



National Research Foundation's Response to the Findings and Recommendations contained in the South African Research Chairs Initiative (SARChI) Review Titled:

SECOND FIVE YEAR INTERNATIONAL REVIEW OF THE SOUTH AFRICAN RESEARCH CHAIRS INITIATIVE (SARChI)

Commissioned by: National Research Foundation

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Respondents: Research Chairs and Centers of Excellence Directorate, SARChI, NRF

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1. Executive summary

1.1. Evaluation process

The 2019 Evaluation of the South African Research Chairs Initiative (SARChI) was completed through a process that was essentially similar to the previous evaluation conducted in 2012, except for the overall management response, which took a different approach based on the findings and recommendations of the Evaluation Panel.

The 2019 Evaluation Panel was made up of the following members:

1. Professor Krish Bharuth-Ram (convenor), Professor Emeritus, University of KwaZulu-Natal/Research Professor, Durban University of Technology and former Head, National Advisory Council on Innovation, Department of Science and Innovation (DSI), formerly Department of Science and Technology (DST), South Africa.
2. Professor Lehana Thabane, Professor and Interim Chair, Department of Health Research Methods, Evidence and Impact, McMaster University, Canada.
3. Professor Siamon Gordon, Professor Emeritus, Sir William Dunn School of Pathology, University of Oxford, United Kingdom (UK) and Chair of the International Scientific Advisory Committee (ISAC), Institute of Infectious Disease and Molecular Medicine (IIDM), University of Cape Town, South Africa.

The evaluation report was organized into sections as listed below, with appendices that provide additional materials to support the findings and recommendations. Section 1 provides background of the SARChI funding instrument, brief profiles of members of the Evaluation Panel, the purpose of the evaluation, and the Terms of Reference (ToRs), which outlines the issues and questions that the evaluation of the SARChI instrument was required to address. Section 2 provides a brief overview of the methods used to conduct the evaluation and some inherent limitations of the approaches used. Section 3 presents the key findings of the evaluation on the key questions, along with the evidence for the findings. Section 4 provides the recommendations from the evaluation. Section 5 concludes and looks into the future (see final evaluation report for details).

The Evaluation Panel considered all of the information provided in the self-evaluation report. The Evaluation Panel also took into consideration inputs provided by key and representative stakeholders through interviews. It must be noted, however, that these recommendations, some of which are far reaching, were developed from a review which was hampered by time and resources and relied principally on the Self Evaluation Report (SER) and personal views of interviewees. Despite these limitations, which are also acknowledged by the Evaluation Panel, the NRF accepts the final evaluation report, to which the NRF management responds to each of the findings and recommendations. The NRF must hasten to add that, with due respect to the Evaluation Panel, it reserves the right not to support frivolous recommendations that are far-fetched and not supported by evidence.

The NRF management response, in addition to traditionally responding to the evaluation report, also considered: (i) issues that were explicitly stated in the ToRs, but were not addressed; and (ii) aspects or dimensions, which were not included in the 2018 ToRs but, with the benefit of hindsight, should have been included. That is, what are the lessons learnt in order to improve reviews and evaluations commissioned by the NRF henceforth.

2. Contextual background

The 1996 White Paper on Science and Technology (S&T) and the 2002 National Research and Development Strategy (NRDS) emphasized the need for South Africa to transform its Science, Engineering and Technology (SET) workforce. Other policy and strategies of government, including the 2009 Human Resource Development Strategy (HRDS) and the 2009 Medium Term Strategic Framework (MTSF), pointed to the shortage of high-level skills as a significant constraint in the development of the economy and society. Accordingly, the aforementioned strategy documents, called South Africa to action and to produce a preponderance of highly skilled individuals, particularly in SET, to achieve a goal of “an equitable, sustainable, and inclusive growth path that brings decent work, sustainable livelihoods, education, health, safe and secure communities, and rural development”.

In order to achieve the above-mentioned goal, the South African Research Chairs Initiative (SARChI) was established in 2006 by the former DST now called DSI. SARChI is implemented and managed by the National Research Foundation (NRF) through a contractual agreement with the DSI. In the main, SARChI is a strategic intervention of the South African government designed to attract and retain research excellence and innovation at South African public universities, Science Councils and National Research Facilities. In particular, SARChI is aimed at increasing scientific research capacity through the development of human capacity and stimulating the generation of new knowledge. SARChI is also intended to support and advance transformation of South African society in terms of demographics and the knowledge economy, so that there is equitable and inclusive participation in the generation of knowledge and such knowledge translates into socio-economic benefits.

In accordance with the SARChI contractual agreement between the DSI and the NRF, the NRF is required to undertake five-year evaluations of SARChI. The evaluation is intended to assess the implementation and management of SARChI and its overall performance over the evaluation period in terms of its mandate and objectives; and to also make the necessary recommendations to continuously enhance the performance of SARChI. The evaluation period covers January 2013 to March 2018 inclusive.

During the evaluation period, SARChI evolved to comprise of the following four categories of Research Chairs:

- I. **DSI-NRF SARCHI Chairs:** These are canonical and traditional Research Chairs fully funded by the DSI and NRF with a primary focus on knowledge advancement and human capacity development. These Chairs are awarded following an open and competitive process to all qualifying universities and their respective nominated candidates who meet the minimum requirements of a SARCHI Chair. During the evaluation period, 205 out of the 233 (88%) of awarded Chairs were in this category.
- II. **DSI-NRF-Co-funded SARCHI Chairs:** These Chairs are funded by the DSI-NRF in partnership with the private sector, other government departments, Science Councils and Universities, respectively. To redress racial and gender imbalances, nominations and applications for these Chairs are invited almost exclusively from black South Africans in particular and females in general, provided they meet the minimum requirements of a SARCHI Chair. That is, these Chairs are awarded following a competitive and rigorous review process that uphold the SARCHI standard of excellence and prestige. These Chairs also focus on advancement of knowledge and human capacity development. During the evaluation there were 28 such Chairs respectively held in partnerships with Nedbank; the Department of Higher Education and Training (DHET); the South African Medical Research Council (SAMRC); the Council for Scientific and Industrial Research (CSIR); the Sugar Milling Research Institute (SMRI) jointly with University of KwaZulu-Natal (UKZN); and the Lund Mission Society (LMS) of Sweden, jointly with the University of Western Cape (UWC).
- III. **Research and Development Research Chairs:** These Chairs are funded by the DSI and NRF in partnership with industry. The research focus of these Chairs have a strong leaning towards evidenced based interventions and include the Mathematics Education and Numeracy Chairs co-funded by the First Rand Foundation (FRF) and the Anglo American Chairman's Fund. During the evaluation period there were four (4) operational Chairs in this category.
- IV. **Bilateral or Trilateral Research Chairs:** These Research Chairs are held in partnership with one or two other countries, respectively, and have a research focus on international or global priority issues of interest to collaborating countries. These Chairs are only tenable at the Tier 1 level¹. During the evaluation period, there were six (6) Research Chairs in this category. They included the South Africa (SA)-Swiss Bilateral Chair in Global Environmental Health; SA-UK Bilateral Chair in Ocean Science and Food Security; SA-UK Bilateral Chair in Social Protection for Food Security; SA-UK Bilateral Chair in Political Theory; SA-Namibia Bilateral

¹ SARCHI Chairs are awarded at either Tier 1 or 2 level. Tier 1 Chairs are awarded to internationally acclaimed researchers preferentially with NRF rating of A or B. Tier 2 Chairs are awarded to established researchers with a potential to attain international acclaim within 5-10 years at the time of the award. They should preferentially be under the age of 40 years at the time of the award and typically hold an NRF rating of either P or C1.

Chair in Astronomy and Astrophysics; and SA-Kenya-UK Trilateral Chair in Transformative Innovation: the 4th Industrial Revolution and Industrial Development.

3. Aims and objectives of SARChI

The main aim of SARChI is to strengthen and improve research and innovation capacity of South African public universities, Research Councils and National Research Facilities in order to produce high-quality postgraduate students and research outputs. The SARChI objectives are:

- a) Expand the scientific research and innovation capacity of South Africa;
- b) Improve South Africa's international research and innovation competitiveness, while responding to social, economic and transformation imperatives of the country;
- c) Attract and retain excellent researchers and scientists;
- d) Increase the production of Masters and Doctoral graduates; and
- e) Create research career pathways for young and mid-career researchers, with a strong research, innovation and human capital development output trajectory.

4. Key findings based on the ToRs and evaluation questions

Overall:

This NRF Management response should be read in conjunction with the enclosed SER and final evaluation report, which contains ToRs and evaluation dimensions as Appendix 1 of the final report. Overall, the 2019 Evaluation Panel of the SARChI instrument found that the performance of SARChI as an instrument was satisfactory as per applicable performance indicators. The Evaluation Panel also found that: "all interviewees were very enthusiastic about the SARChI funding instrument".

Below are specific findings and the NRF Management responses to them, respectively:

Finding 1:

The Evaluation Panel found that SARChI as an instrument is performing well, meeting its mandate and objectives. The Evaluation Panel posited that SARChI remains a prestigious instrument with overwhelming support for its continuation by all stakeholders because it produced high quantity and quality of publications in good impact journals, products and

artefacts. The Evaluation Panel was, however, concerned that while SARChI steadily increased the number of female and black chair-holders during the evaluation period, the increase was modest and hence contributed modestly to transformation of demographics of established researchers in the country. Both commendable and worrisome findings were supported by empirical evidence from the documents reviewed by the Evaluation Panel and testimonies or oral inputs made by key stakeholders through interviews.

NRF management response:

The NRF concurs with findings of the Evaluation Panel that the overall performance of SARChI during the evaluation period was satisfactory.

It is important to note that the primary focus of the NRF is on addressing gender and racial imbalances in the S&T workforce, while not neglecting other dimensions of transformation (for example socio-economic status, disability, institutional and knowledge areas). Furthermore, the NRF's transformation agenda goes hand-in-hand with excellence and the transformation of the knowledge enterprise more broadly. While SARChI when initially conceptualised did not prioritise transformation, it has become apparent that the SARChI funding instrument needs to transform and be a vehicle for transformation. The steady increase in the number of black and female Chair holders during the evaluation period provides testimony for working towards transformation of the SARChI in terms of demographic and gender. The NRF has taken deliberate decisions to establish co-funded Chairs with respective universities to accelerate transformation at like-minded universities and within the National System of Innovation (NSI) through the SARChI by giving preference to blacks and female chair-holders who meet the minimum requirements to hold a SARChI Chair.

Finding 2:

The programme has attracted and retained excellent researchers and scientists who are performing well in comparison to their international peers.

The SARChI has performed well in attracting and retaining excellent researchers (refer to, e.g., Annexure C, Table 3.1 in SER2). After an initial rise in recruiting Chair holders from abroad and/or industry, this has decreased overall (Table 3.4).

NRF management response:

The NRF acknowledges the finding of the review panel. Data on numbers of internationally recognised established researchers and scientists by institution and discipline prior to the start of SARChI is not available as there was no formal indicators nor baseline data prior to the start of SARChI. The SARChI funding instrument over the years since inception has measured excellence and/or internationally recognised researchers based on the review selection criteria where potential SARChI chair

candidates are vetted through a peer review system. In addition to the selection criteria several other additional aspects and indicators such as H-indices, Field Weighted Citation Impact (FWCI), top 1% to 25% citations and citation classics are all considered as proxies of excellence. For instance, Hirsch estimated that after 20 years of active research, a "successful scientist" would have an h-index of at least 20, an "outstanding scientist" would have an h-index of at least 40, and a "truly unique" individual would have an h-index of over 60. Over the period under evaluation, 53% of the SARChI Chairs can be considered as successful scientists and 44% of Chairs were outstanding and 2% of the Chairs for the period under evaluation were truly unique with h-index above 60 (Table 1).

Table 1: Distribution of SARChI Chairs by h-index for the period 2008 to 2018 combined

h-index	Number of Chairs	Tier 1	Tier 2
0-20	124 (53.4%)	74 (59.7%)	50 (40.3%)
21-40	85 (36.6%)	67 (78.8%)	18 (21.2%)
41-60	18 (7.8%)	17 (94.4%)	1 (5.6%)
Above 60	5 (2.2%)	5 (100%)	0

Finding 3:

The SERs also provides some data on how the performance of the SARChI compares with the Centres of Excellence (CoE) programme, another NRF strategic funding instrument. Furthermore, the SARChI is modelled on a similar Canadian-based programme, and as recommended in the 2012 review, it would be good to collect data on indicators used by the Canadian programme so that some comparison can be made between the two programmes. Collecting similar data and presenting this in the SER would facilitate comparisons and bench-marking against the Canadian programme.

NRF management response:

It is important to keep in mind that, although the fundamental goal of the two funding instruments are similar, the funding instruments are structured differently. CoEs are physical and/or virtual centres of research which concentrate existing capacity and resources to enable networks of researchers to collaborate across disciplines on long-term projects that are locally relevant and internationally competitive in order to enhance the pursuit of research excellence and capacity development. The SARChI on the other hand, focuses on attracting world class local and international researchers to South African public universities with the aim of strengthening and improving research and

innovation capacity of public universities, producing high quality postgraduate students, research, and innovation outputs. Notwithstanding, the NRF is in the process of concluding benchmarking SARChI with the Canadian Research Chairs Programme.

Finding 4:

The programme has expanded the scientific research and innovation capacity of South Africa.

Tables 1.1-1.5 in the SERs provide evidence of overall growth in the number of SARChI Chairs, both Tier 1 and 2, and in the number of students, particularly Masters and Doctoral, trained and graduated, with added value of supervision of non-SARChI funded students. Together with postdoctoral scientists, this speaks to expansion of scientific research and innovation capacity.

NRF management response:

There were no formal indicators for scientific research and innovation capacity prior to start of the SARChI. In hindsight and in the absence of formal agreed indicators, expansion of the scientific and innovation research capacity has been indirectly measured by the number of postgraduate students trained and graduated at each level of study as well as postdocs mentored by SARChI Chair holders each year during the evaluation period. The SARChI in addition to the training and supervision of postgraduate students, also mentor and develop research staff at the various host institutions.

Finding 5:

The programme has improved South Africa's international research and innovation competitiveness. The findings are impressive in terms of quantity, with satisfactory collaborative activity, numbers of publications and peer reviewed outputs internationally, including patents registered. The impact factor and FWCI may be above average overall, and exceptional in selected classification of education subject matter (CESM) categories, although much of the output can be ascribed to a minority of the Chairs.

NRF management response:

There were no formal indicators for South Africa's international research and innovation competitiveness prior to start of the SARChI. Impact factor of journals in which researchers publish is one of the proxies for international competitiveness. Other proxies/measures included FWCI which is defined as the ratio of the total citations actually received by the denominator's output, and the total citations that would be expected based on the average of the subject field; international collaborations; research outputs such as patents registered nationally and internationally by Chair holders; and

outputs cited in the top 1% to 25%. The data and evidence provides evidence to support the contributions made by the SARChI to the objective of improving South Africa's international research and innovation competitiveness. Of the operational SARChI Chairs, 108 (46.6%) collaborated internationally over the period under evaluation. National and institutional collaborations were at an average of 16.6% and 27%, respectively. The SARChI Chairs over the period under evaluation demonstrated an overall FWCI average of 1.6, whereby FWCI of 1 is average and anything above 1 is above average by international standards. The average FWCI of 1.6 clearly indicates that the SARChI Chairs created and had a significant impact in their respective fields. This is further evidence that supported the international and innovation competitiveness of SARChI Chairs.

Finding 6:

The SARChI has been successful in increasing the numbers of registered Masters and Doctoral students, although the graduation rate of M and D degree students per Chair holder has been modest over the past five years (a mean value of 0.61 M and D graduates/per year/per Chair holder).

The number of postgraduate (Hons, Masters and Doctoral) students supported over time has increased steadily over time, increasing from 110 in 2007/8 to 1390 in 2018/9, while the number of Chairs increased from 34 to 225 over this period.

NRF management response:

Introduction of the new DSI-NRF postgraduate student funding policy will allow the SARChI funding instrument to have better control and monitoring of the number of postgraduate students and will ensure alignment to the transformation and equity targets required.

Finding 7:

The panel was not in a position to arrive at a finding on whether or not the programme "created research career pathways for young and mid-career researchers, with a strong research, innovation and human capital development output trajectory".

The SER has highlighted the productivity and promotion of the Tier 2 Chairs to Tier 1, which could be considered an appropriate evolutionary stage of the programme that is aligned with this goal. However, at the postdoctoral level, while the training and mentoring is invaluable, the appointment period is short and leaves a gap to the next mid-career stage. The Panel was provided with no information on the subsequent development within South Africa of PhD graduates and Post-Doctoral fellows, e.g., number who went on to

obtain faculty appointments at South African universities, or on their return to the country after further training abroad, of PhD graduates. The Panel was mindful that mid-career pathways to academic appointments or research technology appointments in Industry require positions for appointment to be available at the relevant institutions. These need to be developed (by the NRF) in consultation with the appropriate authorities.

NRF management response:

The SARChI Tier 2 Chairs have done very well since 2012. Collectively, they have supported 725 postgraduate students over the period under evaluation. However, it should be noted that the Tier 2 Chairs graduated more students in 2013-2015 and 2018. This can be attributed to the fact that the Tier 2 Chairs supported more students but not on the SARChI grant. Furthermore, the Tier 2 Chairs have produced 3 097 (23% of the total outputs for all SARChI Chairs) knowledge outputs for the period under evaluation. As part of the Conditions of Grant and the principle of additionality, host institutions have not been successful at replacing SARChI Chairs with suitable candidates when the selected candidate is removed from their teaching environment. This has presented a challenge that the NRF is actively looking into with the host institutions.

Finding 8:

SARChI Chair holders have been very successful in leveraging considerable external funds over and above the SARChI grants.

Over the period 2012/13 – 2018/19 the grand total of funds expensed to Chair holders amounted to R2 844 657 775, the grand total of funds leveraged by the Chair holders amounted to R7 079 639 858.

NRF management response:

The NRF acknowledges and notes the findings of the Evaluation Panel. While the Chairs have been able to leverage additional funding as a result of the SARChI brand, many of the leveraged funds have not been audited and thus the figures were reported as received from the various Chair-holders in their annual progress reports, which are approved by the DVCs of Research at host institutions.

Finding 9:

The number of graduating Masters (M) and Doctoral (D) degree students is modest. Detailed information is presented on Table 1.2B of the SER.

NRF management response:

The new DSI-NRF postgraduate funding policy will assist the SARChI funding instrument to track the graduation rates. The policy aims to ensure that students complete on record time and within the maximum allowable period. This has not always been the case as SARChI did not have control over graduation rates mainly because once the support period allowed by the NRF has lapsed for a particular student they still continue under the Chair but are not reported as graduated students under the SARChI grant.

Finding 10:

There is good retention of Research Chairs. Data presented in SER Section 6.4.3, shows 121 Chairs had their 5 year reviews during the review period.

- I. 107 Chairs were renewed following their evaluations by Review Panels;
- II. 14 required re-evaluation with on-site visits, of which 13 were renewed;
- III. 1 had a negative outcome; and
- IV. 5 Tier 2 Chairs were upgraded to Tier 1.

Annexure C, table 4 of the SER, shows there is a 2 to 1 ratio favoring female Chair holders over males.

NRF management response:

The deliberate efforts by the SARChI management to prioritise South Africans and the constant encouragement by the NRF for institutions to replace vacated Chairs with candidates from South African universities has assisted in the retention of Chairs.

Finding 11:

Evaluation of the socioeconomic impact of SARChI shows many positive impacts.

SARChI was among the NRF funding instruments sampled in 2015 for impact evaluation (refer to “An Exploratory Evaluation of the Socioeconomic Impacts of Selected NRF Instruments: Part 2 of 4”).

The evaluation was based on a model that included three key areas of impact: i) strategic benefits/impacts; ii) direct and indirect economic benefits/impacts; and iii) wider societal impacts (refer to Figure 5 on page of the SER).

NRF management response:

The NRF acknowledges and notes the positive feedback from the Evaluation Panel. The NRF will keep up the good work and align it more to the impact framework currently being drafted by the NRF, the science engagement strategy implementation plan of the DSI as well as other impact implementation plans such as the Decadal Plan currently being drafted by the DSI.

Finding 12:

The evaluation results showed many positive impacts for the SARChI on all three dimensions. The SER also provide evidence (refer to Table 9 of the SER) that shows that the SARChI Chairs:

- I. produce peer-reviewed research publications in high impact journals; have strong international competitiveness in their respective fields as evidenced by field weighted citations impact (FWCI); serve on Editorial Boards of various reputable national and international journals;
- II. produce policy briefs and technical reports that are used by government departments; and
- III. Serve on different Ministerial Advisory Boards and Boards of other public and private entities as well.

NRF management response:

The NRF appreciates the positive findings by the Evaluation Panel and will endeavor to continuously keep on improving the performance of SARChI.

Finding 13:

The SARChI is clearly aligned with the transformation imperatives of the NRF and has made commendable achievements in particular on the numbers of female Chair holders and students supported as well as the number of black students supported.

During the period under review (2012/13 – 2018/19):

- I. The number of female Chair holders increased from 20% to 46%;
- II. The number of female post graduate students funded increased from 49% to 56%; and
- III. The number of black postgraduate students increased from 265 (58%) to 896 (65%).

However problem areas remain. In particular:

- I. The distribution of the Chairs remains unbalanced between blacks and whites, with black (African, Coloured, Indian, Asian) Chair holders constituting only 26% of the total. Of this, African and Coloured Chair holders represent 11.7% and 5.4%, respectively.
- II. While this may reflect the current microcosm of academia in South Africa, urgent steps are required to redress this because of its impact on the next generation of research leaders in South Africa.
- III. The distribution of Chairs between the historically advantaged and disadvantaged institutions remain and may have become worse than in 2012.
- IV. The graduation rate of Masters and Doctoral students remains modest.

The Panel has no information on the racial mix of the graduates, nor on subsequent appointments of graduating PhD students and Post-Doctoral fellows.

NRF management response:

The NRF appreciates the findings by the Evaluation Panel. Notwithstanding, the NRF will continue to address problem areas in partnership with host institutions through progressive frameworks such as the co-funded SARChI Chairs, which targets and gives preference to black researchers provided they meet the minimum requirements of a SARChI chair. Other downstream frameworks that support mainly black emerging researchers will help provide a pipeline of excellent black researchers who can qualify and assume the SARChI Chairs within the next 5 years. Another progressive policy such as the new NRF funding policy for postgraduate students, which effectively implements the Ministerial guidelines on equity in the distribution of bursaries and scholarship, when implemented in 2021, will help the NRF to improve and monitor the number of black and female students, in particular, as well as manage the throughput rates of students in general.

Finding 14:

The Panel found that performance data on each Chair are not individually assessed, but, as reported in the SER, “*SARChI staff rely on NRF systems such as Phoenix to gather data on the performance of the Research Chairs as a group and not as individuals.*”

This probably explains the report at the interviews by DVCs and Chair holders that feedback from the NRF on APRs are either not received or when received are completely unrelated to the APRs.

The NRF acknowledges (SER2,) “this poses a threat to evaluating or picking up challenges faced by individual Research Chair holders or by host institutions”.

Note, too, has to be taken of the Ofir study (ZO 2015) on the Impact of the SARChI, which found that of a set of 47 Chairs sampled “*the performance of the sampled Chairs is*

unequal; in some instances quite dramatically so. Seven Chairs produced nearly half of the research outputs and of joint research outputs with other institutions, three leveraged 60% of the funding.”

NRF management response:

The NRF does access the performance of the individual Chairs through the review of the annual progress reports submitted by Chairs and subsequently through the five (5) year evaluation of the Chairs. To include the performance of all individual Chairs in the self-evaluation report will make the report unnecessarily lengthy and most likely deviate from the purpose of looking at the performance of the funding instrument as a whole rather than that of the individual Chairs.

Once a progress report is submitted on the NRF system, each DVC receives an email acknowledging the submission. Because of the nature and way that SARChI reports were done in the past, with information being analysed at the instrument level, data collection on individual Chairs in the SARChI only started in 2018. Since 2019, the NRF has also introduced analysis of APRs submitted by SARChI Chairs and all NRF’s grant holders, with a view of providing detailed feedback to host institutions, flagging areas of concerns early enough and for every year in which the respective APRs were received.

Many of the challenges faced by the research Chairs at host institutions are dealt with as and when they arise. In many cases these are not explicit in the progress reports and the RCCE directorate deals with such issues as and when received. Many of the challenges experienced by Chairs are also dealt with constantly when SARChI engages institutions at workshops and institutional visit meetings.

Finding 15:

Section 7 of the SER provides evidence of the alignment of the performance of SARChI Chairs to the four conceptual pillars of the NRF Vision 2030 and NRF Strategy 2025—namely, Transformation, Impact, Excellence and Sustainability (TIES), including how the success of the funding instrument within the various knowledge domains aligns to the classification of education subject matter (CESM). This may inform the NRF Research Agenda.

Transformation: There is clear evidence that the SARChI programme has been aligned with the NRF transformation vision. For example, although we do not have baseline data prior to the start of the SARChI programme, the current profile of the SARChI Chairs, since inception, shows a clear upward trajectory:

- I. The percentage of female Chair holders has increased from 20% in 2012/13 to 46% in 2018.

- II. The female postgraduate student representation has also increased from 49% in 2012/13 to 56% in 2018/19.
- III. SARChI has supported more black postgraduate students—this increased from 265 (58%) in 2012/13 to 896 (65%) in 2018/19.

Without baseline data or some comparator, it is plausible that the changes may be attributable to time, rather than the programme itself.

Impact: The SARChI programme has also been able to achieve impact in all the three dimensions of impact as attested by the evidence contained in the impact evaluation report “An Exploratory Evaluation of the Socioeconomic Impacts of Selected NRF Instruments: Part 2 of 4”. See also section on “Impact”.

Excellence: The NRF defines research excellence as “internationally competitive research that advances knowledge, transforms lives and benefits society in all possible aspects”. This includes the originality, discipline-specific methodology, significance, rigour and academic impact of the research. The SER contains evidence showing that the SARChI research outputs in different disciplines have attained all the above attributes.

Sustainability: The NRF concept of sustainability pertains to the “financial, human, intellectual, social, infrastructural and environmental resources”. There are several examples in the SER that provide solid indicators of sustainability of the SARChI Chairs Programme. Examples include:

- I. SARChI Chairs have demonstrated over the years that they can be financially sustainable.
- II. Many SARChI Chairs took advantage of the DSI/NRF SARChI Chairs brand to leverage large amounts of funds both nationally and internationally—overall, SARChI Chair holders have collectively leveraged over R7bn for research and student support (compared with total funds of R2.845 billion invested in SARChI by the NRF).

While the above data provide some evidence of leverage, they do not speak directly to the “sustainability” of the programme—leveraged resources may be viewed as indirect measures that may contribute to the expansion or sustainability of the programme. It would be useful to consider direct measures or indicators of sustainability and prospectively collect information on these indicators.

NRF management response:

The NRF appreciates the positive comments by the Evaluation Panel. The NRF will also consult with SARChI Chair holders, host institutions and the DSI to assess and find how best it can implement the suggestion to consider direct measures of sustainability and prospectively collect information on these indicators.

In fact, true and critical measures of the SARChI success, especially now in the dawn of the new decade and henceforth, should not be quantity or increasing numbers but quality. Success of the SARChI should be measured by the quality and impeccable track-record of Chair holders; the quality of postgraduate students trained and produced; the quality of multi-institutional and pluri-disciplinary collaborations; the quality of research conducted and quality of concomitant research outputs as well as the quality of impact made by translated research outputs in solving intractable and pertinent problems South Africa, Africa and the world face. Therefore, the SARChI must be reimagined and reengineered to deliberately contribute to realising the NRF Vision 2030 which is underpinned by Transformation, Impact, Excellence and Sustainability (TIES); relevant objectives of the NDP 2030, including the seven priority areas of the current (2019-2024) Medium Term Strategic Framework (MTSF), the seven aspirations and respective goals of the African Union's (AU) Agenda 2063, and the United Nations' (UN) Sustainable Development Goals (SDGs), which subsumes all national priorities.

5. Recommendations

In general, there is agreement that the SARChI 2019 evaluation gave a favourable appraisal of the performance of the SARChI funding instrument during the evaluation period. The Evaluation Panel specifically recognized the necessity and potential of the SARChI to re-shape and strengthen the NSI in collaboration with other national role players. The Panel made recommendations on how to optimise the SARChI functions through its current mandate, resources, structure, and operations. Accordingly, this section presents the key recommendations drawn from the 2019 evaluation of the SARChI funding instrument, suggested omissions in this regard, and relevant developments over the period concerned. It also provides brief responses, some of which include sharing of plans already agreed upon, adopted, or in the process of being implemented.

However, it must be emphasized that given the current challenges facing the NSI, the NRF would have to apply itself fully to decide how best to implement many of the recommendations made by the panel in order to re-shape or replace SARChI going forward.

Recommendation 1:

We recommend that further investments in the programme be continued, and that the following elements of the programme be retained and strengthened: i) flexibility; ii) postgraduate training; iii) funding support; and iv) collaboration among the Chairs and between institutions.

NRF management response:

The NRF acknowledges and concurs with this sentiment. The NRF would like to further point out that due to the success of the SARChI there has been a noticeable increase of interest within the DSI itself, other government departments and private sector organizations proposing to jointly fund and establish more SARChI Chairs.

Furthermore, the NRF acknowledges that the flexibility within the SARChI will be maintained. Through the new NRF funding policy for postgraduate students, SARChI will still allow for flexibility within the training of postgraduate students where SARChI Chairs will still be in control of recruiting the best candidates for postgraduate training consistent with the equity targets of the Guidelines set out by the Minister.

Recommendation 2:

To achieve national transformation goals and development of the next generation of research leaders, we recommend that the SARChI programme be restructured so that it is located within Centres of Research rather than being centred on individual Chair holders, i.e., SARChI become a key element in Programme-based Centres/Institutes of Research with multi-Chair holders in multi-campus, including some at the less endowed universities. SARChI thus becomes a catalyst for intra- and inter-institutional research collaborations and partnerships, and in addressing the transformation imperatives of the country's research leadership.

NRF management response:

The NRF does not support this recommendation because this will mean a transition towards, or overlap with the already existing CoE model.

Instead, to encourage collaboration and coalescence of SARChI Chairs; the NRF and DSI have established Communities of Practice (CoPs), which consist of multi-Chairs and in multi-campus. CoPs are collaborations or alliances of multi-SARChI Chairs led by at least one SARChI Chair in partnership with other like-minded researchers, including researchers affiliated to CoEs, with a focus on solution-oriented research findings that can translate research outputs into tangible outcomes and influence policy development and implementation through communication of the necessary research findings. The overall objective of the CoPs is for a group of SARChI Chairs in partnership with other researchers to communicate their solution-orientated research findings in given fora to various stakeholders, government officials, practitioners, policy makers, academics and civil society, with an intent to provide strategies for mitigating social challenges faced by the South African government. The CoPs were first established in 2010 with the FRF-DST-NRF Mathematics Education and Numeracy Chairs, followed by the establishment of the DST-NRF-Mandela Initiative CoP in Poverty and Inequality established in 2015.

In 2017, an additional five (5) CoPs were established, namely, (i) DSI-NRF CoP on the use of fibre-rich biomass in the remediation of degraded land; (ii) DSI-NRF CoP on evaluation of malaria control interventions; (iii) DSI-NRF CoP on marine spatial planning for Algoa Bay; (iv) DSI-NRF CoP on functional biodiversity using biodiversity assessments as a form of social learning; and (v) DSI-NRF CoP on developing indicators for innovation and inclusive industrialization. As and when additional funding become available, more CoPs comprised of like-minded groups of SARChI Chairs will be established.

Recommendation 3:

We recommend consideration be given to modify, improve, discard and introduce some new elements in the programme. These recommendations are classified under different themes:

a. **General:** Programme should be continued but the following issues need to be addressed:

- I. Intra- and inter-institution interaction needs to be nurtured;
- II. Social engagement needs to be fostered as part of the funding instrument;
- III. Guidelines for succession planning need to be considered; and
- IV. Dedicated research Chairs for the less endowed research institutions or foster inter-institutional collaborations where appropriate and feasible, need to be considered, but without any compromise on research excellence.

b. **Co-funded SARChI Chairs:**

- I. Consider changing policy to allow money to flow directly to host universities;
- II. Prepare contingency plans for co-funded Chairs to sustain them in case of unexpected interruptions.

c. **Annual Progress Reporting (APR):** Reporting needs revision—it needs to be simplified, and frequency of reporting and length of APRs reconsidered.

- I. Requirements for APR should be aligned with final approved version of the proposal;
- II. Criteria for final 5-year review need to be provided with the contract;
- III. The system needs to incorporate other ways to automatically obtain information such as publications from available sources, e.g., using DOI information to upload articles;
- IV. Criteria for evaluation of APR be aligned with 5-year Evaluation criteria;
- V. The Annual Progress Report be supported by a reflective report from the DVC-Research of the host institution on the institutional impact of the Chair(s) (as recommended in 2012); and

- VI. Consider establishing a steering or advisory committee to evaluate APRs and provide feedback on APRs.

d. Human Capacity Development (MSc, PhD, Postdocs)

- I. Consider establishing a structured programme to connect trainees within and among institutions to nurture collegiality;
- II. Consider synchronizing the application and approval of the award with the university calendar;
- III. Consider making the funds available at the start of the academic year in January/February;
- IV. Consider opening the programme to part-time students;
- V. Consider retaining the flexibility of student recruitment in the current programme; and
- VI. Consider establishing a structured mentorship programme for all SARChI trainees to build research skills development (report writing, collaborations, leadership, preparing funding applications) social engagement lacking.

NRF management response:

While the NRF support recommendations 3a and 3c above, it does not support recommendation 3b in its entirety because the NRF must comply with regulations of the Public Finance Management Act (PFMA), to which universities are not obliged to comply. Therefore it will be in contradiction of the PFMA to allow funds to flow directly to universities without the NRF accounting for those funds. Furthermore, NRF budget constraints do not allow for the recommendation made above, which stated that NRF should have contingency plans to sustain co-funded Chairs in case of unexpected interruptions on the part of a co-funder. Hence the NRF enters into an agreement of at least 5 years or 1 funding cycle to jointly fund a Chair.

That is, jointly funded Chairs are negotiated for a certain period in good faith that there will be continued funding until the end of the funding cycle or period. The NRF undertakes, in principle to funds all Tier 1 Chairs for up to 15 years and Tier 2 Chairs for 10 years. In the unlikely event that a co-funding partner is not able to continue funding a jointly funded Chair after at least 1 complete funding cycle of 5 years, the NRF in principle underwrites to continue funding a specific SARChI Chair for subsequent cycles provided there are availability of funds and the Chair has been recommended and approved for continued funding. This proviso is stated upfront in the SARChI framework for jointly funded Chairs and concomitant conditions of grant.

Regarding recommendation 3c, in 2018, the NRF took a decision to make all APRs cumulative with a view of using them towards the five (5) year evaluation of each Chair. The DVC report has been made compulsory in the APR for all SARChI Chairs but several

DVCs have complained that the NRF cannot expect them to write a report every year for their Chairs especially those institutions with large number of Chairs. The SARChI funding instrument has considered the establishment of Steering Committees and is in the process of developing a Charter to facilitate and establish the Steering Committee.

Recommendation 4:

We recommend that Management consider performing a thorough review of all NRF funding instruments related to SARChI to assess overlap, gaps, and synergy, and how these may be addressed within the framework of the Centres of Research proposed in Recommendation 2 above.

NRF management response:

The NRF will consider the recommendation but it must be borne in mind that all NRF funding instruments are peculiar and were established to address specific needs within the system. Therefore the objectives and funding amounts differ so significantly that comparisons of performance may not always be ideal. The NRF will consider implementing the recommendation and benchmarking between different instruments by normalising performance such as outputs per rand value investment.

Notwithstanding the above, it must be noted that the SARChI is a self-standing programme that is able to interface with other NRF initiatives without duplication. One needs to move away from a funding instrument mode to advancing the mandate mode.

Recommendation 5:

We recommend that establishment of an Evaluation Division in the NRF, similar to that of the Social Sciences and Humanities Research Council of Canada (SSHRC).

NRF management response:

The NRF does not support this recommendation because it already has a dedicated Reviews and Evaluations (RE) Directorate that performs and facilitates all NRF related reviews and evaluations. This includes the review and evaluation of the individual performance of a Chair. The NRF will, however, explore the process used by the SSHRC and adopt some of their process to further enhance the reviews and evaluation process for individual SARChI Chairs and the SARChI funding instrument through the already existing RE Directorate of the NRF.

Recommendation 6:

We recommend establishing an Advisory Board that includes some SARChI Chairs, senior national and international researchers and other key stakeholders to regularly advise NRF on policy directions related to SARChI and other related programmes.

NRF management response:

The NRF agrees that the suggested Advisory Boards will play important roles in providing collective strategic leadership and direction of the SARChI. The NRF is committed to ensuring that this recommendation is implemented and will also further engage the DSI to agree on the ToRs and nature of representation on the Advisory Board. Furthermore, the SARChI funding instrument has considered the establishment of Steering Committees and is in the process of developing a Charter to facilitate implementation of that.

In addition, the NRF is constituting the NRF-wide Science Advisory Committee (SAC) to advise on the research that should be supported by all the NRF investments in research.

6. Overall reflections and conclusions

In the last decade and in most recent years (i.e., since 2006 until 2019), the SARChI has evidently contributed to increasing the number of established researchers; increasing the number of postgraduate students and increasing the number of research outputs within the NSI. Hence, an overwhelming support from both the 2012 and 2019 evaluation reports that SARChI should continue with further investments. Notwithstanding, true and critical measures of the SARChI success, especially now in the dawn of the new decade and henceforth, should not be quantity or increasing numbers of research outputs but the focus should be on quality. Success of the SARChI should be measured by the quality and impeccable track-record of Chair holders who should enjoy considerable international recognition. The SARChI must be reimagined and reengineered to deliberately contribute to realising the hallmarks of NRF Vision 2030, viz., Transformation, Impact, Excellence and Sustainability (TIES); relevant objectives of the NDP 2030, including the seven priority areas of the current (2019-2024) Medium Term Strategic Framework (MTSF); the seven aspirations and respective goals of the African Union's (AU) Agenda 2063; and the United Nations' (UN) Sustainable Development Goals (SDGs), which subsumes all national priorities. Accordingly, the SARChI funding instrument in the NRF management response discussed above, has considered implementations of only sensible strategic recommendations that are not in conflict but in consonant with the NRF Vision 2030.

When this review commenced in 2019, the world had not factored the coronavirus disease (COVID-19) pandemic. One of the casualties of the pandemic is the reduced funding of

fundamental research that is central to the SARChI. The consequences are even greater when one considers the impact of this on human capital development, innovations, policy developments and global competitiveness, among others. It is therefore incumbent for the NRF to reset its compass regarding the SARChI. While the organisation notes all the recommendations of this review and embraces many of them, the future of the SARChI in its present model will be revisited. This also applies to other funding modalities of the NRF and other support systems. It is against this backdrop that the challenge would be for the NRF to ensure that the four pillars of TIES in its Strategy 2025 and Vision 2030 will prevail into the future.

END