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Changing Global Environments

21. Social science perspectives on global environmental change in sub-Saharan Africa

by
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Climate change and climate variability in sub-Saharan Africa tend to expose existing environmental risks and opportunities. Despite some noted social science interest and work in this field, including good examples at the continental and local levels, much more can still be done by and with Africans, including at the local community level.

Introduction

Global environmental change research requires interaction between social and natural sciences in order to understand the complex Earth system and the mix of competing development and environment interests better (Rockström et al., 2009; Raworth, 2012). There has been a strong focus, internationally and from African natural sciences, on explaining some of the drivers of environmental change – such as land use and agricultural change – with arguably fewer social scientists engaging actively in Earth system science teams.[1]

Traditionally, social scientists seldom initiate research on global environmental change themes, although exceptions do exist (see Odada et al., 2008). One example is that despite the slow interaction between the sciences, the nature–society relationship and the question of how we begin to frame and negotiate future sustainability pathways are becoming active research and policy concerns for the United Nations University and the International Human Dimensions Programme on Global Environmental Change (Duraiappah and Rogers, 2011). Social scientists are increasingly asked to help frame research themes and understand the contested environmental spaces, values, views and meanings of environmental and transformative change in various contexts (Hackmann and St Clair, 2012).

This article examines some of the benefits of trying to improve our understanding of various global environmental change challenges, including socio-ecological complexity, by using a social science lens. The article also identities the opportunities and incentives for undertaking this kind of research, particularly in sub-Saharan Africa. Finally, the author suggests how social scientists could play a more active role in global environmental change research and action in this part of Africa.

Environmental challenges facing Africa

The current development realities facing the continent – including the fact that Africa is experiencing a new optimism, with rising consumer spending, innovation opportunities and a growing, youthful population – cannot be ignored when addressing global environmental change issues (Swilling and Annecke, 2012). Researchers, many from the natural sciences, have identified significant challenges (Odada et al., 2008), including poverty, desertification, disease, deforestation and hunger.

Climate change and climate variability is a particular sustainability challenge for Africa (Christensen et al., 2007; UNEP, 2012; Bhaskar et al., 2010):

> All of Africa is very likely to warm during this century. The warming is very likely to be larger than the global, annual mean warming throughout the continent and in all seasons... Annual rainfall is likely to decrease in much of Mediterranean Africa and northern Sahara… Rainfall in southern Africa is likely to decrease in much of the winter rainfall regions and on western margins.
>
> (Christensen et al., 2007)

Fluctuating temperatures, and rainfall in particular, are critical for rural and urban livelihoods. This means that mitigation of and adaptation to climate change and climate variability are important development priorities, given the risks that climate may have for resources such as energy, water, health and food. A central concern for Africa, as in other regions, is to reduce the possible consequences of climate change, including increased disaster risks at the regional, district and municipal levels, and to ensure that people can live with climate change amidst other pressing challenges (Christensen et al., 2007).

Social sciences and environmental change in Africa

African social scientists have added to these priorities by including other dimensions, for example complex neoliberal globalisation, intercultural relations, poverty, gender and intergenerational relations, the evolution of spirituality and religion in the modern world, and emerging powers in the South (CODESRIA, 2011). The range and variety of these issues are central to the global environmental change discourse, calling attention to social phenomena and processes that need to be understood when identifying environmental drivers, conditions or states. The key challenge, however, is to ensure that such social science approaches are included when the key challenges of global environmental change (e.g. Rockström et al., 2009) are framed, and that social scientists are included from the outset in designing and framing research agendas with Earth systems scientists.

Given this potentially rich field, what has been the social science research role in global environmental change in recent years in sub-Saharan Africa? Publications on climate change and broader global environmental change themes have increased significantly over the past decade (see Table 21.1). These themes include “vulnerability and resilience”, “modelling energy systems” and “environmental governance”. There were noticeable gains between the periods 1990-99 and 2000-11: 405 articles were published on “vulnerability and resilience” from 2000 to 2011 compared with 28 from 1990 to 1999, for example.

Table 21.1. **Social science publications (full counting) on climate change and global environmental change by themes in the sub-Saharan region**

Articles (1990-99)		Articles (2000-11)	
Climate change impacts	7	Climate change impacts	48
Energy resources	1	Energy resources	33
Modelling energy systems	4	Modelling energy systems	146
Sustainable rural development	5	Sustainable rural development	30
Sustainable urban development	22	Sustainable urban development	66
Vulnerability and resilience	28	Vulnerability and resilience	405

Note: See article by Ludo Waltman, Annex B1, for information on methodology used and definitions.
Source: Web of Science. Annex B, Table B.7.

Identifying the reasons for this increase in these global environmental change themes in sub-Saharan Africa is difficult, likewise it is not easy to determine the total proportion of social science funding by country. Available science outputs for all sciences show that South Africa dominates all scientific publications (46.4% of the subcontinent's share) followed by Nigeria (11.4%) and Kenya (6.6%) (Urama et al., 2010b: 26). For example, although the social sciences are being promoted in South Africa, much remains to be done. Over the period 2009-12, 499 projects were supported in the social sciences and 842 in the humanities by two directorates of South Africa's National Research Foundation compared with 2 056 in the natural sciences. In global environmental change research (society and sustainability), less than half the projects (4 of 13) are in the social sciences, with about ZAR 40 million provided in 2012-14, less than half of the total funding.[2]

Science is driven by a number of factors, including curiosity and collaboration. Themes of interest are usually clustered along dominant constellations (Hajer, 1997) and often mirror "Northern" science practice. External funders, including those funding international development, also fund research on global environmental change and play a key role in stimulating global environmental change research in Africa. The Climate Change Adaptation in Africa Programme was funded by Canada's International Development Research Centre (IDRC) and the United Kingdom Department for International Development (DFID); the Climate and Development Knowledge Network (CDKN) is also funded by DFID; other funders include the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), the European Union and the United States National Science Foundation (NSF). These efforts tend to focus on science and development, which includes the Millennium Development Goals, poverty reduction and building resilience to climate change.

While funding is limited for social sciences and training, some funders are making noteworthy contributions. A small survey was undertaken for this article to understand better what drives social science research on global environmental change and climate change in Africa, and sub-Saharan Africa in particular.[3] The issues probed included funding support for social sciences, social sciences and their role in global environmental change in Africa, and the barriers and challenges for social science research and engagement. The survey respondents included social scientists, organisations facilitating global environmental change social science engagement (such as START – Grants for Global Environmental Change Research in Africa[4]) and international funding agencies and organisations operating at national and local levels such as DFID, IDRC, the International Council for Science and its regional African office, the World Bank and the South African National Research Foundation (NRF).

Most respondents, many with notable experience of supporting global environmental change research globally, reported that support for social science research is usually linked to the mandate and agenda of the funder and the aid agency. Many focus on practical efforts – described by one respondent as "taking the pulse" of what is occurring in a particular area, such as agriculture, poverty, green jobs, employment creation or capacity building. Where the science products (such as publications and other reports) and capacity development are both measurable research outputs, these are usually specified in funding calls and often require work from multidisciplinary teams. Notwithstanding this support, measuring the success of outcomes remains difficult. Several respondents noted this as a major challenge, particularly for sustained capacity in social science research. Moreover, donors and funders of social science work are often driven by project-based funding that provides support for a specific period of time. Sustained funding is often very limited for ongoing multidisciplinary and transdisciplinary social science research. As outlined earlier, national funding for social sciences research on global environmental change was also noted as weak in many cases (with some noting the exceptions of South Africa, Ghana and Nigeria).

Consultancy firms are also used to undertake social science research linked to development problems. Some respondents noted that consultants could be hindering sustained social science efforts in this field by not feeding their results back into an overall body of social science knowledge.

This suggests that the development requirements of Africa may be attracting more social development science than deeper thinking around the sociology of the issues (Urry, 2009) confronting Africa. The tendency for social science research bodies to be driven by the latest emerging theme could result in a more superficial understanding of social relations in complex areas such as climate change, for example simply identifying risks and neglecting the social meanings of risk. Better use is therefore needed of the "…arsenal of social theory and methodological approaches" (Agrawal et al., 2012: 330).

Notwithstanding this strong development focus, there seem to be few detailed, nuanced in-depth studies of global environmental change in sub-Saharan Africa from African social science perspectives that include local knowledge, local "framings" of climate change and variability, power and justice. Nor are there detailed studies of cultural meanings, human rights and the ethical dimensions of climate change. Where are the systematic, comprehensive systemic critiques that take us beyond a predominant focus on local case-based research (see Bhaskar et al., 2010)? Despite the significant increase in studies on vulnerability and resilience (Table 21.1) and sustainability, there remains more to be done in African-led, social science-instigated studies focusing on social sciences, global environmental change and climate change.

Challenges and opportunities for social science research excellence

As in other international cases, the interaction between the biophysical and socioeconomic drivers of change operates on several scales: international, regional, national and local. It is not straightforward to investigate such complex issues in the African context. Intellectual capacity is not lacking, but the skills and equipment needed to undertake research on environmental change (such as field and laboratory equipment and technologies) are not always available. There is also a serious shortage of capacity building, and too little training of the next generation of scientists.

At the launch of the Royal Society/DFID Africa Capacity Building Initiative in November 2012, the Chief Scientific Advisor and Director of Research and Evidence at DFID, Chris Whitty, pointed to sub-Saharan Africa's notable growth in GDP in recent years. This growth is estimated at 6-8% per year, meaning an approximate doubling each decade. He suggested that some of this growth could have been used to support scientific research in Africa and to grow its limited pool of scientists. In most African countries there are, however, up to 1 000 times fewer scientists than in Asian countries at a comparable stage of development (Tatalović, 2012). African scientists often move to Europe, America or Australia, seeking better opportunities. In addition, younger, early-career scholars are not usually inclined to pursue crossdisciplinary and transdisciplinary science, preferring to gain a solid training in specific job-related disciplines such as information technology or economics.

An African future for social science and sustainability?

Despite this mixed review, new and interesting social science themes are emerging. These tend to have their roots in critical social issues such as land tenure, the economics of adaptation, behaviour and conflict. A further theme is the benefits of legal and governance systems such as reducing emissions from deforestation and forest degradation (REDD+) (see e.g. Beymer-Farris and Basset, 2012). Understanding the politics of environmental and forest management is important when seeking equitable forest management practices for environmental sustainability. Notions of "forests", baselines of forest cover and how forests are changing all need to be understood from wider and deeper social science perspectives. Such research raises critical questions about the kinds of approaches we use in the practice of global environmental change and sustainability science, such as transdisciplinarity (Thompson Klein, 2009).

Transdisciplinarity and other approaches

Social scientists have recently been articulating what is needed to achieve a better understanding of the social processes – past and present – that drive global environmental change and influence how we respond to change (Hackmann and St Clair, 2012). While many international scientists agree that the climate is changing and that urgent action is needed (Christensen et al., 2007), there are some who contest the conclusion that climate change is driven by human activity. Climate change science is also uncertain. In this context, and with a view to developing solutions to the challenges posed, it is necessary to establish appropriate communication channels and safe spaces for multi-actor dialogue on shared knowledge production, contestation and validation in Africa. Such processes could benefit from more social science research and wider civil society engagement.

Expanding the reach and usefulness of global environmental change and climate change research in Africa and elsewhere will, however, require big shifts in how we do things, including more transformative social science attention to global environmental change (Hackmann and St Clair, 2012). Transdisciplinary approaches could help achieve this (see Thompson Klein, 2009; Boyle and Harris, 2009; Reeger and Bunders, 2009; Chilisa, 2012). Some African social scientists (for example, Urama et al. 2010b; Swilling and Annecke, 2012) are embarking on research that includes local communities, policymakers, city councils and local actors from the outset, and work with a co-designed research agenda. The Council for the Development of Social Science Research in Africa, the International

Union for the Conservation of Nature, and the University of Illinois at Urbana-Champaign (with Swedish International Development Agency support), support a responsive forest governance programme that is examining REDD+. This programme includes local people and local representatives to create a shared understanding of forestry management systems for climate change (Agrawal et al., 2012).[5] Some African-wide research driven by Africans with donor aid is also exploring new research opportunities, using action research and social learning approaches. Examples of these opportunities are the START African capacity-building efforts and the African Climate Policy Centre, focusing on climate science and services, urbanisation and disaster risk reduction.

Concluding thoughts

This article has explored some of the progress made in identifying the important environmental challenges facing Africa. Several conclusions can be drawn from this analysis.

First, and despite notable efforts in some areas, there is still a need for the social sciences to engage more vibrantly in global environmental issues in Africa, emphasising the larger, systemic challenges and aiming for a deeper sociology of science. A specifically African-influenced social science agenda that can improve the understanding of global environmental change challenges in Africa must be supported and strengthened. This could include the role of local knowledge, cultural traditions and resource use, and consciousness and "meaning making" for climate change and global environmental change in Africa. Funders are crucial to stimulate social science research and support a more fundamental, critical social science engagement in environmental issues. Of course development-focused research support in Africa is essential, but this cannot be decoupled from the need for stronger support to examine the sociology of global environmental change themes.

Second, social sciences can and must add value by providing a more nuanced understanding of climate change.

Third, the challenges facing Africa will also require an expanded way of doing science. The co-production of knowledge, and transdisciplinary approaches (e.g. Thompson Klein, 2009; Boyle and Harris, 2009) that address challenges, provide critical realism approaches (e.g. Bhaskar et al., 2010), while indigenous research methodologies (e.g. Chilisa, 2012) offer opportunities to infuse African perspectives into global environmental change research.

There is an overwhelming need for sharpened efforts in education and training in science and technology across all fields (Urama et al., 2010a).

Finally, the lack of useful meta-theories – including those that enable us to critically engage with the complex systems challenges that climate change presents – remains a challenge, globally and for Africa (Bhaskar et al., 2010; Urry, 2009; Swilling and Annecke, 2012).

"Radical intellectuals need to show in detail how alternative futures can be coherently grounded in the deep structures of what already exists, of what people already know and have" (Bhaskar, in Bhaskar et al., 2010).

Notes

1. *www.icsu.org/future-earth*, for example.
2. Personal communication with Achuo Enow, Programme Director for Global Change, National Research Foundation, in 2013.
3. Please note that this survey was a very small and preliminary research effort – an attempt to feel the pulse of African social science research on global environmental change and climate change.
4. START: *http://start.org/programs/africangec*, Global Change System Analysis for Research and Training.
5. Personal communication with Ribot in 2012.

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