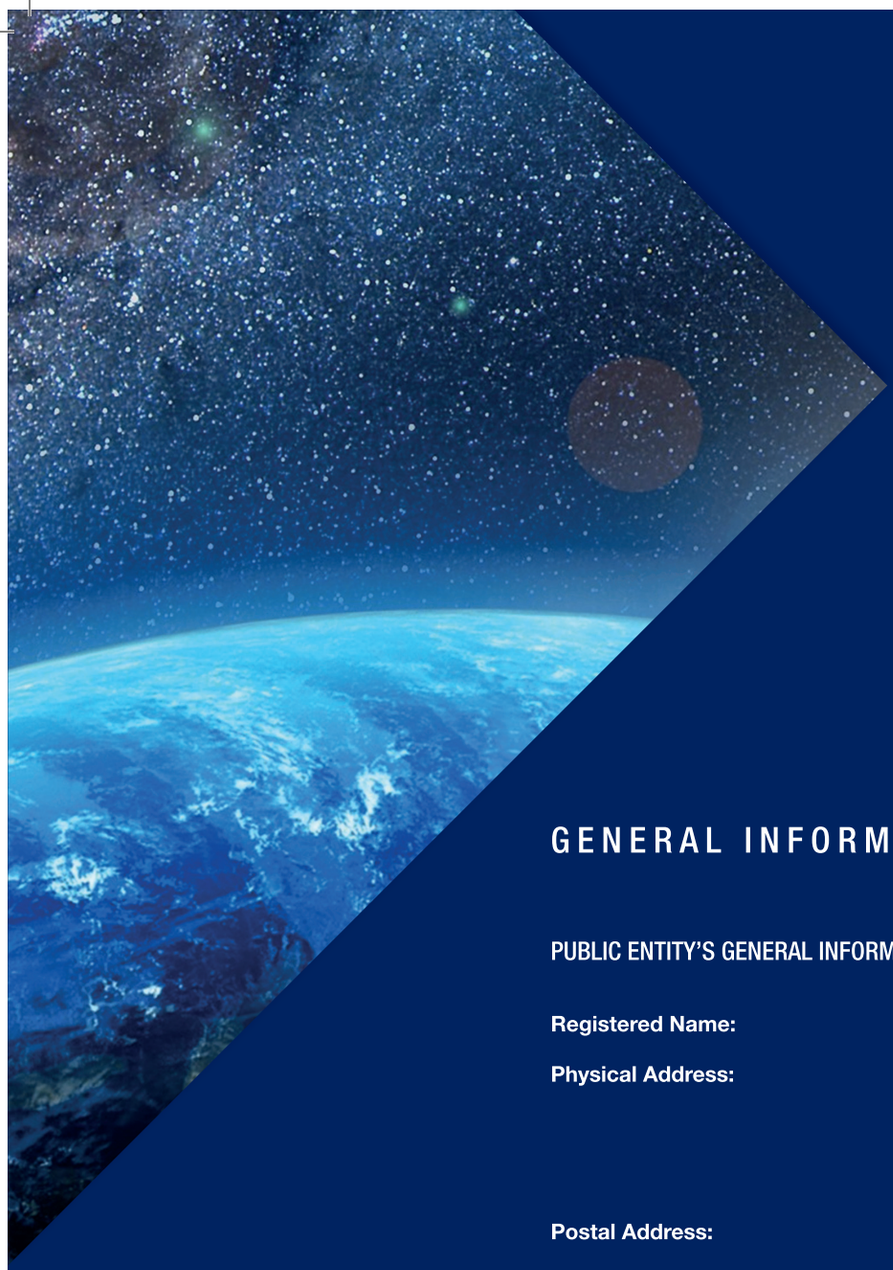
NATIONAL RESEARCH FOUNDATION

ANNUAL REPORT 2016/17

science & technology
Department:
Science and Technology
REPUBLIC OF SOUTH AFRICA

NRF National Research Foundation



GENERAL INFORMATION

PUBLIC ENTITY'S GENERAL INFORMATION

Registered Name:	National Research Foundation
Physical Address:	Meiring Naudé Road Brummeria Pretoria 0002
Postal Address:	PO Box 2600, Pretoria, 0001
Telephone Number/s:	+27 12 481 4000
Fax Number:	+27 12 349 1179
Email Address:	info@nrf.ac.za
Website Address:	www.nrf.ac.za
External Auditors:	Auditor-General of South Africa (AGSA) PO Box 446 Pretoria 0001
Bankers:	ABSA Glenfair Shopping Centre Corner Lynnwood and Daventry Roads Lynnwood Manor Pretoria
Company/Board Secretary:	Mrs Magda Marx
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STATEMENT OF RESPONSIBILITY

To the best of my knowledge and belief, I confirm the following:

All information and amounts disclosed in the annual report are consistent with the Annual Financial Statements audited by the Auditor-General.

The annual report is complete, accurate and free from any omissions. The annual report has been prepared in accordance with the guidelines on the annual report as issued by National Treasury.

The Annual Financial Statements (page 136) have been prepared in accordance with the standards applicable to the public entity. The accounting authority is responsible for the preparation of the Annual Financial Statements and for the judgements made in this information.

The accounting authority is responsible for establishing and implementing a system of internal control that has been designed to provide reasonable assurance as to the integrity and reliability of the performance information, the human resources information and the Annual Financial Statements.

The external auditors are engaged to express an independent opinion on the Annual Financial Statements.

In our opinion, the annual report fairly reflects the operations, the performance information, the human resources information and the financial affairs of the organisation for the financial year ended 31 March 2017.

Yours faithfully

Dr Molapo Qhobela
Chief Executive Officer
July 2017

Prof. Loyiso Nongxa
NRF Board Chairman
July 2017

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FOREWORD BY CHAIRMAN

Introduction

It is my pleasure to present the Annual Report of the National Research Foundation (NRF) for the 2016/17 financial year.

High-level overview of the NRF's strategy and performance in the sector

The 2016/17 financial year was the second year of a five-year implementation plan against the *NRF Strategy 2020*. Over the year in review, the organisation has taken stock of its role in the science system and has foregrounded the issues of transformation and sustainability as key elements in executing the mandate through the pursuit of its strategic outcomes and objectives. The organisation has yielded positive results and the contribution to national imperatives is tangible.

Strategic relationships

The NRF leverages off strategic relationships locally and globally. Against the strategic outcome of *"a vibrant and globally connected national system of innovation"*, the NRF continues to pursue meaningful relationships, thus facilitating a discourse that will yield national and global research agendas that embody the ethos of excellence with relevance. The NRF continues to benefit from the dynamic engagement with the Departments of Science and Technology, Higher Education and Training, and Trade and Industry, to name a few. The close relationships with the universities, and in particular Universities South Africa (USAf), remain fundamental to the decisions and choices of the organisation that impact the broader community.

Challenges faced by the NRF Board

The NRF Board has adopted a risk-based management approach in addressing the strategic challenges of the organisation. The Board once again considered the long-term impact of a less than optimal increase in the parliamentary grant allocation. The Board has noted with trepidation that the internal reprioritisations and cost-containment measures to offset escalating costs of doing business are reaching a critical point beyond which these measures will start to be less effective as the business is faced with hard choices including, in some instances, the risk of discontinuation.

The Board notes the positive engagement with the DST on the possible redefinition of resource-allocation principles to provide flexibility in funding decisions and is also pleased to note that there has been progress in rationalising the DST contracting modality with the NRF. The Board continues to express support for evidence-based decision-making, which ultimately increases accountability, thus requiring higher degrees of efficiency.

The Board has deliberated over the issues of transformation, both internal and at a systemic level. While it is acknowledged that the organisation has made a significant contribution to the transformation challenges, more must be done to improve the breadth, depth and pace of delivery towards an excellent and transformed knowledge enterprise. The Board, supported by the broader executive, will continue to drive the transformation of the equity profiles of the research workforce, the knowledge enterprise, the nature of the relationship between science and society, and a fully diverse and inclusive learning organisation.

The year ahead

The Board looks forward to the 2017/18 financial year as it presents new opportunities for the NRF. The organisation will continue to implement the *NRF Strategy 2020*. To this end, the Board will consider and finalise the NRF transformation strategy that is aimed at shaping and transforming the knowledge enterprise. The Board will continue to support the development of flexible, evidence-led and transparent resource allocation principles that will allow the organisation to maximise the return on investment in the science system. Inputs to the NRF Act amendments are being finalised and approved and the Board will ensure that the organisation is in readiness to implement the enabling amendments of the Act.

The consolidation of the SKA SA project and the Hartebeesthoek Radio Astronomy Observatory to form the South African Radio Astronomy Observatory will start to take on momentum. This positive move to consolidating and rationalising the radio astronomy sector is welcomed. The completion of the MeerKAT telescope in the Karoo and the operations of the 64-dish MeerKAT array will be a first for the African continent and the Board looks to the end of March 2018 for this momentous occasion.

Acknowledgements/Appreciation

On behalf of the NRF Board and Executive, I would like to express our sincere appreciation to the Minister of Science and Technology, the Honourable Mrs Naledi Pandor, for her unwavering leadership, support, and willingness to engage with the NRF Board and Executive Committee. I would also like to express appreciation to the Parliamentary Portfolio Committee on Science and Technology for their open and constructive discourse with the NRF.

I wish to sincerely acknowledge the NRF Executive and specifically the Corporate Executive Committee for their unwavering commitment to the organisation and their meaningful and proactive engagement with the Board. I would also like to thank my fellow Board members for their conscientious attention to Board matters and for bringing their diverse expertise to bear on the challenges confronting the organisation.

Conclusion

Based on the performance and outcomes of the year in review, the NRF is encouraged and looks forward to a new year of opportunities to contribute to *a vibrant and globally connected national system of innovation*.

Prof. Loyiso Nongxa
NRF Board Chairman
July 2017

KAKARETŠO YA MODULASETULO

Matseno

Ke lethabo go nna go aba Pego ya Ngwaga le Ngwaga ya Motheo wa Dinyakišišo wa Setšhaba ya ngwaga wa ditšhelete wa 2016/17.

Kakaretšo ya maemo a godimo ya leano la NRF le go šoma mo lekaleng

Ngwaga wa ditšhelete wa 2016/17 e bile ngwaga wa bobedi wa phethagatšo ya mengwaga ye mehlano kgahlanong le *Leano la NRF la 2020*. Mo ngwageng wa tshekatsheko, mokgatlo o lekotše mošomo wa wona mo mokgweng wa saense gomme o dirile ditaba tše bohlokwa tša phetogo le tshwarelelo bjalo ka dielemente tše bohlokwa tšeo di diragatšago taolelo ka go nyaka dipoleo tša leano la wona le maikemišetšo. Mokgatlo o tšweleditše dipoelo tše dibotse gomme go kgatha tema ga dinyakwa tša setšhaba go a bonagala.

Dikamano tša Leano

NRF e laola dikamano tša leano mo gae le lefaseng ka moka. Kgahlanong e poelo ya *"Mpshafatšo ya leano la setšhaba leo le kgokaganego ka mafolofolo lefaseng ka moka"*, NRF e tšwela pele go latela dikamano tša mohola ka gona e kgokaganya poledišano yeo e tla tšweletšago diagenda tša dinyakišišo tša mo gae le tša lefase ka moka tšeo di emelago moya wa bokgoni ka maleba. NRF e tšwela pele go holega go tšwa go kgokagano ya mafolofolo le Dikgoro tša Saense le Theknolotši le Thuto ya Godimo le Tlhahlo; le Kgwebo le Intasteri go bolela tše mmalwa. Kamano ye botse le diyunibesithi kudu Diyunibesithi tša Afrika Borwa (USAf) e dula e le bohlokwa mo diphething le dikgethong tša mokgatlo tšeo di huetšago setšhaba ka bophara.

Ditlhohlo tšeo di lebanego le Boto ya NRF

Boto ya NRF e amogetše mokgwa wa taolo wo o theilwego dikotsing go šogana le ditlhohlo tša leano la mokgatlo. Boto gape e šeditše khuetšo ya nako ye telele ya ka fase ga koketšo ye kaone go feta ka moka mo kabelong ya thušo ya ditšhelete ya palamente. Boto e lemogile ka letšhogo gore peakanyo ya ka gare le mekgwa ya go laola ditshenyagelo le ekanyetša ditshenyagelo tšeo di golelago godimo tša go dira kgwebo le go fihlelela ntlha ya godimo ka godimo ga moo ditshepedišo tše di tla thomago go se sa šoma gabotse ge kgwebo e lebane le dikgetho tša bothata go akaretšwa, mo dinakong tše dingwe, kotsi ya go emiša.

Boto e lemogile kgokaganyo ye botse le DST ka dikgonagalo tša go hlaloša gape mekgwa ya methopo ya go aba go dumelela go fetogafetoga ga diphetho tša thušo gape e thaba go lemoga gore go bile le tšwelopele mo go kaonafatšeng go ba gona ga dikontraka tša DST le NRF. Boto e tšwela pele go bontšha thekgo ya diphetho tše di theilwego go bohlatse, yeo mafelelong e oketšago maikarabelo ka gona e nyaka bokgoni bja maemo a godimo.

Boto e nagantšhitše ka ditaba tša phetogo bobedi ka go magato a ka gare le a leano. Mola go amogelwa gore mokgatlo o kgathile tema ye kgolo mo ditlhohlong tša phetogo tše dintši di swanelwa ke go dirwa go kaonafatša, le go phethagatša go bohlale le lebelo la kgwebo ya bokgoni le tsebo ye e fetotšwego. Boto e thekgwa ke taolo ka bophara e tla tšwela pele go eta pele phetogo ya diprofaele tša tekatekano ya dinyakišišo tša bašomi; Kgwebo ya Tsebo; mohuta wa kamano gare ga saense le setšhaba; le mokgatlo wa go ithuta ka kakaretšo le phapano ya go tlala.

Ngwaga wo o tlago

Boto e lebeletše pele ngwaga wa ditšhelete wa 2017/18 ka ge e aba dibaka tša mokgatlo. Mokgatlo o tla tšwela pele go phethagatša *Leano la NRF la 2020*. Go fihla mo, Boto e tla šetša le go petha leano la phetogo la NRF leo maikemišetšo a lona e lego go bopa le go fetoša tsebo ya kgwebo. Boto e tla tšwela pele go thekga tšweletšopele ya go fetogafetoga, mekgwa ya go aba methopo ye e bonagalago gape ya tshedimošo ya bohlatse yeo e tla dumelelago mokgatlo go fihliša poelo ya peeletšo magomong mo mokgweng wa saense. Dikgopolo mo dimpshafatšong tša Molao wa NRF di a phethwa le go dumelelwa gomme Boto e tla kgonthiša gore mokgatlo o loketše go phethagatša dimpshafatšo tše di dumeletšwego tša Molao.

Kopanyo ya protšeke ya SKA SA le Moago wa Radio ya Astronomi wa Hartebeesthoek go dira Moago wa Radio ya Astronomi wa Afrika Borwa o tla thoma go šoma. Tšhutišo ye ye botse ya go kopanya le go kaonafatša lekala la radio ya astronomi e a amogelwa. Go phethwa ga theleskoupo ya MeerKAT ka Karoo le dibaka tša mohlwaela wa dibjana tše 64 tša MeerKAT e tla ba sa mathomo mo kontinenteng ya Afrika gomme Boto e lebeletše go fihla mafelelong a Hlakola 2018, ga tiragalo ye ye bohlokwa.

Dikamogelo le Ditebogo

Legatong la Boto le Taolo, ke rata go leboga Tona ya Saense le Theknolotši, Mohlomphegi Mdi Naledi Pandor ka boetapele bja gagwe bja go tia, thekgo, le boikgafo bja go kgokagana le Boto ya NRF le Komotiphethiši. Ke rata gape go leboga Komiti ya Potfolio ya Saense le Theknolotši ka poledišano ya bona ye e bulegilego ya mohola le NRF.

Ke rata go amogela ka nnete Taolo ya NRF kudu Komiti ya Taolo ya Tirišano ka boikgafo bja bona bjo maatla mo mokgatlong le go tšea karolo ga bona ga mohola gape ga mafolofolo le Boto. Ke rata gape go leboga badirišani ba ka ba maloko a boto ka thušo ya bona ya tlhokomelo mo ditabeng tša boto le go tliša bokgoni bja bona bja go fapafapana go šogana le ditlhohlo tše di lebanego le mokgatlo.

Phetho

Go theilwe mo mošomong le dipoelong tša ngwaga wo mofsa mo tshekatshekong, NRF e hlohleletšwa le go lebelela pele mo ngwageng wo mofsa wa dibaka go kgatha tema go *mpshafatšo ya leano la setšhaba leo le kgokaganego ka mafolofolo lefaseng ka moka.*

Moprofesara Loyiso Nongxa
Modulasetulo wa Lekgotla la NRF
Julae 2017

UMBIKO KASIHLALO

Isethulo

Kuyinjabulo kimi ukwethula Uhlelo lwaMinyaka Yonke loMsebenzi we-National Research Foundation (NRF) lonyaka ka-2016/17.

Ukubukezwa okunganingiliziwe kohlelo lwe-NRF nomsebenzi ofeziwe kulomkhakha

Unyaka wezimali ka 2016/17 wawungowesibili wohlelo lweminyaka emihlanu lokufezwa kwe-*NRF Strategy 2020*. Kulonyaka ocwaningwayo, inhlangano ibhekisise iqhaza elibambayo kwezeSayensi futhi ithole ukuthi izindaba ezithinta ukushintsha ngokulinganisa amathuba omsebenzi kwabaNsundu nokuqhutshekiselwa phambili komsebenzi kubalulekile ekufezeni imigomo ebekiwe ngokuzimisela ukufeza imiphumela nimigomo ebekiwe. Inhlangano ifinyelele imiphumela emihle futhi ifake isandla ezicini okumele zifinyelelwe kuqala ezweni.

Ubuhlobo Ngokohlelo

I-NRF izuza ngokubambisana nozakwabo lapha ezweni lakithi nasemazweni angaphandle. Ngemiphumela yohlelo olubizwa ngokuthi *"Inqubo yezwe yokusungula izinto ngomndladla nangokuxhumana nomhlaba wonke"*, i-NRF iqhubekela phambili ngokuthuthukisa ubudlelwane obuhle ngokuqikelela ukuthi kuba nokuxoxisana okuyophumela ezingxoxweni zezwe nezomhlaba wonke ezivumelana nokwenza izinto ngobuciko nangendlela efanele. I-NRF iqhubekela phambili izuza ngobudlelwane obujulile phakathi kwayo neMinyango yezeSayensi noBuciko kanye neMfundo ePhakeme nokuQeqeshwa; nezaMabhazinisi neZimbhoni ukuphawula ezimbalwa. Ubudlelwane obuseduze namaNyuvesithi futhi ikakhulu i-Universities South Africa (USAf) kuyaqhubeka ukuba semqoka ezinqumweni kanye nokukhetha okwenziwa inhlangano okuthinta umphakathi kabanzi.

Izinselele ezibhekene neBhodi le-NRF

IBhodi le-NRF liqale ukusebenzi inqubo yokuqapha izimo ezibucayi ukuze lihlangabezane nezinsalelo zezinhlelo ngaphakathi kwenhlangano. IBhodi liphinde lacabangela umthelela ongaba khona wesikhathi eside ngokuphathelene nokunyuswa kweholo ngezinga eliphansi kwisamba semali esibekelwe iphalamende. IBhodi liveze ukukhathazeka ngezinto okumele zenziwe kuqala nezinyathelo okumele zithathwe ukuze kongiwe imali ngenxa yezindleko ezinyukayo zokusebenza, ngoba zifinyelela eqophelweni elibucayi kakhulu futhi uma kunganakwa ibhizinisi liyohluleka ukuqhubeka kahle ngoba kumele lenze ukukhetha okungelula futhi ngezinye izikhathi kuholela esimenwi lapho kungase kumiswe khona imisebenzi ethile.

IBhodi liqaphela ukusebenzisana okuhle ne-DST okungase kuholele ekuhleleni kabusha indlela yokusebenza ukuze izinqumo ezithinta ukusetshenziswa kwemali zenziwe ngokuvumelana nezimo futhi lijabulela ukuphawula ukuthi kunentuthuko eyenziwe ekuhlelweni kwenqubo elandelwa yi-DST ekusayindweni kwamakontileka ne-NRF. IBhodi liqhubeka liveza ukweseka kwalo ukwenziwa kwezinqumo ngokuvumelana nobufakazi obukhona, futhi lokho kuthuthukisa izinga lokwamukela umthwalo wemfanelo futhi kubizela ukusebenza ngezinga eliphumelela kakhudlwana.

IBhodi lixoxele izindaba ezithinta ukushintsha ngokulinganisa amathuba omsebenzi kwabansundu ngaphakathi nakweminye imikhakha. Yize inhlangano ibambe iqhaza elikhulu ezinseleleni zokwenza ushintsho kusanokuningi okumele kwenziwe ukuze kuthuthukiswe ububanzi, ukujula nejubane lokukhiqiza ngobuciko nangempumelelo nokwenza ushintsho lwentuthuko. Njengoba iBhodi lisekelwa abaholi bonke liyoqhubeka lenze ushintsho ukuze kube nokulingana ngokobuhlanga eqenjini locwaningo; uMkhankaso woLwazi; isimo sobudlelwane phakathi kweSayensi nomphakathi; kanye nenhlangano exubile futhi eyamukela wonke umuntu ngokokufunda.

Unyaka Olandelayo

IBhodi libheke phambili onyakeni wezimali ka-2017/18 ngoba uyoletha amathuba amasha enhlanganweni. Inhlangano izoqhubekela phambili ifeze i-*NRF Strategy 2020*. Ukuze ikufinyelele lokho, iBhodi lizocabangela futhi liphothule uhlelo lwe-NRF ngokuphathelene noshintsho olwenzelwe ukuthuthukisa nokushintsha umkhankaso wolwazi. IBhodi lizoqhubekela phambili lisekela indlela yokusebenza ngokuvumelana nezimo, ngokobufakazi obukhona nangokwezimiso zokuhlela abasebenzi ezisobala eziyovumela inhlangano ifinyelele umkhiqizo omkhulu ngokweSayensi. Amaphuzu afakwa ekulungisweni koMthetho we-NRF ayophothulwa nokugunyazwa futhi iBhodi lizoqikelela ukuthi inhlangano ikulungele ukulandela ukulungiswa koMthetho.

Ukuhlanganiswa komkhankaso we-SKA SA ne-Hartebeesthoek Radio Astronomy Observatory ukuze kumiswe i-South African Radio Astronomy Observatory kuzoqala ngesivinini. Lesinyathelo esihle sokuhlanganisa nokuhlela umkhakha wezomsakazo nezezinkanyezi siyamukeleka. Ukuphothulwa kwetheleskophu ye-MeerKAT e-Karoo nokusebenza kohlelo lwe-64 dish MeerKAT kuzoba okokuqala ezwenikazi leAfrika futhi iBhodi libheke phambili ekupheleni kuka Ndasa ka 2018, kulesenzakalo esiyinqophamlando.

Amazwi okubonga/Nokuveza ukwazisa

Egameni laBaphathi beBhodi, ngithanda ukuveza ukwazisa kuNgqongqoshe weSayensi nozoBuchwepheshe, uNgqongqoshe uNkosikazi Naledi Pandor ngobuholi bakhe obuqinile, ukusekela nokuzimisela ukuholela i-Bhodi le NRF neKomiti yaBaphathi. Futhi ngithanda ukubonga iKomiti yoMnyango weSayensi Nobuciko ngokubamba kwabo iqhaza ngokuqhubekayo kwi-NRF.

Ngithanda ukubonga Abaphathi be-NRF futhi ikakhulu iKomiti laBaholi ngokuzimisela kwabo enkampinini nokuqhubeka bebambisene neBhodi ngokuzimisela. Futhi ngibonga amalungu esikanye nawo kwibhodi nangokubamba iqhaza ngamakhono abo ukuze sihlangabezane nezinselelo ezibhekene nenkampani.

Isiphetho

Ngokuvumelana nendlela yokusebenza nemiphumela yonyaka wocwaningo, i-NRF iqina idolo futhi ibheke phambili onyakeni omusha onamathuba engeziwe okubamba iqhaza *kwinqubo yezwe yokusungula izinto ngomdlandla nangokuxhumana nomhlaba wonke.*

Prof. Loyiso Nongxa
Usihlalo Webhodi Le-NRF
July 2017

CHIEF EXECUTIVE OFFICER'S OVERVIEW

Overview

I have the pleasure of presenting the Annual Report of the National Research Foundation (NRF) for the 2016/17 financial year. The Annual Report provides an account of the organisation's performance against the Annual Performance Plan for the same period, which in turn is part of the implementation of *NRF Strategy 2020*.

High-level financial review of the public entity

During the year under review, the parliamentary grant increased by 0.5% in nominal terms against an annualised inflation rate of 6.6%, resulting in a decrease of 6.1% in real terms. The decline of the parliamentary grant in real terms continues to pose a sustainability risk to the organisation. Ring-fenced funding, however, increased by 25% in nominal terms, translating to 18.7% in real terms, from R1,736 million in 2015/16 to R2,178 million in 2016/17. This was related to a carry forward of funding received for human capacity development (R357m) and the SKA SA project (R339m) in the prior year. Designated income decreased by 6.7% in nominal terms, which represented a decrease of 13.3% in real terms due to the termination of the Technology and Human Resources for Industry Programme (THRIP) contract by the Department of Trade and Industry.

Spending trends and performance against the strategic outcome-orientated goals of the public entity

The organisation achieved 63% of the performance targets in the year under review. This is a 21% increase from the previous year. In contributing to the long-term goal of developing *"an internationally competitive and transformed science and technology workforce"*, the Research and Innovation Support and Advancement (RISA) division supported 14 173 postgraduate students during the 2016 academic year. Of these students, 10 747 (76%) were black and 8 017 (57%) were female. A total of R2 269m was expensed over the financial year in support of human capacity development, knowledge generation and infrastructure provisioning. To this end, R904m was invested in postgraduate support, where a total of 4 995 master's and 3 363 doctoral students were supported against a target of 5 300 (94% performance) and 3 200 (target exceeded by 5%) respectively.

A total of R495m was invested in support of emerging and established researchers including postdoctoral fellows. This resulted in a total of 4 520 researchers being supported in the 2016/17 financial year, of whom 1 563 (35%) were black against a target of 1 739; and 1 699 (39%) were female against a target of 2 209. The relatively slow rate of transformation of the research cohort remains an ongoing challenge. In this regard, the organisation has embarked on a multi-tiered strategy to address this national imperative.

During the year under review, a total of R550m was invested in strategic investments including the Research Chairs (SARChI) and the Centres of Excellence (CoEs). The NRF further supported 3 663 rated researchers against a target of 3 400, with the predetermined performance targets for black and female rated researchers being exceeded by 14% and 8% respectively.

In support of the goal of providing *"leading-edge research and infrastructure platforms"*, the NRF invested R345m through awarding research equipment and infrastructure grants to the universities under the National Equipment Programme (NEP). A further R347m was invested in the National Research Facilities of Programme 4, with R637m being invested in the National Research Facilities of Programme 5 including the SKA SA project. The National Research Facilities supported 666 postgraduate students, which exceeded the predetermined target by 22%; and produced 462 ISI-accredited publications over the year, with a cumulative citation impact of 1.3. The Facilities supported 2 460 users of the various platforms against a target of 1 626.

In support of the goal of a *"scientifically literate and engaged society"*, the organisation invested R174m in science engagement activities. This resulted in 67 955 SET Olympiad participants, 227 200 workshop and science camp participants, as well as 29 300 career profiling and role modelling participants. Through various initiatives across the country, the organisation trained 17 997 educators and engaged with 374 457 learners. A total of 1 084 760 members of the public participated in various science engagement activities during the 2016/17 financial year.

In pursuit of the goal of creating *"a representative research and technical workforce"*, the NRF increased the number of employed black and female technical staff in senior technical and managerial positions. In these categories, the organisation achieved 99% and 94% of its target for the year under review.

Discontinued activities/Activities to be discontinued

The National Zoological Gardens (NZG) was officially transferred to the custodianship of the South African National Biodiversity Institute (SANBI) effective from 1 April 2017. In order to facilitate a smooth transfer, the respective parties agreed to a phased transfer through a transfer agreement signed between the respective parties towards achieving the transfer by 1 October 2017, with any finalities concluded by 31 March 2018.

Over the last decade, the clinical particle therapy activities at iThemba LABS have experienced a sharp decline in patient flow, due to the global evolution in this type of treatment leading to increased availability of turnkey treatment machines set up in hospitals. As part of the long-range planning exercise, an expert panel was invited to review the current activities and supporting infrastructures in order to provide recommendations to management in the context of the research mandate of the facility. Considering, among other things, the severe decline in patient numbers as a result of the outdated technology at iThemba LABS, the NRF Board informed the Minister of Science and Technology of the proposal to discontinue the Particle Therapy programme at iThemba LABS. Management will engage with the Board in more detail in the new financial year.

Challenges experienced

The ongoing decline of the parliamentary grant in real terms remains an area of concern for the operational and financial sustainability of the organisation. This grant is the statutory allocation received by the NRF to deliver on its mandate and the organisation is under pressure due to increased costs of operations, including currency volatility. Over the five-year period from 2012 to 2017, the parliamentary grant has declined, year on year, in real terms by an average of 3% per year. The designated and earmarked allocation to the NRF has, however, increased in real terms over the same period. While this is welcome, these funds cannot be used for other important initiatives outside of their designated purpose. To improve the long-term operational and financial sustainability of the organisation, it will be necessary for the designated and contract income to be included in the parliamentary grant.

Audit report matters

The external audit conducted by the office of the Auditor-General of South Africa (AGSA) resulted in an unqualified audit for the year ending 31 March 2017. The organisation regrettably declared irregular expenditure to the value of R4 545m relating to the procurement of goods and services. However, the NRF received the goods and/or services procured and value was derived from the incurred expenditure. For more information, refer to Note 41 of the Annual Financial Statements on page 184. The audit of predetermined objectives also resulted in a material misstatement in respect of the usefulness and reliability of data from Programme 5 – National Research Facilities (including SKA). This was caused by the number of joint international agreements being misstated by the South African Astronomical Observatory (SAAO). The issue will be monitored closely over the next financial year.

Plans for the future

The ageing infrastructure challenges at the National Research Facilities have long been a concern of the NRF Board and its Executive. Through various partnerships, the NRF and DST have proactively managed the immediate risks with the exception of iThemba LABS, where the ageing and oversubscribed cyclotron remains a concern. In the new financial year, the NRF will continue to develop a plan to acquire a new 70 MeV cyclotron to complement the existing Separated Sector Cyclotron. While this acquisition will provide the capacity and redundancy to offset a key risk to the facility, it also has the potential to revitalise the science agenda and long-range plan of the iThemba LABS and the nuclear physics community in South Africa as well as the continent.

Events after the reporting date

The proposed transfer of the NZG to SANBI will continue to receive greater focus post year-end.

Economic viability

The NRF remains a strong and financially viable organisation.

Acknowledgement/s and appreciation

I would like to express my gratitude to the Board of the NRF under the chairmanship of Professor Loyiso Nongxa for providing leadership and guidance over the past financial year. I also wish to acknowledge, with appreciation, the support of the Minister of Science and Technology, the Honourable Mrs GNM Pandor.

A special word of appreciation is due to the management and staff of the NRF, without whom the NRF would not be able to deliver on its mandate. Similarly, I wish to express our appreciation to our partners and particularly to the academic community which we serve and who continue to contribute so generously to the support of the NRF.

Conclusion

This year marks the second year of the implementation of *NRF Strategy 2020*, which resulted in a 21% increase in the number of performance targets achieved relative to the prior year. This bodes well for the future as we continuously strive for improvement, particularly in the effective and efficient performance against predetermined objectives and the realisation of the National Development Plan.

Dr Molapo Qhobela
Chief Executive Officer
July 2017

KAKARETŠO YA MOHLANKEDIMOGOLOPHETHIŠI

Kakaretšo

Ke thabile go aba Pego ya Ngwaga le Ngwaga ya Motheo wa Dinyakišišo wa Setšhaba ya ngwaga wa ditšhelete wa 2016/17. Pego e hlaloša ka moo mokgatlo o šomilego ka gona kgahlanong le Leano la Go šoma la Ngwaga le Ngwaga la nako ya go swana, yeo e lego karolo ya phethagatšo ya *Leano la NRF la 2020.*

Tshekatsheko ya maemo a godimo ya lekala la setšhaba

Nakong ya ngwaga wa ditshekatsheko, thušo ya ditšhelete ya palamente e oketšegile ka 0.5% ka go se fetoge kgahlanong le lebelo la inflešene ya 6.6%, yeo e latelwago ke phokotšego ya 6.1% ye e fetotšwego. Go fokotšega ga thušo ya ditšhelete ya palamente ye e fetotšwego go tšwela pele go hlagiša kotsi ya tshwarelelo mokgatlong. Le ge go le bjalo thekgo ya ditšhelete ye e kgonthišitšwego e oketšegilego ka 25% ka go se fetoge ya fetolela go 18.7% ye e fetotšwego, go tloga go R1, 736m ka 2015/16 go fihla go R2, 178 milione ka 2016/17. Se se amana le tšhelete ya thekgo ye e fetetšwago pele ye e amogetšwego go Tšweletšopele ya Bokgoni bja Batho (R357m) le Protšeke ya SKA SA (R339m) mo ngwageng wa pele. Letseno le le kgethilwego le fokotšegilego ka 6.7%, ka go se fetoge seo e lego phokotšego ka 13.3% ye e fetogilego ka baka la go fediša ga kontraka ya THRIP ke Kgoro ya Kgwebo le Intasteri.

Go šomiša phetogo le go šoma kgahlanong le maikemišetšo a tlwaetšo ya dipoelo tša leano

Mokgatlo o fihleletše 63% ya tebanywa mo ngwageng wa tshekatsheko. Se ke koketšego ya 21% go tloga ngwageng wa go feta. Ka go kgatha tema mo maikemišetšong a nako ye telele a go godiša *"phadišano ya ditšhabatšhaba le saense ye e fetotšwego le bašomi ba theknolotši"* karolo ya Tšweletšopele le Thekgo ya Dinyakišišo le Mphsafatšo (RISA) e thekgile baithuti ba dialogadigolwane ba 14 173 mo ngwageng wa dithuto wa 2016. Mo baithuting ba, 10 747 (76%) e be e le bathobaso le 8 017 (57%) ya basadi. Palomoka ya R2269m e šomišitšwe mo ngwageng wa ditšhelete go thekga tšwelotšopele ya bokgoni bja batho, tšweletšo ya tsebo le go aba infrastraktšha. Go fihla mo, R904m e beeleditšwe mo thekgong ya dialogadigolwane, moo palomoka ya baithuti ba mastase ba 4 995 le baithuti ba Bongaka ba 3 363 ba thekgilwego kgahlanong le tebanywa ya 5300 (94% ya go šoma) le 3200 (tebanywa e fetile ka 5%) ka gona.

Palomoka ya R495m e beeleditšwe go thekga banyakišiši ba bafsa le bao ba šetšego ba tšwetše pele go akaretša badirišani ba ka morago ga bongaka. Se se feleditše ka palomoka ya banyakišiši ba 4 520 ba thekgwa mo ngwageng wa ditšhelete wa 2016/17, moo 1 563 (35%) e bego e le bathobaso; gomme 1 699 (39%) e le basadi kgahlanong le tebanywa ya 2 209. Lebelo la go nanya la sehlopha sa dinyakišišo e dula e le tlhohlo yeo e tšwelago pele. Ka gona, mokgatlo o lesolong la leano la magato a mantši go šogana le hlokego ye ya setšhaba.

Nakong ya ngwaga wa ditshekatsheko, palomoka ya R550m e beeleditšwe mo dipeekanyong tša leano go akaretša Ditulo tša Dinyakišišo (SARChI) le Disenthara tša Bokgoni (CoEs). NRF e thekgile gape banyakišiši bao ba lekanyeditšwego ba 3663 kgahlanong le 3400, ka tebanywa ya go šoma ye e beakantšwego ya banyakišiši bao ba lekanyeditšwego ba bathobaso le basadi e fetile ka 14% le 8% mmogo.

Go thekga maikemišetšo a go aba *"Dinyakišišo tša ketapele le difala tša infrastraktšha"*, NRF e beeleditše R345m ka go aba thušo ya didirišwa tša dinyakišišo le infrastraktšha diyunibesithing tše di lego ka fase ga Lenaneo la Didirišwa la Setšhaba (NEP). R347m ye nngwe e beeleditšwe mo lenaneong la Dinolofatši tša Dinyakišišo tša Setšhaba tše 5 di akaretša protšeke ya SKA SA. Dinolofatši tša Dinyakišišo tša Setšhaba di thekgile baithuti ba dialogadigolwane ba 666, bao ba fetilego tebanywa yeo e akantšwego ka 22%; gomme ya tšweletša diphatlalatšo tše di dumeletšwego tša ISI tše 462 mo ngwageng ka khuetšo ya ditsopolwa tše di oketšegago ya 1.3. Dinolofatši di thekgile badiriši ba 2 460 ba difala tša go fapana kgahlanong le tebanywa ya 1 626.

Go thekga maikemišetšo a *"Go tseba saense le setšhaba se e tšeago karolo"*, mokgatlo o beeleditše R174m ka mešongwana ye e amago saense. Se se tšweleditše bakgathatema ba SET Olympiad ba 67 955, ditlhahlo tše 227 200 le bakgathatema ba kampa ya saense gammogo le bakgathatema ba 29 300 bao ba lego Profaeleng ya Mošomo le Go ba mohlala wo mobotse. Ka mananeo a go fapana go phatlalala le naga, mokgatlo o hlahlile barutiši ba 17 997 gomme ba amana le baithuti ba 374 457. Palomoka ya maloko a 1 084 760 ya setšhaba bao ba kgathilego tema mo mešongwaneng ya dikamano tša go fapana tša saense mo ngwageng wa ditšhelete wa 2016/17.

Go fihlelela maikemišetšo a go hlola *"Dinyakišišo tša go emela bašomi ba thekniki"* NRF e okeditše palo ya bašomedi ba thekniki ba Bathobaso gape ba Basadi mo maemong a godimo a thekniki le a boetapele. Mo magorong a, mokgatlo o fihleletše tebanywa ya 99% le 94% ya ngwaga wa tshekatsheko.

Mešongwana ye emišitšwego

Serapa sa Diphoofolo sa Setšhaba (NZG) se fedišitšwe semmušo tlhokomelong ya Institute ya Pharologanyo ya Thutaphedi (SANBI) go tloga ka 1 Moranang 2017. Go sepediša phethišetšo ye botse, mekgatlo ka moka e dumelelane ka phetišetšo ka dikarolo ka tumelelano ya go fetišetša yeo e saennwego gare ga mekgatlo go fihlelela phetišetšo ka la 1 Diphalane 2017 gomme dithumo ka moka di feditšwe ka la 31 Hlakola 2018.

Mo pakeng ya go feta mešongwana ya terapi ya ditsekana tša kalafo mo Dilaporotoring tša iThemba e itemogetše palo ya fase ya balwetši bao ba tlago moo, ka lebaka la phethogothaga ya lefase mo mohuteng wo wa kalafo gomme ya dira gore go be le koketšego ya go ba gona ga lenaneo la metšhene ya kalafo yeo e bewago maokelong. Bjalo ka karolo ya mošongwana wa thulaganyo ya mohlwaela wo motelele, phanele ya ditsebi e laleditšwe go sekaseka mešongwana ya gonabjale le go thekga infrastraktšha, gore go fiwe bolaodi ditigelo ka diteng tša taolelo ya dinyakišišo tša senolofatši. Go lebeletšwe gare ga tše dingwe go ya fase kudu ga palo ya balwetši ka lebaka la theknolotši ya kgale mo Dilaporotoring tša iThemba, Boto ya NRF e boditše Tona ya Saense le Theknolotši ka tšhišinyo ya go emiša ka lenaneo la Terapi ya Ditsekana mo Dilaporotoring tša iThemba. Bolaodi bo boledišana le Boto ka botlalo mo ngwageng wo o latelago.

Ditlhohlo tšeo di itemogetšwego

Go tšwela pele go fokotšega ga thušo ya ditšhelete ya palamente ye e fetotšwego e dula e le karolo yeo e hlobaetšago ya tirišo le go swarelela ga ditšhelete ga mokgatlo. Thušo ye ya ditšhelete ke kabelo ya molao yeo e amogelago ke NRF go phethagatša taolelo ya yona gomme mokgatlo o ka fase ga kgatelelo ka lebaka la ditshenyagelo tše di oketšegago tša tirišo, go akaretša go se tiilele ga tšhelete. Mo pakeng ya mengwaga ye 5 go tloga ka 2012 go fihla ka 2017, thušo ya ditšhelete ya palamente e fokotšegile, ngwaga le ngwaga, ye e fetotšwego ka palogare ya 3% ka ngwaga. Kabelo ye e kgethetšwego le go bolokelwa NRF e oketšegile mo go fetotšwego mo pakeng ya go swana. Le ge se se amogelega, dithušo tše tša ditšhelete di ka se šomišetšwe mo mananeong a mangwe a bohlokwa a kantle ga maikemišetšo ao a kgethilwego. Go kaonafatša tirišo ya nako ye telele le tshwaralelo ya ditšhelete tša mokgatlo, go tla ba bohlokwa gore letseno le le kgethilwego le kontraka di akaretšwe mo thušong ya ditšhelete tša palamente.

Pego ya tlhakišo e bohlokwa

Tlhakišo ya ka ntle yeo e dirilwego ke ofisi ya Mohlakišipharephare wa Afrika Borwa (AGSA) e bile le dipoelo tša tlhakišo ya gose kgahliše mo ngwageng wo o felago ka Hlakola 2017. Mokgatlo ka manyami o tsebišitšwe go ba o šomišitše tšhelete ye e ka bago R4 545m bošaedi yeo e amanago le go reka dithoto le ditirelo. Le ge go le bjalo NRF e amogetše dithoto le/goba ditirelo tše di rekilwego gomme tefo e tšwa go ditšhelete tšeo di amogetšwego. Go hwetša tshedimošo ka botlalo lebelela Tsebišo ya 41 mo Ditatamenteng tša Ditšhelete tša Ngwaga le Ngwaga mo letlakaleng la 184. Tlhakišo ya maikemišetšo ao a beakantšwego pele le yona e tšweleditše dimateriale tšeo e sego tša nnete go lebeletšwe mohola le bonnete bja data go tšwa lenaneong la 5 – Dinolofatši tša Dinyakišišo tša Setšhaba (go akaretša SKA). Se se hlotšwe ke ditumelelano tša ditšhabatšhaba tša mohlakanelwa tšeo go se a bolelwago nnete ka tšona ke SAAO. Taba ye e tla lekolwa kudu mo ngwageng wa ditšhelete wo o latelago.

Maano a kamoso

Ditlhohlo tša infrastraktšha ya kgale mo Dinolofatšing tša Dinyakišišo tša Setšhaba ke kgale e le bothata bja Boto ya NRF le Taolo ya yona. Ka ditiršano tša go fapana, NRF le DST di kgonne go laola ka mafolofolo dikotsi tša ka pela go sa akaretšwe Dilaporotori tša iThemba, moo bokgale le go ngwadiša kudu ga saetlotrono e dulago e le bothata. Mo ngwageng wa ditšhelete wo o latelago, NRF e tla tšwela pele go godiša leano go hwetša saetletrone ya 70 MeV go tlaleletša Saetlotrono ya Lakala le le Arogantšwego. Mola phihlelelo ye e tla fa maatla le go hloka mošomo go lekanetša kotsi ye kgolo go Dilaporotori le setšhaba sa difisika tša nyuklea ka Afrika Borwa le kontinenteng.

Ditiragalo ka morago ga tšatšikgwedi la go bega

Diphetišetšo tšeo di šišintšwego tša NZG go ya go SANBI di tla tšwela pele go amogela nepišo ye kgolo ka morago ga mafelelo a ngwaga.

Kgonagalo ya ekonomi

NRF e dula e le mokgatlo wo maatla gape wa kgonagalo ya ditšhelete.

Dikamogelo le Ditebogo

Ke rata go leboga Boto ya NRF ka fase ga bodulasetulo bja Profesa Loyiso Nongxa ka boetapele bja gagwe le tlhahlo mo ngwageng wa go feta wa ditšhelete. Ke rata gape go amogela ka ditebogo le thekgo ya Tona ya Saense le Theknolotši, Mohlomphegi, Mdi GNM Pandor.

Ke iša gape ditebogo tša go ikgetha go bolaodi le bašomi ba NRF bao ntle le bona NRF e bego e ka se kgone go phethagatša taolelo ya yona. Gape, ke rata go leboga badirišani ba rena kudu setšhaba sa thuto seo re se hlankelago gomme bao ba tšwelago pele go kgatha tema ka go loka go thekga NRF.

Phetho

LNgwaga wo o dira ngwaga wa bobedi wa phethagatšo ya *Leano la NRF la 2020* yeo e feleditšego ka koketšego ya 21% mo dilebanyweng tše mmalwa tša mošomo tšeo di fihleletšwego pele ga ngwaga. Se se a tshepiša mo bokamosong ka ge re tšwela pele go leka go kaonafatša kudu go dira mošomo ka katlego le bokgoni kgahlanong le maikemišetšo ao a beakantšwego pele le temogo ya Leano la Tlhabollo la Setšhaba.

Dr Molapo Qhobela
Mohlankedi yo Mogolo wa Taolo
Julae 2017

UMBIKO KA-CEO

Ngamafuphi

Kuyinjabulo kimi ukwethula uMbiko woNyaka we-National Research Foundation wonyaka wezimali ka 2016/17. Lombiko wethula umsebenzi wenhlangano yethu ngokuvumelana nohlelo lwaminyaka yonke lomsebenzi enkathini efanayo, futhi lenkathi iyingxenye yokufezwa kwe-*NRF Strategy 2020*.

Ukuhlaziywa okufingqiwe kwezimali zalenhlangano yesizwe

Kulonyaka ohlaziywayo, isamba semali esiyabelwe iphalamende sinyuswe ngo-0.5% ngokuvamile futhi ngokuvumelana nenani lamandla emali lika-6.6% lokho kusho ukwehla ngezinga eliwu-6.1%. Ukwehla kwemali esiyabelwe iphalamende kuqhubeka kuletha inselele ngokuphathelene nekhono lenhlangano ukuqhubeka isebenza. Nokho ukuxhaswa ngemali okunemingcele kunyuke ngo-25% ngokuvamile okusho ukuthi kunyuke ngo-18.7% , kusuka ku-R1,736m ngo-2015/16 kuye ezigidini ezingu-R2,178 ngo-2016/17. Lokhu kuhlobene nesamba semali esithathwe kwesanyakenye esamukelwa kwi-Human Capacity Development (R357m) ne-SKA SA Project (R339m) onyakeni owedlule. Iholo elihleliwe lehle ngo-6.7% ngokuvamile, futhi lokhu kusho ukwehla ngo-13.3% ngenxa yokumiswa kwekontileka ye-THRIP nguMnyango wezeBhizinisi neZimbhoni.

Ukusetshenziswa kwemali nokusebenza ngokuvumelana nemigomo yohlelo olukhuthaza umkhiqizo enhlanganweni yezwe

Inhlangano ifinyelele ku-63% emigomweni yokusebenza onyakeni ohlaziywayo. Lokhu kusho ukwenyuka kuka-21% uma kuqhathaniswa nonyaka odlule. Ukuze ubambe iqhaza emgomweni wesikhathi eside wokumiswa *"kweqembu labasebenzi bezesayensi nezobuchwepheshe abasezingeni lozakwabo bakwamanye amazwe futhi abathuthukile,"* umnyango we-Research and Innovation Support and Advancement (RISA) uxhase abafundi bemfundo ephakeme abangu-14 173 onyakeni wemfundo ka-2016. Kulabafundi, abangu-10 747 (76%) abansundu kanti abangu-8 017 (57%) abesifazane. Kulonyaka wezimali kusetshenziswe imali engu-R2269m ukuxhasa ukuthuthukiswa kwenani labasebenzi, ukwandisa ulwazi nokuhlela izakhiwo. Ukuze kufezwe lokhu, kusetshenziswe imali engu-R904m ezifundweni zezinga eliphakeme , lapho inani labangu-4 995 abafundela i-Masters abangu-3 363 bafundela iziqu zobuDokotela futhi baxhaswe ngokomgomo obubekiwe ka-5 300 (94% ngokusebenza) ne-3 200 (umgomo udlulwe ngo-5%) ngokulandelanayo.

Inani elingu-R495m lisetshenziswe ukuxhasa abacwaningi abasha nabazinzile kanye nalabo abagogodile kwezobuDokotela. Lokhu kuxhase abacwaningi abangu-4 520 onyakeni wezimali ka-2016/17, abangu-1 563 (35%) abansundu emgomweni obubekiwe ka-1 739; futhi abangu-1 699 (39%) babengabesifazane emgomweni ka-2 209. Inani lihamba kancane ngokuphathelene noshintsho eqenjini lwabacwaningi lilokhu liyinselele. Ngakhoke, inhlangano isungule uhlelo olunabile ukuze kuxazululwe lesisimo esibalulekile ezweni.

Kulonyaka ohlaziywayo, inani lika-R550m lisetshenziswe ngokohlelo oluhlanganisa i-Research Chairs (SARChI) kanye ne-Centres of Excellence (CoEs). I-NRF iqhubeke futhi ngokuxhasa abacwaningi abangu-3 663 emgomweni ka 3 400, emigomweni ebihlelwe kusengaphambili yokusebenza ukuze kufinyelelwe abacwaningi abansundu nabesifazane abadlula u-14% no-8% ngokulandelana.

Ukuze kusekelwe umgomo wokuhlela *"Ucwaningo oluhamba phambili nemizila yezakhiwo",* i-NRF isebenzise u-R345m ngokunikela ngamathuluzi ocwaningo nezakhiwo emanyuvesithi ngaphansi kwe-National Equipment Programme (NEP). Imali eyengeziwe engu-R347m isetshenziswe ohlelweni lwesine lwe-National Research Facilities futhi i-R637m isetshenziswe ohlelweni lwesihlanu lwe-National Research Facilities kuhlanganise nomkhankaso we-SKA SA. I-National Research Facilities ixhase abafundi abangu-666, okuyinani elidlule umgomo obucatshangelwe ngo-22%; futhi kukhiqizwe izincwadi ze-ISI ezingu-462 onyakeni ezibe nomthelela wezinga elingu-1.3. Lezi zikhungo zisekele labo abazisebenzisayo abahlukahlukene ngokomgomo obumisiwe ka-1 626.

Ngokusekele umgomo obizwa ngokuthi *"Umphakathi onolwazi lwezesayensi nobamba iqhaza",* Inhlangano isebenzise u-R174m emisebenzini eholela kwezesayensi. Lokhu kube inani lalaba ababamba iqhaza be-SET Olympiad lafika ku-67 955, abangu-227 200 bahlanganyele emhlanganweni wokufundiswa nokuvakashela indawo yokufundela isayensi kanye nabangu-29 300 abahlanganyele Ekuhlelweni koMgomo Wokuphila nokuLingisa Othile Oyisibonelo. Ngemigudu ehlukahlukene ezweni lonke, inhlangano iqeqeshe oThisha abangu-17,997 futhi ixoxe nabafundi abangu-374,457. Abangu-1,084,760 babambe iqhaza ezinhlelweni ezahlukahlukene zezesayensi ngonyaka wezimali ka-2016/17.

Ukuze kufinyelelwe kumgomo wokumisa *"Iqembu labasebenzi abamelela kahle izwe futhi abanobuchwepheshe"* i-NRF inyuse inani labasebenzi bezochwepheshe abaNsundu nabesifazane ezikhundleni eziphakeme zobuchwepheshe nezobuMenenja. Kulemikhakha, inhlangano ifinyelele u-99% no-94% emgomweni obumisiwe kulonyaka ohlaziywayo.

Imisibenzi emisiwe/Imisebenzi esazomiswa

I-National Zoological Gardens (NZG) ngokusemthethweni idluliselwe ngaphansi kokuphathwa yi-South African National Biodiversity Institute (SANBI) kusukela zizinye ku Mbasa ka 2017. Ukuze izinto zihambe kahle kolukhu, izingxenye zombili zivumelane ukuthi lokhu kudluliselwa kuzokwenziwa ngesivumelwano esisayindiwe ngokwezigaba ukuze lokhu kudluliswa kuphothulwe zizinye ku Mfumfu ka 2017, futhi okunye okudingekile kuyophothulwa ngezi -31 ku Ndasa ka 2018.

Eminyakeni eyishumi eyedlule izinkonzo zokwelashwa okunzulu ngaphansi kwe-iThemba LABS zibe neziguli zenani eliphansi, ngenxa yoshintsho emhlabeni wonke ngokuphathelene nalendlela yokwelapha ngoba imishini esetshenziswayo isiyatholakala ezibhedlela. Ngomgomo wokuhlelela isikhathi eside, ithimba lezinzululwazi limenyelwe ukuba lihlaziye indlela esetshenziswa manje nezikhungo ezisekelayo, ukuze lidlulise izincomo kubaphathi ngokuphathelene nomsebenzi osemqoka wokucwaningo walesisikhungo. Ngenxa yokwehla kakhulu kwenani labagulayo nangenxa yemishini esigugile e-iThemba LABS, iBhodi le-NRF libikele uNgqongqoshe wezeSayensi nezoBuchwepheshe ukuthi kucatshangelwe ukumisa uhlelo lwe-Particle Therapy e-iThemba LABS. Abaphathi bazoxoxa kabanzi ngalokhu neBhodi onyakeni omusha.

Izinselele Esihlangabezane Nazo

Ukwehla okuqhubekayo kwesamba semali esiyabelwa iphalamende kuqhubeka kube yisimo esikhathazayo ngoba inhlangano ayikwazi ukuqhubeka isebenza kahle futhi izinze ngokwezimali. Lesisamba sabiwa ngokomthetho futhi sinikwe i-NRF ukuze ifeze umsebenzi wayo futhi Inhlangano ingaphansi kwencindezi ngenxa yezimali ezinyukile zokwenza umsebenzi, nokufaka phakathi ukushintshashintsha kwamandla emali. Eminyakeni emihlanu kusuka ngo-2012 kuye ku-2017, isamba semali esiyinikwa iphalamende sehlile, unyaka ngamunye, ngokuqondile ngesilinganiso sika-3% ngonyaka. Nokho inani elabelwa i-NRF linyukile ngokoqobo ngesikhathi esifanayo. Yize lokhu kwamukelwa, lezizimali azikwazi ukusetshenziselwa kweminye imigomo ebalulekile ngaphandle kwenjongo ebekelwe yona. Ukuze indlela inhlangano efeza ngayo umsebenzi ithuthukiswe isikhathi eside futhi izinze ngokwezimali, kumele kufakwe phakathi imali yenkontileka kanye neyamaholo kulesisamba sephalamende.

Izindaba zombiko wokuhlaziywa kamabhuku ezimali

Ukuhlaziywa kwezimali okwenziwe i-Auditor General South Africa (AGSA) kuveze umbiko ongemuhle onyakeni ophele ngo-31 ka Ndasa ka 2017. Ngokudabukisa lenhlangano ibike ukusetshenziswa kwemali budedengu okufinyelela u-R4 545m ngokuphathelene nokuthengwa kwempahla nezinkonzo. Nokho, i-NRF yamukele impahla noma izinkonzo ezikhokhelwe futhi ithole inzuzo emalini esetshenzisiwe. Ukuze uthole ukwaziswa okwengeziwe bheka ingxenye ethi Note 41 kwi-Annual Financial Statements ekhasini 184. Imigomo yokuhlaziywa kwamabhuku nayo iveze umbiko onganembile ngokuphathelene nokusebenziseka kanye nokwethenjelwa kokwaziswa kohlelo 5 – National Research Facilities (kuhlanganise i-SKA). Lokhu kubangelwe ukuthi inani lezivumelwano zamazwe onke alizange libikwe ngokunembile yi-SAAO. Lendaba izobhekwa ngeso lokhozi onyakeni olandelayo.

Okuhlelelwa isikhathi esizayo

Izinselelo zezakhiwo ezineminyaka eminingi zikhona ze-National Research Facilities bezilokhu ziyikhathaza iBhodi ye-NRF naBaphathi bayo. Ngokubambisana nabahlukahlukene, i-NRF ne-DST zikwazile ukubhekana nezimo ezibucayi eziphuthumayo ngaphandle kwalezo ezithinta iThemba LABS, lapho imishini esisebenze isikhathi eside iqhubeka iletha inselelo. Onyakeni omusha wezimali, i-NRF izoqhubeka yendlala uhlelo lokuthola umshini omusha we-70 MeV ukuze ulekelele lowo okhona manje we-Separated Sector Cyclotron. Njengoba ukuthengwa kwawo kuzosiza abaningi nokuthuthukisa isimo esibucayi, futhi kuzonikeza umfutho kwezeSayensi nasohlelweni lesikhathi eside kwi- iThemba LABS kanye nalabo abasebenza ngezakhi zenyutliya eNingizimu Afrika nasezwenikazi kabanzi.

Izenzakalo zangemuva kosuku lombiko

Ukudluliselwa okuhlongozwayo kokuba i-NZG ibe ngaphansi kwe-SANBI kusazoqhubeka kunakwe kakhudlwana nangemuva kokuphela konyaka.

Ukuma kwezomnotho

I-NRF iyaqhubeka ngokuba yinhlangano enamandla futhi eqhuba kahle ngokwezezimali.

Amazwi Okubonga/Nokuveza Ukwazisa

Ngithanda ukubonga iBhodi le-NRF ngaphansi kukaSihlalo uProfesa Loyiso Nongxa ngokuhola nokuqondisa kwakhe onyakeni wezimali owedlule. Futhi ngithanda ukuveza ukwazisa nokwesekwa uNgqongqoshe wezeSayensi nezoBuchwephese, uMhlonishwa, uNkosikazi GNM Pandor.

Sidlulisela izwi lokubonga ngokukhethekile kubaholi nabasebenzi be-NRF ngoba ngaphandle kwabo i-NRF ibingeke ikwazi ukufeza umsebenzi wayo. Ngokufanayo, ngithanda ukubonga ozakwethu futhi ngokukhethekile abezemfundo esibakhonzayo futhi abaqhubeka bebamba iqhaza ngesihe besekela i-NRF.

Isiphetho

Lonyaka ungowesibili ekufezweni kwe-NRF Strategy 2020 okuholele ekwandeni ngo-21% enanini lemigomo yomsebenzi efinyelelwe uma kuqhathaniswa nonyaka owedlule. Lokhu kuyibika elihle lekusasa njengoba siqhubeka sizimisela ukuthuthukisa ekufinyeleleni umkhiqizo ohamba kahle ngokuvumelana nemigomo ehlelwe kusengaphambili nokufezekisa uHlelo lweZwe lokuThuthukisa.

Dkt. Molapo Qhobela
Isikhulu Esiyinhloko Sabaqondisi
July 2017

PART A:
STRATEGIC OVERVIEW

1. STRATEGIC OVERVIEW

The National Research Foundation (NRF) was established in 1998 as a Schedule 3A Public Entity through the National Research Foundation Act (Act 23 of 1998). The organisation is mandated to fund research, support the development of high-end human capacity, and provide funding to establish and maintain research infrastructure platforms towards the production of knowledge in priority areas. The NRF has a dedicated mission to promote an informed discourse between science and society through its focus on science engagement. Leveraging on its reputation for excellence and performance, the NRF is able to establish partnerships with both local and international universities, research institutes and industry. These collaborations enable increased knowledge production and exchange, global access to research infrastructure, and the cohesive implementation of national imperatives to improve the quality of life of the people of the Republic of South Africa, with a particular emphasis on responding to the triple challenges of unemployment, poverty and inequality.

1.1 NRF Strategy 2020

The NRF executes its mandate through a strategy and implementation plan that aligns to the legislative mandate. **NRF Strategy 2020** takes cognisance of:

- The National Development Plan (NDP), as articulated through the 14 priority outcomes in the Medium-Term Strategic Framework (MTSF) for 2014–2019;
- National Government's Nine-Point Plan;
- National Government`s triple challenges of unemployment, poverty and inequality;
- Emerging developments in national policy and strategy that potentially impact the execution of the NRF mandate;
- The Department of Science and Technology (DST) strategic objectives, plans and policies aligned to the mandate;
- The Department of Higher Education and Training (DHET) strategic objectives, plans and policies aligned to its mandate; and
- Global goals and strategies (including the UN Sustainability Goals and the Paris Agreement).

1.1.1 NRF vision

The NRF identifies and initiates pertinent and strategic partnerships with role-players within and beyond the National System of Innovation (NSI) to respond to national priorities and international agendas in the interest of benefiting society and ensuring a better life for all the people of the Republic. The NRF vision statement is:

...Catalysing knowledge production for societal benefit.

1.1.2 NRF mission

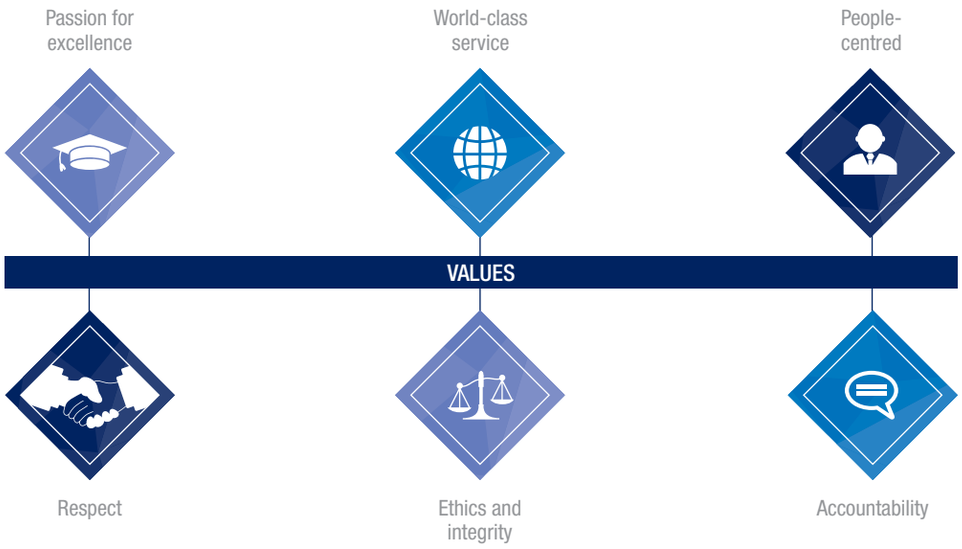
The size of the South African R&D system relative to the global R&D system is very small. The country contributes 0,4% to the global R&D spend, but produced 0,77% of global Web of Science publications in 2016. This represents an increase of 58% over a five-year period. Given the need for the country to significantly increase influence in the global science and technology arena, the organisational mission is:

...To contribute to the knowledge economy in South Africa by attaining at least 1% of the global research and development (R&D) output by 2020.

1.1.3 NRF values

The NRF values underpin the strategic intent of the organisation and inform its approach to delivering on its public mandate. These are based on inclusivity and a tapestry of individual, cultural, and societal values and ethics, and promote strength in diversity, equality, equity, community, and sustainability. The values are cited below in Figure 1 and are built on the foundation of the four core tenets of the NRF: transformation, excellence, sustainability, and service culture.

Figure 1: NRF values



1.1.4 Strategic outcomes and objectives

The NRF is a diverse organisation that leverages the complementarity of its varied and geographically spread business units. The strategic outcomes and objectives have been developed to enable the organisation to contribute to a vibrant and globally competitive NSI. The outcomes are aligned to national strategic priorities as is illustrated through linking each objective to the various MTSF priorities outlined on page 97. By virtue of its mandate, the NRF's objectives integrate seamlessly with the objectives of the DST and are complementary to the objectives of the DHET and other government departments.

The NRF's strategic outcomes are also designed to support the legislative mandate, mission and vision of the organisation. To ensure delivery against the strategic outcomes (and related objectives) over a five-year period, appropriate implementation plans and a suite of indicators have been developed to measure and evaluate incremental progress against predetermined objectives.

Figures 2 and 3 set out the suite of strategic outcomes and objectives, respectively. (The alignment between outcomes and objectives is demonstrated through a system of colours that have been applied throughout this document.)

Figure 2: NRF strategic outcomes

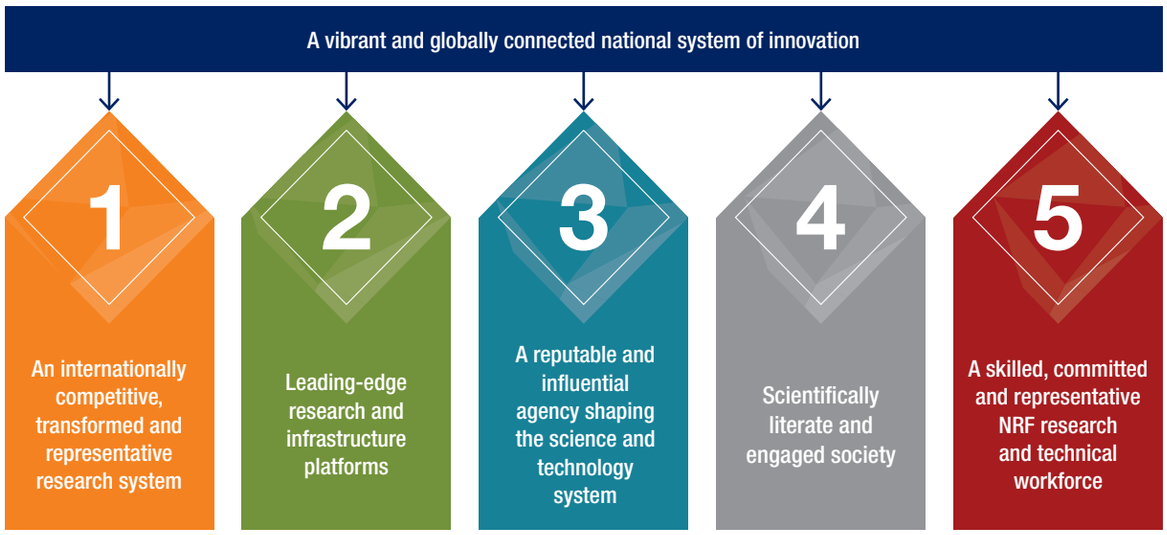
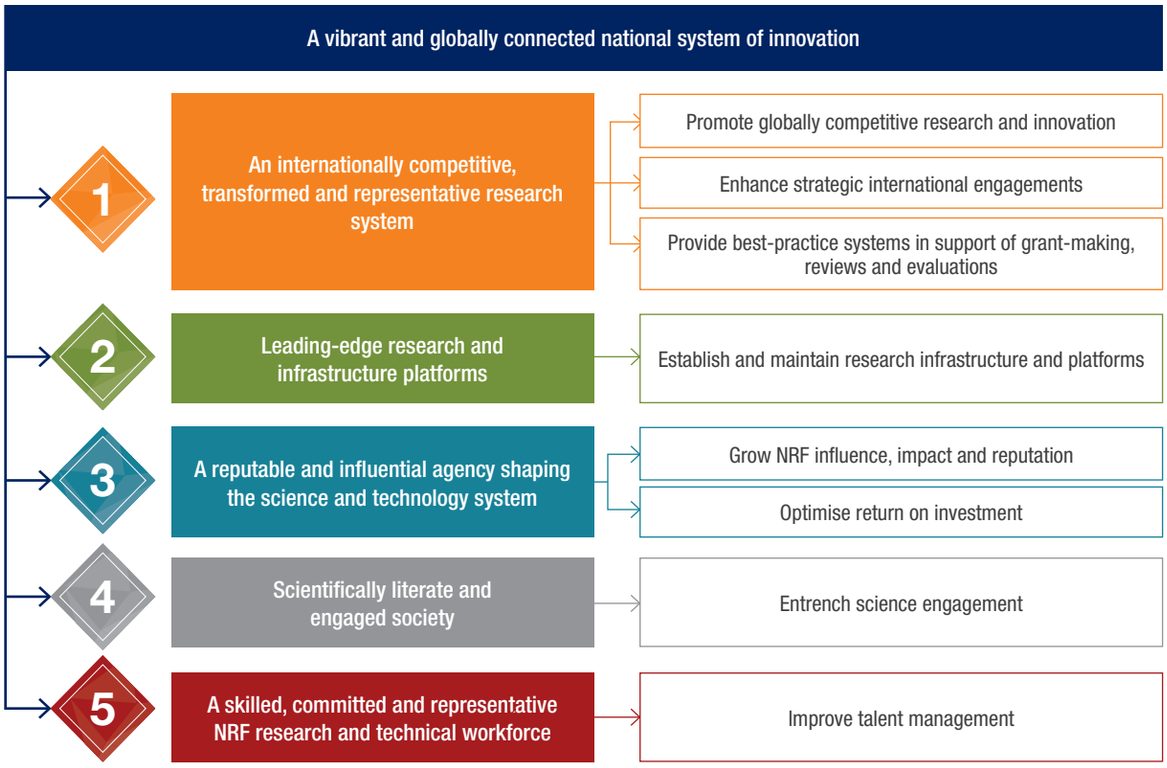


Figure 3: NRF strategic outcomes linked to strategic objectives



2. LEGISLATIVE AND OTHER MANDATES

2.1 Policy environment

The policy environment of the NRF is influenced by applicable national policy and strategies that impact the execution of the mandate.

2.2 Contributors to the NRF mandate

The mandate of the NRF is:

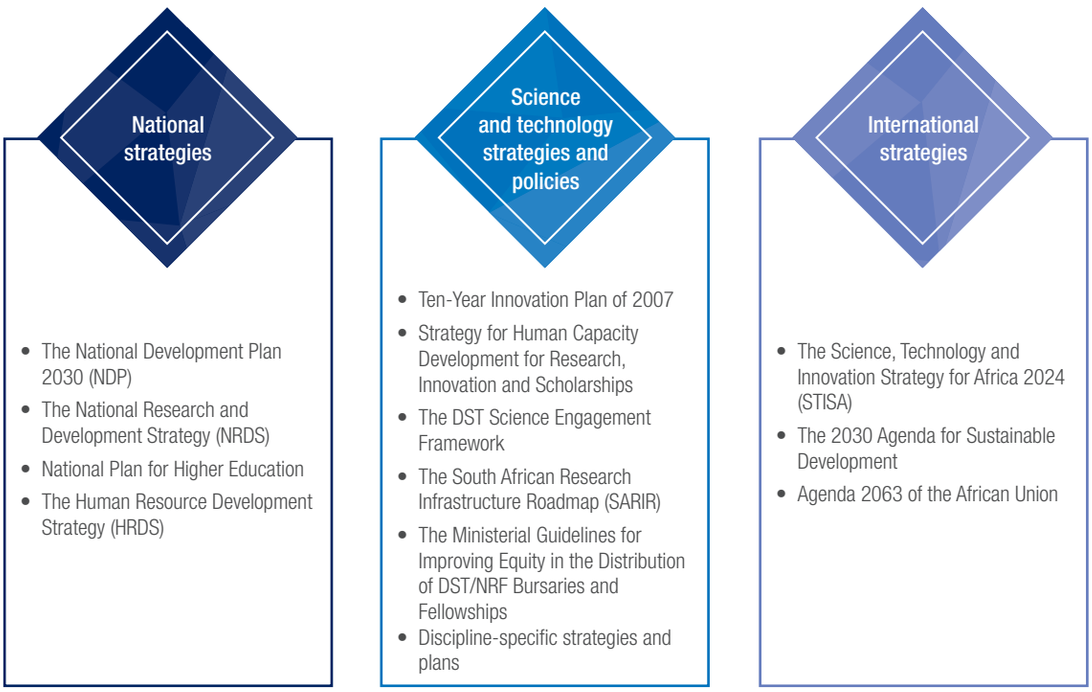
> *"...to support and promote research through funding, human resource development and the provision of the necessary research facilities in order to facilitate the creation of knowledge, innovation and development in all fields of science and technology, including indigenous knowledge and thereby to contribute to the improvement of the quality of life of all the people of the Republic".*

The NRF also supports and promotes awareness of, and engagement with, science to improve science literacy and public participation in science, technology, engineering, mathematics and innovation (STEMI). In executing this mandate, the organisation supports the Constitutional commitment to "improve the quality of life of all citizens and free the potential of each person".

The NRF mandate is contextualised in terms of national priorities as set out in the National Development Plan (NDP) 2030 and the MTSF 2014–2019, as well as applicable strategies and policies of the DST, the DHET and other government departments. Figure 4 is an indication of the policy environment of the NRF. Over and above these factors, the organisation considers shifts in the global research agenda in the pursuit of research excellence with relevance.

The NRF takes cognisance of and responds to national priorities, including the urgent need to reduce poverty, inequality, and unemployment in South African society through knowledge production and human capacity development.

Figure 4: NRF policy environment



2.2.1 National strategies

The National Development Plan (NDP) 2030

The NDP endeavours to "… chart a new course and write a new story" for South Africa. The plan maps a way for the country to eliminate poverty, address inequality, and ensure that all citizens can seize available opportunities. The key role-players in the NSI, namely the DST and the DHET, supported by the NRF, aim to address the challenges by:

- Increasing the number of academic staff with PhD qualifications from 43% to 75%;
- Increasing the number of postgraduate enrolments at higher education institutions (HEIs) from 16% to 25% or more;
- Growing the number of doctoral graduates per annum from 2 000 to 5 000, and in so doing, increase the number of PhDs per million of population from 36 in 2015 to 100 by 2030.

These systemic drivers have been recognised in the strategic plan of the organisation (NRF Strategy 2020), including the inherent requirement for systemic transformation. The alignment to NRF strategic outcomes on page 97 maps the alignment of the NRF's strategic goals and objectives to the 14 priority outcomes set out in the MTSF 2014–2019, as well as the DST's strategic outcomes.

The National Research and Development Strategy (NRDS)

The NRDS articulates the need for a competitive research funding system to be built on international best practice as well as the benefits of and need for knowledge generation and innovation. Human capacity development underpins the strategy, which focuses on transforming the research system through the upliftment of designated groups. The strategy highlights the importance of globally competitive and contextually relevant research outputs in addressing the needs of the country. These are expressed through the geographic and knowledge advantage areas.

National Plan for Higher Education

The National Plan for Higher Education provides an implementation framework for realising the objectives of the White Paper on Science and Technology on transforming the higher education system to meet the social and economic development needs of the country.

The Human Resource Development Strategy (HRDS)

The HRDS recognises the need to implement a systemic strategy for human resource development to address the disparities between wealth and poverty through the institutionalisation of human resource development planning and implementation, as well as the effective monitoring of progress against national targets.

2.2.2 Science and technology strategies and policies

Ten-Year Innovation Plan (2007)

The primary objective of the plan is to drive South African society towards a knowledge economy by using science and technology to enhance economic growth and socio-economic development through the identification of the Grand Challenges, namely astronomy, energy security, global change, and human and social dynamics.

Strategy for Human Capacity Development for Research, Innovation and Scholarships

The strategy identifies a set of interconnected objectives that aim to significantly increase national human research capacity in research and innovation.

The DST Science Engagement Framework

This framework provides an overarching strategic context to advance science engagement in South Africa. The framework is intended to encourage and improve the coordination of science promotion, communication and engagement activities across the DST public entities, universities, other government departments, science councils, museums, and partners outside the public sector.

The South African Research Infrastructure Roadmap (SARIR)

The SARIR provides a strategic, medium- to long-term framework for planning, implementing, monitoring and evaluating the provision of research infrastructure necessary for a competitive and sustainable NSI. The roadmap also creates a basis for the discourse around the financing of future large-scale research infrastructure investments in South Africa, and for the participation in joint international projects.

2.2.3 International strategies

The Science, Technology and Innovation Strategy for Africa (STISA) 2024

This African Union strategy aims to achieve continental growth, sustainable development, and social integration by drawing on the potential of African people, especially women and youth, for its delivery. STISA specifically supports Agenda 2063, which serves the vision and strategy for the African continent.

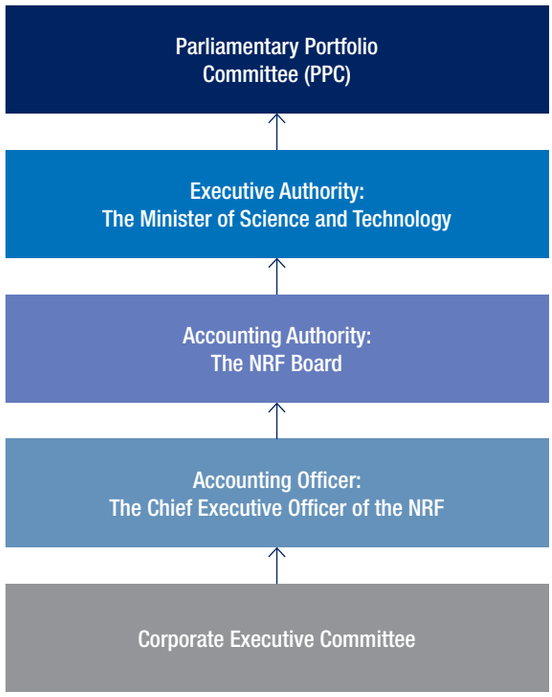
2.2.4 Accountability structure

As a public entity, the NRF functions within the parameters set out by relevant legislation. The NRF is committed to entrenching a culture of transparency, ethical behaviour, and accountability, thereby enhancing stakeholder assurance.

The accountability structures of the NRF include systems through which the organisation is directed, managed and held accountable. These systems are determined by legislative requirements emanating from the NRF Act, the Public Finance Management Act (PFMA), and the Companies Act (Act 71 of 2008) as applicable. In addition, the NRF subscribes to the requirements of the King Report on Corporate Governance for South Africa. The enhanced principles of good governance introduced by King (IV) will be considered over the next financial year.

Parliament, through the Parliamentary Portfolio Committee (PPC) on Science and Technology, maintains high-level oversight of the entity, while the Executive Authority (the Minister of Science and Technology) and the Accounting Authority of the NRF (the NRF Board) are accountable for the entity.

Figure 5: Accountability structure of the NRF



3. ORGANISATIONAL STRUCTURE

The programmes of the NRF separately and collectively enable the execution of the NRF mandate. Through the Corporate Programme (Programme 1) the organisation benefits from an enabling governance structure and shared services including centralised business systems. Programme 2 is an externally focused division that directs and coordinates science engagement, communication and education. Through the Research and Innovation Support and Advancement (RISA) division (Programme 3) the NRF supports research, the development of human capacity, generation of knowledge, and infrastructure provisioning within the NSI. The National Research Facilities and the SKA-SA project (Programmes 4 and 5) perform research and innovate in priority areas through a critical mass of unique skills, cutting-edge research platforms and users in its respective disciplines. The organisational structure is shown in Figure 6.

3.1 Programme 1 – Corporate Programme

The Corporate Programme provides the organisation with an enabling governance structure and shared services through fit-for-purpose business systems, policies and procedures. Although not reflected in the graphic, the internal audit unit of the NRF reports functionally to the Chairman of the Audit and Risk Committee and administratively to the CEO.

3.2 Programme 2 – Science Engagement

Science Engagement is an externally focused division that directs and coordinates the discourse on science in society. Through the science engagement, communication and education initiatives, Programme 2 supports the national imperative of developing a knowledge economy.

3.3 Programme 3 – Research and Innovation Support and Advancement (RISA)

RISA is a key contributor to the achievement of the NRF mandate as the grant-making function of the organisation. The division supports and promotes research through the development of human capacity, the generation of knowledge, and the provision of and access to cutting-edge research infrastructure.

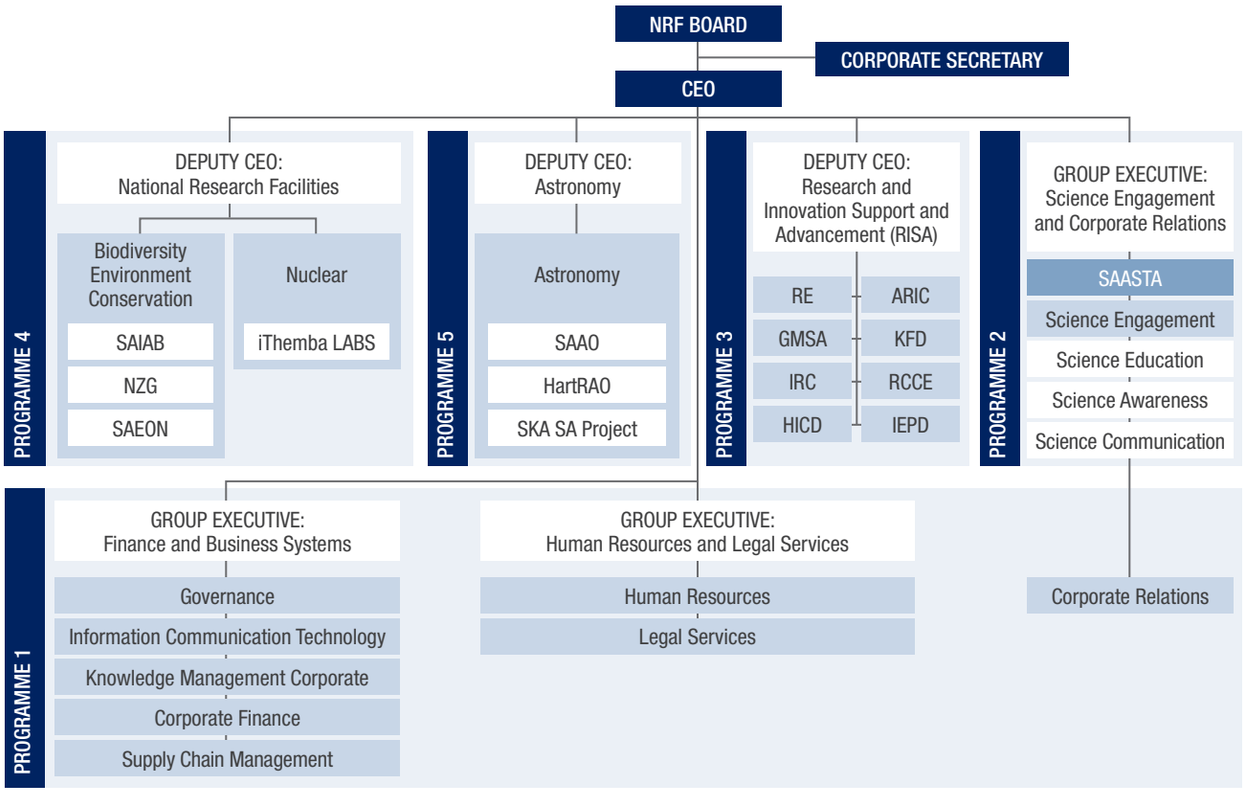
3.4 Programme 4 – National Research Facilities (Excluding Astronomy)

The National Research Facilities of Programme 4 are uniquely positioned to contribute to the objectives of the NSI through knowledge production and the provision of platforms for unique technologies in support of domain-specific research and development. These National Research Facilities provide a critical mass of equipment, skills and users and are well positioned to attract international collaboration in the areas of biodiversity, conservation and nuclear sciences.

3.5 Programme 5 – National Research Facilities (Including SKA)

The National Research Facilities and the SKA SA project of Programme 5 are uniquely positioned to enhance the NSI through knowledge production as well as the provision of platforms for unique technologies in support of domain-specific research and development. These business units provide a critical mass of equipment, skills and users.

Figure 6: NRF organisational structure per programme[1]



For explanations of acronyms, please refer to the list of acronyms on page 191.

1 During the 2016/17 financial year a new organisational structure was proposed and approved through the Annual Performance Plan 2017/18-2019/20. The new structure came into effect on 1 April 2017.

4. FINANCIAL OVERVIEW

A detailed statement of the NRF's financial position is provided in the annual financial statements for the 2016/17 financial year. The section below provides a brief analytical overview.

4.1 Income sources

The NRF has three primary income streams, and one minor source of income, as follows:

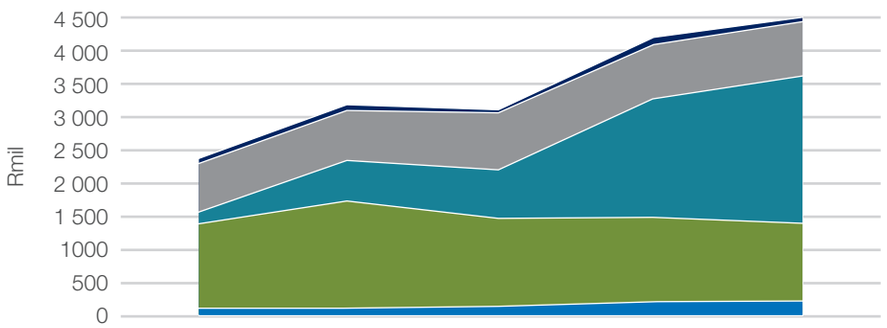
- **Parliamentary grant:** The MTEF parliamentary grant is utilised primarily to fund the programmes and operational activities of the NRF;
- **Ring-fenced funding:** Ring-fenced funding is received from the DST to fund specific projects, and thus funding can only be utilised for such projects;
- **Designated income:** Designated income represents income for specific contract funding. Such funds can only be utilised according to objectives laid down by the respective sponsors through formal contractual agreements; and
- **Other income:** It is represented by interest received on funds invested and trading income for non-core business activities.

Overall, the NRF ended the year with an increase of 8% in income from R4 163m in 2015/16, to R4 501m in 2016/17. Details of the income trends are highlighted in Figure 7.

Income trend

The Parliamentary Grant increased marginally by 0.5% in 2016/17, which was well below inflation (6.6%). Ring-fenced funding increased from R 1,736m in 2015/16 to R 2,178 million in 2016/17. This nominal increase of 25% represents an 18.4% increase in real terms and is as a result of the increased carry forward of funding from the 2015/16 to the 2016/17 financial years. This was related to the SKA project and the SA Research Chairs Initiative. Designated income decreased marginally, by 6.7%, in nominal terms. This is a 13.3% decrease in real terms and was due to the temporary withdrawal of THRIP in the 2016/17 financial year. Other income decreased by 8% in nominal term, which was a 14.6% decrease in real terms. This was mainly as a result of the non-recurring insurance recovery pay-out related to the fire that took place at iThemba LABS in the prior year.

Figure 7: NRF income trend

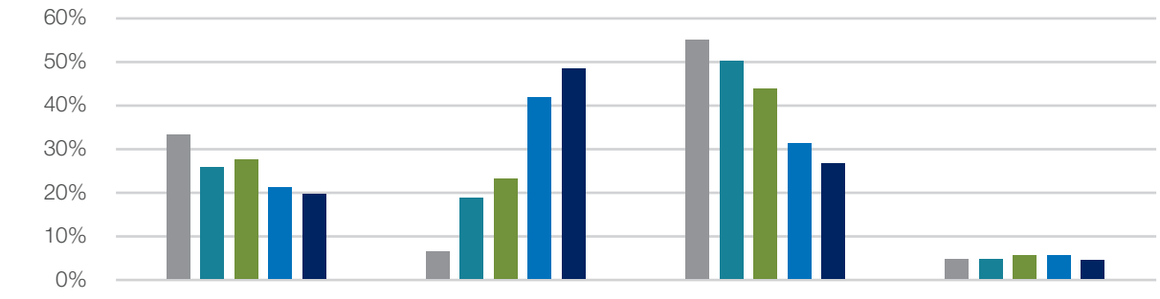


	2013	2014	2015	2016	2017
Parliamentary grant	765,573	816,203	851,286	878,399	882,805
Ring-fenced funding	152,717	596,676	717,470	1,735,687	2,177,930
Designated income	1,270,027	1,593,721	1,352,120	1,305,988	1,218,254
Other income	123,739	153,936	176,787	242,518	222,131
Total income	2,312,056	3,160,536	3,097,663	4,162,592	4,501,120

Income ratios

The income ratios presented in Figure 8 reflect a declining trend in the core Parliamentary grant, while the ring-fenced funds have been increasing over time due to the transfer of certain contracts. Those were previously transferred to the NRF as designated funds, and are now included under the ring-fenced allocation by the DST.

Figure 8: NRF income ratios



	Parliamentary grant to total income	Ring-fenced funding to total income	Designated income to total income	Other income to total income
2013	33%	7%	55%	5%
2014	26%	19%	50%	5%
2015	27%	23%	44%	6%
2016	21%	42%	31%	6%
2017	20%	48%	27%	5%

Income per business unit

The total income per business unit is shown in Table 1.

Table 1: Income per business unit

Programme	Business division	2015/16 R'000	2016/17 R'000
1	Corporate Support	191,618	159,660
2	South African Agency for Science and Technology Advancement	95,945	90,853
3	Research and Innovation Support and Advancement, and THRIP	2,695,461	2,835,176
4	iThemba Laboratory for Accelerator Based Sciences	248,701	240,492
4	South African Institute for Aquatic Biodiversity	35,084	30,921
4	South African Environmental Observation Network	35,940	35,802
4	National Zoological Gardens of South Africa	120,293	119,151
5	South African Astronomical Observatory	83,029	85,029
5	Hartebeesthoek Radio Astronomy Observatory	29,058	28,694
5	Square Kilometre Array project	627,463	875,342
	Total	**4,162,592**	**4,501,120**

4.2 Expenditure

Expenditure trend

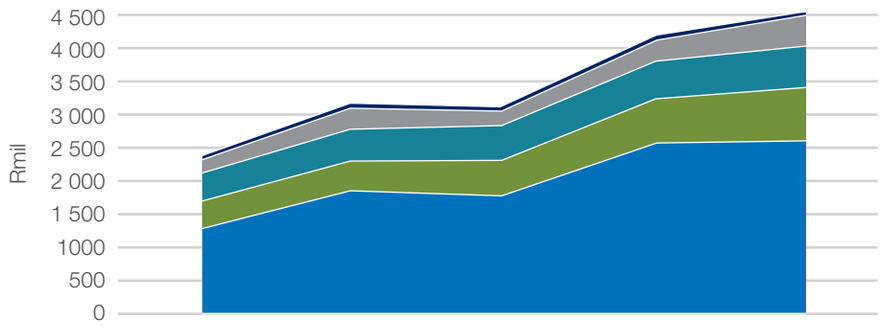
The NRF income and expenditure trends (depicted in Figure 9) are largely mirrored. The increase of 9% in total expenditure from R4 145m in 2015/16 to R4 514m in 2016/17, is mainly attributable to increased capital and operating expenditure in the SKA project. Capital expenditure increased due to the roll out of the MeerKAT dishes, whereas operating expenditure includes a large investment in the sealing of the road in Carnarvon.

The increased research funding expenditure (reduced by other programmes) of 1.7%, is mainly related to the following programmes:

- The SA Research Chairs Initiative (R57m);
- Scarce Skills (R120m).

The increase in employee remuneration is attributed to the general salary increase.

Figure 9: Major expenditure trends per category of expense



	2013	2014	2015	2016	2017
Net capital expenditure	192,333	365,867	238,079	344,500	501,421
Employees' remuneration	434,752	473,744	532,170	577,904	627,096
Programme, operating and other expenditure	403,511	434,837	512,665	666,001	786,203
Grants and bursaries	1,282,177	1,863,232	1,788,421	2,556,223	2,599,677
Total expenditure	2,312,773	3,137,680	3,071,335	4,144,628	4,514,397

Expenditure per business unit

The expenditure (including capital expenditure) per NRF business division is presented in Table 2.

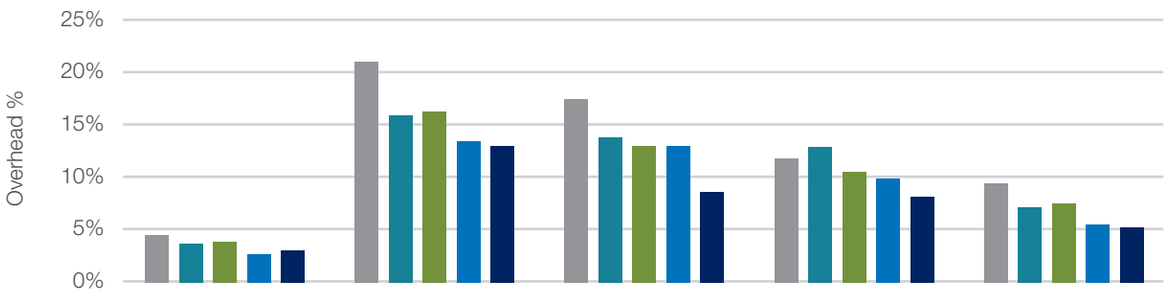
Table 2: Expenditure per business unit

Programme	Business division	2015/16 R'000	2016/17 R'000
1	Corporate Support	145,122	100,716
2	South African Agency for Science and Technology Advancement	98,781	98,599
3	Research and Innovation Support and Advancement, and THRIP	2,639,546	2,678,677
4	iThemba Laboratory for Accelerator Based Sciences	263,378	325,035
4	South African Institute for Aquatic Biodiversity	42,976	49,147
4	National Zoological Gardens of South Africa	123,989	142,159
4	South African Environmental Observation Network	54,795	55,917
5	South African Astronomical Observatory	122,357	124,190
5	Hartebeesthoek Radio Astronomy Observatory	34,193	68,103
5	Square Kilometre Array project	619,490	871,854
	Total expenditure	**4,144,627**	**4,514,397**

Overhead expenditure

The focus on cost-cutting due to economic pressures, has placed greater emphasis on the management of overheads with overheads remaining well below 10%. This is evident from the decrease in the overheads from 5.5% to 5.3%. This figure, on a multi-year basis, remains well within innovative system-type international benchmarks for organisations at a similar level of development. The overhead ratio is reflected in Figure 10.

Figure 10: NRF overhead ratio



	RISA	National Facilities	SAASTA	Special projects	Total NRF
2013	4.5%	20.9%	17.4%	11.8%	9.4%
2014	3.7%	15.8%	13.8%	12.9%	7.2%
2015	4.0%	16.2%	12.9%	10.6%	7.5%
2016	2.8%	13.4%	12.9%	9.9%	5.5%
2017	3.1%	13.0%	8.6%	8.2%	5.3%

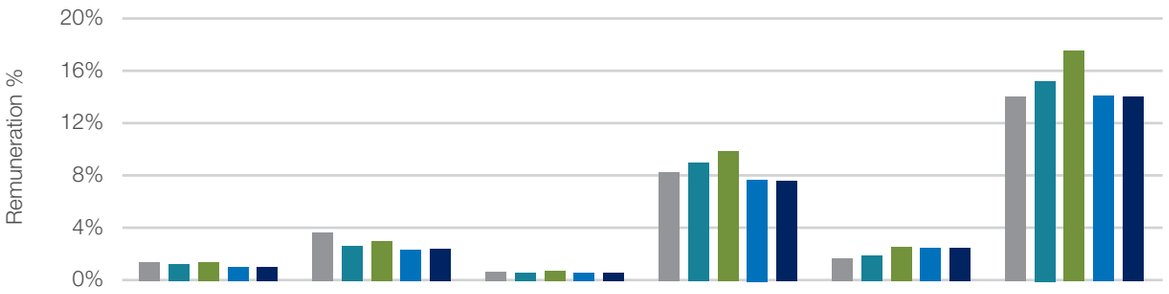
**Included in the above distribution is the corporate overhead of 1.4%.

Remuneration expenditure

The NRF's highly technical and unique world-class infrastructure necessitates labour-intensive infrastructure programmes, which infrastructure acts as a catalyst within the National System of Innovation. The numerous initiatives aimed at enhancing development necessitate a baseline specialist human resource capacity, which is insourced in line with strategic sourcing to promote cost-effectiveness.

The ratio of remuneration to total expenditure of the NRF remains below 20% against the benchmark set by the NRF Board of 22%. The ratio of each programme is in line with the level of operational activity performed by each programme. The National Research Facilities have the highest ratio of remuneration expenditure due to the labour-intensive, and insourced modalities, required to develop and maintain research infrastructure platforms used by both local and international researchers. The ratio of remuneration to total expenditure per entity segments is disclosed in Figure 11.

Figure 11: Remuneration expenditure

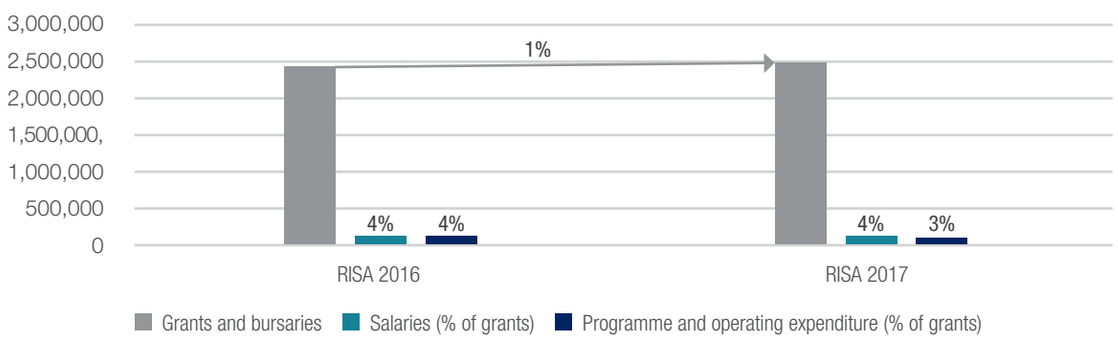


	Corporate	RISA	SAASTA	National Facilities (excl. SKA)	SKA	Total NRF
2013	1.4%	3.6%	0.6%	8.1%	1.6%	13.9%
2014	1.2%	2.6%	0.6%	8.9%	1.8%	15.1%
2015	1.3%	3.0%	0.7%	9.8%	2.5%	17.3%
2016	1.0%	2.0%	1.0%	8.0%	2.0%	14.0%
2017	1.0%	2.4%	0.5%	7.5%	2.4%	13.9%

Grant expenditure

Approximately 96% of grant expenditure of the NRF is managed by RISA (Figure 12). Within RISA, research funding expenditure remained stable with only a 1.2% increase, compared to 2015/16. Programme and operating expenditure decreased by 2%, whilst salaries increased by 14%. Salaries include the annual inflationary adjustment as well as the filling of vacancies from the prior year. Despite these shifts, RISA has managed to contain salaries and operating expenditure to 8% of total grants and bursaries expenditure.

Figure 12: RISA expenditure



4.3 NRF five-year financial trend

The five-year financial review as at 31 March 2017 provides a summary of financial trends for the period between 2011/12 and 2016/17 (refer Table 3).

Table 3: NRF five-year financial trend

Financial indicators	2013 R'000	2014 R'000	2015 R'000	2016 R'000	2017 R'000
Income and expenditure					
Total income	2,312,056	3,160,536	3,097,663	4,162,592	**4,501,120**
Total expenditure	2,312,773	3,137,680	3,071,335	4,144,628	**4,514,397**
Statement of financial position					
Current assets	1,302,336	1,283,449	1,970,808	2,143,119	**1,998,576**
Current liabilities	1,444,239	1,396,432	1,969,808	2,094,018	**1,941,962**
Total assets	2,237,371	2,590,803	3,424,700	3,910,582	**4,246,710**
Ratio analysis					
Current ratio	0.90	0.92	1.00	1.02	**1.03**
Employees					
Number of permanent employees	1 236	1 301	1 389	1 404	**1 444**

Square Kilometre Array South Africa Project trial balance

The SKA-SA project is managed as a special project of the NRF, on behalf of the DST, and is of international strategic scientific importance. The South African SKA pathfinder project includes the construction of the KAT7 prototype telescope array (seven antennas) and the MeerKAT radio telescope (64 antennas) in the Karoo. Once operating, MeerKAT will be the largest radio telescope in the world for many years. The abridged financial information extracted from the SKA project trial balance, as requested by National Treasury, is shown in Table 4.

Table 4: SKA-SA trial balance

Account description	2016 R'000	2017 R'000
Income	**627,462**	**875,342**
Designated income/parliamentary grant	585,804	823,041
Sales of goods and services	68	456
Interest received	41,414	48,742
Gains on disposal of assets	-	-
Other income	177	3,103
Expenditure	**398,860**	**507,230**
Employees' remuneration	100,523	108,488
Accommodation	15,279	16,497
Audit fees	-	550
Books and journals	974	511
Computer requisites	5,081	6,866
Conferences	2,966	3,000
Depreciation	41,100	65,319
Fees for services	52,385	63,961
Grants and bursaries	48,975	47,851
Insurance and licences	1,710	2,787

Account description	2016 R'000	2017 R'000
Lease charges	-	-
Loss on disposal of assets	323	384
Marketing	817	2,829
Medical	-	8
Printing and stationery	2,004	2,666
Purchases	6,384	9,202
Recruitment	907	792
Training	2,448	4,961
Refreshments (conferences and workshops)	609	923
Repairs and maintenance	72,016	134,956
Security	2,584	2,765
Stock	-	-
Travel (staff and non-staff)	20,125	20,862
Telephone and postage	1,992	2,364
Other expenses	19,658	8,689
Assets	**1,880,573**	**2,087,984**
Advances for capitalisation process	130,116	185,354
Cash and cash equivalents	579,806	368,739
Property and equipment	1,170,651	1,533,892
Cost	1,291,082	1,720,293
Buildings	68,520	209,733
Land	16,547	33,061
IT equipment	18,122	36,613
Infrastructure	326,916	272,803
Office furniture	3,339	3,502
Office equipment	6,481	7,014
Machinery and equipment	16,726	27,859
Motor vehicles	17,095	18,409
Research equipment	106,342	375,095
Capital work in progress	710,996	736,204
Accumulated depreciation	(120,431)	(186,401)
Buildings	(9,932)	(21,631)
IT equipment	(7,935)	(13,306)
Infrastructure	(27,088)	(35,974)
Office furniture	(1,188)	(1,538)
Office equipment	(3,797)	(4,633)
Machinery and equipment	(5,284)	(7,259)
Motor vehicles	(8,176)	(10,501)
Research equipment	(57,029)	(91,559)
Capital		
Capital fund (assets)	1,170,651	1,533,892
Liabilities	**709,922**	**554,092**
Trade and other payables	18,419	38,799
Designated income received in advance	669,447	499,487
Department of Science and Technology	562,387	410,009
African VLBI Network (AVN)	107,060	89,478
Accrued grants	1,036	1,680
Provision leave, bonus and savings scheme	20,807	13,956
Finance lease	213	170

PART B:
PERFORMANCE

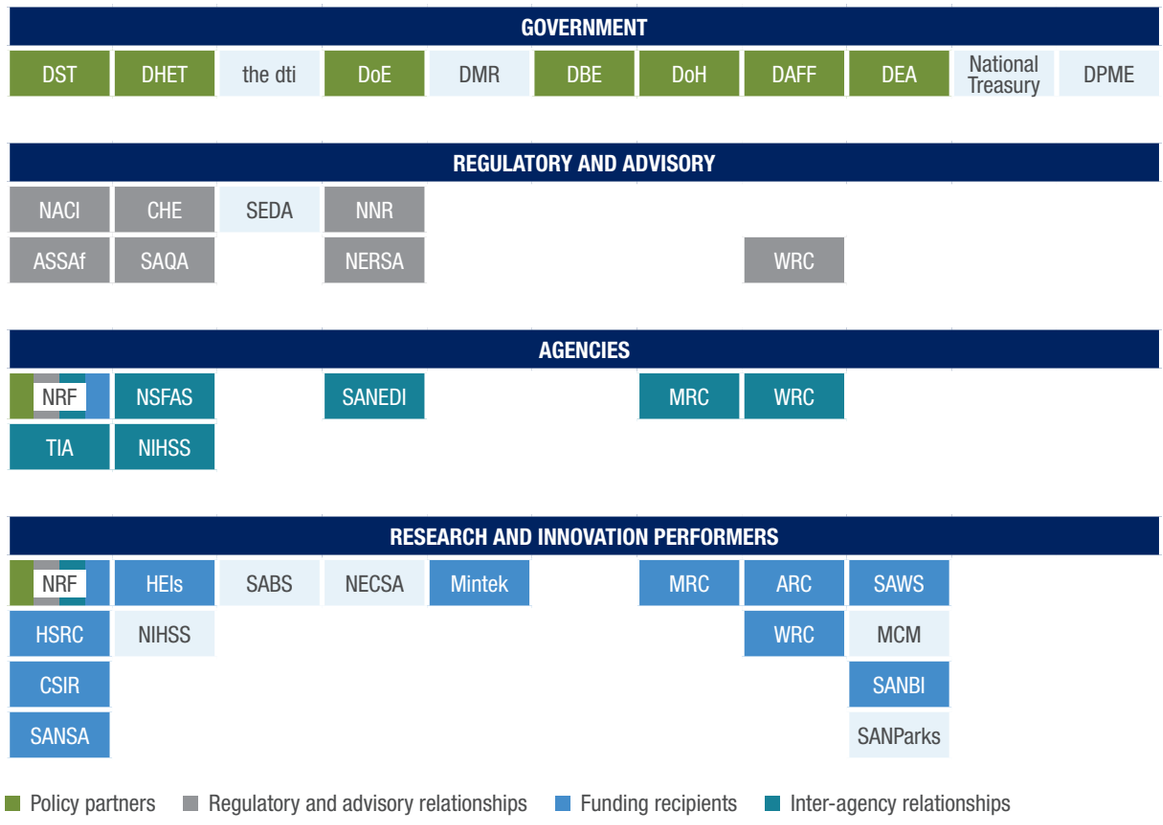
5. OVERVIEW OF NRF PERFORMANCE

5.1 Service delivery environment and strategic partners

The NRF as an agency of government provides a world-class granting system in support of postgraduate human capacity development, cutting-edge research and the provision of access to competitive research infrastructure. The NRF also acts as a research performer through the National Research Facilities of Programmes 4 and 5. Figure 13 maps the NSI and attempts to identify and position the key proponents within the system.

The NRF discharges its mandate in alignment with the objectives of the DST. Other strategic partners include the DHET, the Department of Trade and Industry (**the dti**) and the science councils. The organisation also works closely with the broader stakeholders of the NSI, including the National Student Financial Aid Scheme, the Council on Higher Education, the Human Sciences Research Council, the National Advisory Council on Innovation, and others. Moreover, the organisation actively engages with the public and has fostered long-standing relationships with museums, professional associations, and key local private-sector partners as well as international and multi-national organisations.

Figure 13: The NRF in the public research and development system (based on the Organisation for Economic Corporation and Development [OECD] map)



5.2 Performance overview

The NRF's performance is detailed per programme in sections 7–12 in this report. Over the reporting period, the NRF supported:

- 4 936 Honours students;
- 4 995 Master's students;
- 3 363 Doctoral students; and
- 4 520 Researchers.

In addition to executing its mandate, the organisation responded to the impending amendments to the NRF Act as well as the NRF review recommendation. This resulted in a reorganisation of the NRF operational structure to ensure efficient delivery of services and maximised return on investment.

5.3 Challenges

5.3.1 Financial and operational sustainability

The current global economic environment has negatively impacted South Africa. Financial constraints have affected the public sector and specifically the investment in R&D. The year-on-year decline of the Parliamentary grant in real terms has necessitated the use of austerity measures to mitigate the operational and financial sustainability risks to the organisation. While this has allowed the organisation to continue to deliver on its mandate, it is noted that further austerity measures will start to negatively impact the organisation's performance going forward. In response to the inherent risk to financial sustainability, management is working on a resource allocation framework and policy that will be supported by evidence-based models. This will allow the organisation the ability to choose an investment strategy with the highest possible yield. In this way, the NRF aims to improve long-term sustainable impact.

5.3.2 Ageing research infrastructure

The risk of ageing infrastructure is pervasive among the National Research Facilities. Specifically, the 30-year-old separated-sector cyclotron (SSC) at iThemba LABS has been identified as a major strategic risk to the future sustainability of the facility. Unscheduled downtime has been increasing year-on-year as a consequence of oversubscription, where accelerated ageing through extended use, is currently outpacing the preventative maintenance protocols. In the absence of an infrastructure renewal plan, a serious mechanical failure of the SSC will have a catastrophic impact on the research agenda as well as the training and development of the next generation of scientists and nuclear professionals in the NSI.

As a product of the long-range planning initiative at iThemba LABS, the organisation has developed a strategy to continue to support globally competitive research through addressing the risk of ageing infrastructure. The infrastructure renewal project will be executed through the acquisition of a 70MEV cyclotron. The NRF Board endorsed the project proposal during the reporting period and the drive to secure funding is underway.

5.3.3 Student unrest

During the 2016/17 financial year students at universities across the country disrupted activities in protest against the payment of fees. As a result, university offices were forced to close for periods during the latter half of the 2016 academic year. The NRF and the system will be impacted through extended completion rates, a delay in research projects due to access challenges, and the late application for and uptake of grants.

5.4 Organisational environment

5.4.1 The NRF amendment bill

The NRF Act is currently being amended. The draft Amendment Bill proposes enhancements to the current mandate of the organisation by specifically delineating the objective of the foundation as follows:

- Supporting and promoting research through funding, representative human capital development and the provision of the necessary research infrastructure to facilitate the creation of knowledge, innovation, and development in all fields of science and technology, including the humanities, social sciences and indigenous knowledge;
- Supporting and maintaining National Research Facilities;
- Supporting and promoting public awareness of and engagement with science; and
- Promoting the development and maintenance of the national science system and the support of government priorities.

In response to the impending amendments to the NRF Act, management initiated a reorganisation of the NRF operational structure to ensure efficient and effective delivery against objectives, and maximised return on investment.

The amendments aim to confirm the NRF as a change agent with an enhanced strategic role within the NSI. The NRF conceptualised a new division for Strategy, Planning and Partnerships. The new 'fit for purpose' structure of the

NRF consolidates the National Research Facilities under one programme. RISA will also be reorganised for optimal service delivery and preparations are being made to enable SAASTA to play a greater role in line with the science engagement framework.

5.4.2 Significant developments

During the reporting period the Minister of Science and Technology declared the establishment of a new National Research Facility for radio astronomy. The new Radio Astronomy National Research Facility will merge HartRAO and the SKA SA project.

The South African Research Infrastructure Roadmap (SARIR) was approved and launched during the year and the South African Environmental Observation Network (SAEON) was appointed to host two SARIR projects, namely:

- The Expanded Terrestrial and Freshwater Environmental Observation Network, which will provide impetus to SAEON's eco-hydrological research.
- The Shallow Marine and Coastal Research Infrastructure Programme (SMCRI), which aims to enhance ecosystem-wide multidisciplinary research.

The Phakisa vessel was launched by the South African Institute for Aquatic Biodiversity (SAIAB). Through SARIR, the facility is set to receive another vessel to support the Shallow Marine and Coastal Research Infrastructure Programme (SMCRI).

5.4.3 Key policy developments and legislative changes

The National Zoological Gardens (NZG) was officially transferred to the custodianship of the South African National Biodiversity Institute (SANBI) on 1 April 2017. The respective parties have signed a 'phased transfer' agreement in support of the migration of the NZG from the NRF to SANBI.

5.5 Performance against strategic outcome-oriented goals

In contributing to the long-term goal of *"an internationally competitive and transformed science and technology workforce"*, RISA has provided postgraduate funding support to 10 747 black students (76%) and 8 017 female students (57%). In total, 4 995 master's and 3 363 PhD students were supported.

For the year in review, a total of 35% (1 563) of researchers supported were black, and 38% (1 699) were female. A total of 970 (26%) black and 1 176 (32%) female researchers were rated. In terms of providing *"World-class benchmarking and grant-making systems"*, RISA expensed R2,6 billion in grant funding to institutions and has administered 8 210 applications through the peer-review process.

Strategic investments, including the South African Research Chairs Initiative (SARChI) and Centres of Excellence (CoEs) amounted to a third (R682m) of the investment in human capacity development (HCD). The NRF also established Communities of Practice (CoPs) with the chair holders to ensure socially beneficial research outputs.

Towards the goal of providing *"Leading-edge research and infrastructure platforms"*, the organisation invested R217 million in research infrastructure grants to the universities through the National Equipment Programme (NEP) and the National Nanotechnology Equipment Programme (NNEP). The NRF contributed to the provision of infrastructure platforms by investing a further R760 million in the National Research Facilities, including the SKA SA project. The National Research Facilities produced 462 ISI-accredited publications over the year and maintained an annual cumulative citation impact of 1.33. The facilities, including SKA SA, also supervised 666 postgraduate students.

The number of international co-publications over the year was 9 392 against a target of 7 800.

In the pursuit of the goal of a *"Scientifically literate and engaged society"*, the organisation invested R106 million in science engagement activities. Through various initiatives across the country, the organisation trained 17 997 educators and engaged with 374 457 learners. A total of 1 084 760 members of the public participated in various science engagement activities over the reporting period.

As an organisation committed to institutional transformation, and in pursuit of the goal of creating *"A representative research and technical workforce"*, the NRF increased the number of black and female technical staff from designated groups in senior technical and managerial positions. In these categories, the organisation achieved black representivity at 46% against a target of 47%, and female representivity at 32% against a target of 35%. The organisation spent a total of R627 million on salaries for the period under review, which is 14% of total expenditure.

6. NRF RESPONSE TO STRATEGIES AND PLANS

6.1 Value of the NRF to the NSI

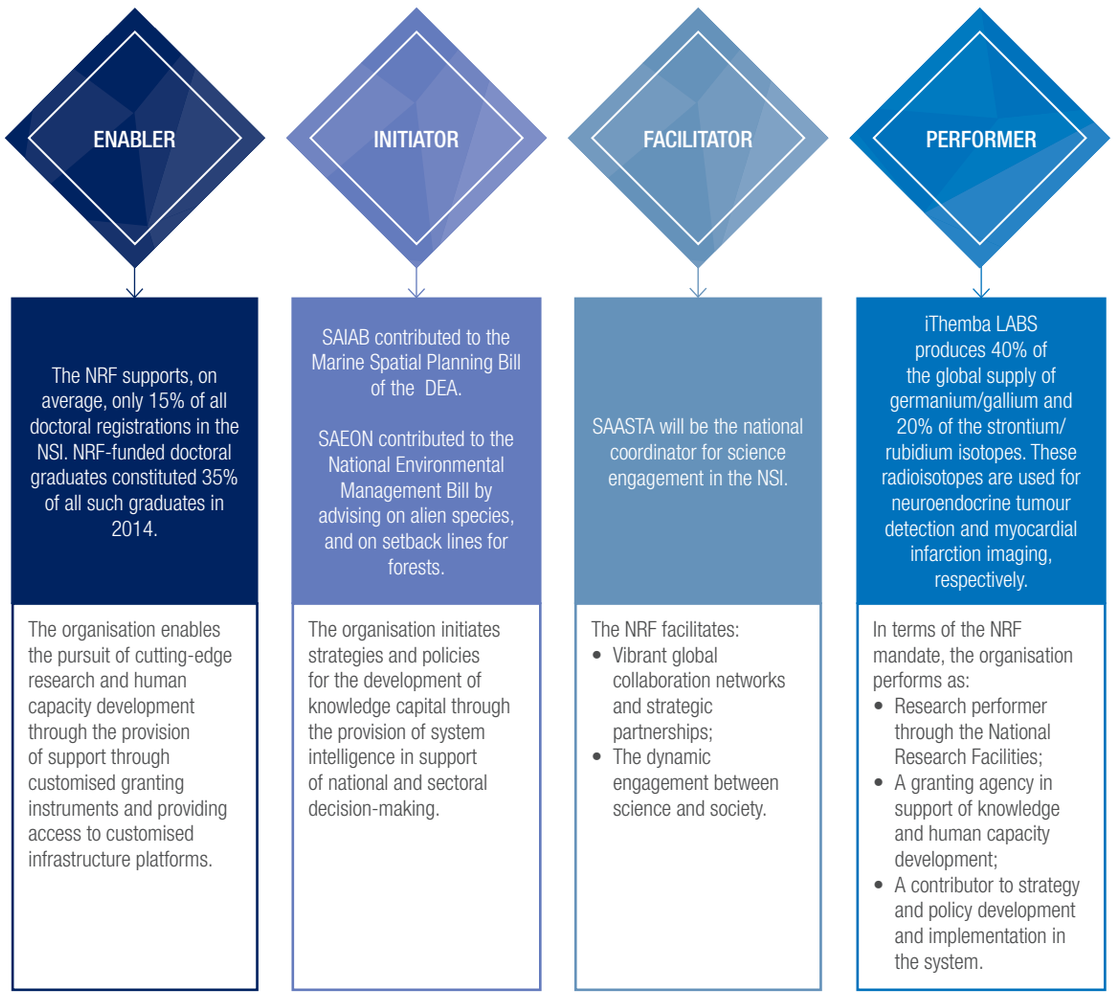
The NRF value proposition is underpinned by its contribution to the NSI in the roles of enabler, initiator, facilitator and performer, as reflected in Figure 14.

The NRF delivers on its mandate as a single cohesive organisation in strategy and operation, and actively collaborates and coordinates with local and international public and private partners. The NDP has identified the doctoral degree as a fundamental component of the knowledge enterprise. To this end, the university system produced 2 530 doctorates in 2015, which reflects a 113% increase in the number of doctoral graduates produced over the 10-year period from 2005 to 2015.

The NSI's productivity with respect to research outputs has been increasing at a steady rate. Currently, South Africa contributes 0,77% (20 066 Web of Science publications) to the global R&D outputs. NRF-funded researchers contributed to 41% (8 156 Web of Science publications) of the total South African R&D outputs.

Research at the National Research Facilities continued to have a positive impact on the national policy environment. SAIAB contributed to the Oceans and Coasts section of the draft Marine Spatial Planning Bill of the Department of Environmental Affairs (DEA). SAEON contributed to the National Environmental Management Bill by advising on alien species, and on setback lines for forests.

Figure 14: NRF value proposition

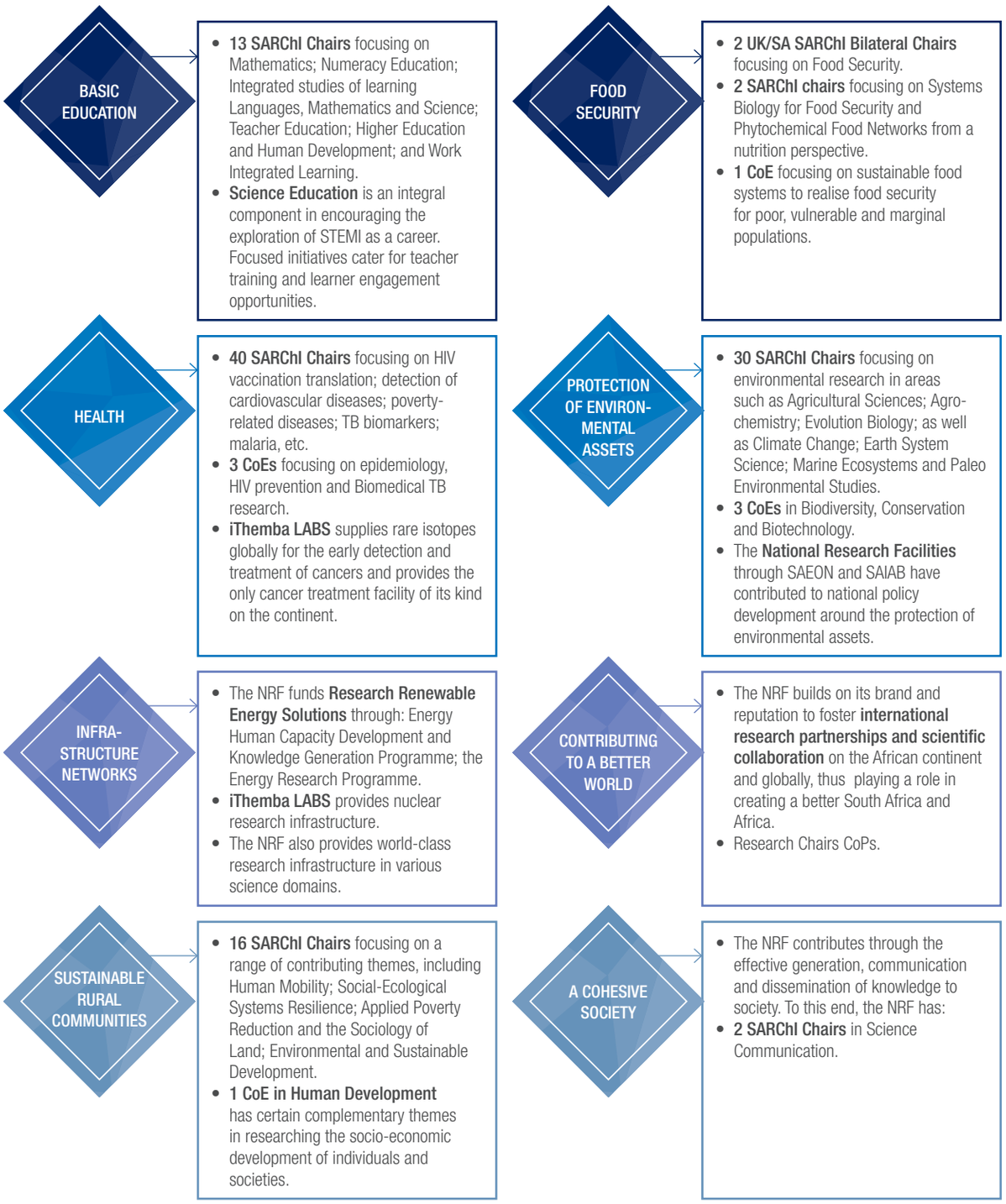


iThemba LABS has developed a global reputation for the development and production of unique radioisotopes. This National Facility contributes significantly to the global supply of germanium/gallium and strontium/rubidium isotopes. These radioisotopes are used for neuroendocrine tumour detection and myocardial infarction imaging, respectively.

6.2 Performance against National Imperatives

The NRF responds to the priorities and strategies of government through supporting research, human capacity development, and platform provisioning in all knowledge fields. In this way the organisation attempts to indirectly impact the triple challenges of government.

Figure 15: National Development Plan (NDP)



6.2.1 Ten-Year Innovation Plan (TYIP)

The TYIP was developed with the purpose of using science and technology to enhance socio-economic development. The plan identifies five grand challenges, which are bio-economy; energy security; global change; human and social dynamics; and astronomy. The key principles of the plan are to:

- Support strategic decision-making to enable government to make informed decisions;
- Pursue competitive advantage, ensuring that investment is made in areas with the highest return;
- Create critical mass, entailing an investment strategy that supports the creation of critical mass in high-yield areas; and
- Scale up sustainable research and development.

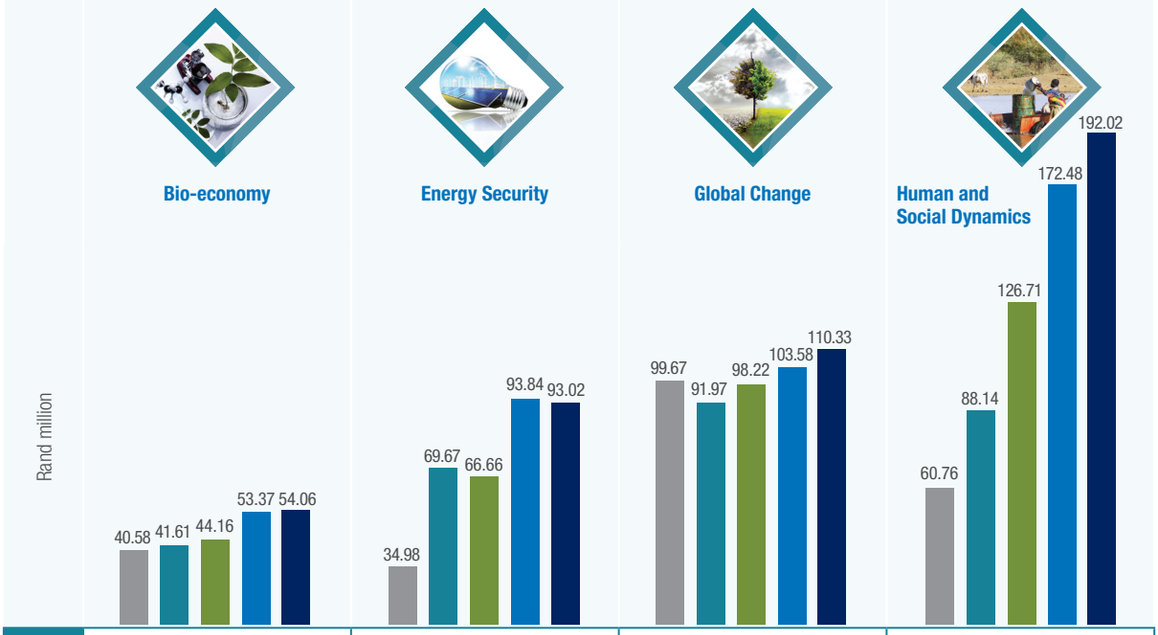
6.2.2 The National Research and Development Strategy (NRDS)

The NRDS articulates the need for a competitive research funding system to be built on international best practice as well as the benefits of and need for knowledge generation and innovation. Human capacity development underpins the strategy, which focuses on transforming the research system through the upliftment of designated groups. The strategy highlights the importance of globally competitive and contextually relevant research outputs in addressing the needs of the country. These are expressed through the geographic and knowledge advantage areas, which are Palaeosciences; Antarctic Research; Indigenous Knowledge Systems related to southern Africa; Biodiversity; and Astronomy[2].

2 Astronomy is uniquely positioned as both an NRDS geographic advantage area and a Ten-Year Innovation Plan grand challenge. For this reason it will be discussed separately from the other disciplines.

Examples of the NRF's contribution to the grand challenges, the geographic advantage areas and other strategic areas

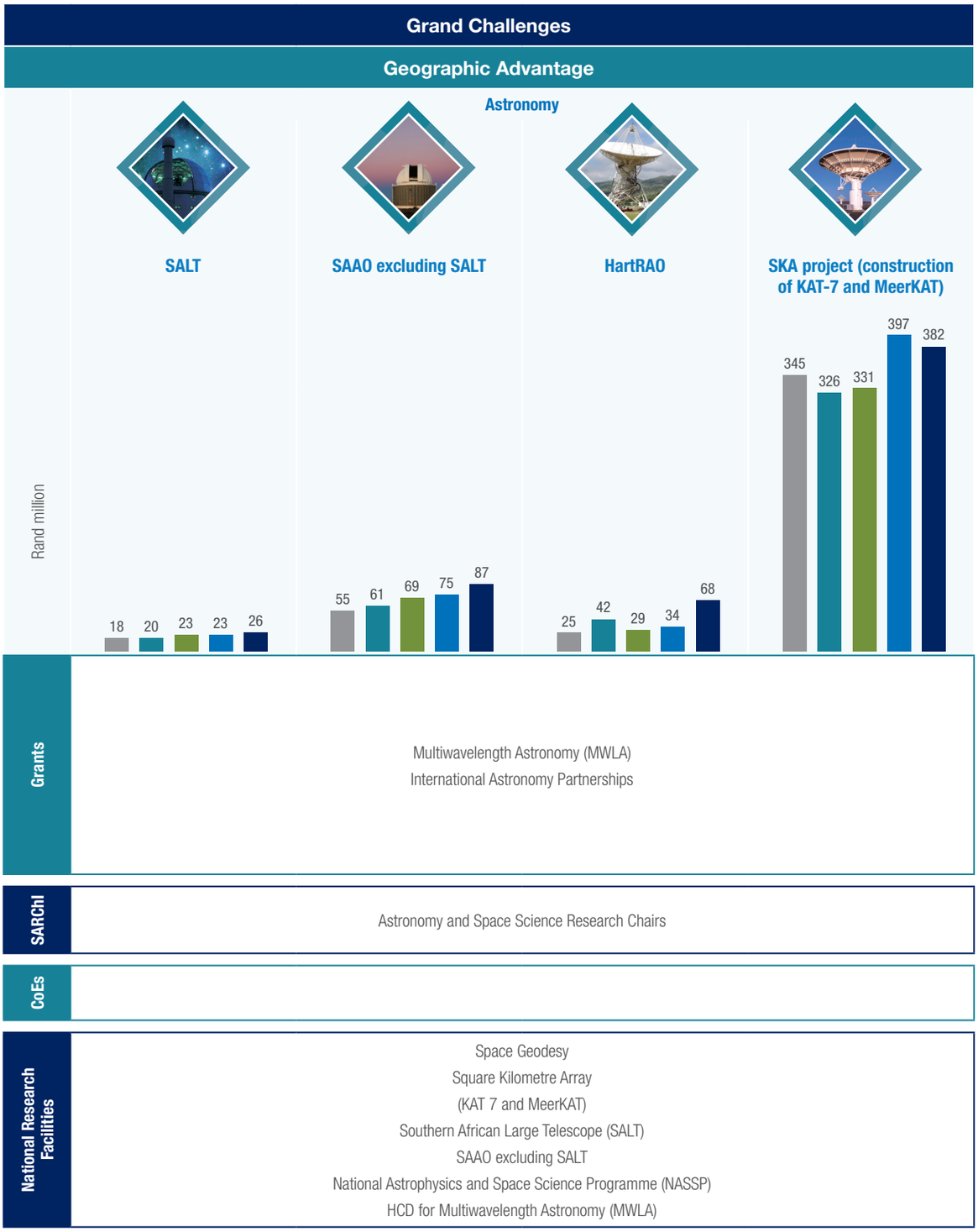
DST Grand Challenges



	Bio-economy	Energy Security	Global Change	Human and Social Dynamics
Grants	Drug Discovery Programme (including FSATI) Marine and Coastal Management (MCM) National Bioinformatics Network (NBN)	Energy Bursaries South African Nuclear Human Asset and Research Programme (SANHARP) Energy Efficiency and Renewable Energy Energy Spokes Energy Hub Joint Institute for Nuclear Research (JINR) SA South Korea	Inkaba yeAfrica Global Change Research Plan (GCRP)	Community-University Partnership Programme: Community-based Assessment Project Human and Social Dynamics Community Engagement with Science
SARChI	Bio-economy Research Chair	Planned Energy Research Chairs Planned Hydrogen Fuel Cells Research Chairs Existing Energy Research Chairs	Global Change Research Chairs	59 Social Sciences and Humanities Research Chairs 4 Mathematics Education Research Chairs (FirstRand)
CoEs	Biomedical Tuberculosis Tree Health Biotechnology Epidemiological Modelling Invasion Biology Birds as Key Indicators of Biodiversity	Catalysis Integrated Mineral and Energy Resources Analysis		Food Security Human Development
National Research Facilities	International Barcode of Life (iBOL)	MANuS and MatSci Environmental Isotope Laboratory Accelerator Mass Spectroscopy (AMS) Unit	Long-term Environmental Observation	

Over the reporting period the NRF invested R449 million, in nominal terms, in the area of the grand challenges. This constitutes a real term investment of R354 million. The investment supported 9 CoEs, 88 research chairs, 121 research grants and 1 263 postgraduate students.

2012/13 2013/14 2014/15 2015/16 2016/17



Over the reporting period the NRF invested R563 million in Astronomy, in nominal terms, excluding grants. This constitutes a real term investment of R444 million. An additional investment of R39 million has supported 11 research chairs, 26 research grants and 244 postgraduate students.

2012/13 2013/14 2014/15 2015/16 2016/17

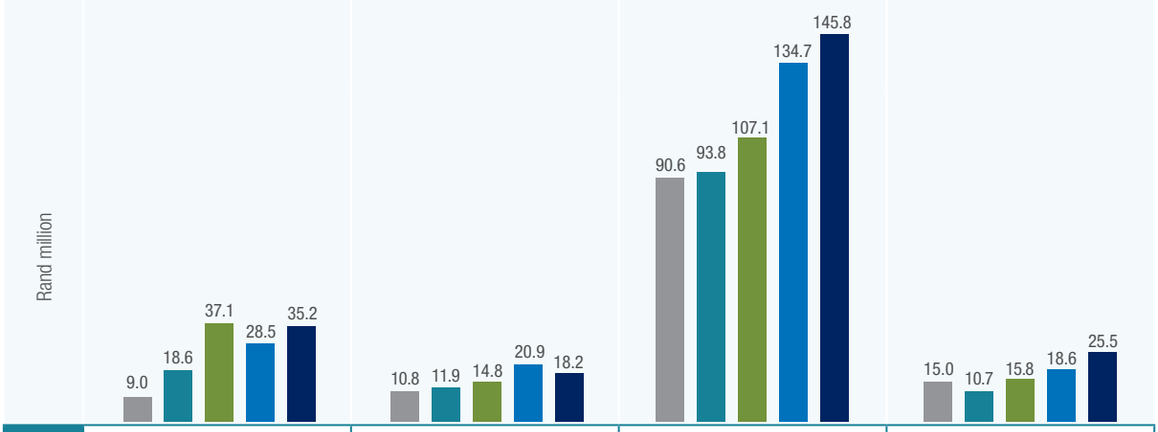
Geographic Advantage

Human Palaeontology

Indigenous Knowledge Systems (IKS)

Biodiversity

Antarctic Research



Grants	African Origins Programme (AOP) Palaeontological Scientific Trust (PAST)	IKS Research Grants IKS Development Grant	Bioinformatics Functional Genomics Collaboration with South African Network for Coastal and Oceanic Research (SANCOR) Marine and Coastal Management (MCM) Society, Ecosystems and Change South African Biosystematics Initiative (SABI)	South African National Antarctic Programme (SANAP)
SARChI	Paleo Research Chair	IKS Research Chairs	Biodiversity Research Chairs	
CoEs	Palaeoscience	IKS	Invasion Biology Birds as Biodiversity Indicators Tree Health	
National Research Facilities				iBOL African Coelacanth Ecosystem Programme (ACEP) Wildlife Biological Resource Centre (wBRC)

Over the reporting period the NRF invested R224 million, in nominal terms, in the geographic and knowledge advantage areas. This constitutes a real term investment of R177 million. The investment supported 9 CoEs, 38 research chairs, 141 research grants and 538 postgraduate students.

2012/13 2013/14 2014/15 2015/16 2016/17

PROGRAMME 1:
CORPORATE

7. PROGRAMME 1: CORPORATE

7.1 Situational analysis

SITUATIONAL ANALYSIS

The Corporate Programme is a cross-cutting support function responsible for providing enabling systems and structures that support the organisation. The Programme is premised on a shared services model that sets the tone and direction for good governance, policy direction and statutory compliance.

The Programme is underpinned by fair and transparent business practices and the responsibility to drive organisational-level compliance, through a system of policies and legislative frameworks.

OPERATIONAL DIVISIONS

Finance and Business Systems	Human Resources and Legal Services	Corporate Relations
This division supports the organisation through the interpretation and application of legislation and best practice; and the creation and support of enabling business systems, policies and procedures.	This function provides the NRF with comprehensive HR management, legal advisory and contract management services.	Corporate Relations facilitates both internal and external communications, brand building and stakeholder relations, and is a key enabler of the science engagement strategy.

PERFORMANCE

Programme 1 is mandated to:

- Promote good governance as a strategic asset;
- Provide leading-edge ICT systems; and
- Provide effective combined assurance.

7.2 Performance against strategic objective 5: Grow NRF influence, impact and reputation

7.2.1 Provide system intelligence that informs strategy and policy

The programme supports high-level strategy development and evidence-based policy and decision-making by providing high-fidelity system intelligence to the organisation and strategic stakeholders. This requires the implementation and management of mature and integrated business intelligence channels.

Business Intelligence (BI)

Development and refining of the internal BI system modules continued during the year. The external BI environment has been upgraded and refactored into a more streamlined interface which includes dashboard reporting that is tablet and smartphone friendly. The external BI system take-up exceeded expectation as more institutions requested access to the system than anticipated.

The NRF was contracted by the DST to customise and implement a Research Information Management System (RIMS) to support the administration of research within universities and to provide a business intelligence capability that would support the institutional and national need for system intelligence. Over the past seven years, RIMS' financial sustainability was identified as a risk since the universities were unable to meet their portion of the operation's costs. Numerous engagements with the forum and Universities South Africa did not yield a decision on RIMS funding. The DST, together with the NRF, decided to discontinue the operations and support of the InfoED-based research administration system since the funding responsibility has fallen to the NRF and the DST. The user community has been extensively engaged and plans are under way for participating institutions to deal directly with InfoED going forward. The NRF will discontinue support services as of 31 May 2017.

7.2.2 Communication of science and research achievements

The Corporate Relations unit has as one of its core mandates, the building of the NRF brand within the broad South African public and key stakeholder communities. Through various interventions the unit contributes to building a positive reputation of the organisation and fostering appreciation of its value proposition and impact of its work. This is pursued through media relations, social media, development of marketing products and continuously engaging NRF staff.

Corporate communication activities are focused on building the NRF brand and include:

- Profiling of the NRF and its funded researchers;
- Facilitating media coverage and exposure for the NRF;
- Managing the roll out of the Mzansi for Science Campaign (NSI Marketing Campaign);
- Developing content and communication products;
- Organising the NRF Science for Society Lectures Series (and other public lectures); and
- Managing stakeholder surveys.

Internally, the unit promotes a positive organisational culture, facilitates Management Development and Information Forums and supports key internal organisational initiatives.

Brand building: The NRF benefits from earned media coverage. This free publicity is generated through media relations and/or public relations activities. During the period under review, the NRF's brand-building activities included the following initiatives:

- The NRF in collaboration with the DST, the Norwegian Embassy and other partners, held the first annual Norway-South Africa Science Week in Pretoria and Cape Town.
- The 2016 NRF Awards in Polokwane was used as a marketing platform to showcase the Limpopo-based SARChI chairs. The media was invited to the awards ceremony and interviews were arranged with SAfm, Unisa FM, The Conversation, and Umhlobo Wenene.

- The NRF was represented on the Morning Live New Age Women in Science Business Breakfast panel by Dr Beverley Damonse. The Minister of Science and Technology, Mrs Naledi Pandor, also took part in the panel discussions. The event was broadcast live on SABC and repeated on SABC News and ANN7. The New Age national and five regional newspapers also published articles on the breakfast.
- Interviews with Umhlobo Wenene ran for four consecutive weeks in celebration of August as the month of Science and Technology. The following topics were discussed:
  - *Radio Astronomy Advances* with Rudzani Nemutudi of iThemba LABS;
  - *Atomic and Molecular Physics* with Dr Zina Ndlovu of iThemba LABS;
  - *Origins of Stars and Planets* with Siyambonga Matshawule of the SKA SA; and
  - *Astrophysics and Space Sciences* with Simphiwe Madlanga of HartRAO.
- The NRF participated in Science Forum South Africa 2016. Dr Molapo Qhobela and Dr Romilla Maharaj were interviewed by Business Day TV on the topic of 'Making international engagement work for Africa'.
- The NRF hosted the Science for Society Lecture at Stellenbosch University (SU) on World AIDS Day, 1 Dec 2016.

Total earned coverage during this financial year comprised 11 broadcast pieces, 18 print and 34 online media coverage events. The total advertising value equivalency (AVE), both earned and bought, is R1.97m with a total reach of 26.6 million. The overall coverage consisted of 54% online coverage, 29% print coverage and 17% broadcast coverage.

The NRF aims to create awareness and engagement to grow its community on social media through the sharing of relevant content that encourages engagement (likes, shares and comments). Social media platforms are also used to promote science engagement through the sharing of interesting and meaningful scientific content. The NRF's social media following is increasing.

Stakeholder communications: During the year several editing, copywriting and design products were produced for the NRF. These include fact sheets, articles, videos, exhibition stands, and invitations.

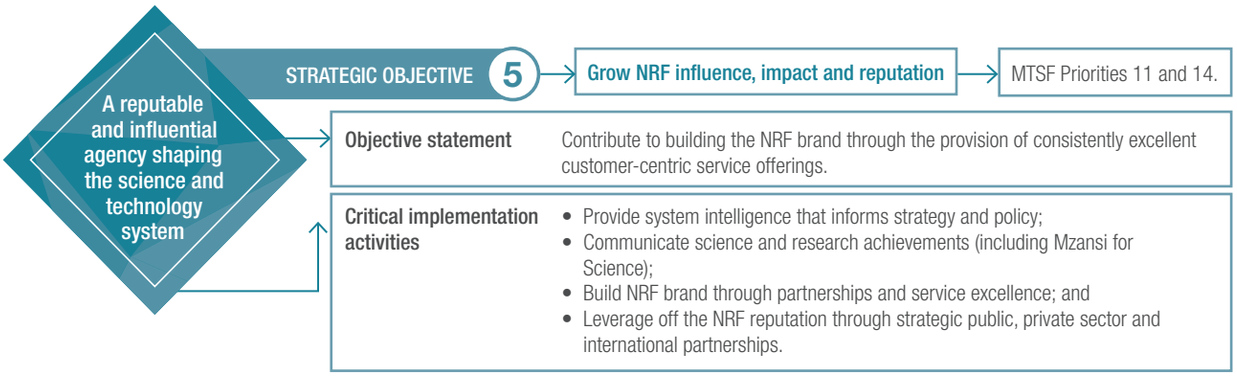
Mzansi for Science Campaign: A set of TV, print and radio advertisements were developed and approved by the Minister of Science and Technology. The first Mzansi for Science TV advert, featuring NRF staff member Nkululeko Qwabe, aired during Science Week on all SABC channels as well as E-TV.

Social investment programmes: The NRF embarked on its annual Mandela Day initiative in partnership with the DST and all its entities. NRF staff donated food parcels as well as stationery and clothes for the Mohau Satellite Centre for teenage girls in Kilner Park. The Mohau Children's Home is a residential care facility for orphaned, abused, abandoned, neglected and terminally ill children and their families who are infected or affected by HIV/Aids. It caters for 45 children, with some of the older children living in a Satellite House in Kilner Park. The NRF envisages an ongoing partnership with the home, and plans on including the children from the home in the annual 'Bring a girl child to work' and 'Men in the making' initiatives.

A group of ten NRF employees were sponsored by NRF employee contributions to participate in the annual CANSA relay fundraising event. NRF employees contributed R3 000 to the advancement of cancer research. The team completed 798 laps, totalling 279,34 km during the 12-hour event.

Staff also participated in the "Keep a girl child in school" initiative by donating money and sanitary products to ensure that girls do not have to miss school due to not being able to afford proper sanitary products. The contributions from NRF staff assisted more than 50 girls in the Letlotlo Secondary School in Mabopane.

Table 5: Performance against strategic objective 5 – 2016/17



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Multimedia coverage items	125	102	87	-15%	The target was not reached due to a reduced number of newsworthy activities in the final quarter of the year.
Number of internal and external users of the NRF business intelligence systems	[3]	65	74	14%	The increasing need for data analysis in the sector resulted in more users requesting access to inform business decisions. Specifically, the number of HEIs utilising the BI systems has increased.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Corporate Relations	10,530	11,037	8,737	-2,300	The variance is due to vacancies not filled during the year. These vacancies are pending reconfiguration of the functions within the unit.

7.3 Performance against strategic objective 6: Optimise NRF return on investment

7.3.1 Promote good governance as a strategic asset

Corporate Governance

The Corporate Governance directorate is responsible for the establishment and support of a framework of governance and control structures to enable the officers and directors of the organisation to discharge their duties effectively. The directorate consists of several compliance and assurance-based business units that support an enabling structure against which the business maintains and measures its compliance in terms of legislation as well as best practice.

Performance Planning and Reporting: During the reporting period, the Annual Report for the 2015/16 financial year was completed and tabled in Parliament on 27 September 2016 and four Quarterly Reports were prepared and submitted to the DST in line with the DST reporting framework. The Annual Performance Plan (APP) for 2017/18 was finalised and presented to the Minister of Science and Technology in February 2017. The APP was tabled in Parliament on 16 March 2017.

Safety, Health, Environment and Risk (SHER) Management: The annual bottom-up risk identification, assessment and aggregation process was conducted during the financial year. This process culminated in a workshop on risk management with the Corporate Executive Committee and the Audit and Risk Committee. Both committees reviewed the aggregated risk registers and endorsed the strategic risk register that was subsequently tabled at the Board meeting in November 2016. The combined assurance matrix was updated as per the framework and reviewed by the Corporate Executive Committee, the Audit and Risk Committee and the NRF Board. Various business continuity plans were tested and updated during the period and a compliance audit was conducted with respect to Safety, Health and the Environment.

3 The indicator was only implemented in the 2016/17 financial year.

Internal Audit: The NRF Internal Audit unit has adopted a co-sourced model, whereby the organisation makes use of internal audit service providers to augment the in-house capacity to achieve the objectives of the unit. For the period under review, the unit completed the 2016/17 risk-based audit plan, approved by the Audit and Risk Committee in March 2016, which consisted of 12 process reviews and implementation tracking of prior year recommendations (internal and external audit). The unit also appointed a panel of service providers to serve as external partners in the new financial year. For more information refer to section 14.14.6.

Knowledge Management Corporate

The role of knowledge management in the NRF is a cross-cutting compliance function aimed at developing, supporting and maintaining a knowledge-based organisation by facilitating access to and utilisation of data management and information systems. Records and document management services; library and bibliometric services; and data, content and curation management services are offered to internal and external stakeholders in accordance with all relevant legislation.

Records and document management services: The unit facilitated access and control of NRF records. This included support and guidance on archiving, off-site storage, disposal and electronic repositories. The Electronic Records and Document Management System has been populated with 39 483 records to date.

Library and bibliometric services: E-resource services were facilitated by retrieving and analysing information from the NRF Resource Centre Collection, specialised subscription bibliographic databases and open source platforms. The information provides strategic insight and trends to inform decision-making and reporting.

Data content and curation management services: The unit facilitated South African Data Archive acquisitions and usage on webometrics, as well as data resources in Africa. To accurately track NRF-funded publications and datasets, the unit provided guidance to business units such as Research Chairs and Centres of Excellence and the National Research Facilities to ensure that research outputs were captured in accordance to the Open Researcher and Contributor ID (ORCID) protocol.

Knowledge Management Communities of Practice: The NRF, through the Knowledge Management Corporate unit, hosted a meeting attended by knowledge management professionals to discuss industry standards.

ORCID: ORCID is an international, interdisciplinary, open and not-for-profit organisation. The aim of ORCID is to transform the research ecosystem by providing a registry of persistent unique identifiers for researchers and scholars and automating linkages to research objects such as publications, grants and patents. The NRF released an official ORCID statement to the research community requesting that all NRF funding recipients register with ORCID. The ORCID researcher registration will allow the NRF to track researcher and institutional performance as well as support the updating of CV data for funding applications.

Corporate Finance

Corporate Finance provides business systems, management accounting, policy development, financial change management, statutory reporting, workflow development and financial control. The controls and processes ensure that the organisation meets all the statutory obligations of a schedule 3A public entity in terms of the Public Finance Management Act (PFMA), while maintaining corporate overheads below 3% and overall NRF overheads below 10%.

Supply Chain Management (SCM)

SCM has been identified as a strategic priority across the public sector. Effective enterprise-wide demand management has the potential to reduce operational costs. The SCM function therefore initiates legislative processes after adopting a risk and change management approach, appropriate to the timing and nature of implementation. During the reporting period, the SCM division circulated all new Instruction Notes and Circulars as issued by National Treasury, including the draft Preferential Procurement Policy Framework Act Regulations.

The NRF travel management regulations and control led to a saving on travel costs of R2.9m over the reporting period. The Bid Award Committee (BAC) convened 15 times during the year and considered 76 bids and 17 cancelled bids. Eleven (11) deviations of above R1m were considered by BAC and reported to both the Auditor-General and National Treasury. The BAC subcommittee, the Bid Specifications Advisory Committee, convened 28 times during the year and advised on 75 specifications. The value of bids awarded is as follows:

- 202 bids for the full financial year as per approved NRF Procurement Plan – above R500 000 (2016/17): **R511 296 554**
- 8 bids recommended for awarding, including multiple year contracts (Prior Year 2015/16): **R 24 521 573**
- 89 bids recommended for awarding, including multiple year contracts (2016/17): **R348 799 847**

7.3.2 Providing leading-edge ICT systems to support effective and efficient operations

The primary goal of the Information Communication Technology (ICT) unit is to provide 'fit for purpose' ICT systems, services, and support based on the needs of the organisation and its stakeholders. Over the reporting period software and hardware were upgraded to ensure system security and relevance.

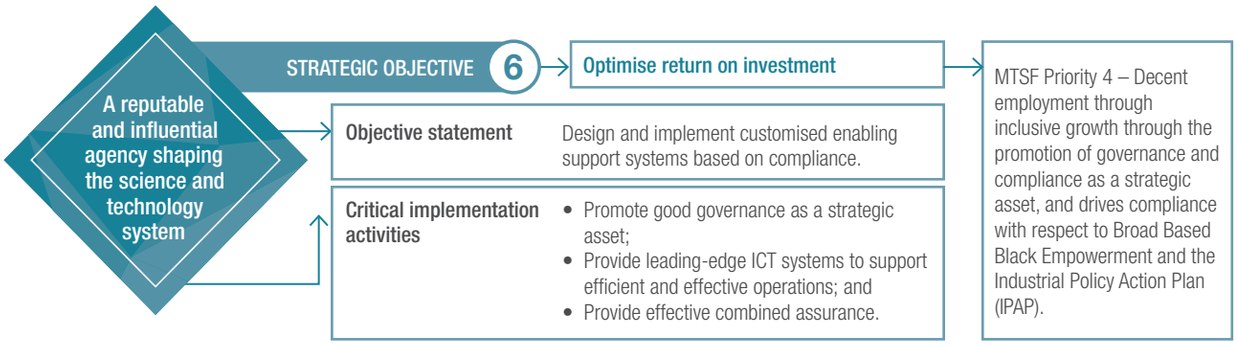
The NRF Cyber Security Committee was established to ensure that the organisation remains diligent in identifying and dealing with the risks related to cyber threats. In line with the RISA business process mapping project, Grant Management and System Administration (GMSA) and the IT development team worked together to review and rationalise the call provisioning process in order to automate the process. The latter includes the process of preparing calls that elicit funding applications from researchers and students. A substantial component of the process has now been automated and application forms have been rationalised to improve the user experience and to enhance the data collection protocol to strengthen the NRF Business Information System.

The NRF IT team has been working with RIMS to develop a central CV database that will synchronise with the NRF online grant application system 'Submission'. This will enable researchers to update CV data in real time through an automated, real-time process. The team has been working with the University of Cape Town (UCT) on this initiative because the system had the capability to synchronise CV data with the university systems as well.

7.3.3 Provide effective combined assurance

The customised combined assurance model for the NRF aims to ensure optimal coverage from management, internal and external assurance providers on the day-to-day risks facing the organisation. The organisation continued to conduct business based on effective combined assurance methodologies, processes and principles.

Table 6: Performance against strategic objective 6 - 2016/17



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Investment in ICT platforms (Rm)	69.52	52.40	83.87	60%	The ICT infrastructure team identified the need during the financial year to upgrade data storage servers and the network backbone to ensure better usage of the TENET bandwidth.
Corporate overheads: calculated as a percentage of total expenditure	1.4%	<3	1.4%	53%	
Organisational overheads: calculated as a percentage of total expenditure	6%	<10	5.3%	47%	

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
NRF Corporate	131.35	109,331	107,258	-2,073	The variance is largely due to a delay in the handover of the new building extension and vacancies across the business unit.

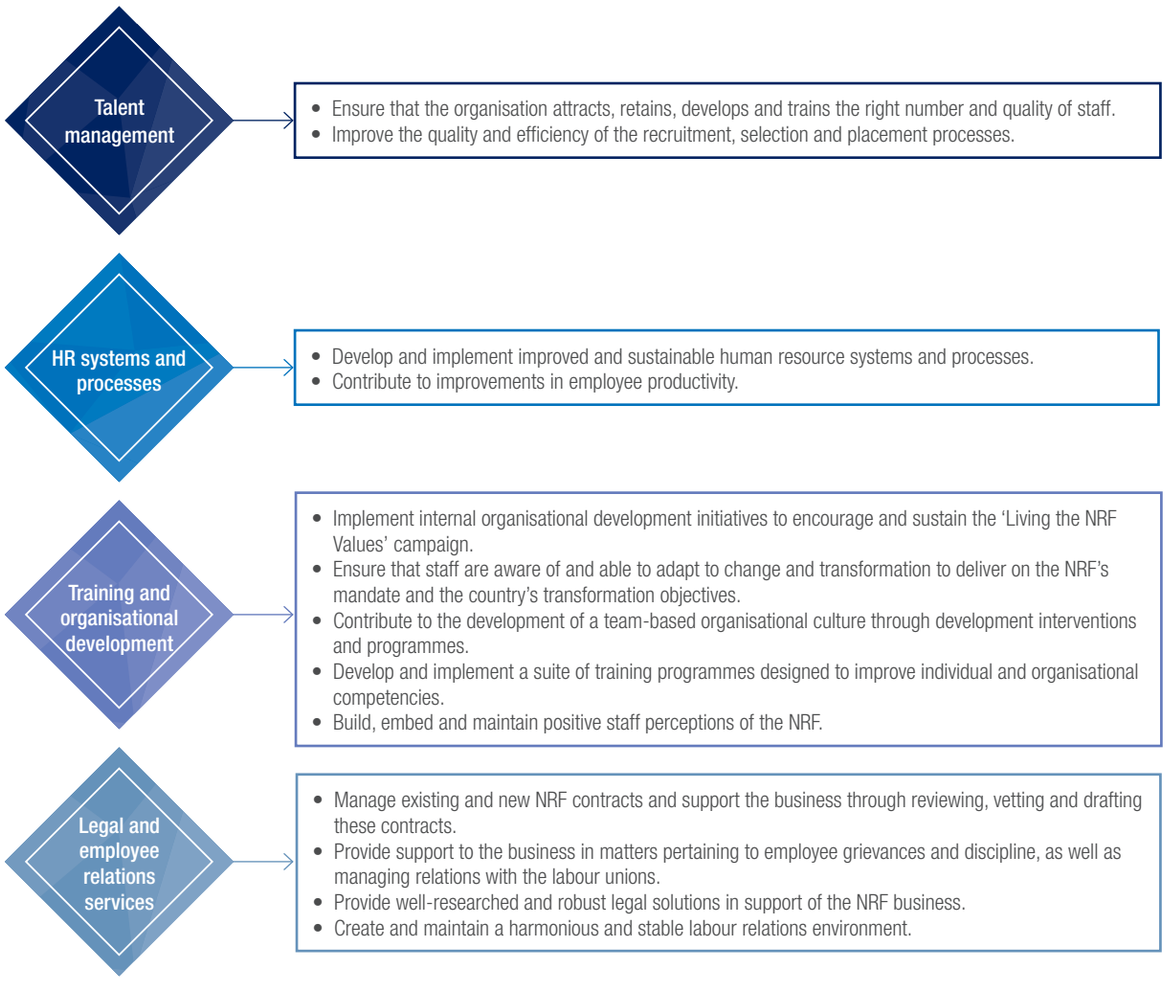
7.4 Performance against strategic objective 8: Improve NRF talent management

Talent management includes the successful attraction, placement, retention and continuous development of a committed, skilled and representative staff. The NRF Human Resources and Legal Services division provides policy direction and strategy for effective human resource management.

7.4.1 Provide policy direction and strategy for effective human resource management

The Human Resources and Legal Services functions provide the NRF with comprehensive human resource and legal services and give policy direction and strategy execution guidelines in these areas. The division leads, promotes and coordinates organisation-wide activities aimed at enhancing the NRF's productivity and interactions with internal and relevant external stakeholders. The organisation is supported through HR and legal services as set out in Figure 16.

Figure 16: Human resources and legal services activities



Employment equity and transformation

The NRF Employment Equity Plan is at the core of NRF's commitment to achieve employment equity on all occupational levels and categories of its workforce. This gives effect to the NRF Employment Equity and Redress Policy adopted by the Board and which sets out the measures to be taken to ensure legal compliance with the Employment Equity Act, 55 of 1998. It includes the objectives, activities, numerical goals, and targets to progressively move towards achieving representivity of the designated groups across the organisational structure.

Progress towards achieving the NRF's long-term employment equity targets continues at a steady pace. In the period under review, the overall representation of black staff is 74.7% against a target of 76%. The target for female representation has been met at 43%. People with disabilities account for 0.7% against an annual target of 1.16%.

Table 7: Employment equity performance as at 31 March 2017

Occupational level	Designated							Non-designated			Total
	Male			Female				Male	Foreign nationals		
	A	C	I	A	C	I	W	W	Male	Female	
Top Management	2	0	3	0	1	0	0	0	0	0	**6**
Senior Management	5	2	1	2	0	2	1	12	3	0	**28**
Professionally qualified and experienced specialists and mid management	48	27	9	19	5	8	36	121	41	14	**328**
Skilled technical and academically qualified workers, junior management supervisors, foremen and superintendents	199	95	6	224	67	11	82	85	10	6	**785**
Semi-skilled and discretionary decision-making	101	15	0	68	12	0	2	3	0	0	**201**
Unskilled and defined decision-making	19	14	0	18	19	0	1	2	0	0	**73**
TOTAL PERMANENT	**374**	**153**	**19**	**331**	**104**	**21**	**122**	**223**	**54**	**20**	**1 421**
Non-permanent employees	7	4	0	7	3	0	1	1	0	0	**23**
GRAND TOTAL	**381**	**157**	**19**	**338**	**107**	**21**	**123**	**224**	**54**	**20**	**1 444**

Note: A=African, C=Coloured, I=Indian, W=White

Occupation and qualification analysis

RISA and SAASTA do not employ staff to conduct formal research. However, senior staff are appointed with a minimum requirement of a master's or business equivalent qualification and top management with a minimum requirement of a PhD or business equivalent qualification. At the National Research Facilities, 14% of staff are researchers (151 of the total of 1 123 staff members).

Of the staff employed at the NRF during the period under review, 177 had doctoral qualifications and 134 had master's degrees. A further 36 staff members are enrolled for PhD studies and 48 for their master's qualification.

Appointments, separation and turnover

The recruitment activity in the organisation remains high. A total of 85 terminations occurred and 119 vacancies have been filled. The cumulative annual staff turnover is at 5.89%, of which 5.19% can be classified as controllable turnover that includes resignations, contracts expiring and retrenchments.

7.4.2 Cultivate a learning organisation based on the NRF values

2016/17 was a crucial year for the NRF with the continuous drive towards achieving the objectives of the staff workshops concluded in March 2017 in phase two of the Diversity Management Programme. The process for compliance to the workplace skills plan was introduced across the organisation.

Implementation and operationalisation of this practice will be part of the overall organisational business planning process from April 2018.

The RISA competency development exercise to identify job competencies commenced in the period under review. This exercise entails the identification of skills, knowledge and behaviours which are essential to perform jobs successfully in RISA. This exercise is beneficial to RISA and its staff as it provides a common language for dialogue in concrete terms, as well as a shared view of the standards staff are striving to achieve in RISA. The process aims to assist in aligning the organisation's human capital needs, its strategic business objectives and the budget.

Continual support of the Diversity Management Programme by management and staff continues to improve at all levels across the organisation.

The NRF-wide Employment Equity and Skills Development (EE & SD) Committee was established at the end of the reporting period. Training has been identified and given for local EE & SD Committees and the national structure. Training interventions reached a total of 1 404 candidates across various NRF business units, namely RISA, SAASTA, NZG, HartRAO, SAAO, iThemba LABS and Corporate Services.

7.4.3 Improve and maintain harmony between staff, management and labour

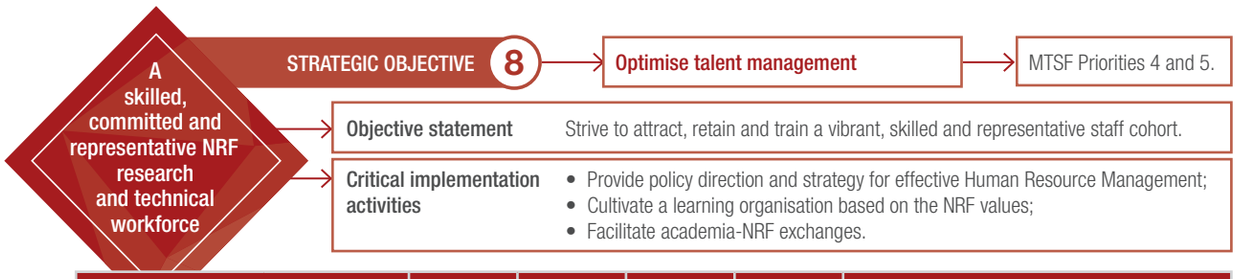
The labour relations climate in the organisation is generally stable. However, challenges exist in some business divisions, particularly in RISA where greater investment in relationship building is still required. Union membership in the organisation remains steady, with overall union representation showing a slight decrease from 48.47% to 46.88%.

7.4.4 Corporate Legal Services and Industrial Relations

Corporate Legal Services and Industrial Relations incorporates the Intellectual Property (IP) Management Unit, and provides the NRF with a range of legal, employee relations and IP management services. These include negotiation, vetting and drafting of contracts, rendering of legal opinions and advice. The office supports the maintenance of labour stability in the workplace as well as ensuring compliance with the NRF IP Policy.

During the period under review, the unit drafted 247 contractual documents (including memoranda of agreement, memoranda of understanding, and service level agreements); convened 85 labour-related cases; litigated 10 court cases; and made 128 written and oral legal advisory submissions.

Table 8: Performance against strategic objective 8 – 2016/17



INDICATORS		Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Proportion of South Africans from designated groups in senior technical and managerial positions (Peromnes 1-8)	Black number	275	291	287	-1%	
	Black %	45%	47%	46%	-2%	
	Female number	195	211	198	-6%	The NRF actively promotes the appointment of female staff in its recruitment strategies to reach the target. Every effort is made to ensure representivity in the management structure in accordance with the Employment Equity Policy.
	Female %	32%	35%	32%	-9%	
% staff turnover		10.5%	6%	7%	-12%	The turnover includes 35 contracts that expired during the reporting period.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Training and development	4,540	5,243	2,648	- 2,595	The underspend is due to the management development programme being reassessed and not expended.

PROGRAMME 2:
SCIENCE ENGAGEMENT

8. PROGRAMME 2: SCIENCE ENGAGEMENT

8.1 Situational analysis

SITUATIONAL ANALYSIS

Transforming from a resource-based to a knowledge-based economy demands a shift in strategic emphasis. In a knowledge economy, generating and distributing knowledge is a key priority, and this knowledge must be disseminated to the wider public. To foster an innovation culture, awareness of the necessity for science and research must be entrenched in society.

Developing meaningful connections between science and society is a long-term endeavour. It underpins the commitment that publicly funded research should be to the betterment of society. To this end, the DST approved a Science Engagement Framework in 2015. This overarching strategy is intended to improve coordination and encourage science promotion, communication and engagement across the national system. The strategy is inclusive and integrative of all knowledge fields, and as such is committed to integrating the natural sciences, engineering, and social sciences and humanities, in pursuit of a society that understands and values science and technology and their critical role in national prosperity and sustainable development, while engaging critically in their development.

OPERATIONAL DIVISIONS

SAASTA → SAASTA is the national coordinating unit for the science engagement strategy.

RISA → RISA engages with and communicates sectoral science and technology strategy and policy and, where appropriate, outcomes and impact.

National Research Facilities → National Research Facilities are mandated to support discipline-specific knowledge dissemination to their stakeholder communities and the public at large through access, collaboration and community outreach initiatives.

PERFORMANCE

As the primary implementer of the science engagement policies and strategies of the DST, the programme adopts a three-pronged approach as set out below.

Science Education → Create tomorrow's scientists and innovators.

Science Communication →
- Celebrate the country's research achievements.
- Expand the public's appreciation for science.
- Encourage engagement with science issues that impact on the daily lives of ordinary people.

Science Awareness → Encourage exploration through hands-on experience while creating enthusiasm for STEMI.

The NDP emphasises the effective application of science literacy: *"…to promote technological advances, developing countries should invest in education for youth ... and should ensure that knowledge is shared as widely as possible across society".*

To this end, the NRF and the DST have set the promotion of science engagement as a strategic priority. The DST in collaboration with the NRF, developed the Science Engagement Framework, which includes, among other things, the need to "actively foster the science and society dialogue within a developing knowledge economy". The framework is committed to integrate the natural sciences, engineering, social sciences, and humanities, in pursuit of a society that understands and values science and technology and its critical role in national prosperity and sustainable development, while engaging critically in societal development.

8.2 Performance against strategic objective 7: Entrench science engagement

Strategic objective 7 is achieved through the promotion of a vibrant national research culture by implementing effective science awareness, education and communication activities.

Programme 2 responds by cultivating science awareness through education and communication, and implementing effective science engagement initiatives within and across all NRF programmes.

8.2.1 Cultivate science awareness through education and communication and implement effective science engagement initiatives

Improving learner participation in SET-based programmes

During the period under review, 374 457 learners were reached through science engagement activities as depicted in Figure 17.

Learner intervention initiatives are skewed towards learner participation and performance. Supplementing the curriculum through exposure to career opportunities in science, engineering, technology and innovation (SETI), as well as identifying and nurturing talent through SETI Olympiads and competitions require more attention. Learners were supported through a consolidated effort by SAASTA and the National Research Facilities as depicted in Figure 17.

Figure 17: Learner support through science engagement initiatives

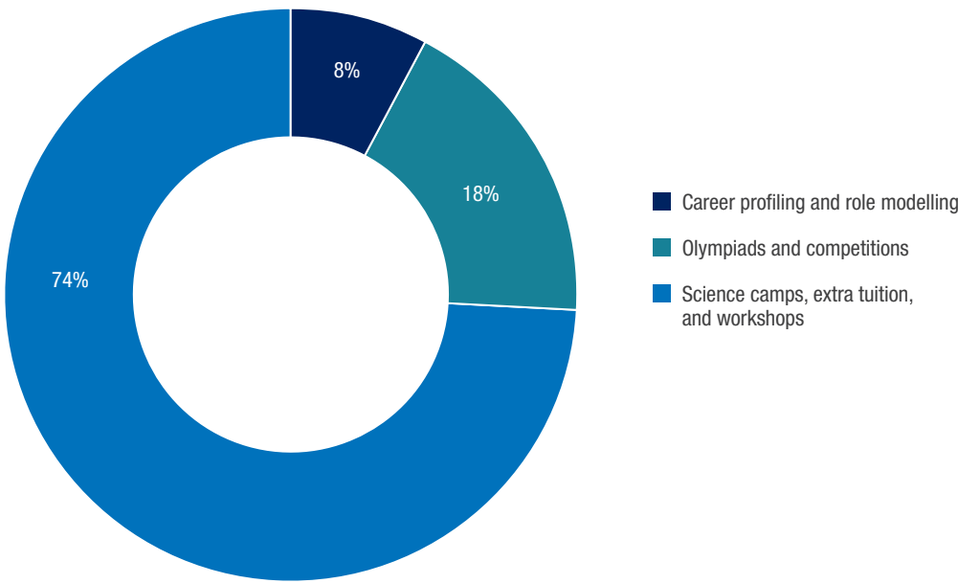
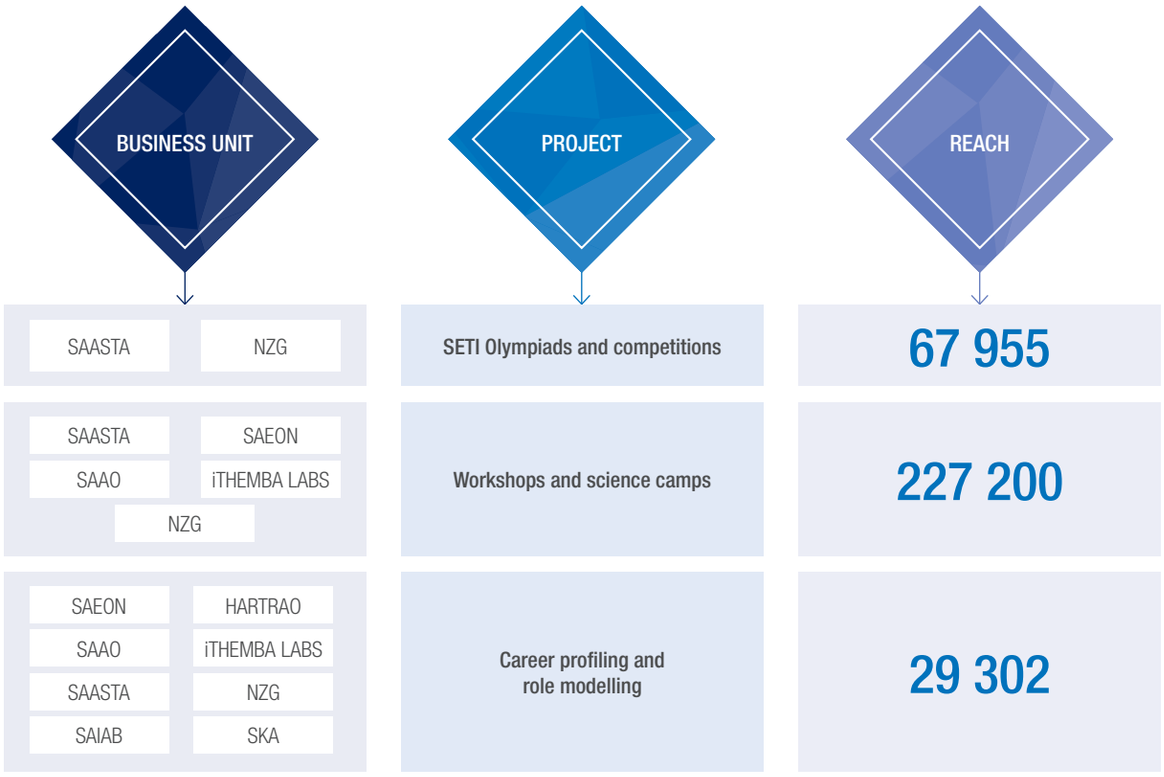


Table 9: Reach on learner development per business unit and project



A total of 12 513 learners were exposed to careers in STEMI through roadshows, career expos, or role-modelling campaigns. Some of the profiled careers are summarised in the following table.

Table 10: Careers profiled during expositions, roadshows, and role-modelling campaigns

Science	Technology	Engineering	Corporate
Veterinary Sciences	Information Technology	Civil Engineering	Human Resources
Food Technology	Aircraft Technology	Mechanical Engineering	Law
Computer Science	Multimedia Specialist	Chemical Engineering	Communication Science
Analytical Chemistry	Computer Science	Electrical Engineering	Actuarial Science
Geology		Engineering Science	Accounting and Taxation
Metallurgy		Industrial Engineering	
Biotechnology		Metallurgy Engineering	

Improving educator participation in SET-based programmes

During the year, 17 997 educators were reached through Educator Development Workshops hosted by the National Research Facilities.

Undergraduate and postgraduate support

Undergraduates are supported in their second to fourth year through role models and industry visits to promote advancement to the postgraduate level in their current field of study. Unemployed SET graduates are identified and placed as volunteers at host institutions to improve their work experience and life skills for employment opportunities. During the reporting period, 699 students were assisted through these interventions.

SAASTA placed 229 newly appointed unemployed SET postgraduate students at 41 different host institutions across the country as volunteers for a period of one year to enable them to gain work experience and prepare them for the labour market.

Scientists and researchers

During the reporting period, 207 scientists and researchers participated in science education, science communication and awareness activities. The participating researchers benefit from these activities by the associated exposure in the media.

Public awareness

A total of 1 084 760 members of the public were reached through participation and awareness initiatives. The initiatives included festivals and other mass public events, open public access to facilities and guided tours through facilities and labs. A total of 41 (79%) district municipalities were reached.

NRF business units participated in several national science festivals, including Science Tube, SciFest, and Sasol TechnoX, to celebrate science in a festive, fun-filled and exciting way. Lectures, exhibitions, live demonstrations of experiments, and workshops were offered to attendees.

Science communication: Science and researchers

Specialist areas within science communication include media engagement; audience analysis; scientific editing; ICT specialisation and discipline-specific science communication currently in biotechnology, nanotechnology, hydrogen fuel cell technology, and space science. SAASTA is managing a science communicator database that currently hosts 365 researchers in various fields.

Science communication capacity is being established at certain universities. The universities of Limpopo and Venda each received a science community engagement grant from the NRF.

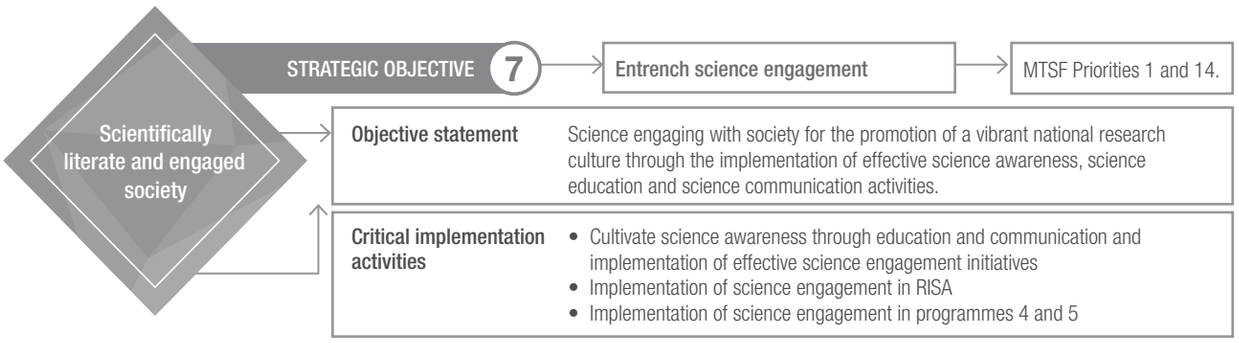
Other highlights include:

- SAASTA projects, such as the Hydrogen Public Awareness and the Nanotechnology Public Engagement programmes, receiving exposure at several conferences;
- Science communication workshops being facilitated as part of the DST-funded Youth Science and Technology Journalism Programme; and
- Collaborative exhibitions between the SKA SA and the University of East Anglia in the UK.

Science Communication: Media

A newsclip analysis recorded a total of 20 242 media placements for the NRF. The majority (73%) were recorded on social media. Communication of science in the media through different South African languages is increasing due to the collaboration with the community media in Limpopo, KwaZulu-Natal, North West and the Eastern Cape. Science topics were presented in English, IsiZulu, IsiXhosa, Sepedi, Northern Sotho, Venda and Shangaan.

Table 11: Performance against strategic objective 7 – 2016/17



INDICATORS		Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Investments in Science Engagement activities (SAASTA & NFs) (Rm)		100.78	82.44	106.1	29%	The programme received additional funding through preliminary funding from contracts such as the National Youth Volunteer Services; Nanotechnology; Hydrogen Fuel Cells, STEMI Olympiads and Competitions, being higher after finalisation by the DST.
Interactions with the public (learners, educators and general public) focusing on science awareness activities (SAASTA)	Number of interactions	7	10	10	0	
	Approximate number of public reached	1 013 716	1 040 000	1 084 760	4%	Science festivals attracted a large number of visitors. This could be due to the Mzansi For Science advert campaign and other active marketing strategies.
Interactions focusing on educator development and learner performance in Mathematics, Technology and Science	Number of interactions	12	9	17	89%	Programme 2 had the opportunity to facilitate additional interactions in this crucial area of educator and learner development.
	Educators reached	19 410	15 210	17 997	18%	Due to additional interactions taking place, a higher number of educators were reached.
	Learners reached	371 624	374 403	374 457	0%	

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Science Engagement	179,360	190,645	174,826	-15,819	The variance is due to lower costs for science engagement and education activities. This is due to partnerships and event materials being reutilised.

PROGRAMME 3:
RISA

9. PROGRAMME 3: RISA

9.1 Situational analysis

SITUATIONAL ANALYSIS

The Research and Innovation Support and Advancement division (RISA) of the NRF supports and promotes human capacity development, knowledge generation and platform provisioning through the provision and administration of, among other initiatives, a world-class granting system. The work of the programme is informed by a range of national policies, priorities and strategies, including the strategy for Human Capacity Development for Research, Innovation and Scholarships and the 2013 Ministerial guidelines for improving equity in the distribution of the DST-NRF bursaries and fellowships.

OPERATIONAL DIVISIONS

ARIC	Applied Research, Innovation and Collaboration
RCCE	Research Chairs and Centres of Excellence
HICD	Human and Infrastructure Capacity Development
IEPD	Institutional Engagement and Partnership Development
GMSA	Grants Management and Systems Administration
RE	Reviews and Evaluation
KFD	Knowledge Fields Development
IRC	International Relations and Cooperation

PERFORMANCE

RISA endeavours to:

- Provide best practice systems in support of grant-making, reviews and evaluations;
- Promote globally competitive research and innovation;
- Enhance strategic international engagements; and
- Establish and maintain research infrastructure and platforms.

9.2 Performance against strategic objective 1: Promote globally competitive research and innovation

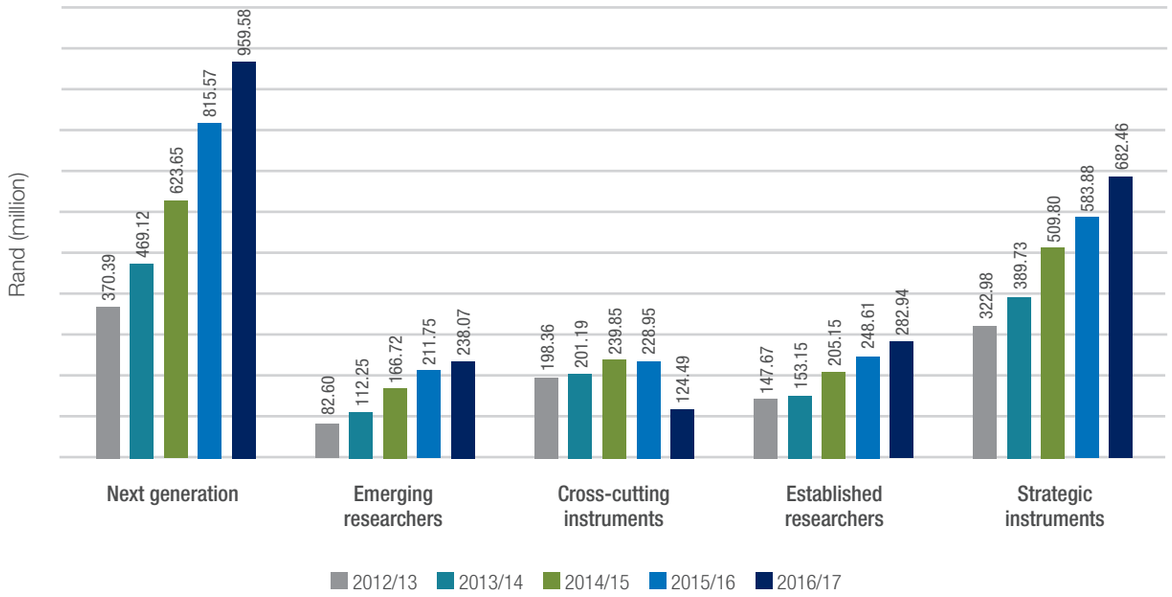
9.2.1 Investment in next-generation, emerging and established researchers through the human capacity development excellence pipeline

The NRF continues to align its funding investment to national research priorities. Through the use of the human capacity development excellence pipeline and the structuring of instruments to support each aspect, RISA is able to function across a grant-making value chain, providing support, research infrastructure, international and industry collaboration opportunities and mobility through all the stages of a researcher's career, across the spectrum of basic, applied, and strategic research with an appropriate mix of programmes and funding mechanisms.

The investment strategy considers the systemic need for supervisory capacity as a determining factor of the capacity for productivity of the system. Established researchers as well as strategy investments are therefore supported with the objective to attract and retain leading supervisory capacity. The need for state-of-the-art infrastructure to support globally competitive research is also recognised and executed in the overall investment strategy.

As is illustrated in Figure 18, a significant investment is made in next-generation (postgraduate student) support. Through following this approach over the last years, the NRF is contributing to transforming the researcher cohort for the future. The second largest investment is in strategic investment areas such as the CoEs and SARChI to build excellence in chosen areas, thereby improving the country's global relevance and competitiveness in R&D. Going forward, the support for emerging and established researchers will be assessed to ensure that critical throughput continues to be supported at an optimal level.

Figure 18: NRF investment trends in the Human Capacity Development Excellence Pipeline



Next-generation researchers (postgraduate student support)

Postgraduate students are supported through free-standing scholarships; grantholder-linked bursaries as well as academic development programmes. The NRF supported 14 173 postgraduate students during the 2016 academic year. Of these students, 10 747 (76%) were black and 8 017 (57%) were female.

Performance of individual funding instruments include:

Innovation Bursary Scholarships (IBS) and Freestanding Bursaries: Over the reporting period 3 952 honours, master's and doctoral students were funded through IBS, with 83% black students and 58% female students being supported. Honours students supported comprised 44% of the total, master's students 35% and doctoral students 21%. Through NRF freestanding bursaries, 925 students were supported. A total of 85% of bursars were black and 61% were female.

New Generation of Academics Programme (nGAP): The HEIs appointed 101 doctoral candidates across 86 disciplines through the DHET-funded nGAP programme. More than half of the 64 eligible candidates, i.e. 34 (53%), applied for the NRF Research Development Grants for nGAP scholars and all 34 applications were awarded funding for the 2016 academic year.

Thuthuka: Thuthuka grants support both next-generation and emerging researchers. A total of 254 new grants were awarded for the 2016 academic year. Demographic targets for new Thuthuka grants were achieved, with 80% of awardees being black and 57% female. The equity targets improved significantly from previous years, with the targeted 80% representation of black recipients being met in all three Thuthuka granting tracks. An additional 327 continuation Thuthuka grants were also awarded for the 2016 academic year. Of the total 594 students receiving bursaries, 419 (71%) were black and 338 (57%) were female.

South African Nuclear Human Asset and Research Programme (SANHARP): The programme awarded 39 grants for master's and doctoral students and 38 bursaries to undergraduate students. The number of first year bursaries awarded was negatively affected by the challenges experienced in obtaining academic results. The NRF has taken cognisance of the DST's intention to now phase out all study levels by not providing further funding for any SANHARP student completing their current degree. The DST has not formally communicated this intent.

Emerging researchers (early career researchers)

The progression of emerging researchers (postdoctoral fellows and early career researchers) is facilitated through a range of targeted funding instruments. These include:

The Research Professional Development Programme (PDP): The instrument awarded 141 doctoral and 96 postdoctoral PDP positions for 2016. To date, 95 PDP doctoral students and 48 PDP postdoctoral fellows have taken up the awards across 113 projects. A total of 38% of the awards were allocated to black researchers, while 59% of all awards were made to female researchers.

The Researcher Mentoring Initiative: To accelerate the development of black and especially female emerging researchers, 25 women researchers at the University of Limpopo, 35 at the University of the Witwatersrand (Wits) and 25 at the University of Zululand (UniZulu) were selected to participate in a series of research writing and grant-making programmes.

Research Development Grants for Y-rated Researchers: These grants support research as the foundation of knowledge production in the disciplines of the humanities, social and natural sciences. At the end of 2015, 30 grants were awarded to run from January to December 2016. For the 2016/17 call for applications that closed in May 2016, 89 applications were received. Of these, 50 applications were considered fundable and all of these have been funded.

Established researchers

During the reporting period, the NRF provided research grants to 4 520 researchers. Of the grant recipients, 1 563 (35%) were black against a target of 1 739; and 1 699 (39%) were female against a target of 2 209. The organisation is yet to achieve the demographic targets in this area, and has embarked on a multi-tiered turnaround strategy to address the underperformance, starting with an analysis of the adequacy of grants, and a look into alternate funding sources available to researchers through, for example, private and donor funding.

Strategic investments

Through strategic investments in, among others, SARChI and the CoEs, the NRF can create multidisciplinary research platforms that support the exploration of innovative research to nationally and globally relevant subjects.

Performance during the year:
The CoPs were initiated by the NRF in recognition that research, and specifically publicly funded research, should be applied to find solutions for social challenges facing South Africa. Research Chairs were required to collaborate towards the production of solution-oriented research findings with the intention to translate research outputs into tangible outcomes and influence policy development and implementation through communication of the necessary research findings. The Research Chairs in Mathematics and Numeracy Education held their annual CoP meeting, themed 'From the classroom to actionable policy', at Rhodes University in September 2016. This was attended by the FirstRand Foundation, Khulisa Management Services, and mathematics education practitioners from participating schools, university representatives and the DST, DHET and the Department of Basic Education.

A number of bilateral chairs have been established with local and international partners. The bilateral SA-UK Human and Social Sciences Chair in Political Theory was awarded to Wits. Two Research Chairs in food security were awarded to the University of the Western Cape (UWC) and the Nelson Mandela Metropolitan University (NMMU). The chairs were launched at the British Council's Going Global Conference in Cape Town. Six bilateral chairs have been approved in partnership with DHET with funding support from the National Skills Fund for a period of five years.

Six Research Chairs will be established at National Research Facilities. Seventeen applications were received. Awards will be made in the next financial year.

The CoEs held a number of seminars and symposia. The CoE in Mathematics and Statistical Sciences and the National Institute for Theoretical Physics hosted weekly Science Talks in their respective domains of expertise. The CoE in Food Security hosted an international symposium on food studies titled: 'Transnational conversations, unpacking the social, political and cultural configuration of food' at the University of Pretoria. The CoE in Scientometrics and Science, Technology and Innovation Policy and the Research Chair in Science Communication held a joint conference at SU at the end of the financial year.

This year marked the twelfth year of the existence of the CoEs. During the 2016 CoE forum, 'Sustainability beyond NRF support' was the central theme. Currently, six of the fifteen CoEs entered their twelfth year of funding. The CoEs are expected to become self-sustainable after the 12 years of NRF funding have concluded.

International human capacity initiatives

The Vrije University Amsterdam – NRF Desmond Tutu Doctoral Training Programme (DTTP): In a recent self-evaluation report, it was recommended that the pool of supervisory capacity in the DTTP should be increased. It has also been recommended that the DTTP be discontinued in its current form and should form part of a larger agreement for doctoral studies abroad between South Africa and the Netherlands. The students under the current DTTP agreement will be supported to completion of their studies and will not be affected by the new memorandum of agreement.

NRF – Fulbright partnership for doctoral studies abroad: The NRF and Fulbright Program joined forces to increase the number of South African doctoral graduates to strengthen South Africa's academic, research and professional workforce. The five candidates have been placed at the Georgia Institute of Technology, UC Berkley, Stone Brooke University, University of Washington and State University of New York at Buffalo.

9.2.2 Support multidisciplinary research and innovation

The majority of the knowledge-generating funding instruments within the NRF serve a dual function:

- To generate new and/or grow the knowledge base; and
- To train and develop the next generation of researchers.

Diversity studies: The NRF provided a development grant of R750k to the Diversity Studies Centre at Wits to continue research in the field in order to develop materials based on a case study at the NRF.

Nursing science: R3.5m was committed towards support for health sciences research in South Africa, in particular nursing sciences. The NRF is currently supporting 17 PhD candidates and 12 lead researchers.

Mathematics and statistics: The NRF and DHET have collaborated to develop a grant proposal towards the establishment of a doctoral training centre for mathematical and statistical sciences. The centre will focus on the strengthening of mathematical and statistical qualifications of academic staff in South Africa.

Transdisciplinary science: In the pursuit of enhancing international and interdisciplinary collaborations, the Belmont

Forum conceived transdisciplinary research training. The NRF coordinated the joint hosting of the transdisciplinary training workshops in South Africa. The workshops were targeted at key national policy-makers, research managers, global change research leaders for the national training offering, and similar participants from selected African countries for the regional training offering.

Marine and Antarctic research: The Marine and Antarctic Research Strategy (MARS) was drafted in collaboration with the DST and academic representatives, and submitted to the DST for review.

Bioinformatics and Functional Genomics (BFG): Twenty-one projects were awarded, with 53 students supported through associated grantholder-linked bursaries.

Research and Technology Fund (RTF): RTF grant awards were made to 103 projects and 120 students have been nominated. The grants are awarded for a three-year period.

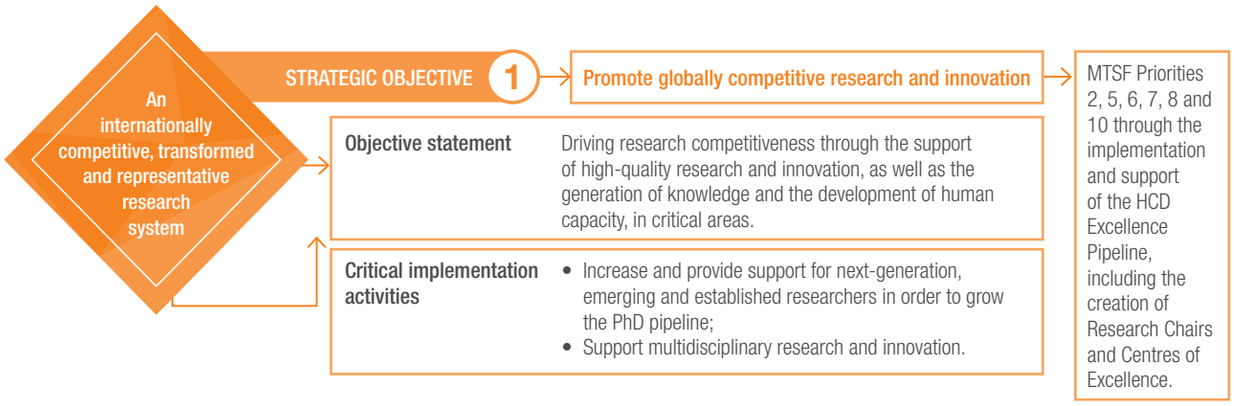
Blue Skies Research: Only 17 of the 28 qualifying concept note holders submitted full proposals. Ten proposals were supported, three proposals were deemed fundable but were not supported due to a lack of funds, and four full proposals were not successful.

Community Engagement: These grants are awarded to researchers to focus their research efforts on improving local communities. Fifteen proposals were supported.

Impact Study – Student Tracking and Alumni Digital Platform

A tracking study has been initiated to determine the socio-economic impact of DST-NRF investments in postgraduate training. The first iteration of the alumni digital platform has been developed and is currently undergoing testing and reconfiguration protocols.

Table 12: Performance against strategic objective 1 – 2016/17



INDICATORS		Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Number of NRF-funded researchers from designated groups	Black	1 355	1 739	1 563	-10%	Researcher support requires dedicated reconfiguration to address the race and gender gaps. Since these are multi-factored and complex indicators that are affected by systemic shifts, it is necessary to perform an in-depth analysis of the contributory factors. In order for the NRF to fully understand the reason for underperformance, the organisation has established task teams to evaluate possible contributing factors like: • The adequacy of funding support • The quality of the research proposals • The presence of designated groups in specific domains • The limitations created through specific contracts
	Female	1 610	2 209	1 699	-23%	
Number of postgraduate students funded per designated group	Black	8 980	9 715	10 747	11%	NRF strategies to support black postgraduate students have started to yield results.
	Female	7 032	8 265	8 017	-3%	The number of female postgraduate students is improving. Some of the deficit can be ascribed to the disruptions at universities during the third quarter, influencing timeous uptake of bursaries.
Number of NRF-rated researchers from designated groups	Black	866	850	970	14%	Rating of black researchers is a priority for the NRF. The overachievement is a result of this effort.
	Female	1 054	1088	1176	8%	Rating of female researchers is a priority for the NRF. The overachievement is a result of this effort.
Number of postgraduate students funded per level	Master's	4 853	5 300	4 995	-6%	The number of master's students were affected by the disruptions at universities during the third quarter, influencing timeous uptake of bursaries.
	Doctoral	3 181	3 200	3 363	5%	The overperformance is as a result of various initiatives such as the career awards programme that are, inter alia, designed to increase the qualifications of research and instructional staff at universities and national research facilities.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Globally competitive research	2,252	2,456	2,269	186	

9.3 Performance against strategic objective 2: Enhance strategic international engagements

9.3.1 Promote system-wide international engagement and facilitate access to local and international research platforms

The NRF facilitates and enhances international scientific collaboration between individual scientists, HEIs, research bodies, and scientific and professional associations (unions) in South Africa and abroad across three focus areas:

- Africa cooperation;
- Overseas cooperation; and
- Multilateral and strategic initiatives, including the Secretariat for the International Council for Science (ICSU); and the comprehensive mobility programme Knowledge Interchange and Collaboration.

Africa cooperation

African bilateral agreements: South Africa concluded a number of bilateral agreements with African countries. During the first quarter, four joint calls with Egypt, Uganda, Kenya and Namibia were launched, covering a wide range of thematic areas including agricultural sciences, biological sciences, health, environmental sciences, social sciences, indigenous knowledge systems, and ICT. Applications were received and reviewed during the second quarter and following approvals in both countries. A total of 12 projects were selected for funding for the Kenya call: three in agricultural sciences, two in biological sciences, two in environmental sciences, two in ICT and three in health.

South Africa/Tanzania: International Relations and Cooperation (IRC) and the Commission for Science and Technology (COSTECH) of Tanzania hosted the third Joint Researchers' Workshop during the 5th COSTECH National Science, Technology and Innovation Conference in Dar es Salaam, Tanzania.

Regional partnership: The NRF in partnership with the UK (British Council), and the National Commission for Science, Technology and Innovation in Kenya awarded funding for a trilateral researchers' workshop that aims to bring together early-career researchers from Kenya, South Africa and the United Kingdom to allow them to make international connections that can improve the quality of their research.

Overseas cooperation

A number of international calls were launched and awarded during the reporting period. These include:

- South Africa/Germany Joint Call for Research: 12 joint projects were approved for funding between the two parties. The NRF hosted its initiation meeting for the projects during the fourth quarter of the year.
- South Africa/France: 14 joint projects were approved for funding: five joint projects in food security, and four joint projects in space science (for improved quality of life).
- South Africa/Switzerland Phase III: 12 joint projects were approved for funding.
- South Africa/Flanders: For the second call to support three-year collaborative research projects between 2017 and 2019, six joint projects were approved for funding.
- South Africa/Austria: 17 joint projects were approved for funding. The initiation meeting will be hosted by Austria in the first quarter of the new financial year.
- South Africa/Sweden: The NRF and the Swedish Foundation for International Cooperation in Research and Higher Education approved 10 joint projects. The NRF hosted the initiation meeting for the funded projects.
- South Africa/Wallonia-Brussels Federation approved four joint research projects for funding.
- South Africa/China Scientific Workshops for young/emerging researchers (under the age of 45): The first workshop was hosted by the National Science Foundation of China in Beijing in 2016, focusing specifically on geosciences.
- South Africa/Argentina: Five joint projects were approved for funding over the three-year period 2017 to 2019.

Multilateral and strategic initiatives

The NRF and Research Councils UK awarded 11 joint PhD Training Partnership grants. A full grant allows for one placement of up to six months for approximately 10 PhD students from each country. The allocation of grants (for a three-year period) has been made to the relevant researchers/institutions.

The first **BRICS** joint call was launched during the reporting period. The NRF participated in the second BRICS Funders' Meeting in Jaipur, India, and the review process was finalised for the 501 proposals received. All BRICS countries are currently conducting national reviews for their respective projects.

A process was set in motion for the merger of the **International Social Science Council** (ISSC) and the **International Council for Science** (ICSU). The NRF participated in the voting process where 76% of ICSU members and 87% of the ISSC members voted in favour of the merger.

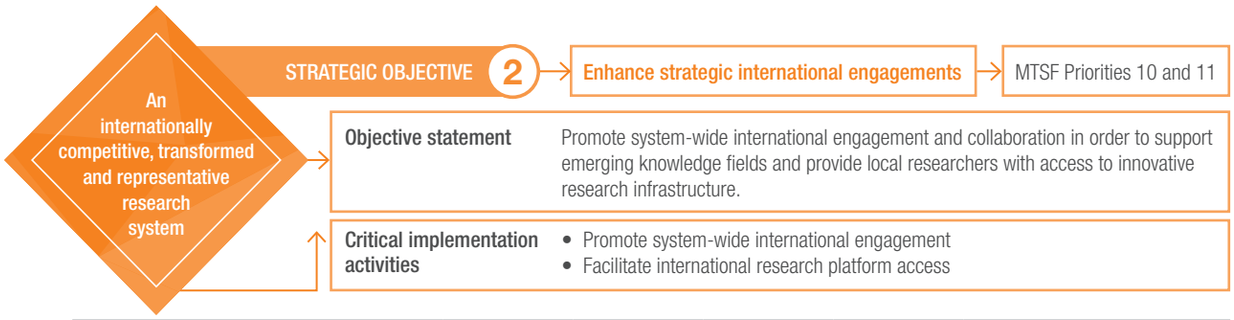
The 2016 Annual Forum of the **Science Granting Councils Initiative** (SGCI) was held in Maputo, Mozambique (23-25 November 2016) in collaboration with Mozambique's National Research Fund, the NRF, and the African Union Commission-New Partnership for Africa's Development under the theme: 'Investing in research excellence in Africa'. The forum was held alongside the 2016 regional meeting of the Global Research Council.

The 2016 **Global Research Council Africa Regional Meeting** took place in parallel to the SGCI, along with an academic symposium on agricultural innovation in collaboration with the **German Research Foundation**.

The **Southern African Systems Analysis Centre**'s 2017 call for PhD scholarships was launched on 15 September 2016. Twenty doctoral students were awarded PhD scholarships on different themes within a systems analysis framework.

The NRF successfully supported the hosting of the **2016 Science Forum South Africa**. The forum serves as a large, open, public platform for debating the science and society interface. The event took place on 8 and 9 December at the CSIR International Convention Centre, Pretoria.

Table 13: Performance against strategic objective 2 – 2016/17



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Number of active grants emanating from binational, multinational as well as agency-to-agency agreements	1 161[4]	1 277	1 008	-21%	The partner country for DAAD bursaries and scholarships experienced some delays in finalising the administrative obligations required to launch the call. As a result fewer applications were received and uptake ratios were negatively affected.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Internationalisation	170,790	150,109	194,975	44,866	There was a concerted effort to drive activities related to various strategic initiatives. This resulted in a larger expensing (uptake) of awards made in the previous financial year.

4 The indicator was only implemented in the 2016/17 financial year.

9.4 Performance against strategic objective 3: Provide best practice systems in support of grant-making, reviews and evaluation

9.4.1 A system of planning, evaluations and reviews in support of research ratings, institutional and programme reviews and the assessment of funding proposals through a peer-review process

Reviews and Evaluation

The unit facilitates the processes, planning, evaluations and reviews related to individual rating, programme and institutional reviews, including the mandatory NRF five-year review, and peer-review processes through which the organisation awards grants and bursaries.

Rating of researchers

During the 2016/17 financial year, 3 663 researchers were rated through the NRF rating system. Of these, 32% were female and 26% were black, attaining the target set for the year. The NRF is also actively pursuing race and gender representivity in review and evaluation panels. Opportunities are provided for inexperienced members to join panels as observers to build capacity. Representivity of the rating panels is improving as is evident from Figure 19 and Figure 20.

Figure 19: Transformation of rating panel demographics: gender

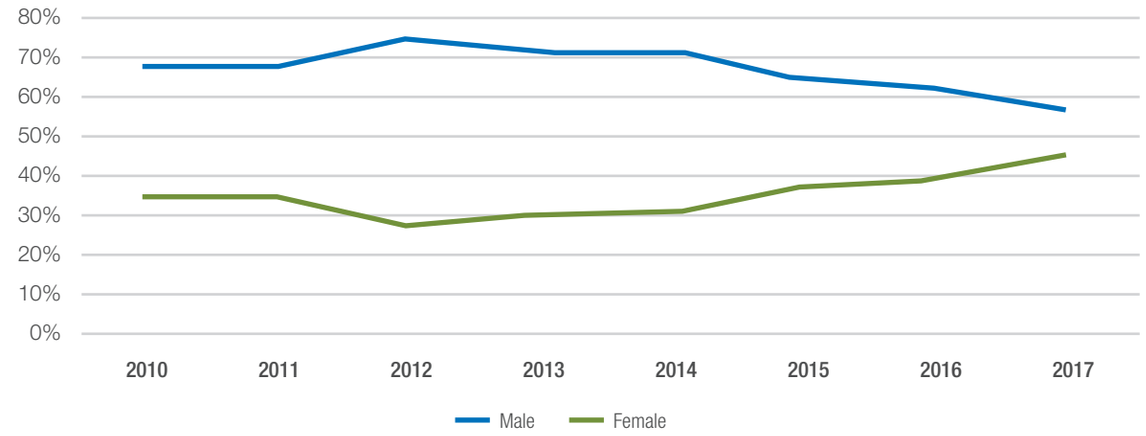
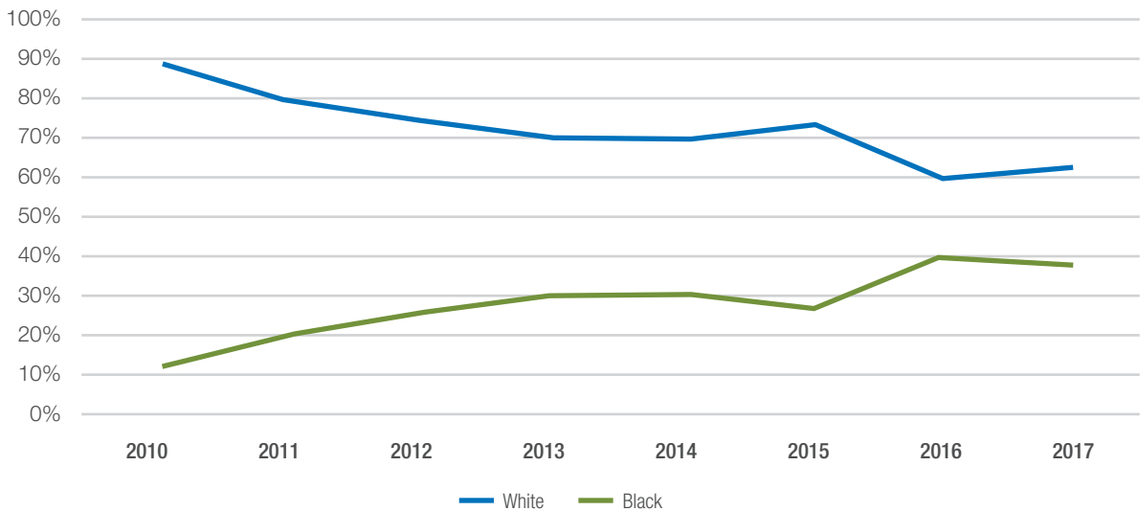


Figure 20: Transformation of rating panel demographics: race



Review of applications

To optimise efficiencies and costs, the unit piloted virtual panel meetings for the review of bursary and scholarship applications. The approach resulted in a cost saving of 75% and has subsequently been adopted as a preferred method where possible. During the reporting period, five more instruments have been selected for virtual adjudication. Further efforts to optimise the review process have been initiated and include the appointment of standing review panels for a specified period with clearly defined terms.

Institutional reviews

The NRF institutional review was concluded in the previous financial year. The final report on the evaluation of the Reference Group was submitted to the Board of the NRF in the second quarter. The Board engaged with the reports and communicated the outcome and actions to the Minister of Science and Technology. NRF leadership has initiated the roll out of the agreed-upon actions.

Evaluation of the Space Geodesy Programme at HartRAO was concluded. The evaluation report as well as the management response has been finalised and adopted.

The French South African Technology Institute proposal for evaluation has been developed. The outcomes of the evaluation will be communicated in the new financial year.

Grant Management and Systems Administration (GMSA)

The centralised GMSA ensures that RISA leverages economies of scale, improves efficiencies and adopts world-class, auditable business processes for managing and awarding grants and bursaries. To optimise efficiencies, the unit initiated rationalisation of different NRF categories of applications with the view to minimise the number of calls in the future. Over 80 different applications were reduced to 13 without losing any content. In addition, a Business Process Mapping Project in collaboration with Unisa commenced to identify areas for improvement. The report will be finalised in the first quarter of the new financial year.

The NRF caters for an over-allocation on grants to mitigate the risk of low uptake and claim ratios by awardees. From Figure 21 it is evident that despite significant over-allocation, there is still under-subscription of grants and bursaries awarded.

Figure 21: Grant claim ratios

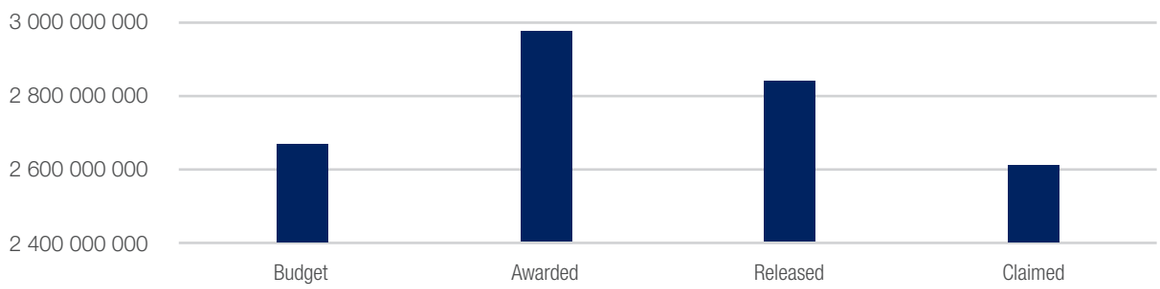


Table 14: Performance against strategic objective 3 – 2016/17

INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Total number of researchers rated by the NRF system	3 369[5]	3 400	3 663	8%	Active campaigns to motivate researchers to request an NRF rating contributed to the target being exceeded.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
RISA Support Systems	58,450	63,517	61,908	1,609	

9.5 Performance against strategic objective 4: Leading-edge research and infrastructure platforms

9.5.1 Provide science infrastructure in priority areas

The NRF facilitates access to global infrastructure such as the European Synchrotron Radiation Facility; the European Centre for Nuclear Research (CERN), which includes the Large Hadron Collider; and the Joint Institute for Nuclear Research (JINR).

A mobility call was launched and 27 students were selected to participate in the 2016 JINR Student Practice. The practice took place during September 2016 in Dubna, Russia. In preparation for the event, students participated in a two-day inception and training workshop that was held at iThemba LABS in Cape Town from 29 August to 2 September 2016.

9.5.2 Incubate, nurture and strategically locate research platforms

The organisation places emphasis on research infrastructure investment in HEIs, and through RISA provides grants that enable researchers to access national and international equipment.

National Equipment Programme (NEP) and National Nanotechnology Equipment Programme (NNEP)

The investment in the NEP has supported the acquisition, upgrade and development of state-of-the-art equipment across the higher education landscape and other public research institutions.

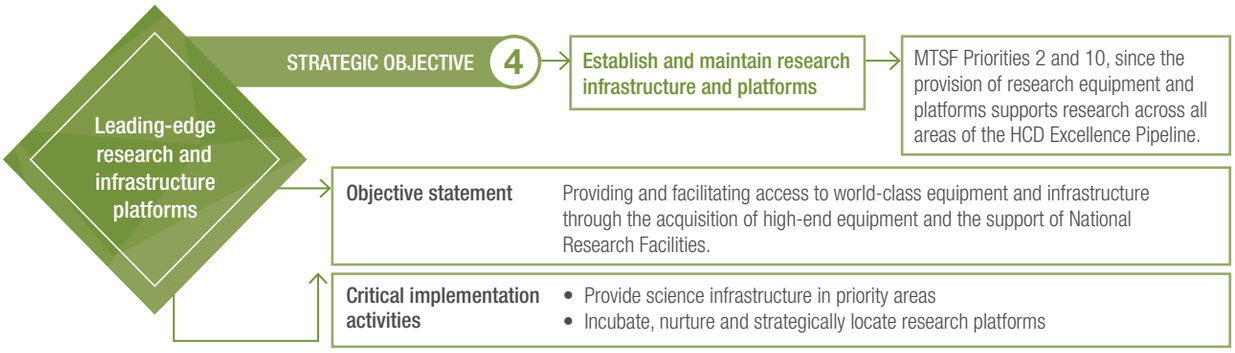
5 The indicator was only implemented in the 2016/17 financial year.

Since the inception of the **NNEP** in 2005, a total of 77 grants have been awarded with a value of more than R250m. The NNEP was discontinued in 2016/17 to allow for the support of strategic research equipment in other emerging research areas beyond nanotechnology. In 2016, three grants were awarded to the value of R146m. On receipt of additional funds from the DST, six additional grants were awarded to the value of R13.8m, resulting in 38 grants being awarded to the value of R160.35m. The demographic profile of grant holders comprises 32% black and 21% female researchers.

A total of 65 applications were received in the 2017 **NEP** call for applications. Of these, seven were rejected at screening and 58 were reviewed. Of the 58 applications that were panel reviewed, a total of 28 applicants were funded, which is reflective of a 48% success rate. Of the 28 grant awards, eight were awarded to black male researchers, one to a black female researcher, 11 to white male researchers and eight to white female researchers.

The new **Strategic Research Equipment Programme** call for research equipment in the R15m to R35m range was initiated. Five Phase 1 applications have been reviewed.

Table 15: Performance against strategic objective 4 – 2016/17



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Number of users of equipment that was funded by the NEP and NNEP programmes	2 360	2 000	2 950	48%	The weakened rand had a negative impact on the NEP programme. Firstly, fewer grants could be awarded due to the higher costs of equipment. Secondly, the extremely volatile exchange rates caused longer than normal lead times in procuring and commissioning equipment. In addition, the 'fees must fall' campaign disrupted activities at the HEIs during two consecutive years. Users were therefore not able to access the equipment during the second semester of the 2015 and the 2016 academic years. Taking these socio-economic challenges into consideration, the targets have been amended for the following financial years as the impact of the forex volatility as well as the university unrest will continue to have a delayed impact on the system.
Number of publications emanating from the use of equipment funded by the NEP and NNEP programmes	1 105	2 300	779	-66%	

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Platform and infrastructure provision	251,520	382,682	345,366	37,316	

9.6 Special projects

The NRF is the custodian of the following special projects through Programme 3:

- Research Information Management System; and
- DST/NRF Internship Programme.

9.6.1 Research Information Management System (RIMS)

Over the financial year, the NRF and DST assessed the sustainability of the RIMS project and specifically the InfoED-based research administration system. Through a process of consultation with the universities, through the DVCs Forum, the Research and Innovation Strategy Group (RISG) and engagement with USAf, it was decided that support of the research administration system would be discontinued as from 31 March 2017. The NRF worked extensively with the universities and InfoED to support the transition to various university systems or to an InfoED-hosted solution that was offered through a contractual agreement between the individual institutions and the service provider. The RIMS Business Intelligence system has been migrated onto the NRF data platform and continues to be supported by the NRF.

9.6.2 DST/NRF Internship Programme

The DST-NRF Internship Programme serves as an enabling platform that provides accelerated work experience to unemployed graduates in the broader SET disciplines. Within this programme, interns are afforded an opportunity to venture into research management under the banners of the South African Research and Innovation Management Association (SARIMA), and the RIMS sub-programmes. The aim of this programme is to:

- Establish and increase a pool of skilled human resources for the public and private sectors, science councils, science institutions and the broader NSI;
- Provide university graduates and postgraduates with work experience in SET fields commensurate with their qualifications, thus increasing their chances of employment;
- Provide SET graduates and postgraduates with exposure to R&D projects that are critical to the NSI; and to attract them to pursue careers in the NSI; and
- Build capacity in research management at HEIs and research institutions throughout the country.

A total of 733 interns have enrolled into the programme and were placed at various participating host institutions throughout the country to be trained under the guidance of experienced mentors. To date, 96 interns exited the programme to join the workforce and one intern was dismissed after a formal hearing. A total of 116 (16%) interns went on to further their studies and pursue higher qualifications so as to contribute to the knowledge economy. These are funded by the NRF through the Innovation Bursary Scheme. There are also 49 interns who have applied for honours' funding and are still awaiting approval from the various HEIs.

The participation target for black candidates was exceeded by 11% (91% against a target of 80%). Female candidates comprised 71% of the total against a target of 50%. Of the total, 58% were postgraduate candidates against a target of 40%. The target for the placement of graduate candidates was not met at 18% below the target of 60%. This could be attributed to the preference for postgraduate candidates by hosting institutions. The target for placement of people with disabilities was significantly below target as only five (1%) interns with disabilities have been placed in the programme. A total of 514 interns have signed the internship offer for the 2017/18 financial year and will commence participation at various host institutions throughout the country, while the remaining 76 interns are expected to start on 1 May 2017.

SARIMA is partnering with the NRF in building capacity in research management, research support and administration through the internship programme. A total of 74 SARIMA interns based at different hosting institutions attended a two-day basic introduction to research and innovation management.

INTRODUCTION TO NATIONAL RESEARCH FACILITIES

10. INTRODUCTION TO NATIONAL RESEARCH FACILITIES

The National Research Facilities, declared by the Minister of Science and Technology in accordance with the NRF Act, are created to provide a critical mass of equipment, cutting-edge platforms, unique technologies, and researchers in support of domain-specific research, human capacity development, and knowledge generation.

The main criteria for the establishment of National Research Facilities are:

- A unique position in the South African knowledge production;
- Offer of core technologies, research methodology or data pools/collections should live up to international standards;
- Goals should be well-aligned with the overall objectives of the NSI, especially with regards to the diffusion of new knowledge;
- A critical mass of equipment, skills and users;
- Potential for networking and for attracting international collaborators to South Africa;
- Ability to provide opportunities for human resource development with special efforts to involve researchers from formerly disadvantaged communities; and
- The ability to provide opportunities for the advancement of science and for the interface between science and society (Please refer to Programme 2 for details).

The National Research Facilities support the National Research and Development Strategy by exploiting geographic and knowledge advantage areas that are unique to southern Africa. The facilities provide unique and cutting-edge research platforms through a network of distributed institutions. They support research of strategic importance and provide national and international researchers access to 'big science' infrastructure to aid research, and contribute to the NRF strategic goal of growing a representative research workforce through focused HCD initiatives. It is through these facilities that South Africa can compete and cooperate effectively with international counterparts in the selected strategic research areas.

The education and training mandates of the facilities enrich and empower individuals to function as productive knowledge workers. Programme 4 represents National Research Facilities in the nuclear sciences (iThemba LABS) and biodiversity and environmental sciences (SAIAB, NZG and SAEON). Programme 5 represents the National Research Facilities in astronomy, including SAAO and HartRAO, as well as the SKA-SA project.

PROGRAMME 4:
NATIONAL RESEARCH FACILITIES EXCLUDING ASTRONOMY

11. PROGRAMME 4: NATIONAL RESEARCH FACILITIES EXCLUDING ASTRONOMY

11.1 Situational analysis

SITUATIONAL ANALYSIS

The National Research Facilities of Programme 4 provide cutting-edge research platforms for Nuclear, Biodiversity, Environmental and Conservation Sciences.

OPERATIONAL DIVISIONS

iThemba LABS	iThemba Laboratory for Accelerator Based Sciences
NZG	National Zoological Gardens of South Africa
SAIAB	South African Institute for Aquatic Biodiversity
SAEON	South African Environmental Observation Network

PERFORMANCE

The National Research Facilities of Programme 4:

- Promote globally competitive research and innovation;
- Enhance strategic international engagements; and
- Establish and maintain research infrastructure and platforms.

The National Research Facilities of Programme 4 are uniquely positioned to contribute to the objectives of the NSI through knowledge production and the provision of cutting-edge platforms for unique technologies in support of domain-specific research and development. These National Research Facilities provide a critical mass of equipment, skills and users and are well positioned to attract international collaboration in the areas of biodiversity, conservation and nuclear sciences. The unique position, core technologies, unique skills and users and alignment to national goals are outlined below:

iThemba Laboratory for Accelerator Based Sciences (iThemba LABS)

iThemba LABS is the premier sub-atomic particle accelerator laboratory on the African continent and the only facility of its kind in the southern hemisphere. The facility contributes to the NSI through the provision of unique research infrastructure platforms supported by highly skilled scientists, and operations staff. The research agenda of the facility is based largely on the separated sector cyclotron (SSC), a particle accelerator that produces particle beams for research and the production of radioisotopes.

National Zoological Gardens (NZG)

The NZG specialises in terrestrial wildlife biodiversity. The NZG's activities include a living animal collection comprising 538 species and subspecies. It is well placed as an education and awareness platform for educators, learners, and the general public through its animal and plant collections.

South African Institute for Aquatic Biodiversity (SAIAB)

SAIAB is a globally competitive research platform in the area of aquatic biodiversity and ichthyological research. The facility serves as a hub for national and international scientific engagement across the full spectrum of aquatic environments, from marine offshore to continental freshwater catchments. SAIAB is also home to the DST/NRF flagship African Coelacanth Ecosystem Programme (ACEP).

South African Environmental Observation Network (SAEON)

SAEON is a business unit of the NRF and serves as a national platform for detecting, translating and predicting environmental change through scientifically designed observation systems and research. SAEON collects and makes long-term datasets freely accessible to the global research network. SAEON has six nodes dispersed geographically across the country that accrue public value through long-term multidisciplinary environmental observation programmes and platforms designed to clarify Earth system dynamics and changes over multiple scales. SAEON is also responsible for an extensive science engagement programme in the communities within which it operates.

11.2 Performance against strategic objective 1: Promote globally competitive research and innovation

11.2.1 Increase and provide support for human capacity development

The National Facilities of Programme 4 supported 554 postgraduate students against a target of 420. The target of 1 164 users of the National Facilities' platforms was achieved as well.

Over the reporting period, 93 postgraduate students from 10 different universities were supervised/co-supervised by SAEON staff. Seventeen interns were mentored as part of SAEON's science and data information management programmes.

SAIAB continues to drive transformation within its student cohort and externally through the SAIAB-DST initiative, the ACEP Phuhlisa Development Programme. The programme supported 24 honours students, 25 master's students and three PhD students during the year. In addition, a collaborative transformation initiative was established with the Water Research Commission (WRC) and three historically black universities (Venda, University of Fort Hare [UFH] and UWC). The project is funded (R1.5m) by the WRC and links long-term monitoring to BSc Honours courses at the universities, with SAIAB providing infrastructure and expertise. The facility further supports 64 students through the SAIAB Postgraduate School. Eight interns were mentored during the reporting period.

11.2.2 Support multidisciplinary research and innovation

The National Facilities of Programme 4 published 321 publications with a normalised citation impact of 1.32, significantly improving on the 278 publications with a normalised citation impact of 1.25 achieved in the previous financial year.

Nuclear Physics

Dr Faïçal Azaiez was appointed Managing Director of iThemba LABS with effect from 1 April 2016. In his first year in office, he started the process of developing a long-term plan for the facility. The plan prioritises globally competitive research and human capacity development through infrastructure renewal.

Over the reporting period, the synthesis of 60-Nickelocene[6] was developed in the iThemba LABS target laboratory as part of a PhD project. Metallocenes from enriched materials will allow for new ion beams with intensities not possible before. This achievement was a result of dedicated staff development efforts at iThemba LABS.

iThemba LABS has won the bid to host the 22nd International Conference on Cyclotrons and their applications in South Africa in 2019. The conference is held every three years with more than 150 scientists from all over the world as well as manufacturers of accelerators and related equipment, to discuss progress in cyclotron technology and their applications in research, technology and industry. iThemba LABS previously hosted the 14th Conference in Cape Town in 1995, where the opening address was delivered by the late President Nelson Mandela.

Conservation and Biodiversity

Researchers at the NZG detected the canine parvovirus in a cheetah. This is the first time the disease has been detected in South Africa and this will influence future vaccination protocols for captive cheetahs in the country.

The Research and Scientific Services Department at the NZG hosted the 7th Annual NZG Research Symposium in November 2016. The annual event showcases research programmes in biodiversity conservation and also provides a platform for researchers to present their research projects. The Executive Director of the Pan-African Association of Zoos and Aquaria (PAAZAB) emphasised the importance of zoos and aquariums in linking *ex-situ* to *in-situ* conservation.

NZG contributes to end illegal wildlife trade

The NZG is a key role player in inter-connecting wildlife forensic science in Africa and Southeast Asia. A recent meeting at the facility brought together wildlife forensic DNA scientists from South Africa and Southeast Asia to strengthen collaborative efforts to end the illegal wildlife trade.

The meeting, funded by USAID through the Wildlife TRAPS programme, was organised by the TRACE Wildlife Forensics Network, the NZG and TRAFFIC, and coincided with another workshop on rhino DNA forensics in Pretoria.

The NZG showcased its new wildlife DNA forensics facility. An African reference DNA project (AFRef) is to be established as part of the Wildlife Forensics/Genomics platform of the NZG with support from TRAFFIC (strategic partner) and TRACE Wildlife Forensics Network with the objective of producing reference cytochrome b DNA samples for African species that could potentially be used in the illegal wildlife trade in Southeast Asia, or be similar to species traded in that region. The DNA sequence data produced and analysed at the wildlife DNA forensics laboratories at the NZG will be shared with the enforcement DNA laboratories from Thailand, Malaysia, Indonesia and Vietnam as part of a collaborative effort to reduce the illegal wildlife trade and prosecute offenders.

6 The production of Nickel-ion beams with the Metal Ion from Volatile Compound (MIVOC) method was investigated. At first, commercial Nickelocene (Ni(C5H5)2) with natural abundance was used and an intensity of 22 micro A of 58Ni8+ could be obtained. The mass-to-charge ratio spectra show the existence of 60Ni and 62Ni ions corresponding to the natural abundance of 26 and 3.6%, respectively. Next, the generation of Nickel-ion beams from in-house produced 99% enriched 60-Nickelocene was investigated. The mass-to-charge spectra showed that the beam (beside of Hydrogen, Carbon and Oxygen content) consists of only 60Ni ions. The beam intensity for 60Ni8+ was 35 micro A.

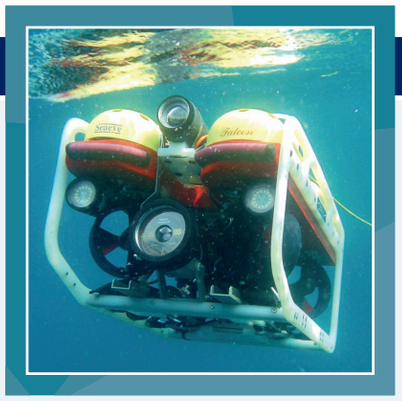
Chain of custody sampling training was conducted at the NZG and included the National Prosecuting Authority, DEA, South African Police Service, and SANBI. The training informed veterinary and conservation professionals on the correct protocols to be observed when collecting samples of species that are of national importance.

Researchers from the NZG participated in an international study on black rhinos. The study, published in Nature Scientific Reports, has found that there has been a staggering loss of 69% in the species' genetic variation. The study compared the DNA collected from specimens housed in museums around the world and animals in the wild. It was found that there is a decline in genetic diversity, with 44 out of 64 genetic lineages no longer existing. Black rhinos have already been hunted to extinction in many parts of Africa: Nigeria, Chad, Cameroon, Sudan and Ethiopia, to name a few. This species is found in only five African countries: Tanzania, Zimbabwe, Kenya, Namibia, with the majority of animals being in South Africa.

Research in aquatic biodiversity (SAIAB) contributes to maintaining sustainable reef ecosystems and fish resources balanced with societal needs. A manuscript on fish biomass and productivity in estuaries has been published in the Journal of Fish Biology. This is the first of its kind globally and will enable the fishery value of estuaries to be quantified. This is of importance to fisheries departments and conservation management authorities.

SAIAB is contributing extensively to the Department of Environmental Affairs: Oceans and Coasts section in the draft Marine Spatial Planning Bill. Research conducted at

SAIAB's Phakisa undertakes maiden voyage – Imida Frontiers Project



During the reporting period, SAIAB launched the Imida Frontiers Project: The first dedicated surveys of the continental shelf in the Amathole region (the 1938 coelacanth capture site). This area over the narrow continental shelf between the Great Fish and Kei Rivers is a hotspot for endemic marine species and a site of considerable interest for submarine mining and small-scale fisheries alike. This area was previously inadequately researched due to difficult diving and vessel accessibility.

The ACEP project, *Imida*, combines geological, oceanographic and ecological studies to investigate and characterise these poorly known marine habitats and provide information for marine spatial planning and sustainable management of marine living resources. After three weeks of working under difficult sea conditions, 34 hours of remotely operated vehicle (ROV) footage provided a visual account of previously unknown cold-water coral reefs and rhodolith beds, colourful nodules of encrusting marine algae. The ROV dives discovered several unique habitats that are of importance to a number of ecologically sensitive marine fish and invertebrate species. This opens up a completely new window to South Africa's eastern shelf edge.

The ground-breaking research was made possible with the newly commissioned research vessel, Phakisa – custom built to allow remotely operated underwater camera observation work in difficult, strong current conditions.

National Research Facilities can inform legislation and policy to enable positive change to the environment and ecological sustainability.

Data collection protocols and management of data are critical to Earth observation sciences. SAEON was the first African member of DataCite two years ago, and has since implemented unique identity datasets through the Digital Object Identifier system.

The third National Conference on Global Change was attended by 350 postgraduate students, academics and researchers from multiple disciplines and universities across the country, as well as relevant government officials. Their purpose was to explore innovative solutions for complicated global challenges facing southern Africa around climate, water, food security, pollution, the environment, transformation, health and similar topics. The conference forms part of the DST's Ten-Year Innovation Plan grand challenges and was co-sponsored by the NRF.

SAEON further contributed to the grand challenges through the BioEnergy Atlas for South Africa that was officially launched on 24 March 2017. This public resource is aimed at supporting the development of bioenergy. Bioenergy assessments have been characterised in the past by a lack of quality data, an over-emphasis on potentials and availability studies instead of feasibility assessment, and lack of comprehensive evaluation in competition with alternatives – both in competing bioenergy options. The BioEnergy Atlas addresses some of these deficiencies, and identifies specific areas of interest where future research and effort can be directed.

The SAEON Agulhas System Climate Array (ASCA) launched its second research cruise. Instruments were placed at a depth of 4 km in the world's fastest flowing current. The cruise hosted 90 scientists, students and technicians and served as education platforms for learners and research students. The objectives of the cruise were to conduct a high-resolution survey of conductivity, temperature and depth (CTD) profiles; and collect nutrient and biological samples. The CTD survey was run in conjunction with a Bongo net survey at and between each station.

The recently signed memorandum of understanding between the SKA SA and SAEON recognises the alignment of SAEON's observational and research mandate, which addresses the SKA SA's needs for environmental management information. The research at the SKA SA site will be integrated into the broader SAEON research and monitoring strategy.

In response to SAEON's objective to contribute towards strengthening the science-society and policy interface locally and internationally, the facility has embarked on several projects and programmes that will increase the role of scientific observations as a valuable contribution to local and international policy.

SAEON was elected to host two projects of the SARIR Map – the Expanded Terrestrial and Freshwater Environmental Observation Network, and the Shallow Marine and Coastal Research Infrastructure. Work plans, budget estimates and collaboration requirements are being finalised between the facility and the DST.

Transdisciplinary research

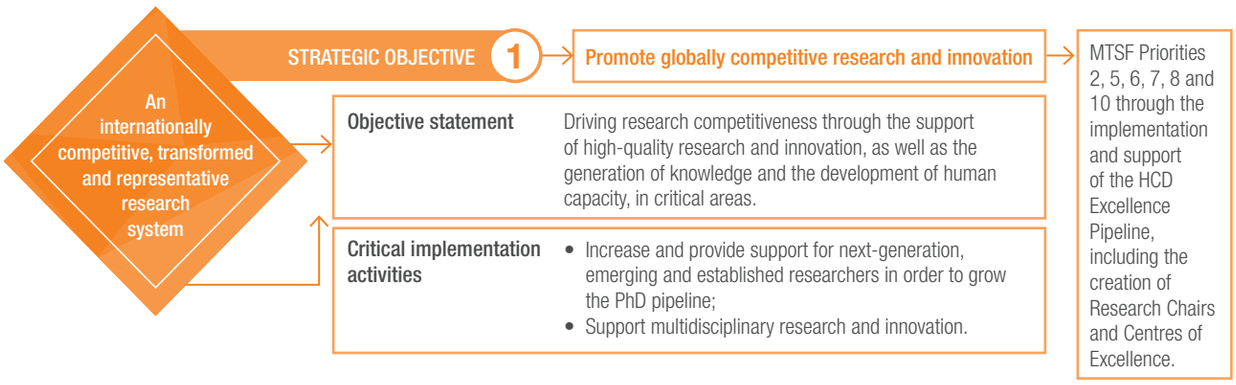
In support of a globally competitive research agenda, and the risk mitigation strategy related to ageing infrastructure, iThemba LABS has adopted an ambitious plan to create a centre for rare isotope production and research. The project, which is in its infancy, will be executed through the acquisition of a new 70 MeV cyclotron, and is based on two distinct but equally important phases, namely:

- The establishment of the Accelerator Centre for Exotic Isotopes (ACE Isotopes), which will allow for the migration of the radioisotope production programme from the existing particle accelerator (the SSC) to the proposed new 70MeV cyclotron. This will then release capacity on the existing SSC to be entirely devoted to the transdisciplinary research agenda of the facility, which will thus meet the requirements of its national and international stakeholders.
- The development of the Accelerator Centre for Exotic Beams (ACE Beams), which will support the production of artificial radioisotopes in support of the expanded research agenda in this area. The production of 'exotic beams' (artificial radioisotopes) will invigorate basic and applied research from innovative cancer therapy treatment modalities to understanding the origin and creation of chemical elements in the universe.

This is an ambitious initiative that will accrue benefits to the country and the world by supporting the leap into the innovative aspects of subatomic physics. Through the production of exotic isotopes, for research into targeted treatments, and early detection of cancers and other ailments, the Facility will contribute directly to addressing the national health challenges.

The expanded research agenda through the introduction of exotic beams will place the Facility at the forefront of research and allow the South African and African research community to further research in the areas of energy sustainability, bio-economy, material science, and astronomy while still pursuing new and exciting fields of sub-atomic research. The project creates endless possibilities for the National System of Innovation. Multi- and transdisciplinary research will support the creation of a vibrant and exciting discourse between researchers and research communities.

Table 16: Performance against strategic objective 1 – 2016/17 (Programme 4)



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Number of postgraduate students supported by the National Research Facilities	460	420	554	32%	The variance is due to higher than anticipated enrolments at all facilities, increase in supervisory capacity at SAEON through PDP postdocs and inclusion of UWC and UniZulu students in ACEP, which is a recent initiative at the request of the DST.
ISI publications at the National Research Facilities	278	210	321	53%	Earlier than anticipated publications which were submitted last year. 25 RSA-CERN papers were published and the submission and publication of these papers cannot be fairly estimated due to the extremely large number of collaborators.
Number of users of National Research Facilities	1 223	1 164	1 168	0%	
Citation impact of National Research Facility outputs (annual cumulative)	1.25	>2	1.34	-33%	A greater than 2 citation impact is an aspirational target, given that the global benchmark is 1. Though the facilities strive to reach the target, 1.34 is a very good result.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Globally competitive research	151.63	138,305	166,777	28,472	The variance is due to a general increase in running expenses arising from prior year commitments, as well as initial start-up costs for the two SARIR projects at SAEON.

11.3 Performance against strategic objective 2: Enhance strategic international engagements

11.3.1 Promote system-wide international engagement and exploit international research platform access

The National Research Facilities promote international collaboration across the NSI and facilitate access to global and local research platforms. During the reporting period the facilities of Programme 4 participated in the following international activities:

Nuclear Physics

Research collaborations between the Botswana International University of Science and Technology (BIUST) and iThemba LABS are ongoing. BIUST intends to join the very successful MANuS (Master's Degree in Accelerator and Nuclear Science)/ MatSci (Master's Degree in Material Science) school hosted as a collaboration between iThemba LABS, UWC and UniZulu. The collaboration will allow for the sharing of supervisory capacity and resources as well as promoting joint projects and joint appointments.

iThemba LABS coordinated the SA-JINR Student Practice that allowed South African students to spend three weeks at the JINR laboratories in Dubna. Students participated in projects supervised by the JINR researchers. The goal of the initiative is to build critical mass of appropriate skill that can later advance research in the various nuclear activities offered by JINR to the benefit of South Africa.

The facility hosted the 28th World Conference of the International Nuclear Target Development Society. This was the first time that the conference was held on the African continent. The decision to hold the conference at iThemba LABS recognises the facility's contributions to research and development in this area. Some of the key outcomes of the conference included training opportunities for young South African scientists at some of the major laboratories in Europe and the United States of America, and the exposure of local students to experts in the field.

Conservation and Biodiversity

The NZG participates in various global conservation workshops, symposia and conferences. During the reporting period Dr Ian Espie, Chief Veterinarian, attended the South African-Kenya joint research programme workshop and presented on the progress of collaborations between the countries with respect to the ecotoxicology project.

The facility also contributed to the revised conservation assessment on the biodiversity management plan for African penguins, initiated by the International Union for Conservation of Nature (IUCN). At the 71st World Association for Zoos and Aquariums conference in Mexico, the NZG discussed its role in combating wildlife trade, and its contribution to Species360 and other conservation initiatives.

In 2016/17, SAEON staff served on 29 international and 53 local scientific committees and working groups (e.g. the Southern African Science Service Centre for Climate Change and Adaptive Land Management; the Indian Ocean Rim Country Academic Group ; the Afromontane Research Unit Advisory Board and the National Spatial Planning Data Repository).

SAEON hosted the 2016 International Long-Term Ecological Research Network (ILTER) open science meeting at the Kruger National Park. The meeting was attended by more than 300 delegates from various countries, including China, Japan, Mexico, Spain, Germany and the United States of America. During the conference, delegates explored opportunities for collaboration between a range of environmental research organisations, networks and initiatives including: the Intergovernmental Platform on Biodiversity and Ecosystem Services; the Global Land Project; the International Nitrogen Initiative; Future Earth; the Group on Earth Observation and related initiatives (GEOBON, GCOS); the World Network of Biosphere Reserves (UNESCO WNBRs), and the Programme on Ecosystem Change and Society (ICSU-PECS). ILTER field trips were facilitated to the SAEON nodes to showcase the capabilities of the facility.

SAIAB is actively involved both regionally and internationally at a number of levels which include active research collaborations (both formal and informal), international workshops and conferences, international organisation representation, editorships of international journals and research visits.

Table 17: Performance against strategic objective 2 – 2016/17 (Programme 4)

INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Number of joint international agreements at the National Facilities	67	62	56	-10%	The underperformance is due to SAEON hosting the ILTER conference with representatives from across the globe. This key engagement resulted in fewer individual engagements.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Internationalisation	11,415	11,415	15,786	4,371	The overspend can be ascribed to the fluctuations in the exchange rate.

11.4 Performance against strategic objective 4: Establish and maintain research and infrastructure platforms

11.4.1 Provide science infrastructure in priority areas

Core to the success of the National Research Facilities is the provision of unique research infrastructure platforms.

Nuclear Physics

Over the reporting period, iThemba LABS:

- Upgraded infrastructure by installing a central cooling water plant. The system is performing within specification, and measurements and monitoring of plant operations show a substantial increase in plant efficiency. Instantaneous power usage has dropped by an average of 200 kW which, under the current operating schedule, equates to an annual saving of 1 500 MWh (R1.35m or 6% of total annual electricity expenses).
- Secured funds for a Dual Electron Beam Deposition System for the Materials Research Department. A state-of-the-art ultrahigh vacuum evaporator system will replace a 40-year-old e-beam evaporator system. The availability and use of the dual e-beam system for thin film deposition will be an essential addition for the success of high-impact materials research and skills development. Projects related to nanotechnology where nano-structured materials can be synthesised will be of national importance for technological applications such as in renewable energy or platinum metals beneficiation.
- Secured funding (R5,5m) for the LaBr3:Ce detectors to support the African LaBr Array project. This project, to some degree, directly mitigates the risk associated with beam scarcity at iThemba LABS affecting researchers and students. Approximately 2 200 hours beam time is available for research annually. A typical MSc project in experimental nuclear physics requires approximately 100 hours of beam time while PhD projects are of the order of 200 to 300 hours. The limited beam time places the research work of students at risk and is detrimental to achieving the goal to increase the number of graduate students. The acquisition of the LaBr3 detectors presents a solution that will be implemented within a few months, alleviating the shortage since some beam time requests may be cut in half while at the same time new high-impact measurements will become available.

The facility has designed and built a Digital Low-Level Radio Frequency system with a stable control of the amplitude and phase of the radio frequency (RF) system, which is critical to the operation of cyclotrons and similar specialised equipment. Cyclotrons require optimal RF systems as it directly influences system performance, operability, reliability and beam quality. After successful performance and operational reliability tests, two digital RF systems were installed during the midyear shutdown. The systems have worked reliably. Five international laboratories have already indicated an interest in implementing the new control system with their nuclear accelerators. This is a prime example of the translation of basic to applied research in a multidisciplinary environment.

Conservation and Biodiversity

The NZG is developing several species specific, single nucleotide polymorphism panels for flagship wildlife species, such as critically endangered pangolins, penguins, sungazers, and the white-winged flufftail.

SAIAB has been collaborating with the Department of Agriculture, Forestry and Fisheries and the UFH to expand the existing shallow-water stereo-baited remote underwater videos' remote optical platform. The refurbishment of the second floor of the Collections building will be completed during the current financial year. Collections from Angola have been catalogued, while those from the Okavango are in progress. The enhanced sequencing capabilities of the Molecular Genetics Laboratory have led to discussions with Rhodes University to develop a Genomics "hub". SAIAB's new research coastal craft, Phakisa, is on the water and undergoing sea trials.

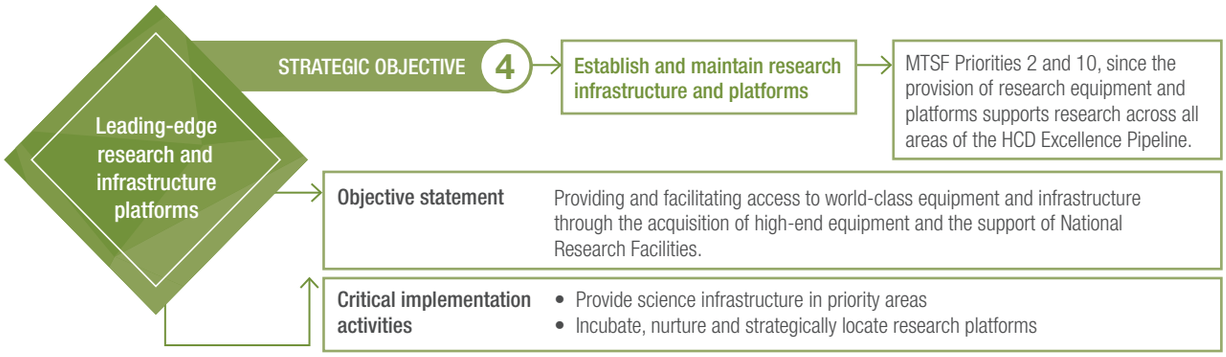
The Acoustic Tracking Array Platform (ATAP) continues to grow and a major tagging effort has been initiated to ensure that the receivers are used optimally. A new telemetry study was initiated in St Joseph Atoll in the Seychelles, and funding was secured from the Strategic Research Infrastructure Grant to refurbish and replace equipment on the ATAP platform.

Utilising research vessels, the uKwabelana and the newly commissioned Phakisa, various science projects have been facilitated. These research infrastructure crafts have undertaken 68 trips with 108 researchers and students participating in the research endeavours.

The research platforms at SAEON remain fully subscribed with the strategic infrastructure grant allowing for the successful expansion of the remote observation platform to 67 observation sites, spanning both terrestrial and marine locations. During the reporting period, SAEON placed research instruments at environmental extremes of 3 000 m above sea level and 4 000 m below sea level. The expansion of arrays of instrumentation for environmental monitoring and research has increased the user base, and makes SAEON an integral component of the global Earth observation network.

The SAEON Arid Lands Node installed a network of temperature i-buttons on and around the Compassberg. With CO_2 and temperatures going up, the i-buttons will determine which way the rainfall will go. Not only is this mountain the highest point of the Karoo (altitude 2 502 m), but also perhaps the wettest.

Table 18: Performance against strategic objective 4 – 2016/17 (Programme 4)



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Total infrastructure investment in the National Research Facilities (Rm)	87.00	73.84	134.94	83%	Due to long lead times of some infrastructure renewal projects, milestones were delayed in the prior year and realised in the current year.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Establish and maintain research infrastructure and platforms	293,790	331,414	347,346	15,933	The over-expenditure is due to new funding for infrastructure projects at iThemba LABS and SAEON, as well as the acquisition of a new online booking system at the NZG.

PROGRAMME 5:
NATIONAL RESEARCH FACILITIES – ASTRONOMY INCLUDING SKA SA

12. PROGRAMME 5: NATIONAL RESEARCH FACILITIES – ASTRONOMY INCLUDING SKA SA

12.1 Situational analysis

SITUATIONAL ANALYSIS

The National Research Facilities and the SKA SA project in Programme 5 provide cutting-edge research platforms for multiwavelength astromony.

OPERATIONAL DIVISIONS

HartRAO	Hartebeesthoek Radio Astronomy Observatory
SAAO incl. SALT	South African Astronomical Observatory including the Southern African Large Telescope
SKA SA	Square Kilometre Array South Africa

PERFORMANCE

The National Research Facilities – Astronomy including SKA SA:

- Promote globally competitive research and innovation;
- Enhance strategic international engagements; and
- Establish and maintain research infrastructure and platforms.

The National Research Facilities and the SKA SA project of Programme 5 are uniquely positioned to enhance the NSI through knowledge production as well as the provision of cutting-edge platforms for unique technologies in support of domain-specific research and development. These business units provide a critical mass of equipment, skills and users. The unique position, core technologies, unique skills and users and alignment to national goals are outlined below:

Hartebeesthoek Radio Astronomy Observatory (HartRAO)

HartRAO focuses its research agenda on stellar evolution, pulsars and masers. The space geodesy research uses space-based techniques to study the earth and contribute to both astronomy and the earth system sciences. The facility is also used by university students for carrying out research, and it undertakes science awareness programmes for schools and the general public.

The South African Astronomical Observatory (SAAO)

SAAO is the national centre for optical and infrared astronomy in South Africa. Its primary function is to conduct fundamental research in astronomy and astrophysics. SAAO operates the Southern African Large Telescope (SALT), located at its site near Sutherland, on behalf of an international consortium and promotes astronomy and astrophysics in southern Africa.

Square Kilometre Array South Africa (SKA-SA)

The SKA project is an international effort to build the world's largest radio telescope, with about a square kilometre (one million square metres) of collecting area. The scale of the SKA represents a huge leap forward in both engineering research and development towards building and delivering a radio telescope, and will deliver a correspondingly transformational increase in science capability when operational. Deploying thousands of radio telescopes, in three unique configurations, it will enable astronomers to monitor the sky in unprecedented detail and survey the entire sky thousands of times faster than any system currently in existence.

12.2 Performance against strategic objective 1: Promote globally competitive research and innovation

12.2.1 Increase and provide support for human capacity development

During the period under review, the National Facilities of Programme 5 supported 112 postgraduate students. The programme employed interns from the DST's Internship Programme for a period of a year in various science and science-related disciplines.

HartRAO supervised eight MSc (two astronomy, five geodesy, one engineering) and 13 PhD candidates (four astronomy students and nine geodesy students). Two MSc students and one PhD candidate from Ghana are being co-supervised by HartRAO staff in association with the African Very Long Baseline Interferometry (VLBI) Network (AVN) project. Five engineering interns (three Durban University of Technology, one Central University of Technology, one Tshwane University of Technology) continued their training in electrical engineering. The process of establishing a joint SARChI chair in VLBI with the University of Pretoria (UP) is ongoing and will be finalised in the first quarter of the new financial year.

The SA-UK collaboration with HartRAO to provide radio astronomy training for development in Africa as part of the AVN provided 10 computers to each of the AVN partner countries' training centres. The 10 computers for Namibia (Windhoek) have been installed, with 20 students receiving training at HartRAO. The students were from Namibia, Zambia, Botswana and South Africa. International lecturers from Spain, the United States of America (NASA, JPL) and Austria participated.

The National Astrophysics and Space Science Programme (NASSP) and the SKA SA HCD Programme have successfully trained students, researchers and engineers in support of astronomy. NASSP has been expanded to a three-node network from the 2016/17 financial year onwards, with UCT being joined by North-West University and the University of KwaZulu-Natal (UKZN). The programme also includes students from other African countries.

An SAAO astronomer was awarded the Silver Jubilee Medal for outstanding achievement by a younger physicist who has excelled in the areas of physics: research, education, technology and industrial development.

The SKA SA HCD Programme recently celebrated its 10th anniversary. Over the past 10 years, more than 800 university academics, researchers, students and artisans have been funded. The first SKA SA-funded artisan student to qualify was employed by SKA SA Site Operations. Two more students (an electrician and a boilermaker) took their trade tests in September

2016. Ten students passed the Further Education and Training bridging course and started their N1 in May 2016, while two students passed N2 and commenced their N3.

12.2.2 Support for multidisciplinary research and innovation

A team of SAAO astronomers observed a nova event (first witnessed in Chile by Polish astronomers). The spectral evolution was studied while simultaneously following up with observations from the Las Cumbres Observatory Global Telescope (LCOGT) and infra-red observations using the Japanese-South African Infrared Survey Facility (IRSF) telescope, both hosted in Sutherland. The spectroscopy confirmed the nova explosion, but the photometric Optical Gravitational Lensing Experiment, IRSF, and LCOGT data indicated a combination of signatures and features from different novae classes. In addition to this unique discovery, the nova is believed to be located in the Sagittarius dwarf spheroidal galaxy, a dwarf satellite companion to our Milky Way. This is the first nova explosion ever discovered in a dwarf spheroidal galaxy. The discovery will contribute significantly to further understanding nova explosions and the post-explosion behaviour of such systems.

The robotic telescope, Kilodegree Extremely Little Telescope (KELT-South), was used in the discovery of planet KELT-10b, with a mass 30% less than Jupiter but 40% larger in radius. The planet is less than one third the density of water and orbits its host star once every 4.2 days. KELT-10b's host star is slightly hotter and larger than the Sun and although it is too dim to see with the naked eye, it is visible with a pair of binoculars. What makes KELT-10b especially interesting is that it has a very strong transit signal. That makes it a valuable target for further investigation with large telescopes like SALT in determining the composition of the planet's atmosphere as well as how heat is transferred from its star to the planet's lower gas layers and around to the back of the planet through winds.

Dwarf Stars – the revenge of the 'degenerates'

SAAO researchers in collaboration with UK astronomers published a joint paper on the discovery of a bizarre binary star system where a degenerate white dwarf pulsar is 'lashing' its red dwarf companion with its strong magnetic field and beamed radiation every minute as it spins on its axis. This discovery of strongly polarised pulsed optical emission from a white dwarf, a so-called degenerate star, in the binary system known as AR Scorpii, establishing it to be a white dwarf pulsar, follows an earlier publication by the UK co-authors from the University of Warwick concluding that the system was dominated by non-thermal emission, characteristic of pulsars. The current paper firmly establishes the pulsar link with the discovery of pulsed polarisation at extremely high levels, reaching 40%, which is among the highest polarisation levels detected in astronomical objects.

HartRAO is collaborating with the School of Engineering at UKZN to establish a Space Geodesy Centre at the university.

An international collaboration to densify the celestial reference frame (CRF) at 22 GHz, with specific emphasis on the southern hemisphere where K-band CRF coverage is weak, recently yielded the tripling of resolutions. This achievement can contribute to the next generation international standard for determining angular positions in the sky. HartRAO is part of the only array of radio telescopes that can do state-of-the-art work at the 1.2cm wavelength in the far southern hemisphere, thus making this a breakthrough achievement for the South African multiwavelength agenda.

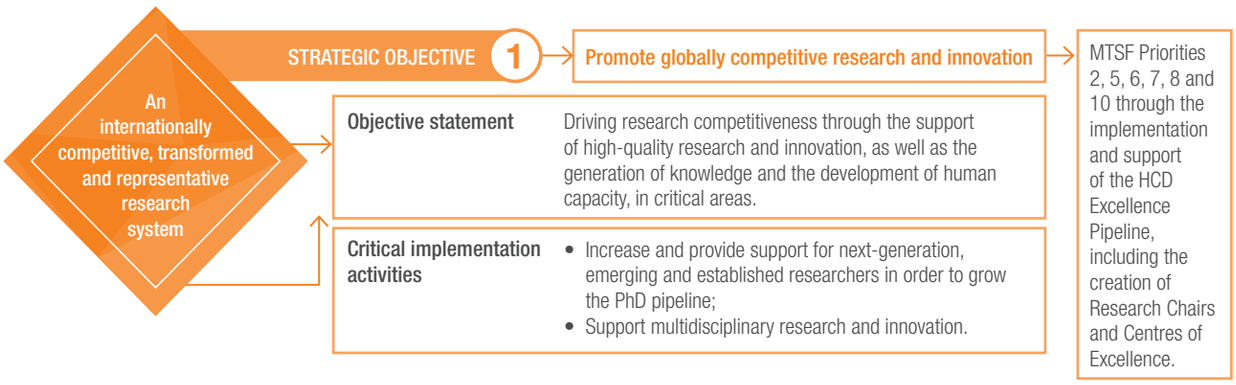
Results from excited hydroxyl (OH) maser searches combined with ongoing methanol/hydroxyl/water maser monitoring programmes have led to the discovery of a massive star that was born on 13 January 2015 (plus/minus five days). HartRAO observed several transitions in all three molecular species brightened at the same time, but it is not clear if the birth was the only factor contributing to this phenomenon. The source, NGC6334F, is being monitored intensely. Also, observations have been completed using Karoo Array Telescope (KAT)-7 (interferometry) at 1.665/7 GHz and LaBr Array (VLBI) at 6.7 GHz. HartRAO will continue to use KAT-7 where opportunities are seen and research can be conducted utilising existing instrumentation (data being processed). Two new 4.660 GHz excited OH maser were detected; only the fifth and sixth ever detected. Follow-up observations indicate that only one other source of the four sources that had previously been detected at 4.660 GHz has excited OH maser emission at this time at 4.660 GHz. These two sources are being monitored. The fifth source exhibits an odd constant velocity drift not yet explained.

A review of the science observations on the KAT-7 has shown that the top fields of research on the system are Fast Transient characterisation, HI nearby galaxy kinematics, OH maser characterisation, extended continuum emission, and continuum polarisation. It is evident that there is still significant science interest in KAT-7. The receivers of the KAT-7 are, however, reaching the end of the lifecycle, and a decision will have to be made on the feasibility of its continuation in the future.

In 2010, an open invitation to the worldwide astronomical community to propose Key Project Science with MeerKAT resulted in 10 Large Survey Projects (LSPs) being approved (each to use more than 1 000 hours of telescope time over five years). Due to the rapid evolution of technology since then, the telescope will be significantly more powerful than anticipated, necessitating updated LSP project plans.

Since MeerKAT has started to collect data more frequently, the data processing systems and infrastructure are being reviewed to ensure optimal scientific value from the telescope. Archiving equipment is being installed from where data will be made available to the scientific community. The SKA SA will form part of a consortium that will set up storage and computing infrastructure in support of astronomy and other science domains. Collaborations with other institutions and organisations such as the Inter-University Institute of Data Intensive Astronomy, IBM Research Africa and IBM Netherlands also contribute to explore and implement data solutions. The African Data Intensive Research Cloud project is progressing rapidly, with a small prototype already operational. International investment will be required for a large roll-out across several SKA African partner countries and into Europe.

Table 19: Performance against strategic objective 1 – 2016/17 (Programme 5)



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Number of postgraduate students supported by the National Research Facilities	109	125	118	-6%	The variance is due to SAAO not being able to support all of the projected students due to an insufficient core grant allocation.
ISI publications at the National Research Facilities	136	140	141	-1%	The variance is due to fewer publications by SKA SA due to shift of focus towards finalising delivery of the dishes.
Number of users of National Research Facilities	137	462	1 293	180%	HartRAO has refined its VLBI tracking system after finalisation of the KPI targets in the APP and is now able to report on the external data users.
Citation impact of National Research Facility outputs (annual cumulative)	1.33	>2	1.32	-34%	A greater than 2 citation impact is an aspirational target, given that the global benchmark is 1. Though the facilities strive to reach the target, 1.32 is a very good result.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Globally competitive research	104,320	117,299	112,176	5,123	

12.3 Performance against strategic objective 2: Enhance strategic international engagements

12.3.1 Promote system-wide international engagement and exploit international research platform access

HartRAO is involved in the planning of a complete MET, Global Navigation Satellite System (GNSS) and seismic installation in Lesotho (Sani Pass). This will facilitate the testing of the site for millimetre astronomy suitability. Discussions were held with the South African National Space Agency (SANSA) on co-locating this station with a Wide Area Augmentation System (WAAS), which will be supplied by SANSA. The SANSA satellite link can be used for data transfer and internet connectivity for the public, hotel, and customs office at Sani Pass.

HartRAO facilitated the visit of distinguished researcher in star-formation from Mexico, Prof. Stan Kurtz, Universidad Nacional de Mexico. Following this collaborative visit, observing proposals have been submitted to various telescopes in Mexico and South Africa. This will contribute to the SA-Mexico collaboration as agreed to by the NRF in November 2015.

The Russian RadioAstron VLBI satellite ground control using the Telkom 18-m antenna collaboration with HartRAO is in progress. A container (control room) has been installed on site close to the antenna. Necessary repairs and replacement of components have been done over the reporting period, including work on the ACU cabinet electronics, replacement of the faulty Heidenhain encoder and the faulty motor tachometer. A PCB is presently being designed. This will be made compatible with the 26-m antenna servo system for upgrading its encoders in due course.

As part of a Dutch-South Africa programme to identify a site for the African Millimetre Telescope that will become part of the burgeoning millimetre VLBI network that will participate in the stated goal of observing the black hole at the centre of the Milky Way (the Event Horizon Telescope project), HartRAO visited the Open University of Dar es Salaam, Tanzania, and made presentations to this university and three others. The Open University has expressed interest in this project and has received government support. This visit will assist them in getting the necessary documentation to place testing equipment on Mount Kilimanjaro.

Various international agreements and collaborations are maintained and explored by SAAO, with among others, China, Sweden, Germany, Scotland, Chile, Canada, Japan, Russia, Nigeria and the United States of America.

SAAO researchers visited the Ultrafast Optics research group at Heriot-Watt University in Edinburgh. The visit revealed various areas of mutual interest and closer collaborations with the institution will be explored. A visit was also made to Durham University and the associated Centre for Advanced Instrumentation to learn how to repair the SALY high-resolution spectrograph (HRS) damaged calibration fibre.

In an effort to advance planetary science in South Africa, SAAO takes advantage of the many telescopes on the Sutherland plateau. The facility is in negotiations with NASA to add the asteroid-hunting ATLAS telescope to the suite of telescopes in Sutherland. In anticipation of the addition, a master's student is being trained to observe and reduce occultation and asteroid data. There is continued involvement with the European AIDA-DART mission to contribute to the international effort to promote planetary science in Africa.

African VLBI Network (AVN) Project

Ghana

Following the achievement of automated rotation of the Kuntunse antenna using the hardware and software designed and developed by the AVN team, the engineering commissioning activities at an integrated systems level commenced during October 2016. Meetings towards the handover and subsequent sustainability of the observatory as well as with the Ghanaian Ministry to start preparations for the launch of the observatory by 2018 took place during the reporting period.

Mozambique

No operators have been appointed for the two-antenna interferometer and 20 PC astrophysics laboratory, yet. Steps towards the relocation of the 7.6m antenna from the Telkom site to HartRAO were discussed, the division of assets was agreed, and cost contributions between the SKA SA and HartRAO were finalised. HartRAO will use the instrument as a key asset in the Newton Fund radio astronomy capacity building and training programme being implemented for all partner countries.

Zambia

The request from the Zambian stakeholders whereby the SKA SA takes responsibility for the relocation of the mast at Zambia's cost, was deemed to be unfeasible. Alternative models for the relocation were suggested to the Zambian stakeholders and their feedback in this regard is awaited. Contact with the official Operating Entity (the National Remote Sensing Centre of Zambia) proved to be difficult, but efforts are continuing.

Madagascar

The agreement for the transfer of the antenna at Arivonimamo has formally been signed between the previous owner, TELMA, and the Ministry. A visit by an AVN technical team to further assess the condition of the antenna and the proposed conversion is planned for early 2017.

Botswana

SKA SA has met with the Ministry of Tertiary Education, Research, Science and Technology of Botswana. The details of the immediate work plan with regards to governance and institutional aspects were agreed, including that Botswana should identify and mandate the Operating Entity that will house the observatory and within which the Botswana team will be employed.

Namibia

The Namibian government has embraced the plan to locate a 'new build' AVN node in Namibia and an agreement is currently being negotiated between the SKA SA and the National Council for Science, Research and Technology (NCRST) to give effect to this. The Operating Entity is yet to be decided by the NCRST. A potential location for the node has been identified on the farm Gollschau (the location of the High Energy Stereoscopic System [H.E.S.S.] gamma ray observatory) 120 kilometres southwest of Windhoek and preliminary radio frequency interference measurements have been carried out. There is good infrastructure on the farm and the farmer has a positive attitude towards astronomy, given his excellent relationship with the H.E.S.S. consortium over the past 15 years. 'Last mile' connections (power, data, etc.) to the final location for the radio telescope will be agreed with the NCRST.

Kenya

A team from the SKA SA visited the Longonot site during November 2016 to investigate and advise the Kenyan stakeholders with regards to the feasibility of the telescope conversion project following reports of vandalism at the site. The findings were captured in a draft of the visit report, which was distributed to the relevant stakeholders.

Mauritius

Mauritius is part of Phase 3 of the AVN deployment, but discussions to identify near future activities to assess whether there is indeed a site, or sites, in Mauritius that would be suitable for an AVN new-build, are under way.

Table 20: Performance against strategic objective 2 – 2016/17 (Programme 5)

INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Number of joint international agreements at the National Facilities	45	35	48	37%	The target was exceeded due to additional agreements brokered by SAAO and HartRAO.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Internationalisation	153,490	456,497	311,859	144,639	

12.4 Performance against strategic objective 4: Establish and maintain research and infrastructure platforms

12.4.1 Provide science infrastructure in priority areas

Preparations are still being made to establish a seismic vault and install a GNSS receiver and a complete meteorological station in support of SKA activities at Klerefontein. These will assist in obtaining long-term seismic and meteorological data for a proposed future Gravity Wave Observatory in the area. Two SU civil engineering students have visited the site and are preparing construction plans. A standard configuration for these instruments has been developed; these will also be used at the AVN sites.

Civil works at HartRAO on the VGOS (VLBI Global Observing System) radio telescope are progressing according to schedule. Foundations for the site office and service pad have been completed and the road graded. The radio telescope tower structure has been finished up to the first floor. The project schedule is on track for completion by the second quarter of the next financial year, despite factory acceptance tests for the radio telescope top structure being postponed to January 2017 due to delays in the supply of steel.

HartRAO, with the South African National Antarctica Programme, has installed equipment at Marion Island, Gough Island and Antarctica, including GNSS, radar reflectors, tide gauges and seismic equipment, since the collaboration started in 2004. As part of a new project, the Global Geodetic Observing System (GGOS) that requires a globally distributed network utilising next-generation Satellite Laser Ranging (SLR) and VLBI technology, HartRAO is considering the establishment of a core GGOS site at either the Norwegian (Troll) or South African Antarctica (SANAE IV) bases. It is expected that about 30 core sites will be established globally to ensure adequate network density and geometry. All continents except Antarctica are currently under consideration for these upgrades.

Installation of the Russian SLR is complete and initial tests have indicated that all systems are functional and operating according to specifications. The site was formally launched on 27 February with Sergey Saveliev, Deputy Director General of the State Space Corporation (Roscosmos) and Dr Thomas Auf der Heyde of the DST officiating. The NMMU GeoStation (seismometer and GNSS reference station) has been installed on the NMMU campus.

An additional 7.6m antenna, previously allocated for Mozambique as part of the SKA-AVN project and currently located at the Telkom site, will be relocated to HartRAO. An amount of R250 000 has been secured for relocation and re-equipping costs. An additional R1.5m was allocated to HartRAO over the Medium-term Expenditure Framework (MTEF) for AVN training. The funds can be utilised to make a connected element interferometer that will serve as a training tool for astronomy students, including SKA AVN JEDI students.

SALT completed the highly anticipated HRS data pipeline. It is now serving all SALT users with automatically reduced and well calibrated and tested science data products in the morning after every observing night.

The third quarter of the reporting period marked the 10th SALT Science semester, and the first semester where the SALT Mirror Alignment System (SAMS) is fully operational. SALT Operations have reached the highest number of observations ever, the highest fraction of fully completed programs, and a significant improvement in data quality with the lowest percentage engineering downtime due to SAMS.

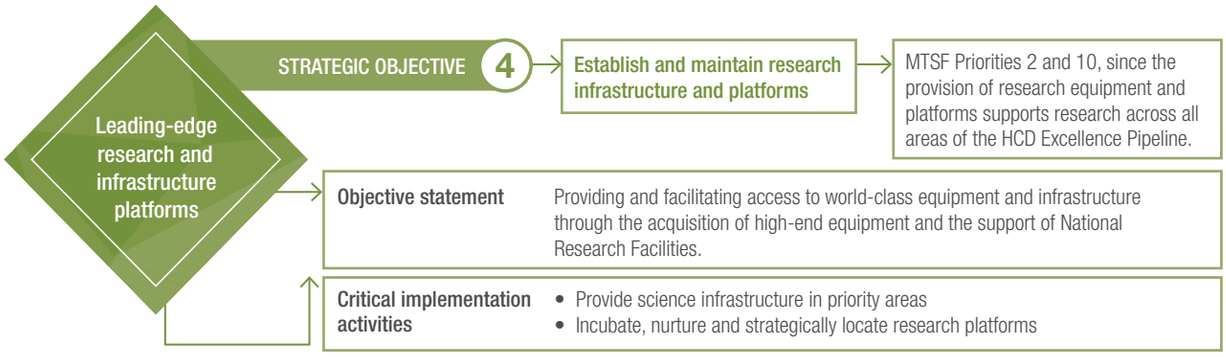
A comprehensive asset renewal plan is being finalised for the next 30 years. Ongoing maintenance and support of the many hosted facilities at Sutherland continue.

The SKA SA successfully demonstrated the science capability of Array Release 1 (16 MeerKAT dishes). However, the target of having all 64 dishes science capable at end March 2018 is challenging. Recent cost estimates for the SKA Phase 1 telescopes have been well above the Phase 1 target budget (around 672 m Euro), and has resulted in a Board request to explore more cost-effective options at a reduced risk. This includes the due consideration of a proposal submitted by SKA SA in which many components of MeerKAT could be scaled up to achieve the cost and risk targets. The SKA Board met in March 2017 to evaluate an updated proposal from South Africa around MeerKAT expansion and a similar proposal to be drafted by Australia for the low-frequency instrument.

A proposal has been developed in conjunction with the Inter-University Institute for Data Intensive Astronomy and the Centre for High Performance Computing for an African Research Cloud that aligns to the AVN goals. This involves establishing cyber-infrastructure and skills for collaborative big data research in South Africa and SKA African partner countries.

The SKA SA delivered Array Release 1 (AR1) in the reporting period, the first science-commissioned MeerKAT system, consisting of 16 antennas. AR1 is the most challenging release of the project, as it is the first time the telescope is integrated and formally verified on site. The image produced was revealed by the Minister of Science and Technology, Mrs Naledi Pandor, on 16 July 2016 and has drawn positive feedback from the scientific community.

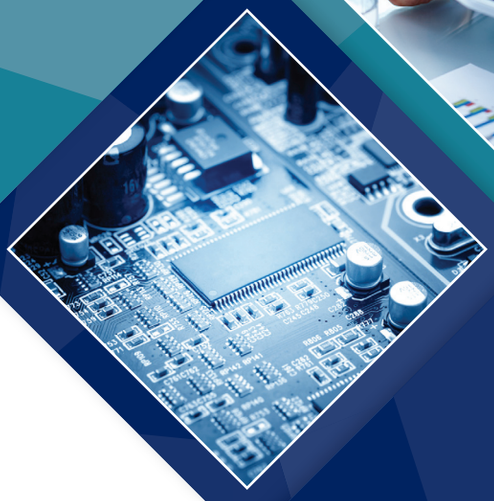
Table 21: Performance against strategic objective 4 – 2016/17 (Programme 5)



INDICATORS	Actual 2015/16	Target 2016/17	Actual 2016/17	Variance	Variance comment
Total infrastructure investment in the National Research Facilities (Rm)	372.57	324.57	625.59	93%	Spending on programme and operating expenditure on the SKA project increased significantly due to the accelerated spending in the roll-out of the MeerKAT dishes, the sealing of the road to Carnarvon and the pre-construction phase of international SKA Phase 1.

BUDGET (R million)	Actual 2015/16	Budget 2016/17	Actual 2016/17	Variance	Variance comment
Establish and maintain research infrastructure and platforms	518,490	617,890	637,447	19,557	

PART C:
COMPLIANCE



13. ALIGNMENT MAPPING

No	MTSF priority outcomes	Strategic outcomes	Responding NRF programme	Initiatives	DST strategic-oriented goals
1	Quality basic education	4	Programme 2	• SARChI chairs focusing on mathematics; numeracy education; integrated studies of learning languages, mathematics and science; teacher education; higher education and human development; and work-integrated learning. • Science education is an integral component in encouraging the exploration of STEMI as a career. Focused initiatives cater for teacher training and learner engagement opportunities.	Human capital development
2	A long and healthy life for all South Africans	1 2	Programmes 3, 4 and 5	• 40 SARChI chairs focusing on HIV vaccination translation; detection of cardiovascular diseases; poverty-related diseases; TB biomarkers; malaria, among others. • Three CoEs focusing on epidemiology, HIV prevention and biomedical TB research. • iThemba LABS supplies rare isotopes globally for the early detection and treatment of cancers and provides the only cancer treatment facility of its kind on the continent.	Increased knowledge generation
3	All people in South Africa are and feel safe				
4	Decent employment through inclusive growth	3 5	Programme 1	The NRF adheres to fair and transparent procurement and employment practices, and subscribes to the BBBEE Act. Furthermore, the organisation supports the DST/NRF Internship Programme by training and, where possible, retaining interns in various fields. The professional development programme supports PhD graduates' transition into positions within the business, while the management development programmes support staff in becoming better managers within the NRF.	
5	A skilled and capable workforce to support an inclusive growth path	1 5	Programme 3 Programmes 1, 4 and 5	To ensure that the organisation continues to create and support a skilled and capable workforce, the NRF provides support for postgraduate studies, assists researcher development at the HEIs (including the provision of targeted grants for this purpose), and supports staff internal to the NRF.	Increased knowledge generation
6	An efficient, competitive and responsive economic infrastructure network	1	Programme 3	The NRF funds research on renewable energy solutions through: • the Energy Human Capacity Development and Knowledge Generation Programme and the Energy Research Programme; • iThemba LABS provides nuclear research infrastructure. The NRF also provides world-class research infrastructure in various science domains.	Increased knowledge generation
7	Vibrant, equitable and sustainable rural communities contributing towards food security for all	1	Programmes 3, 4 and 5	• 2 UK–SA SARChI bilateral chairs focusing on food security; • 2 SARChI chairs focusing on systems biology for food security and phytochemical food networks from a nutrition perspective; • 1 CoE focusing on sustainable food systems to realise food security for poor, vulnerable, and marginal populations.	Increased knowledge generation
8	Sustainable human settlements and improved quality of household life	1	Programmes 3, 4 and 5	The NRF is currently creating a community of practice around human settlements.	Increased knowledge generation

No	MTSF priority outcomes	Strategic outcomes	Responding NRF programme	Initiatives	DST strategic-oriented goals
9	Responsive, accountable, effective and efficient local government				
10	Protect and enhance our environmental assets and natural resources	1 2	Programmes 3 and 4	• 30 SARChI chairs focusing on environmental research in areas such as agricultural sciences; agro-chemistry; evolution biology; as well as climate change; Earth system science; marine ecosystems and palaeo-environmental studies; • CoEs in biodiversity, conservation and biotechnology; • The National Research Facilities, through SAEON and SAIAB, have contributed to national policy development around the protection of environmental assets.	Responsive, coordinated and efficient NSI Increased knowledge generation
11	Create a better South Africa and contribute to a better Africa and a better world	3 1	Programme 1 Programmes 3, 4 and 5	The NRF builds on its brand and reputation to foster international research partnerships and scientific collaboration on the African continent and globally, thus playing a role in creating a better South Africa and Africa.	Responsive, coordinated and efficient NSI
12	An efficient, effective and development-oriented public service				
13	A comprehensive, responsive and sustainable social protection system				
14	A diverse, socially cohesive society with a common national identity	4 3	Programme 2 Programme 1	The NRF contributes through the effective generation, communication and dissemination of knowledge to society. To this end, the NRF has created two SARChI chairs in science communication.	Human capital development

14. CORPORATE GOVERNANCE

14.1 Introduction

The governance structures of the NRF consist of systems and processes that assist the NRF to be directed, controlled, and be held accountable. The NRF Act (No. 23 of 1998), the Public Finance Management Act (PFMA) (No. 29 of 1999) and the South African Companies Act (No. 71 of 2008) contribute to the compliance requirements of the entity, as do the various national and departmental frameworks, instructions and policies. In addition, the NRF applies leading governance practices by adhering to the requirements in the King Report on Corporate Governance for South Africa (King IV).

14.2 Accountability structure

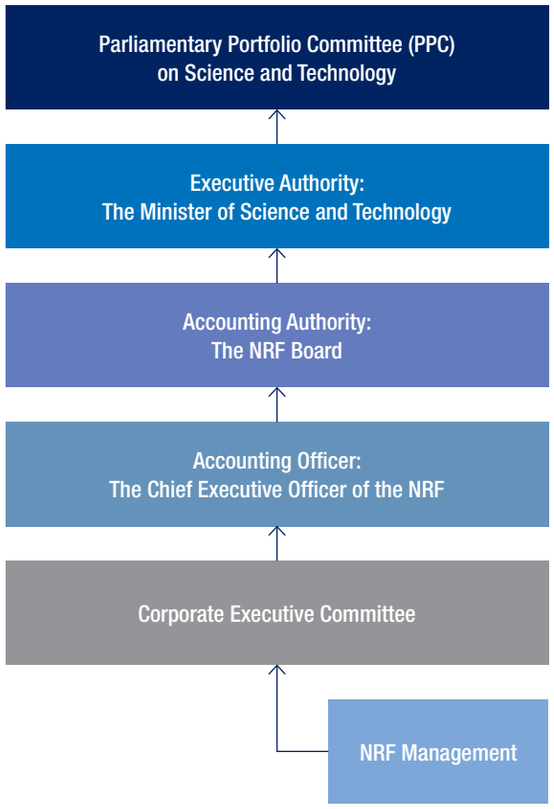
The NRF is accountable to Parliament through the Parliamentary Portfolio Committee on Science and Technology. The Minister of Science and Technology is the Executive Authority in terms of the PFMA. The Board of the NRF delegate to the Chief Executive Officer to act as the Accounting Officer of the NRF. This structure is represented in Figure 22.

14.3 Parliamentary Portfolio Committee on Science and Technology (PPC)

The PPC of the National Assembly processes legislation and conducts oversight of the work of the NRF. During the 2016/17 financial year, the CEO and the NRF Corporate Executive Committee had two interactions with the PPC on Science and Technology, where the PPC exercised oversight of the planning and performance of the organisation through the:

- NRF Annual Report presentation for 2015/16 in September 2016; and
- Annual Performance Plan presentation for 2017/18 in March 2017.

Figure 22: NRF governance structure



14.4 Minister of Science and Technology as Executive Authority

The Honourable Mrs Naledi Pandor has served as the Minister of Science and Technology during the reporting period. Table 23 lists the accountability documents submitted to the Accounting Authority during the 2016/17 financial year.

Table 23: Accountability documents submitted to the Minister of Science and Technology during 2016/17

Accountability report	Date of submission
Annual Report 2015/16	Presentation to the Minister – September 2016
	Tabling in Parliament – 07 September 2016
Annual Performance Plan 2017/18 to 2019/20	Presentation to the Minister – 13 February 2017
	Tabling in Parliament – 15 March 2017
Fourth Quarterly Report 2015/16	Submission to DST – 20 April 2016
First Quarterly Report 2016/17	Submission to DST – 20 July 2016
Second Quarterly Report 2016/17	Submission to DST – 20 October 2016
Third Quarterly Report 2016/17	Submission to DST – 20 January 2017

14.5 NRF Board as Accounting Authority

The NRF Board is appointed by the Minister of Science and Technology (Minister) with the approval of Cabinet in terms of Section (6) of the National Research Foundation (NRF) Act. The role of the Board is to exercise oversight in ensuring that the organisation effectively carries out its functions, powers and duties and realises its object, as set out in the NRF Act.

The Board therefore directs and governs the organisation, putting in place the necessary controls for effectiveness and overall good governance including:

- Establishing committees of the Board in support of oversight and the execution of its duties;
- Supporting the appointment of the CEO as the accounting officer of the organisation with all delegations and powers for the incumbent to execute the legislative and implied mandate of the organisation;
- Supporting the execution of the organisational mandate including rules regarding disclosures; and reporting obligations of the business through the Corporate Executive Committee.

14.6 NRF Board Charter

The functions of the Board of the public entity are outlined in the NRF Act, and explicated in the Board Charter. The Board of the NRF has compiled a progressive Board Charter that outlines its role, responsibility and governance oversight. This document is available from the office of the NRF Corporate Secretary.

14.7 Shareholder Compact between Accounting and Executive Authorities

The Chairman of the Board and the Minister of Science and Technology agree annually on a schedule of performance targets for the organisation that are set out in the Shareholder Compact between the Accounting and Executive Authorities. The Shareholder Compact promotes good governance and is used as a management tool for the organisation. This agreement then forms the basis for quarterly and annual performance reporting.

14.8 NRF Board Term of Office

The term of office of the current NRF Board extends from 1 October 2014 to 30 September 2018.

14.9 Composition of the NRF Board

As at 31 March 2017, the NRF Board was constituted as set out in Figure 23.

Figure 23: Board members as at 31 March 2017

Dr Molapo Qhobela
Ex-officio Member

Prof. Loyiso Nongxa
Chairman
University of the Witwatersrand

Ms Gail Campbell
Zenex Foundation

Dr Peter Clayton
Rhodes University

Ms Joanne Yawitch
National Business Initiative

Prof. Murray Leibbrandt
University of Cape Town

Advocate Louisa Zondo
Bertha Gxowa Foundation
(Resigned October 2016)

Mr Ronny Lubisi
MRL Chartered Accountants

Prof. Sunil Maharaj
University of KwaZulu-Natal

Prof. Tinyiko Maluleke
University of Pretoria

Prof. Mala Singh
Rhodes University

Prof. Errol Tyobeka
Namibia University of Technology

Ms Mpho Letlape
Independent

Dr Sarah Mosoetsa
National Institute for the Humanities and Social Sciences

Note: Adv Louisa Zondo resigned from the NRF Board in October 2016

14.10 NRF Board members with board directorships

Additional directorships held by NRF Board members are shown in Table 24.

Table 24: NRF Board members with board directorships

Board member	Directorships
Prof. L Nongxa (Chairman of the NRF Board)	• Rothschild [South Africa] (Pty) Ltd • Rothschild South Africa Foundation • BP South Africa Education Foundation
Ms GM Campbell	• GDE Science Education Centre t/a Sci-Bono Discovery Centre • Gauteng Education Development Trust • Independent Philanthropy Association of SA (IPASA)
Dr P Clayton	• African Journals Online • GBS Mutual Bank • Rhodes University [Executive Council member]
Prof. MV Leibbrandt	None
Ms Mpho Letlape	• The Standard Bank Tutuwa Community Foundation [NPC] • Lethushane (Pty) Ltd • Tower Group • T-Systems South Africa • Sapphire Logistics • T-Systems Community Trust [Trustee] • SA Women in Dialogue [Trustee] • Africa Harm Reduction Alliance • FoodForward South Africa
Mr MR Lubisi	• Jungle Babies Shop • MRL Auditing Services • MRL Development & Project • MRL Electrical & Consulting • MRL BBBEE Verification Agency • MRL Advisory and Accounting Services • Siyaraga Accounting Services • Isidumo Holdings • Ulwazi Human Capital Solutions • South African Broadcasting Corporation
Prof. SD Maharaj	• Council of the Academy of Science of South Africa • University of KwaZulu-Natal Retirement Fund
Prof. T Maluleke	• Board of Khulumani [NGO]
Dr V Papu-Zamxaka	• Sci-Bono Discovery Centre
Dr S Mosoetsa (Appointed October 2016)	• None
Prof. R Singh	• Council on Higher Education • Council of University of KwaZulu-Natal • Council of the Nelson Mandela Metropolitan University
Prof. A Sitas	• Resigned from the NRF Board on 18 January 2016
Prof. E Tyobeka	• Namibia University of Technology
Ms J Yawitch	• CEO: National Business Initiative • Trustee on the Boris Yawitch Trust • Chairperson of the South African National Parks Board
Adv. L Zondo (Resigned October 2016)	• Bertha Gxowa Foundation • Afrigrow • Oxfam South Africa • SA Airlink (Pty) Ltd

14.11 Competencies of NRF Board members

The competencies and experience of Board members are summarised in Table 25.

Table 25: Highest qualifications and areas of expertise

Board member	Highest qualification	Areas of expertise		
Prof. L Nongxa	PhD	Mathematics	Higher education management	
Ms GM Campbell	B.Social Science [Social work] Honours	Corporate Social		
Dr P Clayton	PhD	Research and development	Higher education management	
Prof. M Leibbrandt	PhD	Development economics	Poverty, inequality and labour markets	
Ms Mpho Letlape	Master's (currently busy with PhD)	Procurement	Human Resource Management and STEM Education	Governance
Mr MR Lubisi	Chartered Accountant [CA]	Corporate accounting services		
Prof. SD Maharaj	PhD	General relativity	Cosmology	Relativistic astrophysics
Prof. T Maluleke	PhD	Theology	Higher education management	
Dr S Mosoetsa (Appointed October 2016)	PhD	Sociology	Higher education management	
Dr V Papu-Zamxaka	PhD	Public health		
Prof. R Singh	DPhil	International higher education policy	Comparative higher education	Quality assurance in higher education
Prof. E Tyobeka	PhD	Biochemistry		
Ms J Yawitch	MSc	Agricultural development	General management	
Adv. L Zondo	LLM	Public law	Economics and political science	

14.12 NRF Board committees – purpose and composition

The NRF Board appointed four standing committees to deal with relevant issues on a regular basis:

- Audit and Risk Committee;
- Remuneration and Human Resources Committee;
- Research Development Committee (established November 2015);
- Procurement Committee; and
- Social and Ethics Committee.

14.12.1 Audit and Risk Committee

The Audit and Risk Committee ensures that the assurance coverage provided by management, risk management, as well as the internal and external audit functions is optimised, and adequately focuses on priority risk areas. The committee plays an integral role in the risk management of the organisation and oversees the annual risk-based internal audit in terms of the King Report on Corporate Governance for South Africa (King III). The committee engages with an external audit initiated by the Auditor-General in line with the PFMA. The committee also evaluates the organisation's integrated reporting with specific focus on:

- Financial reporting;
- Risk management;
- Internal controls;
- Fraud risk as it relates to financial reporting; and
- IT governance.

The committee has adopted formal terms of reference through the Audit and Risk Committee charter in line with the requirements of Section 51 (1) (a) of the PFMA and Treasury Regulations 27.1.7 and 27.1.10. The committee discharged all its responsibilities for the year in line with the charter. During 2016/17, the committee held three meetings. For more information on the meetings held by the Audit and Risk Committee, refer to Table 27.

14.12.2 Remuneration and Human Resources Committee

The committee has adopted formal terms of reference and monitors the performance of the organisation regarding human resources and remuneration. Through the committee, the Board, within the terms of the agreed policy, determines the scope of the remuneration packages of the executive and general staff, including, where appropriate, bonuses and incentive payment schemes. It sets the CEO's performance contract and oversees the general organisational climate and ethical conduct, and any other matters formally delegated by the Board to the committee from time to time. During the 2016/17 financial year, this committee held three meetings. For more information on the meetings held by the Remuneration and Human Resources Committee, refer to Table 28.

14.12.3 Research Development Committee

The work of this subcommittee facilitates the effective exercise of the NRF Board's responsibility for oversight of the execution of the core mandate of the NRF, which is to support research and research capacity development, promote science engagement and knowledge transfer, and advise the Minister on relevant research-related matters. The Research Development Committee convened three times this year. Refer to Table 30 for more information.

14.12.4 Procurement Committee

This Board subcommittee was formed mainly to facilitate the supply chain management requirements of the organisation considering the time-bound nature of some activities. The approved terms of reference allow the committee to consider and approve procurement requests above R10 million and consider and recommend procurement requests over R20 million to the NRF Board in line with the delegation of authority framework. The committee has regular scheduled meetings, but can also convene at short notice should urgent matters require approval. The committee held three meetings during the 2016/17 financial year. Refer to Table 29 for more information.

14.12.5 Meetings of the Board and its committees

The NRF Board met five times during the 2016/17 financial year. The Board met once during the reporting period for its annual strategic planning meeting. The dates and the attendance of members at those meetings are indicated in Table 26.

Table 26: Attendance of Board meetings: 1 April 2016 to 31 March 2017

Board members		26 July 2016 [Annual Strategic Planning Workshop]	27 July 2016	10 November 2016	30 January 2017	29 March 2017
Chairman	Prof. L Nongxa	◆	◆	◆	◆	◆
	Ms GM Campbell	X	X	◆	◆	X
	Dr P Clayton	◆	◆	◆	◆	◆
	Prof. M Leibbrandt	◆	◆	◆	◆	X
	Ms M Letlape	◆	◆	◆	◆	◆
	Mr MR Lubisi	◆	◆	◆	◆	◆
	Prof. SD Maharaj	◆	◆	◆	◆	◆
	Prof. T Maluleke	X	X	◆	◆	◆
	Dr S Mosoetsa	Appointed October 2016		◆	◆	X
	Dr V Papu-Zamxaka	◆	◆	◆	◆	◆
	Prof. R Singh	◆	◆	◆	◆	◆
	Prof. E Tyobeka	◆	◆	◆	◆	X
	Ms J Yawitch	◆	◆	◆	X	◆
	Adv. L Zondo	X	X	Resigned from NRF Board October 2016		
Ex-officio	Dr M Qhobela	◆	◆	◆	◆	◆

◆ In attendance X Absent with apology

Table 27: Audit and Risk Committee meetings: 1 April 2016 to 31 March 2017

Board members		14 July 2016	12 October 2016	08 March 2017
Chairman	Dr P Clayton	◆	◆	◆
	Prof. M Leibbrandt		◆	◆
	Mr MR Lubisi	◆	◆	◆
	Dr V Papu-Zamxaka	◆	X	◆
Ex-officio	Prof. L Nongxa	–	–	–
Invited member	Dr M Qhobela	◆	X	◆
	Mr B Singh	◆	◆	◆

◆ In attendance X Absent with apology – Not an attending member

Table 28: Remuneration and Human Resources Committee meetings: 1 April 2016 to 31 March 2017

Board members		05 July 2016	26 October 2016	02 March 2017
Chairman	Prof. E Tyobeka	◆	◆	–
Chairman [as of November 2016]	Ms M Letlape	◆	◆	◆
	Ms G Campbell	X	◆	X
	Prof. SD Maharaj	X	◆	◆
	Ms J Yawitch	◆	X	◆
Ex-officio	Prof. L Nongxa	–	–	–
Invited member	Dr M Qhobela	◆	◆	◆
	Mr P Thompson	◆	X	◆

◆ In attendance X Absent with apology – Not an attending member

Table 29: Procurement Committee meetings: 1 April 2016 to 31 March 2017

Board members		05 July 2016	26 October 2016	02 March 2017
Chairman [as of November 2016]	Prof. E Tyobeka	◆	◆	◆
	Dr P Clayton	◆	◆	◆
	Ms M Letlape	–	◆	◆
Ex-officio	Prof. L Nongxa	–	–	–
Invited member	Dr M Qhobela	◆	◆	◆
	Mr B Singh	◆	◆	◆

◆ In attendance X Absent with apology – Not an attending member

Table 30: Research Development Committee meetings: 1 April 2016 to 31 March 2017

Board members		05 July 2016	26 October 2016	02 March 2017
Chairman	Prof. M Singh	◆	◆	◆
	Prof. T Maluleke	X	◆	X
	Dr S Mosoetsa	Committee member as of November 2016		◆
	Ms J Yawitch	X	X	◆
Ex-officio	Prof. L Nongxa	◆	–	–
Invited member	Dr M Qhobela	◆	◆	◆
	Dr B Damonse	◆	◆	◆
	Dr G Pillay	◆	X	◆

◆ In attendance X Absent with apology – Not an attending member

14.13 Remuneration of the Board

The remuneration of the NRF Board is determined in line with the National Treasury guidelines. The NRF Board was categorised as a level A1 for the financial year in review. Table 31 offers a summary of the remuneration of the Board for the financial reporting period.

Table 31: Remuneration of Board Members (2016/17)

Name	Remuneration	Other allowance	Other reimbursements	Total
Ms GM Campbell	R 31 097.00	Nil	Nil	R 31 097.00
Dr P Clayton	R 67 595.00	Nil	Nil	R 67 595.00
Prof. M Leibbrandt	R 46 816.00	Nil	Nil	R 46 816.00
Ms M Letlape	R 52 056.00	Nil	Nil	R 52 056.00
Mr MR Lubisi	R 40 085.50	Nil	Nil	R 40 085.50
Prof. SD Maharaj	R 34 845.80	Nil	R 1 552	R 36 397.80
Prof. T Maluleke	R 20 873.00	Nil	Nil	R 20 873.00
Dr S Mosoetsa*	Nil	Nil	Nil	Nil
Prof. L Nongxa	R 107 728.00	Nil	R 1 112.02	R 108 840.00
Dr V Papu-Zamxaka	R 48 563.00	Nil	Nil	R 48 563.00
Prof. R Singh	R 50 309.50	Nil	Nil	R 50 309.50
Prof. E Tyobeka	R 59 042.00	Nil	Nil	R 59 042.00
Ms J Yawitch	R 29 564.00	Nil	Nil	R 29 564.00
Adv. L Zondo	R 27 264.00	Nil	Nil	R 27 264.00

* As per National Treasury regulations, government employees/civil servants who serve on a Board of a state entity do not qualify for Board remuneration.

The members of the NRF Board donated their January 2017 honoraria to purchase an emergency room trolley/bed for the Sutherland Clinic. Members of the Corporate Executive also contributed privately to this donation. It should be noted that Board members are not paid a daily allowance when travelling for NRF purposes. However, all travel costs (such as airfares and car hire) are covered by the NRF. 'Other reimbursements' include actual costs incurred by Board members for incidental expenses such as airport parking costs, toll fees, Gautrain fares, and use of personal vehicles (reimbursed per kilometre as per NRF travel policies).

14.14 NRF organisational structure

The CEO, with the Corporate Executive Committee, supported by Programme 1, provides an enabling governance and compliance structure that ensures the organisation meets its mandate, while operating within an established control environment. This structure provides combined assurance to the NRF Board.

14.14.1 NRF Corporate Executive Committee

The Board of the NRF delegates to the CEO, who performs the function of the Accounting Officer of the NRF in line with the NRF Act. The CEO is also the Chairman of the Corporate Executive Committee. This committee is the formal internal NRF decision-making structure and is constituted as shown in Figure 24. The Corporate Secretary provides the secretariat function to the Corporate Executive meetings. To ensure cascading of key business and strategic information and engagement with all business units, the NRF has created a consultative forum, namely the NRF Directors' Forum, which meets twice a year.

Figure 24: Corporate Executive Management

Dr Molapo Qhobela
Chief Executive Officer (From 1 January 2016)

Dr Gansen Pillay
Deputy CEO
Research and Innovation Support and Advancement

Prof. Nithaya Chetty
Deputy CEO
Astronomy

Mr Patrick Thompson
Group Executive
Human Resources and Legal Services

Mr Bishen Singh
Group Executive
Finance and Business Systems

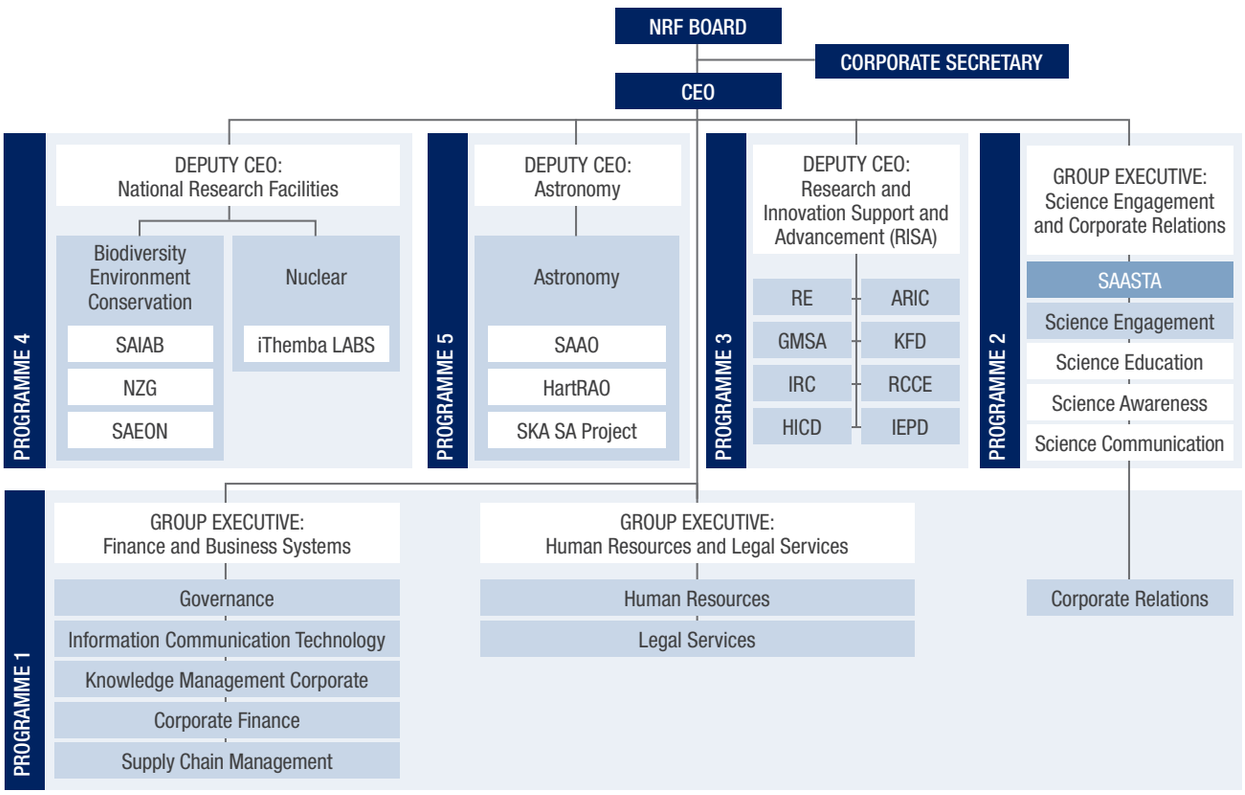
Dr Beverley Damonse
Group Executive
Science Engagement and Corporate Relations

14.14.2 Corporate Secretary

The Corporate Secretary function is mandatory in terms of the NRF Act and plays a pivotal role in Board governance. The Corporate Secretary provides a central source of guidance and advice to the Board in terms of governance principles and legislative compliance, and in this way supports the Board and all the subcommittees of the Board. The Corporate Secretary of the NRF is also the formal point of contact between the organisation, its Board, the Ministry, and the relevant parliamentary committees.

14.14.3 NRF organogram

Figure 25: NRF organisational structure per programme



14.14.4 Risk management

The NRF adopts a balanced approach to Enterprise Risk Management (ERM) in the pursuit of achieving strategic goals while safeguarding the direct interests of the organisation's stakeholders. The NRF risk management framework provides a common 'risk language' and describes the roles and responsibilities of key players in managing enterprise risk as well as measuring the risk appetite of management. The implementation of the ERM framework contributes to:

- Proactively identifying, managing and monitoring enterprise risks so as to minimise losses and disruption to the NRF;
- Promoting and embedding a risk-conscious culture and behaviour throughout the NRF;
- Complying with relevant legal and regulatory requirements; and
- Integrating risk into the internal audit methodology such that internal audit becomes risk based.

Risk management and the tabling of the strategic risk register of the organisation is a standing item on the agenda of the Corporate Executive Committee and the Audit and Risk Committee of the NRF Board. During the financial year, the Corporate Executive Committee reviewed the operational and strategic risk registers of the organisation. Operational risks are managed on an ongoing basis and all business units report on critical operational risks as part of the quarterly reporting cycle.

14.14.5 Internal control

The NRF has established a centralised internal control development unit in support of the organisational philosophy to integrate control across the organisation through a set of policies and procedures. These internal controls are developed, reviewed and implemented in, among others, risk management, policy development, system design, corporate governance, audits, standard operating procedures, and legislative compliance and sustainability initiatives.

14.14.6 Internal audit

The internal audit function derives its mandate from the Audit and Risk Committee terms of reference, whereby the Audit and Risk Committee is pivotal in ensuring that the internal audit function is independent and has the necessary standing and authority to discharge its functions. For a summary of meetings of the Audit and Risk Committee, refer to Table 27.

As crucial assurance providers, both internal and external audits are encouraged to cooperate and ensure that there is an optimal level of overlap between them. The Audit and Risk Committee tasks the in-house Internal Audit function with compiling a three-year rolling annual audit plan that is approved on an annual basis to:

- Test the key internal controls across the business;
- Audit specific areas based on the outcome of a risk assessment;
- Provide advisory services to the organisation as necessary; and
- Provide ad hoc audit and investigative services as necessary.

The NRF internal audit unit has adopted a co-sourced model, whereby the organisation makes use of an internal audit service provider as well as an in-house audit to meet the mandate and responsibilities of the unit. The purpose, authority and responsibility of the Internal Audit Unit of the NRF is defined in a Board-approved charter that is consistent with the Institute of Internal Auditors' definition of internal auditing, Treasury Framework on Internal Audit and the principles of King III. The primary scope in providing assurance includes:

- Evaluating the reliability and integrity of information and the means used to identify, measure, classify and report such information;
- Evaluating the systems established to ensure compliance with policies and procedures, plans and legislation which could be significant to the organisation;
- Evaluating the means of safeguarding assets and, as appropriate, verifying the existence of such assets;
- Evaluating the effectiveness and efficiency with which resources are employed;
- Evaluating operations or projects to ensure results are consistent with established objectives, and whether the operations are being carried out as planned;
- Monitoring and evaluating governance processes; and
- Monitoring and evaluating the risk management process.

The assurance mandate is informed by the results of the risk-based Audit Coverage Plan, which is approved annually by the Board Audit Committee, as well as the Combined Assurance Forum to assist with the monitoring of internal controls, governance and risk management at operational levels of the organisation.

Table 32 : Internal audit reviews for the year ending 31 March 2017

#	Process to be audited	Type of review	(In-house/ outsourced)	Quarter	Current status	Report rating
1	Grant Management - Universities (Limpopo, Fort Hare and UCT)	Compliance	In-house	Q1	Finalised	Medium
2	Grant Management – NRF	Assurance	In-house	Q2	Finalised	Medium
3	Talent Management	Assurance	In-house	Q2	Finalised	Low
4	Procure to Pay	Assurance	In-house and co-source	Q2	Finalised	Medium
5	Contract Management	Assurance/ consulting	Co-source partner	Q2	Finalised	Not applicable: adequacy review
6	Financial Management	Assurance	In-house	Q3	Finalised	Medium
7	Irregular, fruitless and wasteful expenditure management	Assurance	In-house	Q3	Finalised	Medium
8	SCM Performance Management	Assurance/ consulting	In-house	Q3	Finalised	Medium
9	IT Governance	Assurance	Co-source partner	Q3	Finalised	Insignificant
10	Risk Management (maturity assessment)	Assurance	Co-source partner	Q3	Finalised	Not applicable – maturity assessment
11	Fixed Assets Management	Assurance	In-house	Q4	Finalised	Medium
12	Performance Information	Assurance	In-house	Q4	Cancelled	

14.14.7 Compliance with laws and regulations

The organisation uses a Priority Compliance Listing that identifies applicable pieces of priority legislation, regulations, and codes of best practice. This list is continuously monitored and updated. King III urges the organisation's leadership to not only drive compliance with laws but to also focus on non-binding rules, codes and standards. Table 33 and Table 34 contain some key (but not all-inclusive) laws and best practice codes applicable to the NRF's operations and mandate.

Table 33: Priority compliance listing of applicable legislation and best practice

	Legislation	RISA	NZG	SAEON	SAASTA	SAIAB	HartRAO	SAAO	iThemba LABS	SKA
1	National Research Foundation Act 23 of 1998	◆	◆	◆	◆	◆	◆	◆	◆	◆
2	Occupational Health and Safety Act 85 of 1993	◆	◆	◆	◆	◆	◆	◆	◆	◆
3	National Water Act 36 of 1998	◆	◆	◆	◆	◆	◆	◆	◆	◆
4	NEMA - National Environmental Management Act 107 of 1998	◆	◆	◆	◆	◆	◆	◆	◆	◆
5	Public Finance Management (PFMA) Act 1 of 1999	◆	◆	◆	◆	◆	◆	◆	◆	◆
6	New Companies Act 71 of 2008	◆	◆	◆	◆	◆	◆	◆	◆	◆
7	Intellectual Property Rights from Publicly Financed Research and Development Act 51 of 2008	◆	◆	◆	◆	◆	◆	◆	◆	◆
8	Skills Development Act 97 of 1998	◆	◆	◆	◆	◆	◆	◆	◆	◆
9	Employment Equity Act 55 of 1998	◆	◆	◆	◆	◆	◆	◆	◆	◆
10	Labour Relations Act 66 of 1995	◆	◆	◆	◆	◆	◆	◆	◆	◆
11	Basic Conditions of Employment Act 75 of 1997	◆	◆	◆	◆	◆	◆	◆	◆	◆
12	National Environmental Management: Biodiversity Act 10 of 2004		◆	◆		◆				
13	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004): Threatened or Protected Species Regulations		◆	◆		◆				
14	Astronomy Geographic Advantage Act 21 of 2007						◆	◆		◆
15	Mine Health and Safety Act 29 of 1996									◆
16	Mineral and Petroleum Resources Development Act 28 of 2002									◆
17	Marine Living Resources Act 18 of 1998					◆				
18	National Environmental Management: Air Quality Act (NEM:AQA), 39 of 2004								◆	
19	National Environmental Management: Waste Act 59 of 2008		◆			◆			◆	◆
20	Promotion of Access to Information Act 2 of 2000	◆	◆	◆	◆	◆	◆	◆	◆	◆
21	Occupational Health and Safety Act 85 of 1993: Diving Regulations					◆				
22	Occupational Health and Safety Act 85 of 1993: Construction Regulations									◆
23	National Radioactive Waste Disposal Institute Act 53 of 2008								◆	
24	National Health Act 61 of 2003								◆	
25	South African National Space Agency Bill (B20 of 2008)						◆	◆		◆
26	Animal Health Act 7 of 2002		◆							
27	Compensation for Occupational Injuries and Diseases Act 130 of 1993									
28	Animal Protection Act 71 of 1962		◆	◆						

Table 34: Applicable sustainability best practice codes and standards

	Best practice codes and standards	RISA	NZG	SAEON	SAASTA	SAIAB	HartRAO	SAAO	iThemba LABS	SKA
1	King III Code of Corporate Governance for SA	◆	◆	◆	◆	◆	◆	◆	◆	◆
2	International Financial Reporting Standards (IFRS) for Financial Reporting	◆	◆	◆	◆	◆	◆	◆	◆	◆
3	PAAZAB Code of Ethics		◆							
4	African Preservation Programme (APP) Resource Manual		◆							
5	SANS 103862008 South African National Standard for the care and use of animals for scientific purposes		◆							
6	World Association of Zoos and Aquariums (WAZA) Code of Ethics and Animal Welfare		◆							
7	Occupational Health and Safety Management Systems 18001 2007		◆							
8	ISO 14001 2004 Environmental Management System		◆	◆		◆			◆	◆
9	ISO 9001 2008 Quality Management System	◆	◆		◆	◆			◆	◆
10	Current Good Manufacturing Practices (cGMP)								◆	
11	International Atomic Energy Agency (IAEA) standards								◆	

14.14.8 Supply Chain Management (SCM)

In accordance with the statutory regulations stipulated under regulation 16 A of the PFMA (No. 1 of 1999 as amended by No. 29 of 1999) on Supply Chain Management, the NRF has implemented an effective and efficient SCM system to acquire goods and services, and dispose of and let state assets (including the disposal of goods).

The corporate SCM role is to ensure that SCM processes adhere to international best practices, legislation and internal control in the areas of demand management, logistics management, disposal management, SCM risk management, and assessment of SCM performance. This is achieved by designing and implementing appropriate processes, including workflow, and providing support in the form of training, policies, systems, templates, advisories, advice, directives, forums, quality assurance for tenders, as well as contributing to the bid adjudication processes. The unit also ensures the use of transversal agreements and negotiates bulk rates where feasible. The NRF Board have approved the formal Terms of Reference of the Bid Adjudication Committee. The committee members have been appointed for a three-year term and have been functioning well.

14.14.9 Fraud and corruption

The NRF has an all-encompassing policy titled 'The Prevention, Detection and Resolution of Fraud and Corruption', which includes a Fraud Prevention Plan. The policy was reviewed during the reporting period. The organisation subscribes to the National Anti-Corruption Hotline (NACH), which ensures that all allegations of fraud and corruption cases are appropriately investigated in line with policy and NACH turnaround times. Depending on the outcome of the investigation and based on the recommendations of the oversight committee, issues raised are reported to the NRF Board for consideration in terms of the Act.

14.14.10 Minimising conflict of interest

A conflict of interest occurs when an individual or an organisation is involved in multiple interests, and where there is the potential to corrupt the motivation to act in one or another's interests. While it is understood that conflict of interest can be voluntarily identified and defused before corruption occurs, the NRF, given its strategic role in the national landscape, minimises the risk of such conflicts by ensuring that the proper segregation of duties exists at all levels of the organisation. In the area of grant management, the business adopts the process of independent external review and evaluation as opposed to taking those decisions internally.

All the organisation's processes and operating procedures are open to audit, evaluation and review and the NRF engages in an organisation-wide review once every five years as set out in the White Paper on Science and Technology. Specific programmes and units are also open to external review as necessary or as part of the governance of the programme or unit.

From a finance and SCM perspective, all members of the various committees throughout the process – from the drafting of specifications to the award of the bid – are requested to sign a disclosure statement with respect to conflict of interest. The organisation takes the non-disclosure of interest very seriously and punitive action is set out as part of the NRF disciplinary code if any members of staff breach the policy with regard to disclosure.

14.14.11 Code of conduct

The NRF adopted a Code of Ethics, Values and Business Conduct (the Code) as part of its suite of Consolidated Human Resources Policies and Procedures. The Code is complementary to the conditions of service of the NRF and is a statement of the values that the NRF pursues in its dealings with people and organisations, internally and externally. The spirit of the Code is to support ethical conduct by all individuals covered by it. To help employees comply with both the letter and spirit of the Code, the NRF has developed a set of guidelines that are published with the Code. A breach of the Code attracts censure and is dealt with in terms of the NRF's Disciplinary Code.

14.14.12 Health, safety and environmental issues

The Occupational Health and Safety Act prescribes specific compliance requirements for specific environments. Given the diverse nature of the NRF, there are health and safety requirements that vary and therefore require specific interventions to meet the needs. The Risk Unit ensures that specific needs are met by customising the compliance solutions across the NRF.

14.14.13 Ethical and social responsibility

The NRF as an organisation has conducted, and will continue to conduct business in a manner that meets existing needs without compromising the possibilities for future generations. The NRF takes cognisance of the impact that the business has on its stakeholder community. To this end, the NRF Board enhanced the Board's Terms of Reference to include the implementation of legal requirements and prevailing codes of best practice and standards with regard to social and ethics matters. These include:

Good corporate citizenship through:

The promotion of equality, prevention of unfair discrimination, and reduction of corruption:

- The contribution to the development of communities in which its activities are predominantly conducted or within which its products or services are predominantly delivered;
- The environment, sustainability and public health and safety including the impact of all activities, products and services of the entity in terms of the Global Reporting Initiative; and
- The establishment and maintenance of proper stakeholder relations.

Labour and employment, including the:

- International Labour Organization Protocol;
- Employment Equity Act; and
- Broad-Based Black Economic Empowerment Act.

Social and economic development, including the entity's standing in terms of:

- The 10 principles set out in the United Nations Global Compact; and
- The OECD recommendations regarding corruption.

The social and ethics agenda is addressed at various levels of the organisation.

14.14.14 Corporate social investment

The NRF embarked on its annual Mandela Day initiative in partnership with the DST and all its entities. NRF staff donated food parcels including stationery and clothes for the Mohau Satellite Centre for teenage girls in Kilner Park. The Mohau Children's Home is a residential care facility for orphaned, abused, abandoned, neglected and terminally ill children and their families who are infected or affected by HIV/Aids. It caters for 45 children, with some of the older children living in a Satellite House in Kilner Park. The NRF envisages an ongoing partnership with the home, and plans on including the children from the home in the annual 'Bring a girl child to work' and the 'Men in the making' initiatives.

A group of ten NRF employees were sponsored by NRF employee contributions to participate in the annual Cansa relay fundraising event. NRF employees contributed R3 000 to the advancement of cancer research. The team completed 798 laps, totalling 279,34 km, during the 12-hour event.

Staff also participated in the "Keep a girl child in school" initiative by donating money and sanitary products to ensure that girls do not have to miss school due to not being able to afford proper sanitary products. The contributions from NRF staff assisted more than 50 girls in the Letlotlo Secondary School in Mabopane.

15. HUMAN RESOURCES

15.1 Introduction

The Corporate Human Resources and Legal Services function responds to the needs expressed in the strategic and annual performance plans of NRF divisions and business units for 2016/17 by contributing to a qualified staff complement through several processes, tools and interventions in the HR value chain:

- Ensuring transparent, fair and equitable recruitment processes to attract staff who are qualified, motivated and competent to excel in their appointed positions;
- Inculcating commitment to organisational goals, fostering a positive client-centric organisational culture and building competencies on an ongoing basis in staff and management in line with the strategic goals and needs of the NRF;
- Ensuring that key competencies are maintained, managing the risks and planning for long-term succession in strategic and key management and leadership positions;
- Building relationships and maintaining harmony among staff, management and stakeholder labour organisations; and
- Striving continuously to improve the execution and effective management of a set of basic processes and tools to ensure current and future success.

15.1.1 Overview of HR matters

Priorities included a range of strategic shifts and adjustments in policy and processes and the implementation of related tools intended to enable the organisation to adapt to the changing demands in the environment and stakeholders. These priorities included:

- Implementation of innovative recruitment and selection tools, thus contributing to improvement and efficiency of the recruitment process and the quality and fit of NRF recruits;
- Continued implementation and refinement of the Performance Management framework and associated reward mechanisms to align to a team and client-centric culture required to meet the organisation's performance delivery expectations by a range of internal and external stakeholders;
- Facilitation and negotiation of the expected transfer of the NZG to SANBI;
- Continued reorientation, re-skilling and competency development of RISA staff through conducting a skills audit and the implementation of a suite of interventions to enable them to function optimally within the new matrix structure;
- Review of the Management Development and New Managers Development Programmes for effectiveness and impact and roll out of other developmental and support programmes in partnership with line management;
- The implementation of a contract management policy, as well as effective tools for the management of existing and new NRF contracts, and putting in place guidelines, tracking processes and other mechanisms designed to ensure ease of compliance by all employees of the NRF who deal with contracts; and
- Continued implementation of the customised NRF Diversity Management Programme in partnership with the Wits Centre for Diversity Studies as a key driver of transformation in all business units.

Workforce planning framework and key strategies to attract and recruit a skilled and capable workforce

The main objective of the NRF Staff Planning Policy is to strategically align the organisation's human resources with its business direction, thereby ensuring that the NRF has the correct number of people with the right skill sets or competencies in the right jobs at the right time. The process, therefore, enables the organisation to:

- Determine and source the human resources that are capable of meeting strategic and operational objectives;
- Obtain the required quality and quantity of staff;
- Make optimum use of available human resources;
- Anticipate and manage surpluses and staff shortages; and
- Develop a multi-skilled, representative and flexible workforce, which enables the organisation to adapt rapidly to the changing environment in which it functions.

This planning process is integrated, both in approach and in the engagement of Senior Management and Line Management. It takes into account the organisation's strategic direction, and is reconciled to the available budget.

NRF structure fit for purpose

In reflecting on the alignment of the organisation to deliver on its mandate and strategic goals, the Corporate Executive, led by the CEO, initiated a process to conceptualise a new high-

level structure. This structure was approved and endorsed by the NRF Board in July 2016. Consultation sessions are being held with staff and unions to share the recommended high-level structure and to solicit inputs that will lead to the finalisation of the detailed organisational structure. These consultations include discussions around the NZG transfer to SANBI, as well as the merger between the SKA project office and HartRAO to establish SARAO.

Employee performance management framework

The NRF strives to be a high-performance knowledge organisation that yields on-going, long-term value to its stakeholders. It therefore needs to maintain total commitment to high standards of performance, collaboration and teamwork, openness to new ideas and on-going learning. This needs to be done in line with the NRF Act, the NRF Vision strategic objectives, and underpinned by the NRF Values. It is within this context that the NRF Integrated Performance Management System (IPMS) and its requirements are positioned, driven and implemented.

The overall aim of the NRF IPMS is to enable the NRF and its employees to strive for excellence in the achievement of set goals at all levels, through effective performance planning, performance monitoring and measurement, and appropriate skills development. The key principles that underpin the aim of the IPMS are the enhancement of organisational performance, recognition of individual and team contribution, and the effective management of underperformance.

More specifically, the objectives of the IPMS are to facilitate and ensure the following:

- Alignment between organisational, divisional, business unit, departmental and individual goals and objectives;
- Agreement on clearly defined employee performance goals and objectives, in alignment with business goals;
- Monitoring and measurement of employee and team performance, against agreed goals and objectives;
- Provision of regular feedback between management/ supervisors and their direct reports on performance relative to agreed goals and objectives;
- Improvement of performance through multi-faceted employee development approaches and appropriate skills development;
- Effective discussions on career-pathing, which may inform employee development and movement considerations; and
- Enhancement and reinforcement of a culture of performance and teamwork among employees at all levels in the organisation.

Improve staff and succession planning

The NRF reviewed its staffing and succession plans in key positions. This systematic process ensures that:

- Risks to the organisation are managed;
- Resources are optimally used; and
- Sustainability of the organisation is assured.

Areas of improvement were identified and remedial actions incorporated into the short- to medium-term implementation plans.

Employment Equity Plan

The Employment Equity Plan is at the core of the NRF's commitment to transformation and to achieve representivity in all occupation levels and categories of its workforce, as well as to give effect to the NRF Employment Equity and Redress Policy adopted by the Board. The organisation's Employment Plan sets out the measures to be taken to ensure legal compliance with the Employment Equity Act, 55 of 1998 as well as the business imperative to be representative of the areas in which the NRF operates. This includes the setting of objectives, activities, numerical goals and targets to progressively move towards achieving representivity of the designated groups across the organisational structure.

Improve the competency levels of staff through training and development

2016/17 saw the NRF continue its drive towards achieving the phase two implementation of the diversity management programme. In addition, compliance with the Workplace Skills Plan process was introduced across the organisation.

The RISA competency development exercise on identifying job competencies for all RISA jobs was completed in the period under review. This exercise entails the identification of skills, knowledge and behaviours which are essential to perform jobs successfully. The process is aimed at assisting

in the alignment of the organisation's human capital needs, its strategic business objectives and the budget.

The RISA competency development exercise to identify job competencies commenced in the period under review. This exercise entails the identification of skills, knowledge and behaviours which are essential to perform jobs successfully in RISA. This exercise is beneficial to RISA and its staff as it provides a common language for dialogue in concrete terms, as well as a shared view of the standards staff are striving to achieve in RISA. The process aims to assist in aligning the organisation's human capital needs, its strategic business objectives and the budget.

Continual support of the Diversity Management Programme by management and staff continues to improve at all levels across the organisation. Staff Diversity Workshops were concluded in March 2017.

The NRF-wide Employment Equity and Skills Development (EE & SD) Committee was established at the end of the reporting period. Training has been provided for local EE & SD committees and the national coordinating structure.

Training interventions reached a total of 1 404 candidates across various NRF business units, namely RISA, SAASTA, NZG, HartRAO, SAAO, iThemba LABS and Corporate Services.

Salary benchmarking

Salary benchmarking exercises are undertaken by the NRF every three years to determine where the organisation's remuneration is relative to the market and its desired positioning. This exercise commenced in the fourth quarter of the year with the overall objectives to:

- Compare individual salaries to those of similar positions in the market;
- Identify scarce skills positions/roles qualifying for premium salaries; and
- Identify and address misalignment of NRF grades relative to the grades of similar positions in the market.

This exercise will be concluded in November 2017.

15.2 Human resource oversight statistics

Personnel cost per programme

Table 35: Personnel cost by programme

NRF personnel cost	Programme	Personnel expenditure R'000	Personnel expenditure as a % of total expenditure R'000	Total employees	Average personnel cost per employee R'000
	Programme 1 - Corporate	40 470	6%	6	6 745
	Programme 2 - Science Engagement	26 903	4%	28	961
	Programme 3 - Research and Innovation Support and Advancement (RISA)	105 756	16%	328	322
	Programme 4 - National Research Facilities (Excluding Astronomy)	250 038	38%	790	317
	Programme 5 - National Research Facilities (including SKA)	239 539	36%	204	1 174
	TOTAL	**662 706**	**100%**	**1 356**	**489**

Personnel cost per salary band

Table 36: Personnel cost by salary band as at 31 March 2017

Personnel cost by salary band	Occupational level	Personnel expenditure R'000	Personnel expenditure as a % of total expenditure R'000	No. of employees	Average personnel cost per employee R'000
	Top management	13 037	2%	6	2 173
	Senior management	44 450	7%	28	1 588
	Professionally qualified and experienced specialists and mid-management	252 469	38%	328	770
	Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents	309 468	47%	790	392
	Semi-skilled and discretionary decision-making	32 044	5%	204	157
	Unskilled and defined decision-making	11 236	2%	88	128
	TOTAL	**662 706**	**100%**	**1 444**	**459**

Performance rewards

Table 37: Performance rewards as at 31 March 2017

NRF personnel cost	Occupational level	Performance rewards R'000	Personnel expenditure R'000	No. of employees	Personnel expenditure as a % of total expenditure
	Top management	336	13 037	2	5%
	Senior management	1 107	44 450	9	17%
	Professionally qualified and experienced specialists and mid-management	7 600	252 469	124	11%
	Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents	4 045	309 468	170	61%
	Semi-skilled and discretionary decision-making	250	32 044	33	4%
	Unskilled and defined decision-making	100	11 236	11	2%
	TOTAL	**13 438**	**662 706**	**349**	**100%**

Training costs

Table 38: Training costs

Directorate/Business Unit	Intervention	Training expenditure (R`000)	No. of employees trained	Average training cost per employee
NZG	Supply Chain Management	-	20	0
NZG	Diversity Management	-	87	0
Corporate HR (NZG)	Labour Law	37,343.00	20	1,867
Corporate HR (NZG/SAEON)	EE and SD Committee	64,638.00	15	4,309
Corporate HR (HartRAO/SAIAB)	EE and SD Committee	68,947.00	9	7,661
SAAO/SKA/iThemba LABS	EE and SD Committee	91,929.00	21	4,378
Corporate HR (RISA/SAASTA)	EE and SD Committee	25,094.00	14	1,792
Corporate HR (HartRAO)	Labour Law	32,092.00	16	2,006
Corporate HR (SKA)	Labour Law	20,409.00	11	1,855
Corporate HR (SAAO)	Labour Law	31,479.00	13	2,421
Corporate HR (SAASTA)	Labour Law	37,342.00	16	2,334
Corporate HR	Business Writing	56,943.00	15	3,796
Corporate HR	Business Writing	53,146.00	14	3,796
Corporate HR (SAASTA)	Business Writing	43,290.00	13	3,330
Corporate HR	Corporate Induction	19,722.00	60	329
Corporate HR	Corporate Induction (WC) (23 June 2016)	12,761.00	50	255
Corporate HR	Skills Development Workshop (30 June-1 July 2016)	23,272.00	25	931
Corporate HR	Skills Development Facilitator	6,500.00	1	6,500
Corporate HR	Recruitment and Selection	34,000.00	16	2,125
Corporate HR (SAASTA/RISA/HartRAO/NZG)	Basic Excel	60,000.00	81	741
Corporate HR (Gauteng, Cape Town)	Finance for non-financial managers	34,166.00	30	1,139
Corporate HR (iThemba LABS)	Employment Equity	92,064.00	21	4,384
Corporate HR	Recruitment and Selection	34,000.00	16	2,125
Corporate HR (SAASTA/RISA/HartRAO/NZG)	Basic Excel	60,000.00	81	741
Corporate HR (Gauteng, Cape Town)	Finance for non-financial managers	34,165.80	30	1,139
Corporate HR (iThemba LABS)	Employment Equity	92,063.66	21	4,384
Presentation Training (Gauteng, Cape Town)	Presentation Training	51,248.70	45	1,139
HartRAO	IPMS Training	-	45	0
TOTAL		**1,116,615.16**	**806**	**1,385**

Employment and vacancies

Table 39: Vacancies per programme

Total NRF position summary	Programme	2015/16 Number of employees	2016/17 Approved positions	2016/17 Number of employees	2016/17 Vacancies	% Vacancies
	Programme 1 - Corporate	52	74	72	2	0.14%
	Programme 2 - Science Engagement	56	64	61	3	0.21%
	Programme 3 - Research and Innovation Support and Advancement (RISA)	208	191	186	5	0.35%
	Programme 4 - National Research Facilities (Excluding Astronomy)	687	715	683	32	2.22%
	Programme 5 - National Research Facilities (including SKA)	401	491	442	49	3.39%
	TOTAL	**1 404**	**1 535**	**1 444**	**91**	**6.30%**

Table 40: Vacancies per level

Total NRF position summary	Programme	2015/16 Number of employees	2016/17 Approved positions	2016/17 Number of employees	2016/17 Vacancies	% Vacancies
	Top management	6	6	6	-	0.00%
	Senior management	22	28	28	-	0.00%
	Professionally qualified and experienced specialists and mid-management	338	343	328	15	1.04%
	Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents	743	833	790	43	2.98%
	Semi-skilled and discretionary decision-making	211	218	203	15	1.04%
	Unskilled and defined decision-making	84	107	89	18	1.25%
	TOTAL	**1 404**	**1 535**	**1 444**	**91**	**6.30%**

The recruitment activity in the organisation remains high. A total of 85 terminations occurred and 119 vacancies have been filled. The cumulative annual staff turnover is 5.89% of which 5.19% can be classified as controllable turnover which includes resignations, contracts expiring, and retrenchments.

This relatively low cumulative turnover may partially be ascribed to the current economic situation. As the situation improves and stabilises, the NRF will be required to continue its efforts to retain staff and to find innovative ways of engaging and incentivising staff to reduce the risk of losing key personnel.

Very good progress has been made in reducing the recruitment turnaround time, with the average recruitment turnaround time for the period under review at 55 days. The vacancy control system has been developed and automated to monitor and improve recruitment efficiency.

NRF LinkedIn and other social media accounts have been opened and are used as additional platforms to enhance the recruitment process as part of the talent-sourcing strategy.

Table 41: Employment changes as at 31 March 2017 – reasons for staff leaving

Reasons for leaving	Reason	No. of employees	% of total no. of staff leaving
	Absconded	0	0.00%
	Deceased	0	0.00%
	Dismissal	2	2.35%
	End of fixed contract	31	36.47%
	Ill-health/Disability	0	0.00%
	Resignation	44	51.76%
	Retirement	8	9.41%
	Retrenchment	0	0.00%
	Transfers	0	0.00%
	TOTAL	**85**	**100.00%**

Labour relations – misconduct and disciplinary action

Table 42: Disciplinary actions

Nature of disciplinary action	Number
Dismissal	5
Final written warning	10
Verbal warning	5
Written warning	13
TOTAL	**33**

Equity target and employment equity status

Table 43: Male equity target and employment equity status

Equity target and employment equity status	Occupational level	Male							
		African		Coloured		Indian		White	
		Current	Target 2020	Current	Target 2020	Current	Target 2020	Current	Target 2020
	Top management	2	2	0	0	3	1	0	0
	Senior management	5	10	2	1	1	1	12	6
	Professionally qualified and experienced specialists and mid-management	48	67	27	22	9	4	121	78
	Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents	199	232	95	103	6	11	85	89
	Semi-skilled and discretionary decision-making	101	72	15	17	0	2	3	14
	Unskilled and defined decision-making	19	18	14	21	0	0	2	3
	Total Permanent	**374**	**401**	**153**	**164**	**19**	**19**	**223**	**190**
	Non-permanent employees	7	17	4	7	0	0	1	9
	TOTAL	**381**	**418**	**157**	**171**	**19**	**19**	**224**	**199**

Table 44: Female equity target and employment equity status

Equity target and employment equity status	Occupational level	Female							
		African		Coloured		Indian		White	
		Current	Target 2020	Current	Target 2020	Current	Target 2020	Current	Target 2020
	Top management	0	2	1	1	0	0	0	0
	Senior management	2	5	0	2	2	0	1	1
	Professionally qualified and experienced specialists and mid-management	19	60	5	22	8	6	36	30
	Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents	224	220	67	89	11	11	82	62
	Semi-skilled and discretionary decision-making	68	72	12	13	0	4	2	14
	Unskilled and defined decision-making	18	21	19	28	0	1	1	2
	Total Permanent	**331**	**380**	**104**	**155**	**21**	**22**	**122**	**109**
	Non-permanent employees	7	7	3	1	0	0	1	2
	TOTAL	**338**	**387**	**107**	**156**	**21**	**22**	**123**	**111**

Table 45: Disabled staff

Employment equity	Occupational level	Designated							Non-designated			Total
		Male			Female				Male	Foreign nationals		
		A	C	I	A	C	I	W	W	Male	Female	
	Top management	0	0	0	0	0	0	0	0	0	0	**0**
	Senior management	0	0	0	0	0	0	0	0	0	0	**0**
	Professionally qualified and experienced specialists and mid-management	0	1	0	1	0	0	0	1	0	0	**3**
	Skilled technical and academically qualified workers, junior management, supervisors, foremen and superintendents	1	0	0	2	0	0	0	0	0	0	**3**
	Semi-skilled and discretionary decision-making	1	0	0	1	0	0	1	0	0	0	**3**
	Unskilled and defined decision-making	0	0	0	0	0	0	0	0	0	0	**0**
	TOTAL PERMANENT	**2**	**1**	**0**	**4**	**0**	**0**	**1**	**1**	**0**	**0**	**9**
	Non-permanent employees	0	0	0	0	0	0	0	0	0	0	**0**
	TOTAL	**2**	**1**	**0**	**4**	**0**	**0**	**1**	**1**	**0**	**0**	**9**

Note: A=African, C=Coloured, I=Indian, W=White

16. KEY PERFORMANCE INDICATOR REPORT

16.1 STATEMENT OF RESPONSIBILITY FOR PERFORMANCE INFORMATION FOR THE YEAR ENDED 31 MARCH 2017

The Chief Executive Officer is responsible for the preparation of the public entity's performance information and for the judgements made in this information.

The Chief Executive Officer is responsible for establishing and implementing a system of internal control designed to provide reasonable assurance as to the integrity and reliability of performance information.

In my opinion the performance information fairly reflects the actual achievements against planned objectives, indicators and targets as per the strategic and annual performance plan of the public entity for the financial year ended 31 March 2017.

The NRF performance information for the year ended 31 March 2017 has been examined by the external auditors and their report is presented on page 132.

The performance information of the entity set out on pages 124 to 127 was approved by the NRF Board.

Dr Molapo Qhobela
Chief Executive Officer
July 2017

16.2 AUDITOR'S REPORT: PREDETERMINED OBJECTIVES

The AGSA/auditor currently performs the necessary audit procedures on the performance information to provide reasonable assurance in the form of an audit conclusion. The audit conclusion on the performance against predetermined objectives is included in the report to management, with material findings being reported under the *Predetermined Objectives* heading in the Report on *other legal and regulatory requirements* section of the auditor's report.

Refer to page 132 for the Report of the Auditor-General, published as Part D: Financial Statements.

16.3 Key performance indicator report

The following section contains tables on the performance targets set for 2016/17 and the NRF's actual performance against these targets.

Table 46: NRF performance against its strategic goals

INDICATORS		Actual 2013	Actual 2014	Actual 2015	Actual 2016	Proj. 2017	Performance ratio % or number	Annual target	Q4 target	Variance	% Variance	Explanation
OUTCOME: An internationally competitive and transformative research system												
STRATEGIC OBJECTIVE 1			**Promote globally competitive research and innovation**									
Number of NRF-funded researchers from designated groups	Black	790	1,008	1,235	1,355	1,739	1,563	1,739	1,739	-176	-10%	Researcher support requires dedicated reconfiguration to address the race and gender gaps. Since these are multi-factored and complex indicators that are affected by systemic shifts, it is necessary to perform an in-depth analysis of the contributory factors. In order for the NRF to fully understand the reason for underperformance, the organisation has established task teams to evaluate possible contributing factors like: • The adequacy of funding support • The quality of the research proposals • The presence of designated groups in specific domains • The limitations created through specific contracts
	Female	1,044	1,285	1,514	1,610	2,209	1,699	2,209	2,209	-510	-23%	
Number of postgraduate students funded from designated groups	Black	5,541	6,110	7,057	8,980	9,715	10,747	9,715	9,715	1,032	11%	NRF strategies to support black postgraduate students have started to yield reslults.
	Female	4,557	5,186	5,976	7,032	8,265	8,017	8,265	8,265	-248	-3%	The number of female postgraduate students is improving. Some of the deficit can be ascribed to the disruptions at universities during the third quarter influencing timeous uptake of bursaries.

INDICATORS		Actual 2013	Actual 2014	Actual 2015	Actual 2016	Proj. 2017	Performance ratio % or number	Annual target	Q4 target	Variance	% Variance	Explanation
OUTCOME: An internationally competitive and transformative research system												
Number of NRF-rated researchers from designated groups	Black	569	668	766	866	850	970	850	850	120	14%	Rating of black researchers is a priority for the NRF. The overachievement is a result of this effort.
	Female	780	889	962	1,054	1,088	1,176	1,088	1,088	88	8%	Rating of female researchers is a priority for the NRF. The overachievement is a result of this effort.
ISI publications published by the National Research Facilities		271	305	369	414	350	462	350	350	112	32%	Earlier than anticipated publications which were submitted last year. 25 RSA-CERN papers were published and the submission and publication of these papers cannot be fairly estimated due to the extremely large number of collaborators.
STRATEGIC OBJECTIVE 2		**Enhance strategic international engagements**										
Number of active grants emanating from binational, multinational as well as agency-to-agency agreements		515	858	1,055	1,275	1277	1008	1277	1277	-269	-21%	The partner country for DAAD bursaries and scholarships experienced some delays in finalising the administrative obligations required to launch the call. As a result fewer applications were received and uptake ratios were negatively affected.
STRATEGIC OBJECTIVE 3		**Provide best practice systems in support of grant-making, reviews and evaluations**										
Total number of researchers rated through the NRF system		2,638	2,959	3,161	3,369	3,400	3663	3400	3400	263	8%	Through active campaigns to motivate researchers to apply for an NRF rating the target was exceeded.

INDICATORS	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Proj. 2017	Performance ratio % or number	Annual target	Q4 target	Variance	% Variance	Explanation
OUTCOME: Leading-edge research and infrastructure platforms											
STRATEGIC OBJECTIVE 4	**Establish and maintain research infrastructure and platforms**										
Number of users of equipment that was funded by the NEP and NNEP programmes	1,651	1,682	1,700	2,360	2,000	2,950	2,000	2,000	950	48%	The weakened rand had a negative impact on the NEP programme. Firstly, fewer grants could be awarded due to the higher costs of equipment. Secondly, the extremely volatile exchange rate has caused longer than normal lead times in procuring and commissioning equipment. In addition, the 'fees must fall' campaign disrupted activities in the higher education institutions during two consecutive years. Users were therefore not able to access the equipment during the second semester of the 2015 and the 2016 academic years. Taking these socio-economic challenges into consideration, the targets have been amended for the following financial years as the impact of the forex volatility as well as the university unrest will continue to have a delayed impact on the system.
Number of publications emanating from the use of equipment funded by the NEP and NNEP programmes	910	1,546	1,700	1,105	2,300	779	2,300	2,300	-1,521	-66%	

INDICATORS	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Proj. 2017	Performance ratio % or number	Annual target	Q4 target	Variance	% Variance	Explanation
OUTCOME: A reputable and influential agency shaping the science and technology system											
STRATEGIC OBJECTIVE 5	**Grow NRF influence, impact and reputation**										
Number of internal and external users of the NRF business intelligence systems	0	0	0	14	65	74	65	65	9	14%	The increasing need for data analysis in the sector resulted in more users requesting access to inform business decisions. Specifically the number of HEIs utilising the BI systems have increased.
STRATEGIC OBJECTIVE 6	**Optimise return on investment**										
Unqualified audit report	yes	yes	yes	yes	yes						
Corporate overheads: calculated as a percentage of total expenditure	2%	2%	2%	2%	<3%	1.4%	<3%	3%	1.6%	53%	The overhead targets are achieved when the overheads are below 3 and 10 respectively. The variance is therefore irrelevant in this instance.
Total overheads: calculated as a percentage of total expenditure	9.4%	7.2%	7.9%	<10%	<10%	5.3%	<10%	10%	4.7%	47%	

INDICATORS	Actual 2013	Actual 2014	Actual 2015	Actual 2016	Proj. 2017	Performance ratio % or number	Annual target	Q4 target	Variance	% Variance	Explanation
OUTCOME: Scientifically literate and engaged society											
STRATEGIC OBJECTIVE 7	**Entrench science engagement**										
Approximate number of public reached through SAASTA's science awareness activities	551,408	502,186	972,547	1,013,716	1,040,000	1,084,760	1,040,000	1,040,000	44,760	4%	Science festivals attracted a large number of visitors. This could be due to the Mzansi For Science advert compaign and other active marketing strategies.

INDICATORS		Actual 2013	Actual 2014	Actual 2015	Actual 2016	Proj. 2017	Performance ratio % or number	Annual target	Q4 target	Variance	% Variance	Explanation
OUTCOME: A skilled and committed NRF research and technical workforce												
STRATEGIC OBJECTIVE 8		**Improve talent management**										
Proportion of South Africans from designated groups in senior technical, and managerial positions incl. SKA (Peromnes 1 - 8)	Black	218	244	250	275	291	287	291	291	-4	-1%	The NRF actively promotes the appointment of black and female staff in its recruitment strategies to reach the target. Every effort is made to ensure representivity in the management structure in accordance with the employment equity policy.
	Female	157	176	179	195	211	198	211	211	-13	-6%	

PART D:

ANNUAL FINANCIAL STATEMENTS

FOR THE YEAR ENDED 31 MARCH 2017

INDEX

The reports and statements set out below comprise the annual financial statements presented to the parliament:

17. BOARD'S RESPONSIBILITIES AND APPROVAL

The Board is required by the Public Finance Management Act (Act 1 of 1999, as amended), to maintain adequate accounting records and is responsible for the content and integrity of the annual financial statements and related financial information included in this report. It is the responsibility of the Board to ensure that the annual financial statements fairly present the state of affairs of the NRF as at the end of the financial year and the results of its operations and cash flows for the period then ended. The external auditors are engaged to express an independent opinion on the annual financial statements and were given unrestricted access to all financial records and related data.

The annual financial statements have been prepared in accordance with Standards of Generally Recognised Accounting Practice (GRAP) including any interpretations, guidelines and directives issued by the Accounting Standards Board.

The annual financial statements are based upon appropriate accounting policies consistently applied and supported by reasonable and prudent judgements and estimates.

The Board acknowledges that they are ultimately responsible for the system of internal financial control established by the NRF and places considerable importance on maintaining a strong control environment. To enable the Board to meet these responsibilities, the Board sets standards for internal control aimed at reducing the risk of error or deficit in a cost effective manner. The standards include the proper delegation of responsibilities within a clearly defined framework, effective accounting procedures and adequate segregation of duties to ensure an acceptable level of risk. These controls are monitored throughout the NRF and all employees are required to maintain the highest ethical standards in ensuring the NRF's business is conducted in a manner that in all reasonable circumstances is above reproach. The focus of risk management in the NRF is on identifying, assessing, managing and monitoring all known forms of risk across the entity. While operating risk cannot be fully eliminated, the NRF endeavours to minimise it by ensuring that appropriate infrastructure, controls, systems and ethical behaviour are applied and managed within predetermined procedures and constraints.

The Board Is of the opinion, based on the information and explanations given by management, that the system of internal control provides reasonable assurance that the financial records may be relied on for the preparation of the annual financial statements. However, any system of internal financial control can provide only reasonable, and not absolute, assurance against material misstatement or deficit.

The Board has reviewed the NRF's cash flow forecast for the year to 31 March 2018 and, in the light of this review and the current financial position, they are satisfied that the NRF has, or has access to, adequate resources to continue in operational existence for the foreseeable future.

Although the Board is primarily responsible for the financial affairs of the NRF, they are supported by the NRF's external auditors.

The external auditors are responsible for independently reviewing and reporting on the NRF's annual financial statements. The annual financial statements have been examined by the entity's external auditors and their report is presented on page 132.

The annual financial statements set out on pages 136 to 190, which have been prepared on the going concern basis, were approved by the Board on 28 July 2017 and were signed on its behalf by:

Prof. L Nongxa
Chairperson: NRF Board
July 2017

Dr Molapo Qhobela
Chief Executive Officer
July 2017

18. AUDIT AND RISK COMMITTEE REPORT

We are pleased to present our report for the financial year ended 31 March 2017.

Audit and Risk Committee responsibility

The Audit and Risk Committee reports that it has complied with its responsibilities arising from section 51(a)(ii) of the PFMA and Treasury Regulation 3.1.13.

The Audit and Risk Committee also reports that it has adopted appropriate formal terms of reference as its Audit and Risk Committee charter, has regulated its affairs in compliance with this charter and has discharged all its responsibilities as contained therein.

The effectiveness of internal control

The system of internal control applied by the NRF over financial and risk management is effective, efficient and transparent. In line with the PFMA and the King IV Report on Corporate Governance requirements, Internal Audit provides the audit committee and management with assurance that the internal controls are appropriate and effective. This is achieved by means of the risk management process, as well as the identification of corrective actions and suggested enhancements to the controls and processes. From the various reports of the Internal Auditors, the Audit Report on the annual financial statements, and the management report of the Auditor-General of South Africa, it was noted that no matters were reported that indicate any material deficiencies in the system of internal control or any deviations therefrom. Accordingly, we can report that the system of internal control over financial reporting for the period under review was efficient and effective.

Evaluation of annual financial statements

The Audit Committee has:

- reviewed and discussed the audited annual financial statements to be included in the annual report, with the Auditor-General and the Accounting Authority;
- reviewed the Auditor-General of South Africa management report and management's response thereto;
- reviewed changes in accounting policies and practices;
- reviewed the entity's compliance with legal and regulatory provisions; and
- reviewed significant adjustments resulting from the audit.

The Audit and Risk Committee, with one exception detailed in the next paragraph, concurs with, and accepts the Auditor-General of South Africa's report on the annual financial statements, and is of the opinion that the audited annual financial statements should be accepted, and read together with the report of the Auditor-General of South Africa.

Existing legislation requires that tenders may only be awarded to persons whose tax matters have been declared to be in order by the South African Revenue Service. The NRF are obtaining legal and empirical clarification as specified in note 41.

Internal audit

The Audit and Risk Committee is satisfied that the internal audit function is operating effectively, and that it has addressed the risks pertinent to the entity and its audits.

Auditor-General of South Africa

The Audit and Risk Committee has met with the Auditor-General of South Africa to ensure that there are no unresolved issues.

Dr Peter Clayton

Chairperson of the Audit and Risk Committee

July 2017

19. REPORT OF THE AUDITOR-GENERAL TO PARLIAMENT ON THE NATIONAL RESEARCH FOUNDATION

Report on the audit of the financial statements

Opinion

1. I have audited the financial statements of the National Research Foundation (NRF) set out on pages 136 to 190, which comprise the statement of financial position as at 31 March 2017, the statement of financial performance, statement of changes in net assets, statement of cash flows and statement of comparison of budget information with actual information for the year then ended, as well as the notes to the financial statements, including a summary of significant accounting policies.
2. In my opinion, the financial statements present fairly, in all material respects, the financial position of the NRF as at 31 March 2017 and financial performance and cash flows for the year then ended in accordance with the African Standards of General Recognised Accounting Practice (SA standards of GRAP) and the requirements of the Public Finance Management Act of South Africa, 1999 (Act no.1 of 1999) (PFMA).

Basis for opinion

3. I conducted my audit in accordance with the International Standards on Auditing (ISAs). My responsibilities under those standards are further described in the auditor-general's responsibilities for the audit of the financial statements section of my report.
4. I am independent of the entity in accordance with the International Ethics Standards Board for Accountants' *Code of ethics for professional accountants* (IESBA code) and the ethical requirements that are relevant to my audit in South Africa. I have fulfilled my other ethical responsibilities in accordance with these requirements and the IESBA code.
5. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Responsibilities of the Accounting Authority for the financial statements

6. The accounting authority is responsible for the preparation and fair presentation of the financial statements in accordance with SA standards of GRAP, the requirements of the PFMA and for such internal control as the accounting authority determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.
7. In preparing the financial statements, the accounting authority is responsible for assessing the NRF's ability to continue as a going concern, disclosing, as applicable, matters relating to going concern and using the going concern basis of accounting unless the intention is to liquidate the entity or cease operations, or there is no realistic alternative but to do so.

Auditor-general's responsibilities for the audit of the financial statements

8. My objectives are to obtain reasonable assurance about whether financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with ISAs will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of financial statements.
9. A further description of my responsibilities for the audit of the financial statements is included in the annexure to the auditor's report.

Report on the audit of the annual performance report

Introduction and scope

10. In accordance with the Public Audit Act of South Africa, 2004 (Act No. 25 of 2004) (PAA) and the general notice issued in terms thereof, I have a responsibility to report material findings on the reported performance information against predetermined objectives for selected programmes presented in the annual performance report. I performed procedures to identify findings but not to gather evidence to express assurance.
11. My procedures address the reported performance information, which must be based on the approved performance planning documents of the entity. I have

not evaluated the completeness and appropriateness of the performance indicators included in the planning documents. My procedures also did not extend to any disclosures or assertions relating to planned performance strategies and information in respect of future periods that may be included as part of the reported performance information. Accordingly, my findings do not extend to these matters.

12. I evaluated the usefulness and reliability of the reported performance information in accordance with the criteria developed from the performance management and reporting framework, as defined in the general notice, for the following selected programmes presented in the annual performance report of the entity for the year ended 31 March 2017.

Programmes	Pages in the annual performance report
Programme 3 – Research and Innovation Support and Advancement (RISA)	59 – 71
Programme 4 – National Research Facilities excluding Astronomy	75 – 85
Programme 5 – National Research Facilities (including SKA)	87 – 95

13. I performed procedures to determine whether the reported performance information was properly presented and whether performance was consistent with the approved performance planning documents. I performed further procedures to determine whether the indicators and related targets were measurable and relevant, and assessed the reliability of the reported performance information to determine whether it was valid, accurate and complete.
14. The material findings in respect of the reliability of the **programme 5 – National Research Facilities (including SKA)** is as follows:
15. The reported number of joint international agreements at the national facilities was misstated as the evidence provided indicated that it should have been 41 instead of the 48 that was reported.
16. I did not identify any material findings on the usefulness and reliability of the reported performance information for the following programmes:
    - Programme 3 – Research and Innovation Support and Advancement (RISA)
    - Programme 4 – National Research Facilities excluding Astronomy

Other matters

17. I draw attention to the matters below.

Achievement of planned targets

18. Refer to the annual performance report on pages 123 to 127 for information on the achievement of planned targets for the year and explanations provided for the under/overachievement of a number of targets. This information should be considered in the context of the material findings on the reliability of the reported performance information in paragraph 15 of this report.

Adjustment of material misstatements

19. I identified material misstatements in the annual performance report submitted for auditing. These material misstatements were on the reported performance information of Programme 3 – Research and Innovation Support and Advancement and Programme 5 – National Research Facilities (including SKA). As management subsequently corrected only some of the misstatements, I raised material findings on the reliability of the reported performance information. Those that were not corrected are included in the material finding reported in paragraph 15 of this report.

Report on audit of compliance with legislation

Introduction and scope

20. In accordance with the PAA and the general notice issued in terms thereof, I have a responsibility to report material findings on the compliance of the entity with specific matters in key legislation. I performed procedures to identify findings but not to gather evidence to express assurance.
21. I did not identify any instances of material non-compliance with specific matters in key legislation, as set out in the general notice issued in terms of the PAA.

Other information

22. The NRF's accounting authority is responsible for the other information. The other information does not include the financial statements, the auditor's report and those selected programmes presented in the annual performance report that have been specifically reported on in the auditor's report.

23. My opinion on the financial statements and findings on the reported performance information and compliance with legislation do not cover the other information and I do not express an audit opinion or any form of assurance conclusion thereon.
24. In connection with my audit, my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements and the selected programmes presented in the annual performance report, or my knowledge obtained in the audit, or otherwise appears to be materially misstated. If, based on the work I have performed on the other information obtained prior to the date of this auditor's report, I conclude that there is a material misstatement of this other information, I am required to report that fact. I have nothing to report in this regard.

Internal control deficiencies

25. I considered internal control relevant to my audit of financial statements, reported performance information and compliance with applicable legislation; however, my objective was not to express any form of assurance thereon. The matters reported below are limited to the significant internal control deficiencies that resulted in the findings on the annual performance report included in this report.

Financial and performance management

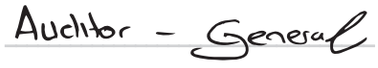
26. Senior management`s reviews were inadequate to ensure that the number of joint international agreements reported in the annual performance report was valid and accurate as the supporting documentation provided did not confirm the reported target.

Other reports

27. I draw attention to the following engagements conducted by various parties that had, or could have, an impact on the matters reported in the entity's financial statements, reported performance information, compliance with applicable legislation and other related matters. These reports did not form part of my opinion on the financial statements or my findings on the reported performance information or compliance with legislation.

Investigation

28. An on-going investigation against a former employee who paid stipends to invalid students was commissioned based on allegation of fraudulent activities relating to "ghost employees" in the South African Agency for Science and Technology Advancement's (SAASTA) national volunteer programme.



Auditor-General South Africa
Pretoria
July 2017

AUDITOR-GENERAL
SOUTH AFRICA

Auditing to build public confidence

ANNEXURE – AUDITOR-GENERAL'S RESPONSIBILITY FOR THE AUDIT

1. As part of an audit in accordance with the ISAs, I exercise professional judgement and maintain professional scepticism throughout my audit of the financial statements, and the procedures performed on reported performance information for selected objectives and on the entity's compliance with respect to the selected subject matters.

Financial statements

2. In addition to my responsibility for the audit of the financial statements as described in the auditor's report, I also:
    - identify and assess the risks of material misstatement of the financial statements whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
    - obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control.
    - evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the accounting authority.
    - conclude on the appropriateness of the accounting authority use of the going concern basis of accounting in the preparation of the financial statements. I also conclude, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the entity's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements about the material uncertainty or, if such disclosures are inadequate, to modify the opinion on the financial statements. My conclusions are based on the information available to me at the date of the auditor's report. However, future events or conditions may cause an entity to cease operating as a going concern.
    - evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

Communication with those charged with governance

3. I communicate with the accounting authority regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.
4. I also confirm to the accounting authority that I have complied with relevant ethical requirements regarding independence, and communicate all relationships and other matters that may reasonably be thought to have a bearing on my independence and, where applicable, related safeguards.

20. ANNUAL FINANCIAL STATEMENTS

STATEMENT OF FINANCIAL POSITION as at 31 March 2017

	Note(s)	2017 R'000	2016 R'000
Assets			
Current assets			
Inventories	11	7,080	6,180
Other financial assets	7	615,914	627,150
Receivables from exchange transactions	12	471,602	445,637
Grants paid in advance	10	409,205	392,677
Cash and cash equivalents	13	494,775	671,475
		1,998,576	**2,143,119**
Non-current assets			
Property, plant and equipment	3	2,148,038	1,639,071
Intangible assets	4	46,200	53,743
Heritage assets	5	15,479	15,479
Investments in associates	6	18,447	22,795
Employee benefit asset	8	3,701	1,459
Prepayments	9	16,269	34,916
		2,248,134	**1,767,463**
Total assets		**4,246,710**	**3,910,582**
Liabilities			
Current liabilities			
Finance lease obligation	16	88	173
Payables from exchange transactions	19	134,761	103,727
Provisions	17	8,374	18,095
Designated income received in advance	18	1,798,739	1,972,022
		1,941,962	**2,094,017**
Non-current liabilities			
Finance lease obligation	16	87	47
Total liabilities		**1,942,049**	**2,094,064**
Net assets		**2,304,661**	**1,816,518**
Reserves			
SALT Fund	15	18,447	22,795
Capital Fund	14	2,209,717	1,708,296
Infrastructure Fund		76,066	81,317
Accumulated surplus		431	4,110
Total net assets		**2,304,661**	**1,816,518**

STATEMENT OF FINANCIAL PERFORMANCE

	Note(s)	2017 R'000	2016 R'000
Revenue			
Revenue from exchange transactions			
Sale of goods and services	20	67,968	72,137
Insurance recoveries		4,113	19,359
Other income	21	9,769	13,440
Entrance fees		34,576	36,054
Interest received – investment	22	103,463	101,528
Total revenue from exchange transactions		**219,889**	**242,518**
Revenue from non-exchange transactions			
Parliamentary grant		882,805	878,399
Ring-fenced income	23	2,177,930	1,735,687
Designated income	24	1,218,254	1,305,988
Total revenue from non-exchange transactions		**4,278,989**	**3,920,074**
Total revenue		**4,498,878**	**4,162,592**
Expenditure			
Programme 1: Corporate		(77,459)	(74,810)
Programme 2: Science Engagement		(169,509)	(163,946)
Programme 3: Research and Innovation Support and Advancement		(2,690,504)	(2,645,156)
Programme 4: National Research Facilities (excluding Astronomy)		(430,026)	(394,746)
Programme 5: National Research Facilities (including SKA)	26	(637,930)	(514,031)
Total expenditure		**(4,005,428)**	**(3,792,689)**
Operating surplus	29	**493,450**	**369,903**
Loss on disposal of assets and liabilities		(1,281)	(784)
Loss on foreign exchange		(1,873)	(3,547)
Actuarial gains/(losses)	8	2,242	-
Share of deficits from associates, accounted for using the equity method		(4,348)	(2,967)
Finance cost		(47)	(141)
		(5,307)	**(7,439)**
Surplus for the year before asset acquisitions*		**488,143**	**362,464**

*R501m (2016: R345m) of this figure has been applied to the net acquisition of assets (refer to Statement of Changes in Net Assets).

STATEMENT OF CHANGES IN NET ASSETS

	SALT fund R'000	Capital fund R'000	Infrastructure fund R'000	Total reserves R'000	Accumulated surplus R'000	Total net assets R'000
Opening balance as previously reported	25,763	1,364,477	61,958	1,452,198	2,537	1,454,735
Adjustments						
Prior year adjustments	-	(681)	-	(681)	-	(681)
Balance at 01 April 2015 as restated*	**25,763**	**1,363,796**	**61,958**	**1,451,517**	**2,537**	**1,454,054**
Changes in net assets						
Surplus for the year	-	-	-	-	362,464	362,464
Transfer from SALT fund	(2,968)	-	-	(2,968)	2,968	-
Transfer to capital fund	-	344,500	-	344,500	(344,500)	-
Transfer from infrastructure fund	-	-	19,359	19,359	(19,359)	-
Total changes	(2,968)	344,500	19,359	360,891	1,573	362,464
Balance at 01 April 2016	**22,795**	**1,708,296**	**81,317**	**1,812,408**	**4,110**	**1,816,518**
Changes in net assets						
Surplus for the year	-	-	-	-	488,143	488,143
Transfer from SALT fund	(4,348)	-	-	(4,348)	4,348	-
Transfer to capital fund	-	501,421	-	501,421	(501,421)	-
Transfer to infrastructure fund	-	-	(5,251)	(5,251)	5,251	-
Total changes	(4,348)	501,421	(5,251)	491,822	(3,679)	488,143
Balance at 31 March 2017	**18,447**	**2,209,717**	**76,066**	**2,304,230**	**431**	**2,304,661**
Note(s)	15	14				

CASH FLOW STATEMENT

	Note(s)	2017 R'000	2016 R'000
Cash flows from operating activities			
Receipts			
Parliamentary grant		882,805	878,399
Ring-fenced funding received		1,925,348	1,891,520
Designated income		1,333,592	1,115,257
Interest income		103,463	101,528
Other receipts		54,422	124,342
		4,299,630	4,111,046
Payments			
Employee costs		(628,114)	(563,292)
Suppliers		(613,445)	(562,543)
Finance cost		(47)	(141)
Grants, bursaries and other research		(2,604,967)	(2,578,464)
		(3,846,573)	(3,704,440)
Net cash flows from operating activities	30	**453,057**	**406,606**
Cash flows from investing activities			
Purchase of property, plant and equipment	3	(628,994)	(438,918)
Proceeds from sale of property, plant and equipment	3	475	881
Purchase of other intangible assets	4	(1,052)	(1,129)
Net cash flows from investing activities		**(629,571)**	**(439,166)**
Cash flows from financing activities			
Finance lease payments		(186)	(523)
Net increase/(decrease) in cash and cash equivalents		**(176,700)**	**(33,083)**
Cash and cash equivalents at the beginning of the year		671,475	704,558
Cash and cash equivalents at the end of the year	13	**494,775**	**671,475**

STATEMENT OF COMPARISON OF BUDGET AND ACTUAL AMOUNTS

Budget on Accrual Basis

	Final budget R'000	Actual amounts on comparable basis R'000	Difference between final budget and actual R'000	Reference
Statement of financial performance				
Revenue				
Revenue from exchange transactions				
Sale of goods and services	**77,137**	67,968	**(9,169)**	
Insurance claim received	**-**	4,113	**4,113**	
Other income	**16,779**	9,769	**(7,010)**	
Entrance fees	**41,378**	34,576	**(6,802)**	
Interest received – investment	**49,127**	103,463	**54,336**	43
Total revenue from exchange transactions	**184,421**	**219,889**	**35,468**	
Revenue from non-exchange transactions				
Ring-fenced income	**2,316,292**	2,177,930	**(138,362)**	43
Parliamentary grant	**882,805**	882,805	**-**	
Designated income	**1,061,690**	1,218,254	**156,564**	43
Total revenue from non-exchange transactions	**4,260,787**	**4,278,989**	**18,202**	
Total revenue	**4,445,208**	**4,498,878**	**53,670**	
Expenditure				
Employees related costs	**(678,756)**	(627,097)	**51,659**	43
Depreciation and amortisation	**(97,855)**	(124,713)	**(26,858)**	43
Grants, bursaries and other research expenditure	**(2,464,323)**	(2,599,677)	**(135,354)**	43
Programme and operating expenses	**(582,806)**	(653,941)	**(71,135)**	43
Total expenditure	**(3,823,740)**	**(4,005,428)**	**(181,688)**	
Loss on disposal of assets and liabilities	**(100)**	(1,281)	**(1,181)**	
Loss on foreign exchange	**(440)**	(1,873)	**(1,433)**	
Actuarial gain/(losses)	**-**	2,242	**2,242**	
Share of surpluses or deficits from associates or joint ventures accounted for using the equity method	**-**	(4,348)	**(4,348)**	
Finance cost	**(31)**	(47)	**(16)**	
	(571)	**(5,307)**	**(4,736)**	
Actual amount on comparable basis as presented in the budget and actual comparative statement	**620,897**	**488,143**	**(132,754)**	

ACCOUNTING POLICIES

1. Presentation of annual financial statements

The annual financial statements have been prepared in accordance with the Standards of Generally Recognised Accounting Practice (GRAP), issued by the Accounting Standards Board in accordance with Section 89 of the Public Finance Management Act (Act 1 of 1999, as amended).

These annual financial statements have been prepared on an accrual basis of accounting and are in accordance with the historical cost convention as the basis of measurement, unless specified otherwise. They are presented in South African Rand.

In the absence of an issued and effective Standard of GRAP, accounting policies for material transactions, events or conditions were developed in accordance with paragraphs 8, 10 and 11 of GRAP 3 as read with Directive 5.

Assets, liabilities, revenues and expenses were not offset, except where offsetting is either required or permitted by a Standard of GRAP.

A summary of the significant accounting policies, which have been consistently applied in the preparation of these annual financial statements, is disclosed below.

These accounting policies are consistent with the previous period.

1.1 Presentation currency

These annual financial statements are presented in South African Rand, which is the functional currency of the entity.

1.2 Going concern assumption

These annual financial statements have been prepared based on the expectation that the entity will continue to operate as a going concern for at least the next 12 months.

1.3 Significant judgements and sources of estimation uncertainty

In preparing the annual financial statements, management is required to make estimates and assumptions that affect the amounts represented in the annual financial statements and related disclosures. Use of available information and the application of judgement is inherent in the formation of estimates. Actual results in the future could differ from these estimates which may be material to the annual financial statements. Significant judgements include:

Trade receivables and loans and receivables

The entity assesses its trade receivables and loans and receivables for impairment at the end of each reporting period. In determining whether an impairment loss should be recorded in surplus or deficit, the entity makes judgements as to whether there is objective evidence indicating a measurable decrease in the estimated future cash flows from a financial asset. Each receivable is reviewed individually at year end.

Fair value estimation

The carrying value less impairment provision of trade receivables and payables are assumed to approximate their fair values. The fair value of financial liabilities for disclosure purposes is estimated by discounting the future contractual cash flows at the current market interest rate that is available to the entity for similar financial instruments.

Impairment testing

The recoverable amounts of cash-generating units and individual assets have been determined based on the higher of value-in-use calculations and fair values less costs to sell. These calculations require the use of estimates and assumptions.

The entity reviews and tests the carrying value of assets when events or changes in circumstances suggest that the carrying amount may not be recoverable. Assets are grouped at the lowest level for which identifiable cash flows are largely independent of cash flows of other assets and liabilities. If there are indications that impairment may have occurred, estimates are prepared of expected future cash flows for each group of assets. Expected future cash flows used to determine the value-in-use of tangible assets are inherently uncertain and could materially change over time.

Provisions

Provisions were raised and management determined an estimate based on the information available. Additional disclosure of these estimates of provisions is included in note 17, Provisions.

Post-retirement benefits

The present value of the post-retirement obligation depends on a number of factors that are determined on an actuarial basis using a number of assumptions. The assumptions used in determining the net cost/(income) include the discount rate. Any changes in these assumptions will impact on the carrying amount of post-retirement obligations.

Other key assumptions for post-retirement benefits are based on current market conditions. Additional information is disclosed in Note 8.

Effective interest rate

The entity used a prime linked interest rate to discount future cash flows.

Property, plant and equipment and intangible assets

The entity's management determines the estimated useful lives and residual values of property, plant and equipment and intangible assets. These assessments are made on an annual basis and use historical evidence and current economic factors to estimate the values.

Administrative computer equipment, office furniture and equipment, exhibits and motor vehicles are not componentised. These assets do not have significant parts that are considered to have an estimated useful life different to the estimated useful life of the asset as a whole.

1.4 Property, plant and equipment

Property, plant and equipment are tangible non-current assets (including infrastructure assets) that are held for use in the production or supply of goods or services, rental to others, or for administrative purposes, and are expected to be used during more than one period.

The cost of an item of property, plant and equipment is recognised as an asset when:

- it is probable that future economic benefits or service potential associated with the item will flow to the entity; and
- the cost of the item can be measured reliably.

Property, plant and equipment is initially measured at cost.

The cost of an item of property, plant and equipment is the purchase price and other costs attributable to bring the asset to the location and condition necessary for it to be capable of operating in the manner intended by management. Trade discounts and rebates are deducted in arriving at the cost.

Where an asset is acquired through a non-exchange transaction, its cost is its fair value as at date of acquisition.

Where an item of property, plant and equipment is acquired in exchange for a non-monetary asset or monetary assets, or a combination of monetary and non-monetary assets, the asset acquired is initially measured at fair value (the cost). If the acquired item's fair value was not determinable, its deemed cost is the carrying amount of the asset(s) given up.

When significant components of an item of property, plant and equipment have different useful lives, they are accounted for as separate items (major components) of property, plant and equipment.

Costs include costs incurred initially to acquire or construct an item of property, plant and equipment and costs incurred subsequently to add to, replace part of, or service it. If a replacement cost is recognised in the carrying amount of an item of property, plant and equipment, the carrying amount of the replaced part is derecognised.

The initial estimate of the costs of dismantling and removing the item and restoring the site on which it is located is also included in the cost of property, plant and equipment, where the entity is obligated to incur such expenditure, and where the obligation arises as a result of acquiring the asset or using it for purposes other than the production of inventories.

Recognition of costs in the carrying amount of an item of property, plant and equipment ceases when the item is in the location and condition necessary for it to be capable of operating in the manner intended by management.

Items such as spare parts, standby equipment and servicing equipment are recognised when they meet the definition of property, plant and equipment.

Major inspection costs which are a condition of continuing use of an item of property, plant and equipment and which meet the recognition criteria above are included as a replacement in the cost of the item of property, plant and equipment. Any remaining inspection costs from the previous inspection are derecognised.

Property, plant and equipment is carried at cost less accumulated depreciation and any impairment losses.

Property, plant and equipment is depreciated on the straight line basis over their expected useful lives to their estimated residual value.

The depreciable amount of an asset is allocated on a systematic basis over its useful life.

Each part of an item of property, plant and equipment with a cost that is significant in relation to the total cost of the item is depreciated separately.

The depreciation method used reflects the pattern in which the asset's future economic benefits or service potential are expected to be consumed by the entity. The depreciation method applied to an asset is reviewed at least at each reporting date and, if there has been a significant change in the expected pattern of consumption of the future economic benefits or service potential embodied in the asset, the method is changed to reflect the changed pattern. Such a change is accounted for as a change in an accounting estimate.

The entity assesses at each reporting date whether there is any indication that the entity's expectations about the residual value and the useful life of an asset have changed since the preceding reporting date. If any such indication exists, the entity revises the expected useful life and/or residual value accordingly. The change is accounted for as a change in an accounting estimate.

The depreciation charge for each period is recognised in surplus or deficit unless it is included in the carrying amount of another asset.

Items of property, plant and equipment are derecognised when the asset is disposed of or when there are no further economic benefits or service potential expected from the use of the asset.

The gain or loss arising from the derecognition of an item of property, plant and equipment is included in surplus or deficit when the item is derecognised. The gain or loss arising from the derecognition of an item of property, plant and equipment is determined as the difference between the net disposal proceeds, if any, and the carrying amount of the item.

The entity separately discloses expenditure to repair and maintain property, plant and equipment in the notes to the financial statements (see note 3).

The entity discloses relevant information relating to assets under construction or development, in the notes to the financial statements (see note 3).

Zoological animals

Zoological animals have not been included as an asset in the statement of financial position. The reason is that the essential recognition criteria of measurement for recognising assets cannot be met for the majority of the animals. The majority of zoological animals are received as donations, transfers from other zoos or from births. As a result, they do not have a cost.

It is considered impracticable to assign a fair value to the animals due to a variety of reasons. These reasons include, among others things, considerations such as the lack of a market for the majority of the animals, because they are not commodities, as well as restrictions on the trade of exotic animals, which precludes the determinations of a fair value.

The animals for which it may be possible to determine an arbitrary value approximates 8% of the total animal collections. It is the view of the NRF that it is unethical and not in the best interest of the National Zoological Gardens (NZG) to attach values to these animals. In addition, the NZG is not in the business of trading with these animals.

Therefore, on the basis that many species cannot be valued and any attempt to attach values to any species may be unethical, it was considered that any assessment of value would be misleading to the users of the financial statements.

1.5 Intangible assets

An intangible asset is identifiable if it either:

- is separable, i.e. is capable of being separated or divided from an entity and sold, transferred, licensed, rented or exchanged, either individually or together with a related contract, identifiable assets or liability, regardless of whether the entity intends to do so; or
- arises from binding arrangements (including rights from contracts), regardless of whether those rights are transferable or separable from the entity or from other rights and obligations.

A binding arrangement describes an arrangement that confers similar rights and obligations on the parties to it as if it were in the form of a contract.

An intangible asset is recognised when:

- it is probable that the expected future economic benefits or service potential that are attributable to the asset will flow to the entity; and
- the cost or fair value of the asset can be measured reliably.

The entity assesses the probability of expected future economic benefits or service potential using reasonable and supportable assumptions that represent management's best estimate of the set of economic conditions that will exist over the useful life of the asset.

Where an intangible asset is acquired through a non-exchange transaction, its initial cost at the date of acquisition is measured at its fair value as at that date.

Expenditure on research (or on the research phase of an internal project) is recognised as an expense when it is incurred.

An intangible asset arising from development (or from the development phase of an internal project) is recognised when:

- it is technically feasible to complete the asset so that it will be available for use or sale.
- there is an intention to complete and use or sell it.
- there is an ability to use or sell it.
- it will generate probable future economic benefits or service potential.
- there are available technical, financial and other resources to complete the development and to use or sell the asset.
- the expenditure attributable to the asset during its development can be measured reliably.

Intangible assets are carried at cost less any accumulated amortisation and any impairment losses.

An intangible asset is regarded as having an indefinite useful life when, based on all relevant factors, there is no foreseeable limit to the period over which the asset is expected to generate net cash inflows or service potential. Amortisation is not provided for these intangible assets, but they are tested for impairment annually and whenever there is an indication that the asset may be impaired. For all other intangible assets, amortisation is provided on a straight line basis over their useful life.

The amortisation period and the amortisation method for intangible assets are reviewed at each reporting date.

Reassessing the useful life of an intangible asset with a finite useful life after it was classified as indefinite is an indicator that the asset may be impaired. As a result the asset is tested for impairment and the remaining carrying amount is amortised over its useful life.

Internally generated brands, mastheads, publishing titles, customer lists and items similar in substance are not recognised as intangible assets.

Internally generated goodwill is not recognised as an intangible asset.

Amortisation is provided to write down the intangible assets, on a straight line basis, to their residual values as follows:

Item	Useful life
Computer software	3 – 10 years

The entity discloses relevant information relating to assets under construction or development, in the notes to the financial statements (see note 4).

Intangible assets are derecognised:

- on disposal; or
- when no future economic benefits or service potential are expected from their use or disposal.

The gain or loss arising from the derecognition of an intangible assets is included in surplus or deficit when the asset is derecognised.

1.6 Heritage assets

Heritage assets are assets that have a cultural, environmental, historical, natural, scientific, technological or artistic significance and are held indefinitely for the benefit of present and future generations.

An inalienable item is an asset that an entity is required by law or otherwise to retain indefinitely and cannot be disposed of without consent.

Recognition
The entity recognises a heritage asset as an asset if it is probable that future economic benefits or service potential associated with the asset will flow to the entity, and the cost or fair value of the asset can be measured reliably.

Initial measurement
Heritage assets are measured at cost.

Where a heritage asset is acquired through a non-exchange transaction, its cost is measured at its fair value as at the date of acquisition.

Subsequent measurement
After recognition as an asset, a class of heritage assets is carried at its cost less any accumulated impairment losses.

Impairment
The entity assesses at each reporting date whether there is an indication that it may be impaired. If any such indication exists, the entity estimates the recoverable amount or the recoverable service amount of the heritage asset.

Transfers
Transfers from heritage assets are only made when the particular asset no longer meets the definition of a heritage asset.

Transfers to heritage assets are only made when the asset meets the definition of a heritage asset.

Derecognition
The entity derecognises heritage assets on disposal, or when no future economic benefits or service potential are expected from their use or disposal.

The gain or loss arising from the derecognition of a heritage asset is included in surplus or deficit when the item is derecognised.

1.7 Investments in associates
An investment in an associate is carried at cost and subsequently using the equity method of accounting.

The entity applies the same accounting for each category of investment.

The entity recognises a dividend or similar distribution in surplus or deficit in its separate annual financial statements when its right to receive the dividend or similar distribution is established.

1.8 Financial instruments
A financial instrument is any contract that gives rise to a financial asset of one entity and a financial liability or a residual interest of another entity.

The amortised cost of a financial asset or financial liability is the amount at which the financial asset or financial liability is measured at initial recognition minus principal repayments, plus or minus the cumulative amortisation using the effective interest method of any difference between that initial amount and the maturity amount, and minus any reduction (directly or through the use of an allowance account) for impairment or uncollectibility.

Credit risk is the risk that one party to a financial instrument will cause a financial loss for the other party by failing to discharge an obligation.

Currency risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in foreign exchange rates.

Derecognition is the removal of a previously recognised financial asset or financial liability from an entity's statement of financial position.

The effective interest method is a method of calculating the amortised cost of a financial asset or a financial liability (or group of financial assets or financial liabilities) and of allocating the interest income or interest expense over the relevant period. The effective interest rate is the rate that exactly discounts estimated future cash payments or receipts through the expected life of the financial instrument or, when appropriate, a shorter period to the net carrying amount of the financial asset or financial liability. When calculating the effective interest rate, an entity shall estimate cash flows considering all contractual terms of the financial instrument (for example, prepayment, call and similar options) but shall not consider future credit losses. The calculation includes all fees and points paid or received between parties to the contract that are an integral part of the effective interest rate, transaction costs, and all other premiums or discounts. There is a presumption that the cash flows and the expected life of a group of similar financial instruments can be estimated reliably. However, in those rare cases when it is not possible to reliably estimate the cash flows or the expected life of a financial instrument (or group of financial instruments), the entity shall use the contractual cash flows over the full contractual term of the financial instrument (or group of financial instruments).

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable willing parties in an arm's length transaction.

A financial asset is:

- cash;
- a residual interest of another entity; or
- a contractual right to:
  - receive cash or another financial asset from another entity; or
  - exchange financial assets or financial liabilities with another entity under conditions that are potentially favourable to the entity.

A financial liability is any liability that is a contractual obligation to:

- deliver cash or another financial asset to another entity; or
- exchange financial assets or financial liabilities under conditions that are potentially unfavourable to the entity.

Interest rate risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market interest rates.

Liquidity risk is the risk encountered by an entity in the event of difficulty in meeting obligations associated with financial liabilities that are settled by delivering cash or another financial asset.

Loan commitment is a firm commitment to provide credit under pre-specified terms and conditions.

Loans payable are financial liabilities, other than short-term payables on normal credit terms.

Market risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices. Market risk comprises three types of risk:

Other price risk is the risk that the fair value or future cash flows of a financial instrument will fluctuate because of changes in market prices (other than those arising from interest rate risk or currency risk), whether those changes are caused by factors specific to the individual financial instrument or its issuer, or factors affecting all similar financial instruments traded in the market.

A financial asset is past due when a counterparty has failed to make a payment when contractually due.

Financial instruments at amortised cost are non-derivative financial assets or non-derivative financial liabilities that have fixed or determinable payments, excluding those instruments that:

- the entity designates at fair value at initial recognition; or
- are held for trading.

Financial instruments at cost are investments in residual interests that do not have a quoted market price in an active market, and whose fair value cannot be reliably measured.

Classification

The entity has the following types of financial assets (classes and category) as reflected on the face of the statement of financial position or in the notes thereto:

Class	Category
Trade and other receivables	Financial asset measured at amortised cost
Cash and cash equivalents	Financial asset measured at amortised cost
Grants deposit accounts & Infrastructure bridging funding	Financial asset measured at amortised cost

The entity has the following types of financial liabilities (classes and category) as reflected on the face of the statement of financial position or in the notes thereto:

Class	Category
Trade and other payables	Financial liability measured at amortised cost
Finance leases	Financial liability measured at amortised cost

Initial recognition

The entity recognises a financial asset or a financial liability in its statement of financial position when the entity becomes a party to the contractual provisions of the instrument.

The entity recognises financial assets using trade date accounting.

Initial measurement of financial assets and financial liabilities

The entity measures a financial asset and financial liability initially at its fair value plus transaction costs that are directly attributable to the acquisition or issue of the financial asset or financial liability.

Subsequent measurement of financial assets and financial liabilities

The entity measures all financial assets and financial liabilities after initial recognition using the following categories:

- Financial instruments at amortised cost.

All financial assets measured at amortised cost, or cost, are subject to an impairment review.

Fair value measurement considerations

The best evidence of fair value is quoted prices in an active market. If the market for a financial instrument is not active, the entity establishes fair value by using a valuation technique. The objective of using a valuation technique is to establish what the transaction price would have been on the measurement date in an arm's length exchange motivated by normal operating considerations. Valuation techniques include using recent arm's length market transactions between knowledgeable, willing parties, if available, reference to the current fair value of another instrument that is substantially the same, discounted cash flow analysis and option pricing models. If there is a valuation technique commonly used by market participants to price the instrument and that technique has been demonstrated to provide reliable estimates of prices obtained in actual market transactions, the entity uses that technique.

The chosen valuation technique makes maximum use of market inputs and relies as little as possible on entity specific inputs. It incorporates all factors that market participants would consider in setting a price and is consistent with accepted economic methodologies for pricing financial instruments. Periodically, an entity calibrates the valuation technique and tests it for validity using prices from any observable current market transactions in the same instrument (i.e. without modification or repackaging) or based on any available observable market data.

The fair value of a financial liability with a demand feature (e.g. a demand deposit) is not less than the amount payable on demand, discounted from the first date that the amount could be required to be paid.

Gains and losses

For financial assets and financial liabilities measured at amortised cost or cost, a gain or loss is recognised in surplus or deficit when the financial asset or financial liability is derecognised or impaired, or through the amortisation process.

Impairment and uncollectibility of financial assets

The entity assesses at the end of each reporting period whether there is any objective evidence that a financial asset or group of financial assets is impaired.

Financial assets measured at amortised cost:
If there is objective evidence that an impairment loss on financial assets measured at amortised cost has been incurred, the amount of the loss is measured as the difference between the asset's carrying amount and the present value of estimated future cash flows (excluding future credit losses that have not been incurred) discounted at the financial asset's original effective interest rate. The carrying amount of the asset is reduced directly OR through the use of an allowance account. The amount of the loss is recognised in surplus or deficit.

If, in a subsequent period, the amount of the impairment loss decreases and the decrease can be related objectively to an event occurring after the impairment was recognised, the previously recognised impairment loss is reversed directly OR by adjusting an allowance account. The reversal does not result in a carrying amount of the financial asset that exceeds what the amortised cost would have been had the impairment not been recognised at the date the impairment is reversed. The amount of the reversal is recognised in surplus or deficit.

Derecognition

Financial assets

The entity derecognises financial assets using trade date accounting.

The entity derecognises a financial asset only when:

- the contractual rights to the cash flows from the financial asset expire, are settled or waived;
- the entity transfers to another party substantially all of the risks and rewards of ownership of the financial asset; or
- the entity, despite having retained some significant risks and rewards of ownership of the financial asset, has transferred control of the asset to another party and the other party has the practical ability to sell the asset in its entirety to an unrelated third party, and is able to exercise that ability unilaterally and without needing to impose additional restrictions on the transfer. In this case, the entity:
  - derecognises the asset; and
  - recognise separately any rights and obligations created or retained in the transfer.

On derecognition of a financial asset in its entirety, the difference between the carrying amount and the sum of the consideration received is recognised in surplus or deficit.

Financial liabilities

The entity removes a financial liability (or a part of a financial liability) from its statement of financial position when it is extinguished – i.e. when the obligation specified in the contract is discharged, cancelled, waived or expires.

The difference between the carrying amount of a financial liability (or part of a financial liability) extinguished or transferred to another party and the consideration paid, including any non-cash assets transferred or liabilities assumed, is recognised in surplus or deficit. Any liabilities that are waived, forgiven or assumed by another entity by way of a non-exchange transaction are accounted for in accordance with the Standard of GRAP on Revenue from Non-exchange Transactions (Taxes and Transfers).

Presentation

Interest relating to a financial instrument or a component that is a financial liability is recognised as revenue or expense in surplus or deficit.

Losses and gains relating to a financial instrument or a component that is a financial liability is recognised as revenue or expense in surplus or deficit.

A financial asset and a financial liability are only offset and the net amount presented in the statement of financial position when the entity currently has a legally enforceable right to set off the recognised amounts and intends either to settle on a net basis, or to realise the asset and settle the liability simultaneously.

In accounting for a transfer of a financial asset that does not qualify for derecognition, the entity does not offset the transferred asset and the associated liability.

1.9 Tax

Tax expenses

The NRF is exempt from paying income tax and Value Added Tax (VAT).

1.10 Leases

A lease is classified as a finance lease if it transfers substantially all the risks and rewards incidental to ownership. A lease is classified as an operating lease if it does not transfer substantially all the risks and rewards incidental to ownership.

Finance leases – lessee

Finance leases are recognised as assets and liabilities in the statement of financial position at amounts equal to the fair value of the leased property or, if lower, the present value of the minimum lease payments. The corresponding liability to the lessor is included in the statement of financial position as a finance lease obligation.

The discount rate used in calculating the present value of the minimum lease payments is the interest rate implicit in the lease.

Minimum lease payments are apportioned between the finance charge and reduction of the outstanding liability. The finance charge is allocated to each period during the lease term so as to produce a constant periodic rate of reduction on the remaining balance of the liability.

Any contingent rents are expensed in the period in which they are incurred.

Operating leases – lessor

Operating lease revenue is recognised as revenue on a straight line basis over the lease term.

Initial direct costs incurred in negotiating and arranging operating leases are added to the carrying amount of the leased asset and recognised as an expense over the lease term on the same basis as the lease revenue.

Income for leases is disclosed under revenue in the statement of financial performance.

Operating leases – lessee

Operating lease payments are recognised as an expense on a straight line basis over the lease term. The difference between the amounts recognised as an expense and the contractual payments is recognised as an operating lease asset or liability.

1.11 Inventories

Inventories are initially measured at cost except where inventories are acquired through a non-exchange transaction, then their costs are their fair value as at the date of acquisition.

Subsequently inventories are measured at the lower of cost and net realisable value.

Net realisable value is the estimated selling price in the ordinary course of operations less the estimated costs of completion and the estimated costs necessary to make the sale, exchange or distribution.

The cost of inventories comprises all costs of purchase, costs of conversion and other costs incurred in bringing the inventories to their present location and condition.

The cost of inventories is assigned using the first in, first out (FIFO) formula, except restaurant and animal-related inventory that uses the weighted average method. The same cost formula is used for all inventories having a similar nature and use to the entity.

When inventories are sold, the carrying amounts of those inventories are recognised as an expense in the period in which the related revenue is recognised. If there is no related revenue, the expenses are recognised when the goods are distributed, or related services are rendered. The amount of any write down of inventories to net realisable value or current replacement cost and all losses of inventories are recognised as an expense in the period the write down or loss occurs. The amount of any reversal of any write down of inventories, arising from an increase in net realisable value or current replacement cost, is recognised as a reduction in the amount of inventories recognised as an expense in the period in which the reversal occurs.

1.12 Impairment of cash-generating assets

Cash-generating assets are assets managed with the objective of generating a commercial return. An asset generates a commercial return when it is deployed in a manner consistent with that adopted by a profit-oriented entity.

Impairment is a loss in the future economic benefits or service potential of an asset, over and above the systematic recognition of the loss of the asset's future economic benefits or service potential through depreciation/(amortisation).

Carrying amount is the amount at which an asset is recognised in the statement of financial position after deducting any accumulated depreciation and accumulated impairment losses thereon.

A cash-generating unit is the smallest identifiable group of assets managed with the objective of generating a commercial return that generates cash inflows from continuing use that are largely independent of the cash inflows from other assets or groups of assets.

Identification

When the carrying amount of a cash-generating asset exceeds its recoverable amount, it is impaired.

The entity assesses at each reporting date whether there is any indication that a cash-generating asset may be impaired. If any such indication exists, the entity estimates the recoverable amount of the asset.

Irrespective of whether there is any indication of impairment, the entity also tests a cash-generating intangible asset with an indefinite useful life or a cash-generating intangible asset not yet available for use for impairment annually by comparing its carrying amount with its recoverable amount. This impairment test is performed at the same time every year. If an intangible asset was initially recognised during the current reporting period, that intangible asset was tested for impairment before the end of the current reporting period.

Value-in-use

Value-in-use of a cash-generating asset is the present value of the estimated future cash flows expected to be derived from the continuing use of an asset and from its disposal at the end of its useful life.

When estimating the value-in-use of an asset, the entity estimates the future cash inflows and outflows to be derived from continuing use of the asset and from its ultimate disposal and the entity applies the appropriate discount rate to those future cash flows.

Discount rate

The discount rate is a pre-tax rate that reflects current market assessments of the time value of money, represented by the current risk-free rate of interest and the risks specific to the asset for which the future cash flow estimates have not been adjusted.

Recognition and measurement (individual asset)

If the recoverable amount of a cash-generating asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable amount. This reduction is an impairment loss.

An impairment loss is recognised immediately in surplus or deficit.

When the amount estimated for an impairment loss is greater than the carrying amount of the cash-generating asset to which it relates, the entity recognises a liability only to the extent that is a requirement in the Standard of GRAP.

After the recognition of an impairment loss, the depreciation/(amortisation) charge for the cash-generating asset is adjusted in future periods to allocate the cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

Cash-generating units

If there is any indication that an asset may be impaired, the recoverable amount is estimated for the individual asset. If it is not possible to estimate the recoverable amount of the individual asset, the entity determines the recoverable amount of the cash-generating unit to which the asset belongs (the asset's cash-generating unit).

If an active market exists for the output produced by an asset or group of assets, that asset or group of assets is identified as a cash-generating unit, even if some or all of the output is used internally. If the cash inflows generated by any asset or cash-generating unit are affected by internal transfer pricing, the entity uses management's best estimate of future price(s) that could be achieved in arm's length transactions in estimating:

- the future cash inflows used to determine the asset's or cash-generating unit's value-in-use; and
- the future cash outflows used to determine the value-in-use of any other assets or cash-generating units that are affected by the internal transfer pricing.

Cash-generating units are identified consistently from period to period for the same asset or types of assets, unless a change is justified.

The carrying amount of a cash-generating unit is determined on a basis consistent with the way the recoverable amount of the cash-generating unit is determined.

An impairment loss is recognised for a cash-generating unit if the recoverable amount of the unit is less than the carrying amount of the unit. The impairment is allocated to reduce the carrying amount of the cash-generating assets of the unit on a pro rata basis, based on the carrying amount of each asset in the unit. These reductions in carrying amounts are treated as impairment losses on individual assets.

In allocating an impairment loss, the entity does not reduce the carrying amount of an asset below the highest of:

- its fair value less costs to sell (if determinable);
- its value-in-use (if determinable); and
- zero.

The amount of the impairment loss that would otherwise have been allocated to the asset is allocated pro rata to the other cash-generating assets of the unit.

Where a non-cash-generating asset contributes to a cash-generating unit, a proportion of the carrying amount of that non-cash-generating asset is allocated to the carrying amount of the cash-generating unit prior to estimation of the recoverable amount of the cash-generating unit.

Reversal of impairment loss

The entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for a cash-generating asset may no longer exist or may have decreased. If any such indication exists, the entity estimates the recoverable amount of that asset.

An impairment loss recognised in prior periods for a cash-generating asset is reversed if there has been a change in the estimates used to determine the asset's recoverable amount since the last impairment loss was recognised. The carrying amount of the asset is increased to its recoverable amount. The increase is a reversal of an impairment loss. The increased carrying amount of an asset attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined (net of depreciation or amortisation) had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss for a cash-generating asset is recognised immediately in surplus or deficit.

After a reversal of an impairment loss is recognised, the depreciation/(amortisation) charge for the cash-generating

asset is adjusted in future periods to allocate the cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

A reversal of an impairment loss for a cash-generating unit is allocated to the cash-generating assets of the unit pro rata with the carrying amounts of those assets. These increases in carrying amounts are treated as reversals of impairment losses for individual assets. No part of the amount of such a reversal is allocated to a non-cash-generating asset contributing service potential to a cash-generating unit.

In allocating a reversal of an impairment loss for a cash-generating unit, the carrying amount of an asset is not increased above the lower of:

- its recoverable amount (if determinable); and
- the carrying amount that would have been determined (net of amortisation or depreciation) had no impairment loss been recognised for the asset in prior periods.

The amount of the reversal of the impairment loss that would otherwise have been allocated to the asset is allocated pro rata to the other assets of the unit.

Redesignation

The redesignation of assets from a cash-generating asset to a non-cash-generating asset or from a non-cash-generating asset to a cash-generating asset only occurs when there is clear evidence that such a redesignation is appropriate.

1.13 Impairment of non-cash-generating assets

Non-cash-generating assets are assets other than cash-generating assets.

Impairment is a loss in the future economic benefits or service potential of an asset, over and above the systematic recognition of the loss of the asset's future economic benefits or service potential through depreciation/(amortisation).

Identification

When the carrying amount of a non-cash-generating asset exceeds its recoverable service amount, it is impaired.

The entity assesses at each reporting date whether there is any indication that a non-cash-generating asset may be impaired. If any such indication exists, the entity estimates the recoverable service amount of the asset.

Irrespective of whether there is any indication of impairment, the entity also tests a non-cash-generating intangible asset with an indefinite useful life or a non-cash-generating intangible asset not yet available for use for impairment annually by comparing its carrying amount with its recoverable service amount. This impairment test is performed at the same time every year. If an intangible asset was initially recognised during the current reporting period, that intangible asset was tested for impairment before the end of the current reporting period.

Value-in-use

Value-in-use of non-cash-generating assets is the present value of the non-cash-generating assets' remaining service potential.

Recognition and measurement

If the recoverable service amount of a non-cash-generating asset is less than its carrying amount, the carrying amount of the asset is reduced to its recoverable service amount. This reduction is an impairment loss.

An impairment loss is recognised immediately in surplus or deficit.

When the amount estimated for an impairment loss is greater than the carrying amount of the non-cash-generating asset to which it relates, the entity recognises a liability only to the extent that is a requirement in the Standards of GRAP.

After the recognition of an impairment loss, the depreciation/(amortisation) charge for the non-cash-generating asset is adjusted in future periods to allocate the non-cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

Reversal of an impairment loss

The entity assesses at each reporting date whether there is any indication that an impairment loss recognised in prior periods for a non-cash-generating asset may no longer exist or may have decreased. If any such indication exists, the entity estimates the recoverable service amount of that asset.

An impairment loss recognised in prior periods for a non-cash-generating asset is reversed if there has been a change in the estimates used to determine the asset's recoverable service amount since the last impairment loss was recognised. The carrying amount of the asset is increased to its recoverable service amount. The increase is a reversal of an impairment

loss. The increased carrying amount of an asset attributable to a reversal of an impairment loss does not exceed the carrying amount that would have been determined (net of depreciation or amortisation) had no impairment loss been recognised for the asset in prior periods.

A reversal of an impairment loss for a non-cash-generating asset is recognised immediately in surplus or deficit.

After a reversal of an impairment loss is recognised, the depreciation/(amortisation) charge for the non-cash-generating asset is adjusted in future periods to allocate the non-cash-generating asset's revised carrying amount, less its residual value (if any), on a systematic basis over its remaining useful life.

1.14 Grant deposits

The NRF advances funding to higher education and research institutions in the form of grant deposits. The advances are calculated based on the expected grant awards for the year. The balance is reviewed annually by the NRF to determine the adequacy of the amount. The advances are done in order to facilitate adequate cash flow for the grant-making process at these institutions. Grant deposits must be preserved and maintained at the approved normal level. Per agreement, the interest earned on the grant deposits by the institutions is used to fund administration costs, inclusive of staff of the institutions that are dedicated to the NRF grant administration process. Should the interest earned be more than funding requisites to fund extra human capacity for staff supporting NRF projects, the institution has the right to utilise such amounts for research purposes as it deems appropriate. The approved normal level of grant deposits are repayable to the NRF on 30 days' notice in an event of the funding being discontinued.

1.15 Grants paid in advance

Grant advances to grant holders represent advances paid on specific grant awards, for which the conditions of grants were finalised, and the specific grant awards released by the NRF. The balance of the grant advances is depleted as and when the recognition criteria for grants and bursaries expenditure are met, i.e. approved and validated claims.

1.16 Employee benefits

Employee benefits are all forms of consideration given by an entity in exchange for services rendered by employees.

Termination benefits are employee benefits payable as a result of either:

- an entity's decision to terminate an employee's employment before the normal retirement date; or
- an employee's decision to accept voluntary redundancy in exchange for those benefits.

Other long-term employee benefits are employee benefits (other than post-employment benefits and termination benefits) that are not due to be settled within twelve months after the end of the period in which the employees render the related service.

Vested employee benefits are employee benefits that are not conditional on future employment.

Short-term employee benefits

Short-term employee benefits are employee benefits (other than termination benefits) that are due to be settled within twelve months after the end of the period in which the employees render the related service.

Short-term employee benefits include items such as:

- wages, salaries and social security contributions;
- short-term compensated absences (such as paid annual leave and paid sick leave) where the compensation for the absences is due to be settled within twelve months after the end of the reporting period in which the employees render the related employee service;
- bonus, incentive and performance-related payments payable within twelve months after the end of the reporting period in which the employees render the related service; and
- non-monetary benefits (for example, medical care and free or subsidised goods or services such as housing, cars and cell phones) for current employees.

When an employee has rendered service to the entity during a reporting period, the entity recognises the undiscounted amount of short-term employee benefits expected to be paid in exchange for that service:

- as a liability (accrued expense), after deducting any amount already paid. If the amount already paid exceeds the undiscounted amount of the benefits, the entity recognises that excess as an asset (prepaid expense) to the extent that the prepayment will lead to, for example, a reduction in future payments or a cash refund; and
- as an expense, unless another Standard requires or permits the inclusion of the benefits in the cost of an asset.

The expected cost of compensated absences is recognised as an expense as the employees render services that increase their entitlement or, in the case of non-accumulating absences, when the absence occurs. The entity measures the expected cost of accumulating compensated absences as the additional amount that the entity expects to pay as a result of the unused entitlement that has accumulated at the reporting date.

The entity recognises the expected cost of bonus, incentive and performance-related payments when the entity has a present legal or constructive obligation to make such payments as a result of past events and a reliable estimate of the obligation can be made. A present obligation exists when the entity has no realistic alternative but to make the payments.

Post-employment benefits

Post-employment benefits are employee benefits (other than termination benefits) which are payable after the completion of employment.

Post-employment benefit plans are formal or informal arrangements under which an entity provides post-employment benefits for one or more employees.

Post-employment benefits: Defined contribution plans

Defined contribution plans are post-employment benefit plans under which an entity pays fixed contributions into a separate entity (a fund) and will have no legal or constructive obligation to pay further contributions if the fund does not hold sufficient assets to pay all employee benefits relating to employee service in the current and prior periods.

When an employee has rendered service to the entity during a reporting period, the entity recognises the contribution payable to a defined contribution plan in exchange for that service:

- as a liability (accrued expense), after deducting any contribution already paid. If the contribution already paid exceeds the contribution due for service before the reporting date, an entity recognises that excess as an asset (prepaid expense) to the extent that the prepayment will lead to, for example, a reduction in future payments or a cash refund; and
- as an expense, unless another Standard requires or permits the inclusion of the contribution in the cost of an asset.

Actuarial assumptions

Actuarial assumptions are unbiased and mutually compatible. Financial assumptions are based on market expectations, at the reporting date, for the period over which the obligations are to be settled.

The rate used to discount post-employment benefit obligations (both funded and unfunded) reflects the time value of money. The currency and term of the financial instrument selected to reflect the time value of money are consistent with the currency and estimated term of the post-employment benefit obligations.

Post-employment benefit obligations are measured on a basis that reflects:

- estimated future salary increases;
- the benefits set out in the terms of the plan (or resulting from any constructive obligation that goes beyond those terms) at the reporting date; and
- estimated future changes in the level of any state benefits that affect the benefits payable under a defined benefit plan, if, and only if, either:
  - those changes were enacted before the reporting date; or
  - past history, or other reliable evidence, indicates that those state benefits will change in some predictable manner, for example, in line with future changes in general price levels or general salary levels.

Assumptions about medical costs take account of estimated future changes in the cost of medical services, resulting from both inflation and specific changes in medical costs.

Other post-retirement obligations

The entity provides post-retirement health care benefits upon retirement to some retirees.

The entitlement to post-retirement health care benefits is based on the employee remaining in service up to retirement age and the completion of a minimum service period. The expected costs of these benefits are accrued over the period of employment. Independent qualified actuaries carry out valuations of these obligations at least every three years.

The amount recognised as a liability for other long-term employee benefits is the net total of the following amounts:

- the present value of the defined benefit obligation at the reporting date;
- minus the fair value at the reporting date of plan assets (if any) out of which the obligations are to be settled directly.

The entity shall recognise the net total of the following amounts as expense or revenue, except to the extent that another Standard requires or permits their inclusion in the cost of an asset:

- current service cost;
- interest cost;
- the expected return on any plan assets and on any reimbursement right recognised as an asset;
- actuarial gains and losses, which shall all be recognised immediately;
- past service cost, which shall all be recognised immediately; and
- the effect of any curtailments or settlements.

1.17 Provisions and contingencies

Provisions are recognised when:

- the entity has a present obligation as a result of a past event;
- it is probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation; and
- a reliable estimate can be made of the obligation.

The amount of a provision is the best estimate of the expenditure expected to be required to settle the present obligation at the reporting date.

Where the effect of time value of money is material, the amount of a provision is the present value of the expenditures expected to be required to settle the obligation.

Where some or all of the expenditure required to settle a provision is expected to be reimbursed by another party, the reimbursement is recognised when, and only when, it is virtually certain that reimbursement will be received if the entity settles the obligation. The reimbursement is treated as a separate asset. The amount recognised for the reimbursement does not exceed the amount of the provision.

Provisions are reviewed at each reporting date and adjusted to reflect the current best estimate. Provisions are reversed if it is no longer probable that an outflow of resources embodying economic benefits or service potential will be required to settle the obligation.

Where discounting is used, the carrying amount of a provision increases in each period to reflect the passage of time. This increase is recognised as an interest expense.

A provision is used only for expenditures for which the provision was originally recognised.

Provisions are not recognised for future operating deficits.

If an entity has a contract that is onerous, the present obligation (net of recoveries) under the contract is recognised and measured as a provision.

Contingent assets and contingent liabilities are not recognised. Contingencies are disclosed in note 33.

1.18 Commitments

Items are classified as commitments when an entity has committed itself to future transactions that will normally result in the outflow of cash.

Disclosures are required in respect of unrecognised contractual commitments.

Commitments for which disclosure is necessary to achieve a fair presentation should be disclosed in a note to the financial statements, if both the following criteria are met:

- Contracts should be non-cancellable or only cancellable at significant cost (for example, contracts for computer or building maintenance services); and
- Contracts should relate to something other than the routine, steady, state business of the entity – therefore salary commitments relating to employment contracts or social security benefit commitments are excluded.

1.19 Revenue from exchange transactions

Revenue is the gross inflow of economic benefits or service potential during the reporting period when those inflows result in an increase in net assets.

An exchange transaction is one in which the entity receives assets or services, or has liabilities extinguished, and directly gives approximately equal value (primarily in the form of goods, services or use of assets) to the other party in exchange.

Fair value is the amount for which an asset could be exchanged, or a liability settled, between knowledgeable, willing parties in an arm's length transaction.

Measurement

Revenue is measured at the fair value of the consideration received or receivable, net of trade discounts and volume rebates.

Sale of goods

Revenue from the sale of goods is recognised when all the following conditions have been satisfied:

- the entity has transferred to the purchaser the significant risks and rewards of ownership of the goods;
- the entity retains neither continuing managerial involvement to the degree usually associated with ownership nor effective control over the goods sold;
- the amount of revenue can be measured reliably;
- it is probable that the economic benefits or service potential associated with the transaction will flow to the entity; and
- the costs incurred or to be incurred in respect of the transaction can be measured reliably.

Sale of goods includes the sale of food and curios at the NZG and isotopes at iThemba LABS.

Rendering of services

When the outcome of a transaction involving the rendering of services can be estimated reliably, revenue associated with the transaction is recognised by reference to the stage of completion of the transaction at the reporting date. The outcome of a transaction can be estimated reliably when all the following conditions are satisfied:

- the amount of revenue can be measured reliably;
- it is probable that the economic benefits or service potential associated with the transaction will flow to the entity;
- the stage of completion of the transaction at the reporting date can be measured reliably; and
- the costs incurred for the transaction and the costs to complete the transaction can be measured reliably.

When services are performed by an indeterminate number of acts over a specified time frame, revenue is recognised on a straight line basis over the specified time frame unless there is evidence that some other method better represents the stage of completion. When a specific act is much more significant than any other acts, the recognition of revenue is postponed until the significant act is executed.

When the outcome of the transaction involving the rendering of services cannot be estimated reliably, revenue is recognised only to the extent of the expenses recognised that are recoverable.

Service revenue is recognised by reference to the stage of completion of the transaction at the reporting date. Stage of completion is determined by services performed to date as a percentage of total services to be performed.

Service revenue includes fees for parking at the NZG and providing tours to the public at some business units.

Interest

Revenue arising from the use by others of entity assets yielding interest is recognised when:

- It is probable that the economic benefits or service potential associated with the transaction will flow to the entity, and
- The amount of the revenue can be measured reliably.

Interest is recognised, in surplus or deficit, using the effective interest rate method.

Entrance fees

The NZG charges patrons an entrance fee to visit the NZG. This revenue is recognised at point of sale of the tickets.

1.20 Revenue from non-exchange transactions

Revenue comprises gross inflows of economic benefits or service potential received and receivable by an entity, which represents an increase in net assets, other than increases relating to contributions from owners.

Conditions on transferred assets are stipulations that specify that the future economic benefits or service potential embodied in the asset is required to be consumed by the recipient as specified or future economic benefits or service potential must be returned to the transferor.

Non-exchange transactions are transactions that are not exchange transactions. In a non-exchange transaction, an entity either receives value from another entity without directly giving approximately equal value in exchange, or gives value to another entity without directly receiving approximately equal value in exchange.

Recognition

An inflow of resources from a non-exchange transaction recognised as an asset is recognised as revenue, except to the extent that a liability is also recognised in respect of the same inflow.

As the entity satisfies a present obligation recognised as a liability in respect of an inflow of resources from a non-exchange transaction recognised as an asset, it reduces the carrying amount of the liability recognised and recognises an amount of revenue equal to that reduction.

Measurement

Revenue from a non-exchange transaction is measured at the amount of the increase in net assets recognised by the entity.

When, as a result of a non-exchange transaction, the entity recognises an asset, it also recognises revenue equivalent to the amount of the asset measured at its fair value as at the date of acquisition, unless it is also required to recognise a liability. Where a liability is required to be recognised, it will be measured as the best estimate of the amount required to settle the obligation at the reporting date, and the amount of the increase in net assets, if any, recognised as revenue. When a liability is subsequently reduced, because a condition is satisfied, the amount of the reduction in the liability is recognised as revenue.

Gifts and donations, including goods in kind

Gifts and donations, including goods in kind, are recognised as assets and revenue when it is probable that the future economic benefits or service potential will flow to the entity and the fair value of the assets can be measured reliably.

Government grants and designated income

Government grants and designated income are recognised in the statement of financial performance, in the period to which the income relates. The government grant and designated income are recognised if there is reasonable assurance that the entity will comply with the conditions attached to the grant or contract, and that the grant or designated income will be received.

The portion of government grants and designated income that is earmarked for a specific purpose and thus conditional, relating to expenditure that will be incurred in future financial years, is reflected as income received in advance in the statement of financial position, as it represents an actual liability if conditions are not met.

1.21 Cost of sales

When inventories are sold, the carrying amount of those inventories is recognised as an expense in the period in which the related revenue is recognised. The amount of any write down of inventories to net realisable value and all deficits of inventories are recognised as an expense in the period the write down or loss occurs. The amount of any reversal of any write down of inventories, arising from an increase in net realisable value, is recognised as a reduction in the amount of inventories recognised as an expense in the period in which the reversal occurs.

The related cost of providing services recognised as revenue in the current period is included in cost of sales.

Contract costs comprise:

- costs that relate directly to the specific contract;
- costs that are attributable to contract activity in general and can be allocated to the contract on a systematic and rational basis; and
- such other costs as are specifically chargeable to the customer under the terms of the contract.

1.22 Grants, bursaries and other research expenditure

Grants, bursaries and other research awarded are recognised as expenditure in the statement of financial performance in the period in which the grants, bursaries and other research are claimed and validated. Included in grants, bursaries and other research are membership affiliations to research science and technology organisations and councils as well as the funding for science activities.

1.23 Translation of foreign currencies

Foreign currency transactions

A foreign currency transaction is recorded, on initial recognition in Rands, by applying to the foreign currency amount the spot exchange rate between the functional currency and the foreign currency at the date of the transaction.

At each reporting date:

- foreign currency monetary items are translated using the closing rate;
- non-monetary items that are measured in terms of historical cost in a foreign currency are translated using the exchange rate at the date of the transaction; and
- non-monetary items that are measured at fair value in a foreign currency are translated using the exchange rates at the date when the fair value was determined.

Exchange differences arising on the settlement of monetary items or on translating monetary items at rates different from those at which they were translated on initial recognition during the period or in previous annual financial statements are recognised in surplus or deficit in the period in which they arise. Cash flows arising from transactions in a foreign currency are recorded in Rand by applying to the foreign currency amount the exchange rate between the Rand and the foreign currency at the date of the cash flow.

1.24 Comparative figures

Where necessary, comparative figures have been reclassified to conform to changes in presentation in the current year.

1.25 Fruitless and wasteful expenditure

Fruitless and wasteful expenditure means expenditure which was made in vain, and would have been avoided had reasonable care been exercised.

All expenditure relating to fruitless and wasteful expenditure is recognised as an expense in the statement of financial performance in the year that the expenditure was incurred. The expenditure is classified in accordance with the nature of the expense, and where recovered, it is subsequently accounted for as revenue in the statement of financial performance.

1.26 Irregular expenditure

Irregular expenditure, as defined in section 1 of the PFMA (Act no. 1 of 1999), is expenditure other than unauthorised expenditure, incurred in contravention of or that is not in accordance with a requirement of any applicable legislation, including this Act.

1.27 Segment information

A segment is an activity of an entity:

- that generates economic benefits or service potential (including economic benefits or service potential relating to transactions between activities of the same entity);
- whose results are regularly reviewed by management to make decisions about resources to be allocated to that activity and in assessing its performance; and
- for which separate financial information is available.

Reportable segments are the actual segments which are reported on in the segment report. They are the segments identified above or alternatively an aggregation of two or more of those segments where the aggregation criteria are met.

Measurement

The amount of each segment item reported is the measure reported to management for the purposes of making decisions about allocating resources to the segment and assessing its performance. Adjustments and eliminations made in preparing the entity's financial statements and allocations of revenues and expenses are included in determining reported segment surplus or deficit only if they are included in the measure of the segment's surplus or deficit that is used by management. Similarly, only those assets and liabilities that are included in the measures of the segment's assets and segment's liabilities that are used by management are reported for that segment. If amounts are allocated to reported segment surplus or deficit, assets or liabilities, those amounts are allocated on a reasonable basis.

If management uses only one measure of a segment's surplus or deficit, the segment's assets or the segment's liabilities in assessing segment performance and deciding how to allocate resources, segment surplus or deficit, assets and liabilities are reported in terms of that measure. If management uses more than one measure of a segment's surplus or deficit, the segment's assets or the segment's liabilities, the reported measures are those that management believes are determined in accordance with the measurement principles most consistent with those used in measuring the corresponding amounts in the entity's financial statements.

1.28 Research and development expenditure

Expenditure on research is recognised as an expense when it is incurred.

An asset arising from development is recognised when:

- it is technically feasible to complete the asset so that it will be available for use or sale.
- there is an intention to complete and use or sell it.
- there is an ability to use or sell it.
- it will generate probable future economic benefits or service potential.
- there are available technical, financial and other resources to complete the development and to use or sell the asset.
- the expenditure attributable to the asset during its development can be measured reliably.

1.29 Budget information

The entity is typically subject to budgetary limits in the form of appropriations or budget authorisations (or equivalent) and designated funding, which is given effect through authorising legislation, appropriation or similar.

General purpose financial reporting by the entity, shall provide information on whether resources were obtained and used in accordance with the legally adopted budget.

The approved budget is prepared on an accrual basis and presented by economic classification linked to performance outcome objectives.

The approved budget covers the fiscal period from 2016/04/01 to 2017/03/31.

The budget for the economic entity includes the approved budgets of all the entities under its control.

The annual financial statements and the budget are prepared on the same basis of accounting, therefore a comparison with the budgeted amounts for the reporting period has been included in the Statement of comparison of budget and actual amounts.

Comparative information is not required.

1.30 Related parties

The entity operates in an economic sector currently dominated by entities directly or indirectly owned by the South African Government. As a consequence of the constitutional independence of the three spheres of government in South Africa, only entities within the national sphere of government are considered to be related parties.

Key management are those persons responsible for planning, directing and controlling the activities of the entity, including those charged with the governance of the entity in accordance with legislation, in instances where they are required to perform such functions. All individuals from the level of Corporate Executive up to the Board of Directors are regarded as key management.

Close members of the family of a person are considered to be those family members who may be expected to influence, or be influenced by, that management in their dealings with the entity.

Only transactions with related parties not at arm's length or not in the ordinary course of business are disclosed.

1.31 Capital fund

The proportion of income used to acquire property, plant and equipment, intangible assets and heritage assets is transferred to the capital fund from the accumulated surplus/(deficit) and is allocated back to the accumulated surplus/(deficit) in the proportions and over the periods in which depreciation/ amortisation on such property, plant and equipment, intangible asset or heritage asset is charged or when the asset is retired.

1.32 Infrastructure fund

This fund represents funds set aside to fund future infrastructure and related projects. It can also be utilised for the decommissioning of assets, where applicable.

NOTES TO THE ANNUAL FINANCIAL STATEMENTS

2. New standards and interpretations

2.1 Standards and interpretations issued, but not yet effective

The entity has not applied the following standards and interpretations, which have been published and are mandatory for the entity's accounting periods beginning on or after 01 April 2017 or later periods:

GRAP 20: Related parties

The objective of this standard is to ensure that a reporting entity's annual financial statements contain the disclosures necessary to draw attention to the possibility that its financial position and surplus or deficit may have been affected by the existence of related parties and by transactions and outstanding balances with such parties.

An entity that prepares and presents financial statements under the accrual basis of accounting (in this standard referred to as the reporting entity) shall apply this standard in:

- identifying related party relationships and transactions;
- identifying outstanding balances, including commitments, between an entity and its related parties;
- identifying the circumstances in which disclosure of the items in (a) and (b) is required; and
- determining the disclosures to be made about those items.

This standard requires disclosure of related party relationships, transactions and outstanding balances, including commitments, in the consolidated and separate financial statements of the reporting entity in accordance with the Standard of GRAP on Consolidated and Separate Financial Statements. This standard also applies to individual annual financial statements.

Disclosure of related party transactions, outstanding balances, including commitments, and relationships with related parties may affect users' assessments of the financial position and performance of the reporting entity and its ability to deliver agreed services, including assessments of the risks and opportunities facing the entity. This disclosure also ensures that the reporting entity is transparent about its dealings with related parties.

The standard states that a related party is a person or an entity with the ability to control or jointly control the other party, or exercise significant influence over the other party, or vice versa, or an entity that is subject to common control, or joint control. As a minimum, the following are regarded as related parties of the reporting entity:

- A person or a close member of that person's family is related to the reporting entity if that person:
  - has control or joint control over the reporting entity;
  - has significant influence over the reporting entity;
  - is a member of the management of the entity or its controlling entity.
- An entity is related to the reporting entity if any of the following conditions apply:
  - the entity is a member of the same economic entity (which means that each controlling entity, controlled entity and fellow controlled entity is related to the others);
  - one entity is an associate or joint venture of the other entity (or an associate or joint venture of a member of an economic entity of which the other entity is a member);
  - both entities are joint ventures of the same third party;
  - one entity is a joint venture of a third entity and the other entity is an associate of the third entity;
  - the entity is a post-employment benefit plan for the benefit of employees of either the entity or an entity related to the entity. If the reporting entity is itself such a plan, the sponsoring employers are related to the entity;
  - the entity is controlled or jointly controlled by a person identified in (a); and
  - a person identified in (a)(i) has significant influence over that entity or is a member of the management of that entity (or its controlling entity).

The standard furthermore states that a related party transaction is a transfer of resources, services or obligations between the reporting entity and a related party, regardless of whether a price is charged.

The standard elaborates on the definitions and identification of:

- Close member of the family of a person;
- Management;
- Related parties;
- Remuneration; and
- Significant influence.

The standard sets out the requirements, inter alia, for the disclosure of:

- Control;
- Related party transactions; and
- Remuneration of management.

The effective date of the standard is not yet set by the Minister of Finance. The entity expects to adopt the standard for the first time when the Minister sets the effective date for the standard.

It is unlikely that the standard will have a material impact on the entity's annual financial statements, as similar accounting policies are already applied.

GRAP 109: Accounting by principals and agents

The objective of this Standard is to outline principles to be used by an entity to assess whether it is party to a principal agent arrangement, and whether it is a principal or an agent in undertaking transactions in terms of such an arrangement. The Standard does not introduce new recognition or measurement requirements for revenue, expenses, assets and/or liabilities that result from principal agent arrangements. The Standard does however provide guidance on whether revenue, expenses, assets and/or liabilities should be recognised by an agent or a principal, as well as prescribe what information should be disclosed when an entity is a principal or an agent.

It furthermore covers definitions identifying whether an entity is a principal or agent, accounting by a principal or agent, presentation, disclosure, transitional provisions and effective date.

The effective date of the standard is not yet set by the Minister of Finance. The entity expects to adopt the standard for the first time when the Minister sets the effective date for the standard.

The impact of this standard is currently being assessed.

GRAP 108: Statutory receivables

The objective of this Standard is to prescribe accounting requirements for the recognition, measurement, presentation and disclosure of statutory receivables. Statutory receivables are receivables that arise from legislation, supporting regulations, or similar means; and require settlement by another entity in cash or another financial asset.

It furthermore covers definitions, recognition, derecognition, measurement, presentation and disclosure, transitional provisions, as well as the effective date.

The effective date of the standard is not yet set by the Minister of Finance. The entity expects to adopt the standard for the first time when the Minister sets the effective date for the standard.

It is unlikely that the standard will have a material impact on the entity's annual financial statements.

GRAP 36: Investments in associates and joint ventures

The objective of this standard is to prescribe the accounting for investments in associates and joint ventures and to set out the requirements for the application of the equity method when accounting for investments in associates and joint ventures.

The effective date of the standard is not yet set by the Minister of Finance. The entity expects to adopt the standard for the first time when the Minister sets the effective date for the standard.

It is unlikely that the standard will have a material impact on the entity's annual financial statements.

GRAP 110: Living and non-living resources

The objective of this Standard is to prescribe the:

- recognition, measurement, presentation and disclosure requirements for living resources; and
- disclosure requirements for non-living resources.

The effective date of the standard is not yet set by the Minister of Finance. The entity expects to adopt the standard for the first time when the Minister sets the effective date for the standard.

The impact of this standard is currently being assessed.

IGRAP 18: Recognition and derecognition of land

The interpretation provides guidance on when an entity should recognise and derecognise land as an asset in its financial statements.

The effective date of the standard is not yet set by the Minister of Finance. The entity expects to adopt the standard for the first time when the Minister sets the effective date for the standard.

It is unlikely that the interpretation will have a material impact on the entity's annual financial statements.

3. Property, plant and equipment

	2017			2016		
	Cost/Valuation	Accumulated depreciation and accumulated impairment	Carrying value	Cost/Valuation	Accumulated depreciation and accumulated impairment	Carrying value
Land	98,886	-	98,886	29,898	-	29,898
Buildings	348,823	(59,533)	289,290	251,840	(47,631)	204,209
Plant and machinery	61,551	(15,265)	46,286	32,316	(11,049)	21,267
Furniture and fixtures	24,315	(12,769)	11,546	20,442	(11,103)	9,339
Motor vehicles	48,602	(24,834)	23,768	39,099	(20,411)	18,688
Office equipment	62,576	(41,875)	20,701	57,550	(37,810)	19,740
IT equipment	137,068	(75,735)	61,333	103,987	(64,220)	39,767
Infrastructure	288,029	(36,700)	251,329	285,622	(23,690)	261,932
Exhibits	7,311	(2,806)	4,505	6,464	(2,177)	4,287
Capital work in progress	866,193	-	866,193	804,581	-	804,581
Research equipment	794,623	(321,958)	472,665	487,852	(263,387)	224,465
Books and journals	1,767	(231)	1,536	944	(46)	898
Total	**2,739,744**	**(591,706)**	**2,148,038**	**2,120,595**	**(481,524)**	**1,639,071**

Reconciliation of property, plant and equipment – 2017

	2017					
	Opening balance	Additions	Disposals	Transfers	Depreciation	Total
Land	29,898	68,988	-	-	-	98,886
Buildings	204,209	13,372	(509)	84,481	(12,263)	289,290
Plant and machinery	21,267	28,391	(23)	870	(4,219)	46,286
Furniture and fixtures	9,339	3,859	(22)	75	(1,705)	11,546
Motor vehicles	18,688	9,682	(71)	-	(4,531)	23,768
Office equipment	19,740	4,578	(63)	1,289	(4,843)	20,701
IT equipment	39,767	38,477	(640)	423	(16,694)	61,333
Infrastructure	261,932	1,421	-	986	(13,010)	251,329
Exhibits	4,287	847	-	-	(629)	4,505
Capital work in progress	804,581	431,118	-	(369,506)	-	866,193
Research equipment	224,465	27,577	(408)	281,382	(60,351)	472,665
Books and journals	898	825	-	-	(187)	1,536
	1,639,071	**629,135**	**(1,736)**	**-**	**(118,432)**	**2,148,038**

Depreciation includes R0.173m (2016: R0.328m), relating to leased assets. Transfers during the year relate to assets capitalised from capital work in progress, upon completion of the assets.

Reconciliation of property, plant and equipment – 2016

	2016					
	Opening balance	Additions	Disposals	Transfers	Depreciation	Total
Land	29,898	-	-	-	-	29,898
Buildings	208,178	1,108	(10)	4,624	(9,691)	204,209
Plant and machinery	19,830	4,401	(177)	-	(2,787)	21,267
Furniture and fixtures	9,242	1,802	(126)	-	(1,579)	9,339
Motor vehicles	12,255	10,910	(493)	-	(3,984)	18,688
Office equipment	20,352	4,358	(152)	-	(4,818)	19,740
IT equipment	26,471	12,620	(400)	12,322	(11,246)	39,767
Infrastructure	261,270	8,424	-	4,799	(12,561)	261,932
Exhibits	3,278	1,571	-	-	(562)	4,287
Capital work in progress	505,957	341,400	-	(42,776)	-	804,581
Research equipment	191,460	51,627	(307)	21,031	(39,346)	224,465
Books and journals	146	792	-	-	(40)	898
	1,288,337	**439,013**	**(1,665)**	**-**	**(86,614)**	**1,639,071**

Depreciation rates

The depreciation methods and average useful lives of property, plant and equipment have been assessed as follows:

Item	Depreciation method	Average useful life
Buildings	Straight line	3 – 50 years
Machinery and equipment	Straight line	5 – 15 years
Office furniture	Straight line	3 – 30 years
Motor vehicles	Straight line	5 – 14 years
Office equipment	Straight line	3 – 25 years
IT equipment	Straight line	3 – 13 years
Computer software	Straight line	3 – 10 years
Infrastructure	Straight line	5 – 25 years
Exhibits	Straight line	5 – 10 years
Books and journals	Straight line	5 – 10 years
Research equipment	Straight line	2 – 27 years
Leased assets	Straight line	2 – 5 years

	2017 R'000	2016 R'000
Assets subject to finance lease (Net carrying amount)		
Office equipment	157	189

	2017 R'000	2016 R'000
Details of properties		
Portion 1 of the farm Scientia No 627, Pretoria, with buildings thereon		
Land	1,277	1,277
Buildings	111,563	30,791
	112,840	**32,068**
Portion 4 of the farm No 996, Blue Downs, Stellenbosch, with buildings thereon		
Land	9,717	9,717
Buildings	28,792	28,792
	38,509	**38,509**
Portion 6 of the farm Kuilenburg No 96, Sutherland, with buildings thereon		
Land	346	346
Buildings	9,151	8,079
	9,497	**8,425**
Erf 26423, Observatory, Cape Town, with buildings thereon		
Land	263	263
Buildings	7,733	7,723
	7,996	**7,986**
Astronomy reserve properties for SKA project, Carnarvon (former farms – register available)		
Land	68,988	-
Buildings	6,640	-
	75,628	**-**
Stand No 2859, 211 Nana Sita Street, Pretoria		
Land	92	92
Buildings	1,567	1,567
	1,659	**1,659**
Portion 1 of Erf 1, Observatory, Johannesburg		
Land	1,685	1,685
Buildings	9,476	9,476
	11,161	**11,161**
Portion 1 of the former farm Losberg No 73, Fraserburg Regional District		
Land	7,796	7,796
Buildings	132,145	124,746
	139,941	**132,542**
Mey's Dam Farm No 68, Fraserburg Regional District		
Land	8,722	8,722
Buildings	7,672	7,020
	16,394	**15,742**
Leasehold improvements – HartRAO		
Capitalised expenditure	1,655	1,655
Leasehold improvements – SAIAB		
Capitalised expenditure	21,596	21,476
Leasehold improvements – SKA Klerefontein		
Capitalised expenditure	10,833	10,515
Total cost of land and buildings	**447,709**	**281,738**

All property in Carnarvon was former farms. These farms are not being farmed on, but are held as part of the astronomy reserve for the SKA project.

The land and buildings situated in Pretoria, on the CSIR campus, are subject to a pre-emptive right in favour of the CSIR should the NRF decide to sell the property. It will revert back to the CSIR for no consideration should the NRF be disbanded.

Land and buildings of the NZG are situated in Boom Street, Pretoria. This property is not reflected in the records of the NRF as ownership thereof resides with the Department of Public Works. The NZG occupies the property for no consideration.

Reconciliation of work-in-progress 2017

	Land & buildings	Research equipment	Other PPE	Total
Opening balance	79,787	722,595	2,199	804,581
Additions/capital expenditure	21,046	403,479	6,593	431,118
Transferred to completed items	(84,481)	(281,382)	(3,643)	(369,506)
	16,352	**844,692**	**5,149**	**866,193**

Expenditure incurred to repair and maintain property, plant and equipment

	2017 R'000
Expenditure incurred to repair and maintain property, plant and equipment included in statement of financial performance	
Contracted services	29,609

NZG animal collection

Refer to note 1.4 for reasons why no financial values are attached to the animal collection.

	2017 R'000	2016 R'000
Number of specimens:		
Mammals	1,309	1,346
Aves	1,061	1,099
Reptiles	348	303
Pisces	1,838	1,930
Amphibia	95	114
Invertebrates	464	445
	5,115	**5,237**

4. Intangible assets

	2017			2016		
	Cost/Valuation	Accumulated amortisation and accumulated impairment	Carrying value	Cost/Valuation	Accumulated amortisation and accumulated impairment	Carrying value
Computer software, other	69,524	(23,324)	46,200	68,718	(14,975)	53,743

Reconciliation of intangible assets – 2017

	2017				
	Opening balance	Additions	Disposals	Amortisation	Total
Computer software, other	53,743	1,052	(13)	(8,582)	46,200

Reconciliation of intangible assets – 2016

	2016				
	Opening balance	Additions	Transfers	Amortisation	Total
Computer software under development	6,600	-	(6,600)	-	-
Computer software, other	53,380	1,129	6,600	(7,366)	53,743
	59,980	**1,129**	**-**	**(7,366)**	**53,743**

5. Heritage assets

	2017			2016		
	Cost/Valuation	Accumulated impairment losses	Carrying value	Cost/Valuation	Accumulated impairment losses	Carrying value
Collections of rare books, manuscripts and records	53	-	53	53	-	53
Objects of scientific and technological interest	15,370	-	15,370	15,370	-	15,370
Historical structures and monuments	56	-	56	56	-	56
Total	**15,479**	**-**	**15,479**	**15,479**	**-**	**15,479**

Reconciliation of heritage assets – 2017

	2017	
	Opening balance	Total
Collections of rare books, manuscripts and records	53	53
Objects of scientific and technological interest	15,370	15,370
Historical structures and monuments	56	56
	15,479	**15,479**

Reconciliation of heritage assets – 2016

	2016		
	Opening balance	Disposals	Total
Collections of rare books, manuscripts and records	54	(1)	53
Objects of scientific and technological interest	15,370	-	15,370
Historical structures and monuments	56	-	56
	15,480	**(1)**	**15,479**

Heritage assets which fair values cannot be reliably measured

Rare books

The SAAO hosts the National Library for Astronomy of South Africa. Some of the books are rare as they are handwritten, one of a kind and irreplaceable. These books cannot be reliably measured for economic value as there is no market for them and they are irreplaceable. These books contributed significantly to the research output of the Observatory in the past and are being preserved for future generations. They are being kept for historical purposes only.

Sammy Marks fountain

The Sammy Marks fountain has been part of Pretoria's landscape for more than 115 years, having first been erected in Church Square. Sammy Marks presented the fountain to Pretoria in 1905. It served as a water supply point as well as for its ornamental value. The fountain cannot be reliably measured for economic value as there is no market for it and it is irreplaceable.

National biological specimen collection

The collection of museum specimens comprise over 100 000 containers of fish and other aquatic organisms, such as amphibians, invertebrates and diatoms. Many of the specimens in the collection are unique and largely irreplaceable. There is also a molecular tissue bank of aquatic samples for genetic analysis and a dry collection of fish skeletons and otoliths. Some specimens date back more than 100 years. The biological collection is supported by scientific graphic images. The collection cannot be reliably measured for economic value as there is no market for it and the collection is irreplaceable.

6. Investments in associates

		2017	2016	2017	2016
Name of entity	Listed/Unlisted	% holding		Carrying amount	
SALT Foundation (Pty) Ltd	Unlisted	35.92%	34.77%	18,447	22,795

The carrying amounts of associates are shown net of impairment losses.

	2017 R'000	2016 R'000
Movements in carrying value		
Opening balance	22,795	25,763
Share of surplus/deficit	(4,348)	(2,968)
	18,447	**22,795**

Principal activities, country of incorporation and voting power

Legal name	Principal activity	Country of incorporation	Proportion of voting power
SALT Foundation (Pty) Ltd	Operation of an 11-metre telescope for optical astronomy research	SA	35.92%

Summary of associate's financial information

	2017 R'000	2016 R'000
Current assets	38,315	25,980
Non-current assets	157,844	168,152
Total liabilities	23,268	18,777
Revenue	34,264	30,800
Surplus/(deficit)	(12,105)	(8,534)

7. Other financial assets

	2017 R'000	2016 R'000
At amortised cost		
Grant deposit accounts	606,110	606,110
The approved normal level of grant deposits are repayable to the NRF on 30 days' notice, in an event of the funding being discontinued.		
Infrastructure bridging funding	9,804	21,040
Funding advanced to institutions for infrastructure, repayable in full to the NRF within 12 months. The funding is non-interest bearing.		
	615,914	**627,150**

8. Employee benefit obligations

Defined benefit plan

Post-retirement medical aid plan

The NRF has a subsidy obligation for those members who did not accept the buy-out offer in 2012. To manage the residual liability that has remained, the NRF has acquired an annuity policy which qualifies as a plan asset.

The amounts recognised in the statement of financial position are as follows:

	2017 R'000	2016 R'000
Carrying value		
Present value of the defined benefit obligation – partly or wholly funded	(12,759)	(12,355)
Fair value of plan assets	16,460	13,814
	3,701	**1,459**

The plan assets consist of an annuity insurance policy. The annuity portfolio is made up of a growth account and a guaranteed account. Increases are guaranteed at a minimum of CPI per annum. Funds are transferred from the growth account to the guaranteed account annually to fund any increase in employer contributions in excess of the guaranteed annuities.

Changes in the present value of the defined benefit obligation are as follows:

	2017 R'000	2016 R'000
Opening balance	(1,459)	(459)
Employer prefunding contributions	-	(1,000)
Net expense recognised in the statement of financial performance	(2,242)	-
	(3,701)	**(1,459)**

Net expense recognised in the statement of financial performance

	2017 R'000	2016 R'000
Current service cost	22	20
Interest cost	1,083	1,094
Actuarial (gains)/losses	(1,979)	-
Assets not recognised	(117)	-
Expected return on plan assets	(1,251)	(1,114)
	(2,242)	**-**

Calculation of actuarial gains and losses

	2017 R'000	2016 R'000
Actuarial (gains)/losses – Obligation	260	-
Actuarial (gains)/losses – Plan assets	(2,239)	-
	(1,979)	**-**

Changes in the fair value of plan assets are as follows:

	2017 R'000	2016 R'000
Opening balance	13,814	12,870
Expected return	1,367	1,114
Actuarial gains/(losses)	2,239	-
Contributions by employer	-	1,000
Benefits paid	(960)	(1,170)
	16,460	**13,814**

Key assumptions used

Assumptions used at the reporting date:

	2017 (%)	2016 (%)
Discount rate/Investment return	8.57%	9.25%
Consumer Price Inflation (CPI)	6.33%	6.50%
Net discount rate – Next 5 years	0.69%	(0.46)%
Net discount rate – After 5 years	0.69%	1.39%
Health care cost inflation – Next 5 years	7.83%	9.75%
Health care cost inflation – After 5 years	7.83%	7.75%
Normal retirement age	65 years	65 years

Other assumptions

Amounts for the current and previous four years are as follows:

	2017 R'000	2016 R'000	2015 R'000	2014 R'000	2013 R'000
Defined benefit obligation	(12,759)	(12,355)	(12,411)	(12,363)	(13,307)
Plan assets	16,460	13,814	12,870	12,127	10,634
Surplus/(deficit)	3,701	1,459	459	(236)	(2,673)

Defined contribution plan

It is the policy of the entity to provide retirement benefits to all its employees through the National Research Foundation Pension Fund, which is subject to the Pensions Fund Act. The fund is administered by Alexander Forbes Consultants and Actuaries.

The entity is under no obligation to cover any unfunded benefits.

	2017 R'000	2016 R'000
The amount recognised as an expense for defined contribution plans is	49,900	43,868

9. Prepayments

Prepayments consist mainly of a 10-year usage membership to be part of the Large Synoptic Survey Telescope, which will commence in 2019, from which time the prepayment will be amortised. Prepayments in the prior year represent a net advance payment made to the contractor awarded the contract for the construction of the MeerKAT radio telescopes for the SKA project. The balance of the prepayment is amortised, based on milestones achieved over the period of the contract by the service provider.

	2017 R'000	2016 R'000
Advance payment on MeerKAT antennas	-	34,916
Prepayment on membership fees	15,882	-
Other prepayments	387	-
	16,269	**34,916**

10. Grants and bursaries paid in advance

	2017 R'000	2016 R'000
Funding advanced for grants and bursaries	409,205	392,677

11. Inventories

	2017 R'000	2016 R'000
Consumable stores and maintenance spares	6,225	5,418
Restaurant stock	855	762
	7,080	**6,180**

12. Receivables from exchange transactions

	2017 R'000	2016 R'000
Trade debtors	24,705	187,299
Employee costs in advance	232	184
Prepayments	215,841	141,219
Deposits	4,268	3,609
Designated income and other receivables	226,556	113,326
	471,602	**445,637**

Credit quality of trade and other receivables

Credit risk, with respect to trade and other receivables, is limited due to the large number of customers comprising the NRF's customer base, and their dispersion across different industries and geographical areas.

Trade receivables

None of the financial assets that are fully performing, have been renegotiated in the last year.

Fair value of trade and other receivables

The fair value of financial assets is not expected to differ materially from their carrying values, due to the short-term nature thereof.

Trade and other receivables past due but not impaired

Trade and other receivables, which are generally less than three months past due, are not considered to be impaired. At 31 March 2017, R7,489m (2016: R8,002m) was past due, but not impaired.

The ageing of amounts past due, but not impaired, is as follows:

	2017 R'000	2016 R'000
1 month past due	26	1,980
2 months past due	171	52
3 months past due	7,292	5,970

Trade and other receivables impaired

As of 31 March 2017, trade and other receivables of R625K (2016: R664K) were impaired and provided for. The amount of the provision was R625K as of 31 March 2017 (2016: R664K).

Reconciliation of provision for impairment of trade and other receivables

	2017 R'000	2016 R'000
Opening balance	664	867
Provision for impairment	61	58
Amounts written off as uncollectible	(4)	(20)
Unused amounts reversed	(96)	(241)
	625	**664**

The creation and release of the provision for impaired receivables have been included in operating expenses in surplus or deficit (note 29). Amounts charged to the allowance account are generally written off when there is no expectation of recovering additional cash.

The maximum exposure to credit risk at the reporting date, is the fair value of each class of receivable mentioned above. The entity does not hold any collateral as security.

13. Cash and cash equivalents

Cash and cash equivalents consist of:

	2017 R'000	2016 R'000
Cash on hand	364	315
Short-term deposits and bank balances	494,411	671,160
	494,775	**671,475**

The balance includes R385 million for the SKA project and R100 million for the Department of Trade and Industry THRIP programme.

Credit quality of cash at bank and short-term deposits, excluding cash on hand

Cash equivalents and short-term deposits are placed with highly rated and National Treasury approved financial institutions.

14. Capital fund

	Note(s)	2017 R'000	2016 R'000
Opening balance		1,708,296	1,363,796
Net acquisition of assets		501,421	344,500
Acquisition of property, equipment and intangible assets	3 & 4	630,187	440,142
Depreciation, amortisation and disposals	3 & 4	(128,766)	(95,643)
		2,209,717	**1,708,296**

15. SALT fund

The SALT fund represents income received from the Department of Science and Technology, for the purpose of investing the funds in the SALT Foundation (Pty) Ltd. The balance is adjusted with post-acquisition surpluses/losses of the SALT Foundation (Pty) Ltd. Refer note 6.

	2017 R'000	2016 R'000
Available income for the SALT Foundation (Pty) Ltd	18,447	22,795

16. Finance lease obligation

	2017 R'000	2016 R'000
Minimum lease payments due		
- within one year	104	189
- in second to fifth year inclusive	96	50
	200	239
Less: Future finance charges	(25)	(19)
Present value of minimum lease payments	**175**	**220**
Present value of minimum lease payments due		
- within one year	88	173
- in second to fifth year inclusive	87	47
	175	**220**
Non-current liabilities	87	47
Current liabilities	88	173
	175	**220**

Certain office equipment is leased under finance leases.

The average lease term was two to five years and the average effective borrowing rate was 14% (2016:14%).

The entity's obligations under finance leases are secured by the lessor's charge over the leased assets. Refer note 3.

Market risk

The fair value of finance lease liabilities approximates their carrying amounts.

17. Provisions

Reconciliation of provisions – 2017

	2017				
	Opening balance	Additions	Utilised during the year	Reversed during the year	Total
Provision for performance bonus	18,095	8,374	(13,438)	(4,657)	8,374

Reconciliation of provisions – 2016

	2016				
	Opening balance	Additions	Utilised during the year	Reversed during the year	Total
Provision for performance bonus	8,373	18,095	(6,024)	(2,349)	18,095

The provision represents an estimated amount to be paid for performance bonuses. The process of finalising performance reviews for the current year will be concluded in the next financial year, when the actual payments, and the determination thereof will occur.

18. Designated income received in advance

Funding that is earmarked for a specific purpose, and thus conditional, relating to expenditure that will be incurred in future financial years, is transferred to income received in advance, until the related costs are incurred.

	2017 R'000	2016 R'000
Income not yet expensed	1,798,739	1,972,022

19. Payables from exchange transactions

	2017 R'000	2016 R'000
Trade payables	65,616	44,031
Accrued leave pay	58,583	50,222
Remuneration accrual	5,252	4,909
Other payables	5,310	4,565
	134,761	**103,727**

20. Sale of goods and services

	2017 R'000	2016 R'000
Sale of isotopes	53,068	52,047
Services rendered	3,829	4,640
National Zoological Gardens sales	10,119	14,584
Other sales	952	866
	67,968	**72,137**

21. Other income

	2017 R'000	2016 R'000
Sundry income	5,776	9,851
Rent received	2,945	2,744
Donations received	62	361
Participation fees	986	484
	9,769	**13,440**

22. Interest income

	2017 R'000	2016 R'000
Bank	102,551	101,475
Interest charged on trade and other receivables	39	48
Interest received – other	873	5
	103,463	**101,528**

23. Ring-fenced income

	2017 R'000	2016 R'000
Ring-fenced funding received	1,925,348	1,891,520
Net ring-fenced funds carried forward from 2015/16	252,582	(155,833)
	2,177,930	**1,735,687**

24. Designated income

	2017 R'000	2016 R'000
Department of Science and Technology	778,874	857,734
Other government organisations	374,700	364,137
Private and international organisations	64,680	84,117
	1,218,254	**1,305,988**

The NRF manages a number of projects/programmes for government departments and local as well as international organisations, on a contractual basis. These funds are designated for specific projects.

25. Board and Corporate Executive members' remuneration

Non-Executive members (Board members)	Short-term benefits R'000	Total package 2017 R'000	Total package 2016 R'000
Dr PG Clayton (From 1 October 2011)	68	68	78
Advocate L Zondo (Up to 31 October 2016)	27	27	64
Ms J Yawitch (From 1 September 2014)	30	30	50
Ms M Letlape (From 1 March 2015)	52	52	31
Dr V Papu-Zamxaka (From 1 October 2014)	49	49	60
Prof. MV Leibbrandt (From 1 October 2011)	47	47	65
Mr MR Lubisi (From 1 October 2014)	40	40	70
Prof. R Singh (From 1 October 2011)	50	50	60
Prof. T Maluleke (From 1 October 2014)	21	21	35
Prof. L Nongxa (Chairperson from 1 October 2014)	108	108	127
Ms GM Campbell (From 1 October 2014)	31	31	51
Prof. SD Maharaj (From 1 October 2011)	35	35	70
Prof. EM Tyobeka (From 1 October 2011)	59	59	79
	617	**617**	**840**

Members of the Corporate Executive	Short-term benefits R'000	Bonuses and performance-related payments R'000	Retirement fund contributions R'000	Medical contributions R'000	Other benefits	Total package 2017 R'000	Total package 2016 R'000
*Dr M Qhobela (CEO from January 2016)	2,297	-	338	154	39	2,828	652
Dr BA Damonse	1,704	156	229	33	35	2,157	2,276
Dr D Pillay	2,188	-	261	-	38	2,487	2,325
Prof. N Chetty (on part-time contract)	1,086	-	-	-	15	1,101	1,009
Mr B Singh	1,946	179	248	47	39	2,459	2,315
Mr PB Thompson	1,983	-	279	-	40	2,302	2,315
	11,204	**335**	**1,355**	**234**	**206**	**13,334**	**10,892**
Total remuneration	**11,821**	**335**	**1,355**	**234**	**206**	**13,951**	**11,732**

*Denotes ex-officio member of the NRF Board.
Corporate Executive members are considered to be key management personnel as they are the delegated key decision-makers.

26. Finance costs

	2017 R'000	2016 R'000
Finance leases	21	50
Other interest paid	26	91
	47	**141**

27. Cost of sales

	2017 R'000	2016 R'000
Sale of goods		
Cost of goods sold – Isotopes	26,283	25,223
Cost of goods sold – NZG	5,474	6,613
Cost of goods sold – Other	893	499
	32,650	**32,335**

28. Auditors' remuneration

	2017 R'000	2016 R'000
Current year audit	1,084	893
Prior year audit	2,876	4,067
Other services	138	109
	4,098	**5,069**

29. Operating surplus

Operating surplus for the year is stated after accounting for the following:

	2017 R'000	2016 R'000
Operating lease charges		
Contractual amounts:		
- Premises	11,253	11,393
- Equipment	230	33
	11,483	**11,426**
Loss on sale of property, plant and equipment	1,281	784
Loss on exchange differences	1,873	3,547
Amortisation on intangible assets	8,581	7,366
Depreciation on property, plant and equipment	116,132	84,194
Employee costs	627,097	577,904
Defined contribution plan	49,900	43,868

30. Cash generated from operations

	2017 R'000	2016 R'000
Surplus	488,143	362,464
Adjustments for:		
Depreciation and amortisation	127,007	93,980
Gain/(loss) on sale of assets and liabilities	1,281	784
Income from equity accounted investments	4,348	2,967
Movements in post-retirement benefit assets and liabilities	(2,242)	(1,000)
Movements in provisions	(9,721)	9,722
Changes in working capital:		
Inventories	(900)	(364)
Receivables from exchange transactions	(25,965)	(182,788)
Prepayments	18,647	28,276
Grants and bursaries paid in advance	(5,292)	(22,241)
Payables from exchange transactions	31,034	(16,437)
Designated income received in advance	(173,283)	131,243
	453,057	**406,606**

31. Financial instruments disclosure

Categories of financial instruments – 2017

	2017	
	At amortised cost	Total
Financial assets		
Trade and other receivables from exchange transactions	251,261	251,261
Cash and cash equivalents	494,775	494,775
Other financial assets	615,914	615,914
	1,361,950	**1,361,950**
Financial liabilities		
Trade and other payables from exchange transactions	70,926	70,926
Finance leases	175	175
	71,101	**71,101**

Categories of financial instruments – 2016

	2016	
	At amortised cost	Total
Financial assets		
Trade and other receivables from exchange transactions	300,625	300,625
Cash and cash equivalents	671,475	671,475
Other financial assets	627,150	627,150
	1,599,250	**1,599,250**
Financial liabilities		
Trade and other payables from exchange transactions	48,596	48,596
Finance leases	220	220
	48,816	**48,816**

32. Commitments

	2017 R'000	2016 R'000
Authorised capital expenditure		
Already contracted for but not provided for		
- Property, plant and equipment	375,833	717,070
Not yet contracted for and authorised by delegated authority		
- Property, plant and equipment	15,873	20,538
Total capital commitments		
Already contracted for but not provided for	375,833	717,070
Not yet contracted for and authorised by delegated authority	15,873	20,538
	391,706	**737,608**
Authorised operational expenditure		
Already contracted for but not provided for		
- Mainly technical services	141,354	70,715
Not yet contracted for and authorised by delegated authority		
- Repairs and maintenance	35,374	282
Total operational commitments		
Already contracted for but not provided for	141,354	70,715
Not yet contracted for and authorised by delegated authority	35,374	282
	176,728	**70,997**
Total commitments		
Authorised capital expenditure	391,706	737,608
Authorised operational expenditure	176,728	70,997
	568,434	**808,605**

The operational and capital expenditure will be financed from the parliamentary grant (MTEF) and designated funds.

Operating leases – as lessee (expense)

	2017 R'000	2016 R'000
Minimum lease payments due		
- within one year	13,567	11,689
- in second to fifth year inclusive	716	2,000
	14,283	**13,689**

Operating lease payments represent rentals payable by the entity mainly for office properties and equipment. Leases are negotiated for a term of between one year and 100 years and rentals escalate between 0% and 10% annually. No contingent rent is payable.

Operating leases – as lessor (income)

	2017 R'000	2016 R'000
Minimum lease payments due		
- within one year	268	612
- in second to fifth year inclusive	371	355
	639	**967**

The entity has entered into non-cancellable commercial property leases for the duration of the lease period. These leases are negotiated for a term of between one year and 10 years and rentals escalate between 5% and 10% annually. There are no contingent rents receivable.

33. Contingencies

	2017 R'000	2016 R'000
Contingent liabilities		
Future grants awarded	4,288,248	4,764,039

The NRF has awarded multi-year grants for up to five years, with subsequent years' payments conditional upon receipt of progress reports.

	2017 R'000	2016 R'000
Removal of historic packageable radioactive waste	4,730	-

Packageable radioactive waste consists of low to medium-level radioactive contaminated solid waste with relatively short half-lives (< 5 years). All the radioactive waste produced by iThemba LABS, since its inception, has been stored on site. New regulations with regards to radiation waste management are envisaged that may result in a possible obligation for the NRF to dispose of such radioactive waste from the NRF premises, whilst also meeting set requirements. The possible obligation calculated represents a best cost estimate of such disposal process.

34. Related parties

Relationships	
Members of key management	Refer to note 25
Controlling entity	Department of Science and Technology
Associates	Refer to note 6
Fellow controlled entities	Academy of Science of South Africa (ASSAf), Council for Scientific and Industrial Research (CSIR), Human Sciences Research Council (HSRC), South African National Space Agency (SANSA) and Technology Innovation Agency (TIA)

By virtue of the fact that the NRF is a national public entity, and controlled by national government, any other controlled entity of the national government is a related party. All transactions with such entities are at arm's length, and on normal commercial terms.

Related party balances

	2017 R'000	2016 R'000
Amounts included in Trade receivables/(Trade Payable) regarding related parties		
SALT Foundation (Pty) Ltd	1,862	3,733
Prepayment to SALT Foundation (Pty) Ltd	17,012	13,582

The outstanding balance at year-end is unsecured, interest free and settlement occurs in cash. There have been no guarantees received. No impairment has been recorded of the amount owed.

Related party transactions

	2017 R'000	2016 R'000
Payments to the SALT Foundation (Pty) Ltd		
Levy for the use of the telescopes	15,052	11,784
Receipts from the SALT Foundation (Pty) Ltd		
The recovery of services rendered	25,136	24,765
Department of Science and Technology		
Parliamentary grant and ring-fenced funding received	2,808,153	2,769,919
Designated income	778,874	857,734

35. Change in estimate

Property, plant and equipment

A change in the depreciation estimate, due to a change in the residual values and useful lives of certain assets, had an impact of R 0,13m increase for the current and future periods.

36. Prior period errors

The SKA project incurred capital expenditure on the construction of certain buildings and infrastructure, in prior years. The costs were recorded as capital work-in-progress. The related assets were, however, completed by 31 March 2014, but the balance was not capitalised at the time.

The correction of the error results in adjustments of corresponding figures as follows:

	2016 R'000
Statement of financial position	
Property, plant and equipment decreased	1,386
Accumulated fund increased	705
Opening capital fund decreased	681
Capital fund decreased	705
Statement of financial performance	
Depreciation expense increased	705

37. Risk management

Financial risk management

The entity's activities expose it to a variety of financial risks: market risk (including currency risk and cash flow interest rate risk), credit risk and liquidity risk.

The entity's overall risk management programme focuses on the unpredictability of financial markets and seeks to minimise potential adverse effects on the entity's financial performance. Risk management is carried out by a central treasury department under policies approved by the Board. Entity treasury identifies, evaluates and hedges financial risks in close cooperation with the entity's business units. The Board provides written principles for overall risk management, as well as written policies covering specific areas, such as foreign exchange risk, interest rate risk, credit risk and investment of excess liquidity.

Liquidity risk

Prudent liquidity risk management implies maintaining sufficient cash and the availability of funding. The entity's risk to liquidity is a result of the funds available to cover future commitments. The entity manages liquidity risk through an ongoing review of future commitments, through proper management of working capital, capital expenditure and actual vs. forecasted cash flows and its investment policy. Adequate reserves and liquid resources are also maintained.

The table below analyses the entity's financial liabilities into relevant maturity groupings based on the remaining period at the statement of financial position to the contractual maturity date. The amounts disclosed in the table are the contractual undiscounted cash flows. Balances due within 12 months equal their carrying balances as the impact of discounting is not significant.

	2017	
	Less than 1 year	Between 1 and 2 years
At 31 March 2017		
Trade and other payables	70,926	-
Finance leases	104	96

	2016	
	Less than 1 year	Between 1 and 2 years
At 31 March 2016		
Trade and other payables	48,596	-
Finance leases	189	50

Credit risk

Credit risk arises from the risk that a counter-party may default or not meet its obligations timeously. The entity is exposed to risk from its operating and financing activities. Credit risk consists mainly of cash deposits, cash equivalents and trade debtors. The entity only deposits cash with major banks with high quality credit standing and limits exposure to any one counter-party.

Trade receivables comprise a widespread customer base. Management evaluates credit risk relating to customers on an ongoing basis. Risk control assesses the credit quality of the customer, taking into account its financial position, past experience and other factors. The entity has no significant concentration of credit risk. The carrying amounts of the financial assets included in the statement of financial position represent the entity's maximum exposure to credit risk in relation to these assets. The entity does not have any significant exposure to any individual customer or counter-party.

Market risk

Interest rate risk

Interest rate risk results from the cash flow and financial performance uncertainty arising from interest rate fluctuations. Financial assets and liabilities affected by interest rate fluctuations include bank and cash deposits.

Interest rate exposure and investment strategies are evaluated by management on a regular basis. Interest-bearing investments are held with reputable banks in order to minimise exposure. The entity furthermore manages its interest rate risk by obtaining competitive rates from different banks. No significant risks have been identified with regards to interest rates.

Cash flow interest rate risk

	Current interest rate	Due in less than a year R'000	Due in one to two years R'000
Financial instrument			
Trade and other receivables – normal credit terms	10.50%	24,705	-
Other receivables – normal credit terms	-	226,556	-
Cash in current banking institutions	5.50%	147,767	-
Short-term deposits	7.32%	346,644	-
Trade and other payables	-	70,926	-
Other financial assets	-	615,914	-
Finance leases	14.00%	88	87

Foreign exchange risk

Foreign exchange risk arises on financial instruments that are denominated in a foreign currency, i.e. in a currency other than the functional currency in which they are measured. There were no foreign currency transactions covered by forward exchange contracts at the end of the year. The entity transacts with foreign entities on a mimimal basis and therefore the balance on foreign exchange debtors and creditors is considered immaterial and therefore within the residual risk limits.

38. Events after the reporting date

The Minister of Science and Technology has gazetted the transfer of the NZG, as a going concern, from the NRF to SANBI with effect from 1 April 2017. The transfer has, however, been postponed to 1 October 2017 to enable SANBI's processes and systems to accommodate the transfer. A transfer agreement in this regard has been signed by the Department of Science and Technology, the Department of Environmental Affairs, SANBI and the NRF.

39. Fruitless and wasteful expenditure

	2017 R'000	2016 R'000
Cancellation and adjustment fees	-	44
Other minor expenditure	7	-
Volunteers paid beyond their contract period	583	-
Laptops stolen	292	-
Written off by the NRF	(882)	(44)
	-	**-**

Each of these have been investigated and disciplinary steps have been taken, where necessary. The volunteers paid beyond their contract period was investigated by an external service provider and subsequently concluded in June 2017. Criminal action will be taken as part of the stipends paid to invalid volunteers (refer note 40 on losses due to criminal conduct).

40. Losses due to criminal conduct

	2017 R'000	2016 R'000
External syndicate-related fraud	-	2,615
Stipends paid to invalid volunteers	1,779	-
Fraudulent travel claims by employee	24	-
	1,803	**2,615**

The alleged fraud case for the stipends paid to invalid volunteers, against a former employee, was reported for criminal investigation and is in progress. A forensic investigation into this matter was initiated and concluded, with a final quantification of losses incurred.

The loss incurred due to fraudulent travel claims by an employee has been recovered and the employee dismissed.

The loss incurred in the prior year has subsequently been recovered.

41. Irregular expenditure

	2017 R'000	2016 R'000
Opening balance	7,533	25,464
Add: Irregular expenditure – current year	4,545	6,567
Less: Amounts condoned	(8,689)	(24,498)
	3,389	**7,533**

Analysis of expenditure awaiting condonation per age classification

	2017 R'000	2016 R'000
Current year	3,069	6,448
Prior years – To be condoned by internal delegated authority	320	320
Prior years – To be condoned by Corporate Executive	-	765
	3,389	**7,533**

		2017 R'000
Details of irregular expenditure – current year	**Disciplinary steps taken/criminal proceedings**	
Non-compliance to section 44(2)(c) of the PFMA and Treasury Regulations 8.2 and 8.3	Internal disciplinary steps were taken, where necessary	273
Volunteers with no or invalid contracts: Non-compliance to Treasury Regulations 8.1 and 8.2	Service provider contracted to perform an investigation	1,179
Non-compliance to instruction note 4A of 2016/17	Internal disciplinary steps were taken	24
Non-compliance to instruction note 3 of 2016/17	Evaluation of steps in progress	374
Non-compliance with practice note 8 of 2007/08	Evaluation of steps in progress	1,482
Non-compliance to Treasury Regulation 16A9(d)	Evaluation of steps in progress	1,213
		4,545
Details of irregular expenditure condoned	**Condoned by (condoning authority)**	
Non-compliance to CIDB Act, 2000	Corporate Executive	764
Non-compliance to Treasury Regulation 16A3.2 – Specification on brand, not performance	Corporate Executive/CIDB	4,812
Non-compliance to the Preferential Procurement Policy Framework Act, Act No. 5 of 2000	Corporate Executive	497
Non-compliance to Treasury Regulation 16A6.1 – Three quotations not obtained	Corporate Executive	298
Procurement-related transgressions for 2015/16	Internal delegated authority	841
Procurement-related transgressions for 2016/17	Internal delegated authority	298
Non-compliance to Treasury Regulations 8.1 and 8.2 – Volunteers with no or invalid contracts	Corporate Executive	1,179
		8,689

Possible irregular expenditure

Existing legislation, including National Treasury Regulation (2005) par. 16A 9.1(d), and Preferential Procurement Regulation (2011) par. 14, requires that tenders may only be awarded to persons whose tax matters have been declared by SARS to be in order. National Treasury Instruction Note 4A (2016/17) par. 3.3 allows that transactions can be conducted with foreign suppliers, even if not listed on the Central Supplier Database (CSD). The NRF is unclear whether such tax compliance declarations apply to foreign suppliers, and if so, which foreign suppliers, and whether non-compliance in this context constitutes irregular expenditure. Legal and empirical research has therefore been commissioned to obtain clarification. Due to the complexity, timing and scheduling of appropriate counsel, the NRF will only be able to conclude on this matter, and quantification if necessary, after the reporting date. With respect to all such transactions, value for money was received, goods and services were delivered and no expenditure was made in vain.

42. Segment information

General information

Identification of segments

The entity is organised and reports to management on the basis of nine business units of the entity. The segments were organised around the type of service delivered. Management uses these same segments for determining strategic objectives.

Information reported about these segments is used by management as a basis for evaluating the segments' performance and for making decisions about the allocation of resources. The disclosure of information about these segments is also considered appropriate for external reporting purposes.

The Corporate office is regarded as an administrative department, which does not generate economic benefits or have service potential. It has subsequently been disclosed as a reconciling item to the entity surplus/deficit.

Types of goods and/or services by segment

These reportable segments as well as the goods and/or services for each segment are set out below:

Reportable segment	Goods and/or services
Research and Innovation Support and Advancement (RISA)	The business unit provides for the promotion and support of research and research capacity development in all fields of knowledge and technology, through investing in knowledge, people and infrastructure; developing research capacity and advancing equity and equality, to unlock the full creative potential of researchers; assisting with the development of institutional capacity; and, facilitating strategic national and international partnerships and knowledge networks.
iThemba Laboratory for Accelerator Based Sciences (iThemba LABS)	The facility provides advanced, viable, multidisciplinary facilities for training, research and services in the fields of subatomic nuclear science and applied radiation medicine.
South African Astronomical Observatory (SAAO)	SAAO is the national centre for optical and infrared astronomy in South Africa. Its primary function is to conduct fundamental research in astronomy and astrophysics. SAAO operates SALT, located at its site near Sutherland, on behalf of an international consortium and promotes astronomy and astrophysics in Southern Africa.
Hartebeesthoek Radio Astronomy Observatory (HartRAO)	HartRAO focuses its research agenda on stellar evolution, pulars, and masers. The Space Geodesy research uses space-based techniques to study the earth and make a contribution to both astronomy and the earth system sciences. The facility is used by university students for carrying out research, and it also undertakes science awareness programmes for schools and the general public. A notice of the intention to withdraw HartRAO as a research facility has been given in April 2017. HartRAO will be incorporated into the newly established South African Radio Astronomy Observatory (SARAO).
South African Institute for Aquatic Biodiversity (SAIAB)	SAIAB serves as a research hub for aquatic biodiversity in southern Africa by housing and developing the National Fish Collection and associated resource collections as research tools and resources of aquatic biodiversity data. It also generates knowledge on aquatic biodiversity through interactive and collaborative scientific research, and disseminates scientific knowledge at all levels.
South African Agency for Science and Technology Advancement (SAASTA)	SAASTA is positioned as a science engagement agency in advancing the public awareness, appreciation and understanding of science, engineering and technology in South Africa, as well as the integration of science awareness activities across the entity.
National Zoological Gardens of South Africa (NZG)	The NZG is a national facility and an active participant in research on terrestrial biodiversity. The NZG will be officially transferred to the custodianship of the South African National Biodiversity Institute (SANBI) from 1 April 2017, although the NRF will continue to manage the NZG up to 30 September 2017, per agreement.
South African Environmental Observation Network (SAEON)	SAEON is a research unit that establishes and maintains nodes (environmental observatories, field stations or sites) linked by an information management network to serve as research and education platforms for long-term studies of ecosystems that will provide for incremental advances in our understanding of ecosystems and our ability to detect, predict and react to environmental change. An application has been submitted to the Minister of Science and Technology to declare SAEON as a national facility.
South African Square Kilometre Array (SKA SA)	The SKA project is an international effort to build the world's largest radio telescope, with about a square kilometre of collecting area. Deploying thousands of radio telescopes, in three unique configurations, it will enable astronomers to monitor the sky in unprecedented detail and survey the entire sky thousands of times faster than any system currently in existence. A notice of the intention to consolidate all existing and future radio astronomy activities into a single radio astronomy observatory to be called the South African Radio Astronomy Observatory (SARAO) has been given, which will include MeerKAT, KAT 7, AVN, HartRAO and international radio astronomy experiments in the SKA site.

Segment surplus or deficit, assets and liabilities

	2017										
	RISA R'000	iThemba LABS R'000	SAAO R'000	HartRAO R'000	SAEON R'000	SKA R'000	SAIAB R'000	SAASTA R'000	NZG R'000	Inter-segment transfers & Corporate office R'000	Total R'000
Revenue											
Parliamentary grant	448,009	162,951	49,234	25,901	11,103	-	17,407	22,384	62,714	-	799,703
Ring-fenced income	1,340,392	-	2,530	-	14,974	794,299	8,000	-	-	-	2,160,195
Designated income	1,046,034	19,219	30,076	1,789	9,714	28,742	5,159	67,320	9,117	-	1,217,170
Revenue from exchange transactions	702	58,318	3,189	1,004	11	3,559	354	1,149	47,320	-	115,606
Inter-segment transfers	27,565	90,293	35,664	37,789	22,996	752	17,927	9,880	25,475	(268,341)	-
Interest revenue	39	4	-	-	-	48,742	1	-	-	-	48,786
Total segment revenue	**2,862,741**	**330,785**	**120,693**	**66,483**	**58,798**	**876,094**	**48,848**	**100,733**	**144,626**	**(268,341)**	**4,341,460**
Corporate office revenue										177,731	177,731
Corporate inter-segment transfers										(20,313)	(20,313)
Total revenue reconciling items										**157,418**	**157,418**
Entity's revenue	**2,862,741**	**330,785**	**120,693**	**66,483**	**58,798**	**876,094**	**48,848**	**100,733**	**144,626**	**(110,923)**	**4,498,878**
Expenditure											
Salaries and wages	109,875	126,838	59,551	19,369	30,538	108,488	20,556	23,811	79,368	-	578,394
Grants, bursaries and other research expenditure	2,494,313	7,379	3,782	1,478	4,170	47,851	2,721	36,522	-	-	2,598,216
Programme and operating expenditure	86,887	128,964	46,198	16,333	16,477	350,890	14,841	37,673	55,743	-	754,006
Inter-segment transfers	195,408	6,517	1,991	1,108	367	4,237	445	2,475	2,624	(215,172)	-
Total segment expenditure	**2,886,483**	**269,698**	**111,522**	**38,288**	**51,552**	**511,466**	**38,563**	**100,481**	**137,735**	**(215,172)**	**3,930,616**
Total segmental surplus/(deficit)	**(23,742)**	**61,087**	**9,171**	**28,195**	**7,246**	**364,628**	**10,285**	**252**	**6,891**	**(53,169)**	**410,844**
Total revenue reconciling items										157,418	157,418
Corporate office expenditure										(153,601)	(153,601)
Corporate inter-segment transfers										73,482	73,482
Entity's surplus/(deficit) for the period	**(23,742)**	**61,087**	**9,171**	**28,195**	**7,246**	**364,628**	**10,285**	**252**	**6,891**	**24,130**	**488,143**

	2017										
	RISA R'000	iThemba LABS R'000	SAAO R'000	HartRAO R'000	SAEON R'000	SKA R'000	SAIAB R'000	SAASTA R'000	NZG R'000	Inter-segment transfers & Corporate office R'000	Total R'000
Opening segment accumulated surplus/ (deficit)	(15,467)	8,521	1,653	677	(2,888)	-	1,671	25	157	9,761	4,110
Transfer from SALT fund	-	-	4,348	-	-	-	-	-	-	-	4,348
Transfer to infrastructure fund	-	875	-	-	-	-	-	-	-	-	875
Segment net capital expenditure	(2,768)	(84,994)	(21,339)	(35,854)	(7,695)	(429,946)	(15,531)	(2,304)	(9,645)	-	(610,076)
Depreciation and amortisation	15,166	23,140	6,680	4,931	2,963	65,318	4,502	1,711	2,597	-	127,008
Corporate office transfers	-	-	-	-	-	-	-	-	-	4,377	4,377
Corporate office net capital expenditure	-	-	-	-	-	-	-	-	-	(18,354)	(18,354)
Accumulated surplus/ (deficit)	**(26,811)**	**8,629**	**513**	**(2,051)**	**(374)**	**-**	**927**	**(316)**	**-**	**19,914**	**431**
Assets											
Segment assets	1,589,967	247,202	92,516	76,017	28,481	2,104,724	52,405	31,108	24,290	-	4,246,710
Total assets as per statement of financial position											**4,246,710**
Liabilities											
Segment liabilities	1,348,014	3,994	2,568	2,902	2,043	570,833	(481)	8,096	4,080	-	1,942,049
Total liabilities as per statement of financial position											**1,942,049**

Segment assets and liabilities for the RISA segment include Corporate office assets and liabilities as these are not separately identified or internally reported.

Segment surplus or deficit, assets and liabilities

	2016										
	RISA R'000	iThemba LABS R'000	SAAO R'000	HartRAO R'000	SAEON R'000	SKA R'000	SAIAB R'000	SAASTA R'000	NZG R'000	Inter-segment transfers & Corporate office R'000	Total R'000
Revenue											
Parliamentary grant	461,178	147,191	46,889	24,667	10,574	-	16,578	21,319	59,728	-	788,124
Ring-fenced income	1,117,074	-	1,500	-	16,761	557,796	-	-	-	-	1,693,131
Designated income	1,115,599	22,567	31,188	3,508	7,972	28,008	18,329	73,775	6,195	-	1,307,141
Revenue from exchange transactions	539	78,939	3,452	883	633	245	176	851	54,370	-	140,088
Inter-segment transfers	42,212	36,386	40,252	6,019	17,400	272	8,390	29,543	8,468	(188,942)	-
Interest revenue	1,071	4	-	-	-	41,414	1	-	-	-	42,490
Total segment revenue	**2,737,673**	**285,087**	**123,281**	**35,077**	**53,340**	**627,735**	**43,474**	**125,488**	**128,761**	**(188,942)**	**3,970,974**
Corporate office revenue										216,690	216,690
Corporate inter-segment transfers										(25,072)	(25,072)
Total revenue reconciling items										**191,618**	**191,618**
Entity's revenue	**2,737,673**	**285,087**	**123,281**	**35,077**	**53,340**	**627,735**	**43,474**	**125,488**	**128,761**	**2,676**	**4,162,592**
Expenditure											
Salaries and wages	96,406	116,488	58,956	17,598	27,150	100,523	17,975	23,627	73,818	-	532,541
Grants, bursaries and other research expenditure	2,463,105	4,165	1,679	653	1,702	48,975	3,424	32,235	-	-	2,555,938
Programme and operating expenditure	89,008	119,247	47,985	13,762	19,615	239,359	11,728	41,845	49,151	-	631,700
Inter-segment transfers	96,748	19,493	1,973	970	255	8,245	464	26,828	2,125	(157,101)	-
Total segment expenditure	**2,745,267**	**259,393**	**110,593**	**32,983**	**48,722**	**397,102**	**33,591**	**124,535**	**125,094**	**(157,101)**	**3,720,179**
Total segmental surplus/(deficit)	**(7,594)**	**25,694**	**12,688**	**2,094**	**4,618**	**230,633**	**9,883**	**953**	**3,667**	**(31,841)**	**250,795**
Total revenue reconciling items										191,618	191,618
Corporate office expenditure										(136,863)	(136,863)
Corporate inter-segment transfers										56,914	56,914
Entity's surplus/(deficit) for the period	**(7,594)**	**25,694**	**12,688**	**2,094**	**4,618**	**230,633**	**9,883**	**953**	**3,667**	**79,828**	**362,464**

	2016										
	RISA R'000	iThemba LABS R'000	SAAO R'000	HartRAO R'000	SAEON R'000	SKA R'000	SAIAB R'000	SAASTA R'000	NZG R'000	Inter-segment transfers & Corporate office R'000	Total R'000
Opening segment accumulated surplus/ (deficit)	(16,844)	25,665	(266)	761	(1,179)	-	1,636	147	(2,490)	(4,893)	2,537
Transfer from SALT fund	-	-	2,968	-	-	-	-	-	-	-	2,968
Transfer to infrastructure fund	-	(19,359)	-	-	-	-	-	-	-	-	(19,359)
Segment net capital expenditure	(2,795)	(44,335)	(18,704)	(6,671)	(9,002)	(272,438)	(13,438)	(2,638)	(3,287)	-	(373,308)
Depreciation and amortisation	11,767	20,857	4,967	4,491	2,674	41,805	3,589	1,564	2,267	-	93,981
Corporate office net capital expediture	-	-	-	-	-	-	-	-	-	(65,173)	(65,173)
Accumulated surplus/ (deficit)	**(15,466)**	**8,522**	**1,653**	**675**	**(2,889)**	**-**	**1,670**	**26**	**157**	**9,762**	**4,110**
Assets											
Segment assets	1,579,348	190,297	79,733	56,968	26,905	1,882,419	41,790	32,722	20,400	-	3,910,582
Total assets as per statement of financial position											**3,910,582**
Liabilities											
Segment liabilities	1,333,456	8,175	3,303	12,048	7,713	713,155	(811)	9,943	7,082	-	2,094,064
Total liabilities as per statement of financial position											**2,094,064**

Segment assets and liabilities for the RISA segment include Corporate office assets and liabilities as these are not separately identified or internally reported.

Measurement of segment surplus or deficit, assets and liabilities

Basis of accounting for transactions between reportable segments

The accounting policies of the segments are the same as those described in the summary of significant accounting policies.

The nature of differences between the measurements of the reportable segments' surplus or deficit and the entity's surplus or deficit and discontinued operations

Inter-segment transfers: segment revenue and segment expense include revenue and expense arising from transfers between segments. Such transfers are eliminated on consolidation.

The Corporate office is regarded as an administrative department and is a reconciling item to the entity's surplus/deficit.

The nature of differences between the measurements of the reportable segments' assets or liabilities and the entity's assets or liabilities

There are no diffferences between the measurements of the reportable segments' assets or liabilities in comparison with that of the entity.

Information about geographical areas

The entity's operations are in different regions around the country. However, geographical areas are not used by the entity for decision-making purposes and information is not reported or collected in such a manner.

43. Budget differences

Material differences between budget and actual amounts

The budget is prepared well in advance of the financial year. Significant differences can occur between the budget compared with the actual results. The entity normally receives additional designated income during the financial year and funds carried forward are only confirmed at year-end, thus subsequent to the preparation of the budget.

Income

The decrease in the **ring-fenced income** is due to the carry forward of unspent funds to 2017/18 on the SKA project on account of the delayed procurement of the MeerKAT antennae and its associated subsystems, as well as the slow progress on the acquisition of land for SKA Phase 1. **Designated income** increased mainly due to additional income received from the Department of Higher Education and Training (DHET) for the Scarce Skills fund, to expand grant activities. Higher **interest income** is due to the build-up of cash holdings on account of the delayed activities on the SKA project, as well as a higher than anticipated Infrastructure Development Fund balance.

Expenditure

The increase in **grants, bursaries and other research** expenditure is due to increases in bursary funding under the DST Human Capacity Development designated funding and the DHET Scarce Skills funding contracts. The decrease in **employees' remuneration** is due to the capitalisation of a portion of salaries to the development of MeerKAT on the SKA project as well as a challenge to find the requisite skills and technical competencies to fill vacancies for the SKA project. The higher **depreciation charge** is due to the earlier than anticipated capitalisation of the AR-1 antennae for the SKA project. **Programme and operating expenses** include costs for the construction of a road for the SKA project, which was included as a capital cost in the budget.

21. ACRONYMS

ACEP	African Coelacanth Ecosystem Programme
AFRef	African reference DNA project
AGSA	Auditor-General of South Africa
AIDS	Acquired immune deficiency syndrome
AMS	Accelerator Mass Spectroscopy
AOP	African Origins Programme
APP	Annual Performance Plan
ARC	Agricultural Research Council
ARIC	Applied Research, Innovation and Collaboration
ASCA	Agulhas System Climate Array
ATAP	Acoustic Tracking Array Platform
AVE	Advertising value equivalency
AVN	African VLBI Network
BAC	Bid Award Committee
BBBEE	Broad-Based Black Economic Empowerment
BFG	Bioinformatics and Functional Genomics
BI	Business Intelligence
BIUST	Botswana International University of Science and Technology
BRICs	Biotechnology Regional Innovation Centres
BTech	Bachelor of Technology
CANSA	Cancer Association of South Africa
CEO	Chief Executive Officer
CERN	European Organization for Nuclear Research (Organisation européenne pour la recherche nucléaire)
cGMP	Current Good Manufacturing Practices
CHE	Council on Higher Education
CIDB	Construction Industry Development Board
CoE	Centre of Excellence
CoEs	Centres of Excellence
CoP	Community of Practice
COSTECH	Commission for Science and Technology
CPI	Consumer Price Inflation
CRF	Celestial reference frame
CSIR	Council for Scientific and Industrial Research
CSR	Corporate Social Responsibility
CTD	Conductivity, temperature and depth
CV	Curriculum vitae
DAAD	German Academic Exchange Service
DAFF	Department of Agriculture, Forestry and Fisheries
DEA	Department of Environmental Affairs
DFA	Department of Foreign Affairs (no longer in existence under this name)
DHET	Department of Higher Education and Training

DMR	Department of Mineral Resources
DNA	Deoxyribonucleic acid
DoE	Department of Energy
DoH	Department of Health
DST	Department of Science and Technology
DTTP	Desmond Tutu Doctoral Training Programme
EE & SD	Employment Equity and Skills Development
ERM	Enterprise Risk Management
ETD	Electronic Theses and Dissertations
F'SATI	French South African Technology Institute
FIFO	First in, first out
FMPPI	Framework for Managing Programme Performance Information
GCRP	Global Change Research Plan
GGOS	Global Geodetic Observing System
GIS	Geographic information system
GMSA	Grant Management and Systems Administration
GNSS	Global Navigation Satellite System
GRAP	Generally Recognised Accounting Practice
H.E.S.S.	High Energy Stereoscopic System
HartRAO	Hartebeesthoek Radio Astronomy Observatory
HCD	Human capacity development
HCP	Human Capacity Programme
HEI	Higher education institution
HERA	Hydrogen Epoch of Reionization Array
HICD	Human and Infrastructure Capacity Development
HIV	Human immunodeficiency virus
HMO	Hermanus Magnetic Observatory
HR	Human resources
HRDS	Human Resource Development Strategy
HRS	High-resolution spectrograph
HSRC	Human Sciences Research Council
IAEA	International Atomic Energy Agency
iBOL	International Barcode of Life
IBS	Innovation Bursary Scholarships
ICSU	International Council for Science
ICT	Information and communication technology
IEPD	Institutional Engagement and Partnership Development
IFRS	International Financial Reporting Standards
IKS	Indigenous Knowledge Systems
ILTER	International Long-Term Ecological Research Network
IP	Intellectual Property
IPAP	Industrial Policy Action Plan
IPMS	Integrated Performance Management System
IRC	International Relations and Cooperation

IRSF	Infrared Survey Facility
ISAs	International Standards on Auditing
ISI	Institute for Scientific Information – now known as Web of Science
ISOLDE	On-Line Isotope Mass Separator
ISSC	International Social Science Council
IT	Information technology
iThemba LABS	iThemba Laboratory for Accelerator Based Sciences
IUCN	International Union for Conservation of Nature
JINR	Joint Institute for Nuclear Research
JPL	Jet Propulsion Laboratory (NASA)
KAT	Karoo Array Telescope
KELT	Kilodegree Extremely Little Telescope
KFD	Knowledge Fields Development
KPI	Key Performance Indicator
LCOGT	Las Cumbres Observatory Global Telescope
LSP	Large Survey Project
M&E	Monitoring and Evaluation
MANuS	Master's Degree in Accelerator and Nuclear Science
MARS	Marine and Antarctic Research Strategy
MatSci	Master's Degree in Material Science
MCM	Marine and Coastal Management
MIVOC	Metal Ion from Volatile Compound
MRC	Medical Research Council
MTEF	Medium-Term Expenditure Framework
MTSF	Medium-Term Strategic Framework
MV	megaVolt
MWLA	Multiwavelength Astronomy
NACH	National Anti-Corruption Hotline
NACI	National Advisory Council on Innovation
NASA	National Aeronautics and Space Administration
NASSP	National Astrophysics and Space Science Programme
NBN	National Bioinformatics Network
NCSRT	National Council for Science, Research and Technology
NDP	National Development Plan 2030
NECSA	Nuclear Energy Corporation of South Africa
NEMA	National Environmental Management Act
NEP	National Equipment Programme
NEPAD	New Partnership for Africa's Development
nGAP	New Generation of Academics Programme
NGO	Non-governmental organisation
NMMU	Nelson Mandela Metropolitan University
NNEP	National Nanotechnology Equipment Programme
NRDS	National Research and Development Strategy
NRF	National Research Foundation

NSI	National System of Innovation
NZG	National Zoological Gardens
OECD	Organisation for Economic Corporation and Development
OH	Hydroxyl
ORCID	Open Researcher and Contributor ID
PAA	Public Audit Act
PAAZAB	Pan-African Association of Zoos and Aquaria
PAIA	Promotion of Access to Information Act
PAST	Palaeontological Scientific Trust
PDP	Professional Development Programme
PFMA	Public Finance Management Act
PhD	Doctor of Philosophy
PPC	Parliamentary Portfolio Committee
PRMB	Post-retirement medical benefits
R&D	Research and development
R&DM	Records and Document Management
RCCE	Research Chairs and Centres of Excellence
RD&I	Research, development and innovation
RE	Research and Evaluation
RF	Radio frequency
RIMS	Research Information Management System
RISA	Research and Innovation Support and Advancement
RISG	Research and Innovation Strategy Group
ROV	Remotely operated vehicle
RTF	Research and Technology Fund
S&T	Science and technology
SA PhD	South African PhD
SA	South Africa
SAAO	South African Astronomical Observatory
SAASTA	South African Agency for Science and Technology Advancement
SABI	South African Biosystematics Initiative
SABS	South African Bureau of Standards
SAEON	South African Environmental Observation Network
SAIAB	South African Institute for Aquatic Biodiversity
SAIF	South African Isotope Facility
SALT	Southern African Large Telescope
SAMS	SALT Mirror Alignment System
SANAE	South African National Antarctic Expedition
SANAP	South African National Antarctic Programme
SANBI	South African National Biodiversity Institute
SANCOR	South African Network for Coastal and Oceanic Research
SANHARP	South African Nuclear Human Asset and Research Programme
SANParks	South African National Parks
SANSA	South African National Space Agency
SARAO	South African Radio Astronomy Observatory

SARChI	South African Research Chairs Initiative
SARIMA	Southern African Research and Innovation Management Association
SARIR	South African Research Infrastructure Roadmap
SARS	South African Revenue Services
SAWS	South African Weather Service
SCC	Separated Sector Cyclotron
SCM	Supply Chain Management
SET	Science, engineering and technology
SETI	Science, engineering, technology and innovation
SGCI	Science Granting Councils Initiative
SHER	Safety, Health, Environment and Risk
SKA	Square Kilometre Array
SKA-SA	Square Kilometre Array South Africa
SLR	Satellite Laser Ranging
SMCRI	Shallow Marine and Coastal Research Infrastructure Programme
SSC	Separated sector cyclotron
STEMI	Science, technology, engineering, mathematics and innovation
STISA	Science, Technology and Innovation Strategy for Africa 2024
SU	Stellenbosch University
TB	Tuberculosis
TENET	Tertiary Education and Research Network of South Africa
the dti	Department of Trade and Industry
THRIP	Technology and Human Resources for Industry Programme
TIA	Technology Innovation Agency
TYIP	Ten-Year Innovation Plan
UCT	University of Cape Town
UFH	University of Fort Hare
UK	United Kingdom
UKZN	University of KwaZulu-Natal
UN	United Nations
UNISA	University of South Africa
UniZulu	University of Zululand
USAf	Universities South Africa
UWC	University of the Western Cape
VAT	Value Added Tax
VGOS	VLBI Global Observing System
VLBI	Very Long Baseline Interferometry
WAAS	Wide Area Augmentation System
WAAZA	World Association of Zoos and Aquariums
wBRC	Wildlife Biological Resource Centre
Wits	University of the Witwatersrand
WRC	Water Research Commission

Physical Address: Meiring Naudé Road
Brummeria
Pretoria
0184

Postal Address: PO Box 2600, Pretoria, 0001

Telephone Number/s: +27 12 481 4000

Fax Number: +27 12 349 1179

Email Address: info@nrf.ac.za

Website Address: www.nrf.ac.za

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