Environmental Management (2009) 43:817–835
DOI 10.1007/s00267-008-9189-0

Adaptation as a Political Process: Adjusting to Drought and Conflict in Kenya's Drylands

Siri Eriksen · Jeremy Lind

Received: 11 June 2007 / Accepted: 12 July 2008 / Published online: 23 August 2008

Abstract In this article, we argue that people's adjustments to multiple shocks and changes, such as conflict and drought, are intrinsically political processes that have uneven outcomes. Strengthening local adaptive capacity is a critical component of adapting to climate change. Based on fieldwork in two areas in Kenya, we investigate how people seek to access livelihood adjustment options and promote particular adaptation interests through forming social relations and political alliances to influence collective decision-making. First, we find that, in the face of drought and conflict, relations are formed among individuals, politicians, customary institutions, and government administration aimed at retaining or strengthening power bases in addition to securing material means of survival. Second, national economic and political structures and processes affect local adaptive capacity in fundamental ways, such as through the unequal allocation of resources across regions, development policy biased against pastoralism, and competition for elected political positions. Third, conflict is part and parcel of the adaptation process, not just an external factor inhibiting local adaptation strategies. Fourth, there are relative winners and losers of adaptation, but whether or not local adjustments to drought and conflict compound existing inequalities depends on power relations at multiple geographic scales that shape how conflicting interests are negotiated locally. Climate change adaptation policies are unlikely to be successful or minimize inequity unless the political dimensions of local adaptation are considered; however, existing power structures and conflicts of interests represent political obstacles to developing such policies.

Keywords Climate change · Conflict · Drought · Multiple stressors · Adaptive capacity · Adaptation · Drylands · Kenya

S. Eriksen (✉)
Department of Sociology and Human Geography, University of Oslo, P.O. Box 1096, Blindern 0317, Oslo, Norway
e-mail: siri.eriksen@sgeo.uio.no

J. Lind
Centre for Civil Society, London School of Economics and Political Science, Houghton Street, London WC2A 2AE, UK

Adaptation is a political process. This is because the adjustments that people make to their livelihoods in the face of multiple shocks and changes have uneven outcomes. Individuals and groups interact and compete to promote their own discrete interests. This article examines how adjustments to drought and conflict involve power relations operating on a variety of geographic scales, where power is understood as a relational effect of social interaction (Allen 2003). The study focuses on adaptive capacity in a situation of drought and conflict in the drylands of Kenya. Conflict may be viewed as forms of interaction that include violence or the threat of violence (Ellis and ter Haar 2004). Here, conflict and violence are regarded as forming part of the societal processes of change that affect people's adaptive capacity (Peters 2004). Importantly, the article does not consider climate change and stress as sources of conflict, the focus of a burgeoning literature elsewhere (Barnett and Adger 2007; Schubert and others 2008). Instead, it is recognized that conflict can generate vulnerability by damaging human and social capital (Barnett 2006) and limiting adaptation options (Lind and Eriksen 2006). Conflict varies in its scale, intensity, and character. At one extreme, it can be characterized by armed violence and militarized confrontation between clearly defined and opposed sides. This article

takes as its reference point a broader understanding of conflict encompassing criminality, banditry, theft, gendered violence, disputes, and tensions leading to chronic insecurity and threats to personal safety (Goodhand 2001; Longley and Maxwell 2003). Though not investigated further here, the current postelection conflict in Kenya, for example, has led to the long-term displacement of at least 100,000 people, disruption of farming and trade, and a dramatic decline in food security (Kenya Food Security Network 2008).

Political considerations in climate change literature have focused on the politics of greenhouse gas reduction commitments (Vaillancourt and Waaub 2006). Considerations of equity and justice that have recently entered the discourse are concerned with the differential impacts of anthropogenic climate change between countries and regions, how the burden should be shared between nations, and mechanisms for compensation and adaptation funding (Paavola and Adger 2002; Brown 2003; Huq and others 2003; Adger and others 2006). In policy discussions on adaptation, there is an implied assumption that climate change adaptation will occur in a linear sequence given sufficient awareness of projected changes, political will, the transfer of new technology, and financing measures.

However, adaptation cannot be understood only as a series of planned technical adjustments and policies to specific changes in climatic conditions (Klein and others 2007). Recent evidence shows that expected adaptation actions, in terms of longer-term adjustments in practices and ecological and socioeconomic systems in response to actual or expected changes in average climate (Smit and Pilifosova 2003), do not necessarily take place. This is because any decision-making is nested in a wider set of societal changes, such as institutional changes and altered relations between public and private actors (O'Brien and others 2006).

Instead, local adjustments to an interacting set of climatic and nonclimatic changes, such as increased drought, economic liberalization, conflict, and biodiversity loss, are an important component of adaptation to climate change. Vulnerability can be considered the context of political, institutional, economic, and social structures and processes that create a present inability to cope with changing climate conditions. O'Brien and others (2007) argue that responses to climate change can affect the context for responding to other societal or environmental changes, and vice versa.

A large literature examines how people respond simultaneously to multiple stressors through adjustments in managing a portfolio of natural and economic assets as well as through trade, migration, and intermarriage (O'Leary 1980; Ellis 1998; Oba 2001; Eriksen and others 2005; Eakin 2006; Thornton and others 2007). Adjusting to climate stress and change does not occur in isolation from the ways that people continuously respond to a multitude of pressures, trends and 'normal' seasonal changes (Davies 1993; Scoones and others 1996; Mortimore 1998). These dynamics are apparent in dryland eastern Africa, where different identity groups have developed particularistic production strategies and techniques for generating livelihood from the land, but as part of a larger, interconnected regional resource system (Sobania 1990; Waller 1999; Goldsmith 1998; Lind 2006).

However, adaptation in terms of local adjustments is not unproblematic or intrinsically positive. Responses to change have uneven outcomes and inherently conflicting interests where particular adjustment strategies by an individual or a group may have consequences for the vulnerability and availability of adjustment options for others. Adger and others (2006) suggest that adaptations are undertaken by those who have the resources and knowledge to do so, meaning those who are less vulnerable; hence, local adaptation may compound existing socioeconomic inequalities. There are winners and losers of adaptation, and equity issues, which are prominent in international dialogue on climate change, also arise with respect to adaptation in localized settings (O'Brien and Leichenko 2003; Thomas and Twyman 2005).

Strengthening local adaptive capacity to shocks such as drought and conflict is critical to achieving adaptation to climate change, then. We suggest that local adaptive capacity depends on the ability to promote interests in decision-making processes regarding access to required capital and adjustment options under varying contexts. The particular strategies that people use to manage a drought, for example, and the types of capital necessary to make those adjustments, are very context specific (Eriksen and others 2005). Marginalized groups remain vulnerable because they cannot, more generally, participate and influence decisions and structures that determine the range of adjustment alternatives available to them. For example, vested interests of the less vulnerable are often protected in collective adaptation actions (Adger and others 2006). Economic and political power influence access to social, economic, and natural capital when climatic conditions change (Barnett 2006). Hence, power and the ability to form social relations are a determinant of uneven outcomes from adaptation.

The key questions that emerge for this research, then, are:

1. How does the way that people form social relations with others to access adjustment options and influence collective decisions affect local adaptation to drought and conflict?
2. How do broader economic and political structures and processes influence such local adaptive capacity?

3. What particular role do conflict and responses to conflict play in adjusting to drought?
4. What are the differential outcomes of these processes, and are there ways that policies can minimize inequality and hence promote justice in local adaptation?

These questions are applied to two case studes: Endau, located in Kitui District in the lowlands of eastern Kenya; and Turkana, located in northwestern Kenya.

Methods and Study Areas

The case-study approach (George 1979; Yin 1994; Fotheringham 1997) provides an appropriate means of exploring adaptation, in particular, the way that local adjustments to change are shaped by interacting processes. We examine two sites, located in Kitui and Turkana districts (see Fig. 1), that are exposed to climatic variability, particularly drought, and are affected by conflict and violence. It is particularly useful to employ a comparative case study approach because it allows us to investigate commonalities in the way that capacity to adapt is negotiated across different contexts.

Data collection formed part of a 3-year project initiated in 2004. Data collection in the sites was carried out by two separate teams that had previous research experience in the areas (Lind 2005; Gachathi 1996; Eriksen and others 2005, 2006a). The methodology and main research questions were developed by researchers from the participating institutions. Data collection was designed around similar themes, various aspects of which have been described by Owuor and others (2005), Eriksen and others (2006b), Lind and Eriksen (2006), and Owuor (2007).

Although addressing the same research questions, the survey and interview techniques were tailored to the local context and logistical constraints at both sites, the two teams collecting both survey and qualitative data. In Kitui, survey and qualitative data were collected through a mixture of household surveys and various interviews—household semistructured, key informant, and group—during several field visits between 2004 and 2007. Given the focus here on the formation of relations and alliances between groups and institutions, the analysis focuses mainly on the qualitative data. The Kitui team had the possibility to return several times to the field and took advantage of this opportunity to follow relations, decision-making processes, and adjustments over time. A total of 37 household survey interviews distributed among the four settlements were carried out during the dry season in 2004. To capture negotiations over drought-coping strategies, social relations, and conflict situations, 21 semistructured household interviews, 10 key-informant interviews, and 4 group interviews were carried out in the early 2005 dry period. To monitor how such negotiations developed over time, a further 10 household surveys and 7 semistructured, 37 key-informant, and 3 group interviews were carried out during three field visits—in 2005 in the run-up to a national referendum over constitutional reform, at the end of the 2006 dry season, and in the run-up to the December 2007 elections. In addition, five household surveys and seven key-informant and two group interviews were purposefully conducted during the 2006 and 2007 data collections, with nomadic pastoralists visiting the area periodically.

In Turkana, a household survey was carried out using the questionnaire-interview technique, which also included a qualitative component, as well as group interviews. Open-ended questions were used to encourage people to share stories and personal experiences as a way of illustrating important local events and trends in insecurity and coping with droughts. Data collection was undertaken in March 2005, before the onset of the long rains. Consecutive droughts in 1999–2001 and 2003–2005 had affected vegetative productivity (Gakure and others 2006). Multi-year droughts are common in Turkana, and few years approximate the ideal pattern of long and short rains for the region (Little and Leslie 1999). Forty-five household surveys were carried out, as well as eight group interviews, distributed in three areas of Turkana District: villages near Kalokol, close to Lake Turkana; villages near Kakuma, in the northern part of the district bordering Uganda; and in Katilu, site of an irrigation scheme along the Turkwel River in southern Turkana (Fig. 1).

The selection of households was designed to achieve a typical representation of the local population. In both sites, local key informants assisted in selecting interviewees. The informants were instructed to balance age and gender as well as households of different socioeconomic and political status. At both sites, group interviews were carried out with both men and women, covering a checklist of questions. Findings from household survey and group interviews were explored in household semistructured and in key-informant interviews, which were carried out with local politicians, leaders, elders, administrative officials, and individual herders and farmers with particular histories, such as livestock loss or landlessness. Informal discussions through interaction with people such as during meals or in the marketplace were also important sources of data regarding power relations, conflicts, and access to resources.

Responding to Drought and Conflict

As described below and summarized in Table 1, the selected study areas differ in the type of conflict and

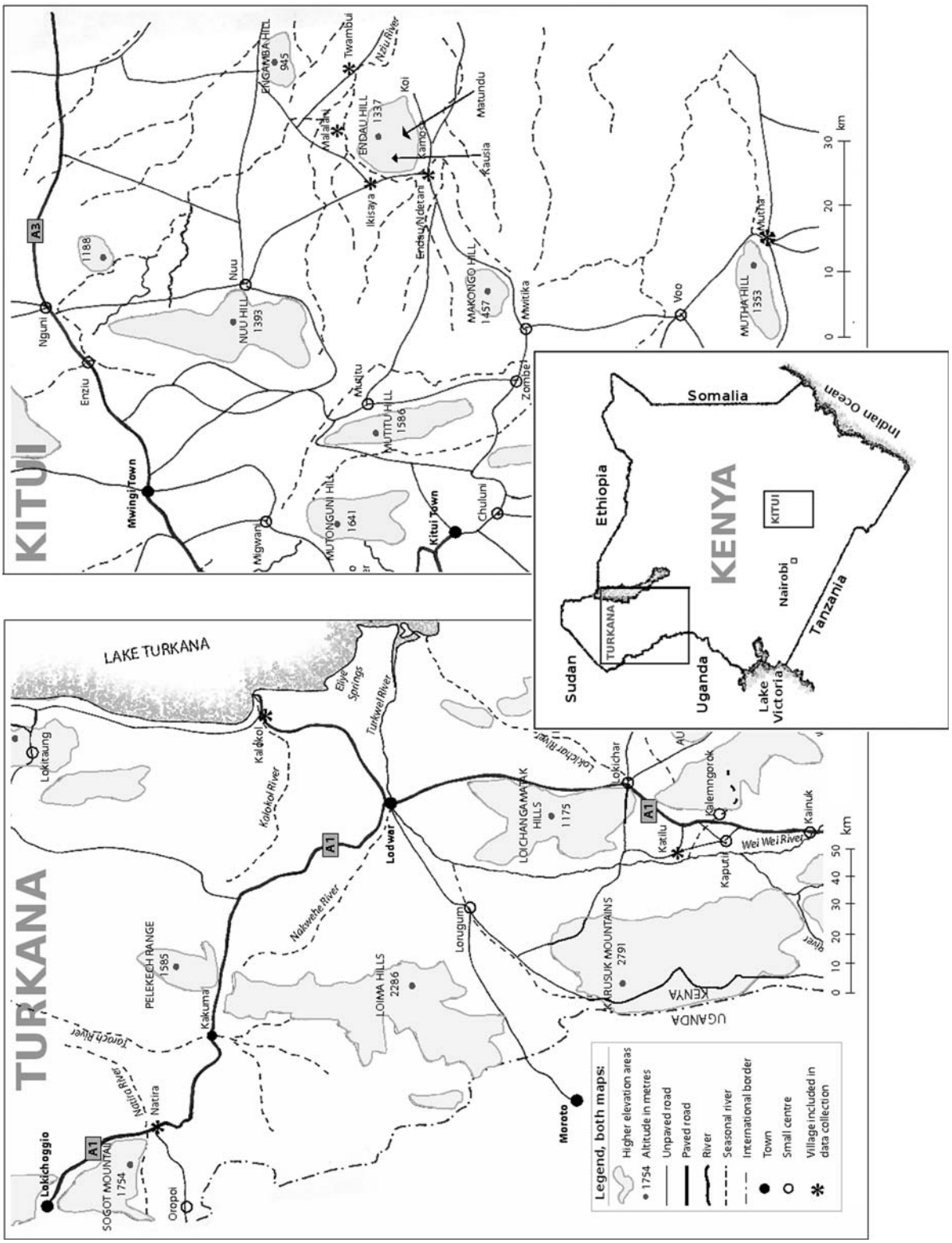

Fig. 1 Location of the case study sites

Table 1 Environment and natural resource use in the case study areas

	Climatic conditions	Water sources	Agriculture	Grazing	Forest use
Endau	780 mm annual rainfall[a]	Seasonal springs	Livestock herding important on north and east sides of hill	Seasonal pattern of wet-season grazing on plains and dry-season grazing near or on the hill Also grazing on private land, for rent	Historical use of indigenous forest on Endau hill Presently indigenous plant products mainly accessed from lowland forests for home consumption and small-scale marketing
	Two rainy seasons, October–December rains most important	Seasonal rivers	Rain-fed agriculture on southern sides of the hill and along rivers		
	Failure of rains 1 in every 2–3 year	Shallow wells on northern and eastern side of hill	Historically cultivation on the hill		
	Long dry season	Piped water on southern and western side of hill, sourced from the hilltop			
	Intermittent floods	Boreholes			
Turkana	220–235 mm annual rainfall[b]	Lake Turkana	Nomadic pastoralism	Generalized grazing pattern of wet-season use of interior plains and movement of animals to distant border grazing in mountains and along rivers in the dry season	Use of indigenous vegetation in mountains and on plains for home consumption and small-scale marketing
	Two rainy seasons, March–May rains most important	Turkwel and Kerio rivers	Flood retreat sorghum gardening along rivers		
	Long dry season	Seasonal streams and pools	River-fed irrigation schemes		
	Recurring droughts, lasting 2–3 year each	Shallow wells	Rain-fed plots		
	Spatial variation in rainfall				

[a] Estimate based on rainfall data for a 0.5 × 0.5-deg grid covering eastern parts of Kitui District (mean annual rainfall 1961–1990, 779.9 mm) as well as data from the nearest rainfall station, Zombe (mean annual rainfall 1961–1990, 776.6 mm)

[b] Estimate based on rainfall data for a 0.5 × 0.5-deg grid covering Turkana District (mean annual rainfall 1961–1990, 233.9 mm) as well as data from the nearest rainfall station, Lodwar (mean annual rainfall 1961–1990, 221.6 mm)

production systems (agropastoral in Kitui versus pastoral in Turkana) and display variations regarding drought. These differences help us to identify whether some patterns in the political process of adaptation are the same even where the practical adjustments to livelihood strategies vary. Turkana and Kitui are both less favored in development and reflect a consistent development bias in Kenya that has favored regions with greater potential over drylands, as well as agrarian over pastoral systems (Mkutu 2007). This is reflected in 60–70 percentage of the population in both districts living below the poverty line, compared with 20–30 percentage in most of the central highlands of the country (Republic of Kenya 2003). While climatic variability in the two sites includes seasonality, multiyear droughts, unpredictability of onset and location of rainfall, and a range of events such as floods, we focus specifically on the seasonal and prolonged drought during the 2004–2007 study period. Although the East African region as a whole may receive increased rainfall in future, global warming also increases climatic uncertainty at the local level and in the drylands, in terms of both seasonal shifts and the intensity and frequency of droughts. Arid and semiarid areas are projected to undergo at least a 20% reduction in the growing season (Boko and others 2007).

Endau Site, Kitui District

Drought, Conflicts, and Livelihoods

The Endau site is situated around one of several hilltop forests in Kitui District. From the dry plains lying at 500 m above sea level (masl), the hill rises to several peaks, the highest at 1337 masl. The area around the hill was settled by Kamba pastoralists in the late 19th century after fighting and displacing the Akavi, pastoralists related to the Masai ethnic group. The Kamba increasingly diversified into agriculture, some farmers even settling on the hill itself, though livestock-herding remains important for many households.

Data collection was carried out in four settlements around Endau hill in order to capture the varying climatic and conflict situations on different sides of the hill. These represent four of a total eight administrative units (sublocations) around the hill and include Syou sublocation around Ikisaya center to the west, Malalani sublocation to the north, Twambui sublocation to the northeast, and Ndetani sublocation to the southwest (Fig. 1). In addition, some of the interviews with nomadic pastoralists were carried out in Mutha, south of Endau, since this is where many of the pastoralists visiting Endau stay part of the year. The population numbers and poverty levels are described in Table 2. Twambui is the driest area where livestock-keeping dominates and only a few cultivate close

Table 2 Population and poverty statistics of the case study areas

District/location/ sublocation[a]	No. of individuals	% of individuals below poverty line
Kitui District	489,747	70.48
Ndetani sublocation	2,546	63.30[b]
Syou sublocation	1,264	58.10[b]
Malalani sublocation	1,438	58.10[b]
Twambui sublocation	1,665	58.10[b]
Turkana District	331,568	62.42
Kakuma location	17,921	67.82
Kalokol location	14,232	80.67
Katilu location	12,124	50.88

Sources: 1999 census, Republic of Kenya (2003) and the Kitui District Information and Documentation Center population statistics as of 2003

[a] Data at sublocational level not available for Turkana sites

[b] Estimated from location-level poverty data

to the river. Livestock-keeping is also predominant in Malalani, with some farming of cereals and vegetables close to the river. Ndetani has its largest population concentration in a town settlement around its market and in settlements close to the river or the hill, where people cultivate crops such as greengrams, maize, millet, sorghum, cowpeas, pigeonpeas, tomatoes, greens, mangos, and other fruit. Farmers in Ikisaya grow a mixture of crops similar to those in Ndetani, and a few families keep large livestock herds.

There are two rainy seasons, from October to December and from March to May, the former being the most important (Fig. 2). The dry season and household food shortages are at their height in August and September; however, the rains regularly fail, leading to prolonged drought, such as in 1995–1996 and 2004–2006 (see Fig. 3)

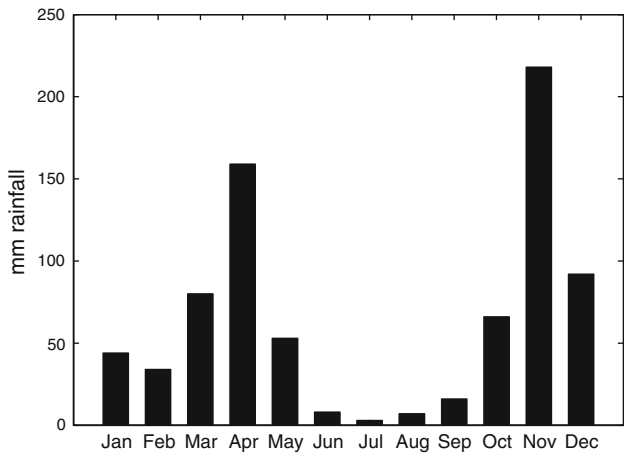

Fig. 2 Mean monthly rainfall, 1961–1990, Kitui. Based on rainfall data for 0.5 × 0.5-deg grid covering eastern Kitui District, CRU TS2.1 dataset

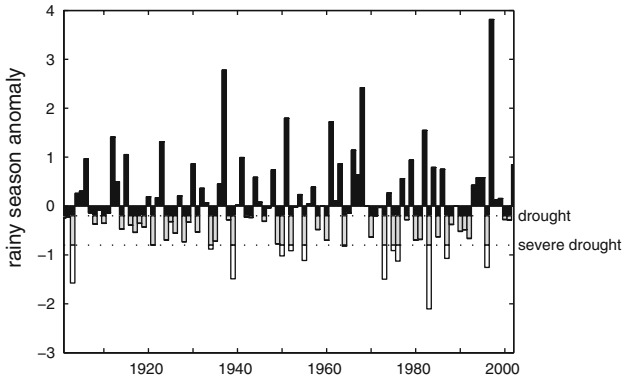

Fig. 3 Annual variation in total rainy season rainfall (March–May and October–December), in standard deviations, 1901–2002, Kitui. Mean rainfall, 1961–1990, is 668 mm. Severe drought signifies ≤486 mm rainfall, and drought ≤623 mm rainfall [season with rainfall 0.8 and 0.2 SD or more below the mean, respectively (Akong'a and others 1988)]. Based on rainfall data for 0.5 × 0.5-deg grid covering eastern Kitui District, CRU TS2.1 dataset

(Republic of Kenya 2006). Intense rainfall also leads to occasional flooding that can sweep away roads and some crops, though it can also lead to bumper harvests for some, such as in 1997–1998 and 2006–2007. In addition to farming and livestock-keeping for subsistence and sale, people commonly rely on casual labor for other farmers, business, and remittances from family members, and many access forest products such as herbs, material for handicrafts, and honey as sources of livelihoods. There is little permanent employment available, and this is mainly limited to local administration and schools, as there are no large businesses or industry in the area.

Very few development projects have been present in the area, and these have largely taken the form of small-scale and short-term interventions. Interviews with chiefs and assistant chiefs as well as farmer key informants revealed that these included a Belgian-funded project that focused on planting seedlings, a women's group planting irrigated vegetables and trees, a commercial group ranch that collapsed in the 1990s, and four projects installing water pipes from the hilltop to tanks in the lowland settlements, with varying degrees of success. During 2006 and 2007, there was an increase in development investment, however, leading to improvement of roads and drilling of two boreholes, as a result of government reform to decentralize development funding to the Constituency Development Fund. The fund is managed by local development committees but highly influenced by the local member of parliament and the councilor. Elected representatives in national parliament and local council have increasing influence over development decisions, therefore. Clan leaders and elders remain powerful in decision-making, largely in solving minor disputes in collaboration with the government administration, that is, the chief who is

employed as the administrative leader of each location and assistant chiefs who lead each sublocation.

Endau hill has a cooler and wetter climate than the plains (Eriksen and others 2006a) and is critical to people's strategies to manage drought in the area. It has permanent water springs, as well as thick forest, and also acts as watershed for seasonal rivers in which people dig wells during the dry season. Apart from farmers that keep only a few cattle or goats, most herders rely on grazing their animals on the large plains north and east of the hill during the wet season and closer to, or on, the hill during the dry season and prolonged drought. The hill is a critical source of other types of dry-season livelihoods too, including timber for sale, wild fruit, and hunting game for consumption and sale, the reliance on which increases during severe drought. As further described by Lind and Eriksen (2006), other drought-coping mechanisms include loans and help from neighbors, migration to find work when no casual employment can be found locally, and reliance on food aid.

The hill is gazetted for conservation, however, and in 1996, the government evicted settlers and made any access to the hill by villagers in practice illegal. The decision significantly reduced options to cope with drought in the short term and adapt to any increase in droughts with climate change in the longer term, since many hilltop forest products became inaccessible; in addition, the diversity and reliability of harvests in Endau were reduced, as several crops that thrived on the hill, including sweet potatoes, sugar, bananas, avocado, mangos, and other fruit, cannot easily be grown in the lowlands. Trade with visiting pastoralists is an increasingly important source of income in the area, centering, in particular, on wells in seasonal rivers in Twambui and Malalani that are supplied by the hill.

Multiple forms of conflict interact on different sides of Endau hill, and consequences vary both between and within villages. Table 3, which summarizes the conflicts and some of their proximate impacts, illustrates that people have typically faced several forms of conflict simultaneously. These conflicts, further described by Lind and Eriksen (2006), have included violent raids, more recent killing and theft of animals, forced eviction of farmers from the hilltop by the government, and conflicts over access to water, leading to landlessness, loss of livestock, restricted grazing areas, loss of drought crops, and disrupted farming. They therefore had profound impacts on the availability of options to adjust livelihoods to seasonality and droughts.

This analysis focuses on the interaction between pastoralists and agropastoralists, which includes both conflict and cooperation within and between the different ethnic groups present in the area. Past violent raiding forms a backdrop to current interaction. There has been raiding of cattle in the wet-season grazing areas shared among Kamba, Orma, and Somali pastoralists since the 1970s. According to farmer and local administration key informants, violence by Orma and Somali groups culminated in the early 1990s with raids of livestock, household property, and businesses in settlements near the hill. Among the 37 households surveyed in 2004, two households (in Twambui and Ndetani) had family members killed, another informant in Ikisaya had his brother kidnapped, while three in Twambui had lost some or all of their livestock. One shop in Twambui was still abandoned by its owner at the time of the interviews, and several key informants interviewed had moved from the eastern side of the hill to Ndetani and Ikisaya to flee the insecurity during the 1990s, switching livelihoods from livestock-herding to cultivation. The raids included attacks on the police station and the school in Ndetani, where seven people were killed.

Smaller-scale raiding and thefts continued until 1999; over the past decade, however, the same Orma and Somali groups have started migrating regularly to Twambui and Malalani to water their cattle and buy food and household necessities during the dry season and prolonged droughts. Such seasonal migration is also increasing among Kamba pastoralists from other areas such as Mwingi district, north of Kitui. The number of people in the area around the hill, totaling 10 970 settled agropastoralists (as of 2003 according to Kitui District Information and Documentation Centre statistics) increases significantly during June to November due to seasonal immigration by pastoralists. According to local administration informants, Twambui is most affected, some years receiving up to 800 Orma/Somali pastoralists and 100 Kamba pastoralists from Mwingi, thereby increasing its population by 50%. The herders rent access to water from the owners of shallow wells in the Nziu River, and they rent grazing lands in order to feed their cattle while in the area.

Interviews in 2006 revealed that interaction with pastoralists was subject to conflicting interests. In Twambui, several Kamba traders explained that renting-out of wells and trade in livestock and food were critical to incomes during drought, with some even prospering from the activity. According to a key informant who was also a well owner, 8 of the 10 families owning wells in the area rented them out to Orma and Somali pastoralists in 2005, at a much more profitable rate than herders from Mwingi pay. Depending on the number of cattle and length of time, a Somali herder could pay up to 40,000 KES (~630 USD) for access to a well during one dry season, while a Mwingi herder might pay up to 2000 KES (~30 USD) and a local Kamba a symbolic fee. A Orma or Somali might pay 5000–6000 KES (~90 USD) for access to grazing land. A young man in Twambui had responded to his family's loss of livestock during raids by setting up a business trading with

Table 3 Conflicts and their impacts at Endau sites

Village	Type(s) of conflict and insecurity	Proximate impact(s)
Ndetani	Eviction from hill	Landlessness and in-migration
		Restricted dry season grazing
		Loss of fruit trees and drought crops
	Violent raids in 1990s	In-migration of people exposed to violent raids in Twambui and Malalani
Ikisaya	Violent raids in 1990s	Loss of livestock and lives
		Closure of school
		Disrupted farming
		In-migration of people exposed to violent raids in Twambui and Malalani
		Restricted dry-season grazing
	Conflict over pipeline	Sabotage to pipes and disrupted maintenance
Malalani	Violent raiding in 1990s	Loss of livestock and lives
		Out-migration
		Restricted wet-season grazing
	Eviction from hill	Landlessness and out-migration
		Restricted dry-season grazing
		Loss of fruit trees and drought crops
	Interaction between pastoralists and agropastoralists over access to shallow wells and dry-season grazing	Precarious access for pastoralist to wells
		High fees to rent water, free access to water difficult for settled farmers
		Livestock theft
		Local political tension in the village over increased trade and incomes during drought
Twambui	Violent raiding in 1990s	Loss of livestock and lives
		Out-migration
		Restricted wet-season grazing
	Interaction between pastoralists and agropastoralists over access to shallow wells and dry-season grazing	Precarious access for pastoralist to wells
		High fees to rent water, free access to water difficult for settled farmers
		Livestock theft and killing
		Local political tension in the village over increased trade and incomes during drought

Orma and Somali pastoralists. He said, "In business, Somalis are good people. If one Somali comes, he may spend 5000 shillings in little time. If one Kamba comes, he may spend a lot of time talking and telling good stories and spend 200 shillings on credit." Others made seasonal incomes from casual labor, e.g., digging wells, or from selling tea and snacks by the river to waiting pastoralists.

However, other households depended on free access to other people's wells since they did not own their own well and expressed concern over difficulties in accessing water during drought. People regularly queued up from the early morning only to find wells running dry. Along with Mwingi herders (whose presence in the area was never questioned) these households wanted other pastoralist groups to be excluded from the area to reduce competition for water and grazing. Disagreements had arisen over pastoralist cattle or camels grazing in areas other than those rented as well as over Kamba stealing of Orma and Somali livestock. Important in people's minds was the fear of violent retribution by Orma and Somali due to these thefts, a sentiment expressed both by farmers and key informants in the district and local administration. The attacks in the 1990s had led to distrust and a feeling that current pastoralist presence and trade made the area unsafe. A young female respondent in Twambui explained that individuals benefit from trade but that if Somali pastoralists come to raid, it would affect the whole community. Trade with Orma and Somali pastoralist groups had caused internal divisions among the settled population, therefore.

Competing Interests and Adaptive Capacity

The interaction between settled agropastoralists and nomadic pastoralists demonstrates the multifaceted ways in which relationships and alliances are formed to secure influence over local livelihood decisions. The situation that developed in Malalani and Twambui during 2006 and 2007, centering on trade and access to water for livestock

during drought, was closely linked to national politics and struggles between Kamba agropastoralists for power and influence. These dynamics had fundamental impacts on options for livelihood adjustments. The different interest groups affected by any decision regarding trade with Orma and Somali pastoralists included, in addition to well owners, traders, small-scale traders and casual laborers, poor farmers with no well, wealthier livestock keepers with no or insufficient wells and grazing areas, Mwingi pastoralists, and Orma and Somali pastoralists. However, politicians also had strong interests in the matter. The increase in trade with pastoralists had led to a shift in the local power balance, with the advent of a new group of relatively richer traders and well owners, who were now independent of favors from political leaders or food aid during drought. Food aid has regularly been handed out strategically to win political support, such as during a 2005 referendum over changes to the constitution (which the government nevertheless lost, both nationally and in Endau). In particular, three local politicians, who were either elected or vying for election to local council or national parliament positions, argued forcefully that trade should be stopped and Somali and Orma herders excluded from the area. In addition to winning support among those fearful of declining access to free water sources and of raids, such exclusion could also indirectly benefit some politicians by eliminating competition for grazing and water for their own herds and undermine the economic activities of their perceived new economic rivals (although the latter argument was never voiced publicly). The public argument for exclusion that some politicians made had a strong ethnic legitimization, based on the notion that Kitui District is only for Kamba people (implicitly, also Kamba from other districts such as Mwingi), while people of Somali and Orma ethnic origin belong in other districts and should not be allowed into Kitui without a government permit. Local informants holding a different view explained, however, that collaboration over water access during drought and trade could be a strategy to ensure peace, because it is precisely when pastoralists depend on collaboration and access to Endau water sources that they are least likely to engage in violent attacks.

While traditionally powerful, informal institutions such as clans and elders are important in solving disputes between individuals, new political alliances were more important in shaping negotiations at the village level regarding interaction with pastoralists. The divergent economic and political interests explained above did not follow strict clan lines. Besides, although clan relations were important to providing assistance during drought and securing access to land to families displaced by violence, as explained by one key informant in Twambui and three interviewees in Ndetani, they could not protect clan members against violence. During 2006, it became apparent that the district administration was pivotal to power struggles through its power to mobilize the police to put force behind decisions. The ability of people to form alliances and relations to influence district level decisions, either through the chief or directly through the District Commissioner, was critical to adaptive capacity.

Decisions regarding whether Orma and Somali pastoralists were allowed to rent wells and grazing and stay temporarily in the area were generally made in public meetings at the sublocational centers. The district and locational government representatives were central to calling and mediating these meetings, and they appeared to have significant influence in guiding discussion and on making the final decisions. Interviews revealed that one strategy to influence such meetings was the formation of organized groups, such as traders forming a 'youth group' that could legitimately voice their views in meetings. The local politicians were active in speaking at public meetings called by the district administration or calling their own public meetings in order to promote their interests. In Malalani, it was decided in both 2006 and 2007 that Orma and Somali should not be allowed into the area. In Twambui, however, decisions varied and were contested. In 2005, a suggestion to ban Orma and Somali from the area was raised in a meeting, but such a decision was not agreed on and trade therefore took place unchecked. A Twambui public meeting led by the district administration decided in 2006 that trade with Somali and Orma should be banned.

As the drought intensified in 2006, some well owners started renting out their wells to Orma and Somali pastoralists in contravention of the ban. Communicating directly with the District Commissioner then became one of the main strategies to promote particular economic and political interests. Some politicians opposed to the trade traveled to the district headquarters to complain that there was now a conflict with pastoralists. The district administration responded by having several wells filled in and two of the owners arrested. Such measures at the height of the drought angered many of the Kamba agropastoralists.

The interviews revealed intense negotiation and competition over relations with the local and district government administrations. By raising allegations that Somali pastoralists had bribed the local administration to allow pastoralists into the area, the politicians succeeded in getting two local administrators temporarily suspended and replaced with someone hostile to pastoralists. Both Kamba and Somali respondents accused the temporary administrator of turning a blind eye to Kamba stealing of Somali animals. According to one of the suspended administrators, 8 cows and 26 goats were stolen during this period. There were also reports of the politicians and administrators hostile to Orma

and Somali pastoralists encouraging people during public meetings to attack and steal Somali animals, and at least one camel was brutally axed to death by a group of Kamba youths in October 2006. The repeated theft of Somali goats and the killing of the camel, an animal of great symbolic as well as economic importance to Somali, eventually provoked a group of 30 Somali to arm themselves and mobilize for revenge. As revealed by interviews with the district administration, the characterization of local interactions with Orma and Somali pastoralists as a conflict resonates with official discourse and the received wisdom that pastoralist–farmer interaction during drought normally leads to conflict over scarce resources and that the solution is to expel pastoralists. Portraying the situation as a conflict, and provoking actual violent conflict, had hence been used as a conscious strategy to influence decision-making toward expelling Orma and Somali pastoralists.

However, villagers responded to such political alliances and strategies by seeking their own alliances and by sending a delegation directly to the divisional and district administration in order to get their own views heard. By portraying the trade as peaceful and arguing that the killing of the camel was a criminal offense, they succeeded in getting the district administration to intervene to defuse the tension and ensure security. With the backing of the police and administration, Somali and Kamba elders, organized in peace committees, negotiated an appropriate compensation for the camel and a fine for the perpetrators. Trade was resumed, and a compromise was reached whereby Somali were allowed to stay some kilometers away from Twambui and enter Twambui only for watering cattle or trading in the market.

Given that stopping the trade with Orma and Somali pastoralists depended on portraying the interaction as a conflict rather than collaboration, it is perhaps not surprising that the local peace committee itself was subject to intense strategies to win control by those in support of or opposed to trade. The continued struggle between these two interest groups and politicians to control the local peace committee was manifested in the ousting of peace committee members who supported pastoralist presence in the area through public accusations of their 'being bought' by pastoralists. Once they gained the support of the district administration, the originally elected peace committee members regained their recognition, and the local administrator who had been suspended was reinstated in late 2006.

Differential Outcomes of Adjusting to Conflict and Drought

Outcomes for adaptive capacity in the face of drought and conflict were uneven. While both the well owners and traders and the pastoralists were wealthy, this did not ensure influence over decisions critical to their adjustments. Drought livelihoods for Kamba traders and well owners and continued access to dry-season water and grazing by Orma and Somali pastoralists remain precarious. Endau was not directly affected by the postelection violence that rocked Kenya in early 2008. However, during the run-up to the hotly contested elections in 2007, the peace committee was dissolved and, apparently through alliances between politicians and the local administration, a decision was made to exclude Orma and Somali pastoralists from the area. When in Endau, Orma and Somali were routinely charged up to twice the going price for goods and services but accepted this since objecting would put their presence in the area at risk. Interviews with Somali pastoralists revealed that exclusion from other water sources in neighboring districts had made them dependent on water sources in Endau to survive droughts. However, they had little influence over decisions regarding whether or not they were allowed into the area. Being nomadic, they could influence district administration decisions only through the Kamba peace committee or local administration and were hence at the whim of local political processes and allegiances. Finally, since conflict and security dominated in campaigns to win political support, landlessness and access of the poor to water were marginalized among concerns raized by influential people. When interviewed, political candidates sometimes even denied the existence of landless in the area. Some poor sections of society had low adaptive capacity, were unable to secure access to land and water resources vital to adjust livelihoods to drought, and had often been made even more vulnerable by violence and displacement.

Turkana Site

Livelihoods and Drought

Turkana District, nestled in the northwestern flank of Kenya, is an expansive rangeland framed by the saline Lake Turkana to the east and highlands along its southern border with West Pokot District and western border with Uganda. It is one of the driest areas in eastern Africa where pastoralism is practiced (Little and Leslie 1999), with low mean rainfall, large seasonal variations, and prolonged periods of drought (see Figs. 4, 5). Pastoralist production systems of Turkana people have customarily depended on social and economic ties with neighboring groups, seasonal movement of herds to highland grazing and browsing sites, and livelihood diversification. However, Turkana livelihoods have long been in crisis, with some of the highest levels of poverty in the country (Republic of Kenya 2003). Turkana District was the largest administrative district in Kenya before it was divided into two districts in 2007 and

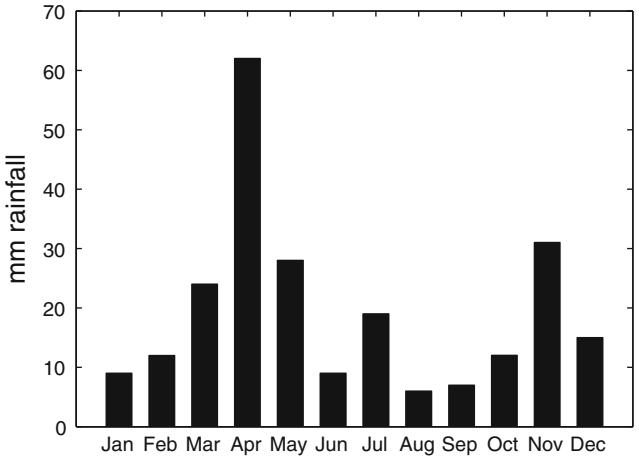

Fig. 4 Mean monthly rainfall, 1961–1990, Turkana. Based on rainfall data for 0.5 × 0.5-deg grid covering Turkana District, CRU TS2.1 dataset

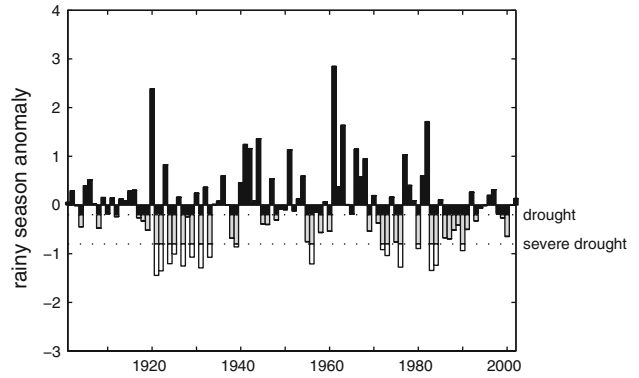

Fig. 5 Annual variation in total rainy season rainfall (March–May and October–December), in standard deviations, 1901–2002, Turkana. Mean rainfall, 1961–1990, is 172 mm. Severe drought signifies ≤101 mm, and drought ≤154 mm rainfall. Based on rainfall data for 0.5 × 0.5-deg grid covering Turkana District, CRU TS2.1 dataset

is sparsely populated outside of a few large towns. The population and poverty data for the sites are summarized in Table 2.

Work options vary across the sites, as do the forms and frequency of violence, as detailed below. The sites share a common background of external intervention. Destitute people have been resettled as part of a commercial fishing scheme in Kalokol and an irrigation scheme in Katilu. In the early 1980s, Kakuma was the site of the main relief camp to assist pastoralists whose herds had been lost following an animal disease outbreak and drought.

Effects of Violence on Adaptive Capacity

Armed violence, development failures, and economic decline have all weakened Turkana production systems and eroded the adaptive capacity of Turkana's people. The incorporation of Turkana into the modern nation-state involved warfare and the loss of customary livelihoods. Approximately 14% of the Turkana population perished in the 1910s as a result of armed conflict, disease, starvation following the wholesale confiscation of herds, and attacks by northern neighbors during a military assault by the King's African Rifles against Turkana fighters (Lamphear 1992). The delineation of borders across northern Kenya and their administrative enforcement were detrimental to cross-border contacts between herding societies during the period of British colonial rule, which ended in 1963. Customarily, this connectivity regarding trade links, intermarriage, and reciprocal resource-use agreements was vital to the adaptive strategies of groups like the Turkana.

Armed violence and the imposition of new forms of authority during colonial rule have continued to impact Turkana livelihoods (Table 4). Vast swathes of Turkana are considered to have a risk of livestock raiding, being most frequent in the dry season when herds are driven to distant borders where grazing and browse is more plentiful. The risk of raiding is high in Katilu as well as in the borderlands of northern Turkana outside Kakuma. By comparison, there is no risk of raiding in Kalokol, which is situated far from border areas. These geographic variations were evident in people's responses in the different study sites to significant events that have shaped their livelihoods in the recent past. Ten of 15 people in Katilu listed armed violence as a significant event, compared with 12 of 15 in the Kakuma region and 3 of 15 in Kalokol.

Other violence in Turkana is caused by *ngoroko*, or Turkana bandits. Attacks by *ngoroko* are a chronic problem in the southern reaches of Turkana District, including Katilu. Several people interviewed in Katilu detailed how *ngoroko* come from the northern and western parts of the district and attack Turkana homesteads on their way to raid tribes in neighboring areas to the south and east. Women are disproportionately affected by *ngoroko*, who engage in the systematic rape of young girls and women, enter homes, demand grains and cooked food, threaten children, and take away girls to make them wives. Records of transgressions by young men against fellow Turkana people date back to at least the 1920s (Lamphear 1992). However, local opinion is that the behavior of *ngoroko* has become more predatory over time and that their attacks have become more frequent, a trend confirmed by McCabe (2004).

An attack in early 2004 on a Turkana caravan that had traveled to a water point in Kaabong in Dodoth-land in neighboring Uganda is illustrative of the impacts of armed violence on people's livelihoods and adaptive capacity. Nine of 15 people interviewed in villages outside of

Table 4 Conflicts and their impacts at Turkana study sites

Study site	Type(s) of conflict and insecurity	Proximate impact(s)
Kalokol region	Raiding and attacks on fisherfolk on the Lake by Merille tribesmen	Physical displacement and resettlement near to larger centers and towns
		Loss of key grazing areas and sites for flood retreat cultivation near the Omo River Delta
		Destabilization leading to restrictions on lake fishing
		Loss of livestock and sources of food
		Loss of human life
	Collapse of fishing industry	Loss of important source of cash income
Kakuma region	Cross-border raiding by neighboring Dodoth and Toposa tribesmen	Physical displacement
		Loss of livestock and human life
		Destabilization leading to disruption of some livelihood activities
		Restricted access to drought reserves and dry-season grazing
Katilu region	Cross-border raiding by neighboring Pokot tribesmen	Loss of livestock and human life
		Loss of access to drought reserves and dry-season grazing
		Abandonment of irrigated fields
		Destabilization leading to disruption of some livelihood activities
	Ngoroko (bandit) attacks	Loss of livestock, household grain stores, and kitchen utensils
		Loss of life
		Rape of women
		Destabilization leading to restrictions on farming activities
		Restricted or lost access to sites for gathering fuelwood and wild foods
		Intracommunity tensions
	Decline of irrigation scheme and collapse of farmers cooperative	Loss of access to farm inputs and extension services
		Loss of access to key market outlets for farm produce
		Decrease in cash income from farming

Kakuma indicated that they incurred the death of a relative or loss of livestock in the raid. Several interviewees recounted how Turkana herders at Kaabong were ambushed by Dodoth warriors. Without access to water, many people died and several hundred animals were lost after becoming stuck in muddy water when returning to the northwestern part of Turkanaland bordering Uganda, an area that is home to the Ngilukumong, one of the Turkana kinship groups (Lind and Eriksen 2006). Many survivors settled in Natira, along the tarmac road that links the towns of Lokichoggio and Kakuma. The coping behavior of survivors of the raid indicated that pastoralism had become unreliable. Raids and the threat of violence both restricted access to resources in borderlands and depleted livestock holdings that are vital to maintain social ties. Many people also possessed too few animals to sustain labor required for livestock movements. One estimate is that a viable herd in Turkana would be 100–200 goats (depending on the typical size of goats in different places) or 10 cattle and 50–75 goats (Levine and Crosskey 2006). Turkana people are notoriously reluctant to reveal the size of their herds. However, for the purposes of this research, participation in livestock exchanges and the importance of nonlivestock products in diets are used as proxy indicators of relative per-capita livestock holdings. In villages outside Kakuma, 11 of 15 respondents did not participate in livestock exchanges. Several people mentioned selling animals for food, a common strategy among the Turkana poor for meeting acute food shortages. Further, only one person interviewed in Kakuma indicated primary reliance on livestock products in the household diet. The direct loss of livestock in raids had in certain cases impoverished entire social networks, as people explained they were unable to acquire livestock on loan or as gifts through social contacts. Armed violence had hastened the shift away from livestock-keeping as the focus of people's work efforts, a trend observed across Turkana in general. Nonlivestock activities such as gathering wild foods, informal trade, and providing cheap labor for public workfare projects as well as to refugees in a camp in Kakuma were used to compensate for losses incurred in livestock-keeping. These were mentioned by 12 of 15 people interviewed in Kakuma.

In other ways, armed violence has undermined trust on many levels. Within households, the loss of joint assets—the family herd—has meant there are fewer incentives to cooperate, as household members emphasize their own individual activities such as informal trade or carrying out

tasks for cash. Within communities, the circulation of stolen livestock has affected reciprocal livestock exchanges, making it more difficult for individual herd owners to cultivate new ties. People are dubious that animals offered for exchange were legitimately acquired through barter, purchase, or reproduction from the existing herd. An elderly female respondent in Katilu said, "I exchange animals only with people in my neighborhood who I know well." Between Turkana and its neighbors, the chronic threat of violence has resulted in a loss of trust that is essential to negotiating reciprocal resource-use agreements that could help to enhance adjustment options on both sides.

Livelihood Adjustments and the Making of Vulnerability

The capacity and options of Turkana people to adjust their livelihoods in a context of violence are shaped, in turn, by structural inequality in Kenya and a history of failed development interventions. Until recently, development policy and planning in Kenya regarded pastoralism as unproductive and inherently destructive to the environment. The allocation of public resources in Kenya has favored the high-potential farming areas of the former 'White Highlands' in central and western parts of the country (Leys 1975). This agrarian bias is reflected in the failure of the state to make significant investments in drylands, particularly in northern Kenya, where nonstate actors such as churches have been more important in providing health and education services. For example, the Catholic Church has built 6 of 8 secondary schools and 112 of 148 primary schools in Turkana District (Lind 2006). Turkana's Human Development index (HDI) value—0.280—is the second lowest in Kenya (UNDP 2003). Relief operations of varying magnitude have been undertaken nearly every year since the early 1990s, but there is an even longer history of humanitarian intervention, stretching back to the 1930s (Lind 2005). The colonial and post-independence development bias has contributed to the trend toward settlement of pastoralists (Lind and Eriksen 2006). Thus, options for adaptation in Turkana have been shaped fundamentally by national development policies and the allocation of development resources.

Unsurprisingly, ordinary Turkana people have had little power to influence development interventions by external agencies. As detailed below, previous development projects in Turkana were poorly conceived in failing to account for fundamental ecological and societal considerations and worsened the vulnerability of people intended to be helped. After independence, in the 1960s and 1970s, the Kenyan government and aid agencies initiated large-scale relief operations in Turkana and resettled destitute herders in irrigation and fishing schemes. The fishing scheme was centered on Kalokol near Ferguson's Gulf on Lake Turkana, where the colonial administration established a camp for destitute people in the 1930s. Inhabitants of the camp were given nets and instructed in fishing as a way of supplementing rations and to transition out of livestock-keeping. However, these efforts were frustrated by difficulties in procuring fishing gear, treacherous conditions on the lake, and a lack of interest in fishing by the camp inhabitants (Lind 2006).

In 1980, there was a significant influx of displaced people when drought combined with livestock disease precipitated a major humanitarian crisis in northern Turkana. The Kenyan government and aid agencies assisted destitute people to resettle in villages near the lake. The Norwegian development agency (NORAD) supported the construction of a fish factory at Kalokol town and the establishment of the Turkana Fisherman's Co-operative Society. Fishermen sold their catch to the factory, which opened in 1982. However, fishing was never able to cover all the nutritional and income needs of the settlers, most of whom devoted time to activities other than fishing to make up for the shortfalls (Broch-Due 1986). The factory closed in 1990 after NORAD withdrew funding when the Kenyan government severed diplomatic ties with Norway, a decision linked to the Kenyan political situation at the time and international pressure on the government to initiate democratic reforms.

Destitute people have continued to settle in Kalokol and other lakeside settlements. Kalokol Division has the highest percentage of the population (81%) living below the monetary poverty line in rural Kenya (Republic of Kenya 2003). Both recent arrivals as well as long-term residents who were interviewed had been forced to practice an assortment of tasks from which they earned scant income. Subsistence fishing and harvesting the *eengol* (doum palm) are the main livelihood activities in Kalokol today, indicated by 13 of 15 people interviewed. Women gather and sell building posts and use palm fronds to weave mats and baskets, but there are no market linkages with Lodwar, the administrative and commercial center of Turkana District. This means that women must rely on itinerant traders to buy their goods, typically at very low prices. Many depend on irregular relief distributions, but local people complain that rations are small and that few people are registered (Jaspars and others 1997).

Similarly, in Katilu, a small center situated near the Turkwel River in southern Turkana, the demise of an irrigation scheme established through external aid, coupled with the constant threat of raids and *ngoroko* attacks, factored centrally in the decline of people's adaptive capacity. The scheme was initiated in the 1960s and expanded in the 1970s and early 1980s to establish destitute people outside the customary pastoralist economy. However, development

planners later recognized that the standard plot size of 0.4 ha (1 acre) was too small. Design features of the irrigation schemes meant that farmers had to depend on food aid and loans of inputs to survive. Further, the scheme was fundamentally misconceived, as it did not take into account the irregular flow of the Turkwel River, which meant that fields were prone to flooding and irrigation channels became silted, or that riparian areas were important drought reserves for pastoralists.

In 1990, the last donor, NORAD, withdrew its support. Leaders of the farmers' cooperative that had been established were accused of embezzling funds, and the cooperative collapsed. The scheme infrastructure has fallen into ruin, and farmers have limited access to improved varieties of seeds, fertilizer, and insecticide or markets for their products. Transport services to Katilu, which is situated over 100 km from Lodwar, the nearest sizable market, are irregular and prohibitively expensive. With little and uncertain assistance from the government, farmers have conceived their own coping strategies, such as shifting from cash to subsistence crops, relying on locally available seeds, investing any surplus in petty trade, and acquiring small livestock. In the end, the intervention of external aid through the establishment of an irrigation scheme actually worsened the vulnerability of the poorest (Hogg 1987; McCabe 1990).

Differential Outcomes and Responses to Insecurity

The nature of vulnerability in Turkana illustrates how development intervention can weaken people's options and ability to make livelihood adjustments. Development planners intended for settlers to abandon their economic involvement in livestock-keeping and become fisherfolk or farmers, which went against people's own ambitions to replenish herds and maintain social ties within pastoralist networks. Sedentarization worsened people's vulnerability, as fishing or farming alone never met their nutritional and food security needs. Being far from their home areas, and having few assets to share, settlers were not able to maintain important social ties in the pastoralist economy requiring the exchange of animals.

Chronic insecurity and the lack of coping options have resulted in widespread destitution. Entire social networks have been impoverished, meaning that customary social safety nets no longer serve to redistribute livestock to needy people. Dependency ratios are high among the few that are considered to be better off. In this context, there are differential outcomes in terms of unmet economic needs and social requirements. The workload of women has increased, as they have tended to undertake the bulk of newly important tasks for cash and petty trade. But, in general, women wield greater control over the income they generate from these individual activities. By comparison, the position and status of young men are linked to the drivers of armed violence and impoverishing processes at work in Turkana society. The impoverishment of family lines means that many men lack animals to formalize marital ties, which require transfer of livestock to a man's in-laws.

There have been significant changes in the social organization of resource use as well as the emergence of new forms of authority, which reflect internal efforts to respond to the threat of raiding and the failure of the state to provide security. Since the early 1980s, herding households have come together in larger 'neighborhoods' known as *arumrum* as a way of seeking safety in numbers. These are loose grazing associations consisting of up to a few hundred households that move as large conglomerations in areas where the threat of attack is greatest (Lind and Eriksen 2006). Decisions on where to graze are made collectively under the leadership of elders within an *arumrum*, which are guarded by armed men. Thus, changes in social organization have permitted a continuation of movements in certain areas.

More recently, aid agencies have supported the establishment of a district-level forum on peace and development as well as an elaborate organizational infrastructure at the locational and sublocational administrative levels to promote peace. However, these have been outside-driven, and most 'village peace committees' are disconnected from a local support base and thus lack legitimacy (Lind 2006). These new organizations were created, in part, because of concern in the diminishing authority of traditional elders to influence young men who raid. According to local views, the position of *emuron*, or diviners, has declined. Traditionally, they have filled an important role in blessing raids and thus exercized some control over Turkana raiders. Men who defend and protect life and property are regarded as the most important leaders, and these are rarely administrative officials or police officers. These include elder leaders of nomadic encampments, who negotiate access to resources in areas in distant border areas; sharpshooters, who protect encampments; and, in some cases, *emuron*.

A variety of social relations is important to how Turkana people negotiate access to resources and adjust their livelihoods, but mostly with people of a similar position and status since destitution is so widespread. Adaptations have permitted the continuation of livestock movements in some areas where the risk of raiding is greater. But these have not altered the longer-term vulnerability of Turkana people, a complex problem which relates to poorly conceived development interventions, marginalization, and underdevelopment of Turkana within the structure of the Kenyan economy.

Discussion and Comparative Analysis

In both Endau and Turkana, people's adjustments to drought and conflict are intrinsically political processes that have differentiated outcomes. First, the process of local adaptation goes beyond the forming of social relations and political alliances to access to resources needed to adjust livelihoods; these relations are sometimes aimed as much at retaining or strengthening power bases as at securing material means of survival. This was exemplified by events that unfolded in Endau as different individuals and groups struggled to ensure either continuation or cessation of trade between Kamba agropastoralists and Orma and Somali pastoralists. These findings are in line with previous observations made in southern Kenya by Campbell and others (2000) that, where concerns of different interest groups intersect on one issue (such as land tenure), political alliances emerge to gain control over resources and to influence policy. Among these different interests is the gaining of political support. Divisions and the forming of alliances need not follow farmer–herder or ethnic lines since communities are not homogeneous in their economic and political interests. Findings in Endau suggest that similar dynamics are present for collective decisions regarding issues that are of key concern for adjusting to multiple stressors. In particular, livelihood adjustments to drought, such as trade, can challenge and rearrange existing power bases. Collective decisions regarding local adjustments are hotly contested. In order to influence such decisions, alliances are formed between different groups of villagers and pastoralists, politicians, clan elders, chiefs, groups such as youth and women community-based organzations, and peace committees.

Both customary institutions, such as clans, spiritual leaders, and social networks, and government institutions, including the local administration, play important, but different, roles in such relations. State institutions are critical because only they can provide protection from violence or policing power to enforce decisions that are subject to conflicting interests. Customary institutions are no longer able to provide protection from violence but are important to how people negotiate access to resources and reduce (though not avoid altogether) the negative effects of conflict or drought. In Turkana, for example, the formation of larger groups to move together has become important to the ability of herders to access resources in insecure borderlands.

Second, national economic and political structures and processes affect local adaptive capacity in fundamental ways. In addition to seeking relations with influential individuals, customary institutions and government administration at the village level, adaptive capacity is critically influenced by relations to government administration at district levels, national politics, and government and international aid development priorities. There is a close connection between the negotiation of competing interests at the local level and political processes at the national level. For example, the capacity of the poor and landless in Kitui to promote their interests with regard to improved access to water, land, and social services is compromised by competition between candidates for local council and national parliament positions, politicizing ethnic divisions and ignoring other concerns. Politicians who express antipastoralist sentiment in public meetings also legitimize attempts by some Kamba groups to restrict Orma and Somali herders' access to resources. These tensions are acute during elections and affect both the herders' access to wells that are critical for surviving drought and Kamba drought adjustment strategies such as trade.

To reemphasize an earlier argument, Kenyan drylands have historically been disadvantaged in the distribution of public resources for development and in services provision. Unsurprisingly, ordinary people in Kitui and Turkana lack influence over decision-making that affect their adjustment strategies to conflict and drought. The availability of livelihood options that are well adapted to drought has been reduced in both sites by development policy biased against pastoralism as well as the failure of the state to provide security. Violence and lack of support for pastoralism have together contributed to sedentarization, a shift away from livestock-keeping as the basis of livelihood security, and destitution.

Third, conflict is part and parcel of adaptation, not just an external factor inhibiting local adaptation strategies. In Turkana, violence has transformed the social relations used in livelihood adjustments. Adaptive capacity in Turkana relates strongly to social networks and the ability to activate reciprocity claims in times of heightened vulnerability. However, armed violence combined with the lack of options to rebuild livelihoods has impoverished entire social networks. Generally, it has become more difficult to reconstitute herds through social contacts. Also, violence has affected trust between individuals. This is fundamental to the customary institution of transferring livestock as a means of building social contacts and increasing the reliability of resources.

Conflicts are also sometimes provoked as a means to influence collective adaptation decisions towards particular outcomes. Politicans' influence over police action (or inaction) has sometimes been abused to gain wealth or political power, as observed in Endau during our fieldwork and as previously observed in Turkana (Meier and others 2007). Those who can perpetuate violence unchecked are often relative winners in negotiations regarding livelihood adjustments, to the detriment of other groups. This underwrites observations in other dryland areas in Africa that

where neither effective arbitration of competing claims nor state mitigation of violence exists, systems are open to abuse and some people stand to gain from violence (Thébaud and Batterbury 2002).

Conversely, drought adjustments affect conflict-resolution processes. Drought adjustments involving peaceful interaction between pastoralists and agropastoralists can represent a threat to existing power bases, making peace committees subject to disputes over their membership, which views are to be promoted publicly, and over their activities. Peace committees can play an important role in the political process of adaptation. In Endau, they provided a critical link to district and policing authorities and were one of the main targets of forming of alliances at the local level. In Turkana, however, official conflict-resolution structures through district and local-level peace committees were regarded as imposed and thus lacked legitimacy.

Fourth, power relations and structural inequalities at multiple geographic scales lead to differential vulnerability both between geographic areas in Kenya and between individuals at the village level—there are relative winners and losers of adaptation. However, local adaptation in the face of multiple threats need not compound existing inequalities, as suggested by Adger and others (2006). Instead, findings in Endau, in particular, support a more nuanced view, since drought adjustments there have actually created new wealth among well owners and traders, at least some of whom were initially destitute.

Relative wealth or poverty is not sufficient to explain people's adaptive capacity. In Endau, wealthy Orma and Somali pastoralists and newly wealthy Kamba well owners and traders have only precarious influence over decisions related to the continuation of trade. Instead, ethnic identity and conflict discourses influence which interests are heard. In Turkana, there is a nearly uniform inability among households, whether rich or poor, to influence government or aid policy or gain police protection. Better-off pastoralists with large herds are vulnerable to violence that can restrict access rights to water, browse, and grazing. However, by virtue of having more animals to distribute to social contacts, the ability to minimize risk of wealthier herders is necessarily greater.

Thus, levels of vulnerability are great among the destitute population in towns and former resettlement areas in Turkana and the landless in Endau, who carry out an assortment of survival tasks, none of which enable them to reconstitute a herd or generate other forms of wealth that could be used to establish new contacts and increase their productive potential. Common to the two cases is the marginalized position of nomadic pastoralists, in terms of their representation of their interests in government decision-making. Whether or not local adjustments to drought and conflict compound existing inequalities depends on structural inequalities and political processes at the national level that shape how conflicting interests are negotiated locally.

Conclusion and Policy Implications

In order to create a context where people are able to respond to multiple types of change and hence reduce vulnerability under future climate change, climate change adaptation policy efforts need to take a broad approach to address the structures and factors that presently create vulnerability among different groups. The study suggests that conflict resolution is critical to adaptation since conflict restricts many drought adjustments. This supports Barnett's (2006) proposition that adaptation is about not only environmental or development measures but also insurance of peace and conflict resolution. Improved protection against violence and access to justice are important for adaptation and involve addressing the marginalization by the state of dryland groups in terms of provision of security and protection from violence and crime. However, since conflict is part of the political process of adaptation, and since many people gain from conflict, efforts to implement such measures are likely to come up against vested interests.

Climate change adaptation policies are unlikely to be successful or minimize inequity unless the political dimensions of local adaptation are considered when exploring which measures to implement. Strengthening adaptive capacity may require addressing imbalances in the distribution of powers and resources within a political system that produces and maintains development inequalities. Hence, adaptation may need political solutions, for example, redistribution of development resources to marginalized drylands and consideration of development inputs that support people's own aspirations to maintain their involvement in livestock-keeping. The study shows that government and aid agency interventions can exacerbate people's vulnerability, including their ability to manage the consequences of climate change. Part of the problem is that 'development' often disregards the logic of people's own adaptation strategies. Within development policy and practice, there is a need to appreciate poor people's understandings and explanations of the insecurities with which they live, an important aspect of the multidimensionality of poverty, as pointed out by Chambers (1995).

The findings support Thomas and Twyman's (2005) suggestion that climate change policies need to be oriented toward enabling, rather than inhibiting, local and regional adaptation options. Such policies imply a shift away from adaptation policies that prescribe practices to those that enable greater local freedom to choose appropriate

practices and to adapt to both climatic and nonclimatic stressors at the same time. In effect, this means a shift in power relations between policy-makers and local populations.

This insight highlights that there are political obstacles to developing effective adaptation policies. Such efforts are likely to have to challenge existing power structures both locally and nationally. In addition, the ability of vulnerable groups to influence the decision-making processes and structures more *generally*, such as development policies that affect the flexibility of households to adjust (Campbell 1999; Thomas and Twyman 2005), may be as important for local adaptation as the ability to influence *specific* climate change adaptation policies. The National Adaptation Programmes of Action, for example, are still at the initial development stages and non-LDC development countries, such as Kenya, do not even have them (Huq and Khan 2006). Experience from African countries that have developed climate change adaptation policies shows that real local participation and taking account of household-level strategies remain challenges (UNFCCC 2007; Eriksen and others. 2008). The mobilization of peace committees and other forms of civil society that have emerged with local democratization in Kenya has sometimes been critical to shaping local decisions and provides some hope that political reforms can potentially strengthen adaptive capacity. The decentralization of development funding increases the influence of the local population over decisions, such as regarding investment in a village water supply, that affect the ability to make livelihood adjustments. However, rivalry for political influence, especially before elections, can lead to alliances and actions that undermine adjustments to drought and even create violent conflict. To minimize inequality and promote justice in local adaptation, policies need to take account of the way different groups seek to promote divergent adaptation interests. Careful consideration must be given to conflicting interests and their representation in any policy process to support adaptation.

Acknowledgments We thank the local administration, community leaders, and ordinary people in Kitui and Turkana districts who agreed to be interviewed for this research. We also thank research assistants in Kitui and Turkana districts. The paper forms part of a research project supported by the Research Council of Norway (2004–2006) and the Global Environmental Change and Human Security Project (2007). The project was carried out in collaboration with Bernard Odit Owuor, Wycliffe Muoka Mauta, Jared Amwatta Mullah, Benard Muok, Abdi Haji, and Samuel Auka (all at Kenya Forestry Research Institute), Kjersti Larsen (Ethnographic Museum at the University of Oslo), and Debby Potts (King's College London) as well as our collaborating partners The African Centre for Technology Studies, Nairobi, and The Center for International Climate and Environmental Research—Oslo (CICERO). Special thanks go to Tone Veiby and Lars Risan, David Lister, and Ian Harris for assisting with climate data, maps and figures. We are also grateful to Karen O'Brien, Jon Barnett, and three anonymous reviewers for commenting on an early draft of this article.

References

Adger WN, Paavola J, Huq S (2006) Toward justice in adaptation to climate change. In: Adger WN, Paavola J, Huq S, Mace MJ (eds) Fairness in adaptation to climate change. MIT Press, Cambridge, MA, pp 1–19

Allen J (2003) Lost geographies of power. Blackwell, Malden, MA, 232 pp

Akong'a J, Downing TE, Konijn NT, Mungai DN, Muturi HR, Potter HL (1988) The effects of climate variations on agriculture in central and eastern Kenya. In: Parry ML, Carter TR, Konijn NT (eds) The impact of climatic variations on agriculture. Assessments in semi-arid regions, vol 2. Kluwer Academic, Dordrecht, Netherlands

Barnett J (2006) Climate change, insecurity, and injustice. In: Adger WN, Paavola J, Huq S, Mace MJ (eds) Fairness in adaptation to climate change. MIT Press, Cambridge, MA, pp 115–130

Barnett J, Adger WN (2007) Climate change, human security and violent conflict. Political Geography 26:639–655

Boko M, Niang I, Nyong A, Vogel C, Githeko A, Medany M, Osman-Elasha B, Tabo R, Yanda P (2007) Africa. In: Parry ML, Canziani OF, Palutikof JP, van der Linden PJ, Hanson CE (eds) Climate change 2007: impacts, adaptation and vulnerability. Contribution of working group II to the fourth assessment report of the intergovernmental panel on climate change. Cambridge University Press, Cambridge, UK, pp 433–467

Broch-Due V (1986) From herds to fish and from fish to food aid: the impact of development on the fishing population along the western shores of Lake Turkana. A socio-anthropological case study. Norwegian Agency for Development Cooperation, Oslo

Brown DA (2003) The importance of expressly examining global warming policy issues through an ethical prism. Global Environmental Change 13:229–234

Campbell DJ (1999) Response to drought among farmers and herders in southern Kajiado District, Kenya: a comparison of 1972–1976 and 1994–1995. Human Ecology 27:377–415

Campbell DJ, Gichohi H, Mwangi A, Chege L (2000) Land use conflict in Kajiado District, Kenya. Land Use Policy 17:337–348

Chambers R (1995) Poverty and livelihoods—whose reality counts. Environment and Urbanization 7:173–204

Davies S (1993) Are coping strategies a cop out? IDS Bulletin 24:60–72

Eakin H (2006) Weathering risk in rural Mexico: climatic, institutional, and economic change. University of Arizona Press, Tucson, 242 pp

Ellis F (1998) Household strategies and rural livelihood diversification. The Journal of Development Studies 35:1–38

Ellis S, ter Haar G (2004) Worlds of power: religious thought and political practice in Africa. Hurst & Co., London, 272 pp

Eriksen S, Brown K, Kelly PM (2005) The dynamics of vulnerability: locating coping strategies in Kenya and Tanzania. Geographical Journal 171:287–305

Eriksen S, Gachathi FN, Muok B, Ochieng B, Owuor B (2006a) Synergies in biodiversity conservation and adaptation to climate change: the case of hilltop forests in Kitui, Kenya. In: Mistry J, Berardi A (eds) The savanna biome system. Ashgate, Aldershot, UK, pp 187–226

Eriksen S, Owuor B, Nyukuri E, Orindi V (2006b) Vulnerability to climate stress–local and regional perspectives. Proceedings of two workshops. January 27–28, 2005, World Agroforestry Centre, Gigiri, Nairobi, and February 14, 2005, KEFRI Research Centre, Kitui. CICERO Report 2006:1, Oslo, Norway

Eriksen S, O'Brien K, Rosentrater L (2008) Climate change in eastern and southern Africa: impacts, vulnerability and adaptation. GECHS Report 2008:1, Oslo, Norway, 26 pp

Fotheringham S (1997) Trends in quantitative methods 1: stressing the local. Progress in Human Geography 21:88–96

Gachathi FNM (1996) Conservation priorities in the arid and semi-arid lands: the case of the hilltop forests of Kenya. In: van der Maesen LJG (ed) The biodiversity of African plants. Kluwer Academic, Dordrecht, Netherlands, pp 313–316

Gakure J, Mbogo D, Ochieng T (2006) Turkana District 2005—short rains assessment 9–20 January 2006. Kenya Food Security Steering Group, Nairobi, 9 pp

George AL (1979) Case studies and theory development: the method of structured focused comparison In: Lauren PG (ed) Diplomacy: new approaches in history, theory and policy. Free Press, Macmillan, New York, pp 43–68

Goldsmith P (1998) Cattle, khat, and guns: trade, conflict, and security on northern Kenya's highland-lowland interface. Institute of Policy Analysis and Research and USAID Greater Horn of Africa Initiative, Nairobi, Kenya

Goodhand J (2001) Violent conflict, poverty and chronic poverty. CPRC Working Paper 6. Chronic Poverty Research Centre, Manchester, UK

Hogg R (1987) Settlement, pastoralism and the commons: the ideology and practice of irrigation development in northern Kenya. In: Anderson D, Grove R (eds) Conservation in Africa: people, policies and practice. Cambridge University Press, Cambridge, UK, pp 293–306

Huq S, Khan MR (2006) Equity in national adaptation programs of action (NAPAS): the case of Bangladesh. In: Adger WN, Paavola J, Huq S, Mace MJ (eds) Fairness in adaptation to climate change. MIT Press, Cambridge, MA, pp 181–200

Huq S, Rahman A, Konate M, Sokona Y, Reid H (2003) Mainstreaming adaptation to climate change in least developed countries (LDCs). International Institute for Environment and Development, London

Jaspars S, Young H, Shuria H, Ogolla L, Kisopia P (1997) People on the edge: an evaluation of Oxfam's emergency intervention in Turkana. March–August 1996. Oxfam, Oxford, UK

Kenya Food Security Network (2008) Kenya Food Security Update January 2008. USAID/FEWSNET/Republic of Kenya/World Food Programme, Nairobi, Kenya

Klein RJT, Eriksen S, Næss LO, Hammill A, Robledo C, O'Brien K (2007) Portfolio screening to support the mainstreaming of adaptation to climate change into development. Climatic Change 84:23–44

Lamphear J (1992) The scattering time: Turkana responses to colonial rule. Clarendon Press, Oxford, UK, 336 pp

Levine S, Crosskey A (2006) Can pastoralism be brought back to life? Towards a safety net and a way forward for North East Turkana. Oxfam GB Kenya Programme, Nairobi, Kenya

Leys C (1975) Underdevelopment in Kenya: the political economy of neocolonialism 1964–1971. Heinemann, London, 123 pp

Lind J (2005) Relief assistance at the margins: meanings and perceptions of "dependency" in northern Kenya. HPG Background Report. Overseas Development Institute, London

Lind J (2006) Fortune and loss in an environment of violence: living with insecurity in south Turkana, Kenya. Unpublished doctoral thesis. King's College London

Lind J, Eriksen S (2006) The impacts of conflict on household coping strategies: evidence from Turkana and Kitui Districts in Kenya. Die Erde 137:249–270

Little MA, Leslie PW (1999) Turkana herders of the dry savanna: ecology and biobehavioral response of nomads to an uncertain environment. Oxford University Press, Oxford, UK, 436 pp

Longley K, Maxwell D (2003) Livelihoods, chronic conflict and humanitarian response: a synthesis of current practice. ODI Working Paper No. 182. Overseas Development Institute, London

McCabe JT (1990) Success and failure: the breakdown of traditional drought coping institutions among the pastoral Turkana of Kenya. Journal of Asian and African Studies 25:146–160

McCabe TJ (2004) Cattle bring us to our enemies: Turkana ecology, politics, and raiding in a disequilibrium system. University of Michigan Press, Ann Arbor, 320 pp

Meier P, Bond D, Bond J (2008) Environmental influences on pastorial conflict in the Horn of Africa. Political Geography 26:716–735

Mkutu KA (2007) Small arms and light weapons among pastoral groups in the Kenya-Uganda border area. African Affairs 106:47–70

Mortimore M (1998) Roots in the African dust: sustaining the drylands. Cambridge University Press, Cambridge, UK, 237 pp

Oba G (2001) The importance of pastoralists' indigenous coping strategies for planning drought management in the arid zone of Kenya. Nomadic Peoples 5:89–119

O'Brien K, Leichenko R (2003) Winners and losers in the context of global change. Annals of the Association of American Geographers 93:99–113

O'Brien KS, Eriksen L. Sygna, Næss LO (2006) Questioning complacency: climate change impacts, vulnerability, and adaptation in Europe. Ambio 35:50–56

O'Brien K, Eriksen S, Schjolden A, Nygaard LP (2007) Why different interpretations of vulnerability matter in climate change discourses. Climate Policy 7:73–88

O'Leary M (1980) Responses to drought in Kitui District, Kenya. Disasters 4:315–327

Owuor B (2007) Institutional dimensions in the management of dryland resources: case of the Kamba and Somali communities around Endau hilltop forest, Kitui District, Kenya. Paper presented at the annual conference of the Norwegian association for development research making institutions work for the poor? CMI Bergen, Norway, 5–7 November

Owuor B, Eriksen S, W. Mauta W (2005) Adaptation to climate change: evidence from a dryland mountain in Kenya. Mountain Research and Development 25:310–315

Paavola J, Adger WN (2002) Justice and adaptation to climate change. Working Paper 23. Tyndall Centre for Climate Change Research, Norwich, UK

Peters P (2004) Inequality and social conflict over land in Africa. Journal of Agrarian Change 4:269–314

Republic of Kenya (2003) Geographic dimensions of well-being in Kenya: where are the poor? vol 1. Central Bureau of Statistics. Ministry of Planning and National Development, Nairobi

Republic of Kenya (2006) Kenya long rains assessment report 2006. Kenya Food Security Steering Group (KFSSG), Nairobi

Schubert R, Schellnhuber HJ, Buchmann N, Epiney E, Griesshammer R, Kulessa M, Messner D, Rahmstorf S, Schmid J (2008) Climate change as a security risk. Earthscan, London, 248 pp

Scoones I, With C. Chibudu, Chikura S, Jeranyama P, Machaka D, Machanja W, Mavedzenge B, Mombeshora B, Mudhara M, Mudziwo C, Murimbarimba F, Zirereza B (1996) Hazard and opportunities: farming livelihoods in dryland Africa: lessons from Zimbabwe. Zed Books and International Institute for Environment and Development, London, 288 pp

Smit B, Pilifosova O (2003) From adaptation to adaptive capacity and vulnerability reduction. In: Smith J, Klein RJT, Huq S (eds) Climate change, adaptive capacity and development. Imperial College Press, London, pp 9–28

Sobania NW (1990) Social relations as an aspect of property rights: northern Kenya in the pre-colonial and colonial periods. In:

Baxter PTW, Hogg R (eds) Property, poverty and people: changing rights in property and problems of pastoral development. Department of Social Anthropology and the International Development Centre, Manchester, UK, pp 1–20

Thébaud B, Batterbury S (2001) Sahel pastoralists: opportunism, struggle, conflict and negotiation. A case study from eastern Niger. Global Environmental Change 11:69–78

Thomas DSG, Twyman C (2005) Equity and justice in climate change adaptation amongst natural-resource-dependent societies. Global Environmental Change 15:115–124

Thornton PK, Boone RB, Galvin KA, Burnsilver SB, Waithaka MM, Kuyiah J, Karanja S, González-Estrada E, Herrero M (2007) Coping strategies in livestock-dependent households in East and Southern Africa: a synthesis of four case studies. Human Ecology 35:461–476

UNDP (2003) Third Kenya human development report. United nations development programme, Nairobi, Kenya

UNFCCC (2007) National adaptation programmes of action (NAPAs) country reports. Available at: http://www.unfccc.int/national_reports/napa/items/2719.php. Accessed December 2007

Vaillancourt K, Waaub JP (2006) A decision aid tool for equity issues analysis in emission permit allocations. Climate Policy 5:487–501

Waller RD (1999) Pastoral poverty in historical perspective. In: Anderson D, Broch-Due V (eds) The poor are not us: poverty and pastoralism in Eastern Africa. James Currey, London, pp 20–49

Yin R (1994) Case study research, design and methods. Sage, Thousand Oaks, CA, 200 pp