



## REPORT BACK ON THE NRF EVALUATION OF THE PALAEOSCIENCES STRATEGY (01/04/14 – 31/03/2020)

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## Executive summary

The National Research Foundation (NRF) appointed a diverse panel of experts with disciplinary depth and breadth to evaluate the implementation of the Palaeosciences Strategy (PS) for the period 1<sup>st</sup> of April 2014 to 31<sup>st</sup> of March 2020. The palaeosciences include palaeontology, palaeoanthropology, archaeology, and related disciplines. Stakeholders were drawn from Department of Science and Innovation (DSI), NRF, the Department of Sports Arts and Culture (DSAC), the National Department of Tourism (NDT), the Centre of Excellence in Palaeosciences (COE-PAL), researchers (including SARChI Chairs), African Origins Platform (AOP) grant holders, students (Honours, Masters, PhD), and Post-Doctoral Research Fellows.

The greatest benefit of the Palaeosciences Strategy (PS) was identified in the level and continuity of research funding and related activities over a sustained period, which allowed for significant milestones to be achieved over the review period. The PS strategy and African Origins Platform (AOP) significantly advanced research in the palaeosciences, strengthened capacity in high-quality research, contributed towards the acquisition and use of strategic equipment, stimulated international collaboration, and developed human resources that otherwise would not have been possible. However, the goals of the palaeosciences strategy were not met in the following areas such as the strategic allocation of resources to develop previously underdeveloped areas of palaeosciences, research capacity building in museums, site management and conservation and the development of palaeotourism. Another major challenge identified is the lack of job creation in the palaeosciences, resulting in a poor retention of student beneficiaries from the strategy.

Our panel proposes the following eleven recommendations that will grow and enhance PS research in South Africa:

- *A new PS strategy should be envisioned for the future*
- *Establish binding high-level contracts with stakeholders*
- *Develop previously under-resourced areas of PS*
- *Create networks to bridge institutional silos*
- *Increase PS research capacity at Museums*
- *Create palaeosciences jobs and retain staff*
- *Market SA as a palaeotourism destination*
- *Grow PS at historically disadvantaged and new institutions*

- *Increase PS communication to the wider public*
- *Establish a National Institute of PS*
- *Increase capacity for site management and conservation*

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## Abbreviations

AOP: African Origins Platform

ASAPA: Association of Southern African Professional Archaeologists

CoE: Centres of Excellence

CoE-PAL: Centre of Excellence Palaeosciences

DAC: Department of Arts and Culture DFFE: Department of Forestry, Fisheries and the Environment

DHET: Department of Higher Education and Training

DSAC: Department of Sports, Arts and Culture

DSI: Department of Science and Innovation) formerly known as DST: Department of Science and Technology)

DST: Department of Science and Technology

GSSA:

HDIs: Historically Disadvantaged Institutions

MoU: Memorandum of Understanding

NDT: National Department of Tourism

NEP: National Equipment Programme

NSCF: Natural Sciences Collections Facility

NMU: Nelson Mandela University

NRF: National Research Foundation

OSD: Occupation Specific Dispensation

PAST: Palaeontological Scientific Trust

PHRAs: Provincial Heritage Resources Agencies

PS: Palaeosciences Strategy

SAASTA: South African Agency for Science and Technology Advancement

SAHRA: South African Heritage Resources Agency

SANReN: South African National Research Network

SARChI: South African Research Chairs Initiative

SER: Self Evaluation Report

SET: Science, Engineering and Technology

UCT: University of Cape Town

UJ: University of Johannesburg

UJ-PR-I: University of Johannesburg Palaeo-Research Institute

Wits: University of the Witwatersrand

## Introduction and background

Palaeosciences (palaeontology, palaeoanthropology, archaeology, and related fields) are strategic disciplines with tangible and intangible benefits to society. This prompted the Department of Science and Innovation (DSI) to unleash a broad-based developmental strategy for palaeosciences to increase South Africa's competitive advantage in these fields. At the core of the palaeosciences strategy is the imperative to enhance and strengthen capacity in research, human resources, palaeotourism and communication and community/public outreach. Palaeosciences fall within an area where South Africa has a geographical and competitive advantage internationally. In 2012, the then Department of Science and Technology (DST) (now renamed Department of Science and Innovation), developed a broad-spectrum strategy for the palaeosciences (*The Palaeosciences Strategy*) in South Africa with the following goals:

- i. To transform the minds of South Africans to instil a sense of pride and provide the intellectual content to their African heritage to make them informed and responsible citizens, and to engage all sectors of society in palaeosciences matters, through information on discoveries that will allow them to appreciate the special place of South Africa in the story of life and humanity on earth.
- ii. To support the country's universities to produce a critical mass of palaeosciences researchers with a range of research, technical, curatorial, public engagement and managerial skills and drive knowledge production and exploitation to make South Africa a world centre of scientific excellence in the palaeosciences.
- iii. To enhance the capacity of museums to curate, conduct and support research in palaeosciences in ways that inform South Africans and the world.
- iv. To ensure that South Africa's palaeosciences heritage is well managed to attain international standards of heritage management and ensure that the country's palaeosciences heritage is well managed and used for the benefit of current and future generations; and
- v. To make South Africa the destination of choice for palaeo-tourism by building a network of site displays and interpretative centres which are managed in a socially responsible and sustainable manner.

The DST implementation plan for the palaeosciences strategy was rolled out in March 2014. Inter-departmental collaboration and synergistic thinking informed the strategy implementation with clearly defined roles for the now Department of Sports, Arts and Culture (DSAC), Department of Forestry, Fisheries, and the Environment (DFFE) (formerly Department of Environmental Affairs), and National Department of Tourism (NDT). The competitive advantage in palaeosciences was to be realised through investment in research and infrastructure, human capacity development and building capacity in museums and universities (PS Goals ii and iii). Site management, science communication and outreach and palaeotourism were to be supported to propel the growth of South African tourism, making it a destination of choice (PS Goals i, iv and v). Overall, 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. 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 appointed an independent panel of experts to perform a retrospective review of the implementation of the palaeosciences strategy for the period 1<sup>st</sup> of April 2014 to the 31<sup>st</sup> of 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*, in terms of their respective roles and in assessing progress made towards achieving the identified goals and desired outcomes (Annexure 1).

### ***Purpose of the evaluation***

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

- i. To assess the extent to which the Palaeosciences Strategy interpretation, as expressed in the Implementation Plan of the DSI, was appropriate;
- ii. To determine whether or not the DSI instituted appropriate interventions to achieve the goals of The Palaeosciences Strategy;
- iii. To assess the performance of the various interventions in achieving the desired outcomes as expressed in the Palaeosciences Strategy Implementation Plan;
- iv. To evaluate whether the resources invested into the development of the palaeosciences was adequate to achieve the goals and desired outcomes;
- v. To pay special attention in assessing the performance of the agencies and entities in fulfilling its assigned role in implementing the Palaeosciences Strategy; and
- vi. To provide recommendations for a sustainable future for palaeosciences.

The assessment was supposed to determine whether the Strategy achieved the following:

- a. That palaeoscientists were producing quality research with international impact.
- b. That collections were being curated to the highest international standards.
- c. That there was equity and redress in PS.
- d. That science awareness and outreach in PS had occurred.
- e. That capacity building had occurred locally and in Africa through collaboration in research and training.

To fulfil the Terms of Reference, the review panel adopted a mixed methodology, combining stakeholder engagement with document analysis and literature review.

## **Methodology**

The evaluation of the palaeosciences strategy was informed by three complementary approaches namely, documents review and analysis, interviews with stakeholders, and analysis of written submissions.

### ***Documents Analysis and Review***

The panel reviewed and analysed the following sets of documents, against the major areas outlined in the Scope of Work and Terms of Reference. Additional documents were sourced from stakeholders. The documents analysed are as follows:

- DSI SER, on the translation and implementation of the Palaeosciences Strategy.
- NRF SER, on the translation and implementation of the Palaeosciences Strategy.
- The South African Strategy for the Palaeosciences – Incorporating Palaeontology, Palaeoanthropology, and Archaeology.
- South African Strategy for the Palaeosciences: DST Implementation Plan, 2014-2020.
- African Origins Platform (AOP) Funding Instrument – Knowledge Advancement and Support Framework Document and Funding Guide, May 2018.
- Human Resource Development Strategy for South Africa, 2010-2030.
- National Heritage and Cultural Tourism Strategy, March 2012.
- Funding Agreement: Number: DST/CON 0147/2017 – Strategic Science Missions.
- Centre of Excellence (CoE) in Palaeosciences mid-term final Evaluation Report, 2018 plus Management Response to this evaluation.



- South Africa's National Research and Development Strategy, 2002.
- National Heritage Resources Act 25, 1999.
- White Paper on Science and Technology, 1996.
- National Development Plan, 2011.
- Ten-year Innovation Plan of the Department of Science and Technology, 2008.
- Human Capital Development Strategy, 2010-2030
- Heritage Human Resources Development Strategy, 2011.

### *Interviews*

Interviews were performed with stakeholders representing DSI, COE-PAL, DSAC, NDT, SARChI Chairs, AOP Grant Holders, Masters and PhD students, Post-Doctoral Research Fellows, the authors of the strategy, and conveners of different themes that informed strategy development such as tourism and legislation (Annexures II and III).

### *Written Submissions*

Stakeholders who for various reasons could not participate in the interviews submitted written submissions (Annexure II and III). These responses were analysed and added on to the list of responses.

## **Limitations**

The major limitation was that some key stakeholders did not participate in the 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.

## Key findings

- i. *Assessment of the extent to which the Palaeosciences Strategy interpretation, as expressed in the Implementation Plan of the DSI, was appropriate*

Documents analyses and review, when combined with insights from interviews and written submissions show that the interpretation of the strategy by DSI was appropriate. The aim was to develop a broad-based agenda to promote research and capacity building in palaeosciences (as broadly defined) in museums and universities to open opportunities for awareness, palaeotourism and site management and conservation. Different role players were given responsibilities aligned with their specialisations and workflow. DSI must be commended for this integrative and collaborative understanding and approach. However, it is the opinion of the panel that DSI should have ensured that all stakeholders responsible for the implementation of the strategy, actually delivered on what they had committed to do.

- ii. *Determination of whether the DSI instituted appropriate interventions to achieve the goals of the strategy.*

DSI crafted various interventions to achieve each of the five goals of the PS strategy. The interventions were customised to align with the strengths of different partners and for achieving aims and objectives at various levels. Based on the palaeosciences strategy implementation plan, each goal was to be supported by different interventions as stipulated in the plan (Annexure I). However, there was no alternative or mitigation plan for dealing with partners in the case of non-performance or poor delivery. This made it impossible to address the lack of progress or delivery.

- iii. *Assessment of the performance of the various interventions in achieving the desired outcomes as expressed in the Palaeosciences Strategy Implementation Plan*

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 instil 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? 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. While interventions for achieving Goals 3 (*capacitating museums*), 4 (*effective management of palaeosciences*) and 5 (*promotion of palaeotourism*) were appropriate, they required active intervention by other departments such as DSAC and NDT who, unfortunately, did not engage with and deliver on the aspects of the strategy. We were not privy to the high-level commutations between DST, DSAC and NDT, which could have shed light on some of the issues we were asked to evaluate. Without written evidence from DSI (e.g., emails to DSAC or NDT), it is not clear whether these departments had committed to the strategy. When asked about the lack of delivery by stakeholders such as the DSAC the response was that structural and personnel changes had impacted negatively on meeting the goals outlined through a lack or absence of leadership. However, the DSI managed to set up the South African Research Infrastructure Roadmap (SARIR) on Natural Sciences Collections Facility (NSCF) to ensure the protection of natural sciences collections at natural sciences museums to enable them to function as research facilities with accessible collections.

*iv. Evaluation of whether the resources invested into the development of the palaeosciences was adequate to achieve the goals and desired outcomes.*

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 spend. 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. For example, none of the SARChI Chairs and COE-PAL focussed on the recent period of the terminal Pleistocene-Holocene (last 20,000 years). 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

v. *Assessment of the performance of the departments, agencies and entities in fulfilling their assigned role in implementing the Palaeosciences Strategy*

That the South African palaeosciences strategy covers multiple, but complementary areas require a concerted approach by various departments. The NRF, SAASTA, PAST, COE-PAL and SARChI Chairs did extremely well. However, DSAC, NDT, and DHET did not participate in this vital programme, and simply did not deliver on the PS. There were no binding agreements, making it difficult to make underperforming units or entities within them accountable. What is surprising is that stakeholders complained about the situation in museums, intensifying research incapacity in the same institutions, while SAHRA is under-resourced and Provincial Heritage Resources (PHRAs) are struggling to the point of being ineffective. For DSAC not to take advantage of the PS that could have improved the situation at these important institutions/agencies is most unfortunate.

vi. *Assessment of whether the Strategy is achieving the following:*

a. *Quality research of international impact.*

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.

*b. Curating the collections to the highest international standards.*

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.

*c. Equity and redress.*

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.

*d. Science awareness and outreach.*

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. PAST even created a travelling exhibition, which has been viewed by 600 000 visitors since 2017.

The CoE-PAL and AOP funding aided many individual researchers to contribute to various kinds of outreach. The CoE-PAL programmes reach 400 000 learners and teachers annually. The researchers, using either CoE-PAL or AOP funding, conduct programmes ranging from visiting previously disadvantaged schools, conducting school field trips, contributing towards events such as the Grahamstown Science Festival and teacher training.

*e. Building capacity locally and in Africa through collaboration in research and training.*

The panel also 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 as 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 PS 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 focussed 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.

## Recommendations

### *Recommendation 1: A new PS 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.

### *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.

### *Recommendation 3: Develop under-resourced areas of PS*

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 PS 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 (see below) 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.

#### *Recommendation 4: Increase PS 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 PS 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 are able to generate some income to sustain their productivity.

#### *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 the PS research a strong boost.

#### *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 sites 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 general public. Additionally, shorter, punchy, 2-3 min videos highlighting palaeontological sites can be developed and can be widely distributed online (twitter, FaceBook etc.)

*Recommendation 7: Grow PS at historically disadvantaged and new institutions*

It is evident that although the PS 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 PS graduates are now unemployed, and key palaeosites are struggling to be sustainable. We recommend that to boost PS research at Historically Disadvantaged and newly established institutions, young recent PS graduates be employed to develop their research agenda.

*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.

*Recommendation 9: Increase PS 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.

### *Recommendation 10: Establish a National Institute of PS*

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 PS 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.

### *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.

## **Conclusions**

It is the view of the panel that the success of the Palaeosciences Strategy and African Origins Platform is mixed: on the one hand, the DSI through the AOP and CoE-PAL have made vital contributions towards supporting PS research at universities and museums and has enabled high quality PS research with global impact and have also led to a significant improvement in the training of postgraduates. On the other hand, the non-participation and inaction by DSAC and NDT resulted in museum-focused and tourism-dedicated goals (i.e., goals 3-5) not being

fully implemented. From our meetings, it is evident that to ensure the success of any future endeavour to harness the potential of PS in South Africa there needs to be a serious high level (inter-ministerial) commitment by all government stakeholders. There is no doubt that continuing and enhancing the Palaeosciences Strategy through lessons learnt will ensure that South African researchers use their geographical advantage to become leaders in palaeosciences, which will lead to job creation, and will feed into the wider heritage and national economy.

## Reviewers' signatures



Professor Shadreck Chirikure:.....8/04/2022



Dr Jennifer Botha:.....8/04/2022



Professor Anusuya Chinsamy-Turan:.....  
8/04/2022.....



Professor John Compton:.....8/04/2022



Professor Innocent Pikirayi:.....8/04/2022

## Annexures

Annexure I: Interventions to achieve goals (extracted from the Palaeosciences Strategy Implementation Plan)

Goal 1 (transform African minds) Interventions:

Development and coordination of promotional materials for Learners,  
Palaeosciences engagement plan,

Improve the accessibility of museums and palaeosciences sites,

Goal 2 (support the country's universities) Interventions:

Assist in the development of skills required to support Palaeosciences,

Research infrastructure support will also be provided through the National Equipment Programme (museums funded),

Support one national research centre of excellence,

Establishment of centralised scientific laboratories,

Strengthening the collaborations with institutions on the rest of the African continent,

Ensure that priority disciplines receive support through the NRF Programmes,

Creation of permanent university positions in palaeosciences – DHET – did not come,

Strengthen critical and diminishing areas while also ensuring that existing specialist research areas are maintained,

Goal 3 (empower museums to increase research outputs) Interventions:

Create areas/clusters of excellence within museums,

Attract and retain scarce skills in palaeosciences,

Improve staff conditions of service through programmes such as OSD,

Conduct an audit of palaeoscience collections at all museums,

Review the efficacy of the current governance and operational model for provincial and national museums,

Goal 4 (Resource South Africa's Heritage Agencies)

Review the regulatory framework for the management of heritage resources,

Explore the creation of an 'Occupation Specific Dispensation' category within the palaeosciences heritage sector,

Explore the inclusion of heritage resource agencies and museums onto the SANReN

Goal 5 (Make South Africa a destination of choice for palaeotourism) Interventions:

Establish a task team to review the mandates and capacity of existing structures,

Heritage sites need to be developed as part of tourism routes and nodes,

Annexure II: Interview Schedules and Programme

Annexure III: List of stakeholders