

Review of the DST-NRF Applied Centre for Climate and Earth Systems Science (ACCESS)- 2014

Review panel

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Executive Summary

The South African National Research Foundation (NRF) convened an external Review Panel of experts to:

- Review the alignment of the Applied Centre for Climate and Earth System Science (ACCESS) with the objectives of a Centre of Excellence (CoE);
- Assess the performance of ACCESS against the Department of Science and Technology (DST) Global Change Grand Challenge (GCGC) goals;
- Assess the performance of ACCESS in key focus areas (i.e. five initially and seven currently) from inception to 31 December 2013;
- Review the governance and funding instrument for ACCESS as a CoE; and
- Make recommendations for the future of ACCESS in the context of the national science priorities in GCGC.

The Review Panel received a wide range of comments and feedback on all aspects of ACCESS. They found that ACCESS education, capacity development, interdisciplinary research networking, and community building activities to be most successful. Some of ACCESS affiliate projects cut across disciplines and institutions that otherwise would not have collaborated. In this context, lessons learnt from ACCESS can benefit national and international efforts in the rapidly changing Global Change research landscape in South Africa.

The Review Panel finds the current ACCESS disciplinary scope to be too broad, and recommends a greater scientific focus and integration on the theme of Earth-Human System Science. The current seven ACCESS Themes follow the traditional disciplinary lines, and lack this holistic approach/integration. There are little or no resources dedicated to identifying and addressing trans-disciplinary research opportunities that are key to the solution of climate and global change issues. In the absence of a science strategy, ACCESS has tried to seek opportunities in national and international developments in climate/global change and as a result its research mandate has broadened with time instead of gaining greater focus. There is an urgent need to develop a bold, innovative, integrative research strategy for ACCESS that captures the imagination and interest of South African researchers and sponsors, with the commensurate expected outcome and impacts that benefit the society. There still remains the opportunity/challenge of defining a small set of compelling scientific questions that require inter/trans-disciplines collaboration, in the spirit that no single group or organization within South Africa can accomplish them. Such a strategy may not meet all expectations of some of the current participants in ACCESS, but would create new opportunities to engage both science and society in preparing and responding to the challenges at the interface of climate/environment, society, and development. According to the majority of those interviewed and consulted during the review process, "ACCESS needs urgently a visionary science leader" to develop such a plan.

There is a wide recognition among ACCESS actors and stakeholders about the value of ACCESS' training and capacity development efforts. The Review Panel received inspiring and convincing testimonies from students and early career scientists on the value of such investments, and the true impact of ACCESS support, mentoring and networking on their personal and professional life. Some ACCESS affiliate projects also cut across some disciplines and institutions that otherwise would not have collaborated, including international partnerships. ACCESS networking has been a rewarding experience for some participants by bringing various players together resulting in complementary research collaborations, new research cooperation, and funding opportunities. Most of these efforts have been opportunity-based, and ACCESS needs to align its education, capacity development and networking with its strategic research objectives to ensure strongest possible support for its objectives.

The progress on Information Brokering and Service Rendering aspects of ACCESS has been very limited. These are truly unique and innovative aspects of national and international initiatives such as GCGC, Future Earth: Research for Global Development, Global Framework for Climate Services, etc. Information Brokering and Service Rendering are inherently related, therefore they can be combined together and developed/managed as one theme. ACCESS should pay greater attention to this theme in the planning and implementation of its research, education and capacity development activities, from inception to completion of these activities.

The Review Panel realizes that declaring ACCESS as a Centre of Excellence by DST and NRF, at the time of establishment, may have been the best available means for its funding and governance. However, given the unique mandate of ACCESS and its approach to coordinating and facilitating inter-/trans-disciplines research requires a different management and governance framework. The Review Panel deliberated extensively on this aspect of ACCESS, taking into account feedback from some South African Science leaders as well as the DST and NRF leadership. The Panel suggests several possible models, and illustrates one such model in detail in the report for consideration by ACCESS sponsors and stakeholders.

The plan and priorities envisioned for ACCESS requires long-term commitment to adequate and stable funding. Some of the ACCESS teams/members have been very resourceful in leveraging funding from other sources. However, there is considerable frustration on the part of the recipients of ACCESS funds, especially students and early career scientists, regarding the stability and timeliness of funding through current organizational arrangements. The NRF and DST should consider revisiting the funding mechanism(s) for ACCESS activities, especially those residing within the universities, to overcome some of the current limitations and shortcomings.

Introduction

An external review panel was convened by the South African National Research Foundation (NRF) to:

- Review the alignment of ACCESS with the objectives of the Centre of Excellence (CoE) funding instrument;
- Assess the performance of ACCESS against the goals of the Department of Science and Technology (DST)'s Global Change Grand Challenge (GCGC);
- Assess the performance of ACCESS from inception to 31 December 2013 in terms of the five key performance areas for CoEs;
- Review the governance of ACCESS from inception to 31 December 2013 in terms of the requirements for the CoE funding instrument; and
- Make recommendations for the future of ACCESS in the context of the DST's GCGC.

The review mandate included evaluation of ACCESS research, education and training, information brokerage, service rendering, networking and its management as a Centre of Excellence. The detailed Terms of Reference for the Review Panel is included in Annex 1 to this report. The members of Review Panel were able to canvass the views of more than 40 individuals and organizations by convening a series of meetings, both face-to-face and through phone interviews, email exchanges, with the sponsors, stakeholders, board members, science team members, national science leaders, and students affiliated with ACCESS during 11-15 August 2014, in Pretoria and Cape Town, South Africa. They received a wide range of comments and feedback on all aspects of ACCESS including its science education and capacity development, research foci, networking and community building, governance and management, information and service rendering, as well as budget and finance.

They witnessed a remarkably divergent set of views on the ACCESS mandate, scope and expected contributions, as well as on its accomplishments and impacts since inception. They interpreted these wide ranging perspectives to be the best indicator of ACCESS' challenging scientific and technical mandate together with the complex arrangements and governance mechanisms that were established for its management, oversight and implementation. The following sections of this report offer the Panel's overall findings and recommendations on ACCESS as a Centre of Excellence for interdisciplinary research and capacity development in Earth System Science (ESS), followed by some more specific findings and recommendations on the seven themes identified in our review charter by the NRF and the DST (see Annex 1). It is hoped that such feedback at this critical juncture in the development of ACCESS conveys clearly a need for continued development and integration of ACCESS research activities focused on observing, understanding, modelling and

analysing the Earth's climate system to provide evidence-based policy relevant information for adaptation and development purposes, in a resource-constrained and competitive world in the ensuing decades. We highly commend DST's visionary approach to invest in trans-disciplinary science and technology research and capacity development activities such as ACCESS to prepare for the future. We note that achievements in this regard would contribute significantly to South Africa's GCGC as well as international efforts such as the emerging Future Earth: Research for Global Development and Global Framework for Climate Services initiatives.

General Findings and Recommendations

Founding of ACCESS as a Centre of Excellence and its Management/Governance:

The ACCESS was initially established as a Centre of Excellence by DST and NRF. This was the best available and most appropriate funding instrument at that time; however, the unique mandate of ACCESS and expectations regarding its role in coordinating and facilitating inter- and trans-disciplinary research requires further consideration by DST and NRF. It is possible that a new, different funding instrument may be required to support such large endeavours as ACCESS, and that an innovative solution for this program/centre/activity may turn out to be also applicable (or adaptable) to other exciting and emerging initiatives within the GCGC and other South African strategic initiatives. We understand that development of ACCESS and its implementation have co-evolved due to the rapidly changing landscape in the global change research arena, in South Africa and globally. In the absence of a project-specific scientific strategy, ACCESS has tried to follow these developments and be responsive to their respective research mandates and as a result its research focus has broadened with time instead of gaining greater focus.

For example, GCGC has an encompassing theme and will be facing the same set of issues that ACCESS is currently struggling with: the balance between depth (scientific understanding of the issues) versus breadth (taking it from enquiry to services and informing policy decisions). The currently available funding instruments may not be well suited to manage complex programmes/centres of this nature, and this may lead to misalignments between plans, expectations and outcomes.

A workable model for managing a wide spectrum of research activities that are emerging through national and international deliberations does not seem to exist at the moment. According to the NRF's internal documentation, CoEs "...are physical or virtual centres of research which concentrate existing capacity and resources to enable researchers to collaborate across disciplines and institutions on long-term projects that are locally relevant and internationally competitive in order to enhance the pursuit of research excellence and capacity development." In addition they are also seen as "... a key component of the human capital and transformation dimensions of government policy." Although ACCESS has attempted to meet these

expectations it has only been partially successful. In practice the magnitude, dimensions and complexity of inter-and trans-disciplinary activities required to pursue ESS may not easily be accommodated in a single CoE. In addition, addressing GCGC issues requires a very strong emphasis on utility and policy relevant research and a set of skills and competences that may exceed the typical mandate of the academic community. It is partly for this reason that it was decided to host ACCESS within the Council for Scientific and Industrial Research (CSIR), which, by its very nature, is geared towards utility based research. This arrangement has created some unintended tensions within ACCESS, as the host division within the CSIR, i.e., Natural Resources and Environment (NRE) is itself a participant in the activities of ACCESS and competing for the available resources, and perceived by some to receive preferential treatment.

The CoEs, as conceptualised, should have visionary leadership that is expected to uplift the science of the CoE to new heights and also beneficial to the disciplines/scientists involved. This has, for understandable reasons not yet happened within ACCESS, though this programme has been very successful in networking and bringing scientists together around relevant and important science and education themes. Programme leadership during the first phase has not been stable, with two different Directors projecting very different views for short periods of time, followed by a subsequent period managed by an interim Director. In any case, there is widespread consensus that even though some of the programme's inherent networking activities have positively influenced the science, the contributions supported through ACCESS so far did not push the boundaries of trans-disciplinary research and could be viewed largely as "business as usual". The major shortcoming at present is "visionary leadership" which, in the complex ESS and very broad based environment, will be a challenge to attain. This may also be the main reason for the ACCESS Board to become too operationally involved, rather than focusing on oversight, strategic guidance on science, and governance.

Given the unique requirements imposed by addressing such a complex, trans-disciplinary issue as climate or global change, the Review Panel suggests that a more flexible or better adapted mechanism should be instituted to govern and manage programmes such as ACCESS. Whatever structure(s) may be put in place in future, the fundamental principle of "structure follows strategy" must be adhered to, which for various historical reasons was not complied with when ACCESS was established. By implication, an innovative, visionary and coherent plan, which optimally capitalises on the globally unique attributes of Southern Africa's geographical, geological, environmental and societal imperatives (i.e. a research strategy), needs to be in place before any new governance and management structures are considered.

In this regard several possible options for NRF's and DST's consideration are indicated in the text box below. The main point is that the current organizational arrangements are not optimally suited for the management and oversight of complex centres/programmes such as ACCESS and similar ones emerging in future.

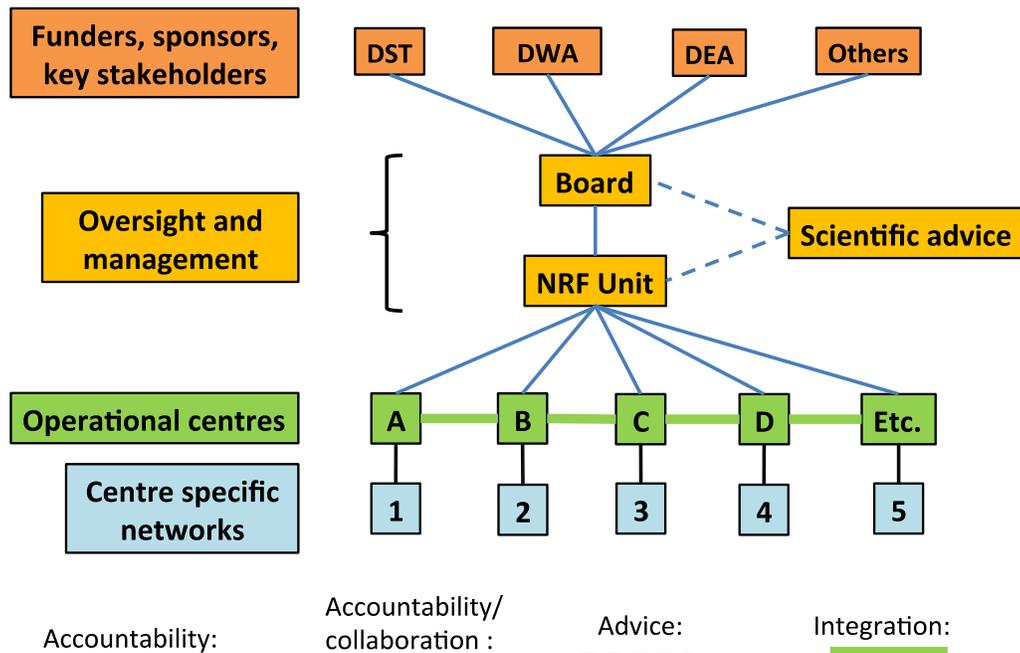
The example highlighted in the following box is offered as a possible starting point for internal discussion between DST and NRF.

The review Panel deliberated on various options for a new structure, different from those presently in place within the NRF, that could be considered in the future to provide the required oversight and management of a complex system programme such as GCGC. These could include the following:

1. To broaden the CoE concept to cater for different CoE categories and, depending on the requirements of the sponsors, allow CoEs to address either disciplinary or interdisciplinary themes, some with a focus on advancing science globally and others with a strong local application and utility element.
2. Utilising other mechanisms to manage wide ranging multidisciplinary programmes, such as is happening to some extent under the South African National Antarctic Programme (SANAP).
3. For DST/NRF to establish a new internal unit for oversight and management, either by way of coordinating several appropriate existing functions within the NRF, as e.g., happens in the National Science Foundation (NSF) for the management of large complex programmes, or by way of independently managing such functions if they do not exist, probably more applicable to the NRF.
4. Conceptualise the “institute” approach presently under consideration, to cater for this.

In view of the fact that the last alternative is only under consideration at present, we provide below the concept of a new structure aligned with the third option above, which could possibly cater for the needs of a complex programme required by national imperatives such as the GCGC.

Potential new governance and management structure



Features of the proposed structure:

- The Board whose members represent the funders and sponsors and other key stakeholders is accountable to the funders and sponsors.
- The NRF manages the programme on behalf of the funders and sponsors and is accountable to them for the successful implementation of the programme through the Board. In this regard it fulfils a coordinating, granting, adjudicating and reporting function in addition to ensuring proper integration of the various operating centres to ensure that the whole is bigger than the constituting parts.
- In managing the programme NRF will rely on scientific advice provided by experts in the field.
- The scientific advisory function can include:
 - Ensuring the strategic alignment between the activities and the ultimate goals and priorities, taking into account inputs from the scientific community.
 - Conducting the mid-term review of the programme and its constituent parts by involving senior scientists not directly involved in the programme.
 - Arranging for the comprehensive review of the programme (e.g., on a 5-year basis) by an international panel of experts.
- The operational centres take on the responsibility of implementing the research programme in accordance with the overall aims and objectives of the strategy, with each centre contributing to the overall programme from the perspectives of its strength and the vision and leadership provided by the responsible leaders. Hubs of centres should be hosted by the most appropriate institutions which can either be universities, science councils or national facilities. Leaders/directors of such centres should be enabled to attend to the activities of the centre either on a full-time or part-time basis depending on the scope of their respective activities, for which purpose the grants to centres must make provision for all or part of their salaries. Their appointment should however be by the host institution through which they are accountable to the NRF. Apart from visionary leadership, they also have an obligation to ensure integration of activities across the centres and the utilisation of the research outputs of their respective centres.
- Each centre will have its own network of participants located within the host or other institutions. Participants in the activities of the centres can either be funded through the programme or be collaborators funded from other sources. In the former case participants are accountable to the leader/director for proper execution of their tasks in accordance with the aims and objectives of the programme.

The required visionary leadership of a complex programme of this nature could either vest in one of the leaders/directors or possibly collectively. These leaders/directors could serve as ex-officio members of the Board to avoid conflicts of interest, yet be available to the Board for effective two-way communication between the Board and ACCESS teams.

If an approach akin to what is suggested in the example above is implemented, necessary mechanisms should be put in place to ensure that all players and stakeholders are aligned with the vision, mission and objectives of programmes with the complexities of ESS or in a broader sense, the GCGC. A further advantage would be that there is one centralised avenue of interaction between sponsors and operations, viz. through the appropriate management and governance structure. This would discourage and prevent any direct interference of sponsors in the day-to-day operations of the programme or elements of operations negotiating directly with any of the sponsors which could lead to immense difficulties in the proper execution of the programme.

Recommendation 1: NRF and DST should consider developing the required mechanism(s) for oversight and management of complex, trans-discipline, programmes/Centres/institutes such as ACCESS.

Past/Present Accomplishments and Challenges

Education, capacity development, and interdisciplinary research networking and community building aspects of ACCESS have been very successful. They are having the desired impact by supporting the training and development of the next generation of South African science leaders, and by enabling researchers with common interests and objectives to pursue interdisciplinary research in Earth system sub-domains of their choice (e.g., water resources, ecosystems and biogeochemistry, oceans and coastal system, etc.), to develop research proposals and successfully obtain required resources to pursue them. For example, the “Habitable Planet” series of workshops, focused on training and development of students and post-graduate fellows, have been very successful in recruiting and motivating students. As such, ACCESS has played a major positive role in participating students’ lives, studies and career choices.

Urgent Need for ACCESS Science Strategy and Leadership

The Review Panel observed a major void in ACCESS scientific and technical leadership. The Global Change research landscape is changing rapidly, both in South Africa and worldwide, and lessons learnt from ACCESS strategic planning and implementation, governance, and management can benefit such national and international efforts. ACCESS has an opportunity to play a significant role in this context as a proactive participant and not be a passive recipient. We believe it is extremely important for ACCESS to be led by *a distinguished, visionary science leader, to guide the development of the ACCESS over substantial periods of time*, to oversee and facilitate its implementation, and to promote it at the national and international level.

There is a general perception, based on interviews and exchanges with the participants in this review that “some participate in ACCESS because what it can offer, not because what it needs. The top down approach has hampered the community-wide engagement and full fledged support. ACCESS has not met its objective of making the whole greater than sum of individual contributions. Integration and trans-disciplinary collaboration in ACCESS are missing, but networking and enabling aspects are working. There are some pockets of strong scientific activities, but the overall science mission for ACCESS is still evolving and requires urgent attention.”

There is also a need for a greater trans-disciplinary approach to the research, i.e., the engagement of beneficiaries of science-based knowledge that ACCESS intends to develop and to get their insight to help shape scientific strategy/questions for ACCESS so that the science is useful to them, i.e. the connection between knowledge development with knowledge use. Early and frequent engagement is critical to success, and it is not intended to supersede the need to do the required inter/trans-discipline science.

For example, one particular view by founders of ACCESS is that “investment in young minds is more important than investing in science and related infrastructure.” It is important to reach agreement as early as possible, among ACCESS sponsors, the science team and stakeholders, on whether this view is broadly shared among them, and on a proper balance between science and capacity development priorities, with commensurate levels of investment.

ACCESS Research Strategy

The Review Panel’s understanding is that the original idea that ultimately became ACCESS developed in parallel to the GCGC, itself one of DST's 5 Grand Challenges. Both ACCESS and GCGC formally came to life in 2009. They co-evolved and may have tried to catch-up with each other, thereby creating some shifting in purpose as time went by. The initial plan for ACCESS identified four thematic areas, which later on became seven after the 10-Year Research Plan for the GCGC was published in 2010.

The process of drafting the original ACCESS plan to address GCGC goals/objectives generated two very useful outcomes: 1) a focus on the specific role South Africa could play in developing national R&D capacity; and 2) a focus on scientific theme(s) for which South Africa offered comparative geographical advantages, such as a unique biodiversity, an interface between three oceans, the origin of humankind, etc. This initial plan may have subsequently lost coherence through its assimilation by the larger national/international initiatives, and in particular by retro-fitting ACCESS into a particular funding instrument (CoE) that is subject to specific organizational and management processes.

In its current form, ACCESS addresses only Knowledge Challenges A and B (biogeophysical issues) of the GCGC. A separate CoE was initially planned to deal with Knowledge Challenges C and D (impacts and adaptation) of the GCGC. This never materialized in the form of a CoE, but resulted in a cluster of 11 individual projects funded and managed by DST/NRF, with no apparent linkages to ACCESS. Also, neither the 'Bureau on Global Change Science' nor the 'Knowledge Brokering Support Unit' that were proposed as integral components of the GCGC were implemented. Instead two other structures seem to have been established by the DST and are referred to in the ACCESS Self Evaluation Report as a “Global Change Science Committee” and a “Global Change Programme Office.” No information was

available to the Review Panel on their respective mandates and their relation to ACCESS. In addition, GCGC support seems also to have been provided to an ESS initiative referred to as the African Earth Observation Network (AEON) with an emphasis on solid Earth (Knowledge Challenge A3), which commenced its activities before ACCESS but was never integrated with or linked to ACCESS. A lack of leadership and funding limitations reduced ACCESS' effective research scope to its current research and student training foci.

The current organization of the work within seven separate ACCESS Themes follows the traditional disciplinary lines (except for Theme 7 that explicitly aims to achieve a better understanding of the coupled nature of biogeophysical processes and human dynamics in ESS, which was not really empowered to do so). In hindsight, it should not have been the role of ACCESS to support more R&D within each of these themes, but rather to promote, foster, drive inter- and trans-disciplinary research informed by scientific questions that require a holistic Earth System Science approach akin to what is now being promoted by the Future Earth research initiative. In this sense, ACCESS has missed the opportunity to begin shaping the agenda for such research in South Africa in its initiation phase.

Many if not most ACCESS Theme Leaders, as well as stakeholders, recognize that the current ACCESS disciplinary scope is too broad and remains as a set of disconnected fields. At the same time, most stakeholders recognize that 1) addressing human (e.g., socio-economic) aspects need to be strengthened if this programme is to have a major and lasting impact on society; and 2) knowledge integration into a holistic understanding of ESS may be more crucially needed than focus/progress in a particular field.

The Review Panel was informed that a “Seasonal Cycle concept” is emerging rapidly as a possible integrating theme for ACCESS because of its appeal to many scientific disciplines. This is based on the premise that there will be significant potential for use of science knowledge to be developed in a wide range of sectors (e.g., food and water resources decisions, marine commerce and fisheries, ecosystems services, etc.). This is clearly a compelling theme with significant societal benefits. However, the scope of scientific endeavour required to undertake this grand science challenge may still be too broad, thus requiring a focused approach to defining the most compelling and relevant aspects of this theme that are unique to South Africa, with due consideration to available expertise and resources at the national level. A set of exciting scientific questions that require engagement of disciplines/organizations, in the spirit that they cannot be pursued independently, can lead to a solid scientific foundation for attracting both national and international investments. In the words of a distinguished South African scientist, “Climate science in South Africa has made no real gains in knowledge or understanding in the past 10 years. We may have **described** the climate/earth system in more detail but we don't really **understand** it any better. This fundamentally limits the societal relevance of the work as we can contribute no new input into decision making processes.”

Way Forward for Research

A way forward for ACCESS is to develop a bold, innovative, integrative research strategy that captures the imagination and interest of South African researchers and sponsors, with the commensurate expected outcome and impacts that benefits the society. Such a strategy may not meet all expectations of most currently involved participants, but would create new opportunities to engage both science and society in preparing and responding to the challenges at the interface of climate/ environment, society, and development.

Ground-breaking advances in ESS may require a different set of benchmarks and tools to evaluate progress, as reliance on traditional 'Key Performance Indicators' would likely pave the way towards a return to disciplinary approaches. The level of financing to address such a broad mandate should be commensurate with the nature of the challenge and the need to propose original solutions. Implementing such a vision hinges on identifying, hiring and retaining a high calibre scientific authority with the vision and drive to move ACCESS towards such a bright future. These individuals should not be encumbered by the specific requirements of a particular financing instrument, and be able to invent, suggest and implement new structures better adapted to meet such a challenge.

Inclusion of additional themes or collaborators, for instance to expand the scope of activities and include socio-economic activities is perceived by many Theme Leaders as difficult or impossible due to either pre-conceived ideas and positions on the scientific status and value of other fields, and/or resource limitations. The former impediment is purely cultural, the latter is indeed acknowledged as a hard constraint. Some progress has been achieved, but the main purpose of the next phase of ACCESS may lie in supporting research that includes or even focuses on broad trans-disciplinary issues (such as socio-economic aspects) rather than just pursuing further disciplinary progress.

While ACCESS has resulted in some new R&D, much of the progress appears to have been within the confines of disciplines and specific Earth system domains (e.g., oceans, ecosystems, water resources, etc.). The newly proposed "seasonal theme" is indeed a worthwhile suggestion which may find some appeal within and among the current seven themes, and may allow the development of significant scientific knowledge of great benefits to society. It should, however, be viewed as a means for interactions and integration, not as a scientific goal in and of itself. There still remains the opportunity/challenge of defining a small set of compelling scientific questions that require inter/trans-disciplinary collaboration to accomplish them, because no single group or organization within South Africa can accomplish this by itself.

Recommendation 2: Develop urgently a research strategy focused on compelling and exciting scientific question(s) that transcend traditional disciplines, Earth system domains, and organizational frameworks, but with direct societal relevance/benefits.

ACCESS Education and Capacity Development

There is a general consensus among ACCESS actors and stakeholders about the great value of its training and capacity development efforts, as well as the notable achievements of this component of the programme throughout all seven themes. Some of the graduates and beneficiaries offered personal testimonies to the Review Panel with inspiring and convincing evidence of the value of these investments, and the true impact that ACCESS support, mentoring and networking has had in their personal and professional life. The success of interdisciplinary workshops for ACCESS graduates has created a demand for other groups of potential or prospective participants (specifically for on the job training, or continuing education) to attend, as well as for the repeat of previously delivered workshops at additional locations. Students, who were interviewed, stated overwhelmingly their gratitude for support and emphasized the benefits they personally derived from participating in ACCESS.

The Review Panel believes there is a need for carefully considering the interactions and balance between scientific research and capacity development. For example, spreading insufficient resources on a wide range of topics led the seven thematic Teams to dedicate the bulk of the limited funding available to training and capacity development, which is a safe, non-controversial and useful purpose. That, in turn, led to the perception of ACCESS as merely a funding mechanism for graduate students. If ACCESS is to retain its goal of scientific excellence and broad, cutting-edge forward-thinking research to address a central societal challenge, fellowships and bursaries should be used to entrain young promising fellows in the scientific venture, but they should focus on the main purpose of the programme and contribute to its overarching science objectives through their research and expertise.

There is an organic relation between cutting edge R&D and the ability to attract, train and retain top graduate students. This, in turn, hinges on the availability of funds to support those individuals throughout their tertiary educational programme and beyond. At the time of this review (August 2014), the training component of ACCESS has supported a reasonably large group of motivated graduate students who have benefited in unique and often unexpected ways from such an opportunity. Yet, the science education and research capacity development impact of ACCESS remains rather limited: it does not appear to have made a major mark at the national and the international level yet, although the period being evaluated (2010-2013) may be too short for this purpose.

Many students have benefited greatly from ACCESS bursaries but it is not clear whether they are in a position to promote or exploit their presumably acquired broad systemic view of ESS. It is possible that they also became disciplinary specialists. On the other hand, students from former Historically Disadvantaged Institutions (HDIs) who became interested in ESS topics found it difficult or impossible to pursue further studies at top universities due to strict entrance requirements. Some efforts geared towards capacity development at HDIs have had marked individual successes, but it will take some time to reduce or remove the distinction between the different classes of universities within the nation. Specific mechanisms may need to be implemented to boost educational background or to mend gaps in learning and skills, though the Review Panel views this issue as lying outside the ACCESS mandate.

Although the Memorandum of Agreement between NRF and CSIR called for it, there has been little effort so far to keep track of students benefiting from ACCESS grants and bursaries, so the impact of that component of the programme is currently assessed in terms of numbers of students rather than in terms of ultimate outcomes after leaving the programme (e.g., unemployment versus job availability or job satisfaction).

Some Theme Leaders noted the bursary opportunities have been so widespread that many students actually engaged in phenomenological studies rather than integrative, quantitative investigations, and many students tend to leave research as soon as they graduate, in order to work and gain income. So the return on investment may be great for the nation or the world, but rather limited for inter/trans-disciplinary research for ACCESS in South Africa.

Annual meetings assembling all ACCESS graduates have been very successful and have provided ample opportunities to promote exchanges or encourage R&D cooperation and networking. Participation of external students (e.g., from USA) has also been highly beneficial in raising awareness and transferring know-how. As noted above, the long-term, lasting outcome is not clear due to lack of tracking of grants/individuals and associate data. For example, for long-term and lasting impact, a comprehensive curriculum for ESS, in particular at M.Sc. level, may need to be developed, and this should ideally involve multiple institutions. The Review Panel notes that limited concern or effort appears to have been given to invent alternative educational platforms, such as Massive Open Online Courses (MOOCs) to compensate for large differences between teaching opportunities offered at different universities.

The difference in funding between bursaries provided by ACCESS and by other programmes has also created some tension and controversy, in particular because it was perceived by some as “damaging the opportunity to attract suitable candidates.” In the same vein, delays in making resources available to students have created serious stress and practical difficulties for students who entirely depend on the bursary.

Recommendation 3: Focus strategically the ACCESS education and capacity development efforts on the development of the next generation of scientists and experts who can help implement its research strategy, and to enable ACCESS over the long-term.

ACCESS Networking

Some ACCESS affiliate projects cut across disciplines and institutions that otherwise would not have collaborated, including scientists, students and organizational engagement and international collaborations, although these appear to be mostly opportunity-based rather than strategically motivated. The Panel heard a number of testimonials by ACCESS Team members and Theme Leaders stating that “it has been a very rewarding experience bringing the different universities and other science councils together. Normally we would be competing for the funding space, but now we are complementing each other and collaborating.” Such collaborations resulted in some new research cooperation and funding opportunities. For example, the human dimension theme received about R8-9 million per year over 5 years from other programmes through partnerships. The Climate Change Theme, together with partners, has been able to leverage about 90% of its annual budget, as of the time of inception of ACCESS. ACCESS played an important role in opening the door for international partnerships such as the collaboration with Japan. In essence, ACCESS served as “a docking station” allowing for self-organization among team members, as well as networking with other international activities. Some of these activities would not have been developed without ACCESS.

The feedback from NRF, DST and Department of Environmental Affairs (DEA) indicated that ACCESS needs to do more in facilitating collaborative relationship with other entities/programmes, as it does with universities. ACCESS networks should strive to avoid isolating themselves. Some participants in the review stated that “engagement of internationally renowned leaders in ACCESS enables it to attract international experts, although others believe that this has not been fully utilized in the past.” Some interviewees stated that “ACCESS is not visible due to being a part of CSIR which is operated more as a business entity, and as a result the collaborative positioning of CSIR is not as user friendly.” Some feel that, for example, the equipment acquired by ACCESS becomes more of CSIR equipment than university equipment with limited opportunities for sharing and synergy. This aspect of ACCESS networking also needs more coherence, which in turn will help with its greater visibility within/among different organizations nationwide.

There appears to be some overlap and lack of coordination/collaboration among those South African institutions that have been established to address or contribute to the GCGC, such as Southern African Science Service Centre for Climate Change and Adaptive Land Use (SASSCAL), AEON, etc. In particular, there does not seem to be central, organic relations between ACCESS and the South African Environmental

Observation Network (SAEON), the South African National Space Agency (SANSA) and other relevant institutions. Multiple interviewees stated that “it is easier to establish collaborations with external (African or international) partners than to work on a common goal with other national entities.” This is probably and partly due to the competition for limited and precious resources available in South Africa, but it also implies that the existing funding mechanisms do not facilitate or promote such collaborations on issues at the core of such a Grand Challenge as Global Change. While external collaborations can be very fruitful (know-how and technology transfer, training and capacity development, contributions in kind, etc.), they also bring their own challenges, including constraints or restrictions imposed by the other party on what is to be achieved and how.

Recommendation 4: Develop a focused strategy for networking, scientific collaboration, and science integration that is informed by ACCESS research and education priorities.

ACCESS Information Brokering and Service Rendering

The Review Panel sought to understand the ACCESS approach to information brokering and service rendering, as a part of its mandate, in particular with respect to mechanisms, methodologies, policies that helped or hindered ACCESS efforts.

The Panel discovered that the progress on Information Brokering and Service Rendering aspects of ACCESS has been very limited up until now. These are truly unique and innovative aspects of national and international initiatives such as GCGC, Future Earth, the Global Framework for Climate Services, etc. Information Brokering and Service Rendering are inherently related, therefore they can be combined together and developed/managed as one.

In developing a plan and a strategy for Information and Services, ACCESS should consider joining forces with current and emerging efforts such as SASSCAL, which has a major focus on services and products. There is opportunity, and a complementary role for ACCESS, to have a major positive impact by making its research accessible through such partnerships. SASSCAL and ACCESS should attempt to complement each other and not try to stand alone: they can team up to pursue the German sponsored activities, and to develop such plans/partnership with other countries too.

The Panel took note of the expectations of the stakeholders (DST and NRF) regarding the delivery of products and services, including information brokerage and other operational outcomes that would be highly significant and quite valuable to the various sectors of society. These could even translate into additional future resources and support. However, it may be unrealistic to expect academics and

students to pursue ideas to that extent. This type of deliverable, and the alternative funding source it may offer, may be more feasible in institutions such as CSIR than in a university-based CoE. There is also a risk in seeing the primary purpose of the programme drift from addressing GCGC towards increasing income.

Recommendation 5: Develop a science-based information development and delivery plan, as a part and parcel of an ACCESS research strategy, focused primarily on South African needs.

ACCESS Funding

The Review Panel understands that ACCESS is being treated like other CoEs and will have a limited lifetime. This has significant implications for expectations of funding, resource mobilization, diversification of ACCESS funding portfolio, and longevity of this CoE. The ACCESS team needs to develop a vision for evolving in order to make a case for continued funding for the remaining of its CoE funding cycle, and to identify a variety of funding sources to carry out its mandate even beyond this period. For this purpose, ACCESS needs to develop a resource mobilization strategy that benefits from the ACCESS long-term science and education strategy and its relevance and benefits to South Africa, the African continent, and the globe. The Panel did not receive any plans or information along those lines. It is apparent that there is a completely different understanding between sponsors and the ACCESS team with respect to the duration of funding for ACCESS as a CoE.

There is some understanding that a CoE should utilize the investment by DST and NRF to leverage funding from alternative sources, also with a view of longer term sustainability of the CoE. The Panel noted that in some cases ACCESS funds may have been leveraged by affiliate projects to pursue their research agendas instead of ACCESS priorities.

Effectively addressing a central issue such as the GCGC requires significantly larger resources than those that have been dedicated to it so far. This may apply to other National Grand Challenges too. ACCESS is only one of a number of activities intended to contribute to the GCGC. Some of the key institutions or support entities that were envisioned in the initial landscape designed to meet the GCGC have never been realized. Yet, there is some overlap between various existing organizations, all funded directly by DST or NRF, with somewhat similar goals and deliverables, thereby creating some redundancy, especially in the absence of a focused strategy to foster greater collaboration and coordination.

For example, DST and NRF intended to support ACCESS as a CoE for an initial period of 5 years, renewable at least once, with the expectation that this CoE would become largely self-sustained after this initial period. However, it appears that this intention

was not clear (or had not been clearly communicated) to at least some of the interviewees. The Panel heard systematic concerns and complaints about uncertainties concerning the funding amount and duration, as well as about the timing of the disbursement of the funds. These issues, in turn, have had several significant adverse impacts on the performance of ACCESS, such as e.g.:

1) low levels of funding (possibly resulting from spreading the available resources much too thinly over way too many projects, a lack of leadership issue), as well as uncertainties concerning even near-future support (e.g., over the following few years), led the various Teams to adopt highly conservative approaches, spending most funds on student bursaries, which are the safest, clearly uncontroversial and most immediately useful item that fits in the CoE mission. As a result, ACCESS has been essentially perceived as bursary programme;

2) by the same token, few or no resources have been dedicated to addressing challenging trans-disciplinary research questions, which were intended to lie at the core of the CoE; and

3) the lack of synchronization between the release of funds and the academic calendar has caused considerable stress and unnecessary damage to the programme, especially because many students rely exclusively on bursaries to pursue their studies.

The Review Panel heard of several cases where students' training programmes were disrupted because of the bare necessity of working to survive, which does not bode well for a positive reputation about ACCESS as a reliable source of support. This is counterproductive and detrimental to any research and education programme, it also hampers progress towards the urgent necessity of transforming the scientific landscape in South Africa by attracting active participation of students and early career scholars.

A variety of reasons were offered by those interviewed on financial challenges that ACCESS has experienced during its inception phase. These are truly valuable experiences gained by the ACCESS Team that can benefit its future implementation, and other comparable National centres/programmes. For example, it was stated that the funding from external sources also brings a separate set of constraints and expectations from the sponsors with respect to goals, processes and procedures, achievements and deliverables, priorities and schedules, etc., which may or may not align fully with those of ACCESS (or of the hosting institution). Nevertheless, such external contributions can and should be pursued whenever appropriate. Another implication of funding shortage is that new partners, who may have been identified as critical contributors to the success of the entire programme, may not be easily accommodated. The most salient example may be materialized by attempts to include a stronger contribution from social, economic or political sciences.

Several interviewees stressed the financial disadvantage of hosting ACCESS at the CSIR rather than in a University environment: by some accounts, up to 20% of the

available resources may be spent in administrative overhead and value added tax. Other financial impediments to progress towards developing a long-term strategy for ACCESS that were identified by the Theme Leaders include; (1) requirement to produce a decadal plan while actual funding was only effectively available for three years or less; (2) the mismatch between the high expectations from the stakeholders and the actual funding level for the entire Team, which often compared to what would normally be attributed to a single investigator in other circumstances; and 3) the degree to which different Themes were able to seek and obtain funds from other sources than the CoE for their activities varies among them. Team Leaders requested clear and reliable funding plans, stable funding as appropriate and for clearly defined periods, as well as clear communication about expectations concerning alternate sources of financing. Some interviewees also had differing opinions about what can or should be financially supported by ACCESS, from student bursaries to networking, and from 'blue-sky' R&D to service delivery. They also shared the impression or perception (held in the general community) that "ACCESS acted as a select club which gave preferential or privileged access to other sources of funding, or perhaps information about funding." In the end, using existing mechanisms or developing new ones to provide required funding to effectively implement such a complex project may be a high priority task for DST and NRF.

Concerning the leverage of existing sources of funding (from DST/NRF), and diversifying sources of ACCESS income in coming years, the Review Panel suggests developing a spend plan that is aligned with the (newly) stated objectives and (re)defined scope of the programme. Specifically, funds should be reserved for;

- Trans-disciplinary R&D that will ensure that innovative approaches and bold solutions to complex problems are indeed addressed, paying special attention to the integration of human and natural sciences.
- Capacity development should remain an important goal/outcome of the programme, but should be focused on developing skills required to address ACCESS integration and trans-disciplinary science objectives.
- Information brokering, service rendering and other practical applications, including communication and public awareness about climate change, should be focused on how to deal with them, and how to facilitate/support positive impacts.

The Panel suggests that the Board and the leaders of ACCESS should strive to;

- Cap overhead expenses related to the management of the centre/programme,
- Minimize spending on items such as value added tax (e.g., by hosting the programme in a tax-exempt institution), and
- Limit support to purely disciplinary research as much as this may be extremely interesting and relevant, but should be funded from other relevant sources.

The institution hosting/managing ACCESS should not expect and be perceived as receiving preferential treatment through this mechanism.

Recommendation 6: Consider streamlining the funding of ACCESS and its oversight to be consistent with other funding modalities of direct transfer of funds from NRF to universities, in particular:

- ***Funding levels should be commensurate with the scope and objectives of the programme***
- ***Financial interactions with contributors to the programme should***
 - ***clarify the scope and timelines of support***
 - ***affirm the reliability and assure the availability of support***
 - ***ensure the timely availability of resources, synchronized with the academic calendar for universities.***

Acknowledgements

The Review Panel Members convey their sincere thanks to the South African National Research Foundation, Department of Science and Technology, many distinguished scientists, and ACCESS Director and Team Members for their support during the review process. The Panel was assisted by Ms Anke Rädcl, Mr David Manamela of NRF, and many other colleagues without whose invaluable contributions the Panel could not have completed this review. Ms Heather Erasmus and Ms Alison Sussex assisted the Panel with recording of interviews and deliberations. The Panel members are grateful to these individuals and organizations.

Abbreviations

ACCESS	Applied Centre for Climate and Earth Systems Science
AEON	African Earth Observation Network
CoE	Centre of Excellence
CSIR	Council for Scientific and Industrial Research
DEA	Department of Environmental Affairs
DST	Department of Science and Technology
DWA	Department of Water Affairs
ESS	Earth System Science
GCGC	Global Change Grand Challenge
HDI	Historically Disadvantaged Institution
MoA	Memorandum of Agreement
MOOC	Massive Open Online Course
NRE	Natural Resources and Environment, a division within the CSIR
NRF	National Research Foundation
NSF	National Science Foundation
R&D	Research and Development
SAEON	South African Environmental Observation Network
SANAP	South African National Antarctic Programme
SANSA	South African National Space Agency
SASSCAL	Southern African Science Service Centre for Climate Change and Adaptive Land Use

Annex I:

TERMS OF REFERENCE

REVIEW OF THE DST-NRF APPLIED CENTRE FOR CLIMATE AND EARTH SYSTEMS SCIENCE

1. Assignment title

Review of the DST-NRF (Department of Science and Technology/National Research Foundation) Applied Centre for Climate and Earth Systems Science (ACCESS)

2. Background

Centres of Excellence (CoEs) are physical or virtual centres of research which concentrate existing capacity and resources to enable 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 DST/NRF CoE Programme and the individual CoEs are sponsored by DST and the operational management of the Programme is managed by the NRF.

In 2010 ACCESS was added to the cohort of seven CoEs established between 2004 and 2006 as listed below:

- DST-NRF **Applied Centre for Climate and Earth Systems Science** (ACCESS) is organized around the dynamics and interactions of earth systems, land, ocean, and atmosphere and implementing a suite of activities with the aim of understanding various space and time scales of change in earth systems. Acting Director: Dr Neville Sweijd, CSIR, Pretoria/Cape Town.
- DST-NRF CoE for **Biomedical TB Research** to research new tools for the diagnosis, treatment and prevention of tuberculosis (established in September 2004 with nodes at Stellenbosch University and the University of the Witwatersrand, and the University of Cape Town added as a third node in 2011). Director: Prof Paul van Helden, Stellenbosch University.
- DST-NRF CoE in **Birds as Keys to Biodiversity Conservation** to focus on understanding and maintaining biodiversity using birds as indicators (established in September 2004). Acting Director: Prof Peter Ryan, University of Cape Town.
- DST-NRF CoE for **Invasion Biology** to address the biodiversity consequences of biological invasions (established in August 2004) Director: Prof Dave Richardson, Stellenbosch University.
- DST-NRF CoE in **Tree Health Biotechnology** to concentrate on understanding and combating diseases affecting South Africa's indigenous trees (established in September 2004). Director: Prof Mike Wingfield, University of Pretoria.

- DST-NRF CoE in **Catalysis** to drive innovation in catalysis, a key process in the chemical and manufacturing sector (established in September 2004).
Director: Prof Michael Claeys, University of Cape Town.
- DST-NRF CoE in **Strong Materials** to seek to understand and improve the properties of advanced strong materials to increase their efficiency and reduce their cost (established in September 2004).
Director: Prof Lesley Cornish, University of the Witwatersrand.
- DST-NRF CoE in **Epidemiological Modelling and Analysis** to use mathematics to understand, predict and ultimately combat diseases (designated by DST and established in March 2006).
Director: Dr Alex Welte, Stellenbosch University.

In terms of the agreement with the DST, reviews of the performance of the CoEs involving international review panels are to be scheduled at regular intervals. The seven CoEs established earlier, were reviewed individually in 2009, as a requirement for continued funding. As ACCESS enters its fifth year of funding it is due to be reviewed along the same lines as the other CoEs.

The origin of the ACCESS CoE is somewhat anomalous from the standard means by which the other CoEs were established in that ACCESS, as a CoE was created as a sub-programme of the Global Change Grand Challenge (GCGC). Thus, no application was made to establish ACCESS as a CoE. Rather, it was conferred this status by the DST in order to provide a platform for the execution of its function within the GCGC. As such, ACCESS was mandated to deliver outputs and outcomes for the GCGC based on a Global Change Research Plan that was developed in 2009. Therefore ACCESS has had a broadly defined mandate in terms of the goals of the GCGC and the context of the programme as a whole, with a set of scientific and education and training aims in the earth systems science domain. To this end, ACCESS structure and partnerships were developed after the establishment of the CoE, and not as a proposal to create a CoE.

3. Assignment Principal and Review Reference Group

The Assignment Principal is the NRF represented by the Deputy CEO: Research and Innovation Support and Advancement (RISA). The Review Reference Group comprises of the Deputy CEO: RISA and five members appointed by the Deputy CEO: RISA.

The role of the Review Reference Group will be to:

- approve the terms of reference;
- recommend the budget;
- approve the members of the international review panel;
- approve the review plan and time frame for the review process;
- consider and suggest suitable interviewees for the review panel;
- meet under the direction of the Chair of the Review Reference Group, as required;
- attend the verbal feedback session of the review panel;
- accept the draft and final reports by the review panel;
- ensure that the review report addresses the ToR;
- accept the response of the management of the CoE to the report.

4. Service provider

The Directorate Reviews and Evaluation (RE) of the NRF will act as the service provider to manage the review process. Its responsibilities will be to:

- develop the terms of reference for the review;
- prepare the letters of invitation for the approved members of the review panel for the Assignment Principal's signature and distribution;
- develop a programme for the review, including a budget;
- coordinate and manage the entire review process, including logistics;
- provide support to the review panel;
- source the necessary documents stipulated in the Appendix with the help of the staff of the NRF CoE Funding Instrument and make them available to the review panel six weeks prior to the commencement of the review in South Africa;
- receive the draft and final report by the review panel and submit them to the Assignment Principal for further action;
- forward the draft and final report by the review panel to the RRG for acceptance;
- solicit the response from the management of the CoE Programme for circulation to the Assignment Principal for acceptance;
- circulate the management response to the RRG members for noting;
- place the final review report on the NRF website within one month of the acceptance of the review report by NRF management.

5. The purpose of the review

The purpose of the review will be to:

- review the alignment of ACCESS with the objectives of the CoE funding instrument;
- assess the performance of ACCESS against the goals of the DST's Global Change Grand Challenge (GCGC);
- assess the performance of ACCESS from inception to 31 December 2013 in terms of the five key performance areas for CoEs;
- review the governance of ACCESS from inception to 31 December 2013 in terms of the requirements for the CoE funding instrument; and
- make recommendations for the future of ACCESS in the context of the DST's GCGC.

6. The scope of the review

The focus of the review will be a retrospective view covering the period since inception of ACCESS. The prospective view will cover the future goals to which ACCESS should strive.

7. Review dimensions

The panel is requested to assess the overall performance of ACCESS in terms of its mandate clustered around the key performance areas (KPA's) given below:

- 7.1 Research
The work should be focused on the creation and development of new knowledge and/or technology.
- 7.2 Education and training
Human resource development is to be done through masters and doctoral programmes, post-doctoral support, internship programmes, support for students to study abroad, joint ventures in student training, etc. In creating, broadening and deepening research capacity, a CoE needs to pay particular attention to racial and gender disparities.
- 7.3 Information brokerage
CoEs are to provide access to a highly developed pool of knowledge, maintaining data bases, promoting knowledge sharing and knowledge transfer, etc.
- 7.4 Networking
A CoE is expected to actively collaborate with reputable individuals, groups and institutions. Equally it must negotiate and help realise national, regional, continental and international partnerships, etc.
- 7.5 Service rendering
A CoE is to provide information, analysis, policy, and other services, including informed and reliable advice to government, business and civil society.
- 7.6 Management of CoE in terms of:
- leadership;
 - staffing;
 - commitment of institution hosting the CoE;
 - location of the CoE;
 - funding;
 - strategic positioning of the CoE and future plans;
 - consideration of its role in the GCGC.
- 7.7 Any other possible key performance indicators aligned with the GCGC.

8. The review structure and process

- 8.1 A panel consisting of at least three members will be appointed for the review of ACCESS. Ideally, one member should be a scientific expert from abroad in the particular field of the CoE and one member with appropriate experience and skills should be from South Africa. The panel will be requested to compile a report.
- 8.2 The resource documents for the review listed in the Annexure will be made available to the panel well in advance of the commencement of the review.
- 8.3 The service provider will draw up a programme for the review in consultation with the Assignment Principal and the management of the DST-NRF CoE Funding Instrument. The panel will have the opportunity to interrogate the proposed programme and to recommend amendments and additions should the need arise.

- 8.4 The panel will have the opportunity to interview members/staff of ACCESS (including their beneficiaries and students) and staff of the DST-NRF CoE Funding Instrument as well as other relevant stakeholders.
- 8.5 The review panel will decide on and pursue its own line of questioning during interviews.

9. Deliverables by

9.1 Director of CoE

- 9.1.1 Self-evaluation report compiled by ACCESS for transmission to the review panel at least seven weeks prior to the commencement of the review programme in South Africa. The report should address the terms of reference including the KPAs (see Item 7 above) and should cover the period since inception of ACCESS up till 31 December 2013. It should not exceed 40 pages with annexures.
- 9.1.2 List of stakeholders
Appointments/discussions with stakeholders will be arranged by the NRF Reviews and Evaluation Directorate in conjunction with ACCESS to facilitate the task of the review panel. ACCESS will therefore be requested to supply the names of stakeholders with whom the CoE is currently interacting, will be interacting in the future and should be interacting but for some reason has not been able to do so yet. It would be helpful, if the names could be clustered under the headings research, education and training, information brokerage, networking, service rendering and management (cf Item 7 of the ToR) and if the stakeholders are ranked as requested on the template to be provided to ACCESS.
- 9.1.3 Concise information on the funds received by the CoE from national (including all sources in the NRF) and international sources per year for the period under review.
- 9.1.4 List of documents considered to be essential reading for the review panel and other documentation which should be accessible to reviewers during the review.
- 9.1.5 Names, affiliations and contact details of possible reviewers for consideration.
- 9.1.6 Written response to the final review report. This will also be placed on the NRF website.

9.2 DST-NRF CoE Management

Documents listed on the Annexure to the terms of reference for the review which are not in the public domain are to be supplied to the Service Provider for onward transmission to the review panel four weeks in advance of the commencement of the programme in South Africa.

9.3 Review panel

- 9.3.1 Verbal feedback to Director of ACCESS as well as representatives of the host institution, DST, NRF and members of the RRG;
- 9.3.2 Draft report on completion of the stakeholder interviews;
- 9.3.3 Final report within two weeks of completion of the stakeholder interviews. The report should include:
 - an executive summary;
 - background to the review;
 - evaluation questions that were addressed;
 - key findings;

- recommendations;
- conclusions;
- appendices containing, e.g. terms of reference, persons interviewed.

10. Time frame

The review will take place during 2014 depending on the availability of suitable reviewers.

11. Budget

The service provider will submit a budget for the review to the management of the DST-NRF CoE Programme Executive for approval and payment.

Annexure

DOCUMENTS FOR THE REVIEW PANELS

ESSENTIAL READING

General

- Self-evaluation report by ACCESS
- Memorandum of agreement entered into between the Department of Science and Technology and the National Research Foundation, October 2009
- Guide to funding of Centres of Excellence, February 2004
- Handbook to assist with the operation of a DST-NRF Centre of Excellence, February 2012
- Framework for the Establishment of DST-NRF Centres of Excellence Managed by the Knowledge Fields Development (KFD), Version 2.0, 2012
- Strategic Plan of the NRF – NRF Vision 2015
- National Development Plan Vision for 2030 (Executive summary and relevant essential chapters covering areas such as earth systems science, climate change, etc.)
- Ten-year Innovation Plan of the Department of Science and Technology
- Report on 2013 review of DST-NRF Centre of Excellence Programme
- Management response to the 2013 review of DST-NRF Centre of Excellence Programme
- ACCESS Implementation Prospectus 2011
- Global Change Research Plan for South Africa, 2010

ADDITIONAL READING

General

- ACCESS Research Highlights 2013 (will give good idea of research products)
- ACCESS Research Highlights 2014 (will give good idea of research products)
- ACCESS Students Research Compendium 2012/13 (will give good idea of research products)
- ACCESS Students Research Compendium 2013/14 (will give good idea of research products)

- ACCESS draft Annual Report 2013/14 (provides clear idea of sense of scope and scale)
- African Centre for Climate and Earth Systems Studies Project Document 55
- Department of Science and Technology Ministerial Review Report, March 2012 (only partly accepted to date)
- National Strategy for Sustainable Development and Action Plan, 2011 – 2014, Dept of Environment Affairs
- Report of the Advisory Panel of the Academy of Science of South Africa on the Research and Impact of the DST-NRF Centres of Excellence, 2013
- National Climate Change Response White Paper, 2011
- South African Risk and Vulnerability Atlas, Dept of Science and Technology
- Human Capital and the South African Knowledgebase
- Annual report of the DST-NRF Centres of Excellence, 2011/2012
- Annual report of the DST-NRF Centres of Excellence, 2012/2013
- Review Framework for the Centre of Excellence Programme, April 2013
- Report on the 2009 review of the DST-NRF Centre of Excellence Programme
- Management response to the 2009 review of the DST-NRF Centre of Excellence Programme
- Handbook to assist with the operation of a Centre of Excellence, April 2004

Annex II:

STAKEHOLDERS INTERVIEWED

Representatives of Department of Science and Technology

Dr Thomas Auf der Heyde, Deputy Director-General: Research Development and Support
Mr Leluma Matooane, Director: Earth System Science & ACCESS Director
Mr Imraan Patel, Deputy Director-General: Socio-Economic Innovation Partnerships
Prof Yonah Seleti, Chief Director: Science Missions

Representatives of Department of Environmental Affairs

Mr Jimmy Khanyile, Scientific Manager: Ocean Processes, Branch Oceans & Coasts

Representatives of Academy of Science of South Africa

Prof Roseanne Diab, Executive Officer (by teleconference)

ACCESS Board

Prof George Philander, previous Director: ACCESS, now resides in USA
Dr Hassan Virji, ACCESS Board member, Executive Director: System for Analysis, Research and Training, USA (by teleconference)

ACCESS Management

Prof May Hermanus, Director
Dr Carl Palmer, Education and Training Manager
Dr Neville Sweijd, Acting Director & Operations Manager

ACCESS Theme Leaders

Dr Emma Archer, Theme Leader, CSIR
Dr Luthando Dziba, Theme Leader, CSIR
Prof Dominic Mazvimavi, Theme leader, University of the Western Cape
Prof Guy Midgley, Theme leader, South African Biodiversity Institute, Stellenbosch University
Dr Pedro Monteiro, Theme leader, CSIR
Dr Angus Paterson, Theme leader, South African Institute for Aquatic Biodiversity (by teleconference)
Prof Mathieu Rouault, Theme leader, UCT

ACCESS collaborators

Prof Farhad Aghdasi, Steering Committee, University of Fort Hare
Prof Kingsley Ayisi, Steering Committee, University of Limpopo
Mr Andisiwe Bango, Collaborator, Walter Sisulu University
Prof Barend Erasmus, Collaborator, University of the Witwatersrand
Dr Edith Madela-Mtla, Collaborator, Director: International Council for Scientific Unions
Regional Office for Africa
Prof Angela Matthee, Collaborator, Medical Research Council
Prof Rob O'Donoghue, Education Committee, Rhodes University (by teleconference)
Prof Hannes Rautenbach, Collaborator, University of Pretoria

Stakeholders added to the programme by the review panel

Dr Stewart Bernard, Earth Systems Earth Observation, CSIR-NRE, Cape Town
Prof Maarten de Wit, Earth Stewardship Science and AEON, Nelson Mandela Metropolitan University (by teleconference)
Prof Bruce Hewitson, Dept of Environmental and Geographical Science, University of Cape Town
Prof Coleen Vogel, Dept. of Geography, Geoinformatics and Meteorology, University of Pretoria (by teleconference)
Dr Bob Scholes, CSIR Fellow and Research Group Leader: Ecosystem Processes and Dynamics, CSIR, Pretoria

Prof Mary Scholes, School of Animal, Plant and Environmental Sciences, University of the Witwatersrand, Johannesburg

Postgraduate students

Mr Hector Chikoore, student/collaborator, ex University of Zululand, now employed by University of Venda

Ms Cherie Forbes, MSc student, UCT

Mr Luke Gregor, PhD student, UCT

Ms Adela Itzkin, MSc student, UW

Mr Precious Mongwe, MSc student, UCT

Mr Kabir Peerbhay, PhD student, University of KwaZulu-Natal

NRF staff involved in management of ACCESS

Mr Jonathan Diederiks, Director: Knowledge Fields Development/South African Science Service Centre for Climate Change and Adaptive Land Management (SASSCAL)

Dr Andrew Kaniki, Executive Director: Knowledge Fields Development, previously responsible for ACCESS

Dr Bernard Nthambeleni, Executive Director: Grants Management Systems Administration

Dr Nthabiseng Taole, Director: Research Chairs and Centres of Excellence

Welcome and briefing of reviewers by Assignment Principal

Dr Gansen Pillay, NRF Deputy CEO: Research and Innovation Support and Advancement

Also present:

Mr David Manamela, NRF Professional Officer: Reviews & Evaluation (R&E)

Mr Lebusa Monyooe, NRF Acting Executive Director: R&E and Director: Grant Management Systems Administration

Ms Joyce Olivier, NRF Director: R&E

Ms Anke Rädcl, NRF Professional Officer: R&E