

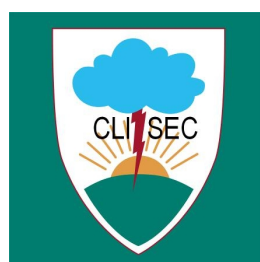


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*On arms and adaptation:  
Climate change and pastoral conflict in Northern Kenya*

University of Hamburg  
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# ON ARMS AND ADAPTATION: CLIMATE CHANGE AND PASTORAL CONFLICT IN NORTHERN KENYA

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## Abstract

Turkana in northern Kenya is shaped by pastoralism which is well adapted to the harsh climatic conditions. Yet, more frequent and prolonged droughts in combination with socio-economic developments and the availability of small arms have increasingly overwhelmed existing coping capabilities. Violence among different groups (Turkana of Kenya, Tepeth and Matheniko of Uganda, Merille of Ethiopia, Toposa of Sudan) tends to increase. Our paper aims to analyse possible linkages between climate change and pastoral conflict in Turkana, discuss options of adaptation and give policy recommendations sensitive to the regional and contextual distinctions.

To achieve the first aim, we analyze climate data in conjunction with conflict records, generated by governmental (CEWARN: Conflict Early Warning and Response Mechanism) and non-governmental organizations (Practical Action, Reconcile and Tupado). The discussion of adaptation options draws on field research conducted in 2010 and 2011. Relevant conflict parties were interviewed, including pastoralists, scientists as well as governmental and non-governmental representatives. Further, we incorporate insights from the Security in Mobility (SIM) initiative and the European Instrument for Democracy & Human Rights (EIDHR) project. Our policy recommendations are based on all three elements: data analysis, field research and project involvement. Based on our findings we develop the “Resource Abundance and Scarcity Threshold” (RAST) hypothesis which suggests that in times of sufficient rain, raiding is mostly conducted preceding and during the long and short rains. But when rains partly or completely fail and a certain threshold of resource scarcity is reached, raids are conducted despite the less fortunate restocking conditions as a means to secure or gain control over watering points and pasture. In addition, a commercialised type of raiding has emerged which shows low seasonality. Options to adapt to changing climatic conditions are limited in Turkana due to the marginalised character of the region. Besides addressing health, education, infrastructure and economic deficits of the region, it is important to strengthen intercommunal conflict resolution mechanisms.

Keywords: climate change, conflict, pastoralism, adaptation, raiding, Kenya

# 1. Introduction

The drought of 2011 is the worst in the Horn of Africa in 60 years (UNOCHA, 2011c). In Kenya, especially the resource dependent and marginalised pastoral areas are vulnerable to the effects of drought (UNOCHA, 2011a). Turkana, in northwest Kenya is such an area. Here, the more frequent and prolonged droughts of the past decade have, in combination with socio-economic developments and the availability of small arms increasingly overwhelmed existing coping capabilities (Mkutu, 2008, UNOCHA, 2011a, UNDP, 2011, GoK, 2008). Concurrently, the level of violence in form of livestock raids is reported to have increased among different groups including the Turkana of Kenya, the Tepeth and Matheniko of Uganda, the Merille of Ethiopia and the Toposa of Sudan (UNDP, 2011). These developments have led to media reports suggesting a direct link between climate change and conflict (e.g. Jha, 2009). Yet, scientifically, the impact of climate change on societal stability in general and in Kenya in particular is far from fully understood. A number of studies (Campbell et al., 2009, Mkutu, 2008, Theisen, 2010, [Witsenburg and Adano, 2009](#), Temesgen, 2010) come to a variety of different conclusions concerning the role of environmental factors as drivers for conflict in Kenya.

The first aim of our paper is to analyse linkages between climate change and pastoral conflict in the district Turkana. Second, we discuss local options of adaptation to third, give policy recommendations which are sensitive to the regional and contextual distinctions. To achieve these three aims, we first present a conceptual framework which identifies potential linkages between climate change, vulnerability and conflict (section 2). Section 3 then gives an overview of climate change in Kenya before section 4 analyses linkages between climate change and pastoral conflict in Turkana, using expert interviews as well as quantitative climate and conflict data. Against this background, options of adaptation are discussed (section 5) and conclusions are drawn to provide policy recommendations (section 6).

## 2. Conceptual Framework on Climate Change, Vulnerability and Conflict

Climate change causes multiple stresses on human communities. How they are affected depends on their vulnerability which according to the IPCC (2007) is a function of

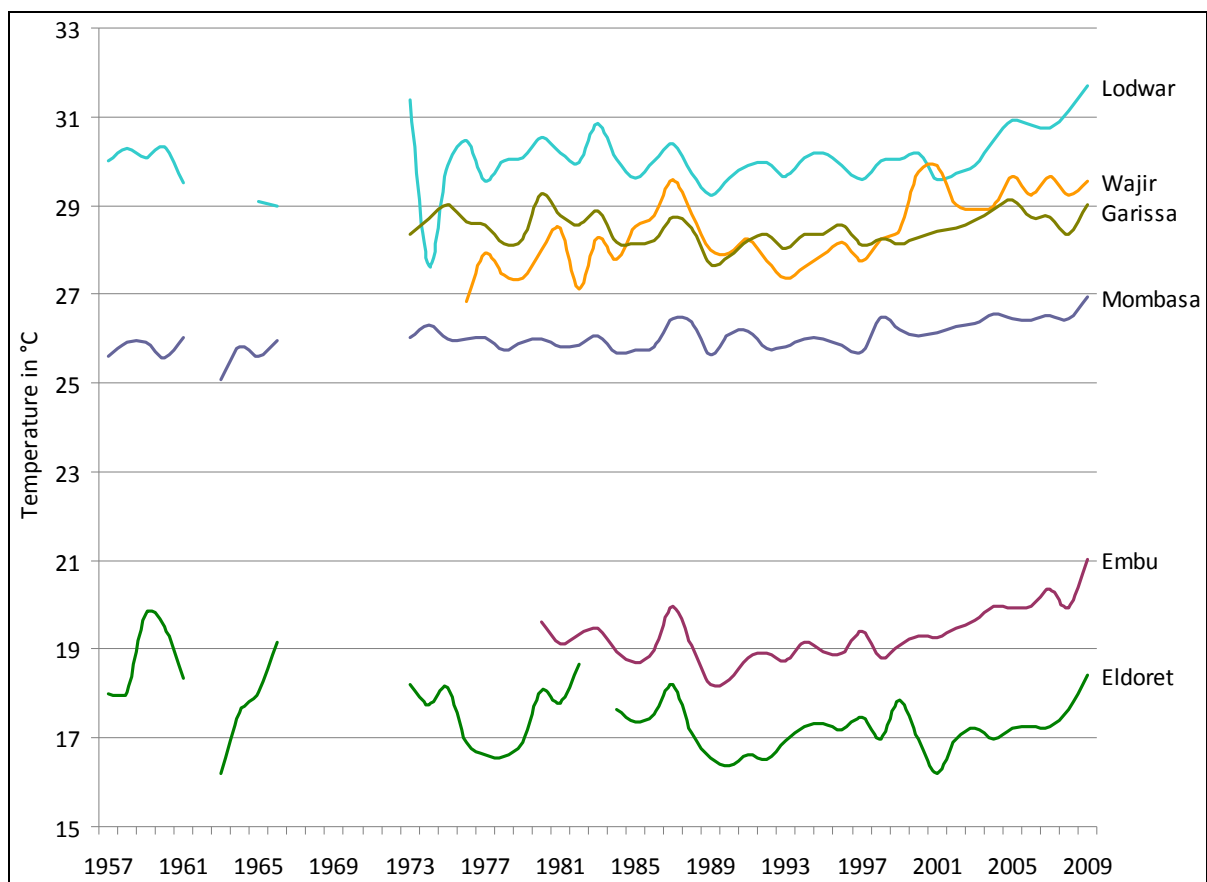
their exposure to climate change, their sensitivity and their adaptive capacity (Adger et al., 2009, Mearns and Norton, 2009). Several studies express concerns that climate change could overwhelm the adaptive capacities of societies and contribute to their destabilization, possibly leading to security risks and violent conflicts (Scheffran and Battaglini, 2011, Scheffran et al., 2011, forthcoming-a, for an overview see Nordås and Gleditsch, 2007). Empirical evidence on the relationship between climatic change and conflict remain inconclusive, partly due to its complexity and lacking data. As suggested by Homer-Dixon (1994, 1991), the depletion of renewable natural resources could trigger environmental conflicts. In some cases conflict becomes more likely with abundance of (non-renewable) resources (Le Billion, 2001).

To bridge the gap between these seemingly contradictory statements, it is important to integrate the climate-conflict relationship into a conceptual framework of human action and interaction (Scheffran et al., 2011, forthcoming-b). What matters in conflict is both the capability and motivation of key actors in pursuing their goals, depending on opportunities to act. Natural resources and environmental conditions play a dual role here: on the one hand, (valuable) resources can function as motivation to take them from others. These resources can in turn increase the capabilities of actors to further engage in (violent) action. On the other hand, resource scarcity can increase the motivation to defend interests against others while it can also diminish the resources to engage in conflict. With declining resources there can be a transition from resource abundance to resource scarcity as a driver of conflict, with a threshold in between. Where the threshold lies depends on the resource type and the actors' response patterns which are shaped by cultural and institutional conditions that could transform a conflict situation into cooperation to share resources in a mutually sustainable way.

### **3. Climate Change in Kenya**

Kenya, located on the equator, has a mostly temperate climate in the inland, a semi arid to arid climate in the northern part and a tropical climate along the coast (Ambenje, 2011). The average annual mean temperature (between 1970 and 1999) is 23.9 °C with little variation throughout the year. The highest temperatures of about 35 °C are reached in North Kenya, while the lowest values of 10 °C and below are mostly found in the central-western parts of the country. Most of the annual rainfall of

about 687 mm falls during the long rains from March to May and the short rains from October to December (McSweeney et al., 2008). According to the IPCC temperatures in Kenya have risen by 1°C over the past 50 years (Christensen et al., 2007). Looking particularly at highlands Pascual et al. (2006) find a significant warming trend of 0.5°C since the end of the 1970s. This trend is in line with on ground measurements. Figure 1 shows temperature curves from six weather stations in Kenya. The whole country is warming at a rate roughly 1.5 times the global average (Christensen et al., 2007).



**Figure 1** Temperature in six towns in Kenya between 1957 and 2009. The locations of the towns are shown in figure 2 (Own representation based on data from metrological station, accessed through Tutiempo (2011))

As for precipitation no statistically significant trend can be observed since 1960 (Tutiempo, 2011, Eriksen and Lind, 2009). Yet, the proportion of rain falling in heavy rainfall events has increased. These events are projected to occur more often, resulting in a higher total amount of rainfall and an increase of rainfall variability (Christensen et al. 2007; McSweeney et al. 2008).

Temperatures are projected to increase up to 2.8°C until 2060 and up to 4.5°C until 2090 (Christensen et al. 2007). In general, it has to be noted that climate models

(REMO, AOGCM) for the eastern African region lack reliability and accuracy (Klehmet, 2009, [Christensen et al., 2007](#)). Still, the trend of increasing temperatures for eastern Africa is consistent throughout the models (ibid.).

The projected trend of increasing temperatures and less reliable rainfall increases the likelihood of floods and droughts in Kenya (WBGU, 2007, Few et al., 2006). In arid and semi arid lands (ASALs), which make up 80% of Kenya's land area, droughts are a common phenomenon (GoK, 2007).<sup>1</sup> In northern Kenya, where the dryness is most pronounced, 28 major droughts have been recorded in the past 100 years. The drought frequency has increased as 4 of the 28 droughts occurred in the last decade ([Mude et al., 2009](#)). Pastoralists and farmers relying on sufficient rain report a sharply contracting drought cycle. According to them rains used to fail every nine or ten years, while they now experience drought every two or three years (Daniel, 2011, Akeru, 2011, Limaris, 2011a).

## **4. Climate Change and Pastoral Conflicts in Turkana**

This section first reviews the existing literature on climate change and conflict in Kenya (4.1). Against this background, the case study region Turkana (4.2) and the methods (4.3) are described before the last section analyses and discusses (4.4) the results.

### **4.1 Review of Existing Literature**

A number of studies have looked into environmental factors as drivers for conflict in Kenya. Table 1 lists the most recent studies and their main findings. Two aspects are particularly evident. First, all studies find a, although mostly indirect, link between climatic factors and the occurrence of violence. Second, two types of studies can be identified: data based studies which are conducted on a national level and empirical studies with a local focus. Further, it is notable that all empirical studies were conducted in predominately pastoralist regions where raiding is the major type of conflict. About half of the listed studies (Njiru, 2011, Cambell et al. , 2009, Mkutu, 2008, Temesgen, 2010, Doti, 2010, [Omolo, 2010](#), [Eriksen and Lind, 2009](#), [Meier et al., 2007](#)) argues along the lines of Homer-Dixon's scarcity theory in which resource scarcity, in the Kenyan context mostly caused by drought, increases the likelihood of violence. The remaining studies (Theisen, 2010, Raleigh and Kniveton, 2010,

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<sup>1</sup> ASALs are characterized by an annual rainfall amount of up to 500 mm (ibid.).

Kennedy et al. , 2008, Witsenburg and Adano, 2009, Eaton, 2008a) find that a higher level of violence is associated with more rainfall and hence increased resource availability.

**Table 1** Main findings and statements on the statistical and empirical link between climatic and conflict variables in Kenya since 2007. Page numbers are given in brackets. The column "Link" denotes whether the study found a relationship between the variables (y) or not (n).

Main findings / statements	Link	District / Scope	Reference
"Climate change is seen as the driving force towards resource competition and consequently resource-based conflict."	y	Kajiado, Machakos	Njiru (2011)
"Climatic factors do influence the risk of conflict incidence, wetter years are less safe than drier ones." (25)	y	Kenya statewide	Theisen (2010)
"We find a definitive relationship between high rainfall patterns and conflict within Kenya" (15)	y	Kenya statewide	Raleigh and Kniveton (2010)
"Climate change is one of a range of factors causing natural resource scarcity; while natural resource scarcity is one of a range of factors causing conflict." (6)	y	Laikipia, Samburu	Campbell et al. (2009)
"Scarcity, mobility and competition, aggravated by climatic conditions, lead to conflict within and across borders." (16)	y	Laikipia, Samburu, Turkana, West Pokot	Mkutu (2008)
"The data-driven modeling of behavior has shown that environmental resources can result in disproportionately large variations in the frequency of conflict and cooperation." (7)	y	Mandera	Kennedy et al. (2008)
"There are three times more killings during rainy season than during the dry seasons. This indicates that in northern Kenya raids-related violence is influenced by climatic fluctuations, which also implies that climate change will have an effect on (in)security." (536)	y	Marsabit	Witsenburg and Adano (2009)
"Deterioration in the climate and environment alone does not lead to conflict, as local populations have learned to adapt to their environments. It is when it is coupled with other social, political and economic factors that exacerbate scarcity that conflicts become more likely." (52)	y	Marsabit	Temesgen (2010)
"Climate change will exacerbate the drought situation, leading to competition over scarce resources and conflicts among resource users." (200)	y	Marsabit, Isiolo	Doti (2010)
"Environmental factors do appear to influence pastoral conflict if only in the influence and constraints they pose to those making the tactical decisions to engage in raids." (733)	y	Turkana, West Pokot, Trans-Nzoia	Meier et al. (2007)
"Climate variability and change have led to increased droughts and floods which have resulted in the loss of animal and human lives, displacements and destruction of property, reduced pasture availability and scarcity of water. This has increased poverty and competition over scarce resources – leading to conflicts, particularly livestock raiding." (98)	y	Turkana	Omolo (2011)
"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." (827)	y	Turkana	Eriksen and Lind (2009)
"Although it may seem logical to suggest that scarcity causes violence, in reality local practice ensures that this is rarely the case." (101) "In the North Rift, raiding tends to fluctuate seasonally, reaching a major peak during the rainy season." (100)	n/y	West Pokot	Eaton (2008a)

While Theisen (2010) as well as Raleigh and Kniveton (2010) find a positive statistical correlation between precipitation and violence, Witsenburg and Adano provide the following explanation: “Raiders like to attack during wet years because of high grass, strong animals, dense bush to hide in and the availability of surface water, which makes it easier to trek with the animals” (2009:723). Additionally, Eaton (2008b, 2008a) has argued that during drought pastoralists cannot engage in raiding as they are too occupied trying to keep their own livestock alive.

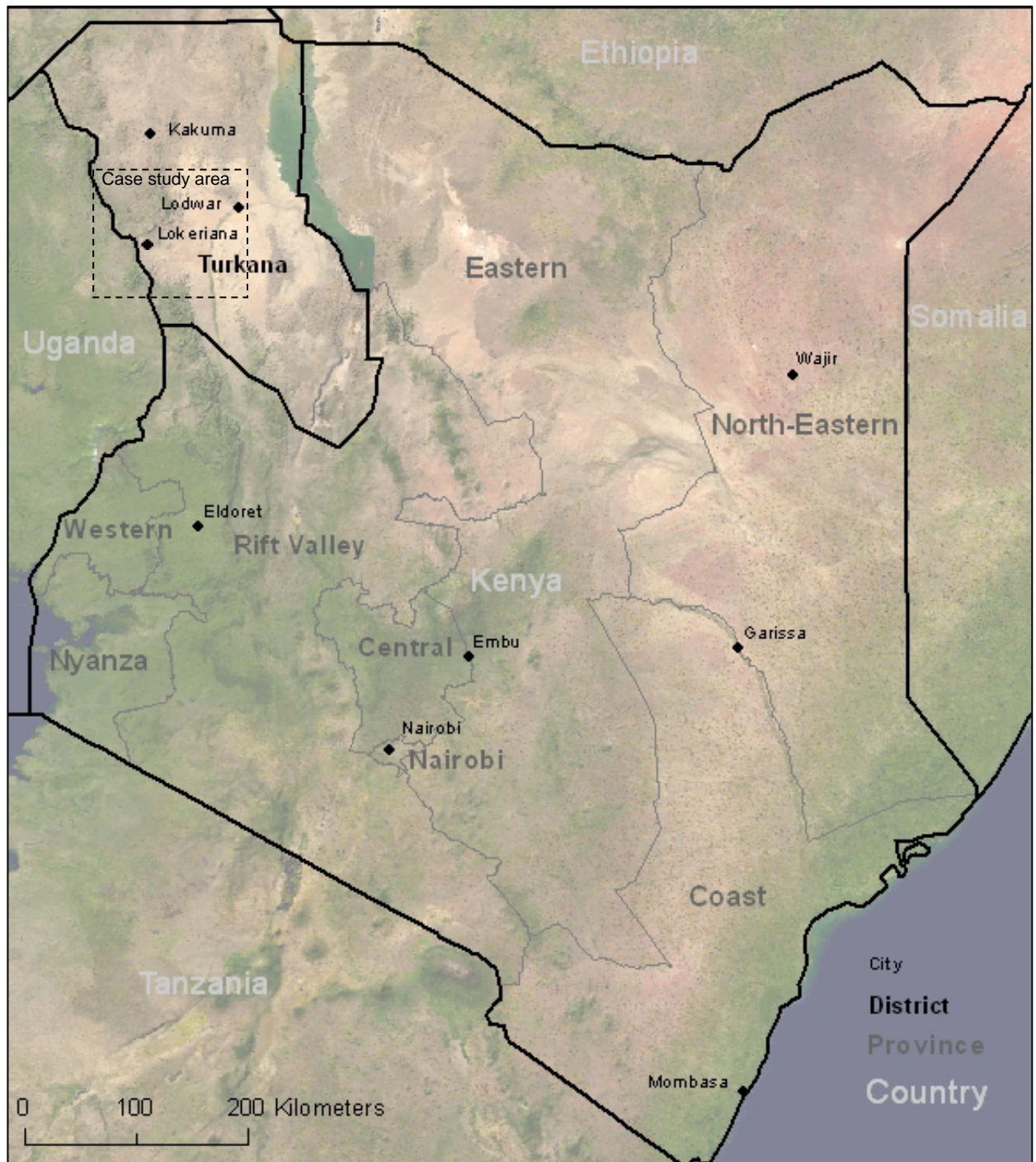
In summary, climate change altering the resource availability seems to play a role in the occurrence of violence especially in pastoral areas. Yet, the existing theories of resource scarcity and resource abundance provide opposing explanations. This suggests that matters are more complex. New explanations are needed. The following sections address this need by analysing the influence of climatic conditions on raiding in Turkana.

## **4.2 Case Study Region: Turkana**

Turkana is located in the northwest of Kenya sharing international borders with Uganda, Sudan and Ethiopia (see figure 2). Covering 77,000 square kilometres, Turkana is the largest district in Kenya. In 2007, the district was subdivided into Turkana North, South and Central. A temperature range between 24°C and 38°C (mean 30°C) and low precipitation levels result in a mostly arid to partly semi arid climate and a landscape characterized by shrubland, savanna and desert (figure 2 and GoK, 2008). The average annual rainfall ranges from about 430 mm in the northwest to less than 120 mm in the central plains around Lodwar. Most of the erratic and unreliable rainfall is received between March and May (long rains) and between October and December (short rains). Besides the major rivers Turkwel and Kerio, Lake Turkana is the only significant and permanent source of water (GoK, 2008). The lake suffers from decreasing water levels and continuing salinisation (Kloos et al., 2010).

In addition to the limited and strongly varying resource basis, Turkana has experienced significant political marginalisation by the central government in Nairobi which has hardly provided the region with basic services such as access to education and health services ([McSherry and Brass, 2008](#), GoK, 2007). With a per capita GDP of 171 USD (UNDP, 2006) and a Human Development Index of 0.333 (UNDP, 2010), Turkana is the poorest and least developed district in Kenya. Around 75% of the





**Figure 2** Case study area and selected locations in Kenya (own representation based on data from Maplibrary (2007))

population in the region relies upon food aid for their livelihoods (USADF, 2011). Most of the 512 000, living in Turkana are pastoralists (GoK, 2008). Besides the Turkana, the district hosts many communities including Dodoth, Matheniko, Pokot and Jie from Uganda, Toposa from Sudan, and Nyangatom and Merille from Ethiopia (UNOCHA, 2010a). These groups periodically engage in conflict with each other

(UNDP, 2011, Mkutu, 2008, [Mkutu, 2006](#), UNOCHA, 2010b, UNOCHA, 2011b, Elim and Imana, 2011).<sup>2</sup>

## 4.3 Methods

To analyse possible linkages between these conflicts and climate change, we apply a dual method which consists of a qualitative and a quantitative component.

### Qualitative Interviews

The qualitative component is based on one phase of field research in Kenya and Uganda in March 2011 and one phase from September 2011 to January 2012. During the first research phase 26 experts from governmental and non-governmental organisations as well as two local chiefs and four community members were interviewed. The experts were interviewed along guiding questions in a structured interview while the community members were interviewed using an open to semi-open questionnaire to give interviewees more freedom and to ensure that a wider range of aspects are accounted for. Most of the interviews took place in Nairobi and Turkana (see case study area in figure 2). One expert was interviewed in Moroto, Uganda. All interviews were conducted in English with the exception of three interviews with community members where an interpreter translated from Kiswahili and Turkana to English. The interviewees were chosen based on relevance and their field of expertise. For example, Reconcile (Resource Conflict Institute) and Practical Action assist with the implementation of the European Instrument for Democracy & Human Rights (EIDHR) which aims to prevent and resolve conflicts in the region (European Commission, 2009).

In addition, one author interviewed six experts and pastoral representatives between December 2010 and July 2011 as part of his work for UN OCHA (United Nations Office for the Coordination of Humanitarian Affairs) within the Security in Mobility (SIM) initiative. The SIM initiative consulted pastoralist communities in northern Kenya and its border region to address the pastoralists' livelihood and security needs (UNOCHA, 2010c, UNOCHA, 2010a, Okoro, 2011).

Table 2 shows the consulted institutions and the main topics that were addressed during the expert interviews. The overall objective of the interviews was to gain an understanding of the conflicts in Turkana and its border region. Chiefs and

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<sup>2</sup> One interviewee referred called the border region between Turkana and Uganda a „conflict hot spot“ (Locham, 2011).

community members were interviewed to get a first impression of how the conflicts and environmental changes are perceived on the ground. These interviews were also conducted to test the questionnaire which will be used during the second field phase when more emphasis is placed on the local perspective.

**Table 2** Organisations and main topics of expert interviews.

Organisation	Main topics of the interviews
<b>International</b>	
Alliance for Pastoralist Development (APAD)	Causes and developments of pastoral conflicts in Kenya, Uganda, Ethiopia and Sudan
Conflict Early Warning and Response Mechanism (CEWARN)	Registration, analysis and resolution of pastoral conflicts
Gesellschaft für Internationale Zusammenarbeit/Civil Peace Service (GIZ/ZFD)	Cross border conflicts between Kenya and Uganda, political developments in Kenya, elections 2012, corruption
Institute for Security Studies (ISS)	Cattle raiding and its commercialisation, resource conflicts in Kenya, corruption, environmental crimes
Intergovernmental Authority on Development (IGAD)	Conflict registration and resolution
International Organization on Migration (IOM)	Migration in Eastern Africa, refugee camps
Practical Action	Conflicts in Turkana, EU project EIDHR
United Nations Development Program (UNDP)	Kenya's development deficits, work of UNDP in Kenya
United Nations Office for the Coordination of Humanitarian Affairs (UN OCHA)	Humanitarian crisis and social problems in Kenya, Security in Mobility (SIM) Project
<b>National/local</b>	
Arid Lands Resource Management Project	Land use in Pokot and Turkana
Catholic Justice and Peace Commission in Kitale	Conflicts between pastoralists and farmers in Pokot
Community of Lokeriana	Conflicts in Turkana, social developments
Karamoja Agro-Pastoralist Program	Conflicts between pastoralists and farmers in Kenya and Uganda
Kenya Meteorological Department	Climatic changes in Kenya
Peace Committee Turkana South	Attacks and raiding in Turkana, pastoral conflicts
Pastoralist Community Initiative	Pastoral developments in Marsabit and Turkana
Development Assistance (PACIDA)	
Resource Conflict Institute (RECONCILE)	Conflicts and social problems in Kenya, developments and dynamics in raiding
Riam Riam	Causes and developments of pastoral conflicts in Kenya, Uganda, Ethiopia and Sudan
Sikom	Recent developments in raids and conflicts: use of technology and arms, commercialisation
Turkana Pastoralist Development Organization (Tupado)	Marginalisation of pastoralists in Turkana, role of the government
University of Nairobi, Armed Conflict and Peace Studies Research Associate	Pastoral conflicts

## Quantitative Data Analysis

The aim of the quantitative analysis was to determine whether any of the linkages between climate change and conflict which were proclaimed by the interviewees, are

reflected in the data. To achieve this aim climate data was analysed in conjunction with conflict data. The conflict data is from the Turkana Pastoralist Development Organization (Tupado) incident register which covers raiding incidents in Turkana from 2000 up to today (Tupado, 2011). Raiding in the context of this paper refers to the mostly violent theft of livestock from one group by another. We base our analysis on the period 2006 to 2009 as the reporting in the remaining years is not fully consistent. The Tupado register uses a variety of sources ranging from peace committee members and local authorities (e.g. district commissioners and area councillors) to representatives of non-governmental organisations and local media. This variety of reporting sources has two advantages over reporting systems such as Conflict Early Warning and Response Mechanism (CEWARN) which mainly relies on CEWARN monitors (von Keyserlingk and Kopfmüller, 2006, Meier et al., 2007, Limaris, 2011a, Renson, 2011). First, the Tupado data collection method allows for a wider coverage of events and second it minimises biases. Furthermore, the Tupado register is very detailed. In addition to basic information such as date, exact location and number and type of raided animals, it also contains the number and type of people injured or killed as well as the number and origin of the raiders. It is even reported what kind of action (if any) was taken by the government and how many (if any) of the stolen livestock was recovered. However, the register only covers Turkana. Raiding in neighbouring districts (West Pokot, Baringo, Marsabit) or beyond the Ugandan, Sudanese or Ethiopian border are not registered. Validation of the Tupado data was done for the years 2006 and 2007 by comparing the data with reports produced by the Alliance for Pastoralist Development (APAD). The climate data was taken from the meteorological station in Lodwar which is the only synoptic station in Turkana, recording temperature and precipitation values eight times per day since 1919 (GoK, 1999). We accessed this data through a public platform which provides daily values since 1957 (see Tutiempo, 2011). For our analysis we aggregated the daily temperature and precipitation values to monthly and annual values.

## **4.4 Analysis and Discussion**

Of the four years we compared, 2006 was the one with the highest total precipitation (503 mm) in Lodwar followed by 2007 (265 mm) and 2008 (206 mm). In 2009 the long rains completely failed and the short rains were limited to October and

December, resulting in a total precipitation of just 105 mm. Between 2006 and 2009 the annual mean temperature rose by 0.9 °C from 30.8 °C to 31.7 °C. The number of recorded raids in Turkana was similar in 2006 (58) and 2008 (72). In 2007 the raiding activity was lowest (31 raids) while in 2009 almost 122 raids were executed. The average number of 71 raids per year (six raids per month) reflects the high level of insecurity expressed by the interviewees (Locham, 2011, Akoule, 2011, Elim and Imana, 2011, Akeru, 2011, Ekal, 2011, Ekiyeyes, 2011, Oesterle, 2011) and organisations (UNOCHA, 2010b, UNOCHA, 2011b). Further, the trend of decreasing precipitation and increasing temperature reflect the interviewee's perception that climate change has intensified over the past years (Ekiyeyes, 2011, Akeru, 2011). To analyse possible linkages between climate conditions and raiding, we correlated precipitation and temperature with the number of raids, the average number of raiders per raid and the number of livestock stolen, finding no consistency in the few higher correlation coefficients (table 3). The only distinctive feature is that in 2006 all precipitation correlations are positive and in 2009 they switch in sign. For temperature, all signs are negative in both years. Yet, overall the values of the coefficients are statistically not significant.

**Table 3** Correlation between climate and conflict data (Tupado, 2011, Tutiempo, 2011)

<b>Correlation precipitation and</b>	<b>2006 - 2009</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
number of raids	-0,08	0,11	-0,03	0,44	-0,25
average number of raiders per raid	0,16	0,09	0,68	-0,09	-0,29
number of livestock stolen	0,00	0,17	-0,18	0,09	-0,39
<b>Correlation temperature and</b>					
number of raids	0,16	-0,02	0,14	0,40	-0,57
average number of raiders per raid	-0,25	-0,32	-0,14	-0,27	-0,12
number of livestock stolen	0,09	-0,29	0,25	0,05	-0,27

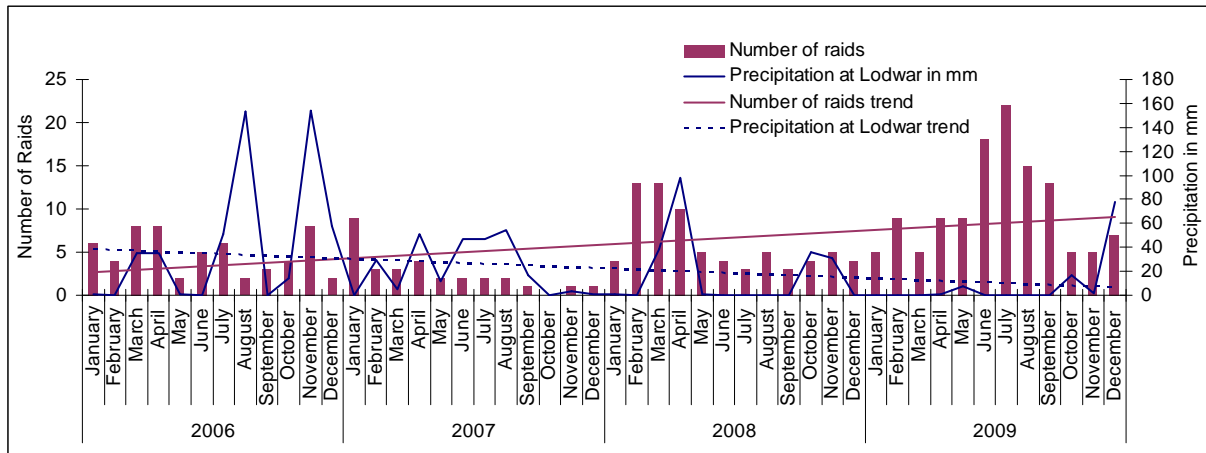
Plotting monthly temperature values against the listed set of variables we found no distinctive features. We therefore focused our analysis on precipitation which most strongly determines the availability of water as well as the amount, distribution, and quality of pasture ([Birch and Grahn, 2007](#), see also [Witsenburg and Adano, 2009](#)).

## Precipitation and Raiding

Figure 3 shows the number of raids per month plotted against precipitation. The years 2006 and 2008 can in part be explained by Witsenburg's theory that raiding increases during periods of increased rainfall (see 4.1). Yet, there are several months



(January, February, May, June and September of 2006 as well as January and May through September of 2008) without rain while raiding continues.



**Figure 3** Precipitation and monthly number of raids in Turkana between 2006 and 2009 (own representation based on data from Tupado, 2011, and Tutiempo, 2011).

The raiding in the months preceding the regular long rains (March to May) and regular short rains (October to December) could be explained by raiders anticipating the rain. “During drought nobody is interested because the animals are dying anyway but when the rains are about to come [...] that is the time when those who’s livestock has died will want to restock and try to multiply and raid” (Muchai, 2011). But even when the momentum of anticipation is included, Witsenburg’s “rains and raids” theory does not hold true for the period June through August of 2007 which shows an unusually high level of precipitation in combination with a low level of raiding activity. The plots of 2009 stand in even stronger contrast to the resource abundance theory. While precipitation was by far the lowest compared to the other three years, the number of raids was by far the highest. This development supports the notion of the resource scarcity theory which identifies the scarcity of resources as a major driver for conflict (see 2 and 4.1).

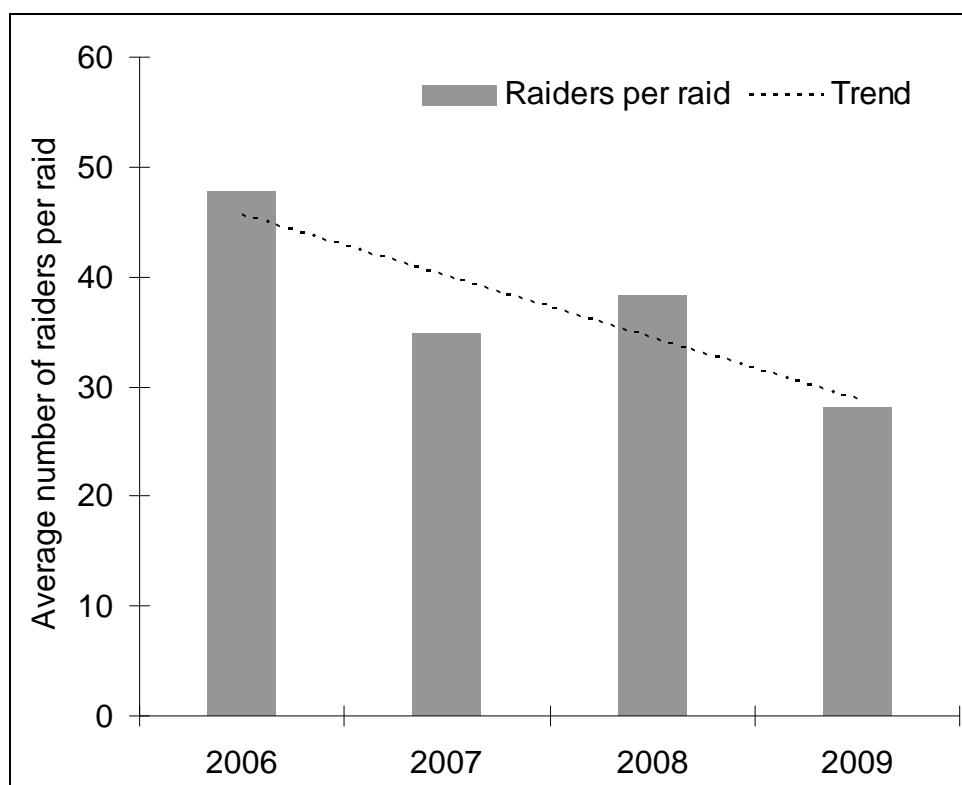
Similar to the opposing findings in the data, several interviewees (Elim and Imana, 2011, Kimani, 2011) stated that raiding mostly occurs before and during rainy seasons while others stressed that people mostly raid during times of drought (Okoro, 2011, Ekal, 2011, Locham, 2011, Akoule, 2011). These interviewees argued that during dry periods raiding is not only used to restock herds but also as a means to secure or gain control over watering points and pasture. In this respect, the two theories of resource abundance and resource scarcity seem contradictory. However, they could be complementary. In regular years with sufficient rain, raiding is mostly

conducted preceding and during the long and short rains to use the opportunities of the wet season. But when rains partly or completely fail and a certain threshold of resource scarcity is reached, raids are conducted despite the less fortunate restocking conditions to compensate for scarcity.

The two described theories can be combined in the “Resource Abundance and Scarcity Threshold” (RAST) hypothesis. We are aware that the RAST hypothesis is based on a limited time series. Thus, the hypothesis will be tested with more quantitative and qualitative data during the second phase of field research (see 4.3).

## Further Findings

Aside from the possible linkages between climate conditions and conflict, the analysis of the raiding data brings up three further findings. First, with 59% the Pokot were the largest group conducting raids between 2006 and 2009, followed by the Toposa (11%) and Dasenach (9%). Second, the government only took action in 13.4% of the raids. The percentage of recovered stolen animals was 8.2. Third, the raiding data supports another shift mentioned by the interviewees (Locham, 2011, Limaris, 2011b): the shift from fewer but larger raids (so called “mass raids”) to more frequent raids with a smaller number of raiders (figure 4).



**Figure 4** Number of raiders per raid in Turkana between 2006 and 2009 (own representation based on Tupado (2011))

This shift is likely to be part of the larger development of commercialisation of raiding which refers to “an aspect of the wider integration of pastoralists within a market economy” (Krätli and Swift, 2003:8). Commercial raiding involves many actors who are connected through a “multi-actor operation chain”. A business man, mostly located in an urban centre, “places an order” on how many and what kind of cattle he needs. Local coordinators organise the actual raid, deciding on the actors, area and timing of the raid. Then a group of young men (called “Ajore”, Elim and Imana, 2011)<sup>3</sup> carry out the raid predominantly early in the morning, assisted by watchers and informants. Sometimes local authorities are involved who are bribed prior or after a raid. After a successful raid logisticians provide trucks to transport the livestock to formal and informal meat markets for example in Nairobi, Garissa or Juba (Sudan) (Elim and Imana, 2011). The raiders get to keep part of the stolen animals or they are paid with money or arms (Kimani, 2011, Akeru, 2011). A successful raid does not only increase the wealth of the young man but also his social status (Elim and Imana, 2011, see also McCabe, 2004). Two interviewees (Kimani, 2011, Limaris, 2011a) stated that the timing of commercial raids mostly depend on the ordering business man, suggesting that commercial raids have a lower seasonality than traditional raids. This aspect needs further exploration which is beyond the scope of this paper.

## **Small Arms and Raiding**

Regardless of the type of raiding, raiding itself is reported to have become more violent (Locham, 2011, Akoule, 2011, Elim and Imana, 2011, Akeru, 2011, Ekal, 2011, Ekiyeyes, 2011, Oesterle, 2011). In the period considered here, the number of deaths and injured during raids rose from 139 and 27 in 2006 to 190 and 80 in 2009. While the cause of death is not listed in the Tupado register, the ratio between people killed and injured points to an increased use of semi and full automatic small arms. Most often mentioned in the interviews were G3 rifles and AK47s (Elim and Imana, 2011, Locham, 2011, Limaris, 2011b).<sup>4</sup> The arms mostly enter Turkana from Uganda, Ethiopia and Sudan. Fewer are said to come from Somalia (Kimani, 2011, Akeru, 2011, Akoule, 2011). The prices of Ak47s have decreased over the past decades while the price of the bullets has risen.<sup>5</sup> Summarising the role of small arms

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<sup>3</sup> Members of these “ajore” are sometimes referred to as “morans”, warriors (Limaris, 2011).

<sup>4</sup> These weapons were also observed several times in Turkana during the field research.

<sup>5</sup> The price ranges for a AK47 bullet differed from 200 to 300 KSH (3,2 USD) (Limaris, 2011) to about 50 to 100 KSH (about 1 USD) (Kimani, 2011). An AK47 was said to cost about 40 000 (about 430 USD) to 70 000 KSH (750 USD) (Elim and Imana, 2011).



in raiding Joseph Elim from the network of civil society actors Riam Riam stated: “the power is not in the person, the power is the weapon” (Elim and Imana, 2011). Mukutu even argues that armed raids have replaced “the traditional unity among pastoralists” (Mukutu, 2008:148). Other studies as well have pointed to the negative effects of raiding (Omolo, 2010, Eriksen and Lind, 2005). It is therefore important to identify other options of adaptation to changing climate conditions.

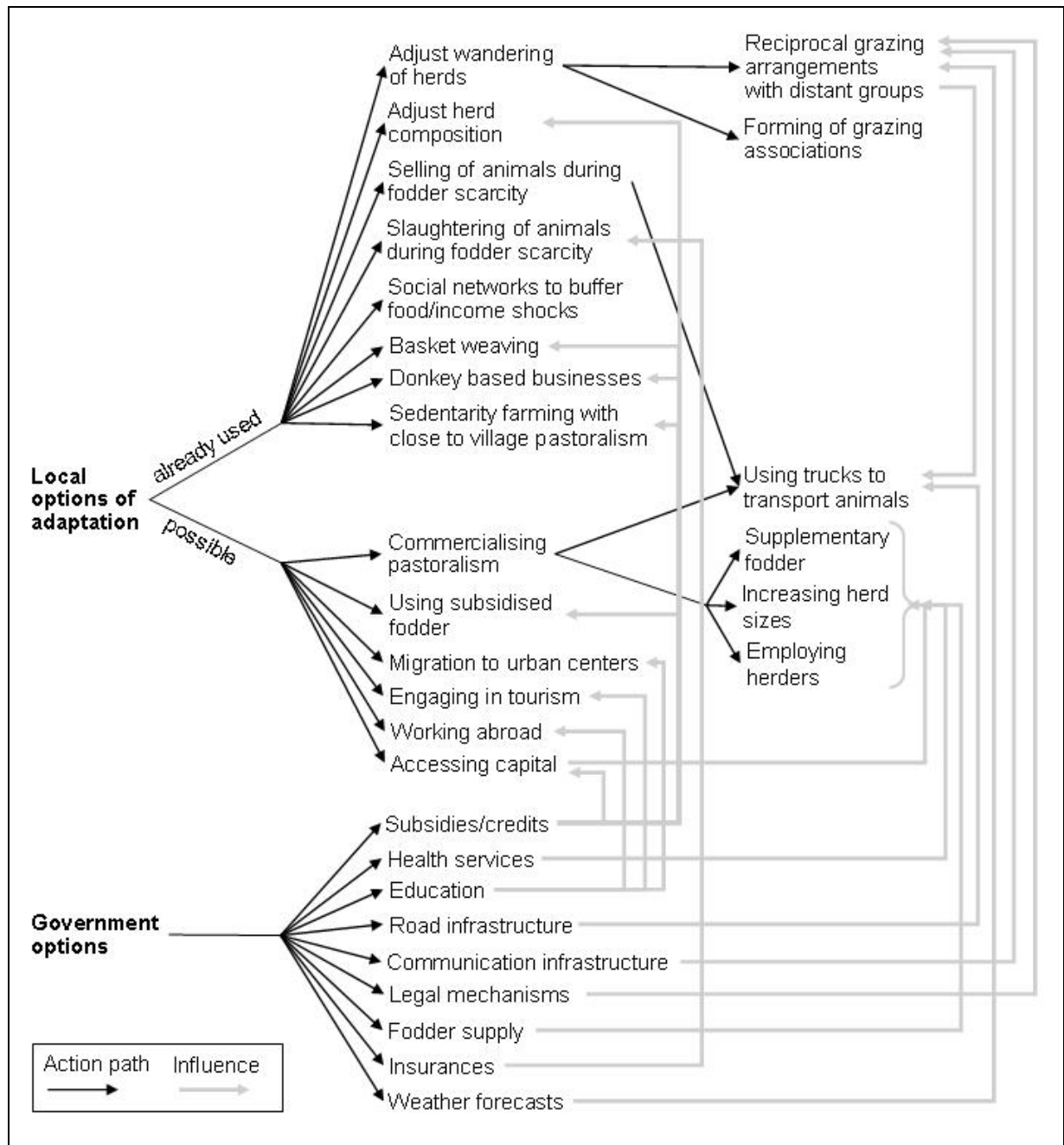
## 5. Options of Adaptation

Pastoralism is a well suited way of livelihood for Turkana as it has evolved over centuries and makes efficient use of the erratic and harsh climatic conditions (Birch and Grahn, 2007). The traditional response to a decreasing resource base is to expand the existing grazing range and/or adjust the wandering of herds (Omolo, 2010). Both imply interaction with neighbouring and distant groups. The interaction can have a cooperative character in the form of reciprocal grazing arrangements which can strengthen ties between different groups. Yet, the increasingly violent raids have decreased trust and made cooperation more difficult (Eriksen and Lind, 2009). Interviewees have also reported that increased highway robbery and banditry further contribute to insecurity and mistrust (Locham, 2011). Against this background Eriksen and Lind (2009) point to a second, more conflicting way of expanding grazing ranges: the formation of loose grazing associations. In these so called “arumrum”, “up to a few hundred households” (Eriksen and Lind, 2009:830) form larger conglomerations to enter insecure areas.

Further traditional options of adaptation are shown in the upper part of figure 5 (see further Schilling et al., 2011). They range from the adjustment of herd composition, for example by replacing cattle by more drought resistant camels, to social networks and trades to buffer shortages.<sup>6</sup> Especially, women can diversify the income sources of a household by weaving baskets or mats. However, as only few markets exist in Turkana, the women mainly dependent on traders who can to a large extent dictate prices (Eriksen and Lind, 2009). Donkeys, usually not used as a food source (milk, meat, blood) offer another income source for women who do not move with the livestock but stay with the young children in villages (Njiru, 2011). Here, water, food and fire wood are needed on a daily basis but often not available in close proximity.

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<sup>6</sup> For an example of the shift in livestock see Oesterle (2008). Oba (2001) and MacCabe (2004) describe the impact of drought on cattle numbers.



**Figure 5** Local options of adaptation and government options in Turkana (own representation based on conducted interviews and Eriksen and Lind, 2009, Omolo, 2010)).

There is potential for women to start a small business based on the transport capacity of donkeys (see Fernando, 2002, Ochieng and Wanja, 2008). Villagers seeking to transport goods can pay donkey owners for accompanying them with their donkey. This type of small scale business seems promising in Turkana where the road infrastructure is poor and the use of motorised vehicles is limited. An illegal version of the business is already in place, facilitating the trafficking of small arms and other (illegal) goods across the porous borders to Uganda, Ethiopia and Sudan (see 4.4).

Despite the climatic conditions of the region, the government of Kenya promoted over many decades a policy of sedentary farming without providing sufficient resources. This policy has contributed to food insecurity and vulnerability of the region as the government itself recognises in a document on Arid and Semi Arid Lands (ASALs). “Previous policies aimed at revitalising ASALs were drafted with a degree of bias against pastoralism as a viable sustainable way of life. Emphasis was put on sendarization of nomadic pastoralists with a strong focus toward crop farming. Because such policies were mainly top-down, discriminative and unconsultative, they often failed” (GoK, 2007:ii).

In addition to the adaptation options which are already used, further options are possible (centre of figure 5). Given access to credits and significant investments in the road infrastructure, a stronger integration of pastoralism into markets could increase income security for pastoralists. Especially, in times of drought, the government could provide subsidised fodder to mitigate livestock losses. So far, the government only buys off weak livestock during periods of drought (Njiru, 2011). Migration to urban agglomerations is impracticable simply because there are very few. Within Turkana, Lodwar is the only town of significant size. Here the largest employer is the relief sector consisting of predominately international non-governmental (aid) organizations (Owiti, 2007).<sup>7</sup> Likewise, engaging in tourism can currently be considered unfeasible as very few tourists find their way to Turkana mainly because of the unreliable security situation, the lack of sufficient roads and the underdevelopment of touristic infrastructure (hotels, services and attractions). Other possible options such as working abroad or accessing capital to generate new income sources, would require the government to improve the region’s access to education and financial services.

## **6. Conclusion and Policy Recommendations**

In a mostly arid area like Turkana, droughts are a common phenomenon. Here, pastoral adaptation to periods of resource scarcity and harsh living conditions has a long history. Yet, in the past decade the existing adaptive capabilities have increasingly been overwhelmed by the more frequent and prolonged droughts. This trend is likely to continue as rainfall variability and temperature are projected to

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<sup>7</sup> Among the non-governmental organizations are USAID, Merlin, International Rescue Committee UK, Practical Action.

increase. It is therefore important to understand linkages between climatic conditions and pastoral conflict. Based on climate and raiding data analysis, qualitative interviews and literature review, we developed the “Resource Abundance and Scarcity Threshold” (RAST) hypothesis. The RAST hypothesis suggests that in regular years with sufficient rain, raiding is mostly conducted preceding and during rainy seasons. But when rains partly or completely fail and a certain threshold of resource scarcity is reached, raids are conducted despite less fortunate restocking conditions. Where this threshold lies and if the hypothesis can be further developed into a theory is subject to the next research phase which will expand the time period of the data analysis and place stronger emphasis on the local perception.

Raiding itself can be seen as a form of adaptation to changing climate conditions (de Vries et al. 2006; Dupont 2008; Eaton 2008a, b; McCabe 2004). Yet, at the same time raiding and associated conflict result in mistrust between the concerned groups and hence undermine traditional adaptation options such as reciprocal grazing arrangements. In line with others (Eriksen and Lind, 2009, Barnett, 2006), we therefore argue that promoting adaptation is not only about addressing health, education, infrastructure and economic deficits of the region but mainly about reducing the level of conflict and insecurity. To achieve this aim three key recommendations can be given. First, strengthening of intercommunal conflict prevention and resolution mechanisms. Second, establishment of a regional framework which promotes pastoral mobility across international borders. And third, reducing the availability of small arms through intergovernmental agreements and harmonised disarmament efforts. None of the listed recommendations will be easy or quickly to implement. Yet, there are developments which provide some hope. As part of the European Instrument for Democracy & Human Rights (EIDHR), several peace meetings were held between conflict parties, especially between Pokot and Turkana communities. In addition, peace committees in each community were established and equipped with mobile phones to warn other communities about planned raids and to assist with the recovery of stolen livestock. Especially, the latter is important to avoid counter and revenge raids. Obstacles to a timely distribution of information included the lack of sufficient vehicles as well as road and communication infrastructure (Muhereza, 2011).

The Security in Mobility (SIM) initiative promotes cooperation between the Kenyan, Ugandan, Sudanese and Ethiopian government to harmonise laws and land tenure systems to improve the security of pastoralists crossing international borders

(UNOCHA, 2010a). To reduce the availability of small arms is probably the most delicate and difficult recommendation to implement. Signing documents such as the Nairobi Declaration on the Problem of Illicit Small Arms and Light Weapons in the Great Lakes Region is one step. The more problematic one is the actual disarmament which needs to be carefully coordinated among governments. Unilateral, punitive and forceful disarmament campaigns as seen in the past (Mkutu, 2008, Mkutu, 2006, Oesterle, 2011, Akoule, 2011) bear the risk of creating disequilibria which further contribute to insecurity.

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## Abbreviations

APAD	Alliance for Pastoralist Development
AOGCM	Atmosphere-Ocean General Circulation Model
ASAL	Arid and Semi Arid Land
CEWARN	Conflict Early Warning and Response Mechanism
EIDHR	European Instrument for Democracy & Human Rights
GDP	Gross Domestic Product
GoK	Government of Kenya
IPCC	Intergovernmental Panel on Climate Change
KSH	Kenyan Shilling
SIM	Security in Mobility Initiative
RAST	Resource Abundance and Scarcity Threshold
Reconcile	Resource Conflict Institute
REMO	REgional Model
Tupado	Turkana Pastoralist Organisation
UNDP	United Nations Development Programme
UNOCHA	United Nations Office for the Coordination of Humanitarian Affairs
USD	United States Dollar
USADF	United States African Development Found
WBGU	German Advisory Council on Global Change

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