



South Africa
Yearbook
2020/21

Human Settlements, Water and Sanitation

Human Settlements, Water and Sanitation

In 2020/21, the Department of Human Settlements (DHS) and the Department of Water and Sanitation (DWS) were reporting to the Minister of Human Settlements, Water and Sanitation. However, in August 2021, President Cyril Ramaphosa announced the separation of the Ministry of Human Settlements from the Ministry of Water and Sanitation. The two portfolios were brought together with the understanding that the provision of water is closely tied to the development of human settlements.

Government has since noted that water is a far broader issue, impacting not only on human settlements, but also on agriculture, industry, mining and environmental management. The separation will enable a dedicated focus on ensuring that all South Africans have access to a secure and sustainable supply of water.

Human Settlements

The DHS is mandated to establish and facilitate a sustainable process of housing development in collaboration with provinces and municipalities. This mandate is derived from Section 3 of the Housing Act, 1997 (Act 107 of 1997). The department's core responsibilities are to determine national policy and national norms and standards for housing and human settlements development, set broad national housing delivery goals, provide funding resources to provinces and metropolitan municipalities, and monitor the financial and non-financial performance of provinces and municipalities against these goals. In executing these roles and responsibilities, the department also builds capacity for provinces and municipalities, and promotes consultation with all stakeholders in the housing delivery chain.

The National Development Plan (NDP) expresses the need for a systematic response to South Africa's entrenched spatial patterns that exacerbate social inequality and economic inefficiency. Priority 4 (spatial integration, human settlements and local government) of government's 2019 – 2024 Medium Term Strategic Framework (MTSF) is aimed at addressing this need. To give effect to these guiding policies, the DHS will focus on four priority areas over the medium term: facilitating the development of integrated human settlements, upgrading informal settlements, providing affordable rental housing and providing affordable housing finance.

Facilitating the development of integrated human settlements

The DHS will continue to review housing legislation and related policies to secure tenure, improve access to the housing market, transform spatial housing patterns, and create inclusive and mixed-use urban living spaces. Investment will be redirected to support the creation of inclusive communities in 94 declared priority development areas, as informed by 75 integrated implementation plans that are set to be developed over the medium term.

In collaboration with provinces and municipalities, the DHS also expects to deliver 270 000 subsidy housing units. Provincial allocations to subsidise low-income housing through the Human Settlements Development Grant amount to R41.7 billion over the medium term, while allocations to fund associated bulk infrastructure projects in metropolitan municipalities through the Urban Settlements Development Grant amount to R22.4 billion.

These initiatives are budgeted for in the Integrated Human Settlements Planning and Development programme, in which spending is expected to decrease from R26 billion in 2020/21 to R22.6 billion in 2023/24, at an average annual rate of 4.6%. This decrease is due to funding for informal settlements being shifted from components in the Human Settlements Development Grant and Urban Settlements Development Grant.

Upgrading informal settlements

In response to rapid urban migration and an increase in the number of informal settlements across South Africa, from 2021/22, informal settlements projects will be funded from the newly created Informal Settlements Upgrading Partnership Grant. The provincial allocation to the grant amounts to R12.3 billion over the Medium Term Expenditure Framework (MTEF) period, and the allocation for metropolitan municipalities amounts to R12.5 billion.

These grants are expected to be used to upgrade and formalise 300 settlements in each year over the medium term; and deliver 180 000 stands with access to municipal services. As a result, spending in the Informal Settlements programme is expected to increase at an average annual rate of 143%, from R648.2 million in 2020/21 to R9.3 billion in 2023/24.

Providing affordable rental housing

To improve the functioning of the rental housing market, the DHS expects to provide 18 000 affordable rental units and 7 200 community residential units at a projected cost of R2.9 billion over the medium term in the Rental and Social Housing programme.

Spending in this programme is expected to decrease at an average annual rate of 5.6%, from R1.2 billion in 2020/21 to R997.2 million in 2023/24, mainly due to the one-off rental relief allocation in 2020/21 and Cabinet-approved reductions on transfers to public entities over the MTEF period. Despite these reductions, the Social Housing Regulatory Authority will continue to invest in the affordable rental housing market by providing R2.4 billion in capital subsidies over the medium term, through the consolidated capital grant, and operational support grants worth R69.9 million, through the Institutional Investment Grant.

Providing affordable housing finance

The DHS provides housing finance for households that earn too much to qualify for a full housing subsidy but too little to qualify for a mortgage loan. Through the Finance-Linked Individual Subsidy Programme (FLISP), the department will provide a targeted 12 000 subsidies that serve as lump-sum deposits to lower monthly mortgage repayments for qualifying beneficiaries.

Spending in the Affordable Housing programme is expected to decrease at an average annual rate of 6.7%, from R734.6 million in 2020/21 to R595.7 million in 2023/24, mainly due to the one-off debt relief allocation in 2020/21. The FLISP accounts for R1.4 billion of the programme's budget over the MTEF period.

Legislation and policy

The mandate of the DHS is derived from the following legislative framework:

- the Housing Act of 1997, which provides for the facilitation of a sustainable housing development process, and further lays down general principles applicable to housing development in all spheres of government, including defining the functions of national, provincial and local governments in respect of housing development;
- the Estate Agency Affairs Board Act, 1976 (Act 112 of 1976),

- which provides for the establishment of an Estate Agency Affairs Board and an Estate Agents Fidelity Fund, including the control of certain activities of estate agents in the public interest;
- the Social Housing Act, 2008 (Act 16 of 2008), which provides for the establishment of the Social Housing Regulatory Authority, as regulator of all social housing institutions, and further defines the functions of national, provincial and local governments in respect of social housing;
 - the Prevention of Illegal Eviction and Unlawful Occupation of Land Act, 1998 (Act 19 of 1998), as amended, which provides for the prohibition of unlawful eviction and further provides procedures for the eviction of unlawful occupiers, including the repeal of the Prevention of Illegal Squatting Act, 1951 (Act 52 of 1951);
 - the Housing Consumers Protection Measures Act, 1998 (Act 95 of 1998), which makes provision for the protection of housing consumers and also provides for the establishment and functions of the National Home Builders Registration Council (NHBRC);
 - the Rental Housing Act, 1999 (Act 50 of 1999), which provides clear roles and responsibilities of government in respect of rental housing property and also makes a provision for promoting access to adequate housing through creating mechanisms for ensuring the proper functioning of the rental housing market;
 - the Public Finance Management Act (PFMA), 1999 (Act 1 of 1999), as amended, which secures transparency, accountability, and sound management of the revenue, expenditure, assets and liabilities of the institutions to which it applies. The Act regulates financial management in the national government and provincial spheres of governments. It also assists in ensuring that all revenue, expenditure, assets as well as liabilities of those two spheres of governments are managed efficiently and effectively. The Act further provides for the responsibilities of persons entrusted with financial management in those two spheres of governments;
 - the Home Loan and Mortgage Disclosure Act, 2000 (Act 63 of 2000), which promotes the practice of fair lending by requiring disclosure by financial institutions of information regarding the provision of home loans. It also serves to establish an Office of Disclosure. The Act requires lenders to compile and disclose annual data on the demographic makeup and geographic distribution of housing-related loans;
 - the Intergovernmental Relations Framework Act, 2005 (Act 13 of 2005), which serves to establish a framework for the three spheres of government to promote and facilitate intergovernmental relations among them. The Act also provides for mechanisms and procedures in order to facilitate the settlement of intergovernmental disputes among spheres of government;
 - the Housing Development Agency Act, 2008 (Act 23 of 2008), which serves to establish the agency and to provide for its functions and powers. It also outlines the roles of the agency, which is to facilitate the acquisition of land and landed property, in a way that complements the capacities of government across all spheres, and to fast-track land acquisition and housing development services for the purpose of creating sustainable human settlements;
 - the Spatial Planning and Land Use Management Act, 2013 (Act 16 of 2013), which provides a framework for spatial planning and land use management in South Africa. It specifies the relationship between the spatial planning and the land use management system and other kinds of planning. It also ensures that the system of spatial planning and land use management promoted social and economic inclusion;
 - the Community Scheme Ombud Service Act, 2011 (Act 9 of 2011), which serves to provide for the establishment of the Community Schemes Ombud Service and to provide for its mandate and functions. The Act also provides for a dispute resolution mechanism in community schemes;
 - the Broad-based Black Economic Empowerment Act, 2003 (Act 53 of 2003), which establishes a legislative framework for the promotion of black economic empowerment (BEE) and empowers the relevant Minister to issue codes of good practice and to publish transformation charters for key sectors. The Act further establishes the BEE Advisory Council;
 - the Expropriation Act, 1975 (Act 63 of 1975), which serves to provide for the expropriation of land and other property for public and certain other purposes;
 - the Development Facilitation Act, 1995 (Act 67 of 1995), which facilitates and speeds up the implementation of the Reconstruction and Development Programme and projects;
 - the Less Formal Township Establishment Act, 1991 (Act 113 of 1991), as amended, which provides for shortened procedures for the designation, provision and development of land and for the establishment of township for less formal forms of residential settlement;
 - the National Environment Management Act (NEMA), 1998 (Act 107 of 1998), as amended, which protects ecologically viable areas representative of South Africa's biological diversity and its natural landscapes and seascapes in a system of protected areas. The Act places a responsibility on the department to adhere to sustainable development and conservation principles;
 - the Sectional Titles Management Act, 2011 (Act 8 of 2011), which provides for the establishment of body corporates to manage and regulate sections and common property in sectional titles schemes and for that purpose to apply rules applicable to such schemes. It further requires the body corporates to establish a sectional titles schemes management advisory council; and
 - the Division of Revenue Act, 2018 (Act 14 of 2018), as amended, which provides for the equitable division of revenue raised nationally among the national, provincial and local spheres of government for various financial years. It also makes a determination of each province's equitable share and allocations to provinces, local government and municipalities from national government's equitable share and the responsibilities of all three spheres pursuant to such division and allocations.

Budget

The DHS's budget allocation for 2020/21 was adjusted downwards by R2.3 billion, from R31.3 billion to R29 billion.

Entities

Community Schemes Ombud Service (CSOS)

The CSOS is mandated to provide dispute resolution services for community schemes; monitor and control the quality of all governance documentation for sectional title schemes; and take custody of, preserve and provide public access to scheme governance documentation.

Over the medium term, the CSOS will continue to focus on registering community schemes and providing quality assurance for scheme governance documentation, providing dispute resolution and adjudication services, and regulating the conduct of parties in community schemes. To improve efficiency, the ombud will acquire an enterprise resource

planning system to automate registration in its aim to successfully register all community schemes and take over all governance documentation for schemes; and acquire a records management system to allow for the retrieval, extraction and storing of scheme governance documents from deeds offices. These investments are expected to enable the entity to register 27 500 community schemes over the next three years.

The entity's total budget for 2020/21 was R271.5 million.

Estate Agency Affairs Board

The board is mandated to regulate, maintain and promote the conduct of estate agents, issue fidelity fund certificates, and prescribe the standard of education and training for estate agents. The board manages and controls the Estate Agents Fidelity Fund, and investigates complaints lodged against estate agents.

Over the medium term, the board will focus on professionalising the sector through education and training, and enforcing compliance with legislation and regulations. As such, the board plans to enroll 6 154 non-principal agents and 541 principal agents in the professional designation examinations, renew 192 261 fidelity fund certificates and inspect 700 estate agencies. In line with its aim to encourage individuals at the lower end of the property market to enter into formal property transactions and use immovable property as a store of wealth, the board will also provide technical support to reduce the cost of transacting for estate agents and agencies who buy and sell properties in the affordable housing market. As a result of these activities, expenditure is expected to increase at an average annual rate of 1.1%, from R186.9 million in 2020/21 to R193.1 million in 2023/24.

The board generates revenue mainly through levies and contributions from estate agents, examination and management fees, and the administration of the Estate Agency Fidelity Fund. As compliance improves, the board expects revenue from examinations and penalties to decrease, resulting in a decrease in total revenue at an average annual rate of 0.3%, from R200.5 million in 2020/21 to an estimated R198.5 million in 2023/24.

The board's total budget for 2020/21 was R186.9 million.

Estate Agents Fidelity Fund

In executing its functions, the Estate Agency Affairs Board administers and manages the Estate Agents Fidelity Fund in

the interests of the public and the estate agents registered with the board. The fund derives its revenue through administrative fees, interest earned on trust accounts held by estate agents and recovered claims.

Expenditure is expected to decrease from R108.3 million in 2020/21 to R94.6 million in 2021/22, then increase to R108.3 million in 2023/24. This fluctuation is mainly due to a decrease in expected revenue from the Services Sector Education and Training Authority for a three-year internship programme for emerging estate agents, which ends in 2020/21.

Housing Development Agency

The agency is mandated to identify, acquire, hold, develop and release state-owned and privately-owned land for residential and community purposes; and manage housing development projects for the creation of sustainable human settlements. The agency also provides provinces and municipalities with project, technical and land geospatial services related to housing developments.

Over the medium term, the agency will focus on preparing provinces and municipalities for housing development projects within declared priority development areas; and facilitating the acquisition, development and release of a targeted 1 875 hectares (ha) of well-located land for human settlements. Expenditure and revenue are both expected to increase at an average annual rate of 2.7%, from R375 million in 2020/21 to R406.1 million in 2023/24. The agency expects to derive 60.7% (R721.7 million) of its revenue over the medium term through transfers from the DHS, and the remainder through provincial projects, and management and professional fees.

The agency's total budget for 2020/21 was R495.4 million.

National Home Builders Registration Council

The NHBRC is mandated to represent the interests of housing consumers by providing warranty protection against defined defects in new homes, and to regulate the home-building industry. It also provides training and capacity building to promote and ensure compliance with technical standards for building homes.

Over the medium term, the council will focus on regulating the home-building industry, increasing the enrolment of subsidy and non-subsidy homes, and increasing the number of home inspections conducted. The council plans to conduct 261 721 inspections on the targeted 148 589 subsidy homes, and 172 750

inspections on the targeted 124 249 non-subsidy homes.

The council often conducts multiple inspections on homes during the construction process. As a result of the projected increase in the number of home inspections conducted and the number of home builders and inspectors trained, the council's expenditure is expected to increase at an average annual rate of 2.1%, from R855.8 million in 2020/21 to R910.7 million in 2023/24.

The council receives income from home enrolments, registrations and renewal fees; and from technical services, interest and dividends. Total revenue is expected to increase at an average annual rate of 4.5%, from R1.4 billion in 2020/21 to R1.6 billion in 2023/24.

The council's total budget for 2020/21 was R855.8 million.

National Housing Finance Corporation

The NHFC is mandated to provide access to affordable housing finance for low-income and middle-income households by leveraging private sector funding to finance housing developments and create affordable housing stock.

Over the medium term, the corporation will provide affordable housing finance to intermediaries, such as social housing institutions; retail financial intermediaries that provide micro loans for home improvements; and developers and emerging contractors who invest in affordable rental housing stock. It expects to disburse R1.4 billion in finance-linked individual subsidies to 12 000 qualifying households over the MTEF period.

The corporation derives its revenue mainly through interest on loans; interest and dividends on investments; rental income; and transfers from the DHS for the FLISP, which account for an average of 43.4% (R1.4 billion) of total revenue over the MTEF period and include an operational allocation.

Social Housing Regulatory Authority

The authority is mandated to regulate the social housing sector, and subsidise affordable rental housing units for low-income to middle-income households. Over the medium term, the authority will focus on increasing the supply of new rental stock and building capacity in the sector by providing capital subsidies to accredited social housing institutions. These subsidies reduce the capital cost of constructing rental units, as well as rental costs for tenants.

The regulator's total budget for 2020/21 was R817.6 million.

Programmes and funding

Finance-Linked Individual Subsidy Programme

The Constitution enshrines the right of everyone to have access to adequate housing and makes it incumbent upon government to take reasonable measures to achieve this.

Among government's many programmes, the FLISP is specifically intended for the market segment whose income is inadequate to qualify for a home loan but exceeds the maximum limit applicable to access government's Free Basic House Subsidy Scheme. This market segment, generally known as the "affordable/gap" market, earns between R3 501 and R15 000 per month.

Households in this segment, if buying a home for the first time, may apply for a FLISP subsidy. The subsidy attaches to the beneficiary and not to the property. This is used to decrease the mortgage bond and applies only to people who have never been assisted by government. It is disbursed as a once-off subsidy.

Rental and Social Housing

Social housing provides medium density rental housing to low-income households. The programme promotes the provision of affordable rental housing, monitors the performance of the Social Housing Regulatory Authority and develops capabilities in the rental housing sector through intergovernmental collaboration and evidence-based research.

Over the medium term, work under the programme will include promoting the delivery of affordable rental housing by conducting research, and developing policies and programmes as and when required, strengthening cooperation and collaboration by facilitating intergovernmental forums and stakeholder partnerships on an ongoing basis, and accelerate the provision of affordable rental housing by providing capital and operational funding to the Social Housing Regulatory Authority to deliver 18 000 social housing units and monitoring and evaluating the financial and non-financial performance of affordable rental housing programmes and projects on a monthly and quarterly basis.

Integrated Human Settlements Planning and Development

The programme manages the development of policy, planning and research in the creation of sustainable and integrated

human settlements, oversees the delivery of the Integrated Residential Development Programme, and coordinates intergovernmental partnerships with stakeholders.

Over the medium term, work under the programme will include accelerating the delivery of spatially integrated housing and human settlements development by transferring and monitoring the Human Settlements Development Grant and Title Deeds Restoration Grant to provinces, the Urban Settlements Development Grant to metropolitan municipalities, and undertaking research and developing housing and human settlements policies and programmes.

It will also promote planning coordination and strengthen intergovernmental cooperation across and within different spheres of government by providing support to provinces and municipalities in the development of 57 integrated implementation plans over the medium term and facilitating intergovernmental forums and stakeholder partnerships on an ongoing basis.

Informal Settlements

The programme provides policy, planning and capacity support for the upgrading of informal settlements, and oversees the implementation of the Informal Settlements Upgrading Programme. Over the medium term, work under the programme will include accelerating the provision of security of tenure, basic services and related infrastructure by managing the transfer of the Informal Settlements Upgrading Partnership Grant to municipalities and provinces, undertaking evidence-based research and developing responsive policies, and supporting provinces and municipalities through the National Upgrading Support Programme.

Affordable Housing

The programme facilitates the provision of affordable housing finance, monitors market trends and develops research and policy that respond to demand. It also oversees housing finance entities reporting to the Minister of Human Settlements. Over the medium term, work under the programme will include strengthening cooperation and collaboration by facilitating intergovernmental forums and stakeholder partnerships.

It will also accelerate the provision of affordable housing finance by providing capital and operational funding to the National Housing Finance Corporation for the administration

of the FLISP, researching and developing policies and programmes that promote the provision of affordable housing finance for households as and when required, and monitor and evaluate the financial and non-financial performance of affordable housing programmes and projects.

Housing subsidies

A housing subsidy is a grant given by government to qualifying beneficiaries to be used for housing purposes. The subsidy is either paid to a seller of a house or, in new developments, it is used to finance the construction of a house that complies with the Ministerial Minimum Norms and Standards. The house is then transferred to the qualifying beneficiary.

One of the DHS's areas of responsibility in the delivery of human settlements relates to the bottom-most end of the market, where it provides housing subsidies to the poor. This is where the bulk of the housing backlog exists, affecting mainly those who earn below R3 500 a month.

Individual subsidies

An individual subsidy provides qualifying beneficiaries with access to housing subsidies to acquire ownership of improved residential properties (a stand or house) or to finance the acquisition of a serviced site linked to a house-building contract that is not part of an approved housing-subsidy project.

The latter option is only available to beneficiaries with access to housing credit. The subsidy amount of R84 000 comprises R6 000 for the raw land cost, R22 162 for internal municipal engineering services and R55 706 for the cost of constructing the top structure.

Consolidation subsidies

This subsidy mechanism gives former beneficiaries of serviced stands, financed by the previous housing dispensation (including the Independent Development Trust's site and service schemes), the opportunity to acquire houses.

Housing Development Finance Programme

The grant funds the delivery of housing and human settlements programmes, and manages all matters related to improving access to housing finance and developing partnerships with the financial sector. Its objectives are to:

- manage the performance of provinces and municipalities by

monitoring the expenditure and non-financial performance of human settlements development and housing programmes on a monthly and quarterly basis;

- accelerate the delivery of housing and human settlements by providing funding from the Human Settlements Development Grant, the Urban Settlements Development Grant and transfers to public entities on a scheduled ongoing basis;
- improve access to housing finance by collaborating with the private sector and related entities to develop mechanisms to increase market penetration and provide loans to low- and middle-income households on an ongoing basis; and
- ensure equal access to housing finance through monitoring the lending practices of the financial sector by publishing an annual report on mortgage finance.

Institutional subsidies

Institutional subsidies are available to qualifying housing institutions. The subsidy is paid to approved institutions to provide subsidised housing on deed of sale, rental or rent-to-buy options.

This is done on condition that the beneficiaries may not be compelled to pay the full purchase price and take transfer within the first four years of receiving the subsidy. Institutions must also invest capital from their own resources in the project.

Subsidies for people with disabilities

People with disabilities who qualify for a housing subsidy receive additional amounts to improve their houses with special additions, such as paving and ramps to their doors, grab rails in bathrooms and visible doorbells for the deaf.

Enhanced Extended Discount Benefit Scheme

The scheme promotes home ownership among tenants of state-financed rental stock, including formal housing and serviced sites. The scheme is only available to beneficiaries who took occupation of such rented houses before 15 March 1991.

Rural subsidies

These housing subsidies are available to beneficiaries who enjoy only functional tenure rights to the land they occupy. This land belongs to the State and is governed by traditional authorities.

These subsidies are only available on a project basis and beneficiaries are supported by implementing agents.

Beneficiaries also have the right to decide how to use their subsidies, either for service provision, building houses or a combination of these.

Farm resident subsidies

The Housing Subsidy Programme for Farm Residents addresses the wide variety of housing needs of people working and residing on farms by providing a flexible package of housing models to suit the local context.

In most instances, the programme is applied where farm residents are required to reside close to their employment obligations and where the farm land is distant from the nearest town, rendering the settlement of the farm residents in town impracticable.

Farm residents play an important role in all aspects of their housing solutions regarding the selection of options, the design and implementation phase, as well as the ongoing management of the housing stock.

Human Settlements Development Grant

The grant reflects the conditional allocation transferred to all provinces for the delivery of housing projects, as per the National Housing Code.

Rural Housing Loan Fund

The Rural Housing Loan Fund is a wholesale lending institution. It is mandated to facilitate access to housing credit to low-income rural households by providing wholesale finance through a network of retail intermediaries and community-based organisations.

International relations

South Africa is party to the United Nations (UN) Millennium Development Goals, which provide for the significant improvement in the lives of at least 100 million slum dwellers by 2020. In addition to these conventions, South Africa adheres to the following declarations under the UN Habitat Programme:

- the Vancouver Declaration on Human Settlements of 1976; and
- the Istanbul Declaration on Cities and other Human Settlements of 1996 and the Habitat Agenda of 1996, the focus of which is to address the plight of people without adequate housing.

World Urban Forum (WUF)

The WUF was established by the UN to ensure that member states and the world responds to ensure proper and sustainable management of urbanisation in towns and cities across the globe. The matters which receive attention include eradicating the ill effects of urbanisation, such as poverty, unemployment, inequality, and managing the negative consequences of climate change on communities.

It brings together government leaders, Ministers, mayors, diplomats, members of national, regional and local government, non-governmental and community organisations, professionals, academics, grassroots leadership of women and youth, to debate and propose solutions to ensure proper, working, equitable and sustainable livelihoods for households and people living in urban areas.

The forum also advises the Executive Director of the UN-Habitat and the UN-Habitat's Governing Council on key issues that should inform the work of UN Habitat and all key stakeholders in the field of human settlements and urban development.

The 10th session of the WUF was held from 8 – 13 February 2020 in Abu Dhabi, United Arab Emirates – the first time that an Arab country hosted the world's most important conference on cities and human settlements.

The event was convened by UN-Habitat, in partnership with the Abu Dhabi Department of Urban Planning and Municipalities, the Abu Dhabi Department of Culture and Tourism, Ministry of Foreign Affairs and International Cooperation, General Secretariat of the Executive Council, and the Abu Dhabi National Exhibition Centre. It was held under the theme; "Cities of Opportunities: Connecting Culture and Innovation".

The WUF11 will take place in Katowice, Poland, in June 2022.

Water and Sanitation

The DWS legislative mandate seeks to ensure that the country's water resources are protected, managed, used, developed, conserved and controlled by regulating and supporting the delivery of effective water supply and sanitation. This is done in accordance with the requirements of water-related policies and legislation that are critical in delivering on people's rights to have sufficient food and water, growing the economy and eradicating poverty. South Africa has an arid to semi-arid climate, with a mean annual rainfall of 500 millimetres (mm), as compared to the world average of 860 mm.

This rainfall produces a total annual runoff of approximately 49 000 million cubic metres (m³)/a. A total of 65% of South Africa has a mean annual rainfall of less than 500 mm and 21% of the country with a mean annual rainfall of less than 200 mm. The country, therefore, experiences severe and prolonged hydrological droughts, which may last as long as 10 years at a time.

The country's water security is mainly reliant on fresh surface water, with ground water and return flows underutilised. There are currently 5 551 registered dams with a total gross storage capacity of 33 291 million m³. Of these registered dams, 4 294 are small (i.e. less than 12 m) serving farms and municipalities. These smaller dams play a critical role in local water security and climate resilience. The total national potential for accessible groundwater, on the other hand, is approximately 4 500 million m³/a; of which between 2 000 and 3 000 million m³/a, is being utilised.

Most of South Africa's freshwater comes from catchments that receive the highest rainfall (strategic water source areas). There are 22 strategic water source areas occupying 8% of the land, however these provide 50% of the surface run-off (water in wetlands, streams and rivers). The strategic water source areas support the water needs of approximately 60% of the population, 67% of national economic activity, and supply approximately 70% of irrigation water.

Chapter 4 of the NDP envisages a South Africa that recognises the importance of secure and equitable access to water and sanitation as catalysts for socio-economic development. This is given expression by Priority 1 (economic transformation and job creation) and Priority 4 (spatial integration, human settlements and local government) of government's 2019 – 2024 MTSF, with which the work of the DWS is aligned. Accordingly, the department will focus on regulating and managing water resources; and providing integrated and sustainable water services management, infrastructure planning and development.

In May 2020, government announced 136 priority human settlements and housing development areas across the country. The initiative is aimed at ensuring redress regarding the pre-1994 spatial plan, revitalising towns and cities and strengthening the livelihoods of households. It will enable residents to live closer to areas with economic activities and social amenities such as schools, health facilities and job opportunities, while accessing adequate accommodation.

The initiative will be implemented in line with national housing programmes, including the Enhanced People's Housing Process, the Informal Settlements Upgrading, the Integrated Residential Development Programme and the Social Housing Programme.

The priority areas will cover the entire country as follows:

- KwaZulu-Natal: 22
- Western Cape: 19
- Mpumalanga: 16
- North West: 14
- Eastern Cape: 12
- Limpopo: 11
- Free State: 10
- Northern Cape: six

Regulating and managing water resources

Over the medium term, the DWS will continue to conduct technical regulatory assessments on the provision of water services. These valuations measure the level of compliance with the Green and Blue Drop regulatory standards. As such, the department plans to assess 963 wastewater systems in 2021/22 and determine the resource quality of the uThukela River System in 2022/23. In continuing to improve equitable access to water resources, the DWS aims to process 80% of the water use licence applications it receives within 120 days in each year over the MTEF period. To carry out these activities, R10.8 billion is allocated to the Water Resources Management programme over the MTEF period.

These allocations will also support the implementation of the Water and Sanitation Master Plan, which details the requirements for appropriate investment into water resources and services, and sets targets for adequate water conservation and demand management. For this purpose, the Water Trading Entity will receive transfers amounting to R7.3 billion over the medium term. Projects include acid mine drainage operations in Gauteng, Phase 2D of the Olifants River Water Resources Development Project, the Mokolo-Crocodile River Water Augmentation Project, the raising of the Tzaneen and Hazelmere dams and the Umdloti River Development Project.

Providing integrated water services, management, infrastructure planning and development

Supporting the sustainable provision of water services is one of the DWS's key priorities. To this end, 68.2% (R35.7 billion) of the department's budget over the medium term is allocated to the Water Services Management programme, of which R18 billion is for direct transfers to municipalities.

Spending in the programme, which funds the Regional Bulk Infrastructure Grant and the Water Services Infrastructure Grant, is expected to increase at an average annual rate of 1.6%, from R11.8 billion in 2020/21 to R12.4 billion in 2023/24. Funds from these grants will be used to implement three mega and 20 large regional bulk infrastructure projects, and 352 small regional bulk and water services infrastructure projects.

Legislation

The Constitution enshrines the basic human right to have access to sufficient water, as well as a safe and healthy environment. Government fulfils these rights through the DWS, assisted by specific legislation, including:

- the National Water Act, 1998 (Act 36 of 1998), which ensures that South Africa's water resources are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner, for the benefit of all people;
- the Water Services Act, 1997 (Act 108 of 1997), which prescribes the legislative duty of municipalities as water-service authorities to provide water supply and sanitation according to national standards and norms. It also regulates water boards as important water service providers and gives the executive authority and responsibility to the Minister of Human Settlements, Water and Sanitation to support and strengthen the capacity of municipalities to manage their own affairs, exercise their powers and perform their functions;
- the Water Research Act, 1971 (Act 34 of 1971), which provides for the promotion of water-related research through the Water Research Commission (WRC) and the Water Research Fund; and
- the NEMA of 1998, which makes provision for cooperative environmental governance by establishing principles for decision making on matters affecting the environment, institutions that promote cooperative governance and procedures for coordinating environmental functions exercised by organs of state.

Budget

The DWS was allocated R16.999 billion for the 2020/21 financial year.

Expenditure is expected to increase at an average annual rate of 2%, from R17 billion in 2020/21 to R18 billion in 2023/24. Cabinet has approved reductions on the DWS's baseline amounting to R1.3 billion over the MTEF period, mainly to be effected on compensation of employees. As a result, spending on compensation of employees is expected to decrease at an average annual rate of 2.3%, from R1.9 billion in 2020/21 to R1.7 billion in 2023/24. Transfers and subsidies account for 54.5% (R28.6 billion) of the department's expenditure, increasing at an average annual rate of 3.8%, from R8.8 billion in 2020/21 to R9.9 billion in 2023/24. The remaining expenditure over the same period is on payments for capital assets (R13.2 billion), and goods and services (R5.2 billion).

Entities

Breede-Gouritz Catchment Management Agency

The agency plays an important role in protecting, using, developing, conserving, managing and controlling water resources in a cooperative manner within the boundaries of the Breede-Gouritz catchment area.

Over the medium term, the agency's strategic objective is to continue providing water resources management activities to support economic development and social well-being. To achieve this, the agency will continue conserving and maintaining ecosystems, promoting tourism and encouraging residential developments within its water management area.

The agency's total budget for 2020/21 was R81 million.

Consolidated water boards

Water boards derive their mandates from the Water Services Act of 1997 and are listed under Schedule 3B in the PFMA of 1999. There are nine water boards, which are primarily mandated to provide bulk industrial and potable water services to municipalities and industries within their gazetted areas of operation.

The water boards' main role is to provide bulk potable and wastewater to water service institutions within their respective service areas. The water boards vary in size, activities, customer mix, revenue base and capacity. Some water boards provide retail water and sanitation services on behalf of municipalities. Rand Water and Umgeni Water serve largely urban areas. The rest of the water boards operate largely in the rural areas.

Water boards' consolidated budget amounts to R80.2 billion over the medium term, increasing at an average annual rate of 8.4%, from R22.7 billion in 2020/21 to R28.9 billion in 2023/24. The increase is mainly due to purchases of raw water, and costs related to energy, pumping and chemicals. Spending on bulk water extraction, purification and distribution constitutes 75.9% (R60.9 billion) of expenditure, increasing at an average annual rate of 8.6%, from R17.2 billion in 2020/21 to R22 billion in 2023/24. Revenue is derived mainly through the sale of bulk potable and waste water and other sources such as interest, dividends and rent on land, and is estimated to be R98.4 billion over the medium term.

Inkomati-Usuthu Catchment Management Agency

The agency plays a key role in the use, protection and development of water resources in the Inkomati-Usuthu Water Management Area, and aims to ensure that water is used and managed to support equitable and sustainable socio-economic transformation and development.

Over the medium term, the agency's focus will remain on meeting water demand for the domestic, agriculture and commercial sectors through processing water use licence applications and ensuring that the area's quality of water resources remains high.

Its total budget for 2020/21 was R156.8 million.

Rand Water

Rand Water is mandated to supply quality bulk potable water within its area of supply. The water board's distribution network includes more than 3 056 kilometres (km) of large diameter pipelines, feeding 58 strategically located service reservoirs, with customers including metropolitan municipalities, local municipalities, and mines and industries in and around Gauteng, supplying, on average, 3.7 million litres of water daily.

Expenditure is expected to increase at an average annual rate of 8.4%, from R13.9 billion in 2020/21 to R17.7 billion in 2023/24. Spending on the provision of bulk water services is expected to increase at an average annual rate of 8.9%, from R11.6 billion in 2020/21 to R15 billion in 2023/24. The increase is mainly due to water treatment and pumping costs. Spending on goods and services is estimated to increase at an average annual rate of 8.3%, from R11 billion in 2020/21 to R13.9 billion in 2023/24.

Over the medium term, the water board is expected to derive R61.3 billion of its revenue from bulk water sales. Water sales volumes are expected to increase from 1 677 568 megalitres (ML) in 2020/21 to 1 763 426 ML in 2023/24. Tariffs are expected to increase to R13.76 per kilolitre by 2023/24.

Trans-Caledon Tunnel Authority (TCTA)

The TCTA was established in 1986 as a specialised liability management entity. It is responsible for financing and implementing the development of bulk raw water infrastructure and providing treasury management services to the DWS. The authority plays an important role in providing financial advisory services, such as structuring and raising project finance,

managing debt and setting tariffs; project implementation services; and other technical support to the department and water boards. Over the medium term, the authority will continue planning and implementing Phase 2 of the Lesotho Highlands Water Project, Phase 2A of the Mokolo-Crocodile River Water Augmentation Project and providing a short-term solution to acid mine drainage in Gauteng.

Expenditure is expected to increase at an average annual rate of 29.9%, from R3.7 billion in 2020/21 to R8.2 billion in 2023/24, mainly due to the escalation of construction activities. The authority's main cost drivers remain planning and implementation to increase water supply in the Vaal River system through Phase 2 of the Lesotho Highlands Water Project, providing a short-term treatment solution to acid mine drainage in Gauteng, and Phase 2A of the Mokolo-Crocodile River Water Augmentation Project. Revenue is expected to increase at an average annual rate of 38.9%, from R3.6 billion in 2020/21 to R9.7 billion in 2023/24, mainly driven by management fees claimed from the Water Trading Entity.

Umgeni Water

Umgeni Water was established in terms of the Water Services Act of 1997 to provide water and sanitation services in its service area, which comprises mostly rural areas in KwaZulu-Natal and the eThekweni metropolitan area. The water board supplies water to approximately six million consumers. Its ongoing objective is to support socio-economic development through water infrastructure investment in its area of operation. Accordingly, over the medium term, the water board will construct Phase 1 of the Greater Mpofana Regional Water Scheme, the Impendle Bulk Water Supply Scheme, and Phase 3 of the Maphumulo Bulk Water Supply Scheme, targeting largely indigent municipal areas.

Expenditure is expected to increase at an average annual rate of 9.4%, from R3.4 billion in 2020/21 to R4.5 billion in 2023/24. Revenue is expected to increase at an average annual rate of 9.8%, from R4.4 billion in 2020/21 to R5.8 billion in 2023/24. Proceeds from the sale of bulk water are estimated at R14.3 billion over the medium term. The volume of water sold is expected to increase from 512 575 ML in 2020/21 to 541 145 ML in 2023/24, with tariffs expected to increase to R7.54 per kilolitre by 2023/24.

The Water Trading Entity

The Water Trading Entity's primary role is to manage water infrastructure and resources, and the sale of raw water. Over the medium term, the entity will continue to focus on maintaining existing water resource infrastructure, supporting the long-term sustainability of water resources, and supplying bulk water to strategic users, such as large industrial companies, to stimulate and support economic development.

Expenditure is expected to increase at an average annual rate of 6.7%, from R14.1 billion in 2020/21 to R17.2 billion in 2023/24. This is mainly driven by the entity continuing with the construction of the Mokolo-Crocodile River Water Augmentation Project, the raising of the Tzaneen and Hazelmere dams, and the Umdloti River Development Project. Revenue is expected to increase at an average annual rate of 7.7%, from R16.2 billion in 2020/21 to R20.2 billion in 2023/24.

Revenue largely funds the TCTA for financing debt repayment for raw water infrastructure constructed by the authority on behalf of the Water Trading Entity. Revenue from the sale of raw water constitutes R47.7 billion over the same period. Transfers from the DWS are expected to amount to R7.3 billion over the MTEF.

Water Research Commission

The WRC's mandate is to conduct research on water by determining needs and priorities for research, stimulating and funding water research, promoting the effective transfer of information and technology, and enhancing knowledge and capacity building in the water sector. Over the medium term, the commission will continue to drive research and enhance knowledge within the water sector.

Expenditure is expected to increase at an average annual rate of 7.3%, from R320.6 million in 2020/21 to R396.4 million in 2023/24. Spending on research and development, and innovation and impact account for 53.6% of the commission's expenditure over the period ahead. Revenue is expected to increase at an average annual rate of 7.3%, from R320.6 million in 2020/21 to R396.4 million in 2023/24. Revenue is mainly derived from the water research levy, which accounts for 81.9% (R892.3 million) of the commission's revenue over the medium term.

In October 2020, the WRC in partnership with the South African Local Government Association launched the Technology Innovation Forum – one of seven platforms under the Local Government Integrated Water and Sanitation Technology and Innovation umbrella.

The forum serves as a platform that will explore the challenges and opportunities for advancing the technology landscape at municipal level. Key to its function will be serving as a collaborative platform for municipal partners to share their innovation needs, mobilise partnerships and jointly conceptualise programmes, projects and funding, including peer-to-peer learning and knowledge exchange on innovative solutions.

The Technology Innovation Forum envisions embracing the District Development Model as a mechanism to enhance technological solutions in municipalities. This partnership-led forum sought to enable some critical pillars, including setting up and expanding a network of testbeds for ground-breaking water and sanitation solutions emanating from South Africa and the global Research Development and Innovation Partnership. The commission's total budget for 2020/21 was R332 million.

National Water Policy

The National Water Policy is underpinned by three fundamental principles for managing water resources: equity, (environmental) sustainability and efficiency.

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

Other uses that must be registered are:

- diversion of rivers and streams;
- discharge of waste or water containing waste;
- storage, which includes any person or body storing water for any purpose from surface run-off, groundwater or fountain flow in excess of 10 000 cubic m³ or where the water area at full supply level exceeds one ha in total on land owned or occupied by that person or body, and who is not in possession of a permit or permission;
- local authorities and other bulk suppliers with their own water sources and purification works; and
- controlled activities such as irrigating with waste, power generation with water, atmospheric modification or recharging of aquifers.

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

To promote sustainable and equitable water resource management, the DWS has developed and continues to update a range of strategies for water management.

National Water Resource Strategy 2 (NWRS2)

The NWRS2 sets out the vision and strategic actions for effective water management, including the security of water supply, environmental degradation, and pollution of resources.

The NWRS2 outlines key challenges, constraints and opportunities in water resource management and proposes new approaches that ensure a collective and adequate response for the benefit of all people in South Africa.

The strategy also responds to the priorities set by government in the NDP and the National Water Act of 1998 imperatives that support sustainable development.

It is centred on these key objectives:

- Water supports development and the elimination of poverty and inequality. The strategy recognises that the manner in which water was allocated in the past was unequal and favoured certain sections of the population. The intention, therefore, is to redress past imbalances in the manner in which water was allocated, ensuring that water contributes to the economy and job creation.
- Water is protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner.

The NWRS2 also focuses on water conservation and the management of water demand as key priorities.

Raw Water Pricing Strategy

Since 1994, there have been continued efforts to reform and realign the water value chain so that it can achieve government's objectives. These include ensuring equitable access to water and sanitation, the sustainable use of water for social and economic benefit and ensuring the sustainability of water resources and water services delivery.

As part of this process, the DWS is looking at pricing, financing and economic regulation reforms in the water sector. This project reviews the Raw Water Pricing Strategy, develops infrastructure funding models and recommends an appropriate model and institutional arrangements for an economic regulator for water.

It is generally agreed that pricing and economic regulations play a key role in the provisioning of infrastructure by assuring

necessary investments to support socio-economic growth and ensuring that services are widely available and accessible and priced at levels that support current and future needs.

The project will contribute to the following:

- the revision of the Raw Water Pricing Strategy to ensure equitable and appropriate raw water tariffs that will enable sustainable operation and management of raw water infrastructure, and will fund catchment management funding models for water resources infrastructure; and
- the establishment of an economic regulator for the entire water value chain.

The project is strategic in nature and will enable the DWS to have sound water-pricing policies, cost-reflective tariffs for the entire water value chain in South Africa and a good funding framework for infrastructure.

National Groundwater Strategy

Groundwater is a strategic resource in many parts of South Africa, especially in rural areas. It also plays an important role in the supply of water to small towns and villages in the drier parts of the country. There is considerable potential for additional development of groundwater resources to augment existing resources.

The need for improved groundwater management to ensure sustainable and efficient use of the resource was recognised in the NWRS1 and led to the formulation of a National Groundwater Strategy through which strategic actions were undertaken.

Reuse Strategy

The DWS has developed a Water Reuse Strategy to encourage informed decisions relating to water reuse. Reuse could be increased significantly with return flows in coastal cities, where it would otherwise drain into the sea. In coastal cities, water reuse and desalination compete as two options for water conservation.

Reuse is becoming increasingly acceptable and feasible owing to increasing shortages, improved purification technology and decreasing treatment costs. Membrane technologies, also used for desalination of seawater, have become more affordable and have improved. The reuse of treated wastewater would be managed to ensure public health safety.

Infrastructure upgrades and bilateral agreements

The DWS has made good progress with the preparatory work of the Lesotho Highlands Water Project, with Phase 2 underway. The project comprises the construction of Polihali Dam, which will provide an additional 465 million m³ of water per year, bringing the total to about 1 245 million m³ of water per year into the Integrated Vaal River System from Lesotho.

South Africa currently receives approximately 780 million m³ of water per year from Lesotho into its Integrated Vaal River System which supplies water to Gauteng and the surrounding areas. The Integrated Vaal River System needs to be urgently augmented in order for it to cope with the increasing water requirements.

Phase 1 of the Mokolo and Crocodile River West Water Augmentation Project, which will transfer water through a 46-km pipeline and pump station from the Mokolo Dam to the Lephalale area, is complete. A second pipeline will be constructed as Phase 2A of the project to transfer water from the Crocodile River (west) to the Lephalale area.

The raising of the Hazelmere Dam wall will incorporate a Piano Key Weir, which is cutting-edge technology in dam-building. The additional water that will become available from this project is aimed at ensuring the supply of water and supporting the development of human settlements, King Shaka Airport and the Dube TradePort. The construction of the dam wall is completed and the capacity of dam can be increased to 120% on impoundment of the previous dam level which shall be beneficial to water users.

The DWS is proceeding with the planning of the Mzimvubu Water Project, which entails the development of a multipurpose dam (the Ntabelanga) to supply new irrigation development, and the Laleni Dam for hydropower generation. It has initiated the raising of the Tzaneen Dam and construction of the new N'wamitwa Dam for the Groot Letaba River Water Development Project in Limpopo.

The first phase of the multi-phase Lesotho Highlands Water Project entailed the construction of Katse Dam, Mohale Dam, Matsoku Diversion Tunnel and the Muela hydropower station. Lesotho benefits from a sustainable, independent energy supply that will meet the country's electricity requirements and royalty revenue from the project, while South Africa benefits from the security of supply of high quality water that is transferred into the Vaal River system for domestic and industrial use in Gauteng.

As per the provisions of the Phase 2 agreement between governments of Lesotho and South Africa, the implementation of the Kobong Pump Storage Scheme or any other hydro scheme was subject to the outcome of a joint feasibility study. The technical and the economic feasibility studies for the Kobong Pump Storage Scheme were completed in 2013. However, the outcome was that further studies should be undertaken. These included, a market study, an integration study, geotechnical investigations and legal and commercial arrangements.

Lesotho secured funding from the World Bank to undertake the above studies, including convectional hydropower options. The further feasibility studies have looked at pumped storage and conventional hydropower options. The decision was taken to defer the pump storage option (due to prevailing economic conditions) and advance the conventional options. This entails one site at Oxbow on Malibamatšo River and two sites on the Senqu River.

The topography of the region allows for the possibility of developing hydro-power generation in Lesotho in conjunction with the provision of water supplies to South Africa. For South Africa, construction of this dam and related infrastructure will guarantee the desired level of water availability in Gauteng and the Vaal River system in the most cost-effective manner.

In parallel with water conservation measures in the Vaal River, it will also influence the improvement of water quality amongst many benefits. Phase 2 water delivery and hydropower generation are expected to be commissioned at the same time – early 2026, and the project close out is forecast for December 2028. The Lesotho Highlands Water Project has two main goals:

- to contribute to South Africa's economic development by providing South Africa with a supply of low-cost, high-quality water to meet the household and industrial water needs of Gauteng, the industrial heartland of South Africa; and
- to contribute to Lesotho's economic development by using the water transfer system to increase the country's capacity for generation of electricity that will meet its requirements and earn it revenue in the form of royalties on the water transferred to South Africa.

Each country has the opportunity to undertake ancillary developments within its borders. These developments include the provision of water for irrigation, potable water supply, the development of tourism, fisheries and other projects for economic and social development.

Rainwater harvesting

The National Rainwater Harvesting Strategy is an adaptation to climate change. Climate change poses significant social, economic and environmental risks, especially in developing countries. This then necessitates the implementation of high impact climate change response measures that will realise considerable mitigation, adaptation and broader socio-economic benefits.

It is in this context that the DWS, in partnership with the Department of Forestry, Fisheries and the Environment (DFFE), is developing the National Rainwater Harvesting Strategy to provide a roadmap for enhanced planning, development and scaled-up implementation of Rainwater Harvesting as a key component of South Africa's water resources and efforts to enhance climate resilience. The strategy will provide guidance for the implementation of a series of action programmes towards the mainstreaming of Rainwater Harvesting in South Africa. This National Rainwater Harvesting Strategy will also help serve as the guiding tool for district and local municipalities to effectively and economically put Rainwater Harvesting into practice.

The DWS also supports a national Rainwater Harvesting programme, which has a narrow but important focus on the construction of above and below-ground rainwater storage tanks by rural households for food gardens and other productive water uses. Several municipalities now use roof rainwater tanks for domestic purposes. These have been found to be particularly effective when used in conjunction with other water supply options.

Though there are no hard figures yet on how many cubic millimetres per year Rainwater Harvesting can contribute, it is an option that can be implemented in a short timeframe. Rainwater Harvesting gives people who live in areas where reticulation has not as yet been implemented access to water. The programme targets rural communities through the installation of tanks and awareness campaigns.

A resource guideline has been developed to assist municipalities that are providing Rainwater Harvesting systems to communities as an interim service or to reduce demand on their water supply systems with best practices. In some areas Rainwater Harvesting systems are provided as drought relief but the DWS is using the programme to advise municipalities to plan for alternative water sources or water mix, since municipalities seem to rely on surface water for water services

and a lot of water schemes are failing because of dependency on a single source.

Desalination Strategy

The DWS has developed a supporting desalination strategy, which also includes desalination as a technology for treating water other than seawater for water reuse. Desalination of seawater could potentially provide an unlimited resource of fresh water. However, the rising cost of energy may be a deterrent.

As with other infrastructure projects with potential environmental impacts, the planning for a desalination plant will have to undergo an environmental impact assessment in compliance with the NEMA of 1998. The DWS will ensure that desalination is considered as an option for meeting future water requirements, in particular in coastal cities where there is sufficient electricity for desalination.

The target is not only to implement desalination in several locations in South Africa, but also to become an international knowledge centre in this particular field.

Resources

South Africa's water resources are, in global terms, scarce and extremely limited. The precipitation per year for Africa is 22 300 km³, of which the evaporation rate is 80% and the runoff rate is 20%. Southern Africa only has 12.25% of the total water in Africa, making it a highly arid region.

Rainfall is, however, relatively higher in the northern and eastern parts of southern Africa (the Democratic Republic of Congo (DRC), Zambia and Mozambique) with the drier parts of the region including Namibia, Botswana and South Africa.

South Africa has a mean annual rainfall of approximately 500 mm, compared to the world's average of 860 mm. It is characterised by low, variably distributed rainfall as well as high evaporation rates, resulting in the uneven distribution of run-off across the country.

The country experiences severe and prolonged hydrological droughts, which may last as long as 10 years at a time. The quality of water in South Africa is also negatively impacted by dissolved salts from host rocks in certain areas such as Namaqualand in the Northern Cape.

The surface water potential of the major drainage systems in South Africa are dominated by the Orange and the Limpopo river basins, which are shared with neighbouring countries.

Over 60% of the country's river flow comes from 20% of the land area. To overcome the uneven spread of water resources and to manage floods and drought, more than two thirds of the country's mean annual rainfall is currently stored in dams.

The country's water security is mainly reliant on fresh surface water, with groundwater and return flows underused. However, the freshwater available for use is currently at its limit, and alternative sources, such as groundwater need to be further exploited. In addition, the country shares four major rivers with six neighbouring states, namely Zimbabwe, Botswana, Mozambique, Eswatini, Lesotho and Namibia. Therefore, international agreements on water sharing are in place on all of these river basins.

There is well-developed infrastructure, with more than 4 395 registered dams in South Africa, including 350 dams belonging to the DWS, and a number of large-scale, inter-basin water transfer schemes. Water services infrastructure covers more than 35 000 km of bulk pipelines and 200 000 km of reticulation systems that are managed by 152 water service authorities and providers.

However, this existing infrastructure needs maintenance and the country is already experiencing challenges with lack of focus on sustainable asset management. The schemes also require efficient and effective operations, for which specialised skills and capabilities at all levels are needed. Major challenges are experienced regarding the capabilities of water services authorities to effectively manage the schemes on a sustainable basis. This issue needs to be dealt with decisively through a review of the mandates and policies in relation to the management of water infrastructure, and available capacity.

Work is also required in terms of rolling-out the establishment of appropriate institutions, such as regional water utilities, as the development of tourism, fisheries and other projects for economic and social development.

Groundwater resources

An estimated 80 000 to 100 000 boreholes are being drilled annually. The National Groundwater Archive is a web-enabled database system that allows capturing, viewing, modifying and extraction (dissemination) of groundwater-related data.

The DWS has a legal obligation to ensure that water resources (including groundwater) are protected, used, developed, conserved, managed and controlled in a sustainable and equitable manner. The National Water Act of 1998 requires the

establishment of national monitoring and information systems as the availability of information about water resources is regarded as critical to the main purpose of the Act.

The need for groundwater data and information continues to increase to assist in planning to provide water to people, monitoring, drought relief and climate change.

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

The lack of perennial streams in the semi-desert to desert parts means that two thirds of South Africa's surface area depend largely on groundwater. Although irrigation is the largest user, the supply to more than 300 towns and smaller settlements is very important.

Through government's commitment towards meeting the basic water needs of communities, groundwater has become a strategic resource for village water supply in the wetter parts of the country, because of its cost-effectiveness in a widely scattered, small-scale user situation.

Groundwater also contributes considerably to river flow. This requires reserving a significant share of groundwater resources to protect aquatic ecosystems in terms of the National Water Act of 1998. The maximum quantity of groundwater that can be developed economically is about 6 000 million m³ a year, while some 4 000 million m³ of groundwater (mainly in the dry season) contributes to surface water flow annually.

Southern Africa also has large hidden underground water reserves, with 12 to 15 aquifer systems, of which three are considered very important for the future.

In South Africa, a substantial resource lies in a massive dolomite aquifer system that covers a vast area, extending from Springs and Brakpan, east of Johannesburg, to Lenasia, south of the city; Zuurbekom, Carltonville and Magaliesberg on the West Rand; Kuruman in the Northern Cape, and even as far as parts of Botswana.

The Witwatersrand mining basin's aquifer storage capacity is about the size of Lake Kariba.

Managing and developing water resources

To facilitate the management of water resources, the country has been divided into 19 catchment-based water management areas, of which 11 share international rivers. Sufficient water resources have been developed and are available to ensure

that all requirements for water can reasonably be met, without impairing the socio-economic development of the country.

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

To underscore its commitment to the pursuit of universal access to water, the DWS is investing in new infrastructure and maintaining and rehabilitating dysfunctional systems to ensure operational efficiency. This is particularly relevant to developing water infrastructure to meet the specific needs of different rural communities. Closely related to rural development is the need for mainstream support to local government to sustain the infrastructure underpinning efficient service delivery to communities.

Managing water quality and wastewater

To ensure compliance with minimum water quality norms and standards, the DWS started the annual Blue Drop and Green Drop assessments to guarantee that water and wastewater systems are managed according to set norms and standards. The department has set a target of 99% compliance with drinking water quality standards, and 80% compliance with wastewater effluent standards.

This incentive-based regulation system aims to improve the quality of municipal drinking water and management of wastewater. Because of the scale and magnitude of resources needed for the National Certification Programme, the Green Drop and Blue Drop programmes take place every second year, alternating with each other. In a programme's "gap" year, progress in the wastewater sector is tracked and reported via the assessment of the cumulative risk status of treatment systems.

Strategic Integrated Projects (SIPs)

SIP 18, which was approved by the Presidential Infrastructure Coordinating Commission (PICC), aims to address water supply and sanitation backlogs to millions of households.

The PICC's 18 SIPs are divided into geographic, energy, spatial and social infrastructure development projects. These projects – headed by different departments – cover more than 150 specific infrastructure interventions in rail, road and ports, dams, irrigation systems, sanitation and electricity.

This 10-year plan will address the estimated backlog of adequate water to 1.4 million households and that of basic sanitation to 2.1 million households.

SIP 18 is expected to fast-track the issuing of water licences, expand the capacity of the water system, speed up build programmes, address backlog projects and rehabilitate and upgrade existing water and sanitation infrastructure.

The project, which focuses on priority small towns and rural areas where water service delivery is a problem, is also expected to create jobs, raise the quality of service delivery of water around the country and extend water supply to areas that are either underserved or unserved.

The DWS identified several projects that will be used to drive SIP 18, including the Sedibeng Regional Sewer Scheme – a R5-billion project to be implemented in the area. Rand Water's BG3 pipeline, which is sub-Saharan Africa's largest water pipeline, running from the Vaal Dam to its Zoekfontein Plant, 8.6 km away, will increase water distribution in this district and surrounding areas.

The BG3 pipeline runs adjacent to Rand Water's existing BG1 and BG2 pipelines that supply water to Gauteng and parts of the neighbouring Free State, Mpumalanga and North West. The Komati Water Scheme Augmentation Project was designed to resolve the water supply problems to Eskom's Duvha and Matla power stations in Mpumalanga.

The Komati Water Scheme Augmentation Project supplements the Komati Water Scheme from the Vaal Eastern Subsystem to help Eskom overcome its water supply challenges. The interaction of the water resources of the Komati, Usutu and Vaal River systems provides a higher assurance of water supply to all Eskom's thermal power stations and other water users in Mpumalanga. The Komati Water Scheme Augmentation Project will deliver an additional 57 million m³ of water a year to the Komati Water Scheme.

Water Allocation Reform Programme

The Water Allocation Reform Programme's objectives are to ensure equitable access to water, eradicate poverty and promote social and economic development. The programme's priorities are to meet the water needs of historically disadvantaged people, ensure their participation in water resources management and promote the beneficial and efficient use of water in the public interest.

Licences are required for storage and use of water, among

other things. To facilitate the availability of water for historically disadvantaged people, attention is also given to the allocation of water following principles of equity and sustainability.

Women in Water

The Women in Water Project aims to strengthen the active participation of rural women in water resource management. Women identify water-related challenges in their communities and conceptualise ideas to address them. They are registered for Women in Water awards. The national winners receive cash prizes which are used for further project development and implementation.

Learning Academy

There is a shortage of skills in the water and sanitation sector. The DWS, through its Learning Academy External Bursary Scheme, provides bursaries yearly to aid in closing this gap. Applications are open to people who would like to pursue careers that are in line with the department's core business.

The department scheme boasts an all-inclusive package recognised in South Africa as being highly competitive. The DWS External Bursary Scheme aims to attract exceptional young and innovative talent to the department.

Students pursuing the following fields of study are eligible to apply: analytic chemistry, aquatic sciences, biochemistry, biological sciences, water and sanitation, geographical information systems, civil/electrical/mechanical engineering, water resource management, environmental law/ management/science, water utilisation, cartography, geo-chemistry, geo-hydrology, geology, hydrology, limnology, microbiology, surveying and water care.

The purpose of the learning academy is to:

- investigate technical and scarce skills development needs within the department;
- address technical and scarce skills gaps in the overall water supply value chain;
- address scarce skills gaps in specific technical areas of the department;
- plan and build capacity for medium- and long-term needs of the department and the water and sanitation sector;
- develop and implement structured training for engineering and scientific graduate trainees;
- develop and propose interventions (regarding mentoring, skills, knowledge transfer and professional registration processes) with the Engineering Council of South Africa, the

South African Council for Natural and Scientific Professions and the Surveying Council of South Africa in line with the Occupations Specific Dispensation.

Management of water conservation and demand

Although South Africa has been classified as a water-scarce country, water from the source to the consumer is often lost as a result of inappropriate and inadequate asset management.

Lack of education on the part of the consumer also leads to inefficiency in the day-to-day use of water. The loss of water depletes the country's resources and reduces revenue to water services authorities.

Water leaks account for nearly 36% of the nation's unaccounted for water and costs the country about R7 billion annually. The DWS is also putting in place medium to long-term interventions that are intended to reduce the risks for water scarcity in the future.

These include:

- Rainwater Harvesting (drinking water, water for livestock, water for irrigation);
- integrating groundwater and surface water use in the future;
- desalination at a large scale;
- investing in innovative water-saving solutions, such as the Drop-the-Block Campaign;
- incorporating all municipal and privately-owned dams into the management system or the future;
- implementing further transfer schemes to improve drought resilience;
- building additional storage capacity; and
- rolling out large-scale reuse of water (recycling of effluent, focus on coastal towns where treated effluent is disposed of via sea outfalls and not taken into account in return flows).

Enhanced local government support approach

A rapid response unit in the DWS addresses poor performance of water and wastewater systems, which has resulted in community protests in some cases.

The unit deals with proactive and reactive non-compliance cases of municipal service delivery. The unit's specialists enable the department to intervene directly in high-risk operational situations, where the lives of citizens and the environment are under threat because of water and wastewater treatment failures.

Freshwater Programme

Recognising the value and threatened status of South Africa's freshwater biodiversity, and the need to build competence and leadership in this area, the South African National Biodiversity Institute (SANBI) has established a programme focusing on freshwater biodiversity.

The programme aims to grow and consolidate freshwater activities within SANBI. The Freshwater Programme focuses on supporting collaborative freshwater initiatives. These include Working for Wetlands, the National Wetland Inventory, National Freshwater Ecosystems Priority Areas Project, a wetlands mitigation banking scheme with the Grasslands Programme and coal-mining industry, and water-related payments for ecosystem services pilot projects.

Key to the programme's operation will be the further development of strategic relationships with other organisations with shared objectives. It includes managing the Working for Wetlands Programme on behalf of the departments of Water and Sanitation, Forestry, Fisheries and the Environment, and Agriculture, Land Reform and Rural Development.

Working for Wetlands champions the protection, rehabilitation and sustainable use of South Africa's wetlands through cooperative governance and partnerships.

Monitoring programmes

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

The oldest flow-gauging station still operating in South Africa is on the Mooi River near Potchefstroom in North West. There are 21 operational rainfall stations in the mountains of the Western Cape and five in the Mpumalanga escarpment. Observations are relayed through a cellular short message system.

Water levels are monitored at some 1 000 observation boreholes across South Africa. Particular attention is given to monitoring in dolomitic areas. In addition, a small network of rain gauges monitors rainwater quality. The importance of qualitative information on South Africa's water resources has led to an increased drive towards creating a national water-quality monitoring network.

The formal protection, restoration and rehabilitation of wetlands is strengthened through improved land-use planning, land and development management policies, as well as

operational and regulatory means at national, provincial and local level.

Adopting of ecosystem-based approaches and implementing the open-space planning and management programmes adds impetus to the protection of these systems and associated services, especially at local government level.

It requires integrated approaches and the involvement of multiple sectors, particularly those dealing with human settlements, development and planning.

The DWS is also designing programmes to assess and report on the radiological (radioactivity) and toxicological quality status of the country's water resources.

National Chemical Monitoring Programme

The programme assesses and reports on the chemical status of water resources in South Africa. The main water-quality challenges for domestic water users are high levels of dissolved salts and, in some places, high fluoride concentration. The other challenges facing irrigated agriculture are the high sodium-absorption ratio, high electrical conductivity, high pH and high levels of chloride.

Another global challenge affecting South Africa is eutrophication or excessive plant (including algae) growth in dams. This is because of high levels of nutrient input from point sources of pollution and diffuse sources of pollution from catchments.

Annual reports indicate that 50% of dams in South Africa are seriously affected (hypertrophic), while the rest range in quality from good (oligotrophic) to poor (mesotrophic). Another problem is the sporadic outbreak of cholera and other water-borne diseases, mainly because of poor sanitation and hygiene at household level. The Eastern Cape and KwaZulu-Natal are prone to cholera outbreaks.

Integrated Water Quality Management Strategy

The pollution of South Africa's water resources, both surface and underground water, not only adversely affects human and environmental health but has severe consequences for the economy and social well-being. In response to the country's need to take an improved integrated approach to Water Quality Management, the DWS recently developed the Integrated Water Quality Management Strategy.

This strategy sets forth a number of objectives, each supported by key actions, which collectively aim to ensure that

government, in partnership with private sector and civil society, secures water that is fit for use for all. These actions range from the need to strengthen institutions, to the need to improve monitoring and information management, and to strengthen regulation of activities that degrade water quality.

Managing water resources under a changing climate

With climate change, water resources that are already under pressure due to increasing water demand will be under even greater stress in the future. Already, physical evidence suggests that there are changes in historical rain patterns and intensities, as observed in the increasing temperature and drought trends.

Water distribution in South Africa is spatially skewed, with decreasing rainfall and increasing evaporation from east to west. Even though rainfall trends cannot be clearly defined, it can be said with high confidence that potential impacts of climate change in South Africa on water availability will be negative. Just with increasing temperatures alone, without considering other climatic and non-climatic factors, evaporation rates will increase and that will affect water availability. Climate change impacts on the water sector will thus, amplify the current existing conditions.

The DWS has made good progress in trying to understand the impacts of climate change on the different water management areas through conducting Risk and Vulnerability Assessment Studies, and accordingly suggesting adaptation strategies as appropriate. These studies reveal that catchments in the eastern side of the country, for example, the Mzimvubu-Tsitsikamma water management area, rainfall has shown an increasing trend, and the area is also projected to experience increasing rain days both in the intermediate and distant futures. This, however, comes with other challenges such as severe erosion and siltation.

Evaporation rates, in most cases, have been shown to exceed precipitation, becoming relatively higher in areas where it rains less, for example, in the Lower Vaal and Lower Orange catchments. What needs to be considered even further is not only the direct impacts of climate change on the water sector, but secondary impacts on other water dependent sectors, such as agriculture, mining and energy. As such, any adverse impacts of climate change, may negatively affect progress towards development in a number of economic sectors in the country.

National Water and Sanitation Master Plan

The development of the National Water and Sanitation Master Plan aims at mobilising the commitment and efforts of all role players and stakeholders in the water and sanitation sector towards collectively achieving the desired future state of the sector, as defined by government's vision, goals and targets until 2030 (NDP, Sustainable Development Goals, MTSFs and other key drivers). It will provide a critical overview of the present state in the sector and the key challenges it is currently facing, together with a consolidated plan of actions required to enable the achievement of the set targets.

The plan of actions includes a detailed schedule of consolidated and prioritised interventions, actions, investments, projects and initiatives. For each action, the plan defines specific intermediate and final targets, the parties responsible for their achievement, the deadlines for delivery and the estimated costs or other required resources. The achievements will be monitored and evaluated annually by a dedicated project management unit managed by the DWS. The master plan will be updated bi-annually to reflect the dynamics in the sector. It will act as the implementation tool for the Water and Sanitation Resources and Services Strategy, and the two documents will be aligned.

National Aquatic Ecosystem Health Monitoring Programme (NAEHMP)

The NAEHMP is a national programme managed by Resource Quality Services with support from the WRC, the Council for Scientific and Industrial Research and various regional and provincial authorities.

It is responsible for managing aquatic ecosystems. It focuses on the biological attributes of a river that serve as indicators of its ecological health. The NAEHMP's main objectives are to:

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

The NAEHMP comprises three separate monitoring programmes, namely:

- The River Eco-status Monitoring Programme (REMP): This is the oldest component of the NAEHMP. It focuses on the monitoring of ecological conditions of river ecosystems as it is reflected by the system drivers and biological responses. The basis of the REMP is the establishment of a reference condition derived from best available information. Present conditions (ecological category) for the different indicators are determined as a change from reference. The REMP is built upon the use of particular models incorporating existing approved Eco-status models. The assessment can be done on a sub-quadernary or site level and includes the use of the Index of Habitat Integrity, Fish Response Assessment Index, Macroinvertebrate Response Assessment Index, Vegetation Response Assessment Index and Integrated Eco-status. Monitoring is conducted on a quarterly basis and technical reports produced annually. Currently a number of provinces are only partially implementing the REMP, focussing mostly on the macroinvertebrates and habitat components but the programme is fully implemented in the Inkomati-Usuthu as well as the Breede-Gouritz, Berg-Olifants and Pongola-Mtamvuna water management areas. Information obtained through the REMP is also used in monitoring the biological and habitat components of the Resource Quality Objectives.
- The National Estuaries Monitoring Programme (NEEMP): The purpose of this programme is the monitoring of water quality, physico-chemical and biological aspects for determining long-term trends and changes in the condition of South African estuaries. The NEEMP coordinates national monitoring efforts and provides support in the form of sampling equipment, training, data management and information dissemination, while collaborating institutions collect physico-chemical data and water samples.
- The National Wetland Monitoring Programme: The programme's design is based on minimising duplication of effort, while maximising the value of outputs of wetland assessment and monitoring, finding suitable methods for prioritising wetlands to be assessed and monitored, adaptive management and maximum engagement and participation by stakeholders. It has not been implemented yet, but aims to assess and monitor the extent of wetlands, the threats to, and the change in, the present ecological state and ecosystem services provided by wetlands in South Africa. It is a state-of-wetland reporting

programme, designed to demonstrate trends in the state or integrity (biological, physical and chemical components of its ecosystem and their interactions) of wetlands over time.

National Toxicity Monitoring Programme

The National Toxicity Monitoring Programme reports on the status of dichloro-diphenyl-trichloroethane (DDT) and other persistent organic pollutants. This information is reported internationally to the Stockholm Convention through the DFFE. The National Toxicity Monitoring Programme was designed to assess the status of water resources through measuring the concentration of a selection of priority pollutants at a number of hot spots, and also assessing the toxicity of the water to some aquatic organisms through direct measurement of effect.

The priority pollutant selection is aligned to the extent possible with South Africa's responsibility for reporting under the Stockholm Convention. The geographic distribution of monitoring points is still largely determined by fiscal and operational constraints. It currently focuses on the upper reaches of the Crocodile (West)-Marico and Olifants River catchments. The combination of chemical and biotic assessment in conjunction with the other national monitoring programmes also supports strategic and operational decision making by identifying areas of impairment of fitness for use.

The first five years of monitoring indicated that the persistent priority pollutant concentrations were generally low but that mild seasonal toxicity occurs, possibly in conjunction with agricultural activity. It also tends to confirm that the major human exposure route of DDT (used in malaria vector control) is unlikely to be through the water. Future development includes extending analyses to riverine sediments.

Education and awareness

Youth development and National Water Week

The sub-directorate Youth Development, within the DWS, is responsible for the coordination of youth development programmes within the department, and the water and sanitation sector. Activities conducted by the unit are guided by the Youth Accord and National Youth Policy Vision 2020, which concentrate on the integrated approach towards job creation, skills development and entrepreneurship. A youth development strategy has been developed as a guiding document towards meeting the commitments made in the African Ministers Council on Water Youth Development Strategy.

National Water Week is an awareness campaign by the DWS. It serves as a powerful campaign mechanism reiterating the value of water, the need for sustainable management of this scarce resource and the role water plays in eradicating poverty and underdevelopment in South Africa.

The campaign seeks to continue building on ongoing awareness creation within the broader South African community. This awareness creation is coupled with the responsibility that every citizen must take in ensuring the integrity of South Africa's water resources and its efficient use.

The National Water Week campaign for 2021 took place from 15 to 22 March. The event focused on educating the public about their responsibility in water conservation initiatives, raising awareness around the need to protect and conserve the country's water resources.

World Water Day was celebrated on 22 March 2021. The day raises awareness of the global water crisis and focuses on the achievement of Sustainable Development Goal 6: Clean Water and Sanitation for all by 2030.

The DWS launched the #SaveWater campaign to remind all South Africans that every drop counts. Despite good rainfall, South Africa remains a water-scarce country and, as such, is susceptible to sustained droughts exacerbated by climate change.

Regional and international cooperation and initiatives

In line with the DWS's regional and international responsibilities in the water sector, the department entered into collaborative relationships with countries, such as:

- Lesotho, Namibia, Botswana, Zimbabwe, the DRC and Eswatini in the region.
- Mozambique and Eswatini on the Inkomati and Maputo rivers.
- Botswana, Lesotho and Namibia on the establishment of the Orange Senqu River Commission.
- Botswana, Zimbabwe and Mozambique on the establishment of the Limpopo Watercourse Commission.
- Lesotho on the Lesotho Highlands Water Project.
- Eswatini on the Komati River Development Project.

These agreements improve South Africa's bilateral and multilateral relations in the African Union. All the countries involved benefit, while sharing development costs. South Africa shares four of its major river systems with six immediate

neighbouring countries, namely Botswana, Lesotho, Mozambique, Namibia, Eswatini and Zimbabwe.

In the area of shared river basins, South Africa continued participating in joint water commissions to form part of Africa bilaterals with Botswana on Joint Permanent Cooperation, and with Mozambique regarding the breach of the Usuthu River, where a feasibility study was completed.

South Africa also has global relations with countries such as Iran, China, Denmark, Russia, Mexico, South Korea, Australia, Germany, the Netherlands and Japan.

Acid Mine Drainage

The DWS launched the Eastern Acid Mine Drainage Treatment Plant, which ensures that the rising water levels in the abandoned Grootvlei mine do not contaminate groundwater. The Eastern Basin Plant in Springs is one of the largest of its kind in the world, treating approximately 110 ML per day.

The plant is among the three main basins in the Witwatersrand Goldfields. These include the Western Basin in the Krugersdorp area, Central Basin in the Germiston area and the Eastern Basin in the Springs area. Both western and central basins have been launched and are running smoothly.

The first long-term solution to acid mine drainage was launched at the Central Basin Acid Mine Drainage Treatment Plant in Germiston in 2016. This was the commencement of several integrated projects aimed at providing a long-term solution to acid mine drainage as well as a water-secure future for the economic hub of Gauteng.

The Eastern Basin Plant in Springs is one of the largest of its kind in the world, treating approximately 110 ML per day. The Eastern Basin Plant is located in one of the three main basins in the Witwatersrand Goldfields. These include the Western Basin in the Krugersdorp area, Central Basin in the Germiston area and the Eastern Basin in the Springs to Nigel areas. Both the Western and Central Basins were commissioned previously and are running smoothly.

