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## **Management Response to the Evaluation of the Palaeosciences Strategy National Research Foundation**

### **INTRODUCTION**

In 2012 the Department of Science and Technology (DST), now the Department of Science and Innovation (DSI)<sup>1</sup>, developed “The South African Strategy for the Palaeosciences - Incorporating Palaeontology, Palaeo-anthropology and Archaeology” (hereafter also simply referred to as “the Palaeosciences Strategy”), to provide a broad-spectrum developmental agenda for the palaeosciences in South Africa<sup>2</sup>. The Strategy was approved in March 2013, and it aims at investing in the development of human capital to protect fossil heritage and build expertise in the palaeosciences. Implementation of the Strategy is articulated in the “South African Strategy for the Palaeosciences: DST Implementation Plan, 2014-2020”. According to the DSI Implementation Plan document, “The National Research and Development Strategy recognises palaeosciences as one of the few areas of science where South Africa (SA) has a competitive advantage and where SA scientists need to be enabled to excel internationally”<sup>3</sup>. Overall, the South African Strategy for the Palaeosciences strategy set an ambitious agenda for enabling and transforming palaeosciences, integrating research, site management and collections care with tourism and socio-economic development.

The NRF appointed an independent panel of experts to perform a retrospective review of the implementation of the Palaeosciences Strategy for the period 1 April 2014 - 31 March 2020. The focus of the review is on evaluating the implementation of the Palaeosciences Strategy by the DSI, the NRF and other institutions as identified in The Palaeosciences Strategy and its Implementation Plan. Inevitably, the integration of different strands demanded strong commitment and delivery from different role players, as non-commitment from one would affect overall success. The NRF Management Response makes no comment on the commitment (or lack thereof) of other role players including various Government departments.

What follows below is the NRF management response to the review report as received. This management response is limited to the aspects of the Palaeosciences Strategy Implementation Plan that required action from the different business units in the NRF. The Knowledge Advancement and Support Directorate, the Human and Institutional Capacity Development Directorate and the Research Chairs and Centres of Excellence Directorate all provided inputs into the review process.

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<sup>1</sup> After this explanation, the rest of the document only uses “DSI”, regardless of what the name was at the applicable time.

<sup>2</sup> The South African Strategy for the Palaeosciences – incorporating Palaeontology, Palaeo-anthropology and Archaeology, DST.

<sup>3</sup> SA Strategy for the Palaeosciences: DSI Implementation Plan 2014-2020; March 2014.

## SELECTED COMMENTS ON THE TERMS OF REFERENCE OF THE REVIEW

The Terms of Reference for the panel set out the purpose of the evaluation as follows:

**1) To assess the performance of the various interventions in achieving the desired outcomes as expressed in the Palaeosciences Strategy Implementation Plan.**

Panel Findings:

- *The interventions made to achieve Goal 1 (transform South African minds) are considered to have been successful; however, there were few measures of its success, and this lack of data made it difficult for the panel to assess to what extent the minds of South Africans had been transformed 'to instill a sense of pride and provide the intellectual content to their African heritage.' For example, how many South African minds were transformed? What was the impact of the transformation? Did it result in more domestic tourism at palaeosites?*

NRF Management Response:

- The NRF acknowledges the difficulty in designing indicators that measure the transformation of South African minds. The NRF will engage with the DSI and the South African Agency for Science and Technology Advancement (SAASTA) to develop and/or use more appropriate indicators.

Panel Findings:

- *Goal 2 (to support South African universities) was hugely successful based on data submitted, for example, by the COE-PAL and the NRF on individual AOP Grant recipients supported by the DSI. High-quality research of international standard was performed by researchers in universities and museums, while students were supported in various areas contributing towards making South Africa a world centre of scientific excellence in the palaeosciences.*

NRF Management Response:

- The NRF is encouraged that the panel was of the opinion that the goal to support South African universities (researchers and students) was successful. The NRF will build on this success by taking steps to better integrate the support of palaeosciences research across the various business units of the NRF.

**2) To evaluate whether the resources invested into the development of the palaeosciences was adequate to achieve the goals and desired outcomes.**

Panel Findings:

- *The resources utilised and invested in the plan appear to have made a significant impact on Goal 1, but more data (e.g., on the number of minds that were transformed) need to be collected to assess whether enough was invested or not. Resources had a huge impact in achieving Goal 2. Universities were capacitated to perform high-quality research, while students were trained in various areas of the palaeosciences. Again, the numbers of publications for example from AOP grant holders and equipment purchased could have assisted in strengthening the case for resources well spent. Museum researchers also accessed grants, enabling them to conduct research aligned to the Strategy and the African Origins Platform. However, museums did not take up resources made available by the NRF for Goal 3. This resulted in the highly undesirable outcome of the loss of expertise staffing at the national museums. Resources allocated to Goal 5 were insufficient to ensure*

*that palaeotourism sites are sustainable. Although resources were scarce, and needed to be astutely allocated to achieve impact, there was, for historical reasons, a stronger concentration of resources in palaeontology and deep history (Miocene-Pleistocene archaeology) than in more recent periods. The consequence is that the more recent periods associated with iconic sites (e.g., Mapungubwe, Thulamela) did not gain as much investment and attention, resulting in limited growth of Iron Age and historical archaeologies despite their significance in transforming minds, building cohesion, promoting of national pride, and contributing towards heritage tourism. Changes in the funding strategy from grant-holder linked bursaries to a centrally administered system, has in many cases negatively affected student recruitment because many of these students are unable to sustain themselves on partial bursaries*

NRF Management Response:

- The NRF acknowledges the difficulty in designing indicators that measure the transformation of South African minds as required in Goal 1. The NRF will engage with the DSI and the South African Agency for Science and Technology Advancement (SAASTA) to develop and/or use more appropriate indicators. The NRF also acknowledges the low take-up of resources made available to museums by the NRF, but do not agree that this resulted in the loss of expertise staffing at the national museums. Administrative frustrations and a lack of interest in research by museum management are well known and are mentioned elsewhere in the review report. These difficulties are more likely to be the cause of the resignation of skilled researchers from museums. Goal 5, making South Africa a destination of choice for palaeo-tourism, falls outside the NRF's sphere of control.
- Limited funding means that not all applicants are supported. This is less than ideal, but the NRF makes every effort to support as many applications from as many fields as possible. The NRF will endeavour to focus future investment and attention on the growth of Iron Age and historical archaeologies. If successful, applications that reflect activities that contribute to transforming minds, building cohesion, and promoting national pride will be prioritised.

## COMMENTS ON THE REVIEW FINDINGS

The review panel was required to determine whether the Strategy achieved the following:

### **a. That palaeoscientists were producing quality research with international impact.**

Panel Findings:

- *One of the greatest successes of the Palaeosciences Strategy and the African Origins Platform was in supporting research in universities and museums and in building capacity in high impact research with international impact. The COE-PAL and SARChI chairs, as well as AOP funded researchers produced high-quality research published in high-impact, internationally regarded journals, placing South Africa among the world leaders in palaeosciences. These impacts are well documented in the COE report, the NRF Self-evaluation Report, and the DSI Self-Evaluation Report.*

NRF Management Response:

- The NRF is encouraged that the reviewers found palaeosciences support to be producing high-quality publications in high impact internationally regarded journals, and that the reviewers consider South African palaeosciences research to be internationally recognised, classifying South African researchers as “world leaders” in the field.

**b. That collections were being curated to the highest international standards.**

Panel Findings:

- *The challenges with the Department of Sports, Arts and Culture's involvement and commitment towards the strategy meant that this vital goal was not achieved. In fact, significant decline in curation of museum collections occurred due to the lack of capacity (trained staff and scientific leadership). Museum collection curation (apart from Iziko Museums of South Africa) is now well below the minimum standards established by SAHRA.*

NRF Management Response:

- This aspect of the review falls outside the NRF's sphere of control.

**c. That there was equity and redress in Palaeosciences Strategy.**

Panel Findings:

- *While black and women researchers in general benefited from the strategy implementation, transformation remains a major challenge. There are very few emerging South African black researchers driving palaeosciences research. The research ecosystem is dominated by more senior, and mostly white researchers. There is a need to recruit and retain high quality black talent, e.g., through creating gainful and fulfilling employment. As a case in point, despite all its success, the CoE-PAL struggles to find a replacement director with the appropriate equity profile and or academic experience and quality as advertised. Because institutions such as CoEs are centres of excellence, the NRF criteria for directors require that highly rated researchers, with substantial publications and extensive student supervision and mentoring experience be leaders. That there were few researchers who either matched the profile or were interested suggests the need to grow talent at different levels to widen the pool and to ensure that black South Africans and women can lead institutions such as the Centre of Excellence. It is difficult to measure the impact of outreach on redress, although the panel is aware different groups including school children benefited as elaborated below. Based on the information provided, most of the funds went to institutions with an established, pre-existing palaeoscience programmes, while historically less-well funded universities appear not to have benefited. It is up to the NRF and DSI to find reasons for this.*

NRF Management Response:

- The NRF acknowledged the challenge of transforming the profile of palaeoscientists in South Africa. Whilst there is a good gender balance, with at least 50% of the grantholders being female, race is problematic. In 2021, the NRF received 25 proposals for AOP funding. Of these, only 6 were from Black researchers, and all 6 were funded. The NRF did not receive a single application from historically disadvantaged institution. This trend is historical and is largely outside the NRF's sphere of control. The NRF will proactively engage with palaeoscientists from historically disadvantaged institutions and encourage them to apply for AOP funding. This will be done with institutional visits and/or workshops to engage more closely with this part of the palaeosciences community in South Africa in preparation for the call for AOP proposals in 2024.

**d. That science awareness and outreach in Palaeosciences Strategy had occurred.**

Panel Findings:

- *PAST and SAASTA performed vital interventions in terms of engaging school children and promoting palaeosciences awareness amongst the public. Learner materials were developed together with exhibitions and other successful outreach programmes. However, such activities are rarely evaluated, and it is unclear whether the public in general is aware of or appreciates their palaeoscience heritage.*

NRF Management Response:

- The NRF acknowledges the difficulty in designing indicators that measure the transformation of South African minds. The NRF will engage with PAST and SAASTA to develop and/or use more appropriate indicators.

**e. That capacity building had occurred locally and in Africa through collaboration in research and training.**

Panel Findings:

- *The panel acknowledges that significant research capacity was built through the implementation of the Palaeosciences Strategy and more specifically, through the allocation of significant resources to the African Origins Platform. However, the success of collaborations between researchers based at historically disadvantaged institutions such University of Venda, University of Limpopo, and the more established institutions such as UCT and Wits could not be established. For unknown reasons, partnerships between University of Johannesburg Palaeosciences Research - Institute (UJ-PR-I) and CoE-PAL did not happen, despite overlapping research interests. The extent to which collaboration between researchers in museums and universities in the fields of palaeosciences was not measured, but the existence of the UCT-IZIKO committee suggests that some relationships within traditionally established institutions exist. The CoE-PAL has been successful in establishing some partnerships with palaeosciences at institutions around the country. There was some success achieved in building palaeosciences research collaborations across the African continent. Although some South African and African students obtained bursary funding through the African Origins Platform and CoE-PAL funding, it is imperative that if South Africa is to become a world leader in palaeosciences, then locally and internationally focused research must be funded. Both types of research are transformative, and South African researchers must also contribute towards global knowledge production, including working in targeted and relevant areas of the continent and the world.*

NRF Management Response:

- It is important to note that the support provided by the NRF for palaeosciences research is guided by the 2013 South African Strategy for the Palaeosciences. This Strategy informs the development of funding instruments at the NRF, and these instruments are required to align with the strategic objectives of the Strategy. The Palaeosciences Strategy is informed by the 2002 National Research and Development Strategy. This National Strategy is aimed at advancing research in science, engineering, technology, and innovation to enable economic growth and social development, emphasising the need to use scientific areas in which South Africa has a geographic advantage to develop globally competitive science and research. It also states that work on South African palaeosciences is of crucial national and international importance. The NRF therefore

acknowledges that increased effort to map, enhance and coordinate collaborative research is an imperative.

## REVIEW LIMITATIONS

Panel Comment:

The major limitation was that some key stakeholders did not participate in the review process. For example, engagements with DSAC and museums only included middle management and researchers and excluded senior managers and museum directors who are responsible for implementing the relevant policies. Unless the decision makers are engaged, the prospect of change is limited. Few students were willing to participate in the interviews. Some of the students who participated did not receive AOP funding and thus, did not benefit from the AOP grants or the strategy. The low levels of response from students who benefitted from the strategy also requires mentioning. A few stakeholders withdrew from the process for personal reasons. Some of the information presented lacked statistical support, and other qualitative indicators making evaluation of success or failure difficult. For example, a list of AOP awards was provided but did all the grantees achieve the same level of success? What worked for the different projects and what did not? These limitations were transcended by combining information from complementary sources and techniques and by keeping to independently verifiable facts.

NRF Management Response:

- The NRF acknowledges the lack of appropriate indicators of success or failure. Additional peer review of final grant award reports could provide a measurable level of success, and reports could include a section on lessons learned. By implementing these changes, the NRF could significantly improve the provision of data for such reviews, and for its own reporting requirements.

## COMMENTS ON THE PANEL RECOMMENDATIONS

### Recommendation 1:

- *A new palaeosciences strategy should be envisioned for the future. The panel recommends that the overall highly successful palaeosciences strategy be revisited and improved. This will strengthen and enhance the gains made in research, training, site management, outreach and communication and building collaboration to ensure that South Africa continues to be a world leader in palaeosciences research that creates jobs and grows the economy, improving the lives of its citizens.*

NRF Management Response:

- The NRF will work closely with the DSI in the development of a revised palaeosciences strategy.

### Recommendation 2:

- *Establish binding high-level contracts with stakeholders. The panel recommends the establishment of binding inter-ministerial agreements to ensure delivery by key stakeholders, such as DSAC, NDT, DHET, and DFFE. It is critical that key administrators be appointed who are informed and driven by the PS at all partner departments. Mid-term monitoring and evaluation are essential to ensure delivery and staff at universities and museums must be allowed and encouraged to speak out when implementation is failing. Intra-department implementation plans with clearly established roles and responsibilities will provide continuity, buffering the implementation of the strategy from the effects of high staff turnover (e.g., as happened with DSAC). The strategic importance of palaeosciences demands oversight at the Presidential level to ensure overall coordination and success of the*

*strategy and the knowledge economy in contributing to the national economy in line with the National Development Plan.*

NRF Management Response:

- This aspect of the review falls outside the NRF's sphere of control.

### **Recommendation 3:**

- *Develop under-resourced areas of palaeosciences strategic interventions such as the Palaeosciences Strategy must through allocation of resources correct for historical imbalances that resulted in some fields in palaeosciences being dominant over others. For example, during Apartheid, palaeontology, and the archaeology of much earlier periods (Early and Middle Stone Age – c. 3.5 million years ago to 60 000 years ago) were strongly supported while that of the more recent periods were not supported. Despite its success, the current strategy made available more resources for older periods (e.g., the CoE-PAL only funds research for periods 60 000 years ago and older, while the two existing SARChI Chairs focus on the same period). The palaeosciences strategy investment (COE-PAL and SARChI Chairs) focus was on palaeontology and Pliocene/Early to Mid-Pleistocene archaeology, leaving the more recent periods under-resourced and under-researched. Curiously, these are the areas where tourism could grow, e.g., the historical importance of cultural heritage places such as the World Heritage Site of Mapungubwe or Thulamela, cannot be overemphasised. To mitigate for the lack of previous investment (going back to the Apartheid period) in the archaeology of more recent periods, including historical archaeology (from 20 000 years ago to the present), we recommend that appropriate interventions be established to enable the development of this field of research to unlock its ability to transform minds and contribute to socio-economic development. For example, SARChI Chairs and the COE-PAL are initiatives where excellence in the terminal Pleistocene, Holocene and Anthropocene may be developed. Alternatively, if a National Palaeosciences Institute is established then adequate resources must be allocated to develop this strategic area more directly connected to more than 40 million South Africans. This can promote the growth of domestic palaeotourism related to more recent palaeo-heritage. Other underrepresented palaeoscience research fields (such as micropalaeontology) with potential to become impact areas in global palaeosciences and national economic development should be supported. For example, the field of micropalaeontology, historically has provided abundant job opportunities in the oil and gas industry as well as in environmental impact assessments, yet it is currently under supported.*

NRF Management Response

- The NRF acknowledges that some areas of palaeosciences are better resourced than others. This is not deliberate, but rather the result of fiscal constraints within the NRF and the DSI. The development of new instruments or the revision of existing instruments remains a possibility. The SARChI programme would be an ideal way to expand resource allocation to the areas identified as underrepresented. The NRF will investigate the possibility of establishing a research chair in one or more of these areas after consultation with the research community.

### **Recommendation 4:**

- *Increase palaeosciences research capacity at Museums. The dire lack of research capacity and curation in museums needs immediate interventions to counter the loss of staff and scientific leadership. Improved funding of museums will create jobs and assist in the recruitment and retention of post-graduates in palaeosciences and will enable the optimal maintenance of infrastructure and collections at international standards and will enable the offering of competitive*

salaries. Salaries for museum based palaeosciences researchers across all fields are very low. There is a need to ensure that museums have strong scientific leadership and succession planning to sustain research, collections care and education. This will arrest the current trend that considers museums as “collection banks” rather than as places for research and gainful employment for black and other graduates. More importantly, this will address problems of lack of employment opportunities of qualified black graduates, as well as improve research capacity within museums. If the situation for palaeoscience researchers (palaeontology, palaeoanthropology, archaeology, and related fields) cannot be improved under the DSAC, we propose that DSI “adopt” them and collections at national museums so that this key sector can fully contribute to the knowledge economy. We also propose that the subsidy system for publications be extended to museums so that the museum researchers can generate some income to sustain their productivity.

NRF Management Response:

- This aspect of the review falls outside the NRF’s sphere of control.

#### **Recommendation 5:**

- *Create networks to bridge institutional silos to grow a strong and inclusive palaeosciences ecosystem, collaboration between historically disadvantaged and historically privileged institutions, as well as between museums and universities must be promoted to create beneficial network effects to address historical imbalances and grow the field. There is a need for activities that build synergies, for example, through job creation, sharing of equipment, conferences, joint supervision of students etc., so that previously disadvantaged and recently established universities such as Mpumalanga, Walter Sisulu, Fort Hare, Venda, and others can become hubs for palaeosciences. Individual universities must be encouraged to take up opportunities available through initiatives such as nGAP. Targeted funding for Palaeosciences positions through DHET (e.g. nGAP) would give palaeosciences research a strong boost.*

NRF Management Response:

- The NRF acknowledges the critical inclusion of HDIs, and will endeavor to forge an inclusive research strategy guided by the new Strategy

#### **Recommendation 6:**

- *Market SA as a palaeotourism destination. The full potential of domestic and international palaeotourism in economic development, job creation and economic growth has not been fully exploited yet. More investment and marketing should be made into profiling Palaeoscience tourism to develop South Africa as a palaeotourism destination. We suggest a multi-pronged strategy. Students in palaeosciences must be taught fundamentals of tourism development and management and palaeotourism must be taught in traditional disciplines to integrate this critical area into the wider economy. Another mechanism to increase awareness is to have key sites become part of the national curriculum with government support of school learners visiting and learning about their rich, deep, historical cultures. This would also allow for the sustainability of these sites, most of which are struggling to generate enough revenue to remain sustainable. These key tourism sites such as the Cradle of Humankind, Mapungubwe, West Coast Fossil Park, and others also have succession issues that need to be addressed. There is a need to involve the Department of Education to include learners by ensuring that site visits to PS sies are included in the teaching curriculum. DFFE effectively manages World Heritage sites such as Barberton and National Parks such as Kruger making it an important stakeholder in palaeotourism development. Additionally, we can learn and*



*derive lessons from other successful cases of PS tourism such as the South African National Parks, as well as from the broader Africa (Kenya, Olduvai, Egypt, etc) and other places. There is a need to engage with stakeholders such as professional associations that are also involved in outreach, including the Geological Society of South Africa (GSSA), Association of Southern African Professional Archaeologists (ASAPA), and the Palaeontological Society of Southern Africa. Another mechanism to promote tourism and outreach would be making of a documentary along the lines of the successful 'Shorelines' that would highlight the major palaeo sites and explain their significance to the public. Additionally, shorter, punchy, 2-3 min videos highlighting palaeontological sites can be developed and can be widely distributed online (twitter, FaceBook etc.)*

NRF Management Response:

- This aspect of the review falls outside the NRF's sphere of control.

#### **Recommendation 7:**

- *Grow palaeosciences at historically disadvantaged and new institutions. It is evident that although the Palaeosciences Strategy contributed to training graduates and assisted with the conservation of key sites, there are serious issues that need to be addressed. For example, qualified palaeosciences graduates are now unemployed, and key palaeosites are struggling to be sustainable. We recommend that to boost palaeosciences research at Historically Disadvantaged and newly established institutions, young recent palaeosciences graduates be employed to develop their research agenda.*

NRF Management Response:

- This aspect of the review falls outside the NRF's sphere of control.

#### **Recommendation 8:**

- *Create jobs and retain staff in the palaeosciences There is a need for investment, integrated thinking, and action to create and retain jobs in the palaeosciences. Through building cross-sectoral synergies, opportunities for economies of scale are developed through supporting job creation (better and more productive), retention and ensuring proper succession planning.*

NRF Management Response:

- This aspect of the review falls outside the NRF's sphere of control.

#### **Recommendation 9:**

- *Increase palaeosciences communication to the wider public Outreach activities should be increased, encouraged, and properly evaluated to measure the impact of the activities in changing perceptions held by the general public. There is a need to cover the range of palaeosciences fields from palaeontology and palaeoanthropology to archaeology and related disciplines. More support must be given to those engaged in outreach at various levels including for the development of educational materials, pamphlets, blogs, etc.*

NRF Management Response:

- The NRF acknowledges the need for further investment in outreach activities that communicate the palaeosciences to the general public. The NRF is of the opinion that these activities be performed by groups that are experienced in this kind of communication, rather than by individual researchers only. Future funding will prioritise support for more of these types of activities.

**Recommendation 10:**

- *Establish a National Institute of Palaeosciences. The success of the palaeosciences strategy and the African Origins Platform and the richness of South Africa’s palaeo-heritage (palaeontology, palaeoanthropology, archaeology, and related disciplines) is a strong motivation for the establishment of a National Institute of Palaeosciences. The CoE-PAL at Wits has made strong contributions to research, training, and outreach, while the CoE at Nelson Mandela University also advanced the field, showing that the establishment of CoEs can be considered a strategic intervention that can bring excellence to the palaeosciences. The establishment of a National Institute of Palaeosciences that embodies equity, redress, inclusivity, and transformation, as well as full participation of stakeholders from all institutions (including Historically Disadvantaged Institutions), and all fields of the palaeosciences across the disciplines and time periods, will have the ability to take palaeosciences research to the next level. One of the key advantages to a National Institute of Palaeosciences is that it could act as the central hub for all stakeholders, linking universities, museums, sites, national labs in the advancement of knowledge and the promotion of national pride.*

**NRF Management Response:**

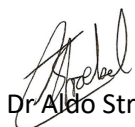
- The NRF notes this recommendation.

**Recommendation 11:**

- *Increase capacity for site management and conservation. Palaeosites comprised of fossil sites, paleoanthropological sites, archaeological sites, and others are repositories of information including collections. Some of the sites are World Heritage sites with Outstanding Universal Value to humanity while others are national heritage and provincial sites. They are destinations for tourism and play a vital role in transforming minds. Adequate resources must be invested in managing and conserving palaeosites to sustainably conserve them and to ensure that tourism will not affect their integrity and long-term sustainability.*

**NRF Management Response:**

- This aspect of the review falls outside the NRF’s sphere of control.



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