

CIRCLE Programme Report Series

Organisational Strategies and Structures for Climate Change Research in Sub-Saharan Africa



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Executive Summary

This report draws on the experience of African research institutions involved in the CIRCLE (Climate Impacts, Research Capacity and Leadership Enhancement in Sub-Saharan Africa) Programme, to highlight areas of good practice and potential pitfalls in developing strategic frameworks for climate change research. It is based on responses to a questionnaire survey by research leaders within 14 CIRCLE institutions, as well as broader discussions held at CIRCLE workshops in 2015 and 2016.

For seven of the 14 responding institutions, climate change is either specifically mentioned in the highest-level university strategy or respondents felt it had been given a similar level of importance by high-level institutional arrangements. In six of the institutions, climate change research is mainly organised through an interdisciplinary climate change centre or institute. While advantages and disadvantages were expressed for both interdisciplinary centres and a more traditional departmental set-up, in general researchers in institutions with centres were more positive about the arrangement. Such centres are perceived as allowing cross-fertilisation of ideas, enabling interdisciplinarity and external partnerships, and attracting donor funding. Recent experience of CIRCLE institutions shows that establishment of climate change research centres is feasible and can be productive within a relatively short time-frame.

External linkages to other research institutions both within country, within sub-regions, within Africa and globally, were widely, though not universally reported. Such links are seen as bringing many and various benefits in terms of exchange of knowledge and ideas, capacity-building and access to funding. Respondents in our survey from institutions with few or no such linkages were vocal in reporting the disadvantages of an absence of this cooperation. This report supports the strong trend for international donors to encourage research linkages. At the same time, those promoting such linkages need to be aware of possible disadvantages; high transaction costs and possible proliferation of bureaucracy, fostering of dependence on external funding, and inequity between northern and African institutions in setting research agendas.

Interdisciplinarity, a key element of climate change research, is widely practiced and promoted by CIRCLE participating institutions. A range of organisational factors encourage it: research culture, formal university-wide policies, interdisciplinary centres, cross-departmental programmes and networks. These need to be backed up by sound administration and appropriate guidelines for promotion (see below). A range of factors can discourage interdisciplinarity, of which lack of a clear policy, lack of funding, and lack of management support are the most important.

Engagement with communities, another key element of climate change research, is also widely practised through different approaches and methods. A range of organisational factors encourage it including policies at university level, and specific programmes or standing arrangements. Factors that may discourage engagement with communities include lack of resources (including transport), the time-intensive nature of good engagement, and lack of incentives for staff.

Engagement with decision-makers is also widely practiced by CIRCLE participating institutions. Again, this is undertaken using a range of methods and in a range of contexts. Universities support such engagement mainly in generic rather than specific ways, although there are examples of more specific mechanisms. Factors that discourage engagement with communities include limited resources, lack of clear institutional incentives, and over-emphasis on publications.

Promotion procedures had emerged in CIRCLE workshops as major possible disincentives particularly to interdisciplinarity, but also to engagement with communities and decision-makers. Questionnaire responses were hard to interpret, but suggest that CIRCLE participating institutions, and by implication African universities more generally, are so far making only weak and partial attempts to recognise some of the key components of climate change research in their promotion procedures.

There is a mixed picture on access to climate data, computing resources and other equipment required for climate change research. Of the three, access to climate data was most problematic. In several countries the availability of data from national meteorological services to universities and research institutions seemed to be restrictive or a source of tension. National governments and funders of climate change research should investigate these aspects of cross-institutional data access in formulating policies and programmes.

The issue of lack of resources, primarily financial but also infrastructural (transport facilities and research equipment) and human (trained and committed researchers) is evident throughout our study. Much needs to be done to reverse historic inequities in research funding and allow African institutions to work in climate change research to their full potential. Such support can go hand in hand with measures to foster research collaboration and networking between institutions (sub-national, national, inter-African, South-South and South-North) and to address the specific needs to promote climate change research that is interdisciplinary and engaged with both communities and decision-makers.

Given the limitations of our study and the diversity of African research institutions, recommendations can only be tentative and subject to adaptation to local contexts, but recommendations are set out for African climate change research leaders, senior university managers, development donors and research funders, and national governments.

1. Introduction, Rationale, Methodology and Structure

In the context of climate change, the defining problem of our age, Africa, in the words of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) “is one of the most vulnerable continents due to its high exposure and low adaptive capacity” (Niang et al. 2014: 1205). The report makes clear that the impacts of climate change in different sectors, “combined with other external changes (environmental, social, political, technological) may overwhelm the ability of people to cope and adapt, especially if the root causes of poverty and vulnerability are not addressed” (Niang et al. 2014: 1204). There are current impacts, and in future there will be substantial impacts on African *ecosystems*, and climate change will amplify existing stress on *water resources*. Climate change will interact with other stressors to increase the vulnerability of Africa’s *agricultural systems*, and progress on managing risks to food production from current climate variability will not be sufficient to address long-term impacts of climate change, with impacts on food security. Climate change will act as a multiplier of existing *health* vulnerabilities and lead to increased negative health outcomes. Governments have not yet evolved institutional frameworks to coordinate adaptation. In the face of these impacts “a wide range of data and research gaps constrain decision making in processes to reduce vulnerability, build resilience, and plan and implement adaptation strategies at different levels in Africa” (Niang et al. 2014: 1204). Additionally, while Africa bears a negligible responsibility for the greenhouse gas emissions that cause climate change, it does present important opportunities for mitigation, in forestry, and promotion of biofuels and other forms of renewable energy, some of which will have important co-benefits for adaptation and sustainable development.

However, Africa is severely under-represented in international research on climate change. Scientists affiliated with institutions in Africa were responsible for less than 2.5% of total world scientific journal articles on climate change 2001-2010, and Africa only accounted for 8% of journal articles on climate change with a specific country focus (Burkett et al. 2014). There is therefore a strong need to build the capacity of African researchers, and African research institutions, to design, carry out, disseminate and promote uptake of research on climate change, its impacts, and the opportunities for adaptation and mitigation. In this context, the Climate Impacts Research Capacity and Leadership Enhancement in Sub-Saharan Africa (CIRCLE) programme is an initiative of the UK’s Department for International Development (DFID) to develop the skills and research output of early career African researchers in the field of climate change and its local impacts on development.

Box 1 - CIRCLE and its Activities

CIRCLE will run from 2014 to 2019 and is managed by the Association of Commonwealth Universities in collaboration with the African Academy of Sciences, with 31 participating research institutions in Africa, mainly but not exclusively universities. Its main activity has been the Visiting Fellowship programme (2015-17) under which almost 100 African early-career researchers (ECRs) were funded to spend a year in another African institution carrying out research on an agreed topic within the broad field of climate change. Each Visiting Fellow was assigned a supervisor in the host institution and a mentor in his/her home institution. CIRCLE has also included an Institutional Strengthening Programme to enhance professional development support for early career academic staff, and develop stronger institutional frameworks for supporting research, both in general and with reference to climate change. This component has been implemented by Vitae. The key contact people for it in each institution are referred to (in most cases) as the Institutional Champions.

CIRCLE’s Quality Support Component (QSC), led by the Natural Resources Institute of the University of Greenwich in collaboration with University College London and the London School of Hygiene and Tropical Medicine, provided international specialist advisors as additional support to the Visiting Fellows, and has also been commissioned to produce a) a final report on the scientific achievements of CIRCLE, to appear in early 2019, and b) the present report.

As part of CIRCLE’s overall design, this report is intended to highlight areas of good practice and potential pitfalls in developing strategic frameworks for climate change research within African institutions. It does so by drawing on the experience of the CIRCLE home and host institutions, as expressed in:

- Dedicated sessions at two workshops¹ for the CIRCLE Institutional Champions, in December 2015 and December 2016, held at the African Academy of Sciences headquarters in Nairobi. These sessions were each facilitated by the QSC leader and involved mini-presentations from several CIRCLE partners. Prior to each of these workshops, some relevant questions were included in a more general questionnaire circulated to participants by CIRCLE management.
- A further questionnaire – of an extremely open-ended nature – that was in late 2017 circulated primarily to Institutional Champions but was also made available to all researchers from the home and host institutions who had served as mentors

¹ The QSC Leader was unable to attend the third workshop, in December 2017, owing to unforeseen transport problems.

and/or supervisors for the three cohorts of CIRCLE Visiting Fellows (CVFs). This questionnaire, included as Annex 1, also allowed respondents to attach documents or links to relevant experiences, a few of which are summarised here as boxes.

Twelve completed questionnaires were received from Institutional Champions or others who had responsibility for CIRCLE within their institutions. An additional seven questionnaires were received from individual mentors or supervisors, of which two were from institutions where there had not been an institutional response (for convenience, these additional two are considered institutional responses in the analysis below). The questionnaire element of the report thus covers 14 institutions (see Box 2), although the experience of others has been incorporated via comments made in the Champions' Workshops. All 19 respondents themselves had personal involvement in researching and/or teaching aspects of climate change.

Box 2 - Institutions Responding to Questionnaire

- Ebonyi State University (EBSU), Nigeria
- Ethiopian Institute for Agricultural Research (EIAR), Ethiopia
- Kwame Nkrumah University of Science and Technology (KNUST), Ghana
- Ladoke Akintola University of Technology (LAUTECH), Nigeria
- Lilongwe University of Agriculture and Natural Resources (LUANAR), Malawi
- Michael Okpara University of Agriculture (MOU), Nigeria
- Muhimbili University of Health and Allied Sciences (MUHAS), Tanzania
- Obafemi Awolowo University (OAU), Nigeria
- University of Cape Town (UCT), South Africa
- University for Development Studies (UDS), Ghana
- University of Energy and Natural Resources (UENR), Ghana
- University of Fort Hare (UFH), South Africa
- University of Nairobi (UoN), Kenya
- Wollo University (WU), Ethiopia

This report discusses successively the internal organisation of climate change research in the CIRCLE Institutions, their external research linkages, and three imperatives for high quality and impactful climate change research that were identified early by the QSC team: interdisciplinarity, engagement with communities, and engagement with decision-makers.² It then goes on to consider promotion and recognition procedures that were spontaneously identified by the Institutional Champions in the workshops as an important issue (because in some cases they militate against interdisciplinarity, engagement with communities, and engagement with decision-makers), and practical and infrastructural issues such as access to data and computing power. The report ends with a discussion of the findings and recommendations.

This report is focussed on organisational strategies specifically for climate change research and is thus distinct from (but hopefully complementary to) outputs arising from CIRCLE's Institutional Strengthening Programme which has worked to strengthen general research capacity of the home and host institutions.

² Definitions of these three factors have deliberately been kept broad – further definitional issues are discussed in each relevant section.

2. Organisational Structures for Climate Change Research among CIRCLE Institutions

2.1 Recognition of Climate Change at University Level

For seven of the 14 responding institutions, either climate change is specifically mentioned in the highest-level institutional research strategy, or respondents felt it had been given a similar level of importance by high-level institutional arrangements. Some of the examples given were:

- Understanding climate change, mitigating the impacts of climate change, and helping the people of the state and the broader nation adapt to climate change
- Mentions of climate change in connection with a) agriculture and b) urban and regional planning
- “There are university structures dealing with the climate change problem, e.g. the desert centre, the centre for sustainability and resilience. In the university’s research strategy, concepts of climate change and climate change impacts on natural resources, sustainability and resilience, agriculture and food security, desertification etc. are important”
- Climate change adaptation strategies, and renewable energy
- “The vision, mission and strategic objectives approved by the University Senate require the institute to mount innovative climate change research and training. Conservation of the environment is a national constitutional objective of the university.”
- The use of strategies to combat climate change at smallholder level, training on climate change impact and adaptation for partners, establishing a climate change research institute.
- “We have organised climate research at programme/directorate level, with a climate and Geospatial Research Directorate. We also have a strategic document drawn up for the years 2016-2030”.

The most detailed account of the incorporation of climate change in university-level objectives comes from UCT (see Box 3).

Box 3 - Climate Change Research within the University of Cape Town Research Strategy, and the Establishment of ACDI

“Climate change research is not explicitly mentioned in UCT’s Research Strategy or UCT’s Strategic Planning Framework (2016 – 2020). These documents are very broad and general in scope. Institutional recognition of the strategic importance of climate change research is demonstrated at UCT through the establishment of the African Climate and Development Initiative (ACDI). ACDI is one of four Strategic Initiatives (SIs) announced by the Vice-Chancellor in 2010. The purpose of the SIs was to address critical South African societal and environmental issues, by working as a cross-university integrative research and socially-engaged endeavour and drawing on multiple disciplines. In addition to being a Strategic Initiative, in 2013 ACDI was awarded Signature Theme status by the University Research Committee (URC). Signature Themes have similar objectives to the SIs but are not necessarily cross-university in scale. They are designed to drive research in a strategic manner and are grounded in existing areas of internationally-recognised excellence at UCT, whilst being aligned to institutional, regional and national priorities.” (UCT questionnaire response)

ACDI has adopted a ‘hub-and-spoke’ model with a small co-ordination and administrative team and 19 core researchers at the hub, and 38 research and teaching associates in other departments actively engaged in ACDI projects or in ACDI’s taught Masters programmes and a further 36 research affiliates whose work intersects with climate and development, but who are not currently working on ACDI-led projects. These associates and affiliates are drawn from at least 17 departments, institutes and centres in the university (ACDI 2016).

The ACDI Self-Review Report (2016), which shows a strong awareness of the difficulties in identifying the added value of ACDI beyond UCT’s ongoing climate change activities, nevertheless attributes to it, over its first five years, 30 research projects, a research income in the order of US\$5 million, 143 peer-reviewed publications, a wide range of other communication outputs and networking activities, and recruitment of over 70 research students. The Self-Review also identifies, with hindsight, missed opportunities in research - for research syntheses, exploratory and proof-of concept research, critical reflection of development under climate change, and documentation of benefits of interdisciplinarity and engaged research. Missed opportunities in networking and influence include targeting of key policy processes, briefing notes and briefing sessions on “hot topics”, and monitoring and evaluation.

2.2 Centre and Departmental Models for Climate Change Research

The 14 institutions reported that their climate change research is mainly organised under the models set out in Table 1.

Even the more established centres, by the very nature of the growing interest in climate change research, are of relatively recent foundation – UCT’s African Climate and Development Initiative (see Box 3) was founded in 2011.

Table 1 - Modes of Organisation for Climate Change research

MODE OF ORGANISATION	NO. REPORTING
WITHIN MORE THAN ONE ACADEMIC DEPARTMENT, BUT WITH LIMITED COLLABORATION BETWEEN DEPARTMENTS	5
WITHIN MORE THAN ONE ACADEMIC DEPARTMENT, BUT WITH SIGNIFICANT INTER-DEPARTMENTAL COLLABORATION ³	3
THROUGH AN INTER-DISCIPLINARY CLIMATE CHANGE CENTRE OR INSTITUTE	6

The more established centres, with their major research priorities or themes, are listed in Table 2.

Table 2 - Some Established Interdisciplinary Centres within CIRCLE Institutions

CENTRE AND INSTITUTION	DETAILS
AFRICAN CLIMATE AND DEVELOPMENT INITIATIVE, UCT	Climate resilient development: <ul style="list-style-type: none"> ○ Resilient cities ○ African climate risk ○ Ecosystem services and livelihoods ○ Adaptation planning, monitoring, evaluation and learning ○ Climate change and health ○ Water and food security in a changing climate Low carbon development <ul style="list-style-type: none"> ○ Climate change and energy poverty ○ Implementation of Nationally Determined Contributions
RISK AND VULNERABILITY SCIENCE CENTRE, UFH⁴	The Centre has identified four challenges for climate change research <ul style="list-style-type: none"> ○ Understanding a Changing Planet ○ Reducing the Human Footprint ○ Adapting the Way We Live ○ Innovation for Sustainability (with 4-5 themes per challenge)
INSTITUTE FOR CLIMATE CHANGE AND ADAPTATION, UON	<ul style="list-style-type: none"> ○ Climate risk management and food security ○ Human dimensions and health ○ Policy and communication ○ Technologies ○ Water Environment and Ecosystems

Some of the interdisciplinary centres or institutes identified by CIRCLE Institutional Champions are in a very early stage of development, and their steering role in climate change research may be more projected than current. Such centres recently established or in the process of establishment included the Centre for Climate Change and Gender Studies at UENR, approved by the University Council in June 2016, and the Kazuhiko Takeuchi Centre for Sustainability & Resilience at UDS. Additionally, Ebonyi State University has a central committee coordinating climate change research, although it does not exist as a Centre.

Of the interdisciplinary centres, only ACIDI at UCT employs significant numbers of staff in its own right – the other centres employ few or no academic staff or use dual affiliation with existing academic departments.

Some of the institutions with Centres expressed views about the overall effectiveness of their research arrangements ranging from very positive to guardedly positive. UCT’s ACIDI organised a critical but positive self-review on its first five years (ACIDI 2016). UoN reported:

³ One of these institutions reported that an interdisciplinary institute was in the process of establishment

⁴ UFH also hosts the Fort Hare Institute of Technology, which has a mandate for climate change research

“Research in the institute (Institute for Climate Change and Adaptation) emphasises transdisciplinary approaches to solving problems. Not all research problems can be solved using this approach, but as far as possible multidisciplinary considerations are given priority. We find our students develop a broadminded approach to meeting their research objectives. The publications coming from our institute are finding acceptance in high quality journals”.

Others, including institutions where Centres are in the process of establishment, were more guarded:

- “Recruiting students across disciplines”
- “The centre is very young and draws staff from other departments to write proposals and implement climate change and gender activity. This current arrangement enables the university to make optimum use of available resources”
- “Quite effective”
- “Even though various disciplines in the university are engaged in climate change research, the various research efforts are uncoordinated. Therefore, the arrangements are not very effective in ensuring a consolidated effort in climate change research”.

Institutions where research is organised around a Centre gave views on both the advantages and disadvantages of such a set-up. These responses did not rigidly distinguish between the (dis)advantages of Centres and other important aspects of research in the institutions, such as linkages to research funders and external research partners (which themselves seem to be enhanced by a Centre arrangement). Advantages included:

- Centralising and sharing institutional knowledge that is otherwise fragmented and scattered across different departments/ individual academics; sharing ideas
- Getting expert knowledge from diverse sources
- Researchers being less restrained in their choice of research themes and topics
- Enabling new interdisciplinary partnerships and hence innovative research and teaching
- Ameliorating institutional challenges by acting as a central contact point for queries about opportunities, collaborations, scholarships etc.
- Enabling fund-raising for internal and external collaborations, ensuring completion and continuity of research
- Optimum use of human resources, and saving of costs
- Promoting a transdisciplinary approach, hence promoting coproduction of authentic knowledge to solve societal problems
- Satisfied clients.

Disadvantages reported by institutions operating a Centre included the following (although some issues could be interpreted as disadvantages of Centres not yet working well but which could, therefore, be resolved as Centres develop):

- It is time consuming to reach a consensus with different stakeholders, especially on methodological approaches
- High costs of development-oriented research, students taking time to learn new (interdisciplinary) methods
- The commitment of staff (i.e. those with a dual affiliation) to the Centre is low
- Funds are a constant worry as the Centre is soft-funded
- When funds are delayed, or external co-researchers are not available, the research process drags and sometimes interest dwindles
- High transaction costs that need to be integrated into the financial model
- The Centre (rather than departments) bears the costs of communication, networking and public engagement, which can strain the core operating budget

Research themes and sub-themes reported for research based in academic departments (whether or not a Centre is also operating) are numerous and cover a wide range of sectors and domains affected by or implicated in climate change. These include: agriculture, forestry, health, energy, water and law.

Institutions reporting that their climate change research is primarily based in departments, but with significant interdepartmental collaboration, made the following responses to the question about effectiveness of their research arrangements:

- “Effective but there is room for improvement in the nearest future”
- “There is need to have an effective and well-coordinated framework for climate change research”.

Institutions reporting that their climate change research is primarily based in departments, but with limited interdepartmental collaboration, made the following responses to the same question:

- “It allows researchers to choose their own climate change research topics within the scope of agricultural research”
- “It is effective because there are substantial projects. However, being coordinated into clusters may enhance effectiveness”
- “Our unit is a standalone department, and therefore it is not as effective as it would have been had the climate change issue been mainstreamed into different programmes and projects. The arrangement presents a weak entry point and narrow impact pathways for mainstreaming climate change issues into the existing commodity-based research system”
- “Averagely effective”
- “Not very effective, efforts are uncoordinated”
- “Not really effective”
- “It is not effective because of lack of synergy and coordination”.

Taken together, the institutions where climate change research is based in departments expressed the following advantages of the arrangement:

- Provision of a specialised area of research where institutional and technical capacity has been built – capacity is not spread thinly
- Climate change does not belong to a single research department, rather several colleges make contributions. Team or multi-disciplinary approaches have advantages for seeing solutions from different angles
- Research endeavours are driven by interest
- The arrangement gives room for individuals to develop themselves in their specialisations
- Freedom of choice and collaboration in multidisciplinary and transdisciplinary teams and among institutions within and outside the country
- The central committee helps the university to improve interdisciplinary and collaborative climate change research.

The same institutions also identified the following disadvantages:

- The arrangement does not promote multi-disciplinarity in climate change research and teaching, making it difficult to meet global standards in curriculum content, to carry out rigorous or in-depth research, or to generate good research outputs
- “Very poor integration with other research programmes and projects, lessening the value and importance of the unit in the face of climate change and the need to develop and scale-out solutions to risk”
- “There is likely to be duplication in research efforts between departments and faculties” (because of poor communication)
- “I do not sincerely see any advantage here”.
- “Some faculties have not contributed as expected, considering it is not their business”
- “It is difficult to get all individuals on board”
- “Some important areas of climate change research may not be covered, even within the field of agricultural research”
- “Reduced confidence among donors that the institution can implement mega-projects”
- “The arrangement does not have a central focus or mission statement on climate change”
- “No synergy and coordination, so the impact of activities is diffused”

2.3 Use of Affiliate Staff

Four of the institutions with interdisciplinary centres, and one where research was organised in departments, reported the use of affiliates or adjunct lecturers from outside the university sector.⁵ Concrete examples of where these affiliates were drawn from were not given. The affiliates are involved in various activities including teaching, research student supervision, research, and co-authoring of articles. Advantages of employing affiliates that were expressed included:

- Bringing the perspectives of other institutions, disciplines or sectors, such as the perspectives of practitioners, decision-makers and the private sector: “diversity which enriches teaching and research”
- Sharing of knowledge, and cross-fertilisation of ideas and thinking to find climate change solutions and map gaps in knowledge
- Increasing research output and building capacity.

⁵ EIAR staff are themselves involved as affiliates at various Ethiopian universities, which is seen as bringing positive benefits.

Disadvantages of using affiliates included administrative difficulties, and the fact that affiliates might cause delays in research activities. One respondent reported that online lectures by affiliates were not as effective as classroom lectures.

2.4 Conclusions on Organisational Structures

Questionnaire responses were not always clear or easy to summarise, but several points do emerge.

There are good examples of climate change being incorporated explicitly in the highest-level published priorities of a university or research institution. In other instances where such formal recognition is not in place, universities can give high-level recognition to climate change through the establishment of dedicated research centres or institutions (see Box 2).

In general, respondents from institutions where climate change is structured around an interdisciplinary centre were more positive about the advantages of their arrangement than respondents from institutions where climate change research is currently based in departments. Centres are seen as allowing cross-fertilisation of ideas, better enabling interdisciplinarity and external partnerships, and attracting donor funding. Some disadvantages are, however, recognised including high transaction costs and difficulties in mobilising researchers. Advantages of research based in disciplinary departments include the possibility of building a critical mass of researchers in a discipline, but otherwise very similar aspirations for intellectual freedom and the ability to form multi-disciplinary teams. It is noteworthy that several universities have very recently founded Centres or have lighter-touch coordination arrangements for climate change research.

3. External Research Linkages

Respondents reported a great range of linkages that their institutions maintained with other research organisations, nationally, at sub-regional and African levels, and globally. At national level, the most frequently reported linkages are with other universities. This is particularly true of South Africa. Here there are several forms of linkage between the two institutions represented in our sample, UCT and UFH, as well as bilateral linkages with other South African universities, and ACCESS (Applied Center for Climate & Earth Systems Science)⁶. The latter is a consortium of ten South African universities and six other research institutions brought together by the Government’s Department of Science and Technology and the National Research Foundation to deliver “a new scale of intervention in earth systems science which will do justice to the globally unique opportunity that the southern African earth system provides us with”. Bilateral linkages between universities (and with Institutes of Technology) also feature within Ethiopia, Ghana, and Nigeria.

National meteorological offices were mentioned as research partners in Ethiopia, Ghana, Nigeria and South Africa. Issues around these partnerships, which are not straightforward, are discussed further in Section 8. Responses also mentioned collaboration with central government research institutions, particularly National Agricultural Research Services and their research stations, but also the Water Research Institute in Ghana.

At the international level, respondents reported direct relationships with other universities. These included universities in other African countries: UCT was mentioned by several non-South African universities, Kenyatta University by UDS, and UoN mentioned several African universities. UCT participates in the development of an open access Masters programme in Climate Change and Sustainable Development through the Southern African Regional Universities Association. There are numerous bilateral linkages with universities in the North: the Universities of East Anglia, Nevada, Puerto Rico, Reading, Sassari and Tokyo, and the United Nations University, among others. Of special note is the holding of split appointments between African and Northern Universities: the Director of ACDI and Pro-Vice Chancellor of UCT, Professor Mark New, formerly held a split appointment with Oxford and now holds one with UEA, and Professor Kees van ‘t Klooster of Wageningen has been appointed to a part-time position at UDS, under the WIENCO Chair, funded by a Ghanaian agri-business company, that also supports climate change research by other UDS staff.

Responding institutions are also involved in large donor-funded networks. The Resilient Africa Network (RAN)⁷ involves 18 African Universities in 13 countries (including four responding institutions and one other CIRCLE member) with the mission “to strengthen resilience in Africa through university-led local innovative solutions using evidenced-based approaches”. WASCAL (West African Science Service Centre on Climate Change and Adapted Land Use)⁸ is an initiative funded by the German Ministry of Education and Research in ten West African countries. It is designed to help tackle the challenge of climate change and thereby enhance the resilience of human and environmental systems by strengthening the research infrastructure and capacity in West Africa related to climate change. WASCAL is in the process of establishing ten graduate schools, of which one will be at KNUST, as well as a “Competence Centre” in Burkina Faso and three focal research sites. UCT leads Adaptation at Scale in Semi-Arid Regions (ASSAR)⁹, a multi-institutional research programme across six African countries and India, funded by IDRC and DFID, using “insights from multiple-scale, interdisciplinary work to improve the understanding of the barriers, enablers and limits to effective, sustained and widespread adaptation out to the 2030s”. The Inter-University Sustainable Development Research Programme (IUSDRP)¹⁰ is a loose network of universities across the world, including a number of African members, with a secretariat in Manchester Metropolitan University. One mention was also made of the Humboldt Foundation International.

⁶ <http://www.access.ac.za>

⁷ <http://www.ranlab.org>

⁸ <http://www.wascal.org>

⁹ <http://www.assar.uct.ac.za>

¹⁰ <http://www2.mmu.ac.uk/sste/research-and-enterprise/environmental-science/inter-university-sustainable-development-research-programme>

Box 4 - Climate & Ecosystem Change Adaptation & Resilience Research in Semi-Arid Africa: An Integrated Approach (CECAR-Africa)

CECAR-Africa was a collaborative project that ran between 2011 and 2016 and linked the University for Development Studies, the University of Ghana, the Ghana Meteorological Agency and the United Nations University-Institute for Natural Resources in Africa, all in Ghana, with the University of Tokyo, Kyoto University, and the United Nations University Institute for the Advanced Study of Sustainability in Japan. Funding was provided by the Japan Science and Technology Agency (JST) and the Japan International Cooperation Agency (JICA). There were three objectives: i) to generate understanding of extreme weather events and their livelihood impacts on ten rural communities in Northern Ghana; ii) to identify technological and institutional means to enhance adaptive management capacities; and iii) to develop an integrated model for enhancing resilience applicable elsewhere in semi-arid Africa. The approach adopted was multidisciplinary in nature.

A centerpiece of the project was the development and promotion of the “Ghana Model” (Saito et al. 2018a), a structured set of 7 principles for transdisciplinary, participatory and multi-stakeholder assessment, research, capacity-building and action to enhance community resilience.

Other outputs of CECAR-Africa included 40 peer-reviewed papers co-authored by Ghanaian and Japanese researchers, an edited book (Saito et al. 2018b), capacity building for Ghanaian and other African researchers through postgraduate scholarships and short courses, engagement with national decision-makers, NGOs, the Ghanaian private sector, other Ghanaian research institutes and multi-lateral agencies, and interventions at village level including mapping and assessment exercises, experiments with drought and flood resistant crop varieties, crop sequencing training, promotion of agroforestry and introduction of improved cooking stoves.

To consolidate the work of CECAR-Africa, the Kazuhiko Takeuchi Centre for Sustainability and Resilience (KTCSR) has been established at the University of Development Studies in Nyankpala, Northern Region, Ghana, to continue research, training, capacity-building for communities and local government, and market studies to local innovations.

Source:

- a) PowerPoint presentation supplied by Dr Gordana Kranjac-Berisavljevic; Saito et al. (2018 a and b)
- b) Press release 21.08.2016 <http://bit.ly/USD-CECAR-press-release>

There were outliers in the questionnaire responses with few, if any, national or international linkages. Two universities in Nigeria and one in Ghana reported only government agencies as national linkages, and only IUSDRP as an external linkage (other than CIRCLE itself).

The questionnaire asked for the advantages and disadvantages of the linkages mentioned, without requiring respondents to differentiate between national and international linkages. By implication, both the advantages and disadvantages reported principally concern international linkages, although some are relevant to national linkages. Major advantages were seen as follows:

- Exchange of knowledge and ideas; deeper understanding of geographical differences and similarities, which drive differences and similarities in vulnerability, impacts, adaptation, mitigation and governance, etc. Institutions can gain access to expertise on specific subjects. There is also the ability to foster and collate different institutional strengths and approaches to research – i.e. to draw from the strengths of other institutions where there is no expertise at home.
- Joint publications.
- Capacity-building and skill development; offering local researchers’ exposure to different climate change research themes, topics and models globally; improved analytical capacity; student exchanges and exposure to international conferences; and support for innovation processes.
- Access to funding and to facilities not otherwise available; also, an improved institutional capacity to manage finances.
- Strengthening outreach and influence.

Perceived disadvantages included:

- High transaction costs, in financial terms (travel costs) and in terms of time needed to reach consensus. Where the responding institution leads a collaboration, the bureaucracy associated with sub-contracting other partners was noted. Overstretching in taking on commitments was also noted.
- Dependence on external funding, and lack of a guarantee of long-term continuity for the linkage.
- Possible inequity; predominance of external (by implication Northern) research agendas, targeting of funding on certain research areas with others ignored; lack of contribution to national development goals.

- Unequal resource distribution can lead to unequal partnerships, and non-lead partners can benefit less than lead institutions. One respondent mentioned loss of data and information to developed countries as a disadvantage.

Respondents from institutions with few or no research linkages were vocal in reporting the disadvantages of their situation:

- Backwardness, lack of contribution to managing climate change in the country
- Lack of awareness of latest trends in climate change research and teaching.
- Limits to research, production and transfer of locally developed innovations

4. Interdisciplinarity

Interdisciplinarity was initially identified by the QSC as a key element of effective climate change research, given the complexity of climate change impacts in the real world (see Morton 2007 and Dasgupta et al. 2014 for agriculture and rural areas more generally, but similar arguments apply to other sectors and to urban areas) and the complex tasks of promoting adaptation and mitigation. A session was held on the topic at the Champions' Workshops in 2015, preceded by some questions on interdisciplinarity in the general pre-workshop questionnaire.¹¹ It was clear from the questionnaire responses and discussions, that in the majority of the CIRCLE home and host institutions a range of disciplines were involved in climate change research, and that Champions and others present were universally positive about interdisciplinarity, keen to project an image of interdisciplinarity for their own institutions, and keen to promote interdisciplinarity.

Box 5 - Disciplines Involved in Climate Change Research at CIRCLE Institutions

- Agriculture, Plant Breeding, Crop Science, Crop Protection, Fisheries/Aquaculture, Soil Science, Land Management, Livestock Systems, Applied Biology & Biotechnology
- Environmental Studies, Environmental Engineering, Environmental Management, Environmental Toxicology, Natural Resources Management, Forestry, Water Resources Management, Wildlife, Conservation and Ecology, GIS & Remote Sensing, Earth Sciences, Marine Science, Oceanography
- Engineering & Technology
- Urban and Regional Planning, Architecture
- Food Science and Technology
- Statistics, Mathematics, Physics, Chemistry
- Medicine, Health Sciences, Microbiology, Parasitology, Medical Entomology, Traditional Medicine, Medical Botany, Public Health, Environmental and Occupational Health, Health Education
- Development Studies, Anthropology, Sociology (Rural Sociology), Geography, Politics, Economics, Agricultural Economics, Home Economics, Population Studies, Business, Gender Studies
- Education, Lifelong Learning, Science Education
- Philosophy, Literature and Linguistics, Film and Media Studies, Archaeology

Source:

Pre-Workshop Questionnaire, CIRCLE Institutional Champions' Workshop, December 2015

The following are some of the remarks made about interdisciplinarity in the responses to the pre-workshop questionnaire:

- "People in natural sciences, social and behavioural sciences are all involved in climate change research"
- "Every researcher in the institute is multidisciplinary"
- "Our academic staff come from all disciplines in the university, the main emphasis is on work and knowledge of transdisciplinarity".

During the workshops, a set of issues emerged around interdisciplinarity, publication and promotion/recognition, with some present arguing forcefully that expectations of publishing in appropriate disciplinary journals, that were relevant during promotion processes, were inhibiting interdisciplinary research. These issues are discussed more fully in Section 7.

A further session on interdisciplinarity was held at the 2016 Champion's Workshop. Prior to this a pre-workshop questionnaire had asked: "Have you developed any cross-cutting climate change groups, centres, networks or mechanisms for sharing climate change research within your institutions or with other institutions?". Of the 22 institutions responding to this question, 14 had answered "yes", and cited intra- and inter-university networks for research, proposal preparation, teaching and capacity-building. However, the bulk of the positive responses emphasised networking and informal linkages rather than new formal institutions.

At both the 2015 and 2016 workshops, participants were briefly introduced to distinctions sometimes made in the literature between "multidisciplinarity", "interdisciplinarity", and "transdisciplinarity" (see for example Choi and Pak 2006). In general, these distinctions did not gain traction in the discussions that were held.

In the more targeted (but more open-ended) questionnaire circulated in late 2017, respondents were asked to identify aspects of the organisational arrangements in their institutions that respectively encouraged and discouraged interdisciplinarity (defined in an inclusive sense). Various aspects of research management that encouraged interdisciplinarity were mentioned in the responses. One respondent specifically noted a "good research culture and understanding among researchers to work

¹¹ The pre-workshop questionnaires for the Champions Workshops covered a range of topics relevant to CIRCLE's Institutional Strengthening Programme, only some of which were relevant to the current report.

together”. Formal university-wide policies and arrangements for interdisciplinarity, not specific to climate change, were also mentioned by several respondents. These included at various universities:

- A full-time Vice-President for Research and Community Services with mandate to enhance interdisciplinary research, backed by four Directors
- A Research Fund managed by the Office of Grants and Research
- A Higher Degrees Committee that approves interdisciplinary supervision arrangements for research students.
- An Office of the Director of Research with a draft policy to encourage interdisciplinarity, and promote cross-supervision of research programmes, and university-wide scholar training programmes that cover interdisciplinarity
- An Institute for Interdisciplinary Research and Consultancy Services which also holds annual conferences on themes that may include climate change

The interdisciplinary centres that have already been discussed were, not surprisingly, mentioned in responses to this part of the questionnaire by the relevant institutions. One spoke of the virtual nature of the institute, with academic staff coming from departments around the university: “all our activities are directed at transdisciplinarity”. At UDS the WIENCO Chair Fund encourages interdisciplinarity in agriculture and related sciences including aspects of climate change.

At a slightly lower level of formality are a range of cross-departmental programmes/networks. One respondent mentioned networks based on common interest across departments/faculties, as well as seminars, newsletters: “numerous interdisciplinary research groupings of different scale and governance arrangements”. Elsewhere, the establishment of a Soil Science, Agro-climatology & Environmental Management research group was mentioned as an example of interdisciplinary working.

In terms of procedures and policies “proper financial administration which is essential to the success of large collaborative projects” was mentioned by one university, as well as appraisal guidelines for promotion that encourage interdisciplinarity and in particular collaborative publications (see also Section 7 below).

The major aspect of research arrangements seen as discouraging interdisciplinarity was (as expressed by several respondents using different terminologies) *over-emphasis on working along departmental lines* rather than making interdisciplinary connections, or “silo organisation” with limited communication between departments.¹² As one respondent put it: “department heads prefer research teams to be from within their department”. Other discouraging factors¹³ included:

- Lack of clear policy/research agenda on climate change
- Lack of funding
- Need for strong financial and management support
- Limited capacity of researchers
- Need for commitment from all staff in proposal-writing, teaching and supervision, something that may not be easily achieved
- Heavy teaching workloads
- Limited facilities for “core” climate change research
- Climate change not being mainstreamed in all departments
- Difficulties in apportioning fees for co-supervision of graduate students.¹⁴

Three respondents specifically noted that no aspect of their institution’s research arrangements discouraged interdisciplinarity.

¹² Programmes in the case of EIAR

¹³ Three respondents specifically noted that they knew of no discouraging factors

¹⁴ Factors specific to individual universities in our sample included the multi-campus nature of the university (UDS) with campuses more than 150km apart, making interaction between departments more difficult, and the fact that climate change is not seen as a primary objective of health research (MUHAS).

5. Engagement with Communities

Engagement with communities¹⁵ was another key element of effective climate change research initially identified by the QSC to form the basis for sessions at the Institutional Champions Workshops in 2015 and 2016. Engagement with communities is of course an important guiding principle of any development-oriented research in poorer countries, and this holds for research whose ultimate aim is to strengthen climate adaptation. As noted by Dasgupta et al.: “Public decision making for adaptation can be strengthened by understanding the decision making of rural people in context, and in particular considering examples of autonomous adaptation and the interplay between informal and formal institutions. Adaptation can also build upon local and indigenous knowledge for responding to weather events and a changing climate” (2014:638). Similar arguments would apply to the residents of cities, particularly in poorer and informal settlements.

In the 2015 pre-workshop questionnaire, participants identified the following communities or groups who they communicated or engaged with: farmers, resource-poor farmers, farmer groups, pastoralists, fishermen, urban poor, women, children and other vulnerable groups. Methods and approaches to engaging with these communities they had found useful included: using local languages, discussing issues in a simple way, supporting the farmers to attend meetings, participatory approaches, demonstrations, one-on-one discussions, phone calls, audio-visual media, community radio, posters, pamphlets, training workshops, drama, Focus Group Discussions, key informant interviews, community feedback sessions, identifying problems and discussing solutions with the communities.

Some of the institutions or systems used for engaging with communities included:

- “Town hall meetings”
- Meetings with Co-ops, farmer leaders and Agricultural Development Agencies
- Model Villages
- Through the university’s Extension Arm
- Through the Department of Agricultural Extension and Rural Development
- Through the Nigerian Organic Agriculture Network
- FM Radio.

Challenges experienced included: expense, difficulties in recovering loans, the need for “motivation”, logistical difficulties, language difficulties and cultural issues, lack of education within communities, and difficulties of mobilising farmers during the cropping season. Some of the failures that had been experienced included:

- Recommending technologies when communities have not participated in their development
- Failure to translate research results into information usable by farmers
- Failure to provide written information in local languages.

Prior to the 2016 workshop, 21 out of the 22 institutions responding to the pre-workshop questionnaire reported engaging or working with communities including the rural and urban poor. 14 of the institutions reported that they had systems or mechanisms to ensure they do this regularly. Challenges discussed were largely as in 2015: financial, logistical and linguistic.

In the questionnaire circulated in late 2017, respondents were asked to identify aspects of the organisational arrangements in their institutions that respectively encouraged and discouraged engagement with communities. Several respondents stressed the importance of *policies at university level* (or in one case the Act of Parliament creating the university) mandating engagement with communities (these policies are not specific to climate change):

- The university supports engaged scholarship, referring to the creation of new knowledge and including “an intentional public purpose or benefit (which) demonstrates engagement with external (non-academic) constituencies”
- Community engagement is one of the three core mandates of the university, alongside teaching and research
- The University Strategic Plan emphasises that the university shall “make her expertise available to local communities and public agencies...”.

¹⁵ “Communities” has deliberately been used loosely and inclusively during the workshops and in the questionnaires to mean the ultimate beneficiaries of research, especially but not limited to the rural and urban poor and those vulnerable to the impacts of climate change. “Engagement” has also been defined loosely to include engagement after the research (i.e. dissemination) but also and especially engagement during the planning or implementation of the research.

Specific *programmes or standing arrangements* for community engagement were mentioned:

- An Integrated Rural Development Programme running since 1967 with a mandate to package and disseminate innovations arising from research activities (including climate change research)
- An Agricultural Technology Centre run by the Agricultural Extension Department
- A centre for university extension services
- A Third Trimester Programme by which all students spend two months every year in local communities
- A University Town and Gown Committee
- “Innovation boot camps”
- Community Training Workshops.

One respondent referred to “no organisational arrangements but natural engagement on many issues”.

Box 6 details an example of community engagement from Zimbabwe. Boxes 7 and 9, included below to illustrate engagement with decision-makers, show that serving the latter objective often overlaps with engagement with farmers.

Box 6 - Strengthening Weather and Climate Change Information Systems in Zimbabwe

Chinhoyi University of Technology led the research component of this project, in partnership with Oxfam GB, the Zimbabwe Meteorological Services Department, AGRITEX (the Zimbabwean agricultural extension service), and farmers, with linkages to Oxfam’s broader Sustainable Livelihoods Programme in Zimbabwe which addresses food security, sustainable livelihoods and climate resilience. The premise of the project is that smallholder farmers benefitting from better climate information can make informed farming decisions, but also better understand institutional responsibilities for other forms of support to climate adaptation, and lobby for that support. Key interventions included establishment of community weather stations, a system of SMS messages on future weather, and training of both farmers and AGRITEX staff. Community engagement was important to ensure that weather information was suited to farmers’ needs, and took place through Focus Group Discussions, participatory mapping of both natural resources and the institutional landscape, and key informant interviews with elders.

Some of the process lessons learnt through the experience included the importance of going through existing institutional structures in villages, and of researchers and extensionists being equipped to address immediate needs and problems: “if you come with training on this kind of sweet potato, that ripens early... [the farmers] even provide indications of areas for further research”. Researchers found they needed to manage cultural differences between themselves and farmers – timing of meetings, dress codes, appropriate formality of language, and even hand gestures (which are politically charged in Zimbabwe). Lessons on substantive project content include the importance of engagement with multiple stakeholders, and of integrating weather and climate information with extension.

Source:

Presentation given by Maria Tsvere and Chipo Plaxedes Mubaya to CIRCLE Institutional Champions’ Workshop 2016

It is important to note that eight of the respondents specifically noted that no institutional factors discouraged community engagement, whilst three others mentioned no constraint other than funding. These responses represented seven of the 14 responding institutions.

Negative factors impacting the ability to engage with communities that were mentioned included:

- Lack of financial resources, and “funding bottlenecks”
- Inadequate transport facilities
- Bureaucracy
- The time-consuming nature of community engagement
- Lack of institutional arrangements to keep staff committed to the community engagement mandate
- Not selecting the right researchers for community engagement roles.

6. Engagement with Decision-Makers

Climate change researchers need to engage with decision-makers¹⁶ because, in the words of the Synthesis Report for the IPCC Fifth Assessment Report, “effective decision-making to limit climate change and its effects can be informed by a wide range of analytical approaches for evaluating expected risks and benefits” (IPCC 2014a:17). National governments are seen as key as they “can coordinate adaptation efforts of local and subnational governments, for example by protecting vulnerable groups, by supporting economic diversification, and by providing information, policy and legal frameworks, and financial support” (IPCC 2014b:25). However, engagement needs to be at multiple levels: “adaptation planning and implementation can be enhanced through complementary actions across levels, from individuals to governments. Local government and the private sector are increasingly recognised as critical to progress in adaptation, given their roles in scaling up adaptation of communities, households, and civil society and in managing risk information and financing” (IPCC 2014b:25). Engagement also needs to be both context specific and broad-spectrum: “Decision support is most effective when it is sensitive to context and the diversity of decision types, decision processes, and constituencies. Organisations bridging science and decision making play an important role in the communication, transfer, and development of climate-related knowledge, including translation, engagement, and knowledge exchange” (IPCC 2014b:26). Overall, better understanding of decision-maker needs means more useful, problem-oriented research, which means more impact on policy and practice.

A preliminary and non-exhaustive list of the types of decision-makers with which the CIRCLE institutions were engaging, compiled during the 2015 workshop, included:

- Government bodies
 - Ministries of Agriculture, Rural Development, Food, Environment, Land and Natural Resources, Forests, Science and Technology, Higher Education, Health and Social Welfare, Tourism, V-P’s Office, National Emergency Management Agency¹⁷
 - Provincial governments, City and Municipality governments, District Assemblies, District Offices of line ministries
 - Parliamentarians
- Regional Bodies: Regional Economic Communities, NEPAD, IGAD-CEWARN (Conflict Early Warning and Response Mechanism), IGAD-IDDRSI (Drought Disaster and Sustainability Initiative)
- National and international NGOs/Civil Society
- The private sector
- Aid donors and international agencies

Engagement can also be with *policy processes* and the fora in which they are discussed and managed: National Adaptation Programmes of Action (NAPAs), National Communications to the UNFCCC, National Adaptation Plans (NAPs), National Climate Change Action Plans, Intended Nationally Determined Contributions; National Committees on Climate Change, National Secretariats for Climate Change, Climate Change Coordination Units, Climate Change Working Groups.

Examples given in the 2015 pre-workshop questionnaire of successful engagement or communication with decision-makers included:

- Policy advice (to INDC), memoranda
- Meetings and workshops
- Research days
- Conferences
- Collaborative research with ministries
- Training (e.g. REDD+ training)
- Researcher involvement in technical committees
- Websites

Challenges experienced in the sphere of engaging with decision-makers included:

- Universities not seeing input to policy formulation as their role
- Researchers not prioritising it and not being incentivised to prioritise it
- Researchers’ experience being compartmentalised or over-specialised
- Policy-makers are not always interested: “they think they don’t need you (but don’t say it)”
- Bureaucratic delays and key people not being available
- Lack of funding

¹⁶ As will be seen in the subsequent discussion “decision-makers” has been defined inclusively. As with communities (see previous footnote) “engagement” has also been defined inclusively.

¹⁷ Other universities or individuals might have added other government stakeholders, in particular ministries or agencies responsible for water resources.

- Decisions being influenced by politics, rather than evidence
- Researchers having a lack of contact with climate negotiations
- Lack of practical expertise on e.g. drafting policy briefs

By the time of the 2016 workshop, 19 out of 22 institutions were reporting communication or engagement with policy-makers on climate change research. The modes of this engagement can be summarised as follows:

Table 3 - Modes of Engagement with Decision-Makers (multiple responses allowed)

THROUGH CONSULTANCY	11	AS ADVISORS	6
THROUGH MEETINGS	16	THROUGH JOINT EVENTS	8
THROUGH FORMAL NETWORKS	9	THROUGH INFORMAL NETWORKS	10
THROUGH PERIODIC REPORTS	1	THROUGH FUNDING	1

14 institutions had systems or mechanisms in place for *regular* communication or engagement, including MOUs, regular dialogue, links with industry, policy briefs, and weekly newsletters.

In the questionnaire circulated in late 2017, respondents were asked to identify aspects of the organisational arrangements in their institutions that respectively encouraged and discouraged engagement with decision makers. The responses show a pattern of generalised interest in and acceptance of engagement with decision-makers, but few examples of explicit mandates or mechanisms. One respondent explicitly said that no aspect of organisational arrangements encouraged engagements, nine reported that there was activity, and variously mentioned either methods of engagement, or specific government agencies their institutions worked with. Three respondents reported that university management supported engagement, in a non-specific way, and only four explicitly reported specific policies or mechanisms.¹⁸

Methods of engagement included:

- Participation in external fora, conferences and exhibitions
- Membership of technical committees
- Seminars and workshops held at the universities to which policy-makers are invited
- Policy briefs

Boxes 7-9 below set out at more length some of the more distinctive methods used or under development by CIRCLE institutions, including formal Multi-Criteria Analysis of participatorily identified responses, and an electronic toolkit for collective deliberation on agricultural and climate trends.

Expressions of generic support by university management in the 2017 questionnaires comprised the following:

- “The university administration encourages our engagement with decision-makers. We also find it useful to be involved in contributing ideas on this issue, either with ministries responsible for the environment, or with Parliament”
- “Faculties and Departments are given a free hand to engage with decision-makers, as long as the terms of engagement do not contravene University guidelines. Engagement is a major thrust of the University. The Vice Chancellor and University Management are always well-disposed to support such engagements”
- Approval to present research outcomes at exhibitions, workshops and conferences.

More specific policies or mechanisms comprised the following:

¹⁸ Two questionnaires had no responses for any question in this section.

- Common plans with local government at district and zonal level and a Memorandum of Understanding with Regional Government
- Support from the university for engaged scholarship, which “demonstrates engagement with external (non-academic) constituencies”
- A linkage unit¹⁹
- Strong government support and linkage with Ministry of Agriculture²⁰

On aspects of organisational arrangements that discourage engagement with decision-makers, five respondents specifically said there were none. Aspects that were cited by other respondents included:

- Lack of explicit or clear institutional arrangements that encourage engagement
- Bureaucracy
- Academic silos
- Limited resources; lack of funding from the institution for either research or engagement, and difficulties with soft-funded initiatives
- Lack of experienced climate change researchers
- Over-emphasis on publications for career progression; reports to external funders are not always acknowledged as contributing to advancement/ promotion
- Politicised appointments of junior researchers

The last point demonstrates some of the sensibilities that appeared around the possible overlap between policy influence and politics; one respondent talked of the need for researchers to inform the Vice-Chancellor of visits to the university by public figures.

Box 7 - Stakeholder Engagement in Rice Research in Ebonyi State, Nigeria

Ebonyi State University’s Strategic Plan emphasises that the University shall “make her expertise available to local communities and public agencies in ways that are consistent with teaching and research functions and contribute to social, intellectual, technological and economic development of the state, the country, and the world”. This commitment has been demonstrated in work on rice agriculture, principally around development and dissemination of drought-resistant rice varieties. The EBSU Faculty of Agriculture has engaged with stakeholders including: government officials including the State Ministry of Agriculture, traditional rulers, other educational establishments, politicians, private-sector operators, NGOs, donors, farmers and local youth. Interaction with farmers has involved carefully-designed research on rice farmer perceptions of climate change and their current adaptation strategies (Oselebe et al. 2016), recording of indigenous knowledge, and promoting networking between farmers and other stakeholders. The engagement with government is deep, with EBSU acting as consultants to the (very active) State Government Committee on Rice, benefitting from grants of farmland for research and loans for pilot cultivation. In 2016 the Faculty held community meetings jointly with the Ministry of Agriculture and extension services, to prepare farmers for state government rice projects. EBSU has also established EBSU Agribusiness Enterprises Ltd, a company to commercialise the seed varieties that have been developed.

Source:

Presentation given by Happiness Oselebe and Johnny Ogunji to CIRCLE Institutional Champions’ Workshop 2016; Oselebe et al. (2016)

Box 8 - An Electronic Toolkit for Climate/Agriculture Scenario Planning

One interesting method for engaging with stakeholders was presented in the 2016 workshop by researchers from the University of Ghana who were developing user-friendly software to allow non-research stakeholders to collectively model combined impacts of agricultural policies and climate change. The method draws on a specific sort of scenario described in the literature as Representative Agricultural Pathways (RAPs), and allows stakeholders to a) rate the short- and long-term impacts of RAPs on parameters such as fertiliser use, improved variety use, and extension services b) project the consequences of very simple scenarios of climate change (Flooding, Good, Fair, Very Dry) c) project the combined impacts of RAPs and climate change, and d) use the projections to suggest adaptation policies for agriculture ministries, farmers and agri-businesses.

Source:

Presentation given by SGK Adiku to CIRCLE Institutional Champions’ Workshop 2016, co-authored by J Anaglo and DS MacCarthy

¹⁹ No further details were given.

²⁰ Cited by EIAR, an outlier as it is not a university.

Box 9 - SmartAgri – Collaborative Development of a Climate Change Response Framework for the Agricultural Sector in the Western Cape

The Western Cape Province of South Africa is agriculturally complex, with 12 major agricultural export products from extensive, irrigated, horticultural and livestock farming systems across multiple agro-climatic zones, and faces specific and complex climate challenges, with a need to consider possibilities of both increased and decreased rainfall. In this context, UCT’s African Climate and Development Initiative (ACDI) collaborated with two provincial government departments – Agriculture, and Environmental Affairs & Development Planning – and other agencies to implement the Smart Agriculture for Climate Resilience Project (SmartAgri) between 2014 and 2016. The project involved both scientific research producing evidence on agricultural systems and climate change, and intense stakeholder engagement, identifying current climate impacts, responses, stressors, and enabling and constraining factors. Together these created a systems perspective on agriculture in the Western Cape, while remaining practical and geographically-specific. Alignment was maintained with both national and provincial policy priorities.

Phase 1 of SmartAgri involved a review of knowledge on agriculture and climate change, from existing literature supplemented by expert consultations and two stakeholder workshops, producing a spatial model of over 80 farming areas, aggregated into 23 agro-climatic zones, and a set of Strategic Response Areas (broad components of a potential plan). In Phase 2, five stakeholder workshops were held at municipality level, focusing on broad categories of agricultural commodity and attended by government departments and agencies, commodity associations, private sector companies, farmer associations and individual farmers (both commercial and emerging). Two additional stakeholder workshops were held for government and for agribusiness, and focus group meetings, with a slightly different format and fewer attendees, for technical experts and commodity associations in specific high-value products (citrus, deciduous fruit, wine and table grapes). Methods involved included spatial mapping of influencing factors and identification of priority responses. From these meetings a list of 66 “response options” was compiled, from combinations of local and expert knowledge, greatly varying in terms of nature, geographical scope, timescales and institutional responsibilities. These were then prioritised using a Multi-Criteria Analysis by nine experts, and by a further workshop, and assessed in detail for coherence with provincial policies. The core team revisited the Strategic Response Areas, formulated a vision, and carried out scenario and gap analyses. Phase 3 involved further stakeholder consultations and drafting of a detailed Implementation Plan.

Source:

Presentation given by Leigh Cobban to CIRCLE Institutional Champions’ Workshop 2016; and other documents on SmartAgri available at <http://bit.ly/SmartAgriAbout> in particular Appendix 4 of the final report, available at <http://bit.ly/SmartAgriFrameworkReport>

7. Promotion and Recognition Procedures

Strong and unprompted views were expressed by some of the Institutional Champions in the 2015 workshop that promotion procedures within some institutions participating in CIRCLE were failing to reward, and thus disincentivising, interdisciplinarity in particular, but also engagement with communities and decision-makers. For interdisciplinarity the most important argument was that interdisciplinary work required multiple authorship of research outputs such as journal articles, and that university promotion procedures based on numbers of articles published typically only credit a staff member for a multi-authored article with a fraction of a point towards the total count of his/her articles (although there was also some suggestion that interdisciplinary outputs *per se* were viewed less favourably).

In the 2017 questionnaire respondents were asked to comment on ways in which promotion procedures or other ways of recognising or remunerating staff in their institutions affect, positively or negatively, interdisciplinarity, engagement with communities, and engagement with decision-makers. Where responses were given in a useful form, they are summarised in Table 4.

Table 4 - Impacts of Promotion Procedures etc. on Interdisciplinarity and Engagement

	INTERDISCIPLINARITY			ENGAGEMENT WITH COMMUNITIES			ENGAGEMENT WITH DECISION-MAKERS		
	+VE IMPACT	NEUTRAL	-VE IMPACT	+VE IMPACT	NEUTRAL	-VE IMPACT	+VE IMPACT	NEUTRAL	-VE IMPACT
INSTITUTIONAL RESPONSES	3	6	2	4	4	1	3	5	1
INDIVIDUAL RESPONSES	0	1	2	0	1	2	0	1	2

At first sight, the 2017 responses appear to contradict the 2015 workshop views in suggesting that the impact of promotion procedures is positive or neutral. However, responses indicating that the three aspects of research were positively affected by promotion and recognition procedures generally included little other information, save that one respondent mentioned the Vice-Chancellor’s Excellence Awards for engagement with communities. Most of the responses were categorised as “neutral”, but this also includes those that said “no incentives” or “no framework in place” or those that were nuanced in other ways. One response gave details of the university’s own policies for recognising interdisciplinarity and engagement but noted a conflict with national procedures. Another noted that interdisciplinarity got more recognition in some departments than others, and that engagement both with communities and with decision-makers jointly accounted for only 5% of the weighted promotion criteria. Views that procedures had negative impacts were spelt out in more detail: “single author publications count more”; “publishing in a journal outside your subject is scored low”; “promotion depends on publishing, which is hard with transdisciplinarity, and projects with communities and decision-makers”.

Overall, while our data is patchy and not terribly clear, the impression emerges that CIRCLE home and host institutions are so far only making weak and partial attempts to recognise these core aspects of climate change research in their promotion and recognition procedures.

8. Other Factors Affecting Climate Change Research

In the 2017 questionnaire, respondents were asked if they were satisfied with their institution's access to climate data, computing resources, and other resources such as laboratory and field equipment. Responses are summarised in Table 5.

Table 5 - Access to Data, Computing Resources and Other Equipment

	ACCESS TO DATA			ACCESS TO COMPUTING RESOURCES			ACCESS TO OTHER EQUIPMENT (E.G. LAB, FIELD)		
	SATISFIED	QUALIFIED SATISFACTION	UNSATISFIED	SATISFIED	QUALIFIED SATISFACTION	UNSATISFIED	SATISFIED	QUALIFIED SATISFACTION	UNSATISFIED
INSTITUTIONAL RESPONSES	3	6	3	6	3	3	6	4	2
INDIVIDUAL RESPONSES	1	0	4	1	1	3	1	2	2

Responses grouped under "qualified satisfaction" were most numerous for access to data. Three of these responses, and four grouped under "unsatisfied", concerned limited or no access to climate data from national meteorological services and what was seen as restrictions, control or poor cooperation from those services. These responses covered Ghana, Ethiopia, South Africa and Tanzania. In South Africa restrictions on data access from the Agricultural Research Council were also mentioned. One more general comment read "I am not satisfied at all: all data I have ever used for my climate research were acquired by me". There were also concerns over dependence on access to computing resources at other institutions, in one case several hundred kilometres away.

In terms of concrete steps suggested by the respondents to overcome lack of access in these areas, the most important were development of further funding applications, especially with external partners or other, more well-established universities. The possibility of entering into partnerships to acquire more powerful computing resources was also identified. Memoranda of Understanding with data collection organisations, by implication national meteorological services, were also suggested. Other more specific suggestions were the use of students on postings to collect primary data, and acquisition of a weather station for the respondent's university. Two respondents could envisage no such concrete steps.

Other relevant factors identified as constraining climate change research in the respondents' institutions included, not surprisingly, scarcity of funds and resources, but also of expertise, and of researchers with the right disposition for climate change research. Factors that were seen as currently encouraging research included co-ordination and networking, and being able to rely on other partners for scaling out of innovations; as well as the over-arching green policy of the government. Factors seen as needed to encourage research included institutional support, and development of external collaborations, including by the signing of MoUs.

Finally, respondents were asked to identify their institution's most important recent achievements in climate change research. Multiple responses were given and are grouped in Table 6.

Table 6 - Most Important Recent Achievements of CIRCLE Institutions (multiple responses allowed)

ACADEMIC PUBLICATIONS (JOURNAL PAPERS AND BOOKS)	4
ESTABLISHMENT OF CLIMATE CHANGE CENTRES	3
CIRCLE-RELATED ACTIVITIES	3
REPORTS FOR POLICY-MAKERS/DONORS	2
TRAINING OF RESEARCH STUDENTS, POST-DOCS AND INTERNS	2
ESTABLISHMENT OF RESEARCH CHAIR, APPOINTMENT OF STAFF AS IPCC LEAD AUTHORS	2
RESEARCH ACTIVITY (NOT SPECIFIED)	1
CONFERENCES	1
COMMUNITY ENGAGEMENT	1
DEVELOPMENT OF CLIMATE INFORMATION SERVICES	1

9. Discussion, Conclusion and Recommendations

9.1 Main Findings

This report, particularly the main data drawn from the 2017 questionnaire, is based on an extremely small sample that suffers from two biases. Firstly, the CIRCLE home and host institutions were pre-selected for CIRCLE on the basis of their ability to describe their research plans and needs in the area of climate change. As a result, they can be assumed, compared to a wider pool of African universities, to have some existing capacity in climate change research as well as the ability to network and win donor funding opportunities. Secondly, response to the 2017 questionnaire was voluntary and involved only 14 institutions, about half of the total involved in CIRCLE. The extremely open-ended questionnaire allowed respondents to express a variety of viewpoints both expected and unexpected but included topics hard to interpret and analyse. In addition, the circumstances of African universities and other research institutions, in terms of legal status, mandate, size, funding, history and geography are so diverse it is difficult to draw general conclusions, still less recommendations. We hope one of the positive aspects of this report is in pointing to the diversity of practice in facing the challenges of organising climate change research, as shown in the report's detail, and thus in stimulating new thinking.

Nevertheless, some important insights can be set out:

Some universities²¹ have explicitly incorporated climate change research and action as objectives in their highest-level plans and strategies, and this remains a feasible objective for senior climate change researchers. Where it is not feasible or appropriate, researchers and others see the existence of a dedicated climate change research centre as a signal of an institution's recognition of the importance of climate change research.

Apart from the public recognition issue, researchers in institutions that have dedicated climate change centres, which almost by definition are to some degree interdisciplinary, are more positive about the advantages of this arrangement than researchers in institutions where climate change research is based in departments. Such centres are seen as allowing cross-fertilisation of ideas, enabling interdisciplinarity and external partnerships, and attracting donor funding. Recent experience of CIRCLE institutions shows that establishment of climate change research centres is feasible and can be productive within a relatively short time-frame.

External linkages to other research institutions both within country, within sub-regions, within Africa and globally, were widely, though not universally reported. Such links are seen as bringing many and various benefits in terms of exchange of knowledge and ideas, capacity-building and access to funding. Respondents in our survey from institutions with few or no such linkages were vocal in reporting the disadvantages of an absence of this cooperation. This report supports the strong trend for international donors to encourage research linkages. At the same time, those promoting such linkages need to be aware of possible disadvantages; high transaction costs and possible proliferation of bureaucracy, fostering of dependence on external funding, and inequity between northern and African institutions in setting research agendas.

Interdisciplinarity, a key element of climate change research, is widely practiced and promoted by CIRCLE participating institutions. A range of organisational factors encourage it: research culture, formal university-wide policies, interdisciplinary centres, cross-departmental programmes and networks. These need to be backed up by sound administration and appropriate guidelines for promotion (see below). A range of factors can discourage interdisciplinarity, of which lack of a clear policy, lack of funding, and lack of management support are the most important.

Engagement with communities, another key element of climate change research, is also widely practised through different approaches and methods. A range of organisational factors encourage it including policies at university level, and specific programmes or standing arrangements. Factors that may discourage engagement with communities include lack of resources (including transport), the time-intensive nature of good engagement, and lack of incentives for staff.

Engagement with decision-makers is also widely practiced by CIRCLE participating institutions. Again, this is undertaken using a range of methods and in a range of contexts. Universities support such engagement mainly in generic rather than specific

²¹ As all but one (EIAR) of the institutions in the sample and the great majority of CIRCLE participating institutions are universities, this section will use that terminology.

ways, although there are examples of more specific mechanisms. Factors that discourage engagement with communities include limited resources, lack of clear institutional incentives, and over-emphasis on publications.

Promotion procedures had emerged in previous CIRCLE workshops as major possible disincentives particularly to interdisciplinarity, but also to engagement with communities and decision-makers. Questionnaire responses were hard to interpret, but suggest that CIRCLE participating institutions, and by implication African universities more generally, are so far making only weak and partial attempts to recognise some of the key components of climate change research in their promotion procedures.

There is a mixed picture on access to climate data, computing resources and other equipment required for climate change research. Of the three, access to climate data was most problematic. In several countries the availability of data from national meteorological services to universities and research institutions seemed to be restrictive or a source of tension. National governments and funders of climate change research should investigate these aspects of cross-institutional data access in formulating policies and programmes.

The issue of lack of resources, primarily financial but also infrastructural (transport facilities and research equipment) and human (trained and committed researchers) runs like a thread through our study. Much needs to be done to reverse historic inequities in research funding and allow African institutions to work in climate change research to their full potential. Such support can go hand in hand with measures to foster research collaboration and networking between institutions (sub-national, national, inter-African, South-South and South-North) and to address the specific needs to promote climate change research that is interdisciplinary and engaged with both communities and decision-makers.

9.2 Recommendations

Given the limitations of this study, and the diversity of African research organisations in terms of legal status, mandate, size, funding, history and geography, recommendations can only be tentative and subject to adaptation to the local contexts. Many of the recommendations here are not specific to climate change research – the benefits of interdisciplinarity and engagement will be experienced in many other research areas. However, generic recommendations for building institutional and individual research capacity are not set out here.²²

For African climate change research leaders:

- 1) Research leaders should advocate for explicit incorporation of climate change research and action as objectives in highest-level institutional plans and strategies. The pre-eminence and urgency of climate change as a societal threat makes this desirable; that several CIRCLE institutions have already done so shows it is a realistic aspiration.
- 2) Even in the absence of such a high-level recognition, research leaders should consider the establishment of climate change research centres that cross-cut traditional departmental and disciplinary boundaries. These bring advantages in addressing climate change, its impacts, and the action needed for adaptation and mitigation in an interdisciplinary and holistic manner and can also serve as a signal of high-level recognition of the problem. The precise model of centre – whether employing its own staff, functioning as a network of departmental staff or something in between – is of secondary importance and can be decided based on the local context.
- 3) Consideration should be given to employment of affiliate or adjunct staff from outside academia in research and teaching on climate change – they can bring valuable complementary perspectives.
- 4) Climate change centres need to communicate their expertise and interests to other researchers, and to research funders. Centres should invest in well-designed, well-maintained and comprehensive websites, including staff profiles and publications which are important tools for this purpose.
- 5) Longer-term linkages to international research have multiple advantages and African climate research leaders should pursue such arrangements, while remaining aware of possible risks in terms of overstressing administrative capacities, becoming over-dependent on single sources of funding, and allowing Northern research institutions to dominate research agendas.
- 6) Interdisciplinarity in climate change research should be promoted at departmental/centre level, regardless of formal institutional arrangements. Climate change research leaders should recognise the need for resources including time generated by interdisciplinarity. Climate change research leaders should advocate for policies encouraging interdisciplinarity at university level.

²² Not least because they have been covered by the Institutional Support Programme of CIRCLE.

- 7) Engagement with communities and research beneficiaries should be promoted at centre/departmental level. Programmes and institutional arrangements which accustom students to working with communities from undergraduate level onwards may be considered as one mechanism for this. Researchers should be encouraged to engage with communities throughout research project cycles, and with a range of methods. Attention should be paid to appropriate communication with farmers and other research beneficiaries, as well as adequate resourcing, time and logistics. Climate change research leaders should advocate for policies at university level encouraging engagement with communities.
- 8) Engagement with decision-makers should also be promoted at centre/departmental level and be seen as a day-to-day responsibility of academic work. Researchers should be encouraged to engage with decision-makers throughout research project cycles, and with a broad spectrum of communication methods. Use of new possibilities arising from information technology should be considered. Climate change research leaders should advocate for policies at university level encouraging engagement with decision-makers.

For senior university managers

- 9) University managers should give careful consideration to explicit incorporation of climate change research and action as objectives in highest-level institutional plans and strategies. The pre-eminence and urgency of climate change as a societal threat makes this desirable; that several CIRCLE institutions have already done so shows it is a realistic aspiration.
- 10) Mechanisms for encouraging interdisciplinarity at university level (for example tasking senior university officers with promoting interdisciplinarity, running interdisciplinary seminars) should be seriously considered and adequately resourced.
- 11) Senior university managers should consider high-level policies to support engagement of researchers with communities, and with decision-makers, as in recommendations 7 and 8 above.
- 12) Senior university managers should ensure that promotion and recognition procedures should not disincentivise interdisciplinarity, or engagement with communities or decision-makers.

For national governments

- 13) National governments should recognise that the urgency of the climate change challenge requires step-changes in both investment and political recognition of the need for climate change research. One particular priority is bridging institutional barriers that exist in some countries between universities and national meteorological offices that is impeding the flow of climate data for research. Inclusion of a climate change mandate in high-level policies regarding research and higher education should be considered.

For development donors and research funders

- 14) Donors/funders should continue to invest in capacity-building for climate change research in African institutions, through a range of modalities including long-term partnerships with Northern institutions, and sub-regional, regional and South-South partnerships. Agencies investing in capacity-building for climate change research need to ensure ownership by senior university management, synergies with existing structures for climate research and climate data generation, and attention to general issues of research capacity, interdisciplinarity and engagement.

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Annex 1: Questionnaire Sent to Institutional Champions and Other Circle Participants

CIRCLE: Developing Organisational Strategies and Structures for Climate Change Research

Survey of Institutional Champions, Supervisors and Mentors

Introduction

As part of the CIRCLE programme design, the Quality Support Component led by NRI is tasked with producing a final report on developing effective strategies and organisational structures for climate change research. We would like to do this through: a) discussions we have already had in the Institutional Champions Workshops in December 2015 and December 2016, and the Supervisors and Mentors Workshop in 2017; b) case-study material provided by CIRCLE participating institutions; and c) findings from this questionnaire. We would like to use the questionnaire to gather some structured data around the way climate change research is currently carried out within your institutions, but we have also designed many parts of the questionnaire to be highly open-ended for you to provide your feedback on your achievements and challenges in climate change research.

The final report on developing effective strategies and organisational structures for climate change research will be drafted by Professor John Morton of NRI with support from Professor Sola Ajayi of Obafemi Awolowo University, Dr Leocadia Zhou of the University of Fort Hare, and the lead members of the Quality Support Component.

In using data from this questionnaire in our report, we feel it will be impractical to give a guarantee of anonymity. Respondents and their institutions will be listed in an annex to the report, unless you request otherwise. In the text of the report we will only associate institutions to particular views or experience where the context demands it. We will not name individuals in the text but may identify them by job or affiliation. If you require stronger guarantees of anonymity/confidentiality than that for any particular views you express, please make it clear in your response.

Many thanks

John Morton
Quality Support Component leader, CIRCLE and
Professor of Development Anthropology,
Natural Resources Institute, University of Greenwich
j.f.morton@gre.ac.uk

1. DETAILS OF THE RESPONDENT

Full name with title (Professor, Dr, Mr, Ms, Mrs):

Name of institution:

Job title within institution:

Years of employment within the institution:

Role(s) within CIRCLE (Institutional Champion, Implementation Lead, Supervisor, Mentor, Other):

Number of years/months actively involved with CIRCLE:

Do your personal research and teaching activities include climate change?

If yes, please provide a brief outline of the nature of your climate change related research and teaching, and what specific aspects of climate change research or teaching you focus on

2. ORGANISATION OF CLIMATE CHANGE RESEARCH IN YOUR INSTITUTION

Is climate change specifically mentioned in the top-level research strategy of your institution (e.g. the university-level strategy)?
If yes, what aspects of climate change research are mentioned in the strategy?

Which of the following responses best describes the way climate change research is organised within your institution?

- Within a single academic department
- Within more than one academic department, but with limited collaboration between departments
- Within more than one academic department, but with significant inter-departmental collaboration
- Mainly through an interdisciplinary climate change centre or institute
- Through an interdisciplinary climate change centre/institute and one or more academic departments
- Another arrangement (please describe)

If your institution has an interdisciplinary climate change centre/institute, does the centre/institute:

- Employ its own staff
- Employ staff with a dual affiliation (centre and academic department)
- Employ few or no staff, operating mainly in a networking/coordination role between academic departments?

Please feel free to give more details

If your institution, uses affiliates/adjunct lecturers from the climate change community other than universities:

What specifically do these affiliates/adjuncts do?

What is the advantage/disadvantage of having this category of faculty?

To the best of your knowledge, what are the main themes or topics in climate change research pursued by the centre/institute?

To the best of your knowledge, what are the main themes or topics in climate change research pursued by academic departments within your institution?

Please feel free to attach documents or give URLs of websites describing the organisation of climate change research and any relevant departments/centres/programmes within your institution.

Considering the overall way in which climate change research is organised within your institution:

- How effective is this arrangement in facilitating climate change research?
- What are the advantages of this arrangement?
- What are the disadvantages of this arrangement?

Feel free to add additional comments

3. EXTERNAL LINKAGES IN CLIMATE CHANGE RESEARCH

What ongoing linkages (other than CIRCLE) does your institution have on climate change research with universities or other centres in:

- Your own country
- Other countries?

What do you consider the advantages of these arrangements?

What do you consider the disadvantages of these arrangements?

Please feel free to add any more comments, or to attach documents or URLs for these collaborations

4. INTERDISCIPLINARITY

What aspects of the organisational arrangements in your institution encourage interdisciplinarity in climate change research?

What aspects of the organisational arrangements in your institution discourage interdisciplinarity in climate change research?

Please give any examples of successful interdisciplinary climate change research within your institution.

Please provide attachments (e.g. project documents, published papers) or URLs, or indicate whether you would be prepared to provide a longer case study (a box of around 500 words)

Please feel free to give any other comments on the value or otherwise of interdisciplinarity and the way it can be embedded in institutional structures to facilitate climate change research.

5. ENGAGEMENT WITH COMMUNITIES

What aspects of the organisational arrangements in your institution encourage engagement with communities in climate change research?

What aspects of the organisational arrangements in your institution discourage engagement with communities in climate change research?

Please give any examples of successful engagement with communities in climate change research within your institution.

Please provide attachments (e.g. project documents, published papers) or URLs, or indicate whether you would be prepared to provide a longer case study (a box of around 500 words)

Please feel free to give any other comments on the value or otherwise of engagement with communities and the way it can be embedded in institutional structures to facilitate climate change research.

6. ENGAGEMENT WITH DECISION-MAKERS

What aspects of the organisational arrangements in your institution encourage engagement with decision-makers in climate change research?

What aspects of the organisational arrangements in your institution discourage engagement with decision-makers in climate change research?

Please give any examples of successful engagement with decision-makers in climate change research within your institution.

Please provide attachments (e.g. project documents, published papers) or URLs, or indicate whether you would be prepared to provide a longer case study (a box of around 500 words)

Please feel free to give any other comments on the value or otherwise of engagement with decision-makers and the way it can be embedded in institutional structures to facilitate climate change research.

7. PROMOTION AND RECOGNITION PROCEDURES

Please comment on any way in which promotion procedures or other ways of recognising or remunerating staff performance in your institution affect, positively or negatively:

- interdisciplinarity
- engagement with communities
- engagement with decision-makers
- other aspects of climate change research

8. OTHER FACTORS

Please comment on how satisfied you are with:

- Your institution's access to climate data
- Your institution's access to computing resources for climate change research

- Your institution's access to other equipment (e.g. laboratory, field) needed for climate change research

Can you envisage any concrete steps you could take to overcome lack of access in these areas?

Can you identify any other important factors that constrain or encourage climate change research within your institution?

What do you think are your institution's most important recent achievements in climate change research? As appropriate can you provide documents (e.g. reports, papers) to illustrate these achievements.

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