



science & innovation

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Department:  
Science and Innovation  
**REPUBLIC OF SOUTH AFRICA**

# **2019/20 Third Quarter Performance Report**

**Final**

**1 October – 31 December 2019**

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**LIST OF ABBREVIATIONS**

<b>ACCESS</b>	Applied Centre for Climatic and Earth System Science South African
<b>APP</b>	Annual Performance Plan
<b>ASSAf</b>	Academy of Science of South Africa
<b>AU</b>	African Union
<b>BIDC</b>	Biomanufacturing Industry Development Centre
<b>CEO</b>	Chief Executive Officer
<b>CESTII</b>	Centre for Science, Technology and Innovation indicators
<b>CIPC</b>	Companies and Intellectual Property Commission
<b>CRDP</b>	Comprehensive Rural Development Programme
<b>CSIR</b>	Council for Scientific and Industrial Research
<b>DPME</b>	Department of Planning, Monitoring and Evaluation
<b>DSI</b>	Department of Science and Innovation
<b>ENE</b>	Estimates of National Expenditure
<b>ERM</b>	Enterprise Risk Management
<b>EU</b>	European Union
<b>Exco</b>	Department's Executive Committee
<b>FEI</b>	Fluorochemicals Expansion Initiative
<b>F'SAGRI</b>	French South African Agricultural Institute
<b>GDP</b>	gross domestic product
<b>GEO</b>	Group on Earth Observations
<b>HCD</b>	human capital development
<b>HySA</b>	Hydrogen South Africa

<b>IAA</b>	Internal Audit Activity
<b>ICASA</b>	Independent Communications Authority of South Africa
<b>ICR</b>	International Cooperation and Resources
<b>ICSU</b>	International Council for Science
<b>ICT</b>	Information and Communication Technology
<b>IDEWS</b>	Infectious Diseases Early Warning Systems
<b>IK</b>	Indigenous Knowledge
<b>IKS</b>	Indigenous Knowledge Systems
<b>IP</b>	intellectual property
<b>IPR Act</b>	Intellectual Property Rights from Publicly Financed Research and Development Act
<b>IT</b>	Information Technology
<b>MCA</b>	Multilateral Cooperation and Africa
<b>MTEF</b>	Medium-Term Expenditure Framework
<b>NACI</b>	National Advisory Council on Innovation
<b>NICIS</b>	National Integrated Cyberinfrastructure System
<b>NIPMO</b>	National Intellectual Property Management Office
<b>NRF</b>	National Research Foundation
<b>NSI</b>	National System of Innovation
<b>NT</b>	National Treasury
<b>OECD</b>	Organisation for Economic Cooperation and Development
<b>R&amp;D</b>	research and development
<b>RDI</b>	research, development and innovation
<b>RDS</b>	Research Development and Support
<b>S&amp;T</b>	science and technology
<b>SADC</b>	South African Development Community

<b>SAEOS</b>	South African Earth Observation Strategy
<b>SANSA</b>	South African National Space Agency
<b>SARChI</b>	South African Research Chairs Initiatives
<b>SARIR</b>	South African Research Infrastructure Roadmap
<b>SEDA</b>	Small Enterprise Development Agency
<b>SEIP</b>	Socio-Economic Innovation Partnership
<b>SETI</b>	Science, Engineering and Technology Innovation
<b>SIF</b>	Sector Innovation Fund
<b>SKA</b>	Square Kilometre Array
<b>SKA/AVN</b>	SKA and African Very Long Baseline Interferometry Network
<b>SLA</b>	Service Level Agreement
<b>STEPSA</b>	Spatial-Temporal Evidence for Planning South Africa
<b>STI</b>	science, technology and innovation
<b>TIA</b>	Technology Innovation Agency
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>WIPO</b>	World Intellectual Property Organisation
<b>WRC</b>	Water Research Council
<b>WSF</b>	World Science Forum

## 1. INTRODUCTION

In an effort to enhance service delivery by the government using the 2019/20 Annual Performance Plan (APP) as an implementation mechanism, the Department continued to contribute to the government's Programme of Action within the Medium-Term Strategic Framework by implementing its five strategic outcome-oriented goals as articulated in the Department of Science and Innovation's (DSI) Strategic Plan. These goals are a responsive, coordinated and efficient national system of innovation; increased knowledge generation; using knowledge for economic development; human capital development (HCD); and using knowledge for inclusive development.

Currently, the 2019 White Paper is the principal policy guiding the national system of innovation (NSI), committing the country to further the role of STI in economic and social development, and emphasising the core themes of inclusivity, transformation and partnerships. Guided by the current APP, the main focus of the Department during the reporting period is to create an environment in which its work and the work of the wider NSI contribute to the reduction of inequality, poverty and unemployment in South Africa, and give marginalised communities more and better opportunities to participate fully in the economy.

Treasury Regulation 5.3.1 requires the accounting officer to establish procedures for quarterly reporting to the executive authority to facilitate effective performance monitoring, evaluation and corrective action. Procedures for quarterly reporting have been established through the August 2011 National Treasury Guidelines, "Preparation of Quarterly Performance Reports Guidelines", in line with the Presidency's outcomes-based approach. Both the National Treasury and the DSI's Performance Information Policy and Procedure Manual require that, where there are deviations between planned and actual performance, reasons for the deviations be provided.

This third quarter review presents the progress made from 1 October to 31 December 2019, including the challenges and issues confronting DSI Programmes in their pursuit of the 2019/20 financial year targets as outlined in the APP. Also, this review details DSI financial transactions as at 31 December 2019.

The overall progress of performance is based on the three classification categories. The legend keys below explain the overall progress as per DSI performance indicators:

Not achieved	No target due	Achieved
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Note that the colour code refers to the quarterly targets (not achievements that were not planned).

- Red – **Not achieved** that the target has not been achieved within the planned timeframes; major remedial action and urgent interventions are required.
- Green – **No target due** and no major action is needed since there are no planned targets within the planned timeframes.
- Blue – the quarterly target is **achieved** within the planned timeframes.

## 2. DSI THIRD QUARTER PERFORMANCE OVERVIEW

Performance information plays a significant role in measuring the contributions of the DSI to the priorities of the government, the use of budget allocations and the monitoring of service delivery in line with its mandate. This report indicates progress with the implementation of an institution's APP during the reporting quarter, with particular reference to monitoring delivery against quarterly performance targets.

Figure 1 below illustrates the performance of the DSI from October to December 2019, integrating all the latest amendments by the Programmes with regard to the finalisation of evidence, which was initially outstanding.

During the period under review, there were 27 planned output targets. The Department achieved 70% of these, and did not achieve 30%.

**Figure 1: The overall 2019/20 DSI's third-quarter performance**

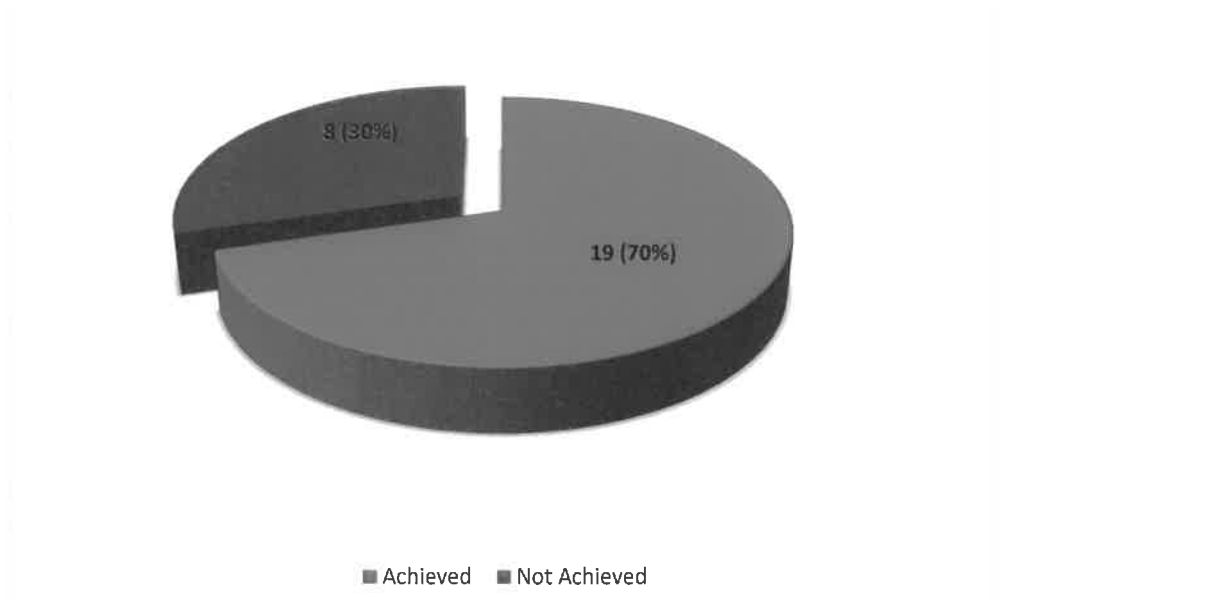


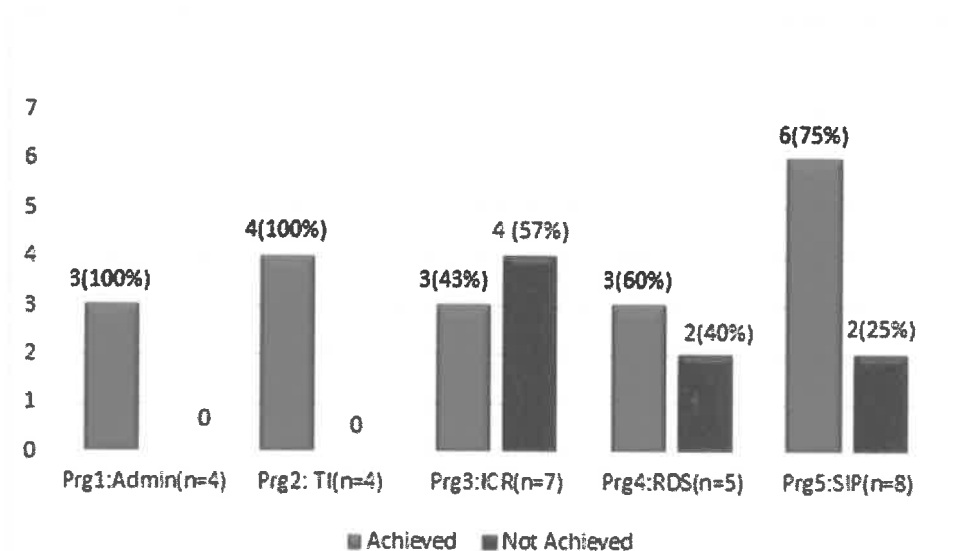
Figure 2 below illustrates the performance of the Department per Programme during the third quarter. The DSI planned to achieve a total number of 27 output targets for the 2019/20 financial year. Performance is based on all five Programmes.

- Programme 1 achieved 100% of its targets.



- Programme 2 achieved 100% of its targets.
- Programme 3 achieved 43% of its targets and 57% of the planned targets were not achieved.
- Programme 4 achieved 60% of its targets and 40% of the planned targets were not achieved.
- Programme 5 achieved 75% of its targets and 25% of the planned targets were not achieved.

**Figure 2: The DSI third-quarter performance per Programme**



### QUARTER THREE PERFORMANCE INFORMATION ANALYSIS

Overall, the Department achieved 70% of the planned output targets. Most indicators from Programme 2 and 3 will be reported in quarter 4, so it is not clear yet whether they will achieve the annual targets for the financial year. The major challenge identified during the reporting period was that the Programmes received evidence late, particularly Programme 3. Programme 5's performance is currently at 75%, with one indicator (turnaround time for providing pre-approval decisions on applications for the R&D tax incentive) that has not been achieved for the past three financial years. Programme 5 will have to design remedial actions on this indicator as it is affecting the overall performance of the Department. Based on the current status of DSI

performance, one can deduce that the Department is likely to achieve most of its set targets by the end of the financial year.

## **PROGRAMME 1: ADMINISTRATION**

The purpose of Programme 1 is to provide the strategic policy and planning alignment, ensure effective governance, risk management, and monitoring and evaluation, and provide strategic science communication with stakeholders about the activities of the DST and national system of innovation (NSI).

The Programme consists of the following chief directorates:

**The Ministry and Office of the Director-General:** Support the Minister, Deputy Minister and Director-General by providing professional and executive support. This component is responsible for the systems and mechanisms for handling Parliamentary questions and replies, Cabinet matters, correspondence, submissions and memoranda. It also coordinates activities within the Department to assist in steering the NSI towards the development of a knowledge-intensive economy with higher productivity levels.

**Enterprise Risk Management (ERM):** Provides and drives an enabling environment in support of the identification, management and oversight of risks across strategic, tactical and operational levels in the Department. This role includes ensuring that countering fraud and/or corruption is made an integral part of the strategy, operations and administration within the Department.

**Policy, Planning, Governance, Monitoring and Evaluation:** Supports the DSI leadership in steering the NSI by facilitating the coordination of selected cross-cutting issues in the Department, strategic and operational planning, monitoring and evaluation for the Department and its public entities, and governance of the public entities, to assist the Department and its entities to contribute to the realisation of departmental and national priorities.

**Internal Audit Activity (IAA):** Serves as the primary assurance tool for improving the Department's governance, risk management and management controls by providing insight and recommendations based on the analysis and assessment of data and business processes.

**Human Resources (HR):** Ensures that the Department is able to (a) provide a professional service through accurate, consistent and best employment practices in all its activities; (b) attract, retain and motivate employees who share the organisational vision; (c) champion change and transition, with a view to being a catalyst in the transition of people and the organisation to embrace and implement change; (d) set performance standards and manage performance against these; (e) promote an environment that supports the personal and career development of all employees so that they can reach their full potential and contribute better to the achievement of the Department's strategic objectives; (f) instil a culture of service excellence; and (g) provide an environment that promotes health, wellness and safety, and embraces the value of diversity.

**Finance:** Ensures the effective, efficient and economical use of financial resources in line with financial prescripts, through the development and implementation of financial systems, policies, frameworks and procedures. This includes budget planning and expenditure monitoring, and the management of procurement, acquisition, logistics, assets and financial transactions.

**Information System and Knowledge Management:** Is responsible for the delivery of services that support the Department's Strategic Plan and individual units' objectives through the effective use of IT. The component's purpose is to align the IT strategy with the business strategy to ensure that the Department uses its resources optimally.

**Science Communication:** Provides strategic communication support to raise local and international awareness of the objectives and activities of the Department, its entities and the NSI, as well as to ensure effective communication among DSI and NSI stakeholders. Its overall focus is to create public awareness and brand the Department as a custodian of developments, benefits and opportunities in publicly

funded STI initiatives across the country's science system. This is done through print, broadcast and online media, speeches and events, including public participation programmes. The component also supports science engagement programmes by the South African Agency for Science and Technology Advancement (SAASTA) and others and ensures the alignment of the DSI communication strategy with the Government Communication Framework.

**Legal Services:** Is responsible for ensuring that the interests of the Department are protected against any legal risk. The component ensures that the Department complies with all relevant legislation, and takes a proactive approach to deal with matters that have the potential to give rise to conflict or legal challenges.





Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	Unqualified audit (clean audit) opinion with no financial matters in the audit report	Unqualified audit (clean audit) opinion with no financial matters in the audit report	No target	No target due	No target due	None	None

## **PROGRAMME 2: TECHNOLOGY INNOVATION**

The purpose of the Programme is to drive strategic research, development and innovation (RDI) in space science and technology, energy, the bioeconomy, and the emerging and converging areas of nanotechnology, robotics, photonics and indigenous knowledge systems (IKS), and to promote the realisation of commercial products, processes and services from these RDI initiatives. Also, through the implementation of enabling policies and interventions along the entire innovation value chain, to promote the protection and utilisation of intellectual property (IP), technology transfer and technology commercialisation.

The Programme provides policy leadership in the DSI's long-term cross-cutting RDI initiatives through four chief directorates.

**Bioinnovation** leads the DSI's implementation of the national Bio-economy Strategy, with its prime focus on the socio-economic outcomes and the strengthening of research and innovation competencies that form the strategic base of the bio-based NSI, rather than the mere development of technologies.

**Hydrogen and Energy** develops a portfolio of technologies to contribute towards resolving the energy security challenge, to increase local mineral beneficiation, and to facilitate South Africa's transition towards a knowledge-driven economy. In line with the NDP, the MTSF and the Nine-Point Plan, the chief directorate seeks to facilitate the achievement of economic development and social equity by including locally developed cleaner energy technology solutions in South Africa's energy system.

**Space Science and Technology** supports the creation of an environment conducive to the implementation of the Space Science and Technology Grand Challenge, the National Space Strategy and the South African Earth Observation Strategy, as well as addressing the development of space technologies, innovative solutions and human capital to respond to national priorities and boost socio-economic growth.

The chief directorate is also focusing on the development of human capital through targeted programmes in the thematic areas of Earth observation and satellite



engineering; navigation and positioning; space science and exploration; and satellite communication. The satellite technology platforms and infrastructure in space S&T will play an important role in decision-making processes in both the public and private sectors.

**Innovation Priorities and Instruments** supports and strengthens the innovation policy package (and related interventions) aimed at creating and sustaining an enabling environment for innovation, technology development, and commercialisation of publicly funded research and development (R&D) initiatives. In performing this function, the chief directorate supports the identification, development, creation and support of policy and institutional structures that facilitate technology development and its progression into national and international markets. The chief directorate also focuses on the conceptualisation, piloting and monitoring and evaluation of innovation policy instruments, such as those centred on the Department's Commercialisation Framework. It is further supporting the development and implementation of emerging and converging technologies that have the potential to influence and affect social and economic development positively, in areas such as synthetic biology, structural biology, systems biology and functional genomics, nanotechnology, photonics and robotics.

**National Intellectual Property Management Office (NIPMO)** is the national implementing agency for the Intellectual Property Rights from Publicly Financed Research and Development Act (IPR Act). NIPMO is currently located in the Department as a specialised service delivery unit. NIPMO's key functions, as set out in the IPR Act, are as follows:

- To facilitate the establishment of offices of technology transfer at institutions (27 higher education institutions and 11 Schedule 1 institutions, which are mostly science councils) and associated capacity development.
- To ensure compliance with the IPR Act and Regulations by recipients of publicly financed R&D.
- To provide funding through the IP Fund for the protection and maintenance of IP emanating from publicly financed R&D.

- To provide incentives for IP creators to encourage them to disclose, protect and commercialise their creations.

### **Highlights of the Quarter**

In realising the Technology Innovation mandate, the following are put forward as highlights.

#### **Increased knowledge generation**

The Indigenous Knowledge Systems team, on the basis of its ongoing work in cannabis research over the years, was nominated to represent the Department in the Presidential Cannabis Master Plan Committees led by the Department of Trade, Industry and Competition; and the Department of Agriculture, Land Reform and Rural Development. The Committees were convened during Quarter 3. A Bill and several strategies for research, conservation and industrialisation of medical cannabis are being developed by the Ministerial Advisory Committee led by the Department of Health.

Two special sessions (a Medical Cannabis Symposium and a session on Indigenous Knowledge-Based Technology Innovation) were organised as part of the Innovation Bridge/ Science Forum South Africa 2019. The sessions covered aspects of legislation and regulations, research and innovation, and the industrialisation of cannabis and natural products. Expert panellists came from leading organisations in South Africa, Jamaica and Lesotho.

#### **Knowledge utilisation for economic development**

The MyPlate Membrane Electrode Assembly, which is based on intellectual property (IP) developed under the Hydrogen South Africa (HySA) programme, passed all the required tests to be incorporated into a commercial fuel cell system developed by the global original equipment manufacturer Horizon. The fuel cell systems will be deployed across five sites spread across Gauteng, KwaZulu-Natal and the Eastern Cape before the end of March 2020. Furthermore, the Bizana local municipality

passed a council resolution to deploy HySA hydrogen fuel cells to provide back-up power at one of the municipal buildings. The passing of a council resolution is a critical step in the process of deployment as it is a firm commitment by the local municipality to commit both technical and financial resources to the successful deployment of the fuel cell system.

Following the establishment of the Indigenous Knowledge-Based Technology Innovation Unit at the Technology Innovation Agency, the Innovation Sector of the BioPANZA initiative chaired by the DSI was formally established.

As part of the implementation of the agricultural bio-economy Strategy, the DSI conducts evidence-based value chain mapping to identify market-led opportunities for innovation investment and efficient coordination of such commodity-based value chains to ensure long term sustainability. The DSI has appointed Automotive Investment Holdings to conduct a feasibility study to establish market opportunities for South African sorghum locally and globally. It is envisioned that the sorghum study should ultimately provide a business case for the sorghum value chain upgrade in South Africa. This would include amongst other things, a strengths, weaknesses, opportunities and threats (SWOT) analysis of the current sorghum value chain; a financial model for a sorghum farm operation and value chain, as well as quantifying and validating sorghum export market opportunities within the region and globally. This study started in November 2019, with the signing of a contract and is expected to be concluded by June 2021.

In partnership with the European Union-led International Bioeconomy Forum, the Bioinnovation team hosted a bioeconomy session (The Solution Towards A Green, Fair and Sustainable Future) as part of the Innovation Bridge-Science Forum South Africa event held from 4 to 5 December 2019. The session was aimed at exploring the potential of the bioeconomy, especially for the African continent. Moreover, the session highlighted the challenges and needs in the creation of national bioeconomy strategies and inspire further collaboration between African and European countries via the International Bioeconomy Forum. The session drew a wide variety of bioeconomy stakeholders, including public servants, industry, researchers and members of the general public.

The World Intellectual Property Management Office (WIPO) in partnership with the National Intellectual Property Management Office (NIPMO) and the Companies and Intellectual Property Commission held the 11th WIPO Summer School for professionals and students at the Central University of Technology from 25 November to 6 December 2019.

Forty-three participants from South Africa and 12 other African countries, including Lesotho, Zimbabwe, Tanzania, Botswana, Kenya and Nigeria, attended the summer school. Through NIPMO's partnerships, the Japanese Patent Office increased scholarships for African participants from 10 to 20. This happened for the first time in 2019 and will continue in 2020. The intense two-week programme consists of lectures, case studies, simulation exercises and group discussions on selected intellectual property (IP) and technology transfer topics. This is one of many high-level interventions that NIPMO puts in place every year to ensure that South Africa and Africa are working increasingly towards having the right quantum and level of experience in the highly complex field of IP management and technology transfer. All the participants were Africans, and more than 50% were women. Most of the participants came from African countries outside of South Africa.

South Africa as one of the Group on Earth Observations (GEO) Co-Chair (Lead) highlighted the following success stories at the GEO Plenary and Ministerial Summit in Canberra, Australia:

- Contribution to the Blue Economy through the National Oceans and Coastal Information Management System, and ZACube-2 automatic identification system data for vessels tracking (oceans traffic).
- South Africa is in the process of establishing a regional node for the Global Mercury Observation System, which will contribute to global mercury monitoring.
- Digital Earth South Africa will lead and contribute to the development of Digital Earth Africa.
- South Africa announced the hosting of the AfriGEO Secretariat by the Regional Centre for Mapping of Resources for Development in Kenya, which is critical for raising awareness of Earth observations (EO) and GEO in the continent.

In October 2019, the DSI successfully supported SANSA and 10 local space companies to exhibit and showcase their capabilities and subsystems at the 70th International Astronautical Congress which was organised by the International Astronautical Federation. Flagship projects (Cape Peninsula University of Technology's satellite programme, South African Radio Astronomy Observatory) and SMMEs (such as Luvhone Consulting and Amaya Space) and national government initiatives (through the South African Council for Space Affairs) were showcased at the biggest International Astronautical Congress event to date. In addition to the exhibition, the South African delegation made technical presentations.

The DSI is a member of the Executive Council of the Genetically Modified Organisms (GMO) Act, 1997. In this role, the DSI supports the approval of GMO products that are safe and not harmful to humans and the environment. The Executive Council considers the applications, including a full risk assessment, the Advisory Committee (from a technical perspective) recommends respective policies and legislation within the sector and public inputs where applicable in their decision-making process. In this regard the DSI provided 12 regulatory recommendations to the Executive Council GMO permit applications. 100% of the applications were considered.

**TABLE 2: PROGRAMME 2 – TECHNOLOGY INNOVATION**

Strategic statement: To facilitate and resource investments in space science, energy, bioinnovation, nanotechnology, robotics, photonics, IKS, IP management, technology transfer and technology commercialisation								
Annual target: 19 instruments funded in support of knowledge utilisation by 31 March 2020								
Performance indicator: Number of instruments funded in support of knowledge utilisation								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	8 instruments funded in support of knowledge utilisation	7 instruments funded in support of knowledge utilisation	3 instruments funded in support of knowledge utilisation	5 instruments funded in support of knowledge utilisation	Achieved	The target was exceeded as Programme 2 was trying to catch up on the one instrument that was short in Q2 and trying to spend the funds timeously.	None
Annual target: 120 knowledge outputs generated by 31 March 2020								
Performance indicator: Number of knowledge outputs generated								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	No target	No target due	No target due	None	None
Annual target: Three strategic policy directives in designated areas in support of economic sectors by 31 March 2020								

Performance indicator: Number of strategic policy directives in designated areas in support of economic sectors									
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken	
No target	No target due	No target	No target due	No target	No target due	No target due	None	None	
Annual target: 100% of regulatory recommendations made to the GMO Executive Council through DAFF to support decision making by 31 March 2020									
Performance indicator: Percentage of regulatory recommendations made to the GMO Executive Council through DAFF to support decision-making									
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken	
100% of regulatory recommendations made from applications received to support decision making	100% of regulatory recommendations made from applications received to support decision making	100% of regulatory recommendations made from applications received to support decision making	100% of regulatory recommendations made from applications received to support decision making	100% of regulatory recommendations made from applications received to support decision making	100% of regulatory recommendations made from applications received to support decision making	Achieved	None	None	
Annual target: Two decision-support interventions maintained by 31 March 2020									
Performance indicator: Number of decision-support interventions developed or maintained									
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken	
No target	No target due	No target	No target due	No target	No target due	No target due	None	None	

<b>Strategic statement: To oversee, monitor and regulate key policy initiatives, including institutions/agencies and support interventions in the key strategic areas of space science, energy, bioinnovation, nanotechnology, robotics, photonics</b>							
<b>Annual target: 210 new disclosures reported by publicly funded institutions by 31 March 2020</b>							
<b>Performance indicator: Number of new disclosures reported by publicly funded institutions</b>							
<b>Quarter 1 target as per APP</b>	<b>Quarter 1 actual output</b>	<b>Quarter 2 target as per APP</b>	<b>Quarter 2 actual output</b>	<b>Quarter 3 target as per APP</b>	<b>Quarter 3 actual output</b>	<b>Status</b>	<b>Reason for variance</b>
100 new disclosures reported by publicly funded institutions	150 new disclosures were received from publicly funded institutions	No target	No target due	100 new disclosures reported by publicly funded institutions	101 new disclosures reported by publicly funded institutions	Achieved	None
<b>Strategic statement: To coordinate and support high-end and skills development in the strategic and emerging S&amp;T areas of space science, energy, bioinnovation, nanotechnology, robotics, photonics, synthetic biology, structural biology, systems biology and functional genomics (collectively the South African BioDesign Initiative), IP management, technology transfer and technology commercialisation</b>							
<b>Annual target: 185 postgraduate students (master's and doctoral) funded in designated areas by 31 March 2020</b>							
<b>Performance indicator: Number of postgraduate students (master's and doctoral) funded in designated areas</b>							
<b>Quarter 1 target as per APP</b>	<b>Quarter 1 actual output</b>	<b>Quarter 2 target as per APP</b>	<b>Quarter 2 actual output</b>	<b>Quarter 3 target as per APP</b>	<b>Quarter 3 actual output</b>	<b>Status</b>	<b>Reason for variance</b>
No target	No target due	No target	No target due	No target	No target due	No target due	None
<b>Annual target: 230 trainees attending training initiatives in designated areas by 31 March 2020</b>							
<b>Performance indicator: Number of trainees attending training initiatives in designated areas</b>							



Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	165 trainees attending training initiatives in designated areas	175 trainees attending training initiatives in designated areas	Achieved	10 more trainees registered as there was a bigger interest in the workshops, as they presented unique training opportunities.	None
<b>Strategic statement: To support, promote, and advocate for the development and translation of scientific R&amp;D outputs into commercial products, processes and services that will contribute towards economic growth and a better quality of life</b>								
Annual target: 10 knowledge application products developed in designated areas by 31 March 2020								
<b>Performance indicator: Number of knowledge application products developed in designated areas</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	No target	No target due	No target due	None	None
Annual target: 8 commercial outputs in designated areas by 31 March 2020								
<b>Performance indicator: Number of commercial outputs in designated areas</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	No target	No target due	No target due	None	None

### **PROGRAMME 3: INTERNATIONAL COOPERATION AND RESOURCES**

The purpose of the Programme is to strategically develop, promote and manage international relationships, opportunities and S&T agreements that strengthen the NSI and enable an exchange of knowledge, capacity and resources between South Africa and its regional and international partners. International Cooperation and Resources (ICR) also support South African foreign policy through science diplomacy. The Programme has three chief directorates.

**International Resources:** Works to increase the flow of international funding into South African STI initiatives, as well as African regional and continental programmes, through foreign investment promotion efforts, and fostering strategic partnerships with partners such as the European Union, as well as foundations and philanthropic organisations and the multinational private sector.

**Multilateral Cooperation and Africa:** Advances and facilitates South Africa's participation in bilateral STI cooperation initiatives with other African partners, in African multilateral programmes, especially SADC and AU programmes, and in broader multilateral STI partnerships, with a strategic focus on South-South cooperation.

**Overseas Bilateral Cooperation:** Promotes and facilitates South Africa's bilateral STI cooperation with partners in Europe, the Americas, Asia and Australasia, especially for STI HCD, for collaborative research and innovation, and to secure partners' support for joint cooperation with other African partners.

#### **Highlights of the Quarter**

Activities with India during the quarter included a meeting of the SA-India Working Group and agreement on the scope and terms of reference for the joint programme of action for the grassroots innovation technology exchange. This is a significant milestone as it gives clarity and guidance on how the joint programme will support innovators and entrepreneurs.

The first SA-Canada Joint Committee meeting was held in Canada and followed by the signing of a memorandum of understanding on science and innovation. This was a big step towards formal engagement with Canada, which will be a strategic partner for South Africa, especially as they are members of several multilateral forums.

A working group planning meeting was held with Jamaica in preparation for the next joint committee meeting and joint research call with the Ministry of Science, Energy and Technology in November. Among other business, the purpose of the meeting was to reaffirm the relationship with Jamaica, a country in the diaspora that is eager to partner with South African researchers in IKS and science promotion.

The BRICS Academies of Science met in Rio de Janeiro to continue discussions towards formal recognition as an advisory group to the Ministers of BRICS on science and innovation. The annual forum gives young researchers an opportunity to discuss their current research in chosen thematic areas, which in 2019 were cybersecurity and the bioeconomy. The third BRICS Biotech and Biomed Working Group (including Human Health and Neuroscience) meeting was held in Campinas in November 2019. The outcomes of the meeting included a unanimous decision to facilitate cooperation on biotechnology and biomedicine and increase trading in hi-tech products among BRICS countries. The 5th BRICS Astronomy Working Group workshop on multi-messenger and multiwavelength astronomy was held in October in Rio de Janeiro, where all countries demonstrated an eagerness to continue with collaborating in astronomy, with special emphasis on human capital development and infrastructure development.

On 7 November 2019, the French South African Agricultural Institute (F'SAGRI) was formally launched at the University of Limpopo in South Africa. F'SAGRI also launched the 1st Innovation Prize Awards and Agricultural Merit Awards for young students and researchers. The winner of the first prize received R50 000, the second prize R30 000, and the third prize R15 000. All eight competitors received fully funded mobility grants to visit Paris in 2020.

Another important development was the launch of the Infectious Disease Early Warning System (IDEWS) Bureau at the Innovation Bridge-Science Forum South

Africa 2019. The Bureau stems from the IDEWS research project, which was funded by the Japan International Cooperation Agency (JICA) under the Science and Technology Research Partnerships for Sustainable Development (SATREPS) call, with DSI co-investment. The IDEWS Bureau is the implementor of the research project, which will be operationalised through a collaboration with the South African Weather Services, the South African Medical Research Council, the Council for Scientific and Industrial Research, the University of Pretoria, the University of the Witwatersrand and the DSI-NRF ACCESS programme. The IDEWS Bureau will be hosted by the National Institute of Communicable Diseases.

The Department hosted the European Commission's Deputy Director-General for Research and Innovation during the Innovation Bridge-Science Forum South Africa 2019. With the Directorate: Environmental Services and Technologies, Programme 3 organised a series of events, including the SA-EU Policy Dialogue on the Circular Economy on 19 to 21 November 2019 in Pretoria, and the South Africa-European Partnerships day workshop on 3 December 2019. The event was an information session on Cooperation on Science and Technology (COST) opportunities as well as the launch of the South Africa-led EUREKA multilateral call on disruptive technologies. During the Innovation Bridge-Science Forum South Africa 2019, an exhibition was co-hosted in collaboration with the European Delegation.

Programme 3 coordinated 12 international activities (training sessions, workshops, dialogues and information sessions) related to the 2019 Innovation Bridge-Science Forum South Africa 2019. The DSI partnered with the Centre for Science and Technology of the Non-Aligned and Other Developing Countries (NAM S&T Centre) and the Academy of Science of South Africa (ASSAf) to host a training workshop on science diplomacy, with participants from the Global South, including countries like Bhutan, Cuba, Egypt, India and Indonesia.

From March 2019 to November 2019, the DSI facilitated and collaborated with seven international partner organisations as part of the Africa-EU research and innovation initiative – the Long-term EU-AU Research and Innovation Partnership for Food and Nutrition Security and Sustainable Agriculture (LEAP4FNSSA) project. The DSI contributed towards a monitoring and evaluation study in this regard. The outcomes

of the study were presented in November 2019 at the 5th Senior Officials Meeting of the Africa-EU High-Level Policy Dialogue Bureau Meeting on Science, Technology and Innovation.

The DSI organised an Agriculture in the Fourth Industrial Revolution seminar and an information-sharing session on DSI's research initiatives for women and young scientists on 13 December 2019, during the Next Einstein Forum Africa Science Week. The event was jointly organised with the Next Einstein Forum's ambassador for 2018/2019 (Ms Keabetswe Ncube, a PhD Candidate at the Agricultural Research Council Biotechnology Platform) with the University of KwaZulu-Natal. The Agriculture in the Fourth Industrial Revolution Seminar and the information-sharing session aimed to bring together academics within the agriculture sector to share opportunities and best practices in incorporating innovation in agricultural/farming activities and offer support to rural women and youth in agriculture. In pursuit of regional integration, the DSI, in partnership with the SADC Secretariat and the United Nations Educational, Scientific and Cultural Organization (UNESCO), hosted SADC training on STI Policy and Governance for Parliamentarians and Senior Officials from 4 to 6 December 2019. The theme of the workshop was on strengthening inclusivity and gender transformation in SADC STI systems.

The DSI participated in the World Science Forum (WSF) in November 2019 at Budapest, Hungary. Its participation entailed serving on the organising committee for the WSF and an exhibition. The Minister of Higher Education, Science and Innovation delivered an address at the opening and closing ceremonies of the forum.

**TABLE 3: PROGRAMME 3 – INTERNATIONAL COOPERATION AND RESOURCES**

Strategic statement: To secure international funds to complement South Africa's national investments in STI, including resources for DSI initiatives requiring external investments								
Annual target: R480m in international funds directly invested in research, innovation and STI HCD programmes as well as research infrastructure investments in South Africa as part of cooperation initiatives implemented by the DSI by 31 March 2020								
Performance indicator: Amount (expressed in Rand millions) of international funds directly invested in research, innovation and STI HCD programmes as well as research infrastructure investments in South Africa as part of cooperation initiatives implemented by the DSI								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	R80 m in international funds directly invested in research, innovation and STI HCD programmes as well as research infrastructure investments in South Africa as part of cooperation initiatives implemented by the DSI	R19 873 m in international funds directly invested in research, innovation and STI HCD programmes as well as research infrastructure investments in South Africa as part of cooperation initiatives implemented by the DSI	Not achieved	Although the target for this indicator is set for Q3 and Q4, based on historical experience, the international partners have indicated that the reports will be made available in Q4.	International partners are being engaged on the submission of evidence.

Annual target: R300m invested by international partners in their own organisations and initiatives but targeted at cooperation in research, innovation and STI HCD with South African partners as part of cooperation initiatives implemented by the DSI by 31 March 2020						
Performance indicator: Amount (expressed in rand million) of funds invested by international partners in their own organisations and initiatives but targeted at cooperation in research, innovation and STI HCD with South African partners as part of cooperation initiatives implemented by the DSI						
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status
No target	No target due	No target	No target due	R50m invested by international partners in their own organisations and initiatives but targeted at cooperation in research, innovation and STI HCD with South African partners as part of cooperation initiatives implemented by the DSI	R55 209 m invested by international partners in their own organisations and initiatives but targeted at cooperation in research, innovation and STI HCD with South African partners as part of cooperation initiatives implemented by the DSI	Achieved
						Information from international partners became available earlier than expected
						None
Strategic statement: To access international knowledge, capacities and resources, to enhance South Africa's national STI capabilities, and to contribute to the attainment of the DSI's targets for human capital development, especially for international PhD training						
Annual target: 680 South African students participating in international training programmes offering a postgraduate qualification as part of cooperation initiatives facilitated by the DSI by 31 March 2020						
Performance indicator: Number of South African students accepted into international training programmes offering a postgraduate qualification as part of cooperation initiatives facilitated by the DSI						

Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	80 South African students participating in international training programmes offering a postgraduate qualification as part of cooperation initiatives facilitated by the DSI	10 South African students participating in international training programmes offering a postgraduate qualification as part of cooperation initiatives facilitated by the DSI	Not achieved	The evidence information is awaited from international partners and will be reported in Q4 as per the TIDS data limitations.	International partners are being engaged for the submission of evidence
<b>Annual target: 600 international partner organisations (i.e. legal entities) collaborating with South African partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI by 31 March 2020</b>								
<b>Performance indicator: Number of international partner organisations (i.e. legal entities) collaborating with South African partners within the formalised framework of collaborative research, innovation or STI HCD projects accounted as part of cooperation initiatives facilitated by the DSI</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
10 international partner organisations (i.e. legal entities) collaborating with South African	104 international partner organisations (i.e. legal entities) collaborating with South African	50 international partner organisations (i.e. legal entities) collaborating with South African	58 international partner organisations (i.e. legal entities) collaborating with South African	50 international partner organisations (i.e. legal entities) collaborating with South African	25 international partner organisations (i.e. legal entities) collaborating with South African	Not achieved	Engagements envisaged for quarter 3 could not be realised as planned.	Continuous efforts are being taken by the programme in ensuring that engagements realised in quarter 4.



partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI	African partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI	partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI	partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI	partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI	partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI	partners within the formalised framework of collaborative research, innovation or STI HCD projects part of cooperation initiatives facilitated by the DSI		
<p><b>Annual target: 30 dedicated international technical exchanges to build or reinforce South Africa's capacities in key STI domains specifically referenced in the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI by 31 March 2020</b></p> <p><b>Performance indicator: Number of dedicated international technical exchanges such as workshops, seminars or training programmes to reinforce South Africa's capacities in key STI domains specifically referenced in the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI</b></p>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
5 dedicated international technical exchanges to build or reinforce South Africa's capacities in key STI domains specifically referenced in	5 dedicated international technical exchanges to build or reinforce South Africa's capacities in key STI domains specifically referenced in	5 dedicated international technical exchanges to build or reinforce South Africa's capacities in key STI domains specifically referenced in	5 dedicated international technical exchanges to build or reinforce South Africa's capacities in key STI domains specifically referenced in	10 dedicated international technical exchanges to build or reinforce South Africa's capacities in key STI domains specifically referenced in	7 dedicated international technical exchanges to build or reinforce South Africa's capacities in key STI domains specifically referenced in	Not achieved	Due to the postponement of some joint committee meetings, there is a shortfall experienced in this quarter	Joint Committee Meetings are being scheduled to facilitated technical exchanges

the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI	the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI	the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI	the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI	the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI	the DSI Strategic Plan, undertaken with the support of international partners and facilitated by the DSI	
<b>Strategic statement: To strengthen cooperation in STI in Africa, to build capacities and support initiatives of the SADC and AU, for the advancement of both South Africa and Africa's growth and development agenda</b>						
<b>Annual target: 120 research, innovation and STI HCD cooperation projects co-funded or supported in kind by the DSI and at least one other African partner by 31 March 2020</b>						
<b>Performance indicator: Number of research, innovation and STI HCD cooperation projects, co-funded or supported in kind by the DSI and at least one other African partner</b>						
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status
No target	No target due	No target	No target due	20 research, innovation and STI HCD cooperation projects co-funded or supported in kind by the DSI and at least one other African partner	67 research, innovation and STI HCD cooperation projects co-funded or supported in kind by the DSI and at least one other African partner	Achieved
						Information from international partners became available earlier than expected
						None
<b>Annual target: R90m in international funds directly invested in African regional and continental research, innovation, STI HCD or research infrastructure programmes as a result of DSI facilitation by 31 March 2020</b>						
<b>Performance indicator: Amount (expressed in rand millions) of international funds directly invested in African regional and continental research, innovation, STI HCD or research infrastructure programmes as a result of DSI facilitation</b>						

Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	No target	No target due	No target due	None	None
<p><b>Annual target: 20 AU or SADC STI initiatives, including programmes, projects or governance frameworks, endorsed at AU or SADC ministerial-level supported (financially or in-kind) by the DSI by 31 March 2020</b></p> <p><b>Performance indicator: Number of AU or SADC STI initiatives, including programmes, projects or governance frameworks, endorsed at AU or SADC ministerial-level supported (financially or in-kind) by the DSI</b></p>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	No target	No target due	5 AU or SADC STI initiatives, including programmes, projects or governance frameworks, endorsed at AU or SADC ministerial level supported (financially or in-kind) by the DSI	13 AU or SADC STI initiatives, including programmes, projects or governance frameworks, endorsed at AU or SADC ministerial level supported (financially or in-kind) by the DSI	Achieved	Information from international partners became available earlier than expected	None
<p><b>Strategic statement: To maximise South Africa's strategic interests in international cooperation in STI, in support of South Africa's foreign policy objectives and international trade and investment partnerships, creating a better South Africa, and contributing to a better and safer Africa in a better world</b></p>								
<p><b>Annual target: 4 formally recorded decisions made in intergovernmental STI forums, such as multilateral organisations, with a direct bearing on resource allocation to support priorities of government's Programme of Action following specific DSI intervention by 31 March 2020</b></p>								
<p><b>Performance indicator: Number of formally recorded decisions made in intergovernmental STI forums, such as multilateral organisations, with a direct bearing on resource allocation to support priorities of government's Programme of Action following specific DSI intervention</b></p>								

Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	2 formally recorded decisions made in intergovernmental STI forums, such as multilateral organisations, with a direct bearing on resource allocation to support priorities of government's Programme of Action following specific DSI intervention	3 formally recorded decisions made in intergovernmental STI forums, such as multilateral organisations, with a direct bearing on resource allocation to support priorities of government's Programme of Action following specific DSI intervention	No target	No target due	No target due	None	None
Annual target: 4 leadership positions occupied by South Africa in international STI governance structures relevant to influencing resource allocation to support priorities of government's Programme of Action following specific DSI intervention by 31 March 2020								
Performance indicator: Number of leadership positions occupied by South Africa in international STI governance structures relevant to influencing resource allocation to support priorities of government's Programme of Action following specific DSI intervention								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	2 leadership positions occupied by	1 leadership position occupied by	No target	No target due	No target due	None	None



## **PROGRAMME 4: RESEARCH DEVELOPMENT AND SUPPORT**

The purpose of the Programme is to provide an enabling environment for research and knowledge production that promotes strategic development of basic sciences and priority science areas, through science promotion, human capital development, the provision of research infrastructure and relevant research support, in pursuit of South Africa's transition to a knowledge economy. The programme has four chief directorates.

**Human Capital and Science Promotion** focuses on developing and renewing science, engineering and technology human capital to promote knowledge generation, protection and exploitation, and to develop science platforms that exploit South Africa's geographical advantages. The Chief **Directorate** also promotes science, technology, engineering, mathematics and innovation literacy and awareness. Funding is provided to the NRF for programmes to develop research and human capital.

**Basic Sciences and Infrastructure** facilitates the strategic implementation of research and innovation equipment and infrastructure to promote knowledge production in areas of national priority and to sustain R&D-led innovation. The Chief **Directorate** also promotes development and strengthening of basic or foundational sciences, such as physics, chemistry, biological and life sciences, geographic and geological sciences, and the human and social sciences.

**Science Missions** promotes the development of research, the production of scientific knowledge, and human capital development within science areas in which South Africa enjoys a geographic advantage. These areas include the dynamics of climate change and its impact on earth systems, Antarctic and marine research, palaeosciences, and indigenous knowledge systems.

**Astronomy** supports the development of astronomical sciences around a multi-wavelength research strategy and provides strategic guidance and support to relevant astronomy institutions in the implementation of DSI astronomy programmes. Of

particular relevance are the MeerKAT, the African Very Long Baseline Interferometry Network (AVN) project, and the Square Kilometre Array (SKA) project.

### **Highlights of the Quarter**

The following specific milestones against the DSI strategic outcome-oriented goals are worth highlighting:

#### ***Increasing knowledge generation through indigenous knowledge systems***

On 4 October 2019, the Minister approved the appointment of a 13-member steering committee to roll out a pilot recognition of prior learning (RPL) programme in KwaZulu-Natal. The pilot programme will facilitate the implementation of a discipline of competence for the traditional health practice domain to test the developed traditional health competency norms and standards in a real-life setting. The pilot will result in a model for RPL that will be rolled-out to other provinces. The steering committee attended a week-long induction workshop organised by the DSI and University of KwaZulu-Natal (UKZN) from 7 to 11 October 2019, to lay the foundation to begin implementing the RPL pilot programme in KwaZulu-Natal.

A highlight of the induction week was the official presentation of appointment letters to the steering committee, at which Inkosi Phathisizwe Chiliza, Chairperson of the KwaZulu-Natal Provincial House of Traditional Leadership, officiated. Inkosi Chiliza indicated the Provincial House's support of the initiative. The national Department of Health pledged support for the RPL pilot process in the province. The terms of reference for the steering committee, including the development of the criteria for the accreditation of assessors, was finalised. A chairperson (Ms Zanele Catherine Sithole) and deputy chairperson (Mr Dumisani Absolom Mkhwanazi) were elected.

The Department of Science and Innovation and the KwaZulu-Natal Department of Cooperative Governance and Traditional Affairs will jointly coordinate the introduction of the steering committee to the Provincial House of Traditional Leadership.

### ***Increasing knowledge generation through the implementation of the South African Research Infrastructure Roadmap***

The Nuclear Medicine Research Infrastructure (NuMeRI) is part of South African Research Infrastructure Roadmap (SARIR). The NuMeRI Node for Infection Imaging was launched on 14 November 2019 as South Africa's first positron-emission computed tomography (PET/CT) facility dedicated to clinical research. This new state-of-the-art imaging facility located at Tygerberg Hospital (hosted by Stellenbosch University's Central Analytical Facility) provides access for researchers to work towards tuberculosis eradication. The PET/CT system is one of the most advanced systems currently available in the world and only the second of its kind in the southern hemisphere.

### ***The Square Kilometre Array***

The senior officials and experts of the Square Kilometre Array (SKA) African Partnership met in Pretoria on 13 and 14 October 2019 to deliberate on matters relating to the SKA, African Very Long Baseline Interferometry (AVN) and other astronomy initiatives aimed at the development of astronomy in the nine African SKA partner countries. The meeting noted that good progress had been made in the implementation of the Resolutions of the 2018 SKA African Partners Ministerial Meeting.

The DSI and the University of Venda partnered to jointly host the 2019 AstroLab workshop at the Thohoyandou campus of the University of Venda from 18 to 22 November 2019. The project is aimed at developing and implementing a research tutorial, AstroLab, in universities in need of astronomy infrastructure and curricula, allowing undergraduate students in the sciences to perform real-time observations on a remote telescope, and transforming those observations into scientific results. The MeerKAT telescope continues to facilitate the performance of science.

A paper was published in the Monthly Notices of the Royal Astronomical Society on 20 November 2019 about the results of a collaboration between scientists using the MeerKAT radio telescope and the Southern African Large Telescope (SALT) optical



telescope. MeerKAT and SALT combined forces for the first time to discover and identify a unique and previously-unseen flare of radio emission from a binary star in the Milky Way Galaxy. The MeerKAT discovered the object which rapidly brightened by more than three times over a period of three weeks. This is the first new transient source discovered with MeerKAT and scientists hope for many more discoveries of transient events with the telescope in the future. Since its inauguration, the South African MeerKAT radio telescope, the project on MeerKAT has been monitoring parts of the southern skies to study the variable radio emission from known compact binary stars, such as accreting black holes. The excellent sensitivity and the wide field of view of the MeerKAT telescope, combined with the repeat ThunderKAT observations of various parts of the southern skies, allows us to search the skies for new celestial phenomena that exhibit variable or short-lived radio emission. This is a perfect example of the coordination of observations across different wavelengths to obtain a holistic view of a newly discovered object. This study was one of the first to involve coordination between two of South Africa's major astronomy facilities (i.e. the MeerKAT radio telescope and SALT).

Findings of the discovery of the highest-energy light from a gamma-ray burst were announced in a study published on 21 November 2019 in the international scientific journal, *Nature*. Gamma-ray bursts are the most luminous explosions in the cosmos. These explosive events last several seconds and during that time emit the same quantity of gamma-rays as all the stars in the Universe combined. An international team of more than 300 researchers, including astronomers from the University of Cape Town, Prof. Patrick Woudt, and an MSc Astronomy student, Reikantseone Diretse, gained further insight into the physical processes at work during these events.

The first radio image of distant Milky Way-like galaxies reveals some of the star formation history of the Universe. This paper appears in the *Astrophysical Journal* as reported on 17 December 2019, that an international team of astronomers, using the South African Radio Astronomy Observatory (SARAO) MeerKAT telescope made the first radio observation sensitive enough to reveal these galaxies. The team used the 64-dish MeerKAT array to observe an area for a total of 130 hours. The resulting image shows a region of the sky that is comparable in area to five full moons, containing tens of thousands of galaxies. The astronomers want to use this image to learn more about

star formation in the rest of the universe. These first results indicate that the star-formation rate around cosmic noon is even higher than was originally expected. MeerKAT is the best radio array in the world for studies like this one because it is the first to use such a large number of extremely low-noise clear-aperture dishes.

**TABLE 4: PROGRAMME 4 – RESEARCH DEVELOPMENT AND SUPPORT**

Strategic Statement: To contribute to the development of representative, high-level human capital able to pursue locally relevant, globally competitive research and innovation activities						
Annual target: Not less than 3 100 PhD students awarded an annual bursary as reflected in the reports from the NRF and relevant entities by 31 March 2020						
Performance indicator: Total number of PhD students awarded bursaries annually as reflected in the reports from the NRF and relevant entities						
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status
Not less than 1 500 PhD students awarded an annual bursary as reflected in the reports from NRF and relevant entities	2 116 PhD students awarded an annual bursary as reflected in the reports from NRF and relevant entities	Not less than 2 300 PhD students awarded an annual bursary as reflected in the reports from NRF and relevant entities	2 750 PhD students awarded an annual bursary as reflected in the reports from NRF and relevant entities	Not less than 2 800 PhD students awarded an annual bursary as reflected in the reports from NRF and relevant entities	2 914 PhD students awarded an annual bursary as reflected in the reports from NRF and relevant entities	Achieved
						Quarterly target over-achieved by 114 (4,1%) because the bursaries were over-allocated due to a large number of quality applicants. The quarterly performance cannot be predicted or managed within closer margins because it depends on the pool of applicants, which cannot
						None



Annual target: 650 graduates and students placed in DSI-funded work preparation programmes in SETI institutions by 31 March 2020								
Performance indicator: Total number of graduates and students placed in DSI-funded work preparation programmes in SETI institutions								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
500 graduates and students placed in DSI-funded work preparation programmes in SETI institutions	672 graduates and students placed in DSI-funded work preparation programmes in SETI institutions	550 graduates and students placed in DSI-funded work preparation programmes in SETI institutions	848 graduates and students placed in DSI-funded work preparation programmes in SETI institutions	600 graduates and students placed in DSI-funded work preparation programmes in SETI institutions	874 graduates and students placed in DSI-funded work preparation programmes in SETI institutions	Achieved	The target was exceeded due to retention of some of the 2018/19 interns, in line with the extension of the programme from 12 to 24 months.	None
Strategic statement: To ensure availability of and access to internationally comparable research and innovation infrastructure in order to generate new knowledge and train new researchers								
Annual target: 20 annual research infrastructure grants awarded as per award letters by 31 March 2020								
Performance indicator: Number of research infrastructure grants awarded per award letters annually								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
No target	No target due	Call for proposals on awarding of research infrastructure grants issued by	Call for proposals on awarding of research infrastructure grants was issued by	No target	No target due	No target due	None	None

	30 September 2019	30 September 2019						
<b>Annual target: 3 500 Gbps total available broadband capacity provided by SANReN by 31 March 2020</b>								
<b>Performance indicator: Total available broadband capacity provided by SANReN per annum</b>								
<b>Quarter 1 target as per APP</b>	<b>Quarter 1 actual output</b>	<b>Quarter 2 target as per APP</b>	<b>Quarter 2 actual output</b>	<b>Quarter 3 target as per APP</b>	<b>Quarter 3 actual output</b>	<b>Status</b>	<b>Reason for variance</b>	<b>Actions taken</b>
No target	No target due	New links and upgrade plan finalised by 30 September 2019	New links and upgrade plan finalised by 30 September 2019	No target	No target due	No target due	None	None
<b>Strategic statement: To support and promote research that develops basic sciences through the production of new knowledge and relevant training opportunities</b>								
<b>Annual target: Not less than 4 500 researchers awarded an annual research grant through NRF-managed programmes as reflected by the NRF project reports by 31 March 2020</b>								
<b>Performance indicator: Total number of researchers awarded research grants through NRF-managed programmes as reflected in the NRF project reports</b>								
<b>Quarter 1 target as per APP</b>	<b>Quarter 1 actual output</b>	<b>Quarter 2 target as per APP</b>	<b>Quarter 2 actual output</b>	<b>Quarter 3 target as per APP</b>	<b>Quarter 3 actual output</b>	<b>Status</b>	<b>Reason for variance</b>	<b>Actions taken</b>
Not less than 2 000 researchers awarded research grants through NRF-managed programmes	1 580 researchers awarded research grants through NRF-managed programmes	Not less than 3 500 researchers awarded research grants through NRF-managed programmes	2 557 researchers awarded research grants through NRF-managed programmes	Not less than 4 000 researchers awarded research grants through NRF-managed programmes	2 831 researchers awarded research grants through NRF-managed programmes	Not achieved	The target is under-achieved by 1 169 (29%). The drastic reduction in the number of researchers supported (emerging and established) is due to the	The NRF is being engaged to understand the implication of this reduction on the final target.

revision of the funding model from Rated Researchers Programme. Previously the Programme awarded grants annually to all rated researchers for the duration of their rating period. With the revised model, only P-rated researchers receive annual grants, and those in other rating categories receive once-off grants in the year in which they get their rating. The revision of the model was mainly motivated by lack of increase in funding, which



												constrained increase in the number of researchers supported.	
Annual target: Not less than 7 000 research articles published by NRF-funded researchers and cited in the Thomson Reuters Web of Science Citation Database as reflected in the NRF project reports by 31 March 2020													
Performance indicator: Number of research articles published by NRF-funded researchers and cited in the Thomson Reuters Web of Science Citation Database as reflected in the NRF project reports													
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken	
No target	To be reported in quarter 4	No target	No target due	No target	No target due	No target	No target due	No target	No target due	No target due	None	None	
Strategic statement: To strategically develop priority science areas in which South Africa enjoys a competitive advantage, by promoting internationally competitive research and training activities and outputs													
Annual target: 8 Large survey project (LSP) science mode installed on MeerKAT correlator by 31 March 2020													
Performance indicator: Number of science mode receivers installed on MeerKAT													
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken	
No target	No target due	SKA SA Project approved progress report on installation of LSP science modes on MeerKAT correlator provided by	SKA SA Project approved progress report on installation of LSP science modes on MeerKAT correlator provided by	No target	No target due	No target	SKA SA Project approved progress report on installation of LSP science modes on MeerKAT correlator provided by	No target	No target due	No target due	None	None	



	30 September 2019	30 September 2019					
<b>Strategic statement: To promote public engagement on science, technology and innovation</b>							
<b>Annual target: Not less than 2.1 million participants (learners and members of the public) in science awareness and engagement programmes annually as reflected in the project reports of the NRF and other service providers by 31 March 2020</b>							
<b>Performance indicator: Number of participants in science awareness and engagement programmes annually as reflected in project reports of the NRF and other service providers</b>							
<b>Quarter 1 target as per APP</b>	<b>Quarter 1 actual output</b>	<b>Quarter 2 target as per APP</b>	<b>Quarter 2 actual output</b>	<b>Quarter 3 target as per APP</b>	<b>Quarter 3 actual output</b>	<b>Status</b>	<b>Reason for variance</b>
Grant funding awarded to organisations implementing the initiatives by 30 June 2019	10 grants awarded to organisations implementing the science awareness and engagement initiatives by 30 June 2019	National Science Week held by 30 September 2019	National Science Week was held from 29 July to 3 August 2019	3 science festivals and 6 science, technology, engineering, mathematics and innovation Olympiads and competitions held by 31 December 2019	6 science festivals and 6 science, technology, engineering, mathematics and innovation Olympiads and competitions held by 31 December 2019	Achieved	Major participants in science festivals are learners. With the DSI having entered into formal collaboration agreements with provincial departments of education, it has become easier to organise festivals.
							None

## **PROGRAMME 5: SOCIO-ECONOMIC INNOVATION PARTNERSHIPS**

This Programme enhances the growth and development priorities of government through targeted S&T-based innovation interventions and the development of strategic partnerships with other government departments, industry, research institutions and communities. This programme has the following four Chief Directorates:

**Technology Localisation Beneficiation and Advanced Manufacturing** advance strategic medium and long-term sustainable economic growth and sector development priorities as well as government service delivery.

**Sector Innovation and Green Economy** provides policy, strategy and direction-setting support for the R&D-led growth of strategic sectors of the economy and to enhance science and technology capacity to support a transition to a green economy.

**Innovation for Inclusive Development** supports the experimentation of S&T-based innovations for tackling poverty including the creation of sustainable job and wealth opportunities, building sustainable human settlements, and enhancing the delivery of basic services.

**Science and Technology Investment** leads and supports the development of indicators and instruments for measuring and monitoring investments in S&T and the performance of the NSI, and ways of strengthening the NSI and innovation policy.

### **Highlights of the Quarter**

#### ***Responsive, coordinated and efficient NSI***

Dr Melanie Samson from the University of the Witwatersrand was profiled on television for the work funded by the Waste RDI Roadmap's Project Management Unit to integrate waste pickers into the formal economy, and the development of a municipal guideline on how to do it.

### ***Increased knowledge generation***

The SA-EU Dialogue Facility "SA-EU Science Technology and Innovation (STI) relations within a Circular Economy – a dialogue of concepts, STI partnerships and cooperation" held a symposium and an EU study tour. The symposium was held over two days and had speakers from government, civil society, business and labour. DDGs from three different South African government departments attended, namely, the Department of Environment, Forestry and Fisheries, the National Treasury and the Department of Science and Innovation. The DSI hosted the symposium. A high-ranking European Commission official attended, as did representatives of other European agencies such as the Joint Research Commission and the OECD.

The symposium was followed by a government delegation to the EU to learn about the implementation and development of circular economy policy. The departments represented included the DSI, the Department of Trade, Industry and Competition, the Department of Environmental Affairs and the Presidency. Organisations represented included the National Business Initiative and Green Cape. Over five days, the delegation visited Spain, Belgium and the Netherlands, and two promising outcomes that will be explored further are potential collaborations with Spain and the Netherlands.

The Waste RDI Project Management Unit partnered with Cefas (UK) to co-host a workshop from 1 to 2 October 2019 in Cape Town. This was to present draft papers from South African researchers on a marine plastic science review. The workshop was attended by representatives of government, academia, industry and NGOs. Representatives of the Chemicals and Waste Branch of the Department of Environment, Forestry and Fisheries were also present.

The DSI-funded Centre for Artificial Intelligence Research (CAIR) won the bid to host the 32nd International Joint Conference on Artificial Intelligence (IJCAI) in Cape Town in 2023. The IJCAI is one of the oldest and most prestigious conferences on artificial intelligence worldwide, and hosting it in Cape Town will have a significant impact on

the artificial intelligence community in South Africa. This will be the first time the event is hosted in Africa.

### ***Using knowledge for economic development***

The Biomanufacturing Industry Development Centre (BIDC) is one of the industry development centres that the DSI funds through its Industry Innovation Partnerships programme. Three of the SMMEs that it supports (and a previously supported SMME) received a number of awards in quarter 3:

- CapeBio was successful in accessing support from the TIA Technology Matchmaking Pilot Programme in the Technology Transfer Matchmaking Intellectual Property (IP) pitch side event hosted by the Small Enterprise Development Agency (SEDA) and TIA at the Innovation Bridge-Science Forum. A prize of R125 000 was awarded for the matchmaking deal between the Agricultural Research Council (ARC) and CapeBio to explore commercialisation and further development of ARC-developed diagnostic enzyme-linked immunosorbent assay (ELISA) kits for approximately 170 locally identified plant viruses. R25 000 cash will be received from TIA to progress activities in the joint venture and R100 000 in kind towards IP legal services from Kisch IP to finalise the agreement between CapeBio and the ARC. CapeBio is currently receiving BIDC support towards the development of a Polymerase Chain Reaction (PCR) kit that will form part of their stable of products for distribution locally and internationally (but the award received is not related to the BIDC project).
- Summer 87 was awarded the 2nd Runner-Up and Top Female Entrepreneur at Seda Pitch and Perfect Competition held at the Innovation Summit 2019. The award consists of a R100 000 technology incentive from SEDA and media coverage of the company and its activities. Summer 87 also entered the Eskom Business Investment Competition and was 2nd Runner-up in the Agriculture and Agroprocessing category, winning a R25 000 cash prize and business training. Summer 87 is receiving support from the BIDC in repackaging and testing its range of indigenous tea products, specifically testing of antioxidant ability in order to enhance the health claims for teas, and is also being supported through the DSI's Directorate: Indigenous Knowledge-based Technology Innovation.

- Sawubona Mycelium entered the Innovation Hub Gauteng Accelerator Programme (GAP) competition and was awarded first prize in the Biosciences category for 2019. Their award includes some seed funding and business support services over a 12-month period. They were awarded R500 000 towards the development of products derived from mushroom mycelia. B IDC is assisting Sawubona Mycelium in scaling up mycelial production from 10L to 1000L and making products of both the biomass and the broth components of the production process.
- One of our previously supported enterprises, Golden Goose (B IDC improved the process around production of a fermented sorghum drink) also participated in the Technology Transfer Matchmaking IP event and was awarded R100 000 to be used in product development in conjunction with the University of Zululand, which has a research programme on sorghum fermentation.

It should be noted that the awards are not necessarily linked to the support provided by the B IDC, but may be a downstream benefit of the support provided by the B IDC. Prof. Linda Godfrey the Waste PMU Manager based at the CSIR presented a paper (*Transition from open dumping to circular economy through research, development and innovation: The case of South Africa*) at the International Solid Waste Association Annual Conference in Bilbao, Spain, on 9 October 2019:

Droppa, which is a mLab alumni member, is an on-demand platform for trucks and bakkies, have secured a multi-million (R5m+) rand investment from SA investor IDF Capital.

The 2019 award for Boost Up Coach of the Year was won by mLab. The Boost Up series comprises Set Up, Stand Up and Scale Up events, which include coaching, pitch competitions and the incubation of five start-ups representing each country taking part in Slush 2019 in Helsinki.

**TABLE 5: PROGRAMME 5 – SOCIO-ECONOMIC INNOVATION PARTNERSHIPS**

Strategic statement: Through knowledge, evidence and learning, to inform and influence how S&T can be used to achieve inclusive development								
Annual target: Six knowledge products on innovation for inclusive development published by 31 March 2020								
Performance indicator: Number of knowledge products on innovation for inclusive development published								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
1 knowledge product on innovation for inclusive development published between 1 April 2019 and 30 June 2019	1 knowledge product on innovation for inclusive development was published between 1 April 2019 and 30 June 2019	2 knowledge products on innovation for inclusive development published between 1 April 2019 and 30 September 2019	2 knowledge products on innovation for inclusive development published between 1 April 2019 and 30 September 2019	3 knowledge products on innovation for inclusive development published between 1 April 2019 and 31 December 2019	3 knowledge products on innovation for inclusive development published between 1 April 2019 and 31 December 2019	Achieved	None	None
Annual target: 10 decision-support systems maintained and improved by 31 March 2020								
Performance indicator: Number of decision-support interventions introduced and maintained								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
Annual work plan approved for at least 2 decision-support	Annual work plan was approved for at least 2 decision-support	Annual work plan approved for at least 8 decision-support	Annual work plan approved 9 decision-support systems	Annual work plan approved for at least 10 decision-support	Annual workplan approved for at least 10 decision-	Achieved	None	None

systems between 1 April 2019 and 30 June 2019	support systems between 1 April and 30 June 2019	systems between 1 April 2019 and 30 September 2019	systems between 1 April 2019 and 30 September 2019	between 1 April 2019 and 30 September 2019	systems between 1 April 2019 and 31 December 2019	support systems between 1 April 2019 and 31 December 2019		
<b>Annual target: Nine learning interventions (seminars) generated by 31 March 2020</b>								
<b>Performance indicator: Number of learning interventions (seminars, briefs, policy papers) generated</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
At least 1 learning intervention (seminars) between 1 April and 30 June 2019	Nothing reported	At least 2 learning interventions (seminars) between 1 April and 30 September 2019	2 learning interventions (seminars) between 1 April and 30 September 2019	At least 5 learning interventions (seminars) between 1 April and 31 December 2019	At least 6 learning interventions (seminars) between 1 April and 31 December 2019	Achieved	An additional seminar was hosted as an opportunity for stakeholders, who were attending another event	None
<b>Strategic statement: To identify, grow and sustain niche high-potential STI capabilities for sustainable development and the greening of society and the economy</b>								
<b>Annual target: 90 honours, master's and doctoral students fully funded or co-funded in designated niche areas that support the green economy and sustainable development by 31 March 2020</b>								
<b>Performance indicator: Number of honours, master's and doctoral students fully funded or co-funded in designated niche areas</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
50 honours, master's and doctoral students fully funded or co-funded in	49 honours, master's and doctoral students fully funded or co-funded in	No target	No target due	No target	No target due	No target due	None	None

designated niche areas that support the green economy and sustainable development between 1 April 2019 and 30 June 2019	designated niche areas that support the green economy and sustainable development between 1 April 2019 and 30 June 2019									
Annual target: 4 knowledge and innovation products (for example, patents, prototypes, demonstrators, methodologies, and technology transfer packages) added to the sustainable development IP portfolio between 1 July 2019 and 31 March 2020										
Performance indicator: Number of knowledge and innovation products (for example, patents, prototypes, technology demonstrators, methodologies, and technology transfer packages) added to the sustainable development IP portfolio										
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken		
No target	No target due	At least 1 knowledge or innovation products added to the industrial development IP portfolio between 1 April 2019 and 30 September 2019	10 knowledge or innovation products added to the industrial development IP portfolio between 1 April 2019 and 30 September 2019	At least 1 knowledge or innovation products added to the industrial development IP portfolio between 1 April 2019 and 30 December 2019	At least 11 knowledge products added to the industrial development IP portfolio between 1 April 2019 and 31 December 2019	Achieved	The GBS funds have allowed for a greater number of demonstrations to be funded.	None		
Strategic statement: To identify, grow and sustain niche high-potential STI capabilities that-										
<ul style="list-style-type: none"> <li>improve the competitiveness of existing industries with growth potential in aerospace, advanced manufacturing, chemicals, advanced metals, mining, ICTs, and the industry innovation programme (incl. Sector Innovation Funds); and</li> </ul>										



<ul style="list-style-type: none"> <li>facilitate the development of R&amp;D-led new targeted industries</li> </ul>								
Annual target: 252 master's and doctoral students fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals, ICTs, the Industry Innovation Programme and the sector innovation fund) by 31 March 2020								
Performance indicator: Number of high-level research graduates (master's and doctoral students) fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals, ICTs, the Industry Innovation Programme and the Sector Innovation Fund)								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
200 master's and doctoral students fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals, ICTs, Industry Innovation Programme and the sector innovation fund)	116 master's and doctoral students fully funded or co-funded in designated niche areas (advanced manufacturing, aerospace, chemicals, mining, advanced metals, ICTs, Industry Innovation Programme and the sector innovation fund)	No target	No target due	No target	No target due	No target due	None	None
Annual target: 120 interns fully funded or co-funded in R&D related to design, manufacturing and product development by 31 March 2020								
Performance indicator: Number of interns fully funded or co-funded in R&D related to design, manufacturing and product development								

Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
100 interns fully funded or co-funded in R&D related to design, manufacturing and product development	190 interns fully funded or co-funded in R&D related to design, manufacturing and product development	No target	No target due	No target	No target due	No target due	None	None
<b>Annual target: At least 50 industrially relevant knowledge and innovation products (patents, prototypes, technology demonstrators or technology transfer packages) added to the industrial development IP portfolio by 31 March 2020 (cumulative target)</b>								
<b>Performance indicator: Number of industrially relevant knowledge and innovation products added to the Intellectual Property (IP) portfolio through fully funded or co-funded research initiatives</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
At least 1 industrially relevant knowledge or innovation product added to the industrial development IP portfolio between 1	Nothing reported	At least 4 industrially relevant knowledge or innovation products added to the industrial development IP portfolio between 1	6 industrially relevant knowledge or innovation products added to the industrial development IP portfolio between 1 April 2019 and	At least 10 industrially relevant knowledge or innovation products added to the industrial development IP portfolio between 1	At least 17 industrially relevant knowledge or innovation products added to the industrial development IP portfolio between 1	Achieved	Due to the uncertainty associated with IP product creation, it is very difficult to forecast the actual IP products declared with	None

April 2019 and 30 June 2019	April 2019 and 30 September 2019	April 2019 and 30 September 2019	April 2019 and 31 December 2019	April 2019 and 31 December 2019	100% accuracy			
<b>Annual target: 9 instruments funded in support of increased localisation, competitiveness and R&amp;D-led industry development by 31 March 2020 (cumulative target)</b>								
<b>Performance indicator: Number of instruments funded in support of increased localisation, competitiveness and R&amp;D-led industry development in aerospace, advanced manufacturing, chemicals, mining, advanced metals, and ICTs, Industry Innovation Programme and the sector innovation fund</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
Annual work plans or contract approved for 6 support instruments	Annual work plans or contract approved for 9 support instruments	No target	No target due	No target	No target due		None	None
<b>Strategic statement: To strengthen provincial and rural innovation and production systems through analysis and catalytic interventions</b>								
<b>Annual target: 12 innovation-support interventions funded or co-funded that strengthen provincial or rural innovation systems by 31 March 2020 (cumulative target)</b>								
<b>Performance indicator: Number of innovation-support interventions funded or co-funded that strengthen provincial or rural innovation systems</b>								
Quarter 1 target as per APP	Quarter 1 actual output	Quarter 2 target as per APP	Quarter 2 actual output	Quarter 3 target as per APP	Quarter 3 actual output	Status	Reason for variance	Actions taken
Annual work plan approved for at least 4 innovation support interventions between 1 April 2019 and 30 June 2019	Annual work plan approved for at least 7 innovation-support interventions between 1 April 2019 and 30 June 2019	Annual work plan approved for at least 9 innovation-support interventions between 1 April 2019 and 30 June 2019	Annual work plan approved for 12 innovation-support interventions between 1 April 2019 and 30 June 2019	Annual work plan approved for at least 11 innovation-support interventions between 1 April 2019 and 30 June 2019	Annual work plan approved for at least 15 innovation support interventions between 1 April 2019 and 30 June 2019	Achieved	The call for proposal process that are used to solicit proposals for the interventions in the Regional	None

	30 September 2019	September 2019	December 2019	December 2019	Innovation Support Platforms (RISP), the interventions supported are dependent on the number and quality of proposals received.
<b>Strategic statement: To enhance understanding and analysis that support improvements in the functioning and performance of the NSI</b>					
<b>Annual target: Six statistical reports and policy briefs approved by Exco for publication and/or submitted to Cabinet between 1 April 2018 and 31 March 2020 (cumulative target)</b>					
<b>Performance indicator: Number statistical reports and policy briefs approved by Exco for publication and/ or submission to Cabinet</b>					
<b>Quarter 1 target as per APP</b>	<b>Quarter 1 actual output</b>	<b>Quarter 2 target as per APP</b>	<b>Quarter 2 actual output</b>	<b>Quarter 3 target as per APP</b>	<b>Quarter 3 actual output</b>
No target	No target due	No target	No target due	3 statistical reports approved by Exco for publication and/ or submitted to Cabinet between 1 April 2019 and 31 December 2019	1 statistical report approved by EXCO for publication between 1 April 2019 and 31 December 2019
					<b>Status</b>
					Not achieved
					<b>Reason for variance</b>
					Delays due to staff capacity challenges. The following 6 reports are ready for presentation to EXCO in January/ February 2020
					•2018/19 R&D tax incentive annual report to Parliament
					•Impact evaluation on



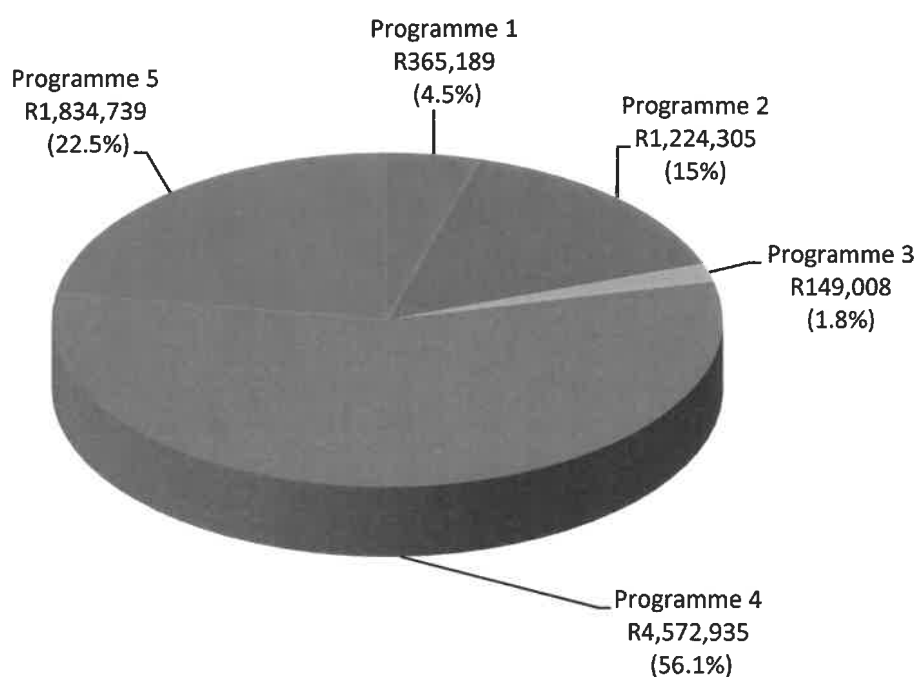
90 days on 80% of applications received between 1 January 2019 and 31 March 2019	90 days on 21% (or 6) of the 29 applications received between 1 January 2019 and 31 March 2019	90 days on 80% of applications received between 1 April 2019 and 30 June 2019	90 days was none (or 0%) of the 31 applications received between 1 April 2019 and 30 June 2019	90 days on 80% of applications received between 1 July 2019 and 30 September 2019	2019, 23 applications were received, and 5 (or 22%) were provided with decisions within 90 days	effect of vacancies on staff capacity in the Directorate (there were 4 vacancies in Quarter 3).	with decisions during Quarter 3. (2) Processes to recruit Director (R&D Tax incentive) were concluded, and the appointee will start on 1 February 2020. (3) Job description for DD (R&D Tax Incentive) updated as per HR request in preparation for the recruitment process.
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### 3. FINANCIAL PERSPECTIVE

#### 3.1.1 Voted funds: The budget for 2019/20 financial year

The budget of the DSI in the 2019/20 financial year is R8.146 billion – of which 92.4% is allocated as transfer payments and 7.6% to administrative activities of the Department. Figure 3 below analyses the distribution of allocations among the programmes.

**Figure 3: DSI budget split among the five Programmes**



The bulk (93,7%) of the DSI budget is allocated to three core Programmes of the Department (i.e. Programmes 2, 4 and 5). Programme 3 has 1,8% of the total budget. The division according to the major items is detailed in Table 6 below.

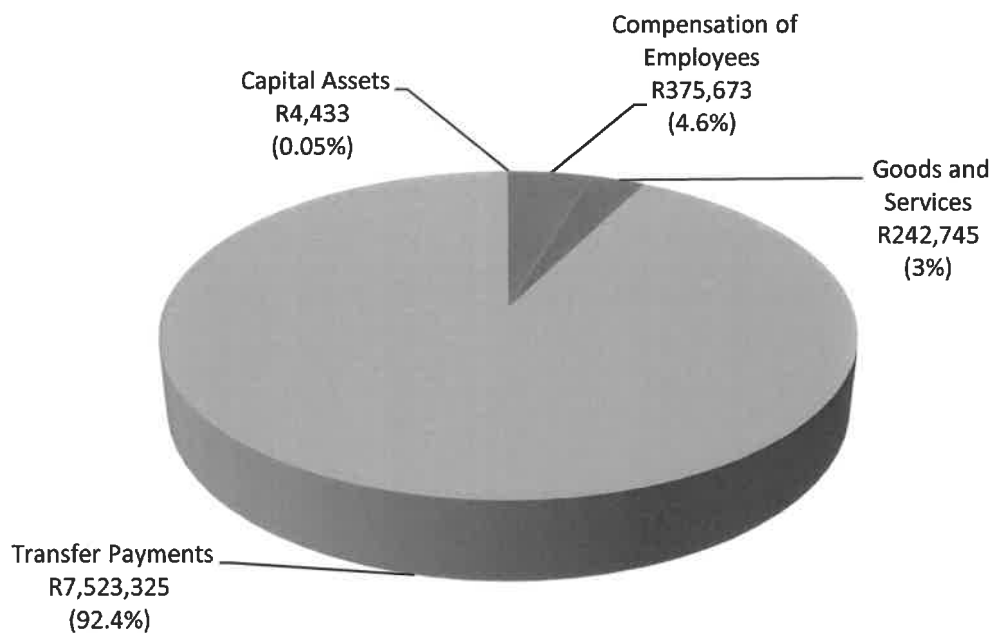
**Table 6: DSI major item categories**

R' thousands	Compensation of Employees	Goods and Services	Transfer Payments	Capital Assets	TOTAL
Programme 1	169,205	176,465	15,086	4,433	365,189
Programme 2	56,744	22,063	1,145,498		1,224,305
Programme 3	58,456	18,577	71,975		149,008
Programme 4	42,640	15,925	4,514,370		4,572,935
Programme 5	48,628	9,715	1,776,396		1,834,739
	<b>375,673</b>	<b>242,745</b>	<b>7,523,325</b>	<b>4,433</b>	<b>8,146,176</b>

As depicted in Table 6 above and Figure 4 below, above, the cost driver of the DSI is transfer payments, with 92.4% of the DSI budget paid out as transfer payments to public institutions and other DSI policy implementing partners. Of the transfer payments, 37,8% are paid out as parliamentary grants to six DSI-managed public institutions, namely, the Academy of Science of South African (ASSAf), the Council for Scientific and Industrial Research (CSIR), the Human Sciences Research Council (HSRC), the National Research Foundation (NRF), the South African National Space Agency (SANSA) and the Technology Innovation Agency (TIA). The remaining 62,2% is payments for various projects which are managed through contracts.



**Figure 4: Distribution of DSI budget among the four major item categories  
(expressed in R'000)**

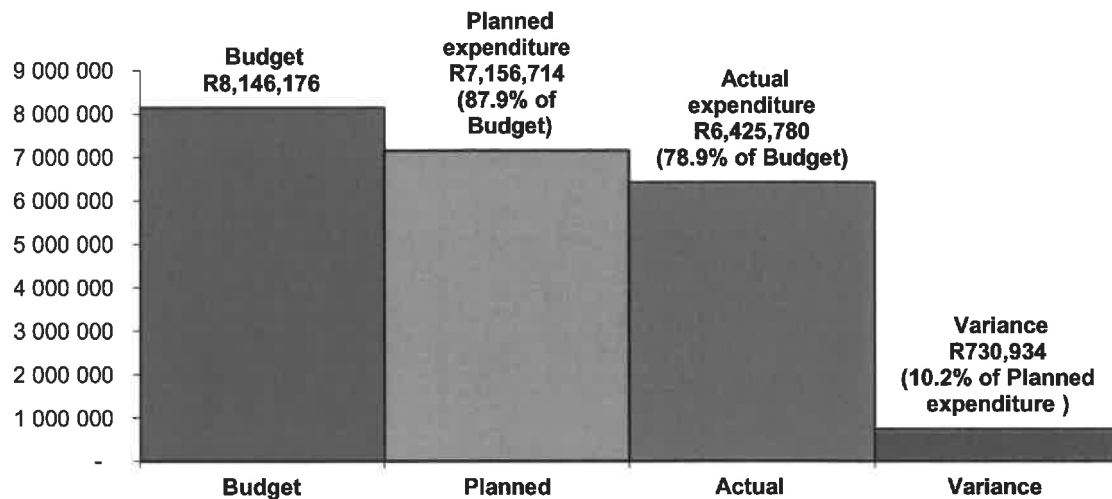


## Expenditure

The DSI projected to spend R7,157 billion or 87,9% of its total budget by the end of the third quarter of the 2019/20 financial year. However, R6,426 billion or 78,9% was spent instead for the period under review, resulting in a variance of R730,9 million or 10,2% of the projected expenditure as shown in Figure 5 below.

**Figure 5: DSI third quarter financial performance (including parliamentary grants)**

R 'thousands



Another analysis was made on the same variables shown above, but this time the analysis excluded the parliamentary grants – allocations to ASSAf, CSIR, HSRC, NRF, TIA and SANSA. According to the aforesaid analysis the DSI spent R4,075 billion or 76,9% of the total budget (excluding parliamentary grants) up to the end of the third quarter of 2019/20 financial year, against the projected expenditure of R4,806 billion or 90.7% of its total budget excluding the parliamentary grants. That resulted to a positive variance of R730,9 million or 15,2% of the projected expenditure. The details are depicted in Figure 6 below.

**Figure 6: DSI third quarter financial performance (excluding parliamentary grants)**

R 'thousands

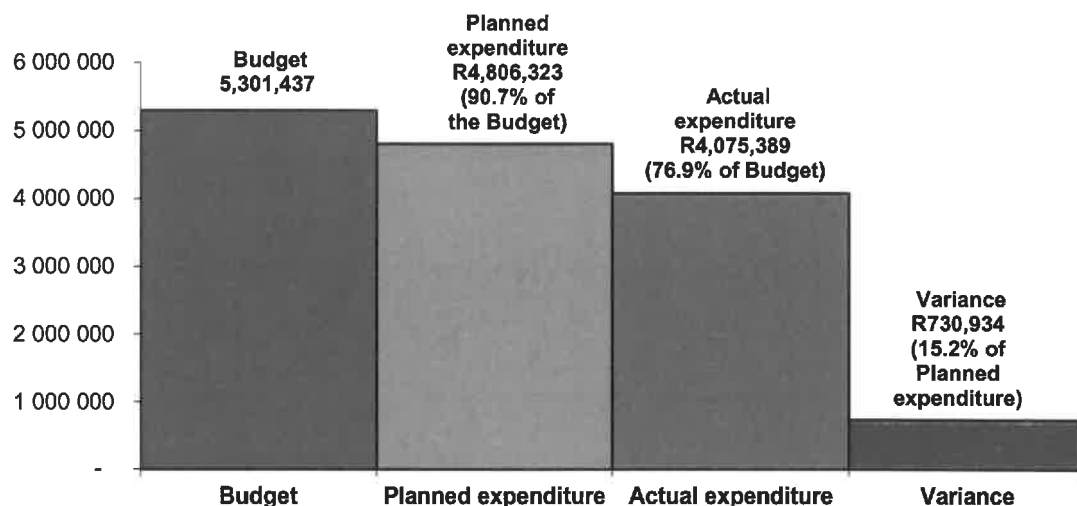
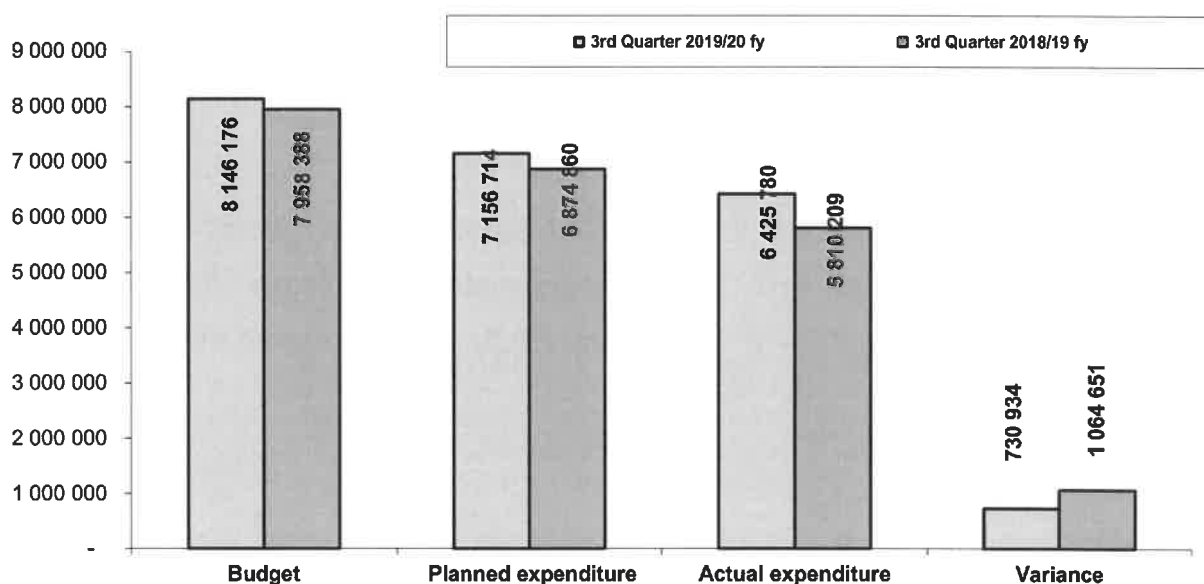


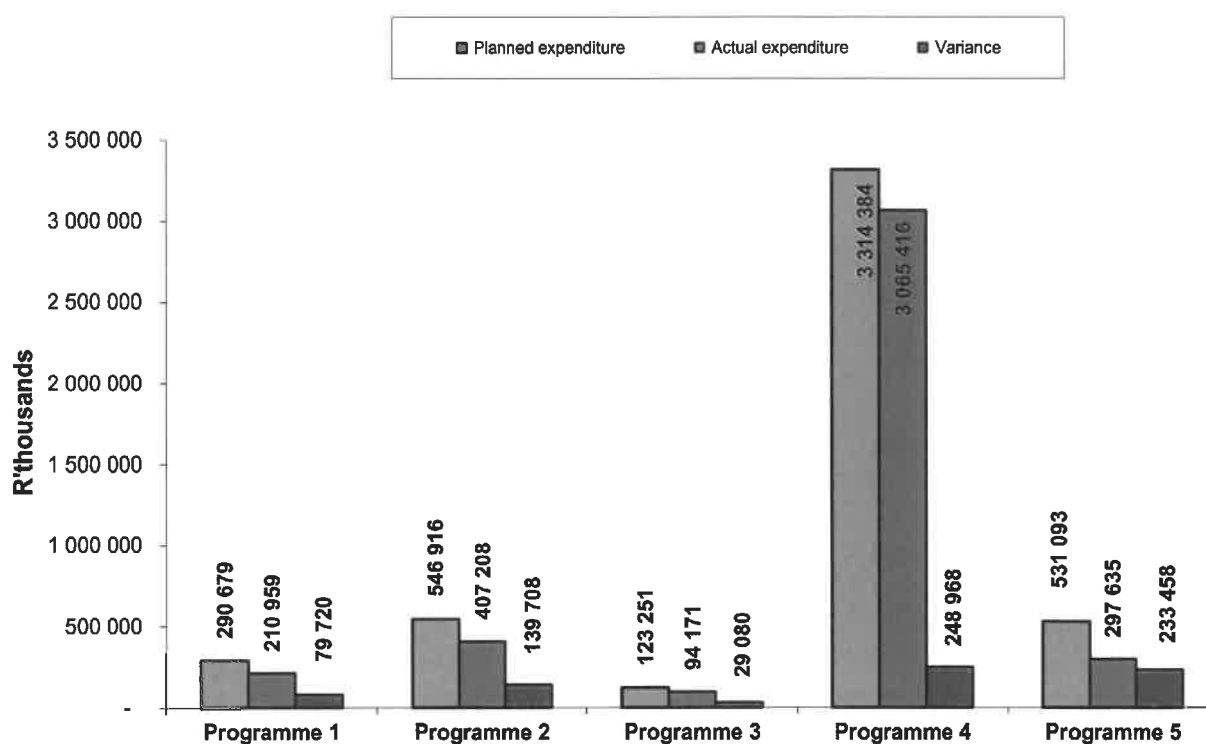
Figure 7 below illustrates the year-on-year comparison of the third quarter's financial performance for 2019/20 and 2018/19 financial years. The variance between the 2019/20 and 2018/19 financial year is 5,3%.

**Figure 7: Year-on-year financial performance analysis (2019/20 and 2018/19)**

R'thousands



**Figure 9: Financial performance per Programme (excluding parliamentary grants)**



### Donor funding

According to Table 7 below, the expenditure for the period amounts to R11, 219 million of the requested funding of R11,219 million.

**Table 7: Analysis of financial performance – Donor funding**

Donor	Project name	Programme	Funds requested (R'000)	Actual spending as at 31 December 2019		Balance (R'000)
				Amount (R'000)	% spending	
European Union	GBS Small Holder Essential Oils Value Chain Project	Socio-economic Innovation Partnerships	11,219	11,219	-	-
<b>Total</b>			<b>11,219</b>	<b>11,219</b>	<b>100%</b>	<b>0</b>

**APPROVAL**

This is to confirm that the Executive Committee of the Department of Science and Innovation discussed the Department's performance report for the third quarter of the 2019/20 financial year at its meeting held on 27 March 2020 and that Exco made inputs on the contents of the report which reflects the DSI's performance for the period covered in the report.



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PHIL MJWARA

DIRECTOR-GENERAL

DATE: 17-04-2020