community Water Supply and Sanitation (CWSS) Programme

The Department of Water Affairs and Forestry's CWSS Programme was initiated in 1994 to achieve the constitutional objective of ensuring that all South Africans have access to sufficient water and a healthy living environment, with the focus on rural areas.

One aim of the CWSS Programme is to capacitate local government and promote the sustainability of water-service projects.

President Thabo Mbeki joined the celebrations on 5 July 2003 at the Umzinyathi village outside Durban, KwaZulu-Natal, when the nine-millionth connection of safe water, since

South Africa became a democracy in 1994, was celebrated.

In 2002/03, some 1,2 million people received water-supply infrastructure and 65 105 toilets were built.

This translates to 390 630 people who received sanitation through the CWSS Programme.

In the process, temporary employment was provided to 98 000 people, 11 300 of which received formal training.

Government is on target to eradicate the backlog in water infrastructure and sanitation facilities by 2008 and 2010, respectively.

Census 2001 also highlighted the following trends, which could have an impact on the Department's programmes:

- rapid urbanisation, with many municipalities facing challenges typical to cities in a developing country
- additional households will necessitate the provision of additional sanitation infrastructure.

The National Sanitation Programme, which includes the Housing and Municipal Infrastructure Programmes, continues to accelerate, with improved sanitation provided to an estimated 2 260 000 people in 2002. The Department spent about R221 446 000 providing toilets for 65 105 households.

Some R321 million was allocated in 2003/04 to provide sanitation to 120 000 households, as part of the national target of 300 000 households for the combined Programme. Through community-based labour-intensive approaches, the Programme is expected to generate over 6 000 jobs annually and plough R50 million into rural economies.

The Department intends to eradicate the bucket system in 430 000 households by 2006.

The Department 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 school sanitation.



In August 2003, the Minister of Water Affairs and Forestry, Mr Ronnie Kasrils, handed over 29 boreholes worth R1 million to the communities under the Greater Groblersdal Municipality – Dennilton, Phokwane, Leeufontein, Doornlaagte, Driefontein, Elandsdoorn, Tafelkop and Naganeng.

The boreholes form part of government's efforts to provide people with clean drinking water and curb the spread of waterborne diseases such as cholera.

The Department has set aside R116 million for refurbishment, plus another R210 million in the next two years of the Medium Term Expenditure Framework (MTEF), R93 million for capacity-building and R25 million for strengthening the Department's oversight role.

Municipal Infrastructure Grant (MIG)

To eradicate backlogs in access to water and sanitation by 2008 and 2010 respectively, future funding for water and sanitation is expected to increase.

The MIG is intended to facilitate and ensure more effective and integrated service delivery.



In November 2000, the Minister of Water Affairs and Forestry, Mr Ronnie Kasrils, signed a partnership agreement with Roundabout Outdoor and the United States' Kaiser Family Foundation for the installation of 100 merry-go-rounds, which use the energy of children at play to pump water to rural communities.

Water tanks are installed a few metres away from the play pumps, sporting HIV/AIDS-prevention messages aimed specifically at young women who frequently collect water for their households. The tanks also carry paid advertising by companies such as Unilever, Colgate-Palmolive and Telkom, which covers the cost of maintaining the play pumps.

In 2001, play pumps were installed in 40 rural villages throughout South Africa. The Kaiser Family Foundation donated US \$250 000 in 2001 to install an additional 60 play pumps countrywide.

Tapping the energy of children at play, the pumps can generate some 1 400 litres of water per hour, saving young women time and energy they would otherwise have spent walking to and from more remote water resources.

The play pumps also help prevent diseases such as cholera that can stem from open-water supplies.

International donor money continues to come in from the World Bank, and the latest contributor to join the project is the ClearWater Project. Roundabout Outdoor has 130 sites already established and during National Water Week 2003, the SABMiller (until recently South African Breweries) donated a cheque of R5 million for 110 more sites.

These sites are in the Eastern Cape, KwaZulu-Natal, Mpumalanga, North West and Limpopo.

Free basic water

The Free Basic Water Policy was launched in July 2001.

By June 2003, 78% of the country's municipalities were implementing the Policy, providing more than 27 million people with free basic water.

Provincial support units, staffed by trained free-basic-water specialists, were established.

Medium-term targets of the Department of Water Affairs and Forestry include supplying an additional one million people with basic water and 300 000 households with basic sanitation every year.

The Department also aims to expand the Free Basic Water Policy to 85% by March 2004.

Water policy

South Africa is developing a multidisciplinary approach to managing the country's scarce water resources, based not only on technical considerations, but also on economic, social, political and environmental considerations. This new approach to integrated water resource management is enshrined in the National Water Resource Strategy, which was published in August 2002 for public comment.

The draft Strategy outlines the framework for water resource management as required by the National Water Act, 1998, and describes, among other things, how the Government intends to implement water-resource protection measures. These measures are being implemented and include the determination of the reserve-water required to meet basic human needs and ecological-flow requirements for aquatic ecosystems, as a standard prerequisite before any other water use is authorised.

The Strategy also describes provisions for water-use and how it will be authorised, water conservation, demand management, water pricing, the institutional arrangements for water resource management, infrastructure development, monitoring and information systems, and public safety in water matters.



Considered to be South Africa's 'blueprint for survival', the Strategy sets out proposed strategies to achieve equity, sustainability and efficiency in the use of the country's water resources.

It also outlines plans for investment in new dams and related infrastructure over the next 25 years, and proposes arrangements with neighbouring countries for managing shared rivers.

The Strategy also describes how government will deal with water allocations, water pricing and pollution control, and outlines how the demands for water will be met in future, as well as the institutions that will be established to allow the public to participate in water resource management.

Public safety, and ways to manage disasters such as droughts and floods and their impact, are also addressed.

The Strategy will ensure that water resources are used to meet the needs of the people, create jobs and support sustained economic development while ensuring that aquatic ecosystems are protected.

The Strategy was expected to be finalised in November 2003.

Water Services Act, 1997 (Act 108 of 1997)

The Water Services Act, 1997 aims to:

- ensure and define the rights of access to basic water supply and basic sanitation services
- set out the rights and duties of consumers and those who are responsible for providing services
- allow the Minister of Water Affairs and Forestry to set national standards (including norms and standards for tariffs) to ensure sufficient, continuous, affordable and fair water services
- promote the effective and sustainable use of financial and natural resources
- regulate contracts for the fair and transparent provision of water services
- create effective and financially viable statutory institutions to assist local government to fulfil its obligations under the Act.

In addition, a potentially powerful provision of the Water Services Act, 1997 requires the production by Water-Service Authorities (the designated municipalities) of Water-Service Development Plans, within the framework of the Integrated Development Plans, now required by municipal legislation. In a similar manner, tariff regulations cover areas (also addressed by legislation) governing municipal finances, highlighting the need for a coherent interface between generic municipal regulation and sector-focused regulation.

In addition to regulating the Water-Service Authorities, the Water Services Act, 1997 provides a comprehensive framework for the oversight and regulation of the Water Boards, established as a family of regional public utilities under the authority of the Minister of Water Affairs and Forestry. It also provides a framework for the collection and publication of information about water services, which may come to be one of the more



National Water Week 2003 was celebrated from 17 to 23 March under the theme *Water is our Future* – focusing on protecting and respecting South Africa's water resources.

Water Week 2003 coincided with the launch of the International Year of Fresh Water in South Africa, as well as the Third Water Forum in Japan.

A call was made to all South Africans during the Week to maintain and improve the quality and quantity of freshwater available for current and future generations.

As part of the Water Week celebrations and activities, the Minister of Water Affairs and Forestry, Mr Ronnie Kasrils, awarded the annual *Baswa le Meetse* Youth in Water Arts Award to learners who produced inspiring educational messages to the public about water and sanitation through theatre and the arts.

The Award was complemented by the existing school-based 2020 Vision for Water Education Programme.

Minister Kasrils also awarded the annual National Women in Water Awards. These Awards serve to honour women who have distinguished themselves in water resource management.

powerful regulatory tools available to national government.

National Water Act, 1998

The National Water Act, 1998, provides for:

- integrated management of surface water and groundwater
- sustainable use of groundwater within the average annual replenishment rates
- sustainable use of surface 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 does not differentiate between surface water and groundwater with respect to allocation, protection and conservation. 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 water resources.

On 1 October 1999, the Department of Water Affairs and Forestry started a registration drive for users of large amounts of untreated raw water.

The new measures do not apply to users of borehole water for domestic purposes, those who use it to grow food for subsistence, or those who use it to water a few head of cattle. It affects those who draw water from a dam,

stream or underground aquifer and use it for irrigation, mining, industrial use and feedlots.

Water users had to register before 30 June 2001 or face paying a late registration penalty of the greater of R300 or 10% of outstanding water charges. The registration of users of raw water provides the knowledge base needed to manage the country's water resources more effectively. From 1 April 2002, the process also saw management charges levied on commercial users of water.

By May 2002, about 46 000 water users had been registered, accounting for about 90% of the country's water use.

New water use is now subject to licensing. 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.

Billing through the Water Administration and Resource Management System to all water users started in the 2002/03 financial year to recover the appropriate costs. The majority of the 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.

Draft Water Services White Paper

The *Draft Water Services White Paper* was released for public comment by the Minister of Water Affairs and Forestry in February 2003.

The Draft White Paper seeks to address government's beliefs that:

- everyone is entitled to a basic supply of 25 litres of clean water per day, or 6 000 litres per household per month
- no one should be without a water supply for more than seven days per year – if a public supply is interrupted for more than 24 hours, the municipality should liaise with residents and arrange for emergency supplies



The Department of Water Affairs and Forestry was awarded with a Best Practice Certificate for its initiative 'Partnership in Service Delivery for Sustainable Rural Water Provision' by the United Nations Human Settlement Programme (UN-Habitat) in January 2003.

The International Award for Best Practice aims to identify and promote best practices in development from around the world.

Government aims, through the initiative, to eliminate the backlog of water in South Africa within a period of 10 years. The target is for every citizen to have at least 25 litres of clean water available within 200 metres of their households.



- people who cannot afford to pay for water are still entitled to a free basic water supply
- it is a criminal offence to connect to a public water supply without municipal permission
- people who are unable to pay their water bill should make arrangements with their municipality
- municipalities may restrict people to the free basic amount, but may not withhold the basic supply
- municipalities must inform people before they discontinue their services and must also have a consumer service where people can lodge complaints.

The White Paper provides a comprehensive review of policy with respect to the water-service sector in South Africa and provides a policy framework for the next 10 years.

The White Paper addresses the full spectrum of water-supply and sanitation services and all relevant institutions. It will replace the 1994 *White Paper on Water Supply and Sanitation*. The *White Paper on Basic Household Sanitation* of 2001 will also be amended to ensure compatibility with the new White Paper.

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. The objective of this policy is to manage water resources in an integrated manner that will ensure a healthy, stable water-resource base to meet the current and future needs of South Africa.

The definition of water quality has been extended from the classical microbiological and physicochemical status to encompass a more comprehensive consideration of water resources as dynamic aquatic ecosystems, including indicators such as biotic diversity and the status of riverbank or riparian habitat. Water resource quality provides an indication of the status of water resources and the ability of resources to provide sustained access for use. Recognising that protection and conservation are not goals in themselves, the policy reflects the reality that certain effects are associated with equitable water use.

Water resource management provides a protective framework that is intended to safeguard water resource quality against unsustainable practices, through a system of pollution source controls and resource-protection measures. Source-directed measures include a range of regulatory controls aimed at the sources of impact on water resources, such as limitations on:

- abstractions
- the volumes and minimum quality standards for water containing waste being discharged.

Resource-directed measures focus on ecosystems because these provide people with goods and services such as water supply, waste transport, processing and dilution, natural products (e.g. reeds, fish and plants), nature and biodiversity conservation, flood control, recreation, a 'sense of place', and places for religious rituals or spiritual needs. Resource-directed measures are therefore designed to protect the resource to ensure that adequate ecosystems continue to supply people with these goods and services.



Claire Reid, the South African Youth Water Prize winner, was awarded the prestigious Stockholm Junior Water Prize in Stockholm, Sweden, on 12 August 2003.

Claire, a Grade 11 learner at St Teresa Mercy School in Rosebank, Johannesburg, won a R37 000-scholarship and a crystal sculpture, which was awarded by the Crown Princess Victoria on behalf of the Stockholm Water Foundation.

Claire developed the so-called Water Wise Reel Gardening System, a seed-planting system that cuts down water usage by as much as 80% by reducing water leakage into the soil. It also keeps seeds moist, so that they can germinate without using additional water.

A classification system will provide the basis for setting appropriate resource-quality objectives and pollution-source controls for the management of the resource. Water use will be allocated according to the resource class, including the use of certain water resources for disposal of waste discharges. Water resources classified as particularly sensitive or environmentally important will be stringently controlled, with water-use allocations limited to minimise detrimental effects.

While recognising that water resources cannot be protected from all detrimental effects on quality, it is not realistic to seek to prevent all effects on economically important water resources. Controlled effects will be permitted and managed within a system of waste-minimisation technologies, pollution

prevention, recycling and re-use of water. A system of economic incentives will form part of the management approach, through the introduction of the Waste Discharge Charge System (WDCS) in a phased manner intended to foster the use of low-waste or zero-waste technology.

The WDCS will be based on the waste loading discharge by polluters of a particular water resource.

Voluntary as well as mandatory measures for water conservation are intended to ensure that water is used efficiently, as are demanding management strategies, which increasingly form part of water supply, management and development decision-making. The establishment of formal structures for integrated management of water resources at catchment and local level will bring a new dimension to the management of water resource quality. Stronger user representation of all interest groups will ensure equitable allocations among the user groups, as both the costs and benefits of utilising water resources are realised by the stakeholders. Decision-making will be devolved to the appropriate level, allowing those most affected by the decisions to provide primary input through catchment-agency structures.



In September 2003, the 31st Ordinary Session of the Tripartite Permanent Technical Committee (TPTC) considered a report on the drought situation in the southern Africa region.

The TPTC comprises Swaziland, Mozambique and South Africa.

At the 29th Ordinary Session in December 2002, the TPTC noted the scarcity of water in the Inkomati River Basin and mandated the Inkomati System Operation Task Team to monitor the situation.

Following an evaluation of the drought situation, the 30th Ordinary Session held in April 2003 decided to:

- declare a situation of drought in the Inkomati River Basin
- set up a task team to implement measures to manage the use of the waters of the Inkomati River and develop practical measures to mitigate the effects of the drought
- instruct the task team to, among other things, prioritise the supply of water to priority users and ensure effective management of water in the Inkomati River.

At the 31st Ordinary Session, the Task Team reported that it had visited areas affected by the drought on the Mozambican portion of the River, which resulted in measures being adopted to achieve an adequate flow at the Mozambique/South Africa border.

South Africa reported at the meeting that to achieve those flows, restrictions of more than 50% of allocations had been imposed on local irrigators.

Water management institutions

The National Water Act, 1998 sets out the framework for the management of water resources in South Africa. This framework provides for the establishment of water management institutions, which include Catchment Management Agencies (CMAs) and Water-User Associations (WUAs). The core purpose of CMAs is to ensure the sustainable use of water resources in line with the purpose of the Act, which is underpinned by the principles of equity, efficiency, sustainability and representivity.

The country has been divided into 19 Water Management Areas which will each be managed by a CMA. The Inkomati CMA will



be the first to be established in the country, closely followed by an additional three CMAs in the following two years.

The departmental co-ordinating committee, established by the Departments of Water Affairs and Forestry and of Agriculture and Land Affairs, continues to support the plight of emerging farmers. Continued efforts are being made to ensure that these farmers are empowered to establish WUAs and that they function in a sustainable manner.

Numerous Catchment Management Forums have been established nationally to ensure active participation in the management of local water resources so as to acquire optimal social and economic benefits.

These forums ensure that integrated water resource management is implemented. They also play an important role in establishing statutory institutions such as CMAs and WUAs.

During 2002/03, a proposal to establish a CMA in the Inkomati Water Management Area was published for public comment as an important step towards establishing this institution.



In June 2003, the Department of Water Affairs and Forestry announced that a total of 1 577 water and sanitation schemes operated by the Department would be transferred to 84 municipalities.

Some 1 544 departmental schemes valued at R9,95 billion were surveyed before their transfer to local government.

The transfer team comprises the Department of Water Affairs and Forestry, the National Treasury, the Department of Provincial and Local Government and the South African Local Government Association.

The Department's target is to complete all transfers by June 2005, with 90 schemes expected to be transferred in the 2003/04 financial year.

By June 2003, negotiations were under way for the transfer of the 8 094 departmental staff who operated the schemes. Conditional grants [subsidies], which will be phased out by June 2011, will be incorporated into the equitable share allocations to local government.

By June 2003, some 50 Irrigation Boards had been transformed into 25 WUAs. Three Water Boards had been transformed into three WUAs, and eight new WUAs had been established. A further 31 constitutions for WUAs were being evaluated.

Water Boards

The Water Boards were 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.

By March 2003, some 15 Water Boards were in operation.

Working for Water Programme

The Working for Water Programme is a labour-intensive initiative to clear invasive alien plants. These introduced species have a negative impact on South Africa's water security, biological diversity, the ecological functioning of natural systems, the productive use of land and the intensities of fires and floods.

The Programme has a marked influence on employment opportunities, training and capacity-building, community empowerment, social development and the creation of secondary industries. It focuses on the most marginalised – the poor, rural communities, women, the disabled and those living with HIV/AIDS.

The Working for Water Programme 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.

The Working for Water Programme hosted its first Inaugural Research Symposium in Cape Town in August 2003.

The Symposium aimed at highlighting ongoing research, while eliciting responses from the broader research community on innovative approaches in dealing with the problem of alien invader plants.

By August 2003, over one million invader plants had been cleared while over 15 million person days of employment had been created.

A collaborative research partnership between Working for Water and the Agricultural Research Council's (ARC) Plant Protection Research Institute to conduct research into the identification and screening of biological agents was expected to be signed in 2003.

Flood and drought management

In terms of the South African Disaster Management Policy, there is a major move in focus from reactive to preventive disaster management. This will inevitably move the South African flood-management focus from structural to non-structural, such as attaching special value to floodplain zoning and flood warnings.

Dams and water schemes

A number of new projects were and are being undertaken by the Department of Water Affairs and Forestry. Departmental policy ensures that water-demand management programmes are implemented before embarking on new infrastructure development.

One of the most ambitious binational water projects ever to be undertaken is the Lesotho Highlands Water Project between South Africa and Lesotho. The completion of the first phase was celebrated in January 1998. The first phase of the project is composed of 1A and 1B. The main components of 1A are the construction of dams at Katse and Muela, an 82-km water-transfer tunnel and a hydroelectric plant at

Muela. Phase 1B includes the construction of the Mohale Dam and tunnel, and the Matsoku tunnel and weir. The latter was inaugurated in October 2001. By June 2003, the Lesotho Highlands Water Project was progressing well with the Mohale Dam nearly a quarter full.

Planning studies and an environmental-impact assessment have been compiled on the proposed Skuifraam Dam on the Berg River near Franschhoek in the Western Cape. The Dam was also reviewed against the World Commission on Dams' Guidelines, with satisfactory results.

The Levuvhu Water Scheme will provide nine million people in Limpopo with drinking water. Construction of the Nandoni Dam started in May 1998. The total cost of the project will amount to R750 million. The Scheme will also stabilise the water supply for irrigation, and alleviate water shortages in the Kruger National Park. It will be run by the Department of Water Affairs and Forestry's CWSS Programme while municipalities gain the experience and capacity needed to handle the provision of services.

Progress is being made in the establishment of a commission in the Orange-Senqu Basin between Lesotho, Namibia and South Africa. The country is also engaged in a number of collaborative projects with Mozambique and Swaziland. An interim water-sharing agreement was signed in August 2002 as a first step towards the implementation of full basin-management arrangements, as provided for in the Southern African Development Community (SADC) Protocol on Shared Rivers.

The Minister of Water Affairs and Forestry announced during a parliamentary media briefing in February 2003 that the Olifants River would be developed to cope with the increasing water demand generated by platinum-mining developments in Limpopo and Mpumalanga.

During the first phase of the development, the Flag Boshielo Dam, situated on the river near Marble Hall in Mpumalanga, will be raised



The Department of Water Affairs and Forestry/Unilever WASH Partnership was launched in October 2003.

The WASH Partnership involves delivering safe water and adequate sanitation, and educating people on hygienic practices.

The key message of WASH is that proper handwashing at critical times plays a major role in reducing diseases such as diarrhoea.



by 5 m at an estimated cost of R180 million. This will increase its storage capacity from 100 million m³ to 188 million m³, allowing 72 million m³ of water to be used annually, compared with the present 56 million m³. The project is expected to be completed by October 2005.

During the second phase, a large dam will be built, either at Rooipoort, or on the Steelpoort River, a tributary of the Olifants River.

Construction on this phase will start in 2006 and is expected to be completed by 2010. The dam yield will be between 50 and 70 million m³, depending on the final design, and is estimated to cost between R700 and R900 million.

In the interim, the additional water secured by raising the Flag Boshielo Dam will be made available to new mining ventures near Burgersfort in Mpumalanga. This will enable water entitlements, currently leased on a temporary basis by the mining ventures, to be returned to small farmers on the irrigation schemes downstream of the Flag Boshielo Dam, which are being rehabilitated.

Drainage and hydrology

Worldwide, 31% of all rainfall returns as run-off to the sea through rivers. In South Africa, with its abundant sunshine and high evaporation rate, the figure is a mere 9%.

The average annual run-off of all South African rivers amounts to approximately 50 billion m³. This is only half the run-off of the Zambezi River and roughly equal to that of the Nile River at Aswan in Egypt or the Rhine River at Rotterdam in the Netherlands. South Africa lies in a drought belt. Rainfall is seasonal and is influenced by topography. The slopes of the eastern plateau, which cover 13% of the surface area of South Africa, account for nearly 43% of the total run-off. The Orange River System, which drains almost the entire plateau – 48% of the total surface area of the country – accounts for only 24% (about 12 060 million m³) of the total average annual run-off to the sea.

Truly perennial rivers (those that flow all year round) are only found over one quarter of South Africa's surface area – mainly in the southern and south-western Cape and on the eastern plateau slopes.

Rivers that flow only during the rainy season are found over a further quarter of the surface area. Rivers in the western interior are episodic, that is, they flow only sporadically after infrequent storms, while their beds are dry for the rest of the year.

Research on river ecosystems is funded by the Water Research Commission (WRC) and the National Research Foundation. (See Chapter 18: *Science and technology*.)

A key objective of the River Health Programme (RHP) is to 'package' and disseminate information on river health in such a way as to serve ecologically sound management of rivers in South Africa, and inform and educate the people of South Africa regarding the health of rivers.

During the past two years, and in collaboration with the Department of Environmental Affairs and Tourism, the WRC and the Council for Scientific and Industrial Research's (CSIR) Environmentek, a new and sophisticated template has been developed for river-health reporting.

Specific objectives of this reporting format are to:

- provide information to government and agencies for improved decision-making in river management
- compare environmental performances of different areas
- increase public awareness of environmental and development issues
- empower people and organisations to improve their environment and quality of life for themselves and future generations.

The RHP primarily uses biological indicators (e.g. fish communities, riparian vegetation, aquatic invertebrate fauna) to assess the health of river systems. The rationale for using biological monitoring is that the integrity of the

biota inhabiting river ecosystems provides a direct, holistic and integrated measure of the integrity or health of the river as a whole.

The RHP serves as a source of information on the ecological state of ecosystems in the country, in order to support the rational management of these natural resources.

The objectives of the RHP are therefore to:

- measure, access and report on the ecological state of aquatic ecosystems
- detect and report on spatial and temporal trends in the ecological state of aqua
- identify and report on emerging problems regarding aquatic ecosystems
- ensure that all reports provide relevant scientific and managerial relevant information on aquatic ecosystem management.

Lakes and pans

Except for Lake Fundudzi, which was formed by a huge landslide in the Soutpansberg in Limpopo, there are no true inland lakes in the country. Coastal 'lakes' are found at Wilderness on the Cape south coast, and at St Lucia, Sibaya and Kosi Bay on the KwaZulu-Natal coast. Although they are seldom without water, Lakes Chrissie and Banagher near Ermelo in Mpumalanga differ little from the innumerable 'pans' to be found in a wide belt from the Northern Cape through the western Free State to the North West.

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 also

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.

A national groundwater mapping programme and the development of a national groundwater information system form part of the new strategy. A number of important secondary maps, such as national exploitation potential, groundwater importance, classification and groundwater pollution-vulnerability maps have also been produced.

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 in the rural areas. Forestry represents a massive investment in the country and plays an important role in the rural-development strategy.

South Africa has developed one of the largest planted forests in the world. Production from these plantations approached 15,1 million m³, valued at almost R11,86 million, in 2001. Together with the processed products, the total industry turnover was approximately R2,7 billion in 2001, including R2,0-billion worth of wood-pulp.

More than 11,8 million tons (pulpwood, mining timber, matchwood and charcoal) and 3,2 million m³ (sawlogs, veneer and poles) were sold in this period.

Collectively, the forestry 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 balance 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 1 100 indigenous tree species found in South Africa grow along the south and east coasts and on the southern and south-eastern slopes of inland mountains. The other half is spread over the interior plateaux.

The 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.

Arbour Day celebrated its 131st anniversary in 2003. Every year, National Arbour Week is celebrated 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 2003 Trees of the Year were the Kiaat (*Pterocarpus angolensis*) and the Red Current (*Rhus chirindensis*).

In 2003, Arbour Week was celebrated under the theme *Trees are our Heritage – Mehlare ke Bohwa Bja rena*.

At the launch of National Arbour Week 2003 in Johannesburg, the Minister of Water Affairs and Forestry, Mr Ronnie Kasrils, called on the public to help prevent veld and forest fires.

The Minister also announced at the launch that he had proposed a way forward for saving the Jacaranda tree, by asking the Minister of Agriculture and Land Affairs, Ms Thoko Didiza, to list the tree under Category 2 of the Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983), which means that it will be maintained in a similar way to industrial

plantations, but within the boundaries of South African cities. In addition, research is being developed with government funding to develop an infertile seed, so that Jacarandas will not be able to propagate themselves.

The Jacaranda was previously listed as a prohibited tree.

Managing the forests

The Department of Water Affairs and Forestry is pursuing a reform programme in the forestry sector which will eventually see the Government leasing all State-owned forest land to private-sector operators.

The Department will thus move from the management of plantations towards promoting, regulating and developing the forest industry. The forestry policy of the Department focuses on several elements:

- overall policy on the place of forestry in the management of land, water and other natural resources
- industrial forestry
- community forestry
- the conservation of natural forests and woodlands
- South Africa's response to global concerns about forests
- research, education and training
- South Africa's relationship with SADC members, and bilateral relations with countries beyond the SADC.

The policy has been applied, tested and developed in accordance with the following principles:

- sustainable forest development
- forests and forest resources are to be treated as national assets
- democratisation
- gender equity
- people-driven development
- recognition of the scarcity of water resources
- a competitive and value-adding forest sector
- decent employment conditions.

The overall goal of the Department is to promote a thriving forestry sector, to be

utilised for the lasting benefit of the nation, and developed and managed to protect the environment.

The Department of Water Affairs and Forestry has been involved in a strategic transformation and restructuring process during the past two years. To this end, the forestry division has been restructured into two main functional areas, namely Forestry Operations and Policy and Regulation.

The Policy and Regulation branch has four management components:

- Forestry Policy and Strategy is responsible for developing an appropriate policy and strategy framework for sustainable forest management (SFM) in South Africa, and for promoting the Department's sector leadership role in forestry, both nationally and inter-nationally
- Technical and Information Services is responsible for developing forestry norms and standards, technical guidelines, criteria and indicators for SFM, managing systems for forestry information, and providing technical advice to the Department's regions and other sector institutions
- Participatory Forestry is responsible for providing assistance, advocacy and promoting and formulating programmes and guidelines for the implementation of participative forestry to serve the livelihoods of poor, rural and marginalised urban communities, in terms of using indigenous forests, exotic plantations and associated resources.
- Forestry Regulation is responsible for ensuring effective regulation under the National Forest Act, 1998 (Act 84 of 1998), and the National Veld and Forest Fire Act, 1998 (Act 101 of 1998), including overseeing the management of State forests by commercial entities and/or public bodies.

The Forestry Operations Branch has two management components:

- Forestry Transfers co-ordinates and supports the Department's regional operations in transferring the management of commercial

plantations (as well as indigenous forests) to other private (or public) institutions.

- Forestry Support co-ordinates and monitors the operations of the regional clusters in line with the Department's forestry policy, and co-ordinates the implementation of national forestry programmes.

The following are some highlights of the progress made in the restructuring of the State's forest assets:

- Late in 2001, the remaining 22 800 hectares (ha) of forest plantation in the KwaZulu-Natal package was sold to the Siyaqhubeka Consortium comprising Mondi Ltd and Imbokodvo Lemabalabala, a black empowerment company representing communities living near the forest plantations. This area was sold for R100 million in addition to the lease rentals, which were valued at R48 million.
- Late in 2001, the Eastern Cape North package (57 000 ha) was sold for R45 million to Singisi Forest Products, which is a consortium involving Hans Merensky Holdings and community groups living in the areas adjacent to the forest. The involvement of the communities has been facilitated by the Eastern Cape Development Corporation.
- The largest package to be put out to tender in the restructuring process was the Komati-land Forests package.

The bid price was R446 million, or R335 million for 75%. The Department of Public Enterprises announced the short-listed bidders in May 2003. The preferred bidder was expected to be announced in December 2003. Komati-land operates 20 plantations that occupy approximately 129 000 ha in Mpumalanga, Limpopo and KwaZulu-Natal. It also operates two sawmills, a veneer-slicing plant and an export facility in Richards Bay.

- The Eastern Cape South package, consisting of approximately 15 000 ha of forests, has been offered for sale.
- The South African Forestry Company Ltd's



(SAFCOL) commercial forest operations and sawmills in the Western and southern Cape have been restructured into a single package and transferred to a special-purpose vehicle company called Mountain to Oceans (MTO) Forestry (Pty) Ltd.

- Forestry will be phased out on 12 000 ha, on the eastern and western shores of Lake St Lucia. Of the area to be phased out, SAFCOL will clear-fell about 6 600 ha over the next five years. The land will be transferred to the Greater St Lucia Wetland Authority and will be incorporated into the conservation area falling under the World Heritage Site. This will encourage tourism investment through the Lubombo Spatial Development Initiative.
- Forestry operations will be phased out on 15 000 ha in the Boland area of the Western Cape and 30 000 ha in the southern Cape currently managed by SAFCOL. These plantations are not commercially viable and timber no longer represents the best land-use option in these areas. This will open up opportunities for other land uses including agriculture (particularly fruit and grapes), tourism and conservation. The process of conversion will be carefully managed over a period of 10 to 15 years.

With the conclusion of the Singisi and Siyaqhubeka deals by the beginning of 2002, SAFCOL's plantation area stood at 179 000 ha, and that of the Department of Water Affairs and Forestry at 158 000 ha.

The latter area will gradually reduce as the Department's title deeds are transferred into SAFCOL's name. As part of the restructuring process, the Department's plantations were split into category A, B and C plantations. The category A plantations were regarded as being commercially viable and were amalgamated into the SAFCOL plantation packages. No final decision has however been taken regarding the future of the category B and C plantations which are regarded as being non-commercially viable.

The remaining forestry areas (3 000 ha in the Western Cape and 30 000 ha in the

southern Cape) will continue to be operated on a sustainable basis. Negotiations are under way with a preferred bidder, Cape Timber Resources (CTR) (Pty) Ltd.

The Department agreed in March 2003 to transfer management control over the Tokai and Cecilia State Forests situated within the area, for the establishment of the Cape Peninsula National Park. The forestry operations will be managed by MTO, and South African National Parks (SanParks) will manage the recreation and conservation functions.

SanParks will continue to accommodate MTO's commercial forestry activities, but will manage the plantations on a multiple use and sustainable basis within a broader conservation framework. The parties will work on a detailed agreement, which will involve the Departments of Water Affairs and Forestry and of Environmental Affairs and Tourism, the MTO, and the Cape Peninsula National Park.

As with the lease agreements for other State forests in the Cape, MTO will retain access to the timber-producing sections of the two plantations for the next 70 years. Conservation and commercial timber production will therefore co-exist on the same area, managed in an integrated and mutually beneficial manner by a single management authority.

By mid-2003, the process of transferring indigenous forests in the Knysna/Tsitsikamma area to SanParks was at an advanced stage of negotiations. Both the process of arriving at an appropriate legal mechanism for the transfer and negotiations for the transfer of employees are at an advanced stage. In terms of the legal mechanism agreed on, the Department of Water Affairs and Forestry will transfer to SanParks through a delegation agreement provided in Section 547 of the National Forests Act, 1998. This will ensure that SanParks will manage the area according to all the provisions of the National Forests Act, 1998.

South African Forestry Company Limited
SAFCOL, a wholly-owned State enterprise

comprising the Department of Water Affairs and Forestry's forestry assets at the time, was formed in 1992.

Its objectives were to enhance the development of the local forestry industry and to optimise the State's forestry assets through running the business on accepted commercial management practices and sustainable forestry-management principles. At the time of its creation, SAFCOL managed 256 000 ha of world-class softwood sawlog plantations, and six small sawmills and pole-treating plants. Its annual roundwood production of 3,3 million m³ represented a significant contribution to the industry's total output and provided the sawmilling industry with 75% of its fibre requirements.

The decision by government to restructure its forestry assets, not just those managed by the Department of Water Affairs and Forestry, but also those managed by SAFCOL, has had a marked impact on the company since 2001. Two special-purpose vehicles to assist in the restructuring process were formed, namely MTO and Komatiland Forests in Mpumalanga.

Once the process is complete, SAFCOL will remain in existence, its task being to manage the removal of plantations from commercial production.

With all the assets of SAFCOL expected to be sold by 31 March 2004, the company will remain as a holding company of the minority interests in the privatised entities, on behalf of government, its shareholder.

Industry and exports

The industry was a net exporter to the value of over R5,7 billion in 2002, more than 97% of which was in the form of converted value-added products. This trade surplus represented 26,4% of the country's entire trade surplus of R4,2 billion in 2002.

The forest-products industry ranks among the top exporting industries in the country, having contributed 3,58% to the total exports and 1,99% of total imports in 2002.

Capital investment in the industry amounted to some R17,8 billion in 2002. Investment totalled R16,3 billion in 2001 and R9,7 billion in 1999.

The value of forest-product exports has grown significantly over the past decade, from R2,3 billion in 1992 to R11,2 billion in 2002, a growth of 379%. In real terms (taking inflation into account), this growth was 129%, or a compounded real growth of 7,8% per annum 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 523% in nominal terms (198% in real terms) to R5,6 billion in 2002.

In 2002, paper exports were the most important (R4,254 billion or 38% of the total), followed by solid wood products (R3,780 billion or 34% of the total), pulp (R2,894 billion or 26% of the total), and other products (R0,275 billion or 2% of the total). Woodchip exports, which are exported mainly to Japan, accounted for 52% (R1,964 billion) of the total solid wood products exports.

Total sales from primary processing plants in 2001 amounted to some R11,9 billion. However, when the value of paper sales are included (this is a secondary processing activity), this figure increases to R22 billion.

In 2001, the forestry industry contributed 8,7% to agricultural Gross Domestic Product (GDP), and the forest products industry contributed 7,1% of the country's manufacturing GDP. The total contribution to the entire South African GDP in that year amounted to 1,2%.

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 SFM and makes recommendations on how public access to State-owned forests can be improved.

Sustainable forest management

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 1 million ha, or over three-quarters of the entire area of commercial forestry plantations in South Africa, are currently certified by the Forest Stewardship Council (FSC) and the ISO 14001 certification schemes as being sustainably managed.

South Africa now has one of the largest areas of FSC-certified plantations of any country in the world. 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 these large companies have their own specialist environmental departments which ensure, among other things, 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 these regular audits are done.

There has also been a large increase in the number of non-corporate growers who have become certified. This has been for a number of reasons, among others, 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 recent accreditation of the South African Bureau of Standards by the FSC to conduct farm management unit-certification audits on their behalf.

As part of its commitment to the practice of SFM, the forestry industry is also involved in the NFAC's Committee for SFM, whose primary responsibility it is to develop 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 is to be tested infield. The industry is fully supportive of this process and has invited the Department to test the criteria in its plantations.

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 received FSC certification, which is a first for the continent for high forests. This is a major step towards the sustainable management of the country's natural forests.

Legislation

The restructuring of the forestry sector is supported by the National Forests Act, 1998 and the National Veld and Forest Fire Act, 1998.

The National Forests Act, 1998 provides a framework for the development of principles, criteria, indicators and standards for SFM. The criteria, indicators and standards that are being developed for SFM are currently being piloted for testing.

The Act ensures that the public has reasonable access to State forest land for recreational, cultural, spiritual and educational purposes. In addition, provision is made for the protection of indigenous forests, as well as support for community forestry.

The National Veld and Forest Fire Act, 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 high-canopy forest

There are approximately 530 000 ha of indigenous high forest in South Africa, amounting to about 0,45% of the country's land surface.

The Department is responsible for the management of between 180 000 ha and 200 000 ha of these forests, which occur mainly on the eastern and southern slopes of mountain ranges from the Soutpansberg in Limpopo to the Cape Peninsula in the Western Cape.

High forest is normally found in isolated pockets, varying in size from only a few hectares to several thousand hectares.

The largest area of high forest (36 000 ha) lies within a strip some 220 km long and 26 km wide between the Outeniqua and Tsitsikamma Mountain Ranges and the sea, extending from Mossel Bay in the Western Cape, through Knysna, to the Humansdorp district in the Eastern Cape. High forest occurs mainly in patches in mountain kloofs. In the Eastern Cape, indigenous forests occur along the coast and on the Amatola and Transkei Mountain Ranges.

Forests in KwaZulu-Natal and the former Transkei area of the Eastern Cape are generally small, and those that are easily accessible have been heavily exploited in the past.

Although similar in composition to those of the Keiskamma area, these forests also include some of the tropical tree species from the northern parts of South Africa.

In Mpumalanga and Limpopo, high forest occurs in patches in the mountain ranges

along the eastern edge of the Highveld plateau, while the largest areas are in the Woodbush and Soutpansberg Ranges.

The single largest part of the indigenous high forest (about 15%) is managed by the Chief Directorate: Forestry according to certain multiple-use objectives.

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.

Scrub forest and woodlands

This vegetation covers extensive areas in the low-lying, drier areas of Limpopo, KwaZulu-Natal and Mpumalanga. Some areas of savanna and woodlands have been denuded for agriculture and firewood. Most tree species of the scrub forests and woodlands grow slowly and do not reach great heights. The woodlands are, however, a valuable source of fuel, fencing material and other products. They provide protection for the soil, and shelter and fodder for livestock. The tree growth along much of the coast is classified as coastal scrub, with the exception of patches of high forest at Alexandria and along the Eastern Cape coast.

Planted 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.

The private sector owns 971 098 ha (or 72%) of the total plantation area of 1 351 176 ha as well as virtually all the processing plants in the country. The remaining 28% (380 663 ha) is under public ownership. The extent of public ownership will decrease significantly once the restructuring process is complete.

In 2002, the capital investment in these plantations stood at R15 billion, 55% of which is 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.

The forestry industry is promoting rural development and economic empowerment through a small-grower afforestation programme. Currently, there are more than 20 000 small emerging black timber growers, the vast majority of whom operate through 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, cultivate 48 000 ha of plantations.

Plantation yields

Of the 1 351 176 ha of plantations in 2001, 52% were softwood species and 48% hardwood species. Thirty-seven per cent of the plantation area was managed mainly for saw-log production, 56% 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 annum for softwood, to 21 m³ per ha per annum for eucalyptus and 10 m³ per ha per annum 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 16,6 million m³ in 2001.

Primary wood-processing

South Africa currently has 167 primary wood-processing plants, 161 of which are owned by the private sector and only six of which are owned by local and State authorities. Of these, some 92 are sawmills; 14 mining-timber sawmills; 29 pole-treating plants; 17 pulp, paper and board mills; two match factories, and four charcoal plants. The total roundwood intake in 2001 was 16,7 million m³ valued at R2,7 billion. The value of sales of timber products produced by these primary processing plants totalled R11 867 million. An amount of some R17,8 billion was invested in primary roundwood-processing plants (at book value). At market value, this increased to an estimated R25 billion.

The two main pulp-and-paper manufacturing companies in South Africa, Sappi and Mondi, rank among the largest in the southern hemisphere and own assets in many parts of the world.

Research and training

South Africa has world-class forestry-research infrastructures and personnel, with almost 2% of the forestry industry 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.

Forestry research is mainly undertaken by the Institute for Commercial Forestry Research, Environmentek (CSIR), the University of Stellenbosch, the Plant Protection Research Institute of the ARC, the Forestry and Agricultural Biotechnology Institute at the University of Pretoria, the University of Natal (Pietermaritzburg), and the Port Elizabeth University of Technology (Technikon), George (Saasveld Campus). All major forestry companies also undertake in-house applied research.

Degrees in forestry are offered by the Faculty of Agricultural and Forestry Sciences at the

University of Stellenbosch, the University of Natal (Pietermaritzburg) and the University of Venda. Diplomas and limited degree courses in forestry disciplines are also offered at the Port Elizabeth University of Technology, George (Saasveld Campus). The Natal University of Technology offers a diploma in Pulp and Paper Technology. 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

According to the *White Paper on Sustainable Forest Development in South Africa*, community forestry is designed and applied to meet local social, household and environmental needs and to favour local economic development. It 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) in the Department of Water Affairs and Forestry has emerged as an integrated approach that contributes to achieving the goal of the SFM of South African forests.

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

The PFM Policy covers all forest resources in South Africa that are under the jurisdiction of the National Forests Act, 1998. For forest

land under State ownership, custodians are requested to adhere to the principles of SFM, including the PFM Policy.

The PFM Policy involves keeping in line with and supporting other policy developments on local economic development, the protection and management of natural resources and biological diversity, transfer of management of government assets, forest-enterprise development, and support for previously disadvantaged individuals and the constitutional rights of all South Africans.

The more detailed approach and priorities for the actual implementation of PFM are guided by the forthcoming strategies for PFM and for Forest Enterprise Development.

PFM is aimed to be:

- the best practice for the management of all State forests
- a key element in the management of the State-owned commercial plantations managed under a private lease
- part of the scope for forest enterprise development
- implemented with communities in the management of woodlots and woodlands.

The PFM policy is subject to policy directions as set out in the:

- *White Paper on Sustainable Forest Development in South Africa*
- National Forestry Action Programme
- National Forests Act, 1998
- Framework for the PFM Programme
- Policy and Guidelines on Access to State Forests
- Policy and Strategy for Management Devolution of State Natural Forests to other Agents.

Food and Trees for Africa (FTFA)

FTFA is the sub-Saharan African partner of the International Global Releaf greening organisation.

In 2003, the FTFA trained some 637 community and government representatives, planted 29 398 trees with a survival rate of



more than 80%, and facilitated some 34 urban greening projects in the greater Johannesburg area.

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 and 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 food life.

Eduplant

EduPlant, the national schools programme funded by the Eskom Development Foundation, contributes to the upliftment of schools throughout South Africa by assisting disadvantaged schools to grow their own food. EduPlant provides greener environments conducive to learning. It focuses on permaculture and has received a R2-million grant from the Department of Water Affairs and Forestry.

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