



**OFFICIAL
GUIDE TO**
South Africa
2020/21

SCIENCE AND INNOVATION

The Department of Science and Innovation (DSI) derives its mandate from the 1996 *White Paper on Science and Technology*, which introduced the concept of the national system of innovation, a set of interacting organisations and policies through which South Africa creates, acquires, diffuses and puts into practice new knowledge to help achieve individual and collective goals.

Over the medium term, the department planned to focus on producing new knowledge; generating and exploiting knowledge and innovation for inclusive economic development; healthcare innovation; developing human capital; developing infrastructure, and championing innovation in the energy sector.

The national integrated cyberinfrastructure system is expected to enable the successful and sustainable implementation of national projects such as MeerKAT and the Square Kilometre Array (SKA), as well as other large research infrastructure that is dependent on the presence of robust cyberinfrastructure. The MeerKAT telescope was expected to add 20 antennae in 2021/22 to its current array of 64 at a cost of about R800 million.

The MeerKAT telescope was expected to be further integrated into SKA Phase 1 with an additional 133 antennas in the Karoo up to 80 km from the core to make it a 197-dish array mid-frequency telescope. This expansion is a partnership between South Africa, Germany and Italy.

The national space strategy is intended to ensure that South Africa captures a reasonable share of the global space market. This involves engaging in economic activities related to manufacturing components that go into earth's orbit or beyond.

To intensify South Africa's intellectual property portfolio, the department also aims to produce 180 innovation products such as patents, prototypes, and technology demonstrators and transfer packages. These activities will be carried out by the Technology Innovation Agency (TIA).

In response to the Coronavirus Disease (COVID 19) pandemic, the DSI developed a strategy to drive a multipronged national vaccine production and development strategy to secure the country's long-term pandemic preparedness.

It also established an indigenous knowledge-based research team that was investigating seven mono-herbal and two multi-herbal medicine formulations with potential relevance to COVID-19.

Entities

Academy of Science of South Africa (ASSAf)

The ASSAf was established in terms of the ASSAf Act of 2001, as amended, to promote outstanding achievements in all fields of scientific inquiry, recognise excellence, and provide evidence-based scientific advice to government and other stakeholders.

Over the medium term, the academy aimed to achieve enhanced national capacity to produce and publish research, provide evidence-based policy advice to government, and increase the quality and visibility of South African research publications.

Council for Scientific and Industrial Research (CSIR)

The CSIR was established in 1945 and is governed in terms of the Scientific Research Council Act of 1988. The council's overarching and continuous focus area is to foster industrial and scientific development in the national interest.

This is achieved through conducting multidisciplinary research and providing technological innovation to improve the ability of the state to deliver basic services with the broader objective of reducing inequality.

Over the medium term, the council aimed to focus on conducting high-quality and relevant research, pursuing technological innovation to foster industrial and scientific development, and building on industrial development opportunities.

The council's ability to generate its own revenue is directly related to its ability to attract and retain the requisite expertise and skills to deliver favourable research outcomes.

Human Sciences Research Council (HSRC)

The HSRC was established in 1968 to undertake, promote and coordinate research in the human and social sciences. The council is mandated to initiate, undertake and foster strategic, basic and applied research in human sciences; and address developmental challenges by gathering, analysing and publishing relevant data, especially through projects linked to collaborative programmes oriented towards the public sector.

The council's research outputs are widely disseminated to support policy development at all levels of government. As such, over the medium term, the council aimed to continue focusing on producing research that serves the public; contributing to good governance and public service delivery; helping to address the challenges of poverty, inequality and inclusive development, and building the capacity of scholars and researchers.

National Research Foundation (NRF)

The NRF was established in terms of the NRF Act of 1998, as amended. In terms of this legislation, the foundation is mandated to support research through funding, the development of human resources, and the provision of research facilities to enable knowledge creation, innovation and development in all fields of science and technology. It is also mandated to promote indigenous knowledge.

The NRF supports approximately research-productive and internationally

recognised researchers. The productivity and quality of the knowledge produced by researchers who are funded by the foundation has been significant over the past five years.

In this regard, over the medium term, the NRF planned to continue driving excellence underpinned by the strength of the South African science system with a strong emphasis on transformation, innovation and sustainability.

South African Council for Natural Scientific Professions (SACNASP)

The SACNASP is the legislated regulatory body for natural science practitioners in South Africa. The natural sciences encompass a wide range of scientific fields covering all of the basic sciences and many of their applied derivatives. Its mission is to establish, direct, sustain and ensure a high level of professionalism and ethical conscience amongst its scientists.

South African National Space Agency (SANSA)

The SANSA was established in terms of the South African National Space Agency Act of 2008, as amended, to promote the peaceful use of space, foster international cooperation in space-related activities, and facilitate the creation of an environment conducive to space technology and industrial development.

In addition to continuing its focus on these priorities, over the medium term, the agency aimed to focus on broadening the suite of products and services available in the space sector, and contributing to promoting socio-economic development across Africa. Currently, more than 30 government departments and entities use national geospatial data for planning, monitoring and decision-making.

South Africa, through SANSA, has been selected as one of two International Civil Aviation Organization (ICAO) designated Regional Space Weather Centres.

By 2024, the country is expected to ensure a fully operational space weather capability that meets the ICAO requirements as well as advance research capabilities in the space weather field.

Technology Innovation Agency

The TIA Act of 2008, as amended, mandates the agency to serve as a key institutional intervention to bridge the innovation gap between research and development outcomes from higher education institutions, science councils, public entities, and private companies.

This with the purpose of intensifying the effect of technological innovation in the economy. Over the medium term, the agency aimed to continue focusing on bridging the innovation gap between research and development goals, and supporting technologies within the national system of innovation.

Research and science bodies

South African Bureau of Standards (SABS)

The SABS was established as a statutory body in terms of the Standards Act of 2008 and is part of South Africa's standardisation, quality assurance, accreditation and metrology technical infrastructure institutions.

The bureau is mandated to develop, promote and maintain South African national standards; render conformity assessment services; and promote the quality of commodities, products and services.

Its overarching objective is to protect the integrity of the South African market, protect consumers, create a competitive advantage, and facilitate access by South Africans to local and international markets.

Over the medium term, the bureau aimed to focus on revitalising testing operations and facilities in key targeted sectors. The bureau also plans to roll out a local content verification programme for key sectors designated for local procurement.

National Intellectual Property Management Office (NIPMO)

The NIPMO is mandated to ensure that intellectual property from publicly financed research and development is identified, protected, utilised and commercialised for the benefit of the people of South Africa, whether it be for social, economic, military or any other benefit.

Agricultural Research Council (ARC)

The ARC was established by the Agricultural Research Act of 1990, which mandates the council to: conduct research and development, and effect the transfer of technology in the agriculture sector; contribute to a better quality of life; and facilitate and ensure natural resource conservation.

Mintek

Mintek's mandate, as set out in the Mineral Technology Act of 1989, is to maximise the value derived from South Africa's mineral resources through, among other things, research and development, technology transfer, and the creation of an enabling environment for the establishment and expansion of mineral industries.

To this end, Mintek develops appropriate, innovative technology for transfer to industry, and provides the industry with test work, consultancy, analytical and mineralogical services.

Council for Geoscience (CGS)

The CGS was established in terms of the Geoscience Act of 1993 to promote the search for and exploitation of any mineral in South Africa. It is mandated

to generate, compile, curate and publish world-class geoscience knowledge products, provide geoscience-related services to the South African public and industry, and render advisory services related to geohazards and geo-environmental pollution.

Over the medium term, the council was expected to continue focusing on the geoscience national mapping programme, the data migration and digitisation programme, the procurement of key geoscientific equipment and infrastructure, and the improvement of high-quality research and analysis.

The high-quality geoscience data provided by geological mapping for exploration and mining is expected to increase exploration activities, resulting in economic growth. This information is also required to assess the environmental impact of mining activities and shale gas development.

South African Medical Research Council (SAMRC)

The SAMRC conducts and funds health research and medical innovation in terms of the amended SAMRC Act of 1991. The council is mandated to contribute to improved health and quality of life for the South African population by providing evidence-based recommendations to various policy-makers through health research, development, technology transfer and capacity development.

Over the medium term, the council was expected to focus on funding and conducting core health research, developing innovations and technology, and building research capacity. It will pay particular attention to risk factors associated with TB, HIV and AIDS, cardiovascular diseases, non-communicable diseases, gender, and alcohol and other drug abuse.

National Health Laboratory Service (NHLS)

The NHLS was established in terms of the National Health Laboratory Service Act of 2000. The entity operates more than 230 laboratories in nine provinces and is the sole provider of training for pathologists and medical scientists, provides comprehensive and affordable pathology services to more than 80% of the South African population, and plays a significant role in the diagnosis and monitoring of HIV and TB.

The entity also houses the National Institute for Communicable Diseases (NICD), which is internationally renowned for its role in the surveillance and monitoring of communicable diseases. It provides expertise to southern African countries on outbreaks such as Ebola, listeriosis and, most recently, COVID-19.

Over the medium term, the NICD planned to continue playing a critical role in the surveillance of COVID-19, focusing on providing services such as mobile testing, community outreach, hotline services, testing at all border posts, and necessary support to provinces in their responses to COVID-19.

Over the medium term, the NHLS was expected to focus on providing laboratory testing services to health care providers mainly in the public sector, and expanding its provisions in response to increased demand for its services in priority programmes such as HIV and TB care.

The COVID-19 pandemic has had a negative impact on overall testing in that fewer patients sought care at health facilities during national lockdown, resulting in a 12% decrease in tests conducted from 2019/20 to 2020/21.

However, as at 20 January 2021, the entity had conducted an estimated 3.3 million COVID-19 tests. The number of tests conducted, excluding those for COVID-19, is expected to increase at an average annual rate of 1%, from 89 million in 2020/21 to 93 million in 2023/24.

South African National Energy Development Institute (SANEDI)

The SANEDI was established in terms of the National Energy Act of 2008, and is listed as a schedule 3A public entity in terms of the Public Finance Management Act of 1999). Its mandate is to direct, monitor and conduct applied energy research and development, and demonstrate and deploy specific measures to promote the uptake of green energy and energy efficiency in South Africa.

Over the medium term, the institute planned to continue focusing on projects that support energy efficiency, including green, sustainable and renewable energy technologies, and smart grids.

It also aimed to commercialise its energy solutions to create jobs, particularly for women, young people and people living with disabilities, in line with national priorities and the strategic intentions of the 2019 *White Paper on Science, Technology and Innovation*. This will entail assessing 12 energy solutions for smart grids.

Water Research Commission (WRC)

The WRC was established in terms of the Water Research Act of 1971. It is mandated to conduct research in the water sector by determining needs and priorities for research; promoting coordination, cooperation and communication in the area of water research development; stimulating and funding water research; promoting the effective transfer of information and technology, and enhancing knowledge and building capacity in the water sector.

Over the medium term, the commission planned to continue driving research and enhancing knowledge within the water sector.

South African Environmental Observation Network (SAEON)

The SAEON is a research facility that establishes and maintains nodes (environmental observatories, field stations or sites) linked by an information

management network to serve as research and education platforms for long-term studies of ecosystems that will provide for incremental advances in the understanding of ecosystems and the ability to detect, predict and react to environmental change.

South African Astronomical Observatory (SAAO)

Founded in 1820, the SAAO is the national centre for optical and infrared astronomy in South Africa. Its primary role is to conduct fundamental research in astronomy and astrophysics by providing a world-class facility to scientists.

The SAAO also promotes astronomy and astrophysics in southern Africa, by sharing research findings and discoveries, and participating in outreach activities to enthuse citizens about physics and astronomy.

The SAAO is a facility of the NRF, which operates under the DSI. Its headquarters are in the eponymous suburb of Observatory in Cape Town, and has a dedicated research and observation station with several working telescopes, including Southern African Large Telescope, outside the Karoo town of Sutherland in the Northern Cape.

To achieve the best possible observing conditions, all of the current astronomy operations occur in Sutherland. Historical telescopes in Cape Town are still regularly used for outreach and public events.