



Re-Defining Sahelian ‘Adaptive Agriculture’ when Implemented Locally: Beyond Techno-fix Solutions

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Summary. — Climate-related adaptation practices are often conscious policy decisions initiated from outside a community by governments, development agencies, or other actors. Whereas expectations that such adaptation strategies would positively interact with local priorities to support action, adaptive actions at one scale might also constrain actions at other scales depending on the context. Yet, limited empirical evidence exists on the tensions, or, in the best case, synergies between adaptation practices that cross spatial scales, policy arenas, and jurisdictional boundaries. Drawing on a longitudinal study conducted in agropastoral communities in Burkina Faso, I examined how higher scale agricultural adaptation actions initiated by government and international organizations were re-defined when implemented locally. The findings illuminate a discrepancy between the aims of (a) higher scale adaptation practices and (b) the strategies pursued by local agropastoralists. While higher scale initiatives, promoted since the great droughts hit the region in the 1970s and 1980s, remained technical in nature and aimed to boost agricultural food production, local strategies were primarily pursued to secure off-farm income and animal fodder. Efforts to advance adaptation across scales will necessitate better attention to local contexts such as off-farm activities as integrated and viable ways of agropastoralists’ ‘agricultural’ adaptation repertoire, and institutions, organizations, and local networks should move forward with collaborative processes, including local stakeholders from the outset, to develop broader adaptation plans than technological-only.
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1. INTRODUCTION

Impacts of climate change on livelihoods are being felt across the world as a result of both gradual changes in temperature and precipitation, as well as more frequent and severe extreme events (IPCC, 2014). To deal with these changes, scholars and policymakers point to the need for effective adaptation actions, especially in developing countries where the confluence of climate change, climate variability, economic pressures of globalization, population growth, and environmental change often threatens development outcomes (Kates, Travis, & Wilbanks, 2012). Such adaptation actions can be driven by agents ranging from individuals, households, and communities, to public institutions and governments at local, regional, national, and international scales (Adger, Arnell, & Tompkins, 2005). While expectations that adaptation strategies initiated at different scales would positively interact to support action; mitigative and adaptive actions at one scale might also constrain actions at other scales depending on the context (Cash & Moser, 2000; Wilbanks, 2002). Examples include national policies that adversely constrain local policies, local actions that aggregate into large-scale problems, and short-term decisions that aggregate into long-term problems (Cash *et al.*, 2006). Yet, concrete evidence of cross-scale interactions has been mixed and limited attention has been devoted to empirically explore synergies, or, in the worst case, tensions between adaptation practices crossing spatial scales, policy arenas, and jurisdictional boundaries. A few exceptions do exist. For example, Murtinho, Eakin, L’opez-Carr, and Hayes (2013) present evidence of negative interactions across scales. They find that local actions to address water scarcity in rural Andean communities are undermined by unsolicited public sector interventions and

rather than enhancing capacities to collectively manage current and future risk, the government support has diminished the inclination for communities to take action.

While this body of research has somewhat advanced our understanding of how external interventions might impede local adaptation, the evidence base is still sparse, leaving questions about scale-interactions, especially in the agricultural sector, relatively unexplored. This is worrying as informal, formal, endogenous, and externally initiated institutions are claimed to be interdependent and equally important in processes of adaptation (Rodima-Taylor, Olwig, & Chhetri, 2011). Thus, it is pertinent to go beyond the well-trodden path of single-scale case studies to empirically examine dynamics across scales. Only by doing so, can understandings of adaptation planning processes at various scales, especially the local and national-scale, be improved which is an important step in the attempt to better align priorities of adaptation actions and overcome challenges arising from cross-scale interactions (Agrawal, Perrin, Chhatre, Benson, & Kononen, 2012).

To begin filling this gap, this paper explores the ways in which higher scale climate adaptation actions are re-defined

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when implemented locally. In particular, I aim to tease out how the priorities of local-, regional-, national-, and international-scale adaptation strategies align (or not) for the agricultural sector and to identify situations in which externally initiated and higher scale adaptation strategies may have unintended (positive) effects, or result in increased local vulnerability to hazards—i.e., perpetuate maladaptation (Maru, Fletcher, & Chewings, 2012). To assess local-scale adaptation, I use a longitudinal data set collected in the mid-1990s and in 2010 across two agropastoralist villages in Burkina Faso. To explore regional-, national-, and international-scale adaptation strategies, I draw on semi-structured interviews with personnel from a subset of key institutions and organizations in Burkina Faso.

Burkina Faso is well suited to explore adaptation practices to climate change given the region's high intra- and inter-seasonal climate variability, as well as the recurrent droughts and floods that affect crops and livestock (Mertz *et al.*, 2012). Also, the region has been portrayed as being among the most vulnerable in the world (Tscharkert, 2007) as it exhibits limited human adaptive capacity to cope with anticipated increases in climate variability and extreme events, resulting from substantial reliance on rain-fed agriculture, limited economic and technological resources, insufficient safety nets and educational progress, and poverty (Niang *et al.*, 2014). As a consequence, unwavering crisis narratives and a notion of victimization were found in the National Adaptation Programmes of Action (NAPAs) across the Sahel (Tscharkert, 2007). But such views tend to downplay accumulated experience in the face of future climatic changes or extreme events and they also undermine the fact that many communities in Burkina Faso and across the Sahel have been exposed to high climate variability for decades and have developed adaptive strategies to respond to it (Mertz, Reenberg *et al.*, 2011; Mertz, Mbow *et al.*, 2011; Mortimore, 1998; Mortimore & Adams, 2001). Burkina Faso thereby presents an interesting case of how local people, governments, development agencies, and other actors have to deal with climate change and variability as well as a myriad of other stressors placed on local livelihoods and well-being. A better understanding of how these adaptation actions unfold and interact across scales is paramount as the conventional wisdom is that state interventions at higher scales are necessary to accomplish climate change adaptation in the vulnerable Sahelian environments (Mortimore, 2010).

2. THE MULTI-SCALE NATURE OF ADAPTATION PROCESSES

(a) *Local and higher scale adaptation*

Many competing definitions of adaptation have been used in the literature, resulting in conceptual murkiness (Burnham & Ma, 2015). The IPCC defines adaptation as an 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (IPCC, 2007). Adaptation can vary in form, function, temporality, and spatial scope, and it may be a response to a range of stimuli in addition to climatic change, such as economic pressures of globalization, population growth, and environmental change (O'Brien & Leichenko, 2000). Given that climate change and variability 'sit' between other, possibly more immediate, stressors (Harmer & Rahman, 2014; Wise *et al.*, 2014), the adaptation strategies are not necessarily separable from the cultural, polit-

ical, economic, environmental, and developmental contexts in which they occur (Shackleton, Ziervogel, Sallu, Gill, & Tschakert, 2015).

Adger *et al.* (2005) argue that adaptation is an issue relevant from the very local to the international scale. 'Local-scale' adaptation refers to the set of adaptations made by individuals or households either as a reaction to various exposures or as ex-ante actions intended to mitigate harm from future exposures. Local-scale adaptation is internally initiated by individuals within a community and is facilitated by their own social capital and resources. Reilly and Schimmelpfennig (2000) point out that some local-scale adaptation actions occur without explicit recognition of the changing risk imposed by climate change or other stressors, while other adaptation actions are specifically targeted climate-induced threats. Given that local people may employ adaptation actions not only to reduce adverse effects of specific environmental changes, but also to enhance opportunities for well-being (Thorn, Thornton, & Helfgott, 2015); local-scale adaptation is inevitably forming much of the climate adaptation repertoire (Washington *et al.*, 2006).

'Higher scale' adaptation will most often require conscious external intervention—or in other words, it is being initiated from outside the community. Higher scale adaptations are deliberate, strategic actions taken by, for example, national governments or international agencies or organizations. Such deliberate actions are often taken with the aim to return to, maintain, or achieve a desired state and they are based on awareness that conditions have changed or will change (Thornton & Manasfi, 2010). Examples of higher scale adaptation can be illustrated by the NAPAs of least developed countries (IPCC, 2014). The NAPAs were mandated in the Marrakesh Accords agreed at the Seventh Conference of the Parties to the United Nations Framework Convention on Climate Change (COP7) in 2001. Since then, many African countries have initiated comprehensive adaptation planning processes through NAPAs as these have been promoted as the most prominent national scale effort to identify priority areas for climate change adaptation. However, implementation is lagging (Niang *et al.*, 2014) and the NAPAs tend to focus narrowly on technical solutions, education, and capacity development within the fields of agriculture, food security, water resources, forestry, and disaster management; while leaving questions about how to integrate actions with economic planning and poverty reduction processes relatively unexplored (Mamouda, 2011; Pramova, Locatelli, Brockhaus, & Fohlmeister, 2012).

(b) *A better focus across scales as a way to achieve more effective adaptation*

While considerable attention has been paid to issues of scales and institutions within the natural resources governance literature (O'Brien, Sygna, & Haugen, 2004; Ostrom, 2001), less effort has been spent in understanding how cross-scale interactions might influence and shape climate change adaptation. When scholars consider climate change adaptation, they tend to focus empirical work on just one scale of action, such as the local or national scale, thereby missing a thorough understanding of interactions within and across scales (Cash & Moser, 2000). Adger *et al.* (2005) highlight the problems with such approaches. They argue that the scales of adaptation are not independent from each other. Whether the adaptation action is undertaken by individuals, households or the nation state; the actions are embedded in social processes that reflect the relationship between individuals, households, com-

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