

Research Application Summary

**Climate Research for Development in Africa collaborative research platform:
Co-designing, co-resourcing and co-producing user-driven climate information
and services**

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Abstract

Climate Research for Development in Africa (CR4D) represents a paradigm shift in dealing with climate change and development in Africa. It provides a mechanism for integrating Africa wide climate research initiatives, bringing both the scientists and institutions including development actors together to deliver on priority end user needs. In this paper we revisit CR4D perspective as a collaborative research platform requiring co-designing, co-resourcing and co-production of user-driven climate information and services. CR4D strategically responds to priority research areas for Africa that were identified during the Africa climate conference, 2013; these however require to be further developed into concrete implementable thematic areas. Co-creation and co-production are important facets in the interdisciplinary and transdisciplinary knowledge development and when co-dissemination is added as a third facet it leads to better knowledge integration. These are suitable dimensions to building a knowledge system that provides wide ranging benefits to diverse groups of actors and stakeholders involved in the process. Co-resourcing collaborative research is a complex phenomenon particularly in sub-Saharan Africa where research investment per scientist has been dwindling over the last 30 years. The rise in philanthropic organisations and individuals investing finances to support climate research for greater community benefit in the last 10 years is an opportunity that needs to be strongly explored to fund collaborative research on a medium to long-term basis in Africa.

Key words: Integration, Knowledge, Philanthropy, United Nations Economic Commission for Africa

Résumé

Climate Research for Development in Africa (CR4D) représente un changement de paradigme pour faire face aux défis du changement climatique et du développement en Afrique. Il fournit un mécanisme pour intégrer les grandes initiatives de recherche sur le climat en Afrique, regroupant à la fois les scientifiques et les institutions, y compris les

acteurs du développement pour satisfaire aux besoins prioritaires des utilisateurs. Dans cet article, nous réexaminons la perspective du CR4D comme une plate-forme de recherche collaborative exigeant une co-conception, une co-mobilisation de ressources et co-production d'informations et de services climatologiques axés sur l'utilisateur. CR4D répond stratégiquement aux domaines de recherche prioritaires pour l'Afrique qui ont été identifiés au cours de la conférence sur le climat en Afrique en 2013; ceux-ci nécessitent toutefois d'être développés en des domaines thématiques concrètes réalisables. La Co-création et la co-production sont des aspects importants dans le développement des connaissances interdisciplinaires et transdisciplinaires et quand l'on ajoute la co-diffusion en tant que troisième élément, ceci conduit à une meilleure intégration des connaissances. Ce sont des dimensions adaptées à la construction d'un système de connaissances qui fournit des avantages variés à divers groupes d'acteurs impliqués dans le processus. La co-mobilisation de ressources pour la recherche collaborative est un phénomène complexe en particulier en Afrique sub-saharienne où l'investissement de recherche par chercheur a diminué au cours des 30 dernières années. La multiplication des organisations philanthropiques et les particuliers qui investissent pour soutenir la recherche sur le climat au plus grand profit de la communauté au cours des 10 dernières années est une opportunité qui doit être fortement exploré pour financer la recherche collaborative à moyen et à long terme en Afrique.

Mots clés: Intégration, connaissances, Philanthropie, Commission économique des Nations Unies pour l'Afrique

Introduction

Climate change is no longer a mythical process that is likely to occur; rather it is occurring with devastating impacts in the developing and developed nations alike. In sub-Saharan Africa, the storylines are rather familiar with drought effects often followed by floods further weakening communities coping ability and range (Gommes *et al.*, 1996; Shiferaw *et al.*, 2014). Sub-Saharan Africa is vulnerable to the impacts effects of climate change; for example, temperature rise in the highland areas is leading to the prevalence of malaria-in communities with low immunity as well as expanded and intermittent occurrence of trans-boundary livestock and zoonotic diseases in the arid and semi-arid areas (Craig *et al.*, 1999; Olwoch *et al.*, 2008; O'Meara *et al.*, 2010). The disease burden is taking a toll on both the communities and the governments as well as the development partners who from time to time have to drastically adjust their development assistance upwards. For example, it is estimated that Africa will need up to US\$10 billion per year at present and this cost will most likely rise to US\$30 billion by 2030 to support its adaptation efforts (Pan Africa Climate Alliance, 2009). Climate change is therefore complicating the development trajectories espoused in the national and regional development priorities of nations and Regional Economic blocks such as the East African Community (EAC), Common Market for Eastern and Southern Africa (COMESA), and Intergovernmental Authority on Development (IGAD) among others. It is also threatening to undo the few development gains that have been achieved over the last decade through the global concerted effort of Millennium Development Goals (Institute for Security Studies, 2010). It also requires considerable effort that the 2015-2030 Sustainable Development Goals ought to pay close attention less a reversal of the investments made is realised.

Whenever adversity strikes, man is drawn to look for solutions so as to better respond in the event of a repeat and/or completely deal with the shock. Similarly, several frantic efforts have been made to tackle climate change; from research, overseas development assistance to recovery and rebuilding of lives and communities that have been affected by climate change. Several of these efforts have had positive gains in facilitating communities to recover but many remain vulnerable to impacts of climate change. In other cases, some of these efforts have not made significant impact. A paradigm shift is thus needed in sub-Saharan Africa to ensure better and more sustained response to climate change. This would require, among others, better coordinated action among the various actors and stakeholders engaged in climate change action. Currently, there are several duplications, snap shot projects, re-do, re-apply and re-spend projects-projects doing the same thing over and over again without exit, as well as budding organisations 'taking action' on several frontiers. To nub this trend, Climate Research for Development (CR4D) has been suggested as one of the alternative frameworks that will help to aggregate stakeholders and actors in climate change efforts to better focus their action and resources.

Climate Research for Development (CR4D) is a strategic response from the 2013 Africa Climate Conference that was held in Arusha, Tanzania. It provides a mechanisms for the integration of Africa climate research community bringing both scientists and institutions including development actors to deliver on priority end user needs. It is premised on three broad objectives seeking to increase; (i) understanding end user needs for climate research information and services in Africa; (ii) understanding the drivers, variability and change processes in the African climate system and predictive capabilities at all timescales, and (iii) quality and relevance of climate information for users and stakeholder communities. Climate Research for Development in Africa is therefore focused at building and enhancing the necessary foundations required to deliver climate information and advisory services urgently needed by policy planners, adaptation decisions makers and vulnerable communities in Africa. The purpose of this paper is to share with the wider audience in Africa and beyond CR4D in Africa as a collaborative research platform that will facilitate co-designing, co-resourcing and co-production of user driven climate information and services in Africa.

Climate research priority areas in Africa. Research advancement on a global scale has received increased pressure to undertake research development from a regional perspective with a bottom-up priority setting and implementation with these being integrated to the global priority-setting and agenda (Janssen *et al.*, 2003). A regional research approach is being preferred as a better mechanism to focus research development and processes because it; (i) ensures economies of scale in research which is particularly vital among small and/or poor countries, and for high-technology research undertakings with expensive equipment and skills; (ii) facilitates positive externalities that can be better internalized at the regional level than at the national level, creating greater incentives to invest in research; (iii) allows for labour division and specialization among the scientists in the region on a comparative advantage basis; (iv) provides opportunities for elevating research priorities above national political cycles to give greater continuity in research undertakings; (v) facilitates guidance and coherence to donors by providing an overall framework with well-defined research priorities; and (vi) provides opportunities for scientists to exchange information on research

issues specific to the region (de Janvry and Kassam, 2001; CGIAR TAC, 2001; Janssen *et al.*, 2003). As the focus on African climate research agenda was evolving, the Africa Climate Change Conference (ACCC) 2013 provided opportunity to set-out the Climate Research priorities for Africa (Table 1). These priority areas form the foundation basis for the Climate Research for Development (CR4D) in Africa.

The priority research areas identified in Table 1 closely relate to the research issues addressed in the development of Future Earth that include; a focus on forecasting, observing, confining, responding and innovating (Reid *et al.*, 2010; Mauser *et al.*, 2013). The Climate Research for Development (CR4D) in Africa has therefore taken the first vital step in its formation and setting the pace for engagement as a collaborative research platform. Collaborative research platforms are focus issues in most of today's scientific engagement and are founded on thorough understanding of what the collaboration will deliver and because without it ideas often remain ideas and not innovations (Raths, 2013). It also depends on a joint understanding of a common challenge across diverse groups and actors (Mesman, 2007). Further, the motivations for the cooperation and participation of individuals and institutions are diverse ranging from direct benefits to the research and indirect strategic, economic and/or political benefits whilst the barriers may include the growing significance of competitiveness issues and a mismatch of institutions and visioning (Georghiou, 1998). Through the Africa Climate Conference the first right strategic step had been taken to define what will bring diverse climate change actors in Africa together into a collaboration. Co-designing and co-producing user-driven climate information and services.

Knowledge generation is a complex phenomenon as its use and applications for which it is generated because diversity exists and time and place dynamics often challenge knowledge relevance. Researchers have observed that co-production" of knowledge through collaborative learning between "experts" and "users" is a more suitable approach to building a knowledge system that provides wide ranging benefits particularly lending credence to sustainability in its broad sense (Roux *et al.*, 2006). This process can be achieved through knowledge interfacing and sharing, which requires a shift from a view of knowledge as a "thing" that can be transferred to viewing knowledge as a "process of relating" that involves negotiation of meaning among partners (Roux *et al.*, 2006). It is within this process of relating that co-designing and production of knowledge is embedded; these form an important conduit for knowledge integration. Though complex, co-designing and co-production of knowledge are critical components in making knowledge available, respected and integrated. Knowledge production will usually take on levels; co-design of research and co-production of knowledge (Fig. 1) and a third level of action often involves co-dissemination of knowledge to facilitate a knowledge integration process (Mauser *et al.*, 2013).

In light of the current climate change knowledge generation and climate research for development in Africa; co-designing and co-production will need to take some of the following fundamental actions: (i) involving the end users in knowledge creation process; (ii) improve credibility of knowledge as well as the scientists involved; (iii) appropriately package the information for diverse audiences; (iv) develop a well-structured framework for action with well spelt out responsibilities; and (v) structure avenues to ease information access and

Table 1. Priority climate research areas for Africa

Key priority area for climate research to serve development needs (cluster)	Pan-African climate research program proposal
Co-designed multidisciplinary research for improving climate forecast skill and reliability, across temporal and spatial scales (towards operational user-relevant seamless forecast products)	<p>Sub-seasonal to seasonal prediction project for Africa.</p> <p>Integrated climate science, applications and policy research - Understanding underpinning drivers of climate variability in Africa across five regions of Africa.</p> <p>Towards robust climate change projections over Africa: Integrated CORDEX user-driven analysis.</p> <p>Integrated multi-disciplinary climate and impacts research (across four priority GFCS sectors-DRR sector, health, water and agriculture).</p> <p>Extremes attribution</p> <p>Multi-disciplinary validation of forecast skill (including impacts skill)</p>
Filling the data gap tailoring for sector decision-making	<p>Filling the gap in multidisciplinary data sets (for both climate and sector-specific vulnerability datasets).</p> <p>Development of Integrated Africa Climate Data Information System within existing national and international initiatives</p> <p>Risk profiles for major African cities.</p>
Capacity-building at all levels	<p>Building African capacity in climate science and communication for linking climate knowledge with action on</p>

Table 1. Contd.

Key priority area for climate research to serve development needs (cluster)	Pan-African climate research program proposal
Mainstreaming climate services into decision making: Linking knowledge with action	<p>Nurturing an African intellectual leadership in climate research for development.</p> <p>African research nodes of excellence developing and mainstreaming training curricula for a changing climate.</p> <p>From global to local: Linkages across prediction centers for delivery of operational climate services.</p> <p>Framework for co-producing climate services and integrating knowledge for action.</p>
Improved and more effective communication between climate science and policy to identify enduser needs	<p>Building the Interface: Multi-stakeholder platforms for dialogue - Best methods for bringing together climate scientists and users for definition of common language, identification of needs and design of climate services to meet user needs.</p> <p>Co-producing climate knowledge with local stakeholders – the end of end-users.</p> <p>Supporting adaptation under deep uncertainty adaptation scenarios addressing envelope of uncertainty, across timescales.</p>

Source: Africa Climate Conference 2013 Communique (ACC, 2013)

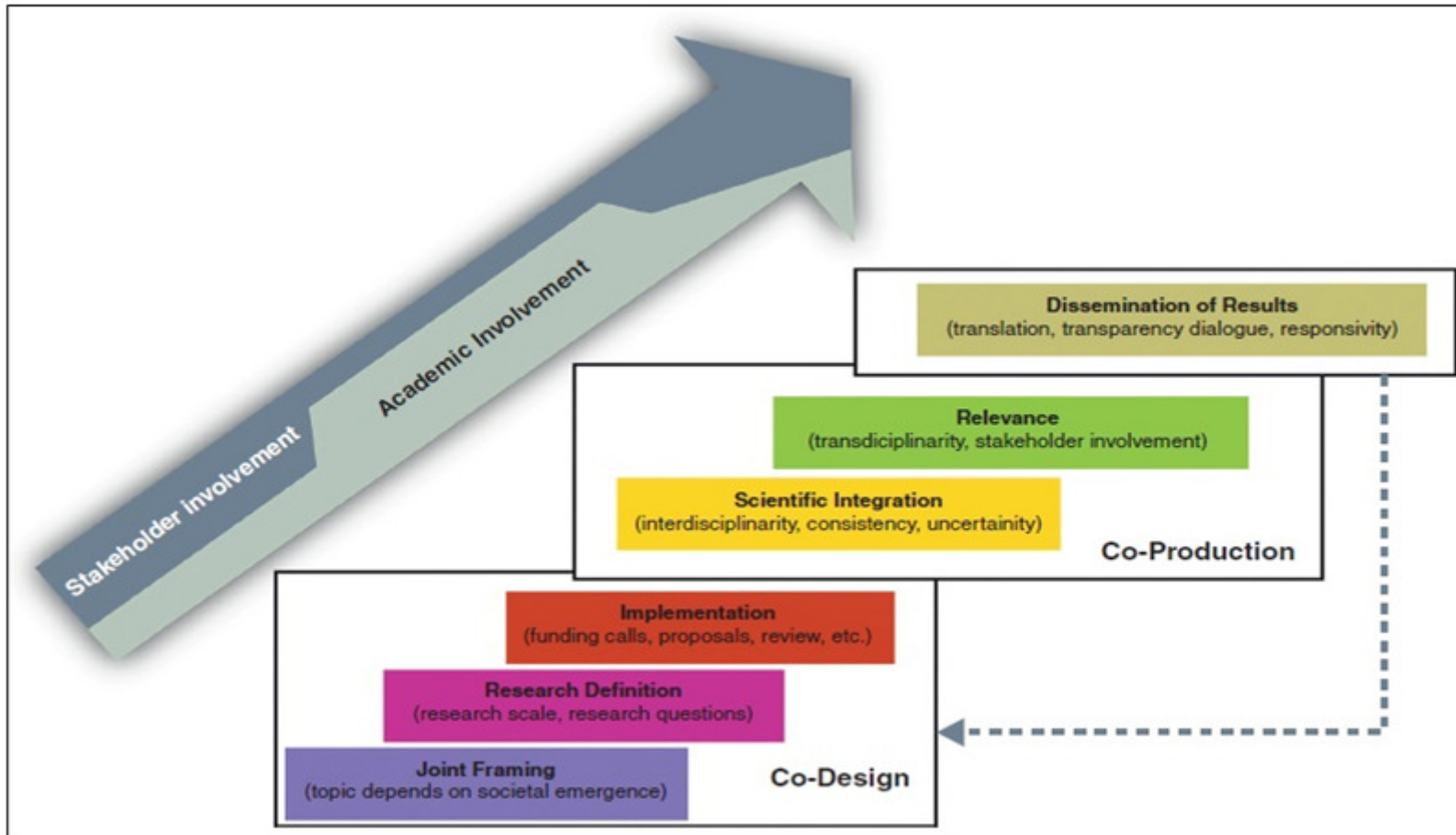


Figure 1. Framework for interdisciplinary and transdisciplinary co-creation of knowledge (Source: Mauser *et al.*, 2013)

filtering. In the co-creation and co-production of user driven climate information and services, it is vital to underscore the fact that; the more technologically advanced a knowledge supplier is, the more technologically deprived a potential knowledge adopter/user will be and the bigger the scope for introducing new knowledge but the lower the chance that the transfer of knowledge will be successful (Roux *et al.*, 2006). The most affected in the African sense are the poor users in remote locations and are technological disadvantaged; it is this group that are most in need of the climate information and services that will support their efforts to build resilient livelihoods and ecosystems. In the knowledge co-designing and co-production, a complex of integration thus arises; what is vital is critically understand the integration process and the level of integration and the actors involved (Fig. 2) and for integration to better meet the needs of users effectively as well as to better guide sustainable policy directions, it becomes paramount to articulate the meaning of integration with a better guide on moving to achieve it as reflected in Figure 1 (Mauser *et al.*, 2013).

Co-resourcing collaborative climate research. Collaborative research in essence is a complex undertaking; from the initiation of ideas to agreement on processes and protocols to be followed to financing mechanisms to facilitate the research process particularly when such research efforts are within the medium to long-term range. in the African context where research financing has essentially be relegated to the whims of development partners and further where research investment and funding per research scientist has been dwindling (Pardey, 1997; Alston *et al.*, 1998), innovative financing mechanisms are needed to sustain increased demand for evidence to guide decision making and planning in Africa. Co-resourcing of research is novel, as it allows for a pool of resources to further the research agenda of the consortia. However, when dealing with African countries whose net investments in research has been declining over the last 30 years, co-resourcing is a real challenge even when the research issue is of great importance such as climate change in the present situation. Different financing mechanisms exist and so are the various funders but, over time the requirements and restrictions have been becoming harder and tighter with each round of call for funding opportunity available and/or released. This often leaves many African countries

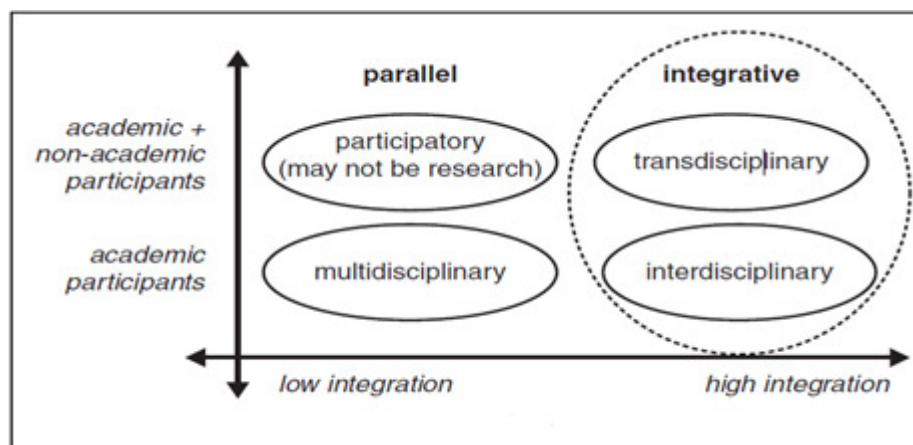


Figure 2. Degrees of integration and stakeholder involvement in integrative and non-integrative approaches (Source: Tress *et al.*, 2005)

and researchers unable to meet the timelines as well as unable to submit expression of interests and/or proposals. However, there is a budding opportunity to finance research for public benefit that is opening within the philanthropists (Wadman, 2007; Spero, 2014). There are more global rich individuals and companies than ever before that are providing more financial resources and equipment to support research efforts around the world. Philanthropic organisations and individuals have come forth to take an active role in fighting climate change; the Hewlett Foundation for example has been making a commitment of \$100 million per year for five a year period. This growth in philanthropy has not left Africa either; a tremendous growth has been realised in the last decade supporting development course in Africa (African Grant Makers, 2013). The key issue that will remain to be addressed whilst engaging with philanthropists and that often remains sticky is; whose research are they funding. In the overall, this is the one of the novel areas that requires to be strategically explored to co-resource climate research, information and service provision in Africa.

Acknowledgement

We acknowledge the support provided by the United Nations Economic Commission for Africa (UNECA) that facilitated the organisation of the Climate Research for Development in Africa (CR4D) workshop in Nairobi and formed the basis upon which this paper was developed. This paper is a contribution to the 2016 Fifth African Higher Education Week and RUFORUM Biennial Conference.

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