
THE ROLE OF LOCAL INSTITUTIONS IN ADAPTIVE PROCESSES TO CLIMATE VARIABILITY

The cases of southern Ethiopia and southern Mali



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ABBREVIATIONS

AFD	Action for Development
AOPP	<i>Association des Organisation Professionnelles Paysannes</i>
CMDT	<i>Compagnie Malienne pour le Développement Textile</i>
GDPI	Gayo Pastoralist Development Initiative
GoE	Government of Ethiopia
HRD	Humanitarian Requirements Document
INGO	International nongovernmental organization
MSc	Master of Science
NGO	Nongovernmental organization
PA	Peasant association

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EXECUTIVE SUMMARY

The research presented in this report was conducted with the goal of describing and analyzing the diverse roles of local social institutions in adaptation processes over the course of recent decades. Field sites were chosen in the agro-pastoral zone of Borana in southern Ethiopia and in the cotton-growing regions of Mali because of these areas' significant vulnerability and sensitivity to climate variability, particularly drought.

The following key questions guided the fieldwork:

1. What role do local social institutions have in long-term adaptation to environmental change?
2. How have extra-local actors interacted with local social institutions in development and adaptation efforts?
3. How is the production and use of weather and climate information organized?

Drawing inspiration from Agrawal (2008, 2), local social institutional dynamics were analyzed in terms of how

- a) they structure impacts and vulnerability,
- b) they mediate between individual and collective responses to climate impacts and thereby shape outcomes of adaptation, and
- c) they act as the means of delivery of external resources to facilitate adaptation, and thus govern access to such resources (2008, 2 formatting is author's).

The research found that local social institutions mediate people's adaptive processes, production practices, land and water governance, social support systems, gendered household dynamics, use of weather and climate information, and interactions with external actors and interventions. Adaptation is a long-term transformation of social and technical practices and networks. Efforts that build on or complement existing adaptive processes and institutions stand a better chance of being both materially and socially effective. Furthermore, the research showed that local social institutions are rarely fully transparent, democratic, or inclusive. However, this does not necessarily mean that local social institutions lack social legitimacy or accountability. Because of their legitimacy and accountability, it is generally preferable to work with existing institutions instead of attempting to establish new ones.

The report concludes with seven recommendations:

1. Development efforts should enhance people's adaptive capacities so that they are then better able to engage in and lead adaptation processes.
2. Nongovernmental organizations (NGOs) should look for opportunities to support endogenously led adaptation rather than presuming to initiate adaptation processes.
3. Land and water management issues should simultaneously engage both customary and state institutions, building cooperation and collaboration.
4. Opportunities for market integration should be weighed against the costs that often come in relation to erosion of customary social support mechanisms.
5. Increasing women's access to educational, political, and financial opportunities will help reduce their vulnerability to the adverse effects of climate change. However, such increases can only be meaningfully achieved through long-term sustained engagement, not short project cycles.
6. Livelihood diversification into economic activities that are not directly climate-dependent should be promoted to reduce vulnerability to climate shocks. This diversification can include cyclical or long-term labor migration.
7. Synergy in weather and climate information production practices should be facilitated through collaborative efforts between customary producers and scientific forecasting.

INTRODUCTION

Adaptation to climate change and climate variability poses serious challenges to farmers and herders¹ in arid Africa. Although farmers and herders in semiarid ecologies are highly exposed to climate stresses, especially drought, adaptation to climate change is far from being a clear-cut biophysical or technical problem: it is also a deeply social challenge. Climate scenarios for the coming century indicate that even cultures and livelihoods in semiarid zones that have been organized around uncertainty and drought risk are expected to be exposed to new extremes, challenging their adaptive capacities. High poverty rates and fragile ecologies create a situation where farmers and herders are highly sensitive to even relatively small decreases in rainfall. These factors combine to create high vulnerability to drought and associated food insecurity.

Sahelian Africa is known for extreme variability, with both historical and archaeological records indicating acute and protracted swings in the climate patterns (Hulme et al. 2001; McIntosh 1993). Even in a stable long-term climate, there is interannual variability: some years are always warmer or colder, wetter or drier, than others. Indeed, many farmers around the world will say that there is no such thing as an average year. Not only have farmers and herders always had to adapt technical practices to interannual climate variability, they also have a large degree of uncertainty about what any given year will bring.

The droughts over the last 50 years may or may not be directly attributable to anthropogenic climate change, but from the perspective of understanding adaptive processes of social institutions, this is not an important distinction. What is important is that we can learn about how social institutions mediate adaptive processes in relation to recent climate variability, which in turn can inform forward-looking approaches to climate change adaptation in the coming decades. This is particularly important in that many climate change scenarios point toward such new conditions that they may surpass the thresholds of institutions, local or otherwise, to effectively respond to them. However, in addition to extreme climate variability, Africa has also seen substantial political, technical, and economic changes, the effects of which cannot be simply bracketed away from climate. Instead, adaptive processes must simultaneously balance the many intersecting drivers and dynamics of change.

Local social institutions form a key locus of such multifaceted adaptive processes. Such institutions represent mechanisms of both culture continuity and dynamism in agrarian societies; they are mediums through which people adapt to changes (driven by any factors), while simultaneously maintaining some degree of social coherence and continuity. As such, the study of adaptive processes in local social institutions is an important aspect of climate change research, one which often receives insufficient attention.

From the perspective of external development actors, the question becomes how to support local adaptation processes and their associated institutions in ways that are both materially effective (adapted to ecological and climatological factors) as well as socially effective (serving human needs and interest). How can external stakeholders contribute to enhancing the farmers' and herders' resilience and adaptive capacities? Ethnographic research is particularly well-suited to address these questions in relation to climate adaptation through the integrated analysis of how farmers' knowledge, practices, and social institutional processes interact with the environment, on one hand, and also with extra-local actors, such as nongovernmental organizations (NGOs), development agencies, and governmental bodies, on the other (Roncoli, Crane, and Orlove 2009). Furthermore, an ethnographic research approach enables analysis of adaptation as something that emerges from the dynamic and creative agency of rural people, rather than something that is suffered through and initiated by external actors.

¹ "Herder" and "pastoralist" are used interchangeably throughout this document.

Box 1: Defining coping and adaptation

Following on Agrawal (2008) and many others, we distinguish between coping and adaptation. *Coping* refers to short-term responses to stress that are then followed by a return to previous practices. On the other hand, *adaptation* represents long-term processes through which baseline practices themselves are changed.

To maintain viable livelihoods, farmers and herders must be able to cope with and/or adapt to (see Box 1) all climatological dynamics and extremes across a sliding time scale, from individual weather events to long-term climate change (Crane, Roncoli, and Hoogenboom 2011). Rural livelihoods have always relied on a mix of social institutions and technical practices to cope with and adapt to environmental stresses. However, the scope and pace of contemporary change—environmental and otherwise—leads to a situation where local adaptive capacities are sometimes exceeded. For example, technical practices can cease to work under new conditions, or they can degrade resource bases, crossing thresholds toward unsustainability. Similarly, the efficacy of social institutions can break down due to exogenous factors (“globalization,” “modernization”) or are sometimes undermined—either intentionally or incidentally—by state or development agendas. Alternatively, the magnitude of environmental changes can simply surpass the capacity of local institutional and technical innovation to effectively address the stressor, leading to both social and environmental upheaval. The strategic and careful interventions by external actors, such as NGOs can contribute to successful adaptation in rural communities.

LOCAL SOCIAL INSTITUTIONS

In climate adaptation literature, a great deal of attention is paid to biophysical models indicating potential impacts (Hein, Metzger, and Leemans 2009; Hulme et al. 2001), science- and technology-driven adaptation (Millner and Washington 2011; Ortiz et al. 2008; Thomas et al. 2007), and the practices and structures of governance (Adger, Arnell, and Tompkins 2005; Adger et al. 2003; Young and Lipton 2006). However, comparatively little work has been done on local-level responses to climate change and variability, especially the institutional processes that shape them. Adaptation of agrarian livelihood practices necessarily occurs in particular social and ecological settings. As such, the adaptive dynamics of local social institutions (see Box 2) are often of critical importance because centralized planning or generic, ready-made technical fixes are of limited utility for the specificities of local practice. Thus local institutional structures become critically important in adaptation strategies. Agrawal (2008, 2) points out three aspects that make local institutions relevant in climate adaptation:

- a) they structure impacts and vulnerability,*
- b) they mediate between individual and collective responses to climate impacts and thereby shape outcomes of adaptation, and*
- c) they act as the means of delivery of external resources to facilitate adaptation, and thus govern access to such resources.*

The general mediating role of institutions—between people and the environment, between individuals and collectivities, and between different collectivities—make them essential to adaptation efforts. As such, these three characteristics of institutions form the cornerstones of analysis in this report. The first characteristic of institutions—structuring impact and vulnerability—is touched on in this report, but is treated more lightly than the following two. There have been several climate vulnerability analyses done in semiarid Africa (Eriksen, Brown, and Kelly 2005; Ifejika-Speranza 2006; Makoka 2008; Quinn et al. 2011; Ribot, Magalhães, and Panagides 1996; Tschakert 2007), which are useful in describing interactions between social organization and exposure to biophysical stressors, such as drought.²

However, because we are specifically interested in dynamics of change in adaptation, this project has given greater attention to the ways that local social institutions mediate responses and relationships over time, especially how they have mediated changes in social organization and technical practice. The emphasis on social institutions as mediators of action is important because it provides a conceptual mechanism for connecting technical and social practices, as well as individual and collective behaviors, an often overlooked angle in adaptation research (Agrawal 2008; Crane, Roncoli, and Hoogenboom 2011).

On top of the changing environmental landscape, the institutional landscape itself is likewise dynamic, meaning that the factors and mechanisms that mediate people's relationships with the environment and each other are in flux. Social institutions can be internally contested, highly variable across space, and flexible over time in response to both social and environmental changes. For example, the role of local social institutions in the Sahel has changed dramatically in recent decades, partly in response to the severe droughts of the 1970s and 1980s, but also in response to non-climate drivers. The way people draw on kinship networks has changed, women's groups and youth organizations have risen in prominence, and new institutions for local natural resource management have been formed under decentralization policies (Batterbury and Warren 2001). Similarly, in the Borana zone of Ethiopia, social institutions mediating land and water use, as well as social order, have been transformed by a variety of intersecting climatic and political events over the last few decades (Kamara, Swallow, and Kirk 2004; Watson 2003).

² The research acknowledges flooding as another manifestation of extreme climate events but has focused on drought due to its high salience in the study zones.

Box 2: Defining social institutions

For the purposes of this research project and this paper, “social institution” is used in the broadest sense. This means that it encompasses both formal organizations, such as councils and associations, and informal organizations, such as kinship and commercial networks. Regularized social practices —such as customary tenure or gendered divisions of labor —are also included in the concept of social institutions. Such an inclusive definition emphasizes the practical importance of not simply equating “institutions” with physical organizations: doing so risks leaving critical aspects of rural society invisible.

Furthermore, “local social institutions” are considered those with accountability and legitimacy primarily established at the village or regional levels where they operate. This puts them in contrast to “external actors,” such as national governments or international NGOs (INGOs), with accountability and legitimacy typically established beyond the scope of the villages and regions where they often operate. While the distinction between these two is partly arbitrary and overly simple, it is also a useful heuristic for alluding to power differences between actors.

Interventions by national governments, NGOs, and other development agencies have been, and continue to be, contributing factors to these fluctuations, in turn working in collaboration with (Homann et al. 2008), in parallel to, in ignorance of, and sometimes against local social institutions (Angassa and Oba 2008; Kamara, Swallow, and Kirk 2004). Because adaptation is a process that necessarily occurs in particular social and geographical locations, it is important for external actors to understand the adaptive dynamics of local social institutions for their efforts to be more effective. Already embedded in people’s social lives and livelihoods, local social institutions are often considered to have greater social legitimacy than external actors. However, after examining interactions between Borana pastoralists and international NGOs and development agencies, Watson (2003) warns against idealizing the capacities and potentials of local institutions, pointing out that their embeddedness also may a) make them sites of local political struggles and mechanisms inequity and b) limit their ability to address some issues that fall outside the scope or capacities of the institution.

Recognizing the importance, limitations, and risks of collaborating with local social institutions in development projects, the question then becomes, how can such collaboration be pursued in ways that meet both local needs as well as those of the external organizations? One of Agrawal’s (2008) key conclusions is that before any external adaptation intervention is conducted, organizations such as NGOs should first have a solid understanding of the existing dynamics of access within and between local institutions. Such an understanding increases the odds that adaptation projects effectively address biophysical stresses, such as climate variability, while simultaneously meeting the social needs of local actors in meaningful ways. Relatedly, Agrawal’s other key recommendations involve greater support for partnerships and coordination between institutions (local and extra-local), both of which will be enabled through improvement of local institutional capacities. These recommendations are the launching point for the research project undertaken by Oxfam in Ethiopia and Mali.

RESEARCH QUESTIONS AND METHODS

There is increasing awareness that effective collaboration with community-based social institutions is an important aspect of climate change adaptation and development in general (Agrawal 2008). This research project was inspired by the desire to understand how local social institutions mediate adaptive response to long-term environmental change. Through such analyses, the objective is for development organizations, such as Oxfam, to develop ways of partnering with local social institutions more effectively in climate adaptation efforts.

This project has intentionally avoided focusing on short-term coping mechanisms that have been amply covered elsewhere (Cekan 1992; De Bruijn and Van Dijk 1994; Deressa, Hassan, and Ringler 2008; McCabe 1990; Roncoli, Ingram, and Kirshen 2001; Thornton et al. 2007; Webb 1993). We have also intentionally avoided focusing exclusively on technical practices, for two reasons. Many technical studies assume that adaptation occurs at the household level (production units) and gloss over dynamic social processes beyond households. While we have paid attention to changing technical practices, this is set in the context of how certain social institutions enable or constrain them, ultimately shaping the adaptive process. Because women are often more vulnerable to suffer the negative consequences of environmental change than men, and often relatively less powerful than men in accessing and shaping social institutions, both research teams included gender analysis in their research.

The research teams focused on answering the following questions:

1. What roles do local social institutions have in long-term adaptation to environmental change?
 - What are the relevant institutions?
 - How have they acted in relation to a changing environment?
 - How are they organized?
 - How are they accessed, and by whom?
2. How have extra-local actors interacted with local social institutions in development and adaptation efforts?
 - Who are the relevant extra-local actors?
 - What are their agendas?
 - What strategies and entry points have been used to pursue their agendas?
 - What effect have these strategies and entry points had on local social dynamics?
3. How is the production and use of weather and climate information organized?
 - Are there local weather and climate specialists?
 - If so, what is their social standing and how is their knowledge used?
 - Does scientific meteorological information reach people?
 - If so, how is it perceived and used?

This research project developed in phases. After the research proposal was funded, a project initiation meeting was held in Bamako, Mali, in February 2011. This meeting brought together Oxfam staff, national research consultants, and civil society members from Ethiopia, Mali, the Netherlands, and the United States. At the workshop, participants collectively and iteratively developed a shared understanding of the problem definition, specific research questions, and approaches to conducting the research, as well as a timeline and a definition of expected outputs.

Because the research settings and the composition of the research teams in Mali and Ethiopia were different in a many ways, each team was given some liberty in how to organize fieldwork and methodological approaches to the research themes. Fieldwork was conducted in spring and summer of 2011. In both countries, sites selection was based on a combination of factors: the area's significant exposure to high climate variability as well as Oxfam's existing networks and programs. In addition to the research consultants and their teams, two Master of Science (MSc) students student from Wageningen University also conducted research, in coordination with, but largely independent of, the consultants. All researchers used a mixed-methods approach, combining focus-group discussions, semi-structured key informant interviews, life histories, case studies, and household surveys. A strong emphasis on qualitative data was intended to elicit information on social processes and the mechanisms of change, while some quantitative data provide descriptive statistic values.

In Ethiopia, research was conducted in the heavily pastoralist Borana zone in the southern part of the country (see Debsu 2012). Oxfam also has a long history of involvement in pastoralism in Ethiopia (Kirkbride and Grahn 2008). The research in Ethiopia was complicated by the fact that it was conducted while the Borana zone was experiencing a severe food shortage due to the extreme ongoing drought. Not only did this complicate logistics, but the acute food shortage, livestock deaths, and social stress meant that many people were too busy coping with the immediate drought to discuss adaptation to drought. It did, however, provide an opportunity to observe some social responses to drought in action. Also, a Masters student did independent research on the role of NGOs in drought responses (Arendse 2012).



A woman holds a basket of locally-produced cotton in Banakoro, Mali.
(Rebecca Blackwell/Oxfam America)

In Mali, the research (see Diawara and Sissoko 2012) was conducted in the southern and western parts of the country, the cotton-growing zones, where Oxfam has a long history of involvement (Traore and Bickersteth 2011). One fieldwork site was in the heart of the old cotton zone in the region of Koutiala and another site in the western region Kita, where cotton has only recently been promoted. Research was conducted in the villages of Kita and Koutiala. A Masters student did research independently on a third village in the Sikasso region (Howard 2012).

In both countries, research findings were presented at the communities and at national workshops. The findings of the two theses (supervised by the author of this report) were also presented at these events. These four documents form the source material for this synthesis report. Two external reviewers with topical and regional expertise provided extensive feedback on the country reports and synthesis report.

FINDINGS BY SUBTHEMES

Local social institutions relevant to climate change adaptation are highly varied. Informal institutions, such as gender roles, household structures, and ethnicity define constraints and opportunities that are available to people, as well as the values according to which they will assess and engage those constraints and opportunities. Social institutions that mediate access to the basic material means of production, such as land, pasture, water, seeds, and equipment, are of obvious relevance to climate adaptation. Such institutions provide stable reference points for the social “rules of the game,” while also framing the range of potential avenues for change or alternative adaptive pathways. Social institutions that generate information on weather, climate, and environment are also pertinent because they inform farmers’ and herders’ production practices. Beyond these social institutions, local organizations and associations that are oriented toward social or economic development may also indirectly be relevant in adapting to climate change, inasmuch as they improve people’s access to new skills, resources, and networks that promote livelihood diversification and resilience.

Due to the intertwining nature of these various social institutions, it is difficult to analyze each distinctly in a compartmentalized fashion. Instead, this section is organized around five key themes, within which multiple social institutions and the complex institutional interactions will be described and analyzed:

- Production strategies
- Land and water governance institutions
- Social-support systems
- Household, gender, and adaptive-capacity dynamics
- Weather and climate information

Illustrative cases are drawn from the consultant reports and MSc theses to serve as reference points for the broader discussions. Various external interventions will be referred to throughout the five subsections that follow, while a sixth subsection will discuss external interventions explicitly.

PRODUCTION STRATEGIES

Changing basic production strategies in response to climate change is often characterized as a clear-cut technical issue. However, the capacity for such change is largely a function of social institutions, because they mediate people's relationship with productive resources, with neighbors, and with society in general. Change occurs in this context. Agricultural and pastoral livelihoods require that people effectively mobilize diverse networks to gain access to material inputs, labor, information, market outlets, value chains, social-support systems, and ecosystems. In other words, any individual's ability to engage in a particular practice is shaped by the intersection of multiple social institutions: household, kinship network, ethnicity, gender, land tenure, village associations, markets, governmental policies, and aid and development agencies. As such, adapting basic production strategies to a new climate pattern is very rarely a simple technical question.

For example, one important aspect of Borana culture is the gada system, which is a cultural complex spanning across all Oromo ethnic groups that integrates politics, military, religion, kinship, ethnic identity, social hierarchy, natural resource use, etc. (see Legesse 1973). Despite a strong cultural value for cattle herding, the Borana have increasingly adopted camel and goat herding as an adaptation to persistent drought and pasture decline. The adoption of camel and goat herding as production strategies requires the acquisition of different patterns of pasture and water use, new knowledge about animal management, and linkages with new market channels, all of which represent some degree of institutional change. Moreover, Borana have historically had particularly strong taboos against the consumption of camel meat and milk, meaning that the camel herding has met resistance on deep cultural grounds. Thus, camel herding adoption is not simply a change of technical practice by individual herders, but an affront to collective cultural identity that continues to meet resistance by some gada officials and spiritual leaders (qallu). However, culture is ultimately flexible, and the social institutions, such as the gada and qallu, which mediate the interaction of cultural ideals, technical practicalities, and the environment, are gradually adapting to the new situation.

As camels continue to prove to be more resilient to droughts than cattle, camel herding and the consumption of camel products are increasingly gaining cultural acceptance in the face of environmental change. So, on one hand, traditions and values in relation to cattle herding that are institutionalized throughout Borana culture are being challenged by the adoption of camel and goat herding. On the other hand, the cultural values and social institutions supporting pastoralist livelihoods in general are maintained though the adoption of camel and goat herding, thus Borana pastoralism in general shows resilience in the face of necessary change. Though the cultural identity of cattle herders might have to be given up by the Borana, the cultural identity of being pastoralists is maintained by the adoption of camel and goat herding. This dynamic highlights how people can maintain some degree of self-determination in the face of change through the adaptive flexibility of "traditional" cultural institutions.

All around the world, altering planting regimes is a key adaptation to increasing climate variability in agricultural livelihoods. The strategic use of seed varieties and timing of planting are two key planting strategies that are varied to meet climate variability. Far from being simple technical acts, numerous social institutions bear upon people's abilities to use these strategies effectively. Institutions such as meteorological services and folk forecasting provide information. People have variable degrees of access to, and find variable utility in, these meteorological services when choosing when to plant. (See the "Weather and Climate Information" section below.)

Furthermore, institutions such as the kinship networks and gender mediate the ways people are able to access the labor and equipment necessary for planting at favorable moments. (See the "Household, gender, and adaptive-capacity dynamics" section below.) These social institutions in turn interact with formal organizations that promote market-oriented agriculture through access to credit, seeds, equipment, etc.

For example, in Mali, the Compagnie Malienne pour le Développement Textile (CMDT) promotes cotton production throughout the region. By mediating farmers' access to inputs through its own standards and practices, such as only contracting with the one person per household who is in charge of farming activities (typically male), the CMDT shapes resource distribution patterns in families and villages, affecting the structure of these fundamental social institutions. (See the "External interventions" section below.) However, as a parastatal focused largely on the production of an export crop, cotton, CMDT also mediates between farmers and institutions of the global commodity markets. In this function, it has often come under intense criticism for its treatment of the Malian peasantry, who have protested its policies on several occasions (see Bingen 1998; Roy 2010).

Although the CMDT is a powerful organization, with its own agenda in the Malian cotton belt, Malian farmers maintain a substantial degree of independence from CMDT's vision of proper agriculture, illustrating that Malian farmers selectively draw on different institutions to pursue their own ends, their own vision of what is adaptive agricultural practice. For example, although CMDT officially recommends planting cotton in monoculture, peasants continue to plant in mixed polyculture to manage risk and needs through a strategy of diversification. While the CMDT has been an important source for high-potential hybrid seeds (not only cotton), which fill a niche in many household's production strategies, evidence indicates that farmers simultaneously engage in informal networks through which landrace and open-pollinated seed varieties are exchanged. While many of these seeds are not as high yielding as hybrid seeds in favorable growing seasons, they are more reliable producers under less-than-ideal growing conditions, which are characteristic of Sahelian agriculture.

The continued maintenance of a dual-seed system is significant in that it underscores the importance of access to diverse institutions and networks for maintaining the availability of a wide range of agrobiodiversity choices. Selections vary from person to person and from household to household, as well as from year to year, depending on particular climatic, economic, and social factors. The delivery of higher-quality seeds through the formal breeding and extension institutions is often cited as an essential aspect of adaptation in agricultural systems, but working with informal seed exchange networks is likewise an oft-overlooked opportunity for supporting robust and resilient agrarian systems.

One important aspect of adaptive processes is that people have an array of opportunities and options that they are aware of, have access to, and can choose to implement. Local social institutions can be enabling and/or constraining in relation to these factors, as can broader institutional environments. The Borana camel-herding case illustrates that adaptive choices are framed by constraints that contextualize them.

Consequently, the geographical and institutional scale within which development projects are framed has political implications in terms of how problems are defined and thus what solutions are pursued (see also Crane 2009). Both countries show that social institutions and the values that they reproduce are ultimately flexible, but the processes by which they adapt can be slow and uneven. This process, however, is an important aspect of self-determination in the face of change. NGOs seeking to engage in climate change adaptation will need to simultaneously facilitate access to new ideas, skills, and practices, while leaving room for social deliberation and choice about whether and how to integrate them.

LAND AND WATER GOVERNANCE INSTITUTIONS

Land and water are fundamental productive resources for farmers and pastoralists, meaning the social institutions that mediate access to them inevitably play an important role in shaping people's adaptive capacities. Much adaptation hinges upon the ability to use these essential resources in a new, different, or flexible fashion.

Over the last 50 years, substantial changes have occurred in institutional practices of land and water tenure in both Mali and Ethiopia. Both countries have customary local institutions that continue to have social legitimacy, if not necessarily legal recognition, and they also have local institutions with legal authority that have been formed by the modern state. This creates situations where legal authority and social legitimacy do not overlap entirely, leading to lack of clarity in, or contestation between, local institutions.

While camel herding has been cited above as a climate-related livelihood change that is occurring in the Borana zone of Ethiopia to maintain pastoralism as livelihood strategy, this practice has been substantially affected by changes in the institutions governing land and water use. In the gada system, rules and practices governing pasture and water management, as well as herder mobility, are revisited in eight-year cycles, creating opportunities for change while simultaneously maintaining stability and continuity.

Starting with the Derg³ in 1974, however, the Government of Ethiopia (GoE) has sought to sedentarize pastoralists in the southern lowlands and convert them to agricultural livelihood strategies as a part of an overall "modernization" of the country. A major part of this political strategy has been to systematically undermine the gada system. The rationale behind these attempts to dismantle the gada lies in the modernist state perspective that the gada represented an implicit challenge to state authority. Furthermore, pastoralism was seen as "backwards" by the modernist Derg regime. One primary strategy for building new local institutions undertaken by the Derg regime was the establishment of peasant associations (PAs), which were staffed by local people—usually young men enthused and empowered by the modernist revolutionary project of the Derg—but were accountable to the national government rather than to the peasants themselves, as noted by Watson (2006, 79):

Many indigenous forms of institution were seen as problematic, as they were considered to be mired in tradition and superstition, and thus the opposite of the society that the modernizing revolutionaries wished to engender. No doubt many of these institutions were also seen as alternatives and therefore threats to the establishment of the regime's new grassroots institutions, the Peasant Associations. The PAs, which exist to this day, were officially granted many powers that had historically rested with the gada. Subsequently, the gada had no legal standing but continued to exist in a weakened form.

In terms of Borana adaptation to climate variability, the Derg, through the PAs, imposed two key policies: banning bushfires and limiting pastoral mobility. The bushfire ban led to rangeland degradation through the encroachment of woody species and non-palatable grasses. Limiting herders' mobility through sedentarization and the delimitation of administrative zones created a political context that effectively reduced the viability of cattle herding. While severe droughts in the region over the last few decades would have put major stress on cattle herding as a viable livelihood in any case, the sedentization policies must be seen as having an exacerbating effect to the drought, as these policies remove the essence of the pastoralist adaptation to semiarid environments, mobility.

³ A strong Marxist military regime that overthrew the imperial regime of Haile Selassie. The *Derg* gave way to a democratic republican government in 1987, although many members continued to be influential.

The fall of the Derg regime in 1991 and disillusionment with the PAs has led a partial resurgence of the gada system's engagement in land management. Currently, while the GoE continues to promote privatization of land and sedentary agriculture through the PAs, the gada is striving to promote and support pastoral livelihoods through the reestablishment of its collective-management rangeland and water resources as public goods (see also Watson 2003). While there are some instances of cooperation between PAs and gada authorities, when two local institutions claim authority over the same resource domain, it creates a situation in which various actors are able to appeal to the institution that best serves their interests. Wealthy herders and people who have fully converted to agricultural livelihoods have successfully enclosed many key rangelands and water points supported by GoE privatization policies and are thus resisting efforts to reestablish customary collective management by the gada.

Placing the Borana experience in broader context shows that neighboring ethnicities, which have also historically been cattle herders, suffer under the same stresses of rangeland degradation, land enclosures, and tensions between customary institutions and the PAs. This combination of stresses has promoted cattle raiding and conflicts between groups, compounding the challenges of a pastoral livelihood in the area to the point of becoming an existential crisis. One Borana herder sums up the situation (Debsu 2012):

Today, most parts of the Borana grazing lands are being taken away by three enemies: hostile neighboring groups, thorny bushes, and private enclosures. These situations may lead to the complete disappearance of the Borana rangelands. I have a concern that the Borana people may cease to exist as cattle herders as the grazing lands become a bone of contention among these three enemies.

The case in Ethiopia highlights how local social institutions, while often construed as having greater social legitimacy and accountability in rural communities, can also be sites of complex power contests that intertwine with broader political, cultural and economic institutions.

In Mali, as in Ethiopia, customary local institutions and local institutions established by the "modern" state intersect and overlap, leading to increased complexity around adaptive dynamics. For example, village chiefdom and land tenure are two of the most important social institutions in rural Mali, and they are undergoing intertwined changes driven by a variety of factors. Village chief (dugutigi) is a hereditary position that stays within the extended family of a village's founding lineage. A dugutigi plays many social roles, with a very important one being in customary land tenure practices. It is a dugutigi's right and duty to allocate land within his domain. These allocations were for agricultural use and were not permanent-use rights.

Because of their deep history and privileged position, members of a village's founding lineage have had greater access to more and better land. But these initial land claims are augmented by continued close access (through lineage ties) to those who distribute land. Historically, any fallow land could be reallocated to other families or newcomers by the village chief, if there was a perceived need. This rule did not apply, however, to fallow lands belonging to members of the founding lineage. Thus the founding lineage's land access was supported and preferentially maintained by the customary land tenure system headed by the dugutigi.

Nevertheless, in recent years, it has been increasingly common that all village lands have been distributed to local families, and fallowing has become rare. This is significant because it is creating a situation wherein the social institutional mechanisms of access to land are undergoing considerable change. People seeking land must now negotiate with heads of landholding households rather than village chiefs, leading to a decline in chiefs' influence and power over the distribution of agricultural land.⁴ Even in the absence of formal titling institutions, a kind of de facto ownership is emerging, though there is still no formal "market" in a neo-liberal sense. In other parts of Africa, such gradual,

⁴ It should be noted that village chiefs retain the right to convert use and ownership of agricultural land for the purposes of housing construction.

evolutionary, and organic change in the institutions of land access and tenure is increasingly running up against more transformative modernist experiments with formal land titling (Baye 2008; Chimhowu and Woodhouse 2006; Sjaastad and Cousins 2009). This creates another situation in which customary and modernist institutions both claim authority and social legitimacy in mediating access to this fundamental productive resource, while promoting different visions of their objectives and mechanisms. However, the binary of informal and formal need not be so stark. There is likewise some evidence of emerging hybrid forms of land tenure taking hold, though their stability and efficacy remain unclear (Yemadje et al. 2012.). In the coming decades, as arable land becomes scarcer and the effects of climate change unfold, social institutions of land tenure will play a central role in shaping the adaptive dynamics in agrarian communities. Those who are able to maintain access to viable quantities and qualities of land will be able to explore certain opportunities for adaptation in technical practices or social organization, but the adaptive capacities of those whose tenure on viable land is insecure will have a very different range. Limited access to and productivity of land will likely be one driver of out-migration to urban centers, as agricultural livelihoods become less and less tenable, as is already being seen elsewhere in West Africa (Yemadje et al. 2012.). This dynamic has already been documented in response to demographic growth and soil degradation, and we can expect climate change to compound the issue.

The institution of the village chiefdom is tied to more than land allocation. Membership in the lineage is itself a mark of distinction and creates differences in access to networks and opportunities. In Gouana, for example, descendants of the founding lineage were found to hold key leadership positions in most of the village's voluntary membership-based associations and organizations, whereas the second-largest lineage held none. Extended kinship networks can operate as very organized corporate entities, with leadership councils, coordinated activities, and political factions. While the details in this particular case are unknown, the observation that one lineage holds leadership positions in most village organizations implicitly challenges assumptions that village associations and organizations operate as independent and democratic entities, in contrast to historic-heritage-based leadership roles. The significance and dynamics of such lineage dynasties varies from village to village in Mali—and are sure to vary even more widely in other locations around the world—but they can have important implications for how external organizations interact with local institutions.

Findings from both Mali and Ethiopia indicate that choice of local partners by an external organization may have substantial implications in terms of local politics. It must always be recognized that there are many layers of power and interest in local social institutions that may not be readily apparent at first glance, and indeed may not be at all transparent to external actors. However, it should also be emphasized that local power hierarchies may often have social legitimacy, and circumventing or challenging them can undermine an external organization's credibility. The cases in both Mali and Ethiopia illustrate that social legitimacy and power disparities are not necessarily mutually exclusive, especially in hierarchical cultural contexts without strong democratic traditions. The gada system, dominated by men and based on age-grade system, has seen resurgence largely because many Borana people find it more equitable and accountable than organs of the national government. Social hierarchies based on lineage in Mali have in some ways led to institutionalized inequalities but are also recognized as a part of the social order. Democratic movements in both countries over the last 20 years (recent coup in Mali notwithstanding) have led to some questioning and challenging of traditional social hierarchies received from history, but this questioning and challenging is also associated with an individualism that runs counter to institutionalized values of social interdependence.

SOCIAL-SUPPORT SYSTEMS

Societies in semiarid Africa have developed various sorts of social-support mechanisms over time with which to buffer against the threat and impact of drought on their livelihoods. While these can be seen as short-term coping mechanisms, they also represent long-term adaptations to the vagaries of social and environmental stresses. Changes in social-support systems over the last several decades indicate transformations in the ways that household livelihood strategies are connected to each other.



Qaballe Sirba, 30, walks home with her new goats, in the village of Kanbi, where Dubaf runs a restocking program.

Eva-Lotta Jansson / Oxfam America

In the Borana pastoral system, livelihood stability in the face of extreme climate variability is made possible by important social-support institutions, especially those oriented toward restocking cattle to households that have lost theirs through the effects of drought. The *buusa gonnofa* is a key social-support system in Borana culture, wherein people who have lost their cattle (to drought or to raiding) can be given cattle (usually milk cows) by more-successful clan members to restock their herds and maintain at least a bare-minimum living from the milk. It is important to note that cattle given through *buusa gonnofa* are gifts, not loans. *Buusu gonnofa* is premised on a moral economy of mutual interdependence within kinship networks, but it also requires socioeconomic differentiation: for a destitute herder to receive cattle, he needs a clan member with a wealth of cattle. Furthermore, *buusa gonnofa* is not without economic calculus. As a material investment in a social network, it is possible for successful cattle herders to see some struggling cattle herders as too poor to be a worthwhile investment. Reliance on this social safety net has historically been an important motivator for respecting rules regarding the use of communal pastures, emphasizing the degree to which the various aspects of the *gada* system are intertwined.

Buusa gonnofa continues to be practiced in the Borana zone, but it has extended beyond cattle to include goats, sheep, and camels as well. In recent years, goats have become the most gifted of animals, reflecting the diversification of Borana herds, but perhaps also the general poverty of Borana herders, as goats are the least valuable of all animals. It is also telling that bulls are increasingly given, reflecting the increased importance of farming and animal traction in the area.

A combination of political and environmental factors has weakened the *buusa gonnofa* support system over recent decades. Because it is based on economic stratification and differentiation of herders, *buusa gonnofa* has not proven resilient to universally devastating cattle die-offs, where everyone becomes poor. The increased articulation with the market economy has also significantly undermined interest in *buusa gonnofa*. Promoted by privatization and intensification policies, a cash economy of individualistic opportunities in market networks has been gradually replacing the moral economy of mutual obligation in kinship networks.

Beyond the challenges posed by universal poverty and increasing institutionalization of market orientation, there is one final limit to the efficacy of *buusa gonnofa*: shame. Receiving aid in the form of handouts, whether from a relative or an NGO, is seen as debasing because it concretely identifies the receiver as being lower in socioeconomic hierarchy. Consequently, agreeing to receive any form of assistance is not taken lightly.

The mechanisms of social support in response to food shortage in agricultural societies are likewise based on mutual interdependence across socioeconomic stratification and differentiation. In Mali, as in Ethiopia, gifting resources within kinship networks is an important practice for short-term coping with food insecurity or with shortage in planting seeds. Historically, redistribution of food resources would take place within large, extended families that operated as a single, collective, economic-production unit, managed by the senior male head of household. However, over the course of the last two decades, such large polynuclear families have increasingly split into numerous smaller households.⁵ While shared lineage is still an important channel through which social-support resources flow, the economic compartmentalization of households from the same lineages is reported to have raised barriers to seeking assistance from kin.

Although it remains more common to appeal to a relative than a non-relative for assistance, gifting has become increasingly rare in Mali. Now, it is more common for families whose crops have failed or done poorly to exchange labor for food, representing a subtle commodification of debt. One positive side of this is that it facilitates making labor-for-food exchanges with non-kin, widening the pool of potential benefactors. That being said, as in Ethiopia, shame is a noteworthy factor in shaping people's choices to borrow from either kin or non-kin. Customary social support may be seen as having become even more commodified in that people now may choose to take on formal economic debts from state-based and market-based institutions, such as the CMDT.

Over the last several decades, local social-support institutions in both Mali and Ethiopia have weakened significantly. Customary social mechanisms of risk mitigation, while still existent, are no longer as effective as they had once been. While this decline is undoubtedly linked to many factors, environmental degradation and market integration are identified as important drivers. Environmental degradation contributes to the diminishing resource base, which decreases social stratification by impoverishing nearly everyone, meaning there are fewer and fewer highly successful people to act as benefactors toward the less successful. Intensification of market integration has promoted compartmentalization of household economies and stimulation of greater investment in capital goods at the expense of investing in social networks. This is reinforced by formal institutions of credit and debt.

⁵ The splitting and consolidation of households is a common phenomenon seen throughout West African kinship dynamics. What is particularly noteworthy here is the degree to which it is connected to increased articulation with market institutions.

HOUSEHOLD, GENDER, AND ADAPTIVE-CAPACITY DYNAMICS

The family remains a core social institution, which shapes people's access to various resources, as well as their vulnerability to hazards. Household structures and kinship networks organize people's relationships with each other and the environment, particularly in terms of gendered activities, and their access to resources. Our research finds that women and girls are often the first to suffer adverse social effects caused by droughts due to the gendered division of labor in households.

In Ethiopia, it falls on the shoulders of women and girls to compensate for many of the immediate hardships that emerge during droughts, adding an extra burden to their already substantial normal tasks (cooking, collecting firewood, and collecting water). One significant aspect of drought is the reduced availability/quality of nearby pasture for cattle. To make up for this, women and girls are tasked with collecting fodder by hand from remote locations, often locations that are difficult for animals to reach. Water collection, for both household and animal consumption, can also become more time consuming, as some water sources dry up and greater distances must be travelled. These tasks often fall on young girls, who may be removed from school to engage them, further adding to the impact of drought. Even men acknowledge this gendered burden (Debsu 2012):

Whenever serious drought like this one strikes, it is the women who are directly affected due to, first, increasing work load: women fetch water from distant place, they care for sheep, goats, calves and weaker livestock; prepare food, look after children. Second, in terms of food availability, it is women who bear the burden. They feed their children and their husband before they eat themselves.

It is worth pointing out that this method of caring for cattle during droughts represents an intensive practice, the necessity of which can only be properly understood when situated within the broader context of reduced mobility. Historically, mobility is the essential adaptive strategy of pastoralists in semiarid ecologies. Extreme drought would have stimulated migration toward better pastures. However, government policies promoting sedentarization, enclosure of pastures, and strict geographic boundaries on cattle movements change the scope of adaptive options available to pastoralists, highlighting how extra-local institutions with very different visions and values have the potential of limiting the range of options pursued within local institutions.

In Mali, where male heads of households are allotted fields through requests to the village chief (dugutigi), women typically gain access to personal fields through their male head of household, often their husband or their husband's brother or father. Having a personal field is customarily seen as a woman's right so she may grow crops for household consumption (usually vegetables for the sauce) and/or for cash marketing (the money from which often goes toward provisioning children).

Even after procuring a field, women face additional challenges to productivity based on gendered social norms. What land women do get from their husbands is usually very degraded, having been mined of soil fertility through continuous cropping. Improving a field's condition is up to the women, but this can only be done through acquisition of animal manure, which is most often used on family (men's) fields, or chemical fertilizer, which is prohibitively expensive.

Similarly, access to field plowing is impacted by gender. Women's plots are usually the last to be plowed, which further affects their productivity (see above section on production strategies). Plows and traction animals are in high demand during the early season, and plowing is explicitly men's work, so women must contract with men to get plowing done. Some women have the social or financial resources to get their fields plowed earlier than others, but overall, their secondary position in the family leads to late planting. Finally, women's tenure on fields is poor, meaning that even if they manage to substantially improve a plot, it can be reclaimed by their head of household.

In recent decades, women in the village of Gouana have seen their access to and tenure on fields decline. This is driven by increasing pressure on land, which results from demographic growth and declining soil fertility. In recent decades, village lands have been increasingly brought into production, with fallow times decreasing or disappearing entirely, and soil degradation is severe, leading to declines in productivity. As male heads of household are responsible for decisions about how to distribute household land, women are increasingly losing out. Furthermore, the lack of uncultivated land makes it difficult for women's associations to convince village chiefs to grant them collective plots. In this situation, the local institutions of household and chieftaincy tend to systematically, if not necessarily deliberately, undermine women's adaptive capacities, which often affects children's well-being as well.

Access to financial resources is a key aspect of adaptive capacity. In both Mali and Ethiopia, extra-local development actors have stimulated various forms of cooperatives or savings and credit groups oriented toward women, some of which have analogues in customary practices. These cooperatives have had some success in increasing women's access to cash economy, enabling them to develop and explore new opportunities in diversification. While diversification is often touted as an important aspect of adaptation and resilient livelihoods, it is important to emphasize that not all forms of diversification are equally adaptive to climate hazards. Women's investments in climate-sensitive activities such as farming, herding, or handicrafts—which are often the most accessible to women—can be a risky strategy of economic diversification in the face of climate variability. Alternatively, investment in economic activities that are not so directly climate sensitive—such as commerce—is a more-resilient strategy. Cooperatives have created means of pooling risks and increasing economic efficiencies through collective action, but again, when they are focused around climate-sensitive activities, they continue to be vulnerable to interannual climate variability. Moreover, in both countries, women's ability to administer cooperatives and savings groups is constrained by extremely limited literacy and numeracy skills.

While many of these gendered household dynamics are not directly linked to climate change, taken together they underscore how women's ability to adapt their livelihood practices is often constrained, and not only by the structure of familial institution. Household and gender practices limit women's access to land, labor, education, and finances, and market institutions such as the CMDT can build upon and reinforce such inequitable familial organization, directly or indirectly. (See the "External Interventions Section" below.) General socioeconomic factors, such as literacy and numeracy, are important determinants of adaptive capacity, emphasizing that social processes of climate adaptation are strongly linked with "non-climatic" factors.

WEATHER AND CLIMATE INFORMATION

Social institutions involved in the production of weather and climate information are obviously relevant to how farmers adapt to drought and drought risk. In both Mali and Ethiopia, people continue to engage in locally embedded practices to anticipate conditions in upcoming seasons. These practices sometimes involve common folk knowledge and sometimes rely on specialists who use more arcane methods. Furthermore, religious rituals promoting good rainy seasons are regularly held. Such traditional practices, while not always acknowledged by outsiders as effective, continue to have social legitimacy in rural communities in terms of the knowledge they produce or the social effect they have.

In Mali, Muslim, Christian, and traditional rituals are undertaken to petition supernatural forces to provide for a good season. These rituals can intensify in years when rains are slow or late in starting. In addition to whatever effect they may have on actual rain patterns, from a social institutional perspective they serve to bring people together to pool risk (at a metaphysical level) and confirm social solidarity in the face of uncertainty. This can be instrumental in forming the foundation of social-support networks that can be mobilized in the case of drought stress.

In both Mali and Ethiopia, rural communities draw on observation of natural phenomenon, such as plant and animal behavior, not only to gauge the timing of the onset of the rainy seasons, but also to estimate the relative quantity of the rainfall that can be expected. For example, a small portion of people sampled in Mali look to the ripening of particular wild fruits as indicators of the relative quantity of rains in the upcoming growing season. Poor visibility of certain stars, especially the Pleiades, prior to the rainy season is seen as an augur of poor rains, as has been found elsewhere in the Sahel⁶ (West, Roncoli, and Ouattara 2008).

Farmers and herders in Mali and Ethiopia have varying degrees of exposure to scientific meteorology. While the majority of farmers interviewed in Mali acknowledge hearing weather reports over the radio, those reports are generally accorded little value as inputs for agricultural risk management. The Borana expressed a clear preference for using seasonal forecast information from traditional forecasters (ayyantu), who use closely held arcane methods. Information from ayyantu is seen by the Borana as being timely, accessible, and specific to the area, and is used to inform decisions about migration with herds (see also Luseno et al. 2003).

Meteorological forecasts are generally perceived as having less legitimacy due to their unfamiliar language and their lack of geographic specificity and timeliness. For example, farmers find that forecasts framed at the regional level —“There will be rain across the Sikasso region” —lack the specificity that could make the information more useful as operational information.

Overall, these findings indicate the importance of the social distance between the production of information and its use. Farmers and herders do not draw strongly on scientific weather reports transmitted over the radio partly because there is no dialogue with that institution of knowledge production, thus there is no accountability. While the empirical accuracy and quality of the information is important, so too is the relationship between production and application of that information. Social legitimacy is as important as scientific legitimacy when it comes to how people use information. Rather than using anticipatory information, such as scientific weather forecasting, farmers and herders often continue to rely on local institutions and observations. Farmers and herders continue to rely on their own local forecasting practices because they are grounded in their own experience, and they have a relationship with those making forecasts, leading to greater trust and accountability. This is not to deny the potential utility of meteorological forecasting but to recognize that its relevance to decision making in rural communities is a function of its institutional organization vis-à-vis end-users.

⁶ Poor visibility of the Pleiades is thought to be an indicator of particulate matter in the upper atmosphere, which may be linked to precipitation.

The integration of traditional and scientific forecasting is suggested as a means of allowing rural communities to more effectively capitalize on synergies between them. While there is great potential for bridging across climate-information-generating institutions, it is not without its challenges. There is often mutual skepticism and mistrust between scientific meteorologists and traditional forecasters, both of whom see themselves as holding specialist knowledge and methods that do not mix easily with the other (Berkes 2009; Guthiga and Newsham 2011). However, there have been some successes with this approach, emphasizing the importance of building mutual trust and commitment to the shared goal of developing information that is relevant, timely, and credible to community members (Guthiga and Newsham 2011).

When pursuing the integration of traditional and scientific meteorology forecasting, it is important to note that other research has clearly indicated that the social channels through which weather and climate information is processed, exchanged, and acted upon are particular to cultural settings and can reflect or even magnify social disparities (Broad, Pfaff, and Glantz 2002; Crane et al. 2010; Roncoli et al. 2003; Roncoli et al. 2009; Siregar and Crane 2011). It is tempting to view climate information as an objective or neutral input, but in as much as it is produced, disseminated, and applied within particular institutional contexts, it has the potential to be done in socially or politically pointed fashions (Broad and Agrawala 2000). For example, during the 2010-2011 drought in Ethiopia, in addition to the GoE's drought early warning system, two national NGOs⁷ and one INGO⁸ also maintained their own drought early warning systems. However, NGOs cannot effectively mobilize resources in response to droughts until the GoE officially declares a drought, leading to unnecessary replications and delays in drought response (see Box 3).



Drought Early Warning system (DEWS) community meeting in Borena region in Ethiopia - Emily Farr/ Oxfam America

Furthermore, it needs to be recognized that institutional contexts —ethnic identities, socioeconomic positions, etc. —can predispose people toward profoundly different choices of adaptive strategies, even regarding the same situation and information (Crane 2010). As such, it is not enough to pay attention to the salience, credibility, and legitimacy of climate information itself (Cash, Borck, and Patt 2006); attention also needs to be paid to the social mechanisms through which it is processed (Peterson et al. 2010) and acted upon (Siregar and Crane 2011).

⁷ Action for Development (AFD) and Gayo Pastoralist Development Initiative (GDPI), and CARE.

Box 3: The 2010-2011 drought in Ethiopia

In terms of institutional monitoring of weather and climate conditions, it is important to take special note of the drought early warning systems, which mediate the national and international responses to droughts. In principle, early warning systems create objective ways of recognizing severe droughts as they happen so they may be responded to quickly and effectively. However, the early warning system in Ethiopia, in place since 1976, has until recently been widely recognized as being calibrated to highland agriculture, both institutionalizing a governmental bias against lowland pastoralists and masking that bias behind the veneer of a set of objective indicators. While this systematic bias was meant to be addressed through the recent development of a designated Pastoralist Early Warning System (EPaRDA 2008), even this is seen as having several shortcomings.

The extreme drought of 2010-2011 provides further indication of bias against pastoralists by the Ethiopian government in terms of how drought information is used in political contexts. After the *haggaya* rains of October and November 2010 completely failed to materialize, the NGOs and pastoralist organizations began gathering data and raising alarms about the impending humanitarian crisis. However, the GoE eventually chose to officially verify that there was a crisis, replicating much of the data collection. This led to a three-month delay in the release of the Humanitarian Requirements Document (HRD), the official declaration of a humanitarian emergency. This is important because international NGOs and aid agencies cannot even begin to mobilize relief services until the HRD is made. As such, emergency interventions did not reach the Borana zone until April 2011, after the crisis had severely deepened. These interventions were widely seen as inadequate because the first HRD, published in late February 2011, significantly underestimated the scope and severity of the drought and the number of people affected. In June 2011, the HRD was revised to more accurately reflect the severity of the humanitarian crisis, with the number of affected people increasing from 2.8 million to 4.1 million (ECHO 2011).

EXTERNAL INTERVENTIONS

In the Borana region of Ethiopia, there is a decades-long history of external interventions in livelihoods and adaptive processes. State-driven interventions in governance practices and their effects have already been described above. In addition to the GoE, however, NGOs, development organizations, and humanitarian aid agencies have also been active in southern Ethiopia for decades. Humanitarian relief agencies became firmly established in Ethiopia following the severe droughts of 1973-1974 and 1984-1985, although the number of NGOs and the scope of their activities were extremely restricted throughout the Derg regimes (1974-1991). It was not until the fall of the Derg that NGOs, both national and international, began to proliferate, though they continue to be closely monitored by the GoE.

A survey of NGOs active in the field sites of Yabello and Moyale reveals that although no NGOs have activities that are explicitly oriented toward climate change adaptation, there are a great number of activities pertaining to vulnerability reduction. However, the history of external actors as important agents in emergency relief is apparent in the Borana NGO sector. Virtually all of the NGOs active in Yabello and Moyale have their origins in emergency relief, particularly during the droughts of the 1980s. Consequently, emergency relief forms the core reference point for the organizational cultures and their interactions with Borana pastoralists. Pastoral development efforts oriented toward disaster risk reduction, addressing the factors that create vulnerability, were only later added to the portfolio of activities. Broadly speaking, most of these activities are directed toward pasture and water rehabilitation, veterinary services, health and nutrition, and marketing opportunities.

Development initiatives that either mimic or build directly upon customary risk management strategies are more likely to be take hold. Due to their familiar forms, such interventions are more easily able to integrate with existing cultural dynamics. Several NGOs have been active in reinvigorating buusa gonnofa, the social-support system of gifting cattle to destitute relatives. GDPI, notably a Borana-led NGO focused on pastoral issues, and AFD have been engaging in restocking programs organized around the same principles as buusa gonnofa. Their programs provide a female animal to families in need, determined through the same criteria as customary buusa gonnofa, which are then in turn required to give the offspring of that animal to another family in need. These programs are not based purely on kinship relations but are instead designed to enhance mutual support and reciprocity between herding families.

Newer social institutional forms in Borana, namely milk and livestock marketing cooperatives, have had limited success. These have been introduced by various NGOs, with the aim of livelihood diversification through better connection with the cash economy. Livestock cooperatives, however, have not created significant benefits for herders vis-à-vis traders, and articulations with the national and international market may in fact create incentives for unsustainable rangeland management. Furthermore, the livestock cooperatives tend to be dominated by wealthy herders and so may elevate socioeconomic stratification (Holtland 2011).

Livelihood diversification is a major theme in NGO development projects in Ethiopia. While diversification is, in general, an effective way of buffering against shocks and stresses, it is important to consider the nature of the activities into which people are diversifying. Diversification into activities that are highly climate dependent may be effective in buffering against social or economic stresses, but it cannot be seen as a useful strategy of adaptation to climate change or variability. For example, in Ethiopia, milk cooperatives (which are overwhelmingly oriented toward women) are only functional during good rainy seasons, when milk cows are most productive (Holtland 2011). The climate dependency of this diversification strategy means that it is still highly vulnerable to climate variability and will represent idle capital during nonproductive times.

While international development projects and NGO programs are also ubiquitous in rural Mali, there is no other extra-local organization that has had a greater impact on the research areas than the CMDT, a parastatal corporation that has a monopoly on cotton in Mali. Following a policy pursued even in the colonial era, the Malian state continues to heavily stimulate cotton production to generate international

exchange revenues. This national policy position has led to a strong investment in promotion and extension programs in rural locales in southern and western Mali.

The CMDT was founded by the government of Mali in 1974. It is now 60 percent owned by the Malian state and 40 percent owned by a French company. In Malian cotton zones — especially those where cotton has been grown for the longest time—the CMDT has become a pervasive and encompassing organization in village life, despite long having had a contentious relationship with farmers (Bingen 1998).

The CMDT has a significant effect on local social institutions. For example, it has a rule of dealing only with the person in a household who directly manages agricultural activities. This person is quite often the son or younger brother of the official head of the household. From the CMDT's administrative perspective, this makes perfect sense. When looking at the policy from the perspective of customary social institutions, which values the authority of elderly males, it has had significant repercussions in that it tends to empower young men vis-à-vis their elders, contributing to a shifting social structure in rural Mali, where elders customarily have had ultimate power. CMDT policy also means that women producers do not have direct access to the CMDT but can only access it through their male head of household.

While there are frequently calls for working with existing local social institutions, there are also occasions where external actors have an interest in challenging institutionalized behaviors. As indicated in the gender section above, women and women's groups are finding it more and more difficult to gain access to fields for their own production. In Gouana, the interventions by a female extension agent from the Association des Organisation Professionnelles Paysannes (AOPP) are working against the local social institution practice to promote more-equitable modes of development and adaptation. The women's association sought access to its own field through the village chief, who said there was none available. After the women agitated further, the village chief called a council of (male) heads of households to discuss the issue, after which the women were offered a parcel of land that was consistently waterlogged and thus unproductive. The AOPP agent, witnessing the situation described above, stepped in to facilitate a dialogue. While she was not successful at securing a functional field for the women's group in time for the growing season, she did manage to get the men of the village to acknowledge that they had marginalized the women, which was problematic for the long-term well-being of the village.

In addition to challenging gender discrimination in land allocation, the same AOPP agent has taken it upon herself to convince men and women to cooperate in new ways. She facilitated a combined application for a grain mill between a women's association and a cereal cooperative run by men. The mill was obtained and is now jointly managed by the two groups. In this unprecedented joint commercial venture, the books are kept by a mixed team, but men and women still retain customary gender roles. Men run and repair the machine, while women manage the rest of the milling process. Also, a member of the women's group cooks the midday meal for the staff. This is an example of the stimulation of a new dynamic between men and women, while still maintaining aspects of continuity in "gender-appropriate" work. While this is a long way from gender equality in access to opportunities, it is nonetheless a significant step in cultural change stimulated by external intervention. As one member of the men's association observed (Howard 2012):

If equity is considered, women and men should operate together. This is a change which has been introduced to us by partners such as AOPP, the organisations that come for literacy training with women, educational partners who say that boys and girls are equal, the partners who financed the grinding mill, and even through the cotton activities [women do the harvesting]. Although the idea came from the partners, we saw that it made sense.

The examples of external interventions presented here illustrate how NGO and government actors can engage with local institutions constructively. Whether mimicking or reinforcing local institutions such as *buusa gonnofa*, or challenging institutionalized gender roles, as in Mali, knowledge of the dynamics within the institutions is important for recognizing the capacities and boundaries for change.

CONCLUSIONS

People draw on many different institutions—local and international, formal and informal—to pursue their objectives of fulfilling livelihoods. Just as Elinor Ostrom has called for a “polycentric approach” in developing climate change mitigation strategies (Ostrom 2009), wherein a wide variety of actors explore alternative pathways without centrally coordinated planning, this research suggests that adaptation in smallholder agricultural and pastoral livelihoods should remain a fundamentally polycentric process.

The emphasis on local institutions presented in this paper is not meant to put forward a naïve notion that adaptation will always go just fine if only rural people are simply left to sort things out for themselves. It is quite likely that long-term climate change will lead to situations well beyond the scope of local institutions’ adaptive capacities, where robust networks with NGOs, government agencies, and market institutions can be instrumental in adapting to the intensifying challenges of climate change. However, because adaptation is an inherently place- and practice-based process, local social institutions will be central to mediating the articulations between rural producers and external actors.

As such, climate change adaptation in agricultural and pastoralist communities is a sphere where there is great potential for novel forms of partnership between farmers and herders, NGOs, and researchers. Specialist knowledge regarding future climate change scenarios and potential technical adaptations may be instrumental for enabling more-forward-looking anticipatory strategies (Arendse and Crane 2011; Crane, Roncoli, and Hoogenboom 2011), and local institutions will likely be instrumental in adapting and enacting those strategies. As such, adaptation of rural livelihoods will entail the intersection of a variety of knowledge, practices, and organizations, and the primary point of confluence should be local social institutions. Following on this, institutions of policy, research, and development need to avoid an overly heavy-handed or top-down approach and provide space for the adaptive capacity of local institutions to flourish.

Recognizing the importance of working with local institutions in climate change adaptation is not about preserving the past through artificially bolstering traditional practices or cultural values. It is instead about appreciating that local institutions—whether “customary” or “modern”—represent the social location through which rural communities will be able to most effectively exercise self-determination in how to manage change. Functioning local institutions enable continuity in the face of change, as well as enable more equitable interactions with external organizations.

Presently, national governments, INGOs, and research communities all have strong presence in the current global discourses around adaptation. However, farmers and herders themselves have relatively limited influence in research and policy agendas, despite being central to any adaptive processes in food production. This can be seen partly as a function of the prevalence of conceptualizing adaptation as a condition to achieve through planning. Alternatively, conceiving climate adaptation as an organic and perpetually on-going process points instead toward a focus on more farmer- or herder-led adaptation. Following this logic leads to an approach to adaptation in which farmers’ and herders’ adaptive dynamics become central in research and policy.

To avoid engaging in practices that are counterproductive to local well-being, it is often recommended that development practitioners gain a thorough understanding of local social dynamics before seeking to enhance or change them. This is indeed a good idea. However, it can be a difficult, if not entirely unrealistic, expectation for development NGOs, perhaps even less of government agencies and market-based actors. It is rarely possible to do full ethnographies prior to beginning projects. In some ways, it is indicative of an unequal partnership, as the inner workings of development agencies are not laid bare to farmers and herders prior to engagement.

Instead, NGOs should begin collaborations with local institutions not by thoroughly analyzing and understanding them, but by directly engaging them, even acknowledging that they may have processes

and organizations that are not fully democratic or transparent. Shared problem definition is more important than shared institutional values. A process-oriented relationship that is based on long-term commitments (not based on short project cycles) would permit for a reflexive and iterative approach to addressing different social values through engagements around a jointly shared problem.

For example, respecting local culture is not always entirely compatible with many NGOs' goals of democracy and equality. Gender inequality is deeply embedded within many, if not most, agrarian cultures around the world. Similarly, strong social hierarchies in agrarian cultures—whether by age, class, or caste—often do not function in particularly democratic ways. This is not to say that there is no social accountability, but that it operates through different mechanisms. A process-based approach to engagement in such contexts enables NGOs to work through existing mechanisms of social accountability rather than trying to create new ones based on their own ideals.

As the section on land and water governance points out, when an extra-local organization chooses to engage with local institutions, the choice of local partners has significant implications for what sorts of power are being reinforced and what sorts can be marginalized. Again this is not meant to suggest that customary or “modern” institutions are categorically preferable or better equipped for partnerships but that there are trade-offs.

In both Mali and Ethiopia, informants indicated a connection between intensification of market articulation with a decline in customary social-support systems. In both cases this decline has also been exacerbated by environmental stress and perhaps also democratic forms of national governance that undermine traditional institutional authority, sometimes implicitly and sometimes explicitly. While it is not suggested that farmers and herders should not be linked with markets, the development challenge is to accomplish this in ways that empower the farmers and herders themselves to articulate with the market. This would enable them to address their social goals (individual and collective) and to manage the trade-offs themselves, rather than letting social structures be redefined exogenously to align them with market logics.

Another theme that has emerged through this research is that of customary risk management institutions relying on social solidarity across socioeconomic stratification and differentiation. This has important implications for NGOs and development agencies, who often emphasize equality. Equality of access to opportunity is without a doubt an important value, but the strength and resilience of social-support mechanisms that function to connect people with unequal socioeconomic positions should not be overlooked. In much of Africa, democracy and equality are often associated with market-oriented individualism, which undermines social cohesion by removing cultural norms that encourage the well-off to assist family or community members who are in need. This is far from proposing to institutionalize inequality itself, but to recognize the value of institutions that can serve people through cycles and across levels of both poverty and wealth.

RECOMMENDATIONS

The recommendations that emerge from this study suggest that NGOs and other development actors should pursue hybrid engagements with local institutions, seeking to draw on the strengths of both customary and modern local institutions, even in cases where they are at odds with each other. These recommendations are given in recognition of the complexity of on-going and long-term livelihood and cultural changes in response to climate change.

1. Rather than focusing exclusively on the development and dissemination of technical practices that are adapted to anticipated climate conditions, development efforts should also emphasize the development of rural peoples' adaptive capacities, their abilities to undertake effective technical and social innovations in the absence of external intervention. While this may be challenging given the short-project-cycle approach to development activities, enhancing existing adaptive capacities creates a foundation for the generation of adaptations independent of projects. It can also enable farmers and herders to collaborate with other partners in a more sophisticated fashion.
2. Following on the previous recommendation, NGOs can engage in innovative project forms that support development that is driven by farmers and herders themselves. Typically, NGOs and researchers solicit farmers and herders to participate in their programs. It is proposed here that NGOs and researchers instead participate in adaptation processes that are led and initiated by farmers and herders themselves. This is premised on the recognition that producers themselves have ongoing adaptive processes. For example, one possibility is to start with farmers' successful adaptive strategies as the core nodes of community-based innovation. This approach has the distinct advantage of being rooted in rural communities' social, material, and institutional realities.
3. Land- and water-management issues should simultaneously engage both customary and state institutions, building cooperation and collaboration. While this may be challenging in cases where the state and customary institutions do not recognize the legitimacy of the other or where tensions exist, dealing with one to the exclusion of the other appears to be an unlikely formula for success.
4. While opportunities for market integration should be pursued, this should be done in a more deliberate fashion. Assumptions that more connections to markets are a good thing should be tempered with a consideration of making qualitatively better connections to markets. As a part of this, potential trade-offs that may come in the realms of non-market social-support systems and collective action should be directly addressed in public forums.
5. Women are categorically more vulnerable to adverse events because they lack equal access to financial, educational, and sociopolitical resources, largely resulting from institutionalized values about gender roles. Increasing women's access to educational, political, and financial opportunities will help reduce their vulnerability to the adverse effects of climate change. However, inasmuch as this may represent a radical cultural transformation, these changes cannot be generated in short project cycles focused specifically on climate adaptation. Enhancing women's' adaptive capacity must be addressed gradually through persistent and patient engagement with long-term women's development work in general.
6. Livelihood diversification into economic activities that are not directly climate-dependent should be promoted to reduce vulnerability to climate shocks. This diversification should be considered broadly, including greater education for children (opening more livelihood options), cyclical labor migration to urban centers, or long-term migration of family members to wealthier nations, which are all social strategies for livelihood diversification.
7. Synergy in weather and climate information production practices should be facilitated through collaborative efforts between customary producers and scientific forecasting. Hybridizing these knowledge institutions has potential to create information that integrates the best of both institutions and is thus more relevant to the needs of rural people.

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