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FACULTEIT POLITIEKE EN SOCIALE WETENSCHAPPEN

**Climate change, a cause of conflict between pastoralists in the semi-arid and
arid regions of Wajir, Kenya?**

Wetenschappelijke verhandeling

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List of abbreviations

ALDEF	Arid Lands Development Focus
ALRMP	Arid Lands Resource Management Project
CDF	Constituency Development Fund
DC	District Commissioner
DDC	District Development Committee
KCBS	Kenya Central Bureau of Statistics
KFSSG	Kenya Food Security Steering Group
KNBS	Kenya National Bureau of Statistics
MP	Member of Parliament
NEMA	National Environment Management Authority
NGO	Non Governmental Organisation
SLF	Sustainable Livelihoods Framework
WPDA	Wajir Peace and Development Agency
WPDC	Wajir Peace and Development Committee
WPG	Wajir Peace Group

Contents

- Abstract**..... 1

- Chapter 1 Introduction** 2

- Chapter 2 Data and methods**..... 3
 - 2.1 Data collection 3
 - 2.2 Data processing..... 3

- Chapter 3 Results and discussion** 6
 - 3.1 *Study area* 6
 - 3.1.1 General facts..... 6
 - Location..... 6
 - Geography 7
 - Climate 7
 - Vegetation 9
 - Population..... 11
 - Politics..... 12
 - Development 13
 - 3.1.2 History of conflict 14
 - Pre-multi-party era: ... - 1992 14
 - Conflict in Wajir between 1992 and 1995..... 15
 - Community initiatives towards peace 16
 - 3.2 *Climate change* 18
 - Climate change in Africa..... 18
 - Climate change in East Africa..... 19
 - Climate change in Wajir..... 21
 - 3.3 *Climate change and conflict* 23
 - 3.4 *Climate change and conflict in Wajir district* 25
 - 3.4.1 Vulnerability..... 26
 - Climate change..... 26
 - Decreasing ecological carrying capacity 28
 - Causes of high grazing pressure 31
 - Other constraints 35
 - Conclusion..... 36

3.4.2	Impacts on livelihood assets.....	37
	Human capital	37
	Natural capital	39
	Financial capital	39
	Social capital	40
	Physical capital.....	41
	Conclusion.....	42
3.4.3	Policies, institutions and processes	43
	Policies, institutions and processes affecting adaptation capacity	43
	Policies, institutions and processes affecting conflict	46
	Conclusion.....	49
3.4.4	Livelihood strategies	50
	‘Hanging on’	50
	‘Stepping up’	52
	‘Branching out’	52
	‘Moving away’	52
	Conclusion.....	53
3.4.5	Conflict occurrence	54
Chapter 4	Conclusion	57
Chapter 5	Samenvatting	59
5.1	<i>Inleiding</i>	59
5.2	<i>Materiaal en methoden</i>	59
5.3	<i>Resultaten en bespreking</i>	61
5.3.1	Studiegebied.....	61
5.3.2	Klimaatwijziging en conflict	63
5.3.3	Klimaatwijziging in Wajir	63
5.3.4	Klimaatwijziging en conflict in Wajir	64
	Kwetsbaarheid.....	64
	Impact op livelihood assets	67
	Politiek beleid, instituties en processen.....	67
	Strategieën.....	68
	Ontstaan van conflict.....	69
5.4	Besluit	70
Bibliography	72

Appendix A : Overview of conducted interviews in Wajir district.....	78
Appendix B : Map of Wajir district.....	79
Appendix C : 10-days rainfall for 2002-2009	80

Abstract

The viability of the paradigm “climate change as a threat for the national and international peace and security”, was investigated for a specific study area, Wajir district in Northeastern Province of Kenya. As the main livelihood in the district is pastoralism, they are highly dependent on natural resources, making them vulnerable for a reduction in these natural resources caused by climate change. The link between climate change and violent conflict seems straightforward: climate change is causing increased scarcity and increased competition, and increased competition is leading to an increase in violent conflict. However, the relationship between two complicated processes like climate change and conflict, can not be depicted in such simple way. First, an increase in scarcity of natural resources in the district is not only caused by climate change, but also other factors, like high population and grazing pressure and unadapted policies, are playing a major role in this. Second, the link between scarcity and violent conflict, wherein adaptation capacity plays a central role, is very complex and influenced by many factors. Climate change has the capacity to aggravate challenges already faced by the communities. It also has the capacity to lead to violent conflict when adaptation capacity is limited, other non-climatic causes of violent conflict are in place and conflict management fails.

Chapter 1 Introduction

Scientific research has shown that climate change will have major impacts on the earth ecosystems and the human environment in the next decades. Large population groups will be negatively affected as their livelihood comes under pressure. This knowledge has given rise to a new paradigm: climate change as a threat for the national and international peace and security. According to this paradigm, climate change could lead to a proliferation of violent conflicts worldwide, both within and between nations, jeopardizing the international peace and security.

In this research the viability of this paradigm will be examined for a specific study area, Wajir district in Northeastern Province of Kenya. As the main livelihood in the district is pastoralism, they are highly dependent on natural resources, making them vulnerable for a reduction in these natural resources caused by climate change. During the last decade, the region has been subjected to more frequent and severe droughts, which are ascribed to climate change. These droughts are causing scarcity of natural resources like water and pasture and a related increase in competition over them. The link between climate change and violent conflict seems straightforward: climate change is causing increased scarcity of natural resources and increased competition, and increased competition is leading to an increase in violent conflict. However, the relationship between two complicated processes like climate change and conflict, can not be depicted in such simple way. Climate changes will not be the only cause of a decrease in ecological carrying capacity and the related increase in scarcity. Moreover is scarcity not the only factor influencing conflict, the political, institutional and socio-economic context will play an important role hereby. In this research the factors influencing the causal relationship between climate change and violent conflict in Wajir district will be examined.

To conduct this research, a central research question and three additional research questions are formulated. The central research question is: "To which extent and in which way could climate change in Wajir districts result in an increase in the amount and intensity of conflicts in the region?". The three additional research questions are: (1) Which factors will influence the ecological carrying capacity of the district besides climate change? (2) What are the livelihood strategies of pastoralists in the district to cope with periods of scarcity? (3) What is the importance of the political, institutional and socio-economic context in the causal relationship between scarcity and violent conflict?

Chapter 2 Data and methods

2.1 Data collection

To be able to investigate the link between climate change and conflict, it was important to select an appropriate study area. However, the selection of a study area was also influenced by the search for a possible host organisation. Eventually Wajir district, in the Northeastern Province of Kenya, was chosen as the Foundation for the Welfare of Wajir was willing to help and facilitate this research. The Foundation for the Welfare of Wajir is a Dutch organisation which has years of experience and numerous local contact persons. But this is not the only reason that makes Wajir a good area to conduct this research. The major livelihood in Wajir district is pastoralism, thus the population is highly depending on natural resources for their daily survival. As climate change already is and further will affect these natural resources, they are extremely vulnerable for its impacts. Above this, the district was prone to conflict for decades until the 90s, but is now peaceful mainly thanks to a community initiative. All this makes Wajir district a very interesting study area.

The data required for this research was assembled in two ways. First, some literature study was conducted to get a general view on the research context. The main themes whereof literature was collected were Wajir district, pastoralism, climate change, conflict and combinations of them. Second, field research was performed in Wajir district from 19th August until 25th September. In this period data was mainly collected in two specific areas: (1) the traditional livelihood of pastoralists and how they cope with periods of drought and (2) the presence and character of conflicts in the area. This data has been collected by conducting interviews and focus group discussions, attending workshops and informal contacts. An overview is given in Appendix A.

2.2 Data processing

The central research question is: To which extent and in which way could climate change in Wajir districts result in an increase in the amount and intensity of conflicts in the region? Hereby three additional research questions are formed: (1) Which factors will influence the ecological carrying capacity of the district besides climate change? (2) What are the livelihood strategies of pastoralists in the district to cope with periods of scarcity? (3) What is the importance of the political, institutional and socio-economic context in the causal relationship between scarcity and violent conflict? The possible link between climate change and violent conflict is visualized in Figure 2.1. Climate change results in a decrease in the ecological carrying capacity, which causes an increase in scarcity of natural resources. As the natural resources like pasture and water, where pastoralists are depending on, are becoming scarcer, competition over them will increase. This increase in competition could result in violent conflicts. However, these causal relationships are not straightforward and a lot of other factors

are influencing them. The purpose of this research is investigating these relationships and the influencing factors, to be able to determine whether climate change could lead to violent conflict and which factors are critical hereby.

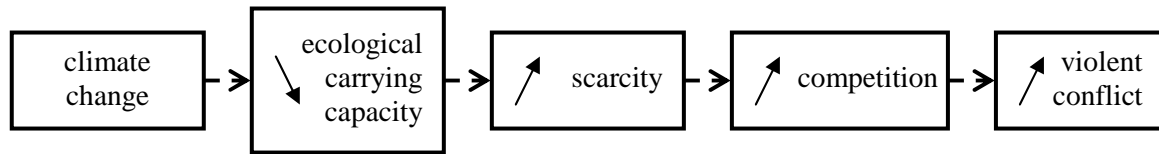


Figure 2.1: Adopted causal relationships between climate change and violent conflict

To be able to analyze these relationships it is important to get a proper insight in the pastoral livelihood and how it could be affected by climate change. Therefore a Sustainable Livelihoods Framework (SLF) is used (Figure 2.2), which gives the possibility to analyze the influences of climate change on pastoral livelihoods in a structured way. The first additional research question was: which factors will influence the ecological carrying capacity of the district besides climate change? This question corresponds with the first causal relationship, these between climate change and conflict, and partly with the vulnerability context of the SLF. In this vulnerability context, the major constraints for the pastoral livelihood in Wajir district will be addressed. Special attention will be given to a decrease in ecological carrying capacity, as this is a major cause of climate change. However, also some other constraints will be discussed as they influence the possible livelihood strategies of the pastoralists. The next step in the SLF is how the factors addressed in the vulnerability context, will affect the livelihood assets of the population.

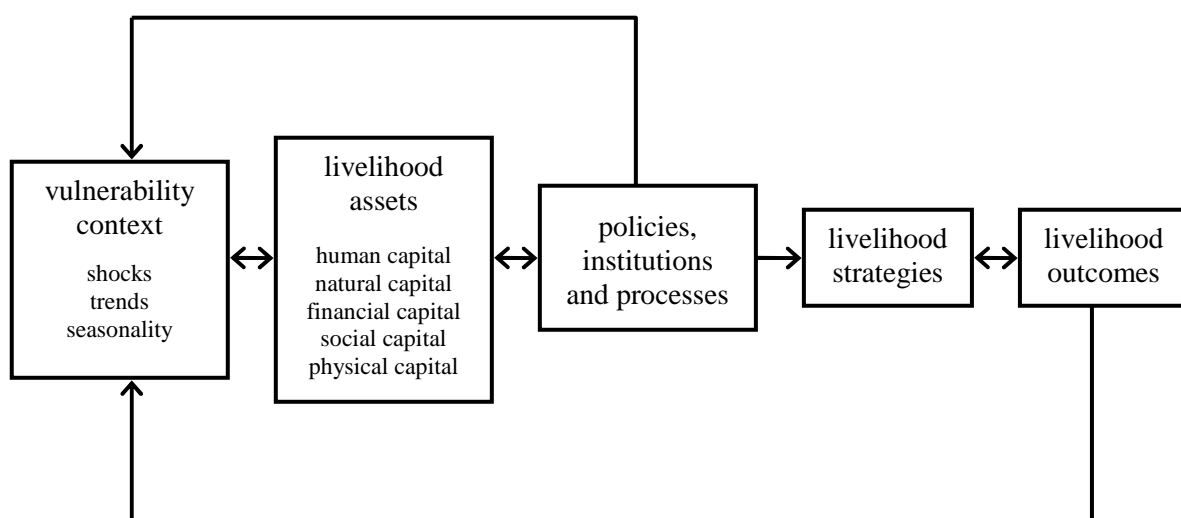


Figure 2.2: Sustainable Livelihoods Framework

The second additional research question was: what are the livelihood strategies of pastoralists in the district to cope with periods of drought? These livelihood strategies are depending on the available livelihood assets, but are also influenced by policies, institutions and processes in the district. This corresponds with the third and fourth part of the SLF. The third and last research question was: what is the importance of the political, institutional and socio-economic context in the causal relationship between scarcity and violent conflict? This is mainly covered by the policies, institutions and processes of the SLF. These two last research questions and their corresponding parts in the SLF, give the possibility to analyse the causal relationship between a decrease in ecological carrying capacity and an increase in violent conflict, and to identify the influencing factors hereby. The use of a SLF as framework to analyse the causal relationships between climate change and violent conflict allows to find an answer for the central research question: to which extent and in which way could climate change in Wajir districts result in an increase in the amount and intensity of conflicts in the region?

The approach on the research in the next section is the following one. In a first part, study area, some important general characteristics of Wajir district are depicted followed by an overview of conflicts and conflict resolution in the last century. Secondly, special attention is given to climate change in general and what this means for Wajir district. This is necessary as predicting the impact of climate change without first analysing what these changes are, is meaningless. In a third part a general overview is given about the current scientific approach towards climate change and conflict. In the last and most important part, the SLF is applied for Wajir district in order to be able to analyse the causal relationship between climate change and violent conflict, a described above.

Chapter 3 Results and discussion

3.1 Study area

In this section some important characteristics of the study area will be described. In a first part, general facts about Wajir district, like location, geography, climate, vegetation, population, politics and development are discussed. This is important to be able to frame the research. In a second part, the history of conflict in the district is discussed as this gives some important insights in the causes and dynamics of past conflict in the region.

3.1.1 General facts

Location

Wajir district is located in the Northeastern Province of Kenya, with Wajir as its capital town (Adan & Pkalya, 2005; Ibrahim & Jenner, 1996; KFSSG, 2005; Lembara, Mathumbi, Makokha, Shukri & Noor, 2009; Walker & Omar, 2002). It covers an area of approximately 56 600 km², about 10 percent of the total land mass of Kenya. Its location is depicted in Figure 3.1.



Figure 3.1: Map of Kenya with indication of some important towns and features, district boundaries and Wajir district highlighted in yellow

Wajir district consists of four constituencies: Wajir North, East, South and West. In July 2009 these constituencies had been converted into separate districts (Mathenge, 2009, 13 July). However, in September 2009 the High Court ruled that 210 of Kenya's 256 districts were illegal, resulting in the remaining of only three districts in Northeastern Province: Wajir, Garissa and Mandera (Nyasato, 2009, 5 September). An Interim Independent Boundaries Review Commission (IIBRC) was appointed to review the electoral boundaries in the following months. At the time of writing it is uncertain whether Wajir district will remain one or will be subdivided. However, when the term Wajir is used in this research it refers to Wajir district with its current boundaries (Figure 3.1). Appendix B provides a more detailed map of Wajir district with indication of livelihood zones and important settlements.

Geography

The landscape in Wajir district is mainly flat with some scattered hills in the north near the Ethiopian border (Adan & Pkalya, 2005; ALRMP, 2005; Ibrahim & Jenner, 1996; KFSSG, 2005; Walker & Omar, 2002). Its altitude above sea level varies between 150m in the south-east to 200m in the north-west and rises up to 460m in the complete north. The district has no natural permanent rivers or open water sources and only one major seasonal river along the Garissa border, the Ewaso Nyiro (Walker & Omar, 2002). This makes the population completely dependent on underground water sources.

Climate

Wajir district lies in the Sahelian climatic region, which is characterised by long dry spells and short rainy seasons (Adan & Pkalya, 2005; ALRMP, 2005; KFSSG, 2005; Lembara et al., 2009; Musili, Wasike & Nyatuga, 2008). With an annual average rainfall between 250 and 300mm and an annual evaporation of about 300mm it is a very arid region. This is confirmed by looking at the moisture availability zones of Kenya, depicted in Figure 3.2. Apart from the extreme northern part, whole Wajir district is classified as very arid. The moisture availability is based on the average annual rainfall and the average annual potential evaporation. Thus besides very low annual rainfalls, the low moisture availability is also due to very high temperatures in the district which causes higher evaporation. Wajir district is characterised by mean annual temperatures of 28°C, with the hottest period between January and March and the coolest between June and September (ALRMP, 2005). Figure 3.3 shows the temperature zones of Kenya. It indicates that the entire district is situated in the area with temperatures between 24 and 30°C. The data for Figure 3.2 and Figure 3.3 were derived from the International Livestock Research Institute (ILRI, 2007).

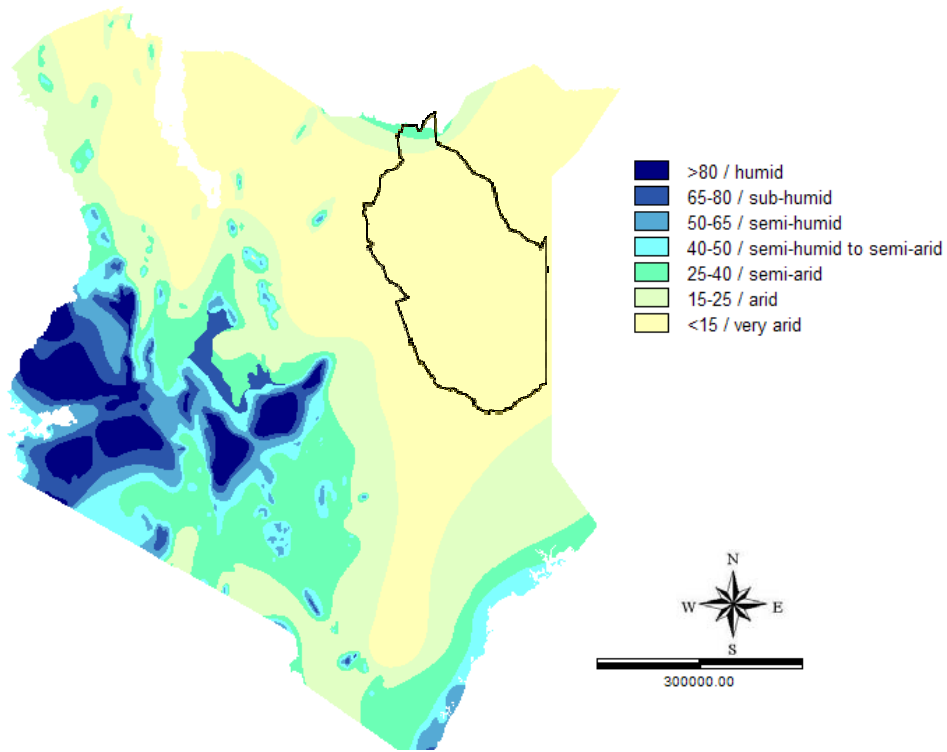


Figure 3.2: Moisture availability zones of Kenya, with location of Wajir district (data derived from ILRI, 2007)

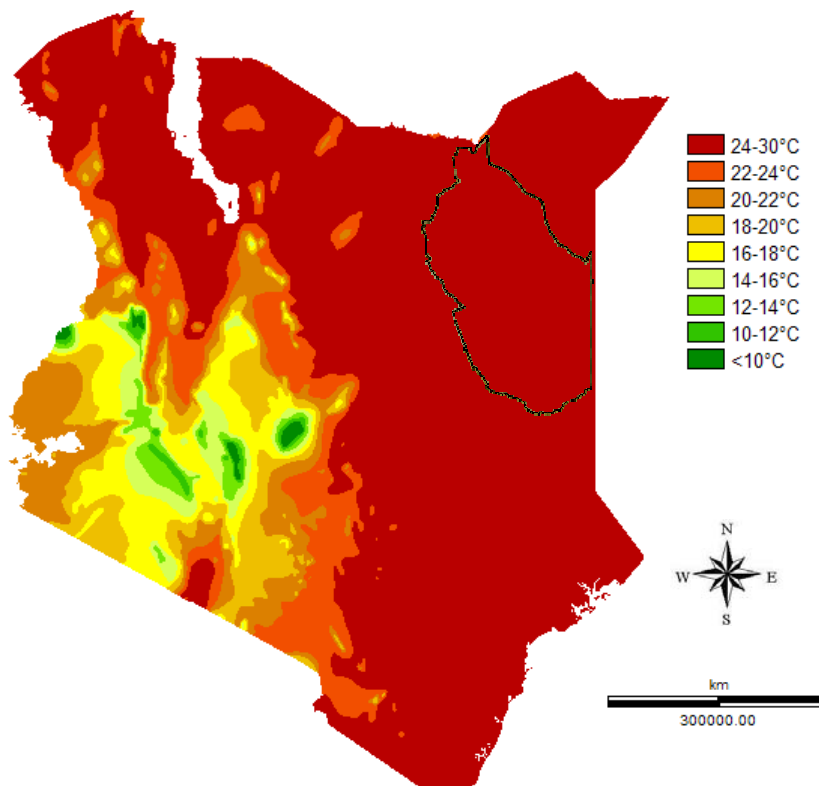


Figure 3.3: Temperature zones of Kenya, with location of Wajir district (data derived from ILRI, 2007)

Figure 3.4 provides an indication of the annual precipitation and temperature pattern in Wajir district. The data is derived from Livestock Early Warning System (LEWS, 2009) that distributes data from weather stations in Kenya and some other African countries. The figure is based on daily rainfall and temperature values collected from 1/1/1961 to 31/12/2008. It confirms the low rainfall figures and high temperatures as described above and gives an indication of the annual pattern of them. Rain falls mainly during two rainy seasons, the long rains from March to May and the short rains from October to December. However, these rainy seasons are not always reliable. Temporal and spatial variations are very wide and periods of drought are frequent, especially during the last decade. This will be discussed in further detail in section 3.2.

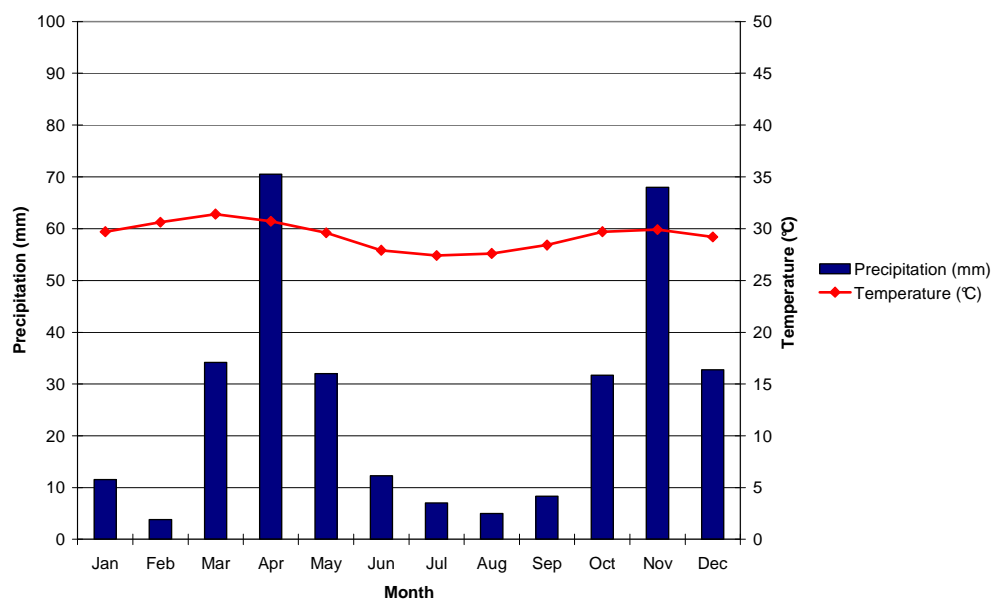


Figure 3.4: Mean monthly precipitation (mm) and temperature (°C) for Wajir district (data derived from LEWS, 2009)

Vegetation

The vegetation in Wajir district is adapted to the harsh climatic environment, resulting in species capable to survive with low amounts of water and under high temperatures. Figure 3.5 shows the location of the different vegetation types in Kenya. It is composed with data from Africover (2002) that bases its classification on Landsat images. The figure indicates that almost whole Wajir district is covered by grassland or shrubland. This means that in these areas grasses or shrubs are the main vegetation type. But great variability in landscapes can be found, as the amount of shrubs and sparse trees differs. Figure 3.6 gives an image of how the vegetation looks like in the area. It is important to take into account that the photographs were taken in the beginning of September 2009, in the middle of a serious drought.

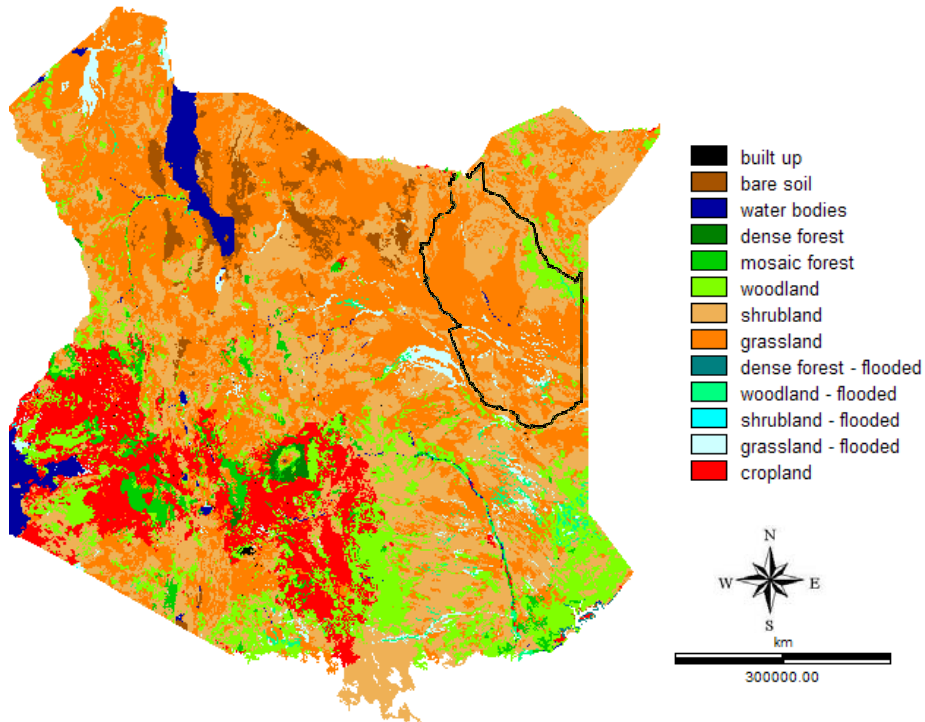


Figure 3.5: Vegetation zones of Kenya with location of Wajir district (data derived from Africover, 2002)



Figure 3.6: Photographs of the vegetation in Wajir district in the beginning of September 2009

If the vegetation in Wajir district is classified from the viewpoint of land use, instead of according to vegetation cover like above, the entire area is classified as rangeland. A suitable definition for rangelands is: “land carrying natural or semi-natural vegetation which provides a habitat suitable for herds of wild or domestic ungulates” (Homewood, 2004). They can be found in all bioclimatic zones of the world, with a completely different appearance according to their location. However, they have two important common features. They are always used as grazing land by wild and domestic herbivores and historically they were inhabited by pastoralists and hunter-gatherers (Blench &

Sommer, 1999). According to Homewood (2004) African rangelands span ecoclimatic zones between 250 and 1500mm rainfall isohyets¹. With an annual average rainfall between 250 and 300mm Wajir district lies at the lower end of this interval.

Population

As the results of the most recent population census in August 2009 are not yet available and the last population census was in 1999, the actual population figures are estimations. According to a population projection made by the Kenya National Bureau of Statistics (KNBS), the population in Wajir district will be 622 990 by 2010 (KNBS, 2008). Table 3.1 gives an overview of some available population figures for Wajir district. However they are estimations, they indicate that Wajir district is characterised by a very rapid population growth. This is confirmed by a study carried out by the Kenya Central Bureau of Statistic (KCBS) in 2003. They found a fertility rate of 7 in Wajir district compared to 4.9 nationwide (KCBS, 2004).

Table 3.1: Overview of available population figures for Wajir district

Year	Population	Type of information (source)
1992	250 000 – 275 000	Famine relief figures (Ibrahim & Jenner, 1996)
1999	319 261	Kenya National Housing and Population Census (KNBS, 2009)
2002	356 000	Estimation (ALRMP, 2005)
2005	478 523	Estimation (KFSSG, 2005)
2008	562 271	Projection (KNBS, 2009)
2010	622 990	Projection (KNBS, 2009)
2012	672 745	Projection (KNBS, 2009)

Nearly the entire population of Wajir district belongs to the Somali ethnic group and the small population of non-Somalis consists almost entirely of civil servants, security forces and businessmen (Adan & Pkalya, 2005; Ibrahim & Jenner, 1996; Walker & Omar, 2002). The main religion is the Sunni Islam and as the large majority is very religious this marks the daily lives of the population. The Somali society is organised around different clans in which the members trace patrilineary to a common founder (Walker & Omar, 2002). At the widest point of affiliation, Somalis belong to a ‘clan

¹ An isohyet is a line which connects geographical locations with the same annual rainfall (Boudet, 1998)

family' of which there are six. These clan families are composed of clans. The largest Somali clans in the district are the Ajuran, Degodia and Ogaden, but also several smaller clans are present. The Ajuran predominantly occupy the north-west of the district, the Degodia occupy mainly the area south of Wajir town and the Ogaden are the main occupants of the north-east spreading over the west. Clans in turn are composed of sub-clans, sub-clans of sections and sections of sub-sections. The level which is relevant to the communities depends on the context of the situation at a particular time. Elders play a very important role in the Somali society. They are highly respected and are negotiating and taking decisions in name of their entire clan. Other noteworthy facts about the Somali society are that men are polygamous and circumcision is still practised.

Politics

Traditionally, the Somali society had a governance that was headed by clan chiefs, assisted by elders of the sub-clans (Walker & Omar, 2002). During the precolonial periods there were only three or four chiefs in Wajir district. These chiefs ruled through customary law over all aspects of clan welfare including grazing rights, use and management of natural resources, relation with other clans, security and dispute resolution. During the English colonisation, the colonial authorities ruled through the chiefs. However, they were slightly different in their roles as they represented the authorities while at the same time ruling the clans in the traditional way. In 1963 the British government transferred power to the Kenyans. The role of chiefs changed to that of being a civil servant under the direction of the District Commissioner (DC). Within their geographical area they took charge of some smaller administrative units, like locations and sub-locations, instead of the whole clan area as in the colonial days.

This continued till the late 80s when their appointment and working became too political due to subdivisions of the local units into smaller ones, each seen to be representing specific sub-clans or sections (Walker & Omar, 2002). Extreme competition for the post of chiefs was the result, with most of the appointments going to those who could influence the system better, through Members of Parliament (MPs) or other leadership. When the multiparty era started in 1992, their roles expanded into maintaining some form of clan based voting blocks in their administrative areas. During the elections voting is largely ethnicised. Each sub-clan or section leadership bargains for positions of government appointment such as chiefs and elective posts of MP or councillor, as a precondition for voting in favour of the ruling party. These ethnicised politics are present over whole Kenya, of which the post-election violence in the beginning of 2008 is an aftermath. Youth of Wajir district also expressed that tribalism is one of the main challenges in the political system of Kenya, beside corruption, manipulation and dictatorship (Youth workshop on peace, 2009, 22 August).

Development

In comparison to the rest of Kenya, Wajir district is severely underdeveloped. It lags significantly in infrastructure, health services, education and economic development, mainly due to a lack of investments by the government in the area. This underdevelopment results in some astonishing figures. Only 7% of the roads are tarmaced and the mean distances to the nearest potable water source and health facility are respectively 15 and 70km (KFSSG, 2005). In 2003 65% of Wajir residents lived below the poverty line. The health status of the population suffers: there was an under-five mortality rate of 163/1000 compared to 115/1000 nationwide, 34% of the children were underweight (20% nationwide) and the vaccination coverage was only 9% (57% nationwide) (KCBS, 2004). The life expectancy was 52 years as compared to 55 years nationwide (KFSSG, 2005).

More than 70% of the population in Wajir district are nomadic pastoralists, depending on livestock assets for their daily survival (Adan & Pkalya, 2005; ALRMP, 2005; Walker & Omar, 2002). Livestock contributes to the livelihood of the population in many ways. It can provide food, transport, skins for clothes and fuel, and it can contribute to food security, enhance crop production and generate cash incomes (Noe, 2003; Wint & Robinson, 2007). Pastoralists in the district herd combinations of cattle, camels² and shoats³ and they use donkeys for transport. Between 2002 and 2008 there was a general increase in the livestock population in Wajir, with the highest increase in the goat population, followed by sheep (Lembara et al., 2009). A livestock survey conducted in 2007 resulted in the following figures: 379 500 ±74 000 goats, 345 500 ±117 000 sheep, 251 350 ±99 000 cattle and 147 700 ±55 000 camels (Murithi, Mulinge, Wandere, Maingi & Matata, 2007).

For centuries pastoralism was a sustainable way of living and the most efficient method of exploiting rangelands. It evolved in response to long-term climate variability 7000 years ago, when people adapted to an increasingly arid and unpredictable environment by moving livestock according to the shifting availability of water and pasture (Birch & Grachn, 2007; Nassef, Anderson & Hesse, 2009). The last decades however, it is coming under increasing pressure with as main contributing factors a high population growth and an increase in the frequency and intensity of droughts.

² Actually this are dromedaries, but they are generally called camels

³ Shoat is a term that includes both sheep and goat

3.1.2 History of conflict

In order to be able to investigate the relationship between climate change and violent conflict in Wajir district, it is important to have comprehension of the history of conflict in the area. Therefore this section will give an overview of tensions and violent conflicts, their backgrounds, some general causes and results. But the most important fact to investigate is to which extent and how these conflicts have come to an end, as this can provide a critical apprehension of the possible future development of violent conflict in the region.

Pre-multi-party era: ... - 1992

Before the colonisation of the country, Somali customary law, enacted by chiefs, was used to regulate the access to natural resources like water and grazing land (Ibrahim & Jenner, 1996; Walker & Omar, 2002). But under British colonial rule this traditional system came under pressure, as the colonial government initiated clan boundaries and ignored the need of pastoralist to be able to move over large areas in search of water and pasture (Ibrahim & Jenner, 1996). This resulted in an increase in tensions over natural resources between different clans. During this period, Wajir was part of the Northern Frontier District, a closed area isolated from the rest of Kenya.

At the end of the colonial period it was said that northeast Kenya would become part of Somalia as they shared the same ethnicity (Ibrahim & Jenner, 1996). Eventually this did not happen, triggering an unsuccessful war for secession from 1963 to 1969, the so called “Shifta War”. The only result was a further isolation of the people of Northeastern Province from the rest of Kenya. From then onward, a series of inter-clan conflicts occurred. The worst conflict ended in the Wagalla massacre of 1984 (Ibrahim & Jenner, 1996; Interview with ALDEF, 2009, 9 September; Pkalya, Adan & Masinde, 2003), which led to the death of between 300 and 3000 people, depending on the source of info (Interview with ALDEF, 2009, 9 September). They died of exposure to the sun and thirst after being rounded up by the Kenyan military and left there for three days with no shelter, water or food.

The main causes for this inter-clan fighting were clan boundary disputes, political leadership issues and the scarcity of natural resources. Clan boundary disputes and political leadership issues can partly be related to access to resources: access to land means access to the resources on that land and political leadership means power, also power to decide on land issues. As policies are highly tribalised, inter-clan violence often flared during electoral periods (Ibrahim & Jenner, 1996). For example in Wajir West constituency, which was appointed as Ajuran area during the colonial period, the election of a Degodia as Minister in Parliament (MP) was always followed by violent conflict (in 1979, 1984 and 1992). All this resulted in the fact that Northeastern Province remained under a State of Emergency from independence until 1992. This gave the government very wide powers, including the right to kill

on sight any person deemed “suspicious”. On top of this, they continued the process of marginalizing and discriminating against its Somali citizens with a weak to non-existent government in the area, leading to chronic underdevelopment and lack of economic opportunities and an environment of distrust between the government administration and the local population (Ibrahim & Jenner, 1996; Menkhaus, 2008). An ideal breeding ground for discontent, frustration and under the right circumstances violent conflict. In addition, conflicts in neighbouring countries have had an effect on Wajir district in three major ways. They have led to an influx of weapons and refugees, further destabilising the region, to the re-alignment of clan alliances within Wajir, eroding stability even more. But not only refugees from neighbouring countries led to an increased instability. Land pressure became even higher in the 1980s when the Degodia were pushed out of Isiolo district and into Wajir by the Borana (Menkhaus, 2008). Another important contributing factor were some devastating droughts (see section 3.2), in which large numbers of livestock died which meant a heavy loss of basic capital for the community making them vulnerable, desperate and easily manipulated into violence (Ibrahim & Jenner, 1996). For example the drought of 1991-1992 resulted in the death of 80% of the goats, 70% of the cattle and 30% of the camels.

Conflict in Wajir between 1992 and 1995

By 1992, the situation in Wajir was unstable, with large populations of vulnerable people depending on food relief, large tensions between the various clans, distrust between the government and the local population and a huge influx of refugees and weapons from Ethiopia and Somalia. All these factors contributed to the escalation of conflict in the region. A major underlying factor in almost all the conflicts in the district is anxiety over land access and the corresponding resources, mainly pasture and water. However, according to Dekha Ibrahim, the reality is complicated and violent conflicts in Wajir can not be seen as purely resource based (Interview with Ibrahim, D., 2009, 20 August).

The clashes which erupted in 1992 between the Degodia, Ajuran and Ogaden clans were triggered by the arrival of multi-party politics and competition over MP constituencies. In some electoral districts where two or more clans were sharing residency, demographics were actively manipulated to produce a desired outcome for a clan and its MP candidate. This was the case in Wajir West constituency where tensions between Degodia and Ajuran had already led to a high level of assassinations in the 80s. To increase its number the Degodia clan had brought Degodia from outside the constituency, even from Ethiopia, to vote (Menkhaus, 2008). In December 1992 it won the seat and there was a complete absence of the Ajuran in parliament (Ibrahim & Jenner, 1996). This imbalance in political power exacerbated the problems already existing. Eventually this resulted in the eruption of fierce fighting between Degodia and an alliance of Ajuran and Ogaden, in several areas in the district. From June 1993, the situation worsened. Elders and chiefs of different clans were openly recruiting, arming and transporting fighters for their own militias. There were major clashes in Wajir town and almost no

part of Wajir District was safe, there was a general lawlessness and banditry. This insecurity had brought the daily normal activities of the district to a halt.

The results of this violent conflict were devastating, especially because the population was already seriously impoverished by 1992 (Ibrahim & Jenner, 1996). The poor food situation was even worsened by the huge numbers of animal raids. During “normal” livestock raids, livestock are mostly redistributed among populations in the district, without a great loss of animals. However, in this case large numbers of animals left the district due to alliances with clans in other countries. Transportation became extremely difficult and unsafe with frequent attacks of vehicles on the road. The small amounts of civil services available were even more reduced and some important NGO’s left the area due to insecurity.

Community initiatives towards peace

In June 1993, the conflict had spread to Wajir market as female traders refused to sell to members of other clans (Adan & Pkalya, 2006; Ibrahim & Jenner, 1996; Menkhaus, 2008). Two Somali women decided it was time to make an end at the violent conflict between the different clans, starting with the conflict on the market. Almost immediately their efforts were joined by an older, traditional woman leader and for two months they met every afternoon with the market women. Slowly, they were convinced that the fighting at the market was not helping anyone and that it was continuing the cycle of violence. They also started to express their opinion that women and children suffered most from the violence and that it should come to an end. The Wajir Women for Peace group was born, which gradually expanded to include other women from town and rural areas.

In August this women’s group was joined by a group of educated professionals and the Wajir Peace Group (WPG) was formed, with members from all clans in the district (Adan & Pkalya, 2006; Ibrahim & Jenner, 1996; Menkhaus, 2008). Being member of the group meant you were committed to continue the peace work no matter what happens: “If my clan were to kill your relatives, would you still work with me for peace? If you can’t say yes, don’t join the group now.”(Ibrahim & Jenner, 1996). The WPG started contacting clan elders, who were presumed to be able to bring peace once convinced of the necessity (Ibrahim & Jenner, 1996; Menkhaus, 2008). Elders of the minority clans which were not directly involved in the conflict were used as mediators between the warring elders. After series of difficult meetings, there was a breakthrough: the Al Fatah Declaration was agreed and an Elders for Peace group was formed. The WPG also started working with other groups within Wajir, like youth, the business community and religious leaders. They were all contributing to the accomplishment of peace in the district.

In April 1994, a new DC was appointed to Wajir district, from then on also the government was included in the peace process (Ibrahim & Jenner, 1996; Menkhaus, 2008). The DC partnered with local civic groups and traditional authorities to keep the peace and made government resources available. Without this firm commitment of the DC, a positive outcome of the peace process would have been much more difficult and maybe even impossible. One of the most important actions of the WPG was forming a rapid response team. This team is composed of government, civic leaders, elders, women and youth and intervenes at the beginning of a conflict to prevent it from spiralling out of control. When a problem occurs the rapid response team was sent to the area and the disputes are handled according to the Somali way. This consists of one or several meetings with elders of both parties and mediators, where the problem is discussed and solved by for example collective punishment and payment of livestock, but sometimes also by delivering the perpetrator to the Kenyan court. The result of all this was a steady decline in banditry and crime.

At the end of 1994 the members of the WPG realized that some formalisation was necessary which would unite the different peace groups working in the district and would give official legitimacy, insuring the continuation of the peace work in the district (Adan & Pkalya, 2006; Ibrahim & Jenner, 1996; Jenner & Abdi, 2000; Menkhaus, 2008). There is one structure within the district administration in Kenya which brings together government, NGOs and citizen groups, namely the District Development Committee (DDC). So in 1995 the Wajir Peace and Development Committee (WPDC) was established as a subcommittee of the DDC. The chair of WPDC was the DC and members included representatives from the District Security Committee, head of government departments, NGOs, elders, women, youth, religious leaders (both Muslim and Christian), the business community, and the district's four MPs. In this way the committee forms an umbrella organisation for the different peace initiatives in Wajir district. It can be seen as a hybrid structure between traditional conflict resolution mechanisms and the legislation of Kenya. Currently WPDC is registered as Wajir Peace and Development Agency (WPDA) under the NGOs Act of 1990.

Beside sending a rapid response team when conflicts do occur, WPDA is also involved with several other initiatives like peace education and workshops on peace building. Its efforts have resulted in a nonviolent climate in the whole of Wajir district. Based on the peace diaries of WPDA, in which they note every intervention, the rapid response team has to intervene 10-20 times a month on average. During periods of drought, the figures are manifestly higher than during periods with enough water and pasture. This indicates some sort of relationship between conflict and resource availability. The team was not always able to avoid escalation of the conflicts into violence, as was the case in 1998 and 2000 (Pkalya et al., 2003). However, its results are admirable and it is seen as perhaps the best functioning peace committee in Kenya and remains a model (Adan & Pkalya, 2006).

3.2 Climate change

During the past decade and especially the last few years, it has become evident that climate change is not just a myth as almost the whole scientific society has reached a consensus about its existence. Human activities since the industrial revolution have led to a serious increase of greenhouse gasses in our atmosphere with a global warming as result. Observations show that the climate change is already manifesting itself. Of the twelve years with the highest global average annual temperatures since 1850, eleven are between 1995 and 2006 (IPCC, 2007b). The global average annual temperature has risen with 0.74°C since 1850, resulting in the melting of glaciers and ice caps and a sea level rise of 1.8mm per year between 1961 and 2003.

Consequently a lot of research is done on predictions of the magnitude and impacts of the effects of climate change. But as the unknown factors necessary to be able to make a prediction are more numerous than the known factors, great uncertainty remains to which extent the climate on our planet will change during the next century. Important unknown factors are the emission of greenhouse gasses in the future and the non-linear events which can arise ones the temperature rises with more than 2-3°C. On one thing almost all the scientists agree: the impacts will be severe and Africa will be hardest hit.

Climate change in Africa

Africa is seen as one of the regions most vulnerable to climate change (Boko et al., 2007; Brown & Crawford, 2009; IPCC, 2007a; Stern review, 2006; Nassef et al., 2009). The continent is endowed with a harsh climate as temperatures are high and rainfall is erratic in large areas. Climate change will cause it to become even harsher, placing a high pressure on the human population. Furthermore, livelihoods in most African countries are characterised by major non-climatic constraints, reducing their adaptation capacities to climate change and making them more vulnerable.

Due to climate change the average annual temperature in Africa rose about 0.5°C in the 20th century (Lembara et al., 2009), resulting in more warm spells and fewer cold days across the continent (Boko et al., 2007). According to a medium warming scenario, temperatures on the continent will increase with between 3 and 4°C by 2099 (Boko et al., 2007). However, there is variation between the different regions and the drier sub-tropical regions will warm more than the moist tropics (Boko et al., 2007; Brown, Hammill & McLeman, 2007). These changes in temperature, together with other factors, will also influence the rainfall pattern in Africa. Rainfall patterns have already changed and droughts are becoming more frequent (Boko et al., 2007; WBGU, 2007). However, the future effects are not as consistent over the continent, different areas will experience different changes in rainfall (Boko et al., 2007). In western Africa there will be a decline in rainfall, in eastern Africa there will be an increase,

and the long-term trend for southern Africa is not clear. The changes in the rainfall pattern for eastern Africa will be discussed further on. Climate change in Africa will also lead to more extreme weather events like very intense rainfall in a short period of time leading to floods, and a lengthening of drought periods (Boko et al., 2007; Brown & Crawford, 2009; WBGU, 2007). Important to note are the non-linear events which may occur in our climate once the temperature has risen with more than 2-3°C (WBGU, 2007). In this case a critical threshold in the climate system may be crossed, triggering positive feedback loops which can result in the occurrence of some dramatic changes that can not be accurately predicted. During the last interglacial period for example, temperatures were 3 to 5°C warmer and the sea level was 4 to 6m higher (IPCC, 2007b).

Those changes in the African climate will have some serious consequences for the well-being of the population. Existing water shortages will be aggravated and new regions confronted with this problem (Boko et al., 2007; Brown et al., 2007). By 2020, between 75 and 250 million people will be exposed to increased water stress (IPCC, 2007a). There will be a decrease in the areas available for food production, resulting in a decrease of food security (Boko et al., 2007; Brown et al., 2007; IPCC, 2007a). The health of the population will be seriously affected as well as vulnerable ecosystems across the continent (Boko et al., 2007; Brown et al., 2007). All this indicates that the effects of climate change will have major consequences for the African continent.

Climate change in East Africa

While in general a decline in rainfall is predicted throughout Africa, more and more literature is written about the likely increase of rainfall in eastern Africa (Boko et al., 2007; Brown et al., 2007; Bowden & Semazzi, 2007; Camberlin, Moron, Okoola, Philippon & Gitau, 2009; Interview with Birch I., 2009, 19 August; Nassef et al., 2009; Shongwe, van Oldenborgh, van den Hurk & van Aalst, 2009; WBGU, 2007). As Wajir is situated in East Africa this needs some further research. The climate of Wajir district and possible recent changes in it will be discussed in more detail in the following section. In this section different predictions of rainfall over East Africa will be compared in an attempt to analyse the possible effect of climate change for Wajir district.

In the last decade, sub-tropical zones have become more arid (WBGU, 2007) and when drought used to occur every ten year in eastern Africa, now they occur every three to four year or less (Nassef et al., 2009). This coincides with findings for Wajir district as discussed in the next section. During the next century the climate in eastern Africa will become even more variable and less predictable with a mosaic of changing climatic conditions. According to the most recent report of the IPCC rainfall over eastern Africa will increase in general with 7%, but with increases over the northern sector and decreases over the southern part (Boko et al., 2007). Bowden & Semazzi (2007) found an increase of rainfall in the north with 29% and a decrease in the south with 19%. As Wajir lies more or less central

in eastern Africa, this does not bring a lot of clarity about the fate of the district. Shongwe et al. (2007) conducted a detailed research of future changes in rainfall pattern over eastern Africa. They have found an increase in rainfall for the whole area and a decrease in the severity of droughts almost everywhere except over eastern Kenya. This could indicate that, however the rainfall will increase, eastern Kenya will still be prone to droughts. It is important to mention that an increase in annual rainfall does not necessarily means a reduction in periods of drought. Localised and short-lived intense rainfall can significantly contribute to rainfall totals. However, if other periods or areas receive virtually no rain, drought will still be a problem. Shongwe et al. (2007) also made time series analysis which are represented in Figure 3.7 for eastern Kenya. They clearly indicate a rise in rainfall in the next century. But they also show that the increase will be much larger in the short rainy season (OND) than during the long rains (MAM) (attention should be given to the different scales on the Y-axis), which was also predicted by Nassef et al. (2009).

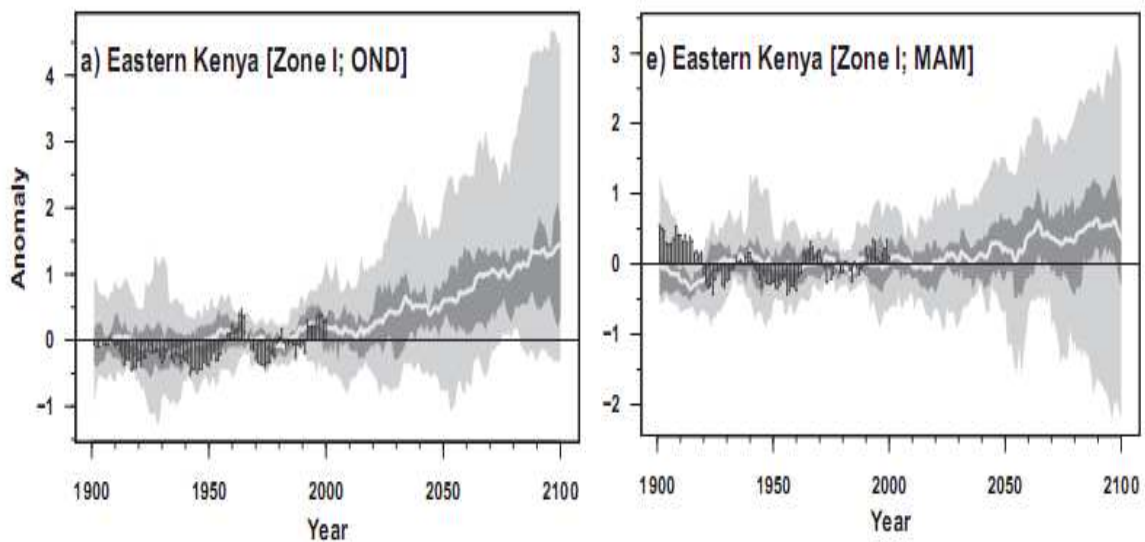


Figure 3.7: Time series analysis predicting rainfall in eastern Kenya for the short (OND) and long (MAM) rains (Shongwe et al., 2007)

When examining Figure 3.7 in more detail, it is seen that a status quo or even a decrease is predicted for the long rains until 2020. The increase in the long rains have already started according to the figure, this is confirmed by observations made in Wajir. A last finding is that the inter-annual variations are very big, with some periods of years with clearly higher rainfall than other periods. All this shows that it is still unclear what will happen during the next century, but it seems very likely that rainfall will increase eventually. However, a study by NASA has shown that higher temperatures in the Indian Ocean are correlated with drought in eastern Africa (Hansen, 2008). Uncertainty about the future remains high, with as only certainty that climate change is already happening. What this means for Wajir district, will be discussed in the next section.

Climate change in Wajir

The long-term trends for rainfall in Wajir district are not clear, however, in the short-term it is very likely that the current pattern will continue. To get a notion of this current pattern, rainfall data and observations by the local population will be used. All the interviewees believed that rainfall patterns have changed during the last 15-20 years (Interview with ALDEF, 2009, 8 September; Interview with ALDEF, 2009, 9 September; Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; National climate change response strategy workshop, 2009, 3 September; Youth workshop, 2009, 30 August). Rains have become less predictable, drought is occurring more frequently and more severe, and when the rains come they are heavier. As this research is mainly focusing on the possibility of occurrence of violent conflict in the short term, this change in rainfall pattern will be used as starting point.

Severe periods of drought in the last decades were 1984-1985, 1991-1992, 1999-2000, 2005-2006 and 2009 (Ibrahim & Jenner, 1996; Interview with ALDEF, 2009, 9 September; Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; National climate change response strategy workshop, 2009, 4 September; Pkalya et al., 2003; Walker & Omar, 2002; Youth workshop, 2009, 30 August). Some interviewees also mentioned 2003-2004 as a period of drought, but this one was less severe (National climate change response strategy workshop, 2009, 4 September). On the other hand, there were also periods of enhanced rainfall during the last decades, mainly caused by El Niño: 1997-1998, a severe one, 2006-2007, a moderate one, and currently at the end of 2009, a moderate one (Kenya Meteorological Department, 2009; OCHA, 2009; Youth workshop, 2009, 30 August). Figure 3.8 gives the annual rainfalls since 1961 and the mean annual rainfall calculated for the period 1961-2009. It is difficult to draw conclusions based on annual rainfalls, as they can be highly influenced by short periods of intense rainfall, but some general comments can be made.

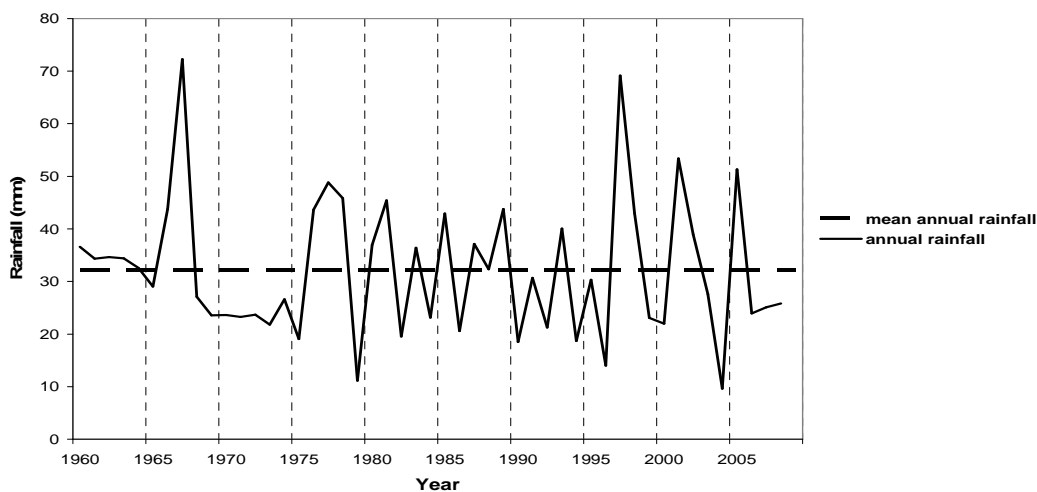


Figure 3.8: Annual rainfall since 1961 compared with the mean annual rainfall for 1961-2009 (data derived from LEWS, 2009)

It seems that rainfall has a higher variability during the last two decades compared with the decades before, except for a ten years period of very low rainfall in the 70s. The rainfall pattern has become more extreme with high peaks and deep dales. However, no clear decrease or increase can be noted (a linear regression indicates a small decrease). The El Ninjo of 1997-1998 is clearly noticeable as is the drought in 1999-2000, 2005-2006 and 2009. However, as the region has two rainy seasons, a high or low annual rainfall is the result of the sum of these two rainy seasons, and intense periods of rainfall will highly influence annual rainfall. Thus, annual rainfall does not always reflect the reality very well. In Appendix C 10-days rainfalls are depicted for the period 2002-2009 together with 10-days mean rainfalls for 1961-2009. The lack of rainfall in 2005 and the failure of the short rains of 2008 and the long rains of 2009, is very clear. These figures give a better reproduction of the real rainfall pattern for different years. As 10-days rainfalls are calculated, short periods with very intense rainfall are also identifiable. One thing is remarkable, the long rains are failing more than the short rains. This corresponds with findings of the interviewees and those of the KFSSG (KFSSG, 2009; Youth workshop, 2009, 30 August). And this is also the prediction made for the future by Shongwe et al. (2007), like discussed above. However, analysing this data in detail, lies out of the scope of this research.

3.3 Climate change and conflict

In this section an overview will be given of some important findings of the scientific literature, which has emerged around the implications climate change could have for the national and international peace and security. It provides comprehension of this paradigm that will be used in the analysis of the link between climate change and violent conflict in Wajir district.

As discussed in section 3.2 climate change will lead to increased temperatures, altered rainfall patterns and increased sea levels during the next century (IPCC, 2009a; IPCC, 2009b; Stern review, 2006). This will have major impacts on the environment and human populations worldwide. Following different pathways these climate induced changes could trigger violent conflicts, which could form a threat for the international peace and security (Barnett & Adger, 2005; Barnett & Adger, 2007; Brown et al., 2007; Brown & Crawford, 2009; Brown & McLeman, 2009; CDC, IISD & Saferworld, 2009; Dupont & Pearman, 2006; Meier, Bond & Bond, 2007; Raleigh & Urdal, 2006; WBGU, 2007). As this research focuses on the arising of violent conflict between citizens and not on the international consequences of it, this issue will not be discussed.

The link between climate change and violent conflict is not straight-forward and will be influenced by many other factors. The impacts of climate change will depend on the speed and extent of them (Brown & Crawford, 2009) and on the environmental vulnerability in certain regions (CDC et al., 2009). As making exact predictions of climate change and its speed and extent is impossible, it is uncertain how major its effects will be. On the other hand its effects will know a high spatial variability, with effecting different areas in various ways. All this forms a major source of uncertainty in the link between climate change and conflict. However, scientists do agree on some major environmental impacts of climate change and the consequences for human livelihoods and socio-economic wellbeing, like increased water scarcity, decreased food security, forced migrations and an increase in population pressures, increased poverty, threats to human health and more extreme weather events causing a lot of damage (Brown & Crawford, 2009; Dupont & Pearman, 2006; IPCC, 2009a; Raleigh & Urdal, 2006; WBGU, 2007). All these factors will undermine human security which could lead to an increase in tensions and violent conflicts (Barnett & Adger, 2007; Brown & McLeman, 2009).

A slightly different, but similar approach is based on the neo-Malthusian model of human-resource relations. Hereby the step between environmental changes and violent conflict is more directly made by assuming that scarcity will be the main trigger for conflict (Brown et al., 2007; CDC et al., 2009). As long as the natural resources and the human population are in balance, chances of occurrence of violent conflicts are low. However, due to environmental changes or changing demography and

consumption, scarcity can arise, which on his turn can lead to competition and violent conflict. As climate change result in changes in the environment, the link between climate change and violent conflict seems straight-forward. However, a lot of research has been done about the link between environmental changes and conflict and the results are not consistent (CDC et al., 2009; Haro, Doyo & McPeak, 2003). It should be noted that this is a specific case of the relationship described in the above paragraph, as the undermining of human security often can be linked with increased scarcity.

In both cases there is no simple one-way connection between climate change and violent conflict. Climate change are not the only causes of environmental changes and related changes in human livelihoods and socio-economic wellbeing. Conflicts are often very complex with a lot of contributing factors and they are very difficult to predict (Clark, 2008). Thus, some caution should be taken before assuming a direct link. However, climate change can be seen as a threat multiplier (CDC et al., 2009), triggering violent conflict when other non-climatic possible causes of conflict are already in place (Brown & Crawford, 2009). Research in recent decades has shown that land degradation, water shortages and resource competition, when combined with other conflict-amplifying factors, have caused conflict and violence in the past (J.K., O.A. & H.E., 2007, 10 December). A very important factor to take into account when analyzing the link between climate change and conflict, is the vulnerability of people's livelihoods and their adaptation capacity to climate change (Barnett & Adger, 2007; Brown & McLeman, 2009; CDC et al., 2009; IPCC, 2009a; Raleigh & Urdal, 2006). In general people will be more vulnerable to climate change if their reliance on natural resources is high and if these resources are sensitive to climate change. But their vulnerability and adaptation capacity will largely be determined by the social, political, institutional and economic conditions in a certain region. Those factors have to be taken into account when investigating the link between climate change and violent conflict. Also the role of individuals and the power relations between different actors can influence the outcome.

As already explained in section 3.2, Africa is seen as the continent which is most vulnerable to climate change, as the climate will become extremely harsh and the vulnerability of the population is high. This high vulnerability can be attributed to some major non-climatic constraints like endemic poverty, poor governance, limited access to capital and global markets (Brown & Crawford, 2009) and high reliance on natural resources for their livelihoods (Brown et al., 2007). On the other hand, African populations have shown for centuries that they have a tremendous ability to adapt to climate variability (Brown et al., 2007). The present concern, however, is that their adaptive capacity may not be robust enough to be able to cope with extreme changes in climate in a short period of time.

3.4 Climate change and conflict in Wajir district

As the major livelihood of the population in Wajir district is pastoralism, they are highly reliant on natural resources like water and pasture, making them vulnerable to a decrease in these resources due to climatic changes. This makes the most likely pathway, between climate change and violent conflict in the region, that of the neo-Malthusian based model wherein scarcity plays a central role. Like mentioned in section 3.1.2 a major underlying cause for past violent conflicts in the region was anxiety over land access and the corresponding resources, being mainly pasture and water. As climate change could decrease these resources, this can be considered as a possible trigger for new violent conflict. Those factors make Wajir district a very good study area to do research about the causal relationship between climate change and violent conflict and the factors influencing this relationship.

For this research the assumption depicted in Figure 3.9 will be taken as starting point. To investigate the applicability of these causal relationships, different factors influencing each causal relationship will be determined and analysed. For this a SLF will be used as depicted in Figure 3.10. The first phase is analysing the relation between climate change and a decrease in ecological carrying capacity, which corresponds with the vulnerability context of the SLF. This vulnerability context will clarify the major challenges for the population in Wajir district, with a special focus on a decrease in ecological carrying capacity. The next step is to analyse the factors which will influence the relation between a decreased ecological carrying capacity and violent conflict. For this, it is important to take a closer look at the socio-economic, political and institutional context in Wajir and at the adaptation strategies applied by the community.

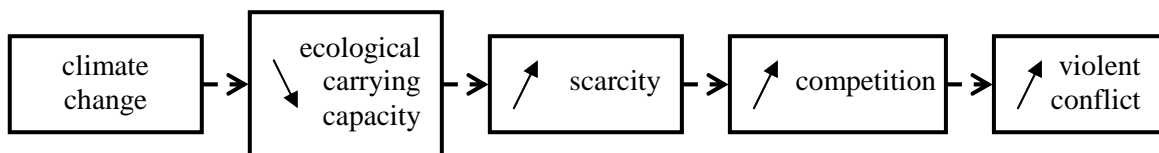


Figure 3.9: Presumed causal relationships between climate change and violent conflict

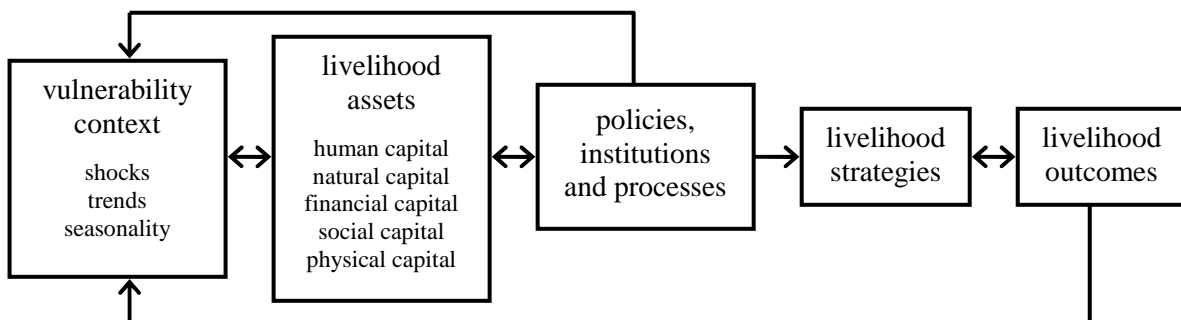


Figure 3.10: Sustainable Livelihoods Framework

3.4.1 Vulnerability

As discussed in section 3.2, it is unclear what the long-term climatic changes for Wajir district will be. However, in the short term it is likely that the current changes in rainfall pattern, like they are experienced during the last decade, will sustain. This means a higher variability in rainfall accompanied with a lower predictability. The consequences on the environment and the human population depending on it, are already severe and will aggravate as the situation continues. In a first part, the impacts of climate change on the environment and the human population will be analysed. One of these impacts is a decrease in ecological carrying capacity. However, climate change is not the only factor leading to environmental changes and a decrease in the ecological carrying capacity of the district. In a second part it will be discussed how different factors contribute to this decrease in ecological carrying capacity. Furthermore, a decrease in the ecological carrying capacity is not the only major constraint on the livelihoods of the communities. Some other constraints, which will influence their adaptation strategies to a decrease in the ecological carrying capacity, will also be discussed.

Climate change

In Figure 3.1 the major consequences of climate change for Wajir district are displayed. The change in climate that will affect the region the most, is an altered rain pattern. According to the interviewees and the assessment of rainfall data this is already the case, and it is likely that this will maintain at least for the next decade (Interview with ALDEF, 2009, 8 September; Interview with ALDEF, 2009, 9 September; Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; National climate change response strategy workshop, 2009, 3 September; Youth workshop, 2009, 30 August). Especially the occurrence of more frequent and more severe droughts during the last decade was mentioned and perceived as a major threat to the pastoral livelihoods. But also the occurrence of very intense rainfall in a very short period of time, is causing challenges for the communities.

The increased frequency and intensity of droughts is laying a heavy burden on the rangelands and the communities depending on them. Especially the succession of partly or completely failed rain seasons without the occurrence of a good rainy season in between is problematic. For example in the area around Arbahajan, they did not have a proper rainy season since the end of 2006 (Interview with elders, 2009, 11 September). The only rains they had were light showers, not enough to refill water stocks and make the vegetation recover.

A first major effect of long periods of drought is water scarcity. As there are no surface water sources like rivers or lakes in the district, the people are depending on rainfall or underground water sources. In a year with 'normal' rainfall, pans and dams will be refilled after every rainy season. Pans are lower

places, often constructed by people, in which rainfall will accumulate, and dams are created in seasonal rivers to hold the water for a longer period of time (Interview with Van Apeldoorn, H., 2009, 27 August). Besides these pans and dams, boreholes and wells form another important water source. Boreholes are constructed with tubes and a pump and are able to catch underground water, sometimes even 300m deep. In places where the underground water table is relatively high, wells are used. Most of the time, the water is brought to the surface by human labour. During the rainy season and the following months the pans and dams are filled with water resulting in a good spread of water sources across the district. This makes it possible for pastoralists to graze their animals in areas far away from boreholes and wells which reduce vegetation pressure. But when the rain season fails and pans do not fill, pastoralists are forced to stay in the vicinity of a borehole or well as they and their animals can not survive without water (Destocking program, 2009, 10 September; Interview with elders, 2009, 11 September). This is especially the case for cattle and goats, while less for camels as they can do without water for at least 10 days. This animal concentration results in an increased vegetation pressure around boreholes and wells, which will cause environmental degradation. During extreme droughts, also some wells are drying out, further decreasing the available water sources (Destocking program, 2009, 12 September; Interview with elders, 2009, 11 September).

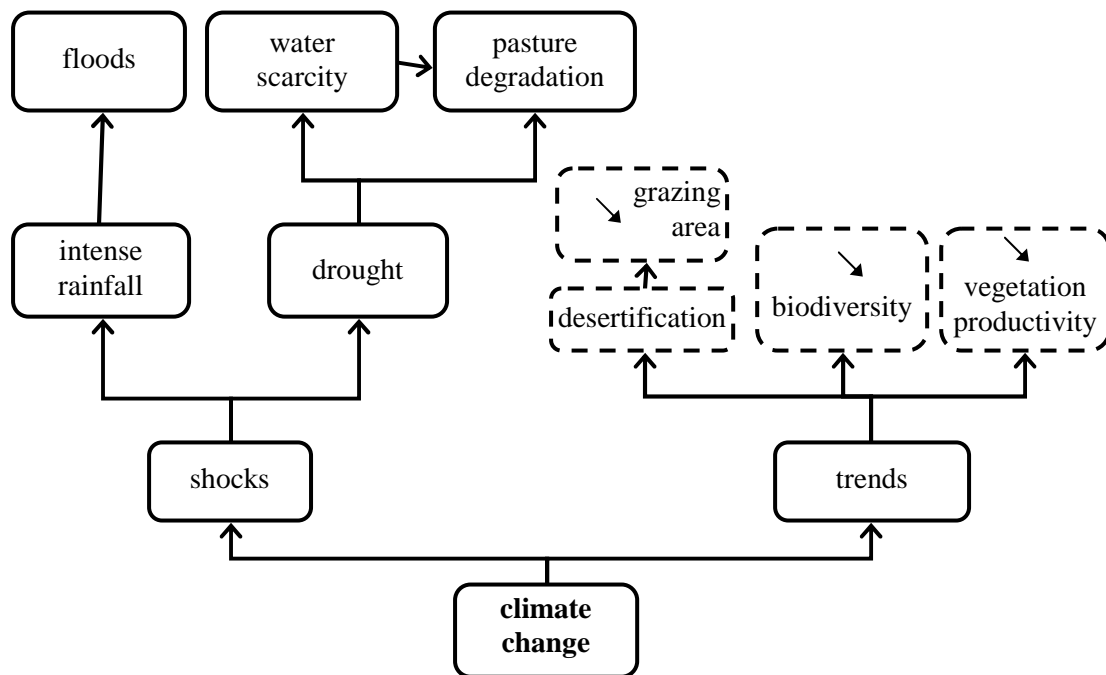


Figure 3.11: Major consequences of climate change for Wajir district

The degradation of pasture and water scarcity can be categorized under shocks, consequences of drought in a short period of time. However, there are also consequences which have long lasting impacts on the environment, trends. So has the succession of severe droughts the potential to lead to desertification of some areas. This on his turn will lead to fewer grazing areas available for

pastoralists. An evidence of the already existing direct link between drought and a deterioration of vegetation, can be found in areas where grazing is forbidden. Despite the absence of grazing pressure, a deterioration of the condition of the vegetation is observed (Interview with elders, 2009, 11 September). Besides this direct link between drought and desertification, drought will also lead to a decrease in the ecological carrying capacity following some other pathways, like a decrease in biodiversity and a poor productivity of the vegetation. As drought is not the only cause of this, it will be discussed together with the effects of high grazing pressure.

Another component of climate change and an altered rainfall pattern is an increase in periods with very intense rainfall, another shock. Rainfall is crucial for the conservation of the livelihood of pastoralists, however, too much of it can have harmful consequences. High amounts of rainfall often lead to floods in lower areas and erosion in the accidented northern part.

Decreasing ecological carrying capacity

The causes of a decrease in ecological carrying capacity can be categorized into two main categories: climate change and high population pressure (Interview with ALDEF, 2009, 9 September; Interview with elders, 2009, 11 September). This high population pressure results in a very fast depletion of wood and a high grazing pressure. These two factors are contributing to the decrease of the ecological carrying capacity. However, besides high population pressure there are some other major factors contributing to the high grazing pressure in the district, this will be discussed in the next section, causes of high grazing pressure.

Wood is a major commodity for the pastoral way of living, they are mainly using it to built houses and fences, and to cook. Consequently, an increase in the population leads to an increase in the use of wood. On the other hand, wood depletion is also a consequence of an impressive number of dropouts who are trying to make an alternative living by selling charcoal (National climate change response strategy workshop, 2009, 3 September). This has led to a decreased biodiversity of woody species, mainly species highly suited for building or cooking, and a poor productivity, regeneration and reproduction of trees. The pressure on the wood has now become very high, with a general depletion, both in quality and in quantity, as consequence. This contributes to the general decrease of the ecological carrying capacity in the area.

Figure 3.12 illustrates how a high grazing pressure, together with the effects of climate change, will lead to a decrease in ecological carrying capacity. One obvious consequence of a high grazing pressure is the very fast grazing away of vegetation. Once the vegetation starts growing after the rains have started, the large amount of weak and hungry animals are eating the vegetation at a very fast rate. On the other hand, the high grazing pressure results in the fact that the vegetation has no recovery time

(Interview with NEMA, 2009, 15 September). Until 20-30 years ago, grazing pressure was not that high, and people were following certain migration patterns. Now these migration patterns have disappeared to large extent and grazing occurs almost everywhere permanently. This results in the fact that the vegetation has almost no time to recover from grazing. The underlying causes of this disappearance of the traditional migration patterns will be discussed in the section about the causes of high grazing pressure.

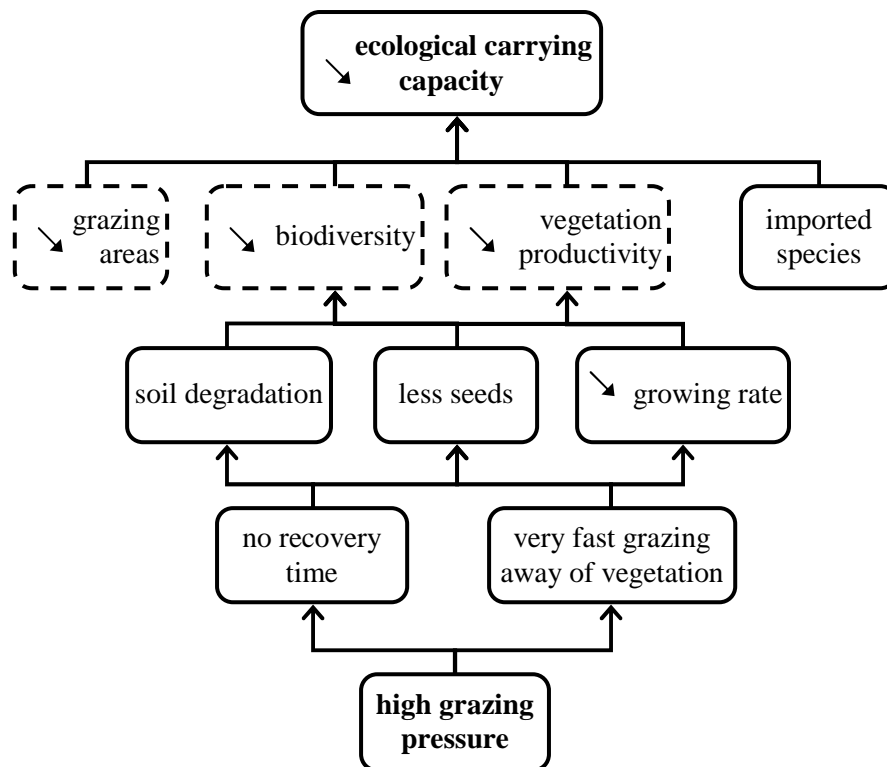


Figure 3.12: Major causes of a decrease in ecological carrying capacity

This lack of recovery time for the plants and the very fast grazing away of the vegetation, results in three major effects. As the vegetation is grazed away very fast, it constantly has to regrow. After some time however, the vegetation is exhausted of energy and nutrients leading to a decrease in growing rate. When the grazing pressure is extremely high, this can even lead to disappearance of the plant as it is just unable to regrow every time it has been eaten. Another effect is the lowering of the production rate of seeds (Interview with elders, 2009, 11 September). Plants need some growing time without destruction before they start their reproduction cycle. If they are eaten before they are getting in this life stage, they will not produce seeds. Thus a high grazing pressure is leading to a low seed production, especially for species with a longer growing cycle. The reduced growing rate and the decrease in seed production are both effects on the plant itself. But also for the soil, no recovery time and fast grazing away of the vegetation has its consequences (National climate change response strategy workshop, 2009, 4 September). First, there is a decrease in the fertility of the soil. As the

vegetation is grazed away very fast, a lot of nutrients are extracted from the soil. On top of this, the amount of plants dying, and thus reducing their nutrients back to the soil, is very low. This contributes to a lower fertility rate. However, on the other hand, high grazing pressure will also lead to a certain increase in fertility rate of the soil due to the faeces of the animals. The second consequence is the result of a decrease in vegetation cover, due to very fast grazing away of vegetation, reduced growing rate and a loss in seed production. As the vegetation cover decreases, the soil is more sensitive for erosion by wind and water. Especially wind erosion is an important factor in some areas. For example around Arbahajan there is dusty wind almost the entire day. This has also its effects on the regeneration of vegetation as seeds need firm soil to germinate and seeds are blown away.

Together with periods of severe drought, these three factors are resulting in a decrease in biodiversity and a poor productivity of the vegetation (National climate change response strategy workshop, 2009, 3 September). A poor productivity of vegetation can be seen as the result of two major processes: a decrease in the vegetation density and a slow growing rate of the present vegetation. A decrease in the amount of plants is caused by the lower production of seeds, resulting in a lower germination rate and eventually less plants, and death of plants after being eaten. Another factor hereby is the soil. Less fertile soil together with soil erosion will make germination even more difficult. Also rainfall will contribute to a large extent in the vegetation density. During periods of drought, germination is almost impossible because of the requisite for water. Especially trees are finding it very difficult to reproduce themselves recently. The same goes for periods with very intense rainfall, this will also inhibit the germination. The other major process resulting in a poor productivity of vegetation is a decrease in growing rate, caused by a high grazing pressure. Also drought and less fertile soil will contribute to this decreased growing rate.

Besides poor productivity of vegetation, decreased biodiversity is another consequence of drought, soil degradation, decrease in amount of seeds and a reduced growing rate (Interview with elders, 2009, 11 September; National climate change response strategy workshop, 2009, 3 September; National climate change response strategy workshop, 2009, 4 September). This decreased biodiversity is mainly caused by the loss of species sensitive to overgrazing (Walker & Omar, 2002). First their growing rate is affected like explained in the previous paragraph, but eventually they are just not able anymore to regenerate and grow as they can not cope with the harsher environment. This has resulted in the disappearance of some important palatable grasses which formed a major part of the diet of the animals (Interview with elders, 2009, 11 September; National climate change response strategy workshop, 2009, 3 September).

The decreased ecological carrying capacity can now be seen as the result of four major factors as depicted in Figure 3.12. The first one is a loss of grazing areas due to desertification. However,

desertification is not the only cause of a decrease in the amount of grazing areas. Neither is drought the only factor leading to desertification. In fact, a poor productivity of vegetation, another cause of a decreased ecological carrying capacity, can also lead to desertification. But to maintain a clear overview some simplification of the causal relationships was necessary. Besides the loss of grazing areas, a decreased biodiversity will also lead to a decrease in ecological carrying capacity for the human population as some important palatable species are becoming very rare or are even extinct. Obviously a poor productivity of the vegetation will also lead to a decreased ecological carrying capacity. Another factor, which is not mentioned yet, are imported species (Interview with NEMA, 2009, 15 September; National climate change response strategy workshop, 2009, 4 September). In some areas in the district, imported species are flourishing at the expense of indigenous species. Some of these imported species are even not edible reducing the amount of pasture for the animals. This factor is also leading to a decrease in ecological carrying capacity.

Causes of high grazing pressure

The major causes of high grazing pressure will be discussed in this section to get a clearer view on some important processes in the pastoralists communities in Wajir district. Figure 3.13 shows how different factors and their interlinking are leading to an increase in grazing pressure. This increase can be attributed to three main causes: an altered composition of livestock, an increase in the number of animals in the district and a disappearance of traditional migration patterns. Each of these three will be discussed here in more detail.

A first cause of an increase in grazing pressure, is the altered composition of livestock herds (Interview with ALDEF, 2009, 8 September; Interview with elders, 2009, 11 September; Lembara et al., 2009). During the last century cattle has gained importance over the traditional camel, as the national market opportunities for cattle are better. However, as cattle have to drink every two days, the possible walking distances between water and pasture source are smaller than with camel. This results in an increased grazing pressure around boreholes and wells during the dry season. Also the type of vegetation consumed differs between the two, as cattle are eating grasses while camels are consuming both grasses and leaves of shrubs and trees. Thus, an increased amount of cattle over camels, will increase the grazing pressure on grasses. Another shift is the gained importance of shoats during the last decade. This can be explained by the increased need for petty cash, the lower purchase price for these animals and their higher reproduction rate. Like cattle, shoats can not survive without water for a long period of time, again increasing the vegetation pressure around boreholes and wells. Sheep have been an important part of livestock herds for centuries, however their number relative to camel and cattle has increased. An increase in the amount of sheep has a major impact on the vegetation as sheep are eating grasses very close to the ground. This makes it more difficult for the vegetation to regrow. The most remarkable shift is the large increase in the goat population: from being the livestock

population with the lowest number to become the most important livestock in the district during the last decade. This shift can partly be explained by the factors described for shoats. However, the major increase in goats is also a consequence of the decrease in available grazing vegetation. Goats are browsers and leaves of shrubs and trees are their major diet. This makes them less vulnerable to drought as they can still find something to eat when all the grass is gone and cattle and sheep are struggling. Because of this, goats have become more and more popular during the last decade. In general this shift in livestock composition has resulted in an increase in grazing pressure on the vegetation. The main factor hereby is the decreased relative importance of camel and the increased relative importance of cattle and shoats.

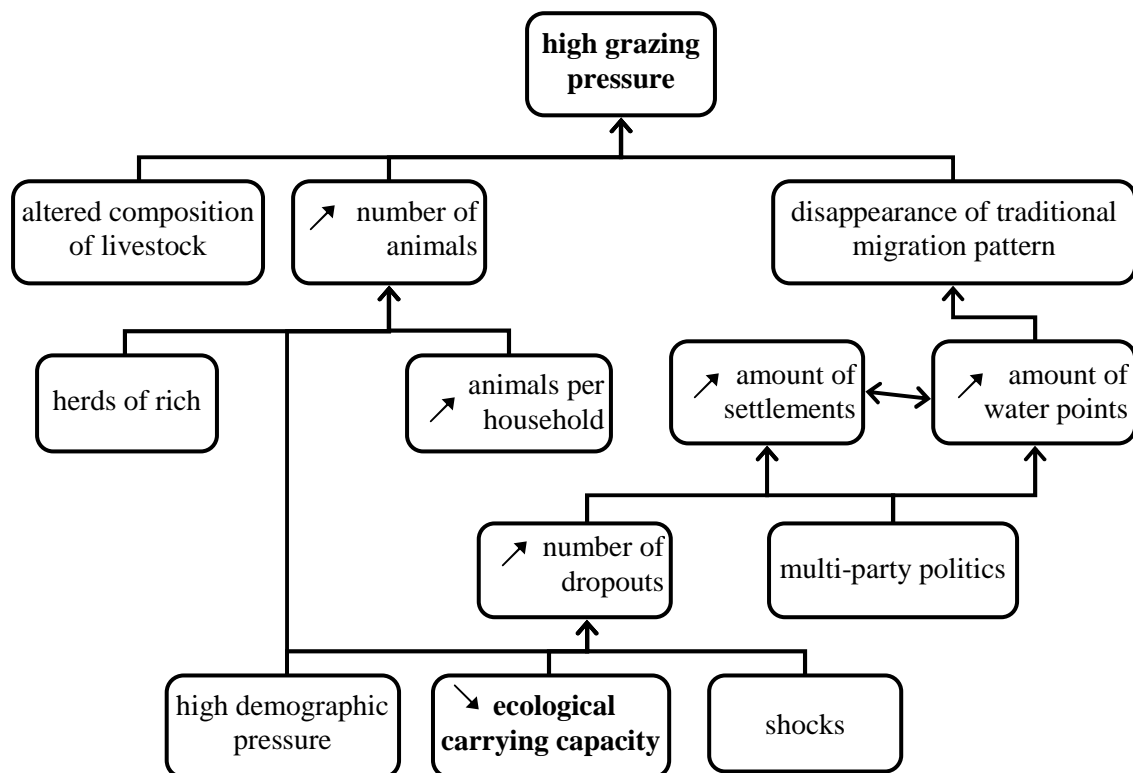


Figure 3.13: Major causes of high grazing pressure

The second main cause of the increased grazing pressure in Wajir district, is simply an increase in the number of animals. It is worth to go into further detail on the causes of this increased number of animals, as this contributes to a better understanding of the region. One logical cause is the high demographic pressure (Interview with ALDEF, 2009, 8 September; Interview with elders, 2009, 11 September). As more and more people are living in the semi-arid and arid rangelands, more and more livestock is needed to maintain their livelihood and provide in their basic needs. Hereby it is important to mention that, while the population is increasing, also more and more people are leaving the pastoralist way of living, becoming dropouts. But even then, they remain partly dependent on

pastoralism livelihood in some form. Another contributing factor is the increased number of animals per household (Lembara et al., 2009). The main explanation for this is that livestock is seen as a sign of wealth, is giving prestige to the owner and has sentimental values (Interview with ALDEF, 2009, 8 September; Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September). An average herd size is between 50 and 200, but a man owning 50 shoats is considered as being poor (Interview with elders, 2009, 11 September). Thus, pastoralists are attempting to keep as much animals as they can afford. The last factor contributing to an increase in the number of animals in the district is the phenomenon of rich Kenyans grazing large herds in these rangelands (Interview with Van Apeldoorn, H., 2009, 27 August). Very often these rich are not living in the district and are even not born there, but they are using its scarce resources to gain wealth. Depending on the condition of pasture and water availability, they are sending their herds with a herdsman to different parts of Kenya. Once the animals are mature enough to be slaughtered they are brought back to Nairobi to be sold at high prices. This money is directly generated thanks to rangelands belonging to often impoverished communities. These communities receive no revenues at all for this service, except maybe some little payment for the consumption of water from boreholes.

The disappearance of traditional migration patterns, is the third major cause leading to an increase in grazing pressure everywhere in the district. The reasons for this disappearance of traditional migration patterns are rather complicated as being a result of political and socio-economic processes. The direct cause is an increase in the amount of permanent water points like wells and boreholes. To be able to explain the consequences of an increase in permanent water points and the resulting disappearance of traditional migration patterns, it is necessary to clarify first what is meant by traditional migration patterns. During the dry season, animals were kept in the vicinity of boreholes and wells to have access to enough drinking water (Interview with ALDEF, 2009, 8 September; Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; Walker & Omar, 2002). As the dry season progressed, and pasture close to boreholes and wells was exhausted, livestock was grazed at progressively further distances but still within a certain radius around a water source. After the rains, animals could drink from pans and dams filled with rain water. This made grazing more disperse, reducing grazing pressure. This also gave the opportunity to the vegetation around boreholes to recover from the intense grazing pressure during the dry season.

However, as the amount of permanent water points is increasing, this pattern is disturbed. Much larger areas are in the vicinity of a borehole or well and are grazed almost permanently. This has caused the nearly disappearance of areas only grazed during the rainy season and reserve grazing areas. Reserve grazing areas are areas at the complete edge of the possible grazing area around boreholes and wells during the dry season. When the drought is continuing for a long time, livestock is grazed further and further away from the water sources. But as these areas are now closer to another water source, they

are already depleted towards the end of the dry season. This places major stresses upon the human population, as they have to struggle to find a place with some remaining pasture within a coverable distance of a water source. As wet grazing areas are disappearing because of permanent grazing, the quality of pasture is going down. These wet grazing areas were only grazed for a certain period of the year, while they could recover during the other periods. This resulted in a high quality of the vegetation in those areas. As the amount of water points in the district has increased and the traditional migration pattern is under severe pressure, grazing pressure in the whole district has gone up. This has caused a shift from water scarcity as major constraint to pasture scarcity (Interview with Oxfam, 2009, 27 August). However, it has to be noted that the effects of an increase in water points are not all negative (Interview with elders, 2009, 11 September). It has resulted in a dramatic increase of rangelands available for livestock grazing, which originally has led to an increase in the carrying capacity of the district.

As an increase in the amount of water points is causing the disappearance of traditional migration patterns, contributing to great extent to a permanent high grazing pressure in all areas, some further attention should be given to the factors contributing to this increase. The increasing number of water points is closely interlinked with an increase in the amount of settlements. On the one hand new water points are attracting new settlements. As there is a permanent water source for human consumption, the energy and time spend to go and catch water is significantly reduced. On the other hand a new settlement often results in a new water point. Once a new settlement is formed in a place without a permanent water source, the inhabitants start lobbying to get one as this would make their daily lives much easier. The large increase in settlements and water points during the last decades has a very political nature.

A first factor hereby was the appointment of chiefs in the large number of newly created locations and sub-locations during the last decades (Interview with NEMA, 2009, 15 September; Walker & Omar, 2002). The policy of the government according to chiefs of locations or sub-locations is that they should settle or face retrenchment. This fits in the general government policy toward pastoral sedentarisation. The result was the settlement of chiefs, often accompanied by close relatives and clan members. However, the government policy towards chiefs was a major impetus, some chiefs made this choice also based on individual interests or their belief that people are better of settled. A second factor is the representation of clans in certain areas. There was and is a tendency for sub-clans and even sections of sub-clans to seek their own settlement. They receive benefits in the form of increased political representation or access to resources. By establishing a settlement, often followed by a water point, claims on the surrounding grazing lands are amplified. A clan section which is concentrated in a particular location, is also considered to be better able to secure administrative and political positions. They can deliver a voting block which results in a high leverage over the MP. The role played by MPs

and potential MPs should not be underestimated. They want to get as many voters as possible and therefore are trying to secure the electoral support of sections of clans, by supporting them in the establishment of a settlement and a water point. However, large numbers of pastoralists are against these new settlements, and especially new water points, as this has a major influence on their source of survival, pasture. But most of the time they have no vote in this or are just ignored. This has resulted in an enormous rise in settlements and water points with disastrous consequences for the rangelands and the human population depending on them.

Another reason for the increase in the amount of settlements is the growing number of dropouts (National climate change response strategy workshop, 2009, 3 September). Once a family has lost all its livestock, often after a shock like drought, it is not advantageous anymore to keep the nomadic lifestyle. They will look for a place to settle in search of an alternative livelihood. This increased amount of dropouts is a consequence of the decreased ecological carrying capacity together with the high demographic pressure in the area. Those two factors are making it more and more difficult to maintain pastoralism as a livelihood, as animals are very sensitive for diseases and death due to lack of good quality pasture. After a period of drought the number of dropouts increases as this causes the death of a large numbers of animals and people do not have the capital to restart with a new stock.

Other constraints

Besides the decreased ecological carrying capacity and other impacts of climate change, pastoralists are confronted with some other important constraints on their livelihood. As these constraints are multiple, only those which have consequences for the link between climate change and violent conflict will be shortly discussed.

A major constraint for pastoralists is the lack of market infrastructure in the area. An important factor hereby is the lack of road infrastructure. As only 7% of the roads in the district are tarmacked (KFSSG, 2005), market access is difficult. This results in a large proportion of the pastoralists relying on remote markets. These markets record lower sale prices and are less reliable in the supply of goods. When better roads were in place, going to markets where sale prices are higher would be a possibility, or retailers would be able to come themselves to more remote markets. In this way producers would be less dependent on middlemen and the prices they receive for their livestock would go up (Interview with ALDEF, 2009, 8 September). Another factor is the lack of market information. Very often pastoralists have no idea of the current sale prices for their animals, making them vulnerable for scams. Moreover, they can not judge when it is the right time for selling and the right time for buying livestock. As the sale of shoats contribute to over 60% of pastoral household incomes in the district (Lembara et al., 2009), this lack of market infrastructure lays a major constraint on the pastoral livelihood.

Another constraint is the lack of alternative livelihood opportunities and the resulting high dependency on food aid in the district (National climate change response strategy workshop, 2009, 4 September). This is closely related with the increasing amount of dropouts caused by multiple factors like explained above. Working opportunities in Wajir district are very low and it is very difficult to find an alternative way of living (Population census, 2009, 24 August; Population census, 2009, 25 August; Youth workshop, 2009, 27 August; Youth workshop on peace, 2009, 23 August). This results in a lot of dropouts being not able to provide in their own basic needs, making them food insecure and reliable on food aid. An important factor hereby are the unadapted policies of the government and ngo's. The government has always marginalised Norhteastern Province with almost no investments in infrastructure, health care, education, This has resulted in a vey low development rate in the area, making it difficult to find an alternative livelihood. Another issue are the assistance programs developed in the area both by the government and ngo's. Those have focused too much on the short-term, resulting in the undermining of the traditional pastoral livelihood and the failing to offer alternative livelihoods (Youth workshop, 2009, 30 August). Instead of supporting mobility of pastoralists and herd management as a coping strategy during periods of drought, aid programmes have mainly focused on food distribution during emergencies. But in this way, they fail to deal with the reasons behind the problems and are contributing to a cycle of emergencies and emergency assistance.

Conclusion

Climate change results in three main constraints for the pastoral livelihoods in Wajir: increased frequency and intensity of droughts, affecting the population mainly through water scarcity and pasture degradation; increase in periods with intense rainfall, causing floods; and a decrease in the ecological carrying capacity on the long term. However, this decreased ecological carrying capacity of the district is not only caused by climate change. Also a high population and grazing pressure play an important role hereby. This illustrates that the first causal relationship, in the link between climate change en violent conflict, is real but not straightforward. Climate change will lead to a decrease in ecological carrying capacity, but this will also be influenced by some other major factors. This vulnerability context has also shown that a decrease in the ecological carrying capacity is not the only constraint pastoralists are facing. All these constraints together are increasing the vulnerability of the population and are reducing their adaptation capacity.

3.4.2 Impacts on livelihood assets

The constraints for the pastoral livelihoods in Wajir district as described in the previous section, are affecting the livelihoods assets of the human population. When livelihood assets are negatively affected, people will become more vulnerable. A higher vulnerability means a lower adaptation capacity to overcome shocks, like a long period of drought. Once their livelihood assets are so seriously affected that their resilience and adaptation capacity is exceeded, they can not maintain their current livelihood and they are forced to look for alternatives. One possible alternative could be trying to earn revenues through violent conflict. Thus it is important to have a clear view on the ways in which livelihood assets are affected in the current context of Wajir district. In this research, five types of livelihood assets will be discussed: human capital, natural capital, financial capital, social capital and physical capital. First a short overview of the available assets is given, followed by an analysis of how these are affected.

Human capital

Wajir district is characterized by a high birth rate, a high mortality rate and low live expectancy (KCBS, 2004). However, the birth rate exceeds the mortality rate resulting in a high growing rate of the population. Besides an increase of the population, this has also its influences on the age distribution in the district. As for all countries with a high growing rate of human population, the form of the population pyramid is a triangle. This means large numbers of children, followed by slightly fewer young adults, a further decrease in the amount of older adults and a small portion of old people. This is generally considered as being a healthy situation, as there is always a large portion of the population which is capable to work and look after the small portion of elders. This is the case as long as the portion of children is not becoming too big.

Human capital can be separated into two parts: the absolute amount of persons capable to work and the capability of one working person. When only looking at the first part, the human capital in Wajir district is high and is still increasing. However, when taking the second factor also into account, the human capital is limited due to a lack of education and health care. The lack of education does not have to be an immediate constraint as long as the pastoral livelihood is maintained. The children learn everything they need to know to be able to survive as pastoralists from their parents. But people who have abandoned the pastoral way of life are very often confronted with this lack of education in their search for an alternative livelihood. Also when the pressure on pastoral livelihoods is increasing and there is need for new coping strategies, lack of education can form a constraint. An example of this is that pastoralists often are illiterate. This illiteracy can reduce their access to the government, their power position in negotiations and their capacity to use the market system to its full extent. The lack of health care is another limitation on the human capital in the district. Getting proper health care for

an injured or sick person is very expensive, mainly due to large travel distances to get to a health centre. Very often people can not afford this or are not aware of the necessity. This results in people staying ill for a long period of time and maybe eventually dying. As people are ill, they can not work anymore which reduces the human capital.

As the human capital present in the district is discussed, now the major effects of the factors described under the vulnerability context will be analysed. Most of these effects can be placed under health problems, restricting the human capital. One consequence of both droughts and high amounts of rainfall is an increase in diseases in the district (National climate change response strategy workshop, 2009, 4 September). During droughts, large amounts of humans and livestock are gathering around boreholes, wells and in areas with some remaining pasture (Interview with ALDEF, 2009, 8 September; Interview with Van Apeldoorn, H., 2009, 26 August). This forms the ideal environment for epidemic diseases, both for humans and animals. But also high amounts of rainfall can cause the outbreak of diseases, as floods results in the contamination of water sources. As people are getting ill, they are not able anymore to perform their daily chores, the human capital is reduced.

People are also affected by drought and a decrease in ecological carrying capacity in two other interlinked ways: long walking distances to find water and pasture, and water scarcity. As the vegetation around boreholes and wells deteriorates, people are forced to look for pasture for their animals in grazing areas further away from boreholes and wells. According to a rapid drought assessment conducted in June 2009 by the district steering group of Wajir district, cattle and shoats trekked an average distance of 30-40km in search of water and pasture (District steering group Wajir district, 2009; DPA, WASDA & ALDEF, 2009). As camels can maintain without water for at least ten days they sometimes trekked for a distance of 60km (District steering group Wajir district, 2009; Interview with elders, 2009, 11 September). During such periods of severe drought, communities are walking large distances in search of pasture and water, and are migrating to distant places, even across the borders of other districts or countries. As people have to walk very long distances to find water for both domestic and animal use, they are getting exhausted. On top of this they often lack water during these searches, making them very weak. Also water for domestic use is forming a problem as temporally settlements are not always in the vicinity of a permanent water source. When pans and dams are drying up, women or children sometimes have to walk for days to go and catch water (National climate change response strategy workshop, 2009, 4 September). On top of this, as so much time is spend on finding water and pasture, time to perform other activities is limited. All these factors are reducing working capacity, limiting the human capital.

Another factor influencing the capability of the population to perform tasks, is the lack of nutrition (National climate change response strategy workshop, 2009, 4 September). Due to a decrease in the

financial capital of the families, which will be discussed later on, the money spend on food is reduced, leading to hunger and malnutrition. On top of this, is the milk production of the animals going down and often stops completely. As this is an important nurturing source for the human population, the nutrition of the people suffers. When people are suffering from hunger and malnutrition their working power is reduced. Increased illnesses, exhaustion, weakening, malnutrition are all factors contributing to a reduction in human capital in the district. When these factors are going into the extreme, they can even lead to mortality, which results in a permanent decrease of human capital.

Beside an increase in health problems and deaths, pressure on the pastoral livelihood has also its consequences for education (National climate change response strategy workshop, 2009, 4 September). The few pastoral children going to school are often kept at home during periods of crisis to help in the search for water and pasture. This leads to an increase in the number of school dropouts, reducing the education level, further limiting the human capital.

Natural capital

As pastoralists are depending almost completely on their livestock for their household income, natural capital is their most important asset. Livestock cannot survive without pasture and water in the rangelands of the district. However, like extensively discussed in section 3.4.1, the ecological carrying capacity of the district is going down and the natural resources are coming under increased pressure. Pans and dams are being dry for longer periods of time than before, and even the water levels in wells are decreasing during extreme droughts. Some wells in Griftu were completely dry during the field visit in September 2009. The pasture available for livestock is and will be further reduced, as the ecological carrying capacity declines. The lack of enough water and pasture, especially in the vicinity of each other, is laying a heavy burden on the pastoral livelihood in the district. Another important natural resource is wood. Pastoralists are using wood to construct their homes and fences and to cook their daily meals. However, there is a serious depletion of wood in the area, resulting in a lack of building and cooking material in some areas. This makes that women or children have to walk long distances to catch wood, another factor which makes their live more difficult. The general depletion in pasture, water and wood is the main constraint for pastoral livelihoods in Wajir district as they are highly dependent on these natural resources.

Financial capital

Livestock forms the major income source for pastoralists (Lembara et al., 2009). Milk that is not consumed is sold. However, this is only possible when the animals are kept in the vicinity of a settlement, as selling milk in isolated places is much more difficult to organise. Besides the selling of milk they are also selling their animals. Shoats are sold as regular income source to be able to buy other basic commodities. Normally, camels and cattle are used as savings and are only sold when there

is a need for a large amount of cash. Pastoralists are convinced that they need to keep large amount of animals to be able to survive in the long term. But also the gaining of respect plays an important role hereby (Interview with elders, 2009, 11 September). This is reflected in the fact that animals are only sold when there is a direct need for cash or when their body condition has deteriorated so badly that they are in danger of dying. This second fact results in the selling of animals during droughts at low sale prices. As a lot of animals are getting weak due to a lack of pasture, their owners want to sell them before they die. This results in a sharp increase in supply which is not covered by the demand, resulting in low market prices. Moreover, animals with a lower body condition are sold in a low quality category with low prices. In this way droughts are causing economic losses (National climate change response strategy workshop, 2009, 4 September). As the body conditions of animals deteriorate, the milk production goes down and eventually comes to a halt. The income from milk sales is declining rapidly. These two factors will lead to a decrease in financial capital of the households.

The selling of animals before they succumb due to a lack of pasture and water is not always successful. During droughts large numbers of livestock are lost, which affects the household income to large extent. Sometimes a household is able to restart with the remaining animals, but this is getting more difficult as droughts are more frequent with almost no recovery time in between. Eventually they lose almost all their animals and are forced to stop their pastoral livelihood and settle themselves. This results in a serious decrease in financial capital, an increase in poverty and high numbers of people depending on relief food (Interview with NEMA, 2009, 15 September; National climate change response strategy workshop, 2009, 3 September; National climate change response strategy workshop, 2009, 4 September).

Social capital

The main source of social capital in Wajir district lies in the traditional Somali society, as there is a high sense of unity within a clan, sub-clan, section or sub-section (Youth workshop, 2009, 27 August; Youth workshop on peace, 2009, 22 August). Within such a group people feel connected with each other, resulting in a very high capacity of sharing. When one member of the community has lost all his animals due to diseases or drought, the community will provide him with new ones to rebuild his herd. Also the sharing of food is very high. This was reflected in the high covering percentage of the food relief during the drought of 2006, 64% of all the people in need were helped, the highest number of Kenya. If you can afford it, you are supposed to help everyone in your clan who is in need. However, there is also a limit: people who are taking advantage of this system are excluded. Also within families, often extended once, there is a very high capacity of sharing. If one member of the family earns a good income, he is supposed to share it with the whole family (Interview with ALDEF, 2009, 8 September; Population census, 2009, 26 August). This custom maintains when pastoralists are

settling. A son or daughter who has a job, is supposed to pay for the education of its siblings, the food of the family, ..., even when he or she has already a family of his/her own to look after. This often results in one wage supporting up to 20 people. The traditional Somali society is not the only source of this high capacity of sharing, as helping the poor also plays a central role in the Islam.

However, between clans and sub-clans, the situation is different as there has always existed competition and rivalry between them. During the 90s this has led to violent conflict like discussed in section 3.1.2. However, particularly thanks to the work of WPDA, this attitude is changing and people are realizing that they have to unite their strengths (Interview with DC, 2009, 25 August). Especially in large settlements like Wajir town, clan divisions are getting less and less important. But that they are still present in the district, became very clear during the conducted fieldwork when attending a destocking project. Each clan or sub-clan was complaining that others were favoured above them and sometimes the tensions were getting high (Destocking program, 2009, 12 September). This illustrates that ethnicity is still an important factor in the Somali society in Kenya.

As live is getting harder and people are struggling to survive, this capacity for sharing is under pressure. If people are jeopardizing their own lives and those of their relatives by helping others, they have no choice but to ignore the needy ones. Another consequence of droughts and a lack of pasture and water, is the breaking up of families and communities. As this happens, members of families and communities can no longer rely on each other for support (National climate change response strategy workshop, 2009, 4 September). Another factor affecting this capacity for sharing is the arrival of 'modern' society. Education is getting more and more important, people want to be able to afford a proper home and some luxuries and even saving is entering the society. This change in mentality has the capacity to gradually undermine the sharing within communities. All these factors are contributing to a decrease in social capital in communities in Wajir district.

Physical capital

The physical capital available to pastoralists is rather low and the infrastructures in place are vulnerable for periods with very intense rainfall (National climate change response strategy workshop, 2009, 4 September). Some of the infrastructures relevant in this research, as they contribute to the resilience of the people will be discussed here. A first infrastructure are the roads. They are not tarmacked and rainfall can cause destruction and blocking. This has major possible impacts, as transportation comes to a halt, stopping the transport of goods, animals and relief food. Also dams and pans are vulnerable for intense rainfall as it can destroy them partly or completely. The walls of dams are made of soil which can be washed away. Pans will gradually fill up due to sedimentation of soil washed in by the water. The heavier the rains are, the more sediment will accumulate. This destruction of pans and dams will have major impacts on the pastoral livelihood as they are an important water

source. Drainage systems in settlements are also affected by high amounts of rainfall. They cannot support the water or are getting blocked. This results in leakages or contamination of drinking water causing outbreak of diseases. Another consequence of storms and heavy rainfall is the destruction of the huts of the pastoralists, which are not adapted for heavy rains. All these factors are causing a decrease in physical capital and are further hampering the pastoral livelihoods in an already difficult environment.

Conclusion

The livelihood assets of the people in Wajir are seriously affected by the increased frequency and intensity of droughts, increase in floods and the decrease in ecological carrying capacity. Droughts and floods are a direct consequence of climate change, while the ecological carrying capacity only partly is caused by it. As all the livelihood assets are negatively affected, the vulnerability of the community increases, while its adaptation capacity decreases. Assets are crucial to be able to overcome difficult periods. Also in the adaptation to climate change, assets play a critical role. The more assets available to the communities, the higher the chances that they will be able to cope with climatic changes.

3.4.3 Policies, institutions and processes

The socio-economic, political and institutional context plays an important role in the way communities are dealing with challenges and constraints. Also in the link between climate change and conflict is this context crucial. On the one hand, they are influencing the adaptation capacity and the applied coping strategies of the population to climate change. On the other hand, they are shaping the environment in which tensions occur and form an important factor determining whether these tensions will escalate into violent conflict or not. In this sections relevant policies, institutions and processes will be discussed. They are divided into two categories: those affecting the adaptation capacity of the communities and those influencing conflict arising and escalation.

Policies, institutions and processes affecting adaptation capacity

If a community's adaptation capacity to climate change is high and they can maintain their livelihood or establish alternative ones, the chances that violent conflict will arise are seriously diminished. In this section, the policies, institutions and processes influencing the adaptation capacity of the population in Wajir district will be discussed. Hereby there are three major factors: culture, policies and services provision.

A first cultural factor which enhances the adaptation capacity of the Somali society, is the high sense of unity within a clan or sub-clan and the resulting capacity of sharing, liked discussed in section 3.5 under social capital. However, the level of sharing is not equally large for everyone in the district. First, it also depends on social relations within clans and people with higher affinity will receive more support than other. Secondly, members of small clans or people living far away from their own clan will not receive much support from outsiders, and are relying on themselves. This sharing of resources also has a negative aspect (Interview with Van Apeldoorn, H., 2009, 26 August; Youth workshop, 2009, 27 August). As one is supposed to share everything with his relatives, incentives to earn a living and improve its incomes are low as the gains from it are shared with everyone in, at least, the extended family. The individual and his close relatives do not experience direct advantages over the others. This leads to a culture in which the stimulation to look for additional livelihood incomes is low. This lays a constraint on the adaptation capacity of the society. Looking for additional livelihood incomes will often coincide with diversification of income. A more diversified income makes people less vulnerable to shocks and trends discussed in the vulnerability context, and increases their adaptation capacity.

Another cultural factor finds its origin in the pastoral way of living of the population for centuries and high religiousness of the communities: trust in God. Pastoralists are completely reliant on pasture and water for their survival, thus ultimately they are dependant on rainfall. As they can not influence rainfall, they are trusting in God that he will provide what they need (Interview with Van Apeldoorn,

H., 2009, 26 August; Youth workshop, 2009, 27 August). The result is resignation in their fate and the sense that their capacities to influence their own lives are very limited. This is reflected in the lack of future planning of pastoralists, even in the short term (Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; Youth workshop, 2009, 27 August). When the rains have failed for example, they know for a fact that drought is coming, but they will apply migration as coping strategy in the hope to find an area with available pasture and water. Often this results in an abatement of the animal conditions and even death. As already discussed, they will only start selling their livestock when they are weak in the climax of the drought (Interview with elders, 2009, 11 September). At that moment they are getting very low prices for them. Another possibility which seems logical is selling animals before the drought really strikes. This has two advantages. On the one hand the sale prices will be higher and they can save the money to buy new stock when the rains are returning. On the other hand this would also decrease the grazing pressure on the vegetation, decreasing the effects of the drought. However, very few pastoralists are reasoning in this way and they remain trapped in the cycle of drought, death of animals and restarting until they are not able to restart anymore. This makes them more vulnerable and reduces their adaptation capacity to great extent.

Another factor largely affecting the vulnerability of the pastoral population in Wajir district, are some governmental policies they are subjected to. Like already discussed in section 3.1.2, grazing areas were defined for different ethnic groups during the colonial period (Walker & Omar, 2002). In this way the migration movements of the pastoralists were restricted which is an important strategy to cope with the spatial and temporal variability in availability of pasture and water. The focus was on the management of rangelands and the development of the livestock sector. After independence, government policies followed a similar path, aiming to upgrade rangeland productivity and transforming subsistence pastoralism into commercial livestock production. The government has always been resistant against pastoralism and favoured agriculture in its policies (Majule et al, 2004; Campbell et al, 2004). This results in the nonexistence of a national legal framework for pastoralists and Kenyan policies that are not adapted to a nomadic way of living (National climate change response strategy workshop, 2009, 3 September). One example of this unadapted policies, are the fixed boundaries and the privatisation of land rights, both restricting pastoral movement. Another way in which policies have influenced pastoralists in Wajir, are the proliferation of water sources almost everywhere in the district. The processes behind this and the consequences were already discussed in the causes on high grazing pressure in the vulnerability context. These unadapted policies are partly a result of the fact that the pastoral community is not engaged in the policy making. The link between pastoralists and the administration is very weak. Mostly the local administration is composed of so called down Kenyans, Kenyans from other parts in the country (Interview with police administrator, 2009, 26 August). Until now there exists a mutual feeling of mistrust, making cooperation very

difficult. The perception by other Kenyans about the Somali society is one of violence and lack of willingness to develop (Interview with DC, 2009, 25 August). This perception finds its cause in the violent conflicts that have characterized the area for decades. However, slowly the public opinion is realising that this is something of the past and that the Somali society has some major strengths, like peace maintenance and livestock production in very difficult circumstances.

Service provision in Wajir district is very weak, increasing their vulnerability and reducing their adaptation capacity. Northeastern Province has been marginalised by the government for decades. Investments in the area are very low, resulting in a lack of education and health services and a lack of infrastructure. This has led to underdevelopment, confining the livelihood opportunities as possibilities for alternative livelihoods and livelihood diversification are limited (Population census, 2009, 24 August; Population census, 2009, 25 August). However, it must be noted that recently a change is noticeable as local officials are no longer perceiving their administrative job in the district as a punishment, but are committed to future development and livelihood improvements for the population. This change in governance, could have large influences on the adaptation capacities of the communities. With financial and structural support from the government, the Somali society may be able to overcome the major constraints they will be facing in the next decades. An example of this commitment of the government is the regional stakeholders workshop held in Garissa on 3rd and 4th September 2009. The aim of this workshop was to analyse the critical climate change issues in Northeastern Province. Such workshop has been held in each province and from the results a national climate change response strategy will be developed.

A lot of the services provided by both government and NGO's are focused on the short term, providing food aid, conducting water trucking in times of drought and carrying out destocking and restocking projects. Water trucking is applied when pans and dams have dried out and the pasture around boreholes is seriously depleted (Interview with ALDEF, 2009, 8 September; Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; Interview with Oxfam, 2009, 27 August). In these cases water is brought to places where there is still some pasture left. Also settlements without a permanent source of water are depending on water trucking during periods of drought. This water trucking is carried out by a local NGO and is only intended for domestic use (Interview with ALDEF, 2009, 8 September). During the most recent drought however, for the first time water trucking for animal consumption was performed by the government with money from the Constituency Development Fund (CDF). In this way, they are hoping to save animals, avoiding that large numbers of pastoralists are becoming dropouts, which would only increase the problems in the district. Another strategy adopted to help pastoralists through the drought are destocking programs, during which weak animals are bought, slaughtered and the meat is distributed under the poorest (Destocking program, 2009, 11 September; Destocking program, 2009, 12 September; Destocking

program, 2009, 13 September; Interview with ALDEF, 2009, 8 September; Interview with Ibrahim, D., 2009, 20 August). After the drought restocking programs are carried out. Families who have lost large numbers of their animals are helped to start again.

While there are undoubtedly major benefits from these short term assistance for the local communities, this focus has also undermined the adaptation capacities of the society in the long term. Especially the high permanent reliance on food aid shapes a situation in which development of the communities has come to a halt. Money would better be spent to support the pastoralists in developing a new way of pastoralism which is more sustainable on the long term or to increase the alternative livelihood opportunities. However, it should be noted that some long term assistance is also in place, under the form of food for work programs, projects to replant trees, vaccination campaigns, early warning systems, ... (Interview with ALDEF, 2009, 8 September; National climate change response strategy workshop, 2009, 3 September; National climate change response strategy workshop, 2009, 4 September). But the major emphasis stays on short term assistance, which is not surprisingly. Lives can be saved by these measures, thus it is considered as more urgent. A major factor hereby are donors contributions (Interview with ALDEF, 2009, 8 September; Youth workshop, 2009, 27 August). Only during periods of crisis money becomes available in large amounts. This money is directed to relief aid as people are in direct danger. Once the crisis is over, the money influx decreases dramatically, resulting in limited amounts of money that can be spend on long term assistance by NGOs. If more money would be available and it would be spend to develop a more sustainable way of pastoralism or to increase the alternative livelihood opportunities, this would contribute to the welfare of the region in the long term.

Policies, institutions and processes affecting conflict

As this research wants to analyse the link between climate change and violent conflict, it is important to understand how policies, institutions and processes will influence the forming and escalation of conflict. First, some important factors which are increasing or decreasing the possibility of violent conflict are discussed. Followed by an analysis of how the government and other institutions intervene when conflicts do occur and what determines whether they escalate into violent conflict or not.

A first factor which influences the possibility of conflict occurrence due to climate change, is the adaptation capacity of the community. When adaptation capacities are high, people will be able to maintain their livelihood or develop an alternative one. This decreases the chances of conflict occurrence, as they do not have to apply conflict as a livelihood strategy. The factors influencing the adaptation capacities of the community were already discussed in different sections and will be synthesized in section 3.4.4, where the possible livelihood strategies of the population will be discussed.

As the conflict history of the district has illustrated, a major underlying factor in almost all the conflicts in the district is anxiety over land access and the corresponding resources, mainly pasture and water. The century old system for land access was based on Somali customary law, with fluid boundaries between clan territories (Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; Walker & Omar, 2002). However, the registering of fixed boundaries for different ethnic groups and the proliferation of new water points and settlements has greatly undermined this system. The control over rangelands is closely related with the control over water points. As a clan has the possibility to deny or allow access to a water point, they are at the same time denying or allowing access to the surrounding pastoral area. When pasture or water is lacking in a certain area, pastoralists are migrating to other places, sometimes outside their own territory. However, before entering, elders of the migrating community will go and negotiate with elders of the community 'owning' the land. Mostly they will be able to come to an agreement, but sometimes this is not the case and then conflict can occur. It is important not to underestimate power relations hereby. Clans or sub-clans with only small numbers are much more likely to be denied access, as they have no relatives living in settlements located at water points and the possible negative consequences, for the 'owners' of the water point, of denying access are small. The proliferation of new settlements and water points has increased the claims made on rangelands surrounding them, making access to resources harder, increasing chances of conflict about it. Also the general decrease of the ecological carrying capacity and the increased frequency of droughts has its influences on access to resources. As there is a general decrease in natural resources like water and pasture, access to them is becoming more difficult. Water points have a maximum capacity and more and more access is becoming restricted. Who has access and who has not, is solely determined by the clans or sub-clans settled in that area. This will lead to an increase in competition over resources and can eventually result in conflicts. Thus, the resource access and the arising of conflicts about it, is influenced by multiple factors like proliferation of new water sources and settlements, a decreased ecological carrying capacity and a reduction in migration possibilities.

Another important factor, influencing the materializing of conflicts, is the political system in Kenya. Since the advent of the multi-party system in 1992, a lot of the conflicts in the district have been driven by the competition between clan members and politicians for positions of chief, councillor and MP (Walker & Omar, 2002). The political power of a clan or sub-clan is to a large extent determined by the amount of administrative positions they possess. And the more power a clan or sub-clan has the more they can influence decision-making in their advantage. The access to resources still remains a major underlying factor as their power position will also enable them to get more control over these resources. A chief of a location for example is responsible for all the resources in that location. He is the one who can decide who has access and who has not. If this chief is of your own clan or sub-clan

your changes to get access are seriously increased. Thus, every clan or sub-clan is trying to get as much political power as possible, this battle for power has often shown to be an important trigger in conflict. This is also the case on the national level. The highly ethnicised policies in Kenya and the battle for power between ethnic groups, has resulted in the post-election violence in the beginning of 2008 (Interview with Ibrahim, D., 2009, 20 August).

In the last section about policies, institutions and processes, it will be discussed which factors are influencing the escalation of a conflict into violence or not. A first actor hereby is the government, or maybe it is better to describe them a non-actor (Interview with ALDEF, 2009, 8 September). Government intervening in conflicts during the last decades was almost non-existing (Delkha & Janice, 1996). They felt that intervening was unnecessary as this region was far away from the economic centre and did not threat national security as a whole. However, like already discussed, this perception is changing and government capacity in the region is increasing. An example is the active involvement of the local government actively involved in WPDA.

WPDA has been involved in conflict management activities since 1992 and its importance for conflict resolution in the region is enormous. They are cooperating with peace committees which are present in all the locations and sub-locations (Interview with elders, 2009, 11 September). Their main activities are: sending of a rapid response team, peace education, workshops on peace and the empowering of youth and women. Peace education and workshops are conflict preventing activities, with which they are attempting to initialize a 'peace mentality' in the district. With the rapid response team, they are trying to avoid the escalation of conflict into violent conflict. This is a conflict managing activity. When a conflict does occur, a group of elders, youth and women are sent to the area (Interview with Billow, A., 2009, 7 September). The composition of the group depends on the type of conflict and the persons involved. This rapid response team will talk with all the involved parties, organise a meeting between the elders of the different parties to talk about the conflict and try to find an agreement. If one meeting does not suffice, they keep organizing new ones until the conflict is settled. The peace diaries which are regularly updated by WPDA, show that a large proportion of the conflicts is about clan boundaries, access to resources, mainly water points, and tensions around settlements. Especially during periods of drought, the number of conflicts for access to resources is high. However, during electoral periods, conflicts flare up, which shows the importance of political power in the area. Another form of conflicts addressed by WPDA are those evolving after criminal acts.

There is no doubt about the great importance of WPDA in the district, but some reservations should be made about their capacity to address conflicts in the future. WPDA has managed to stop the escalation of conflicts into violence and has made peace in the district. However, the underlying causes of conflict are still present and will even aggravate in the future. Without addressing the high

vulnerability of the population and the decrease in ecological carrying capacity, it will be difficult for WPDA to remain managing conflicts. Conflict management without conflict prevention is often not sustainable in the long term.

Conclusion

Policies, institutions and processes are of major importance in the analysis of the link between climate change and violent conflict and this in two ways. First, they will influence the adaptation capacity of the community. If the adaptation capacity of the community is high, they can cope better with climatic changes and a decrease in the ecological carrying capacity, which diminishes the chances of conflict occurrence. The high capacity of sharing present within the community has the possibility to increase and decrease the adaptation capacity, while a lack of planning for the future, unadapted policies and a lack of service provision diminishes the adaptation capacity. Second, policies, institutions and processes can also directly contribute to the arising and escalation of conflicts. Hereby play the institutional context for access to natural resources, the political system and the work of WPDA an important role.

3.4.4 Livelihood strategies

It has become clear that the population in Wajir is facing a lot of constraints on their daily livelihood. However, they have also shown to have a tremendous ability to adapt themselves as they have lived in a very hard and variable climate for centuries. But as the effects of climate change are increasing and aggravating the challenges they are facing, it will become more and more difficult to maintain their pastoral way of living. In this section some important livelihood strategies applied by them will be summarized. This gives an insight in the vulnerability of the community to the impacts of climate change. If they are able to cope thanks to their livelihood strategies, their vulnerability is reduced and adaptation capacity increased. However, when this is not the case, climate change can form a possible source of violent conflict. The livelihood strategies adopted by pastoralists can be narrowed down to four kinds (HPG, 2009): ‘hanging on’, ‘stepping up’, ‘branching’ out and ‘moving away’.

‘Hanging on’

‘Hanging on’ means that pastoralists are attempting to maintain their traditional livelihood, in which their household income is derived almost completely from livestock products. As this livelihood has existed for centuries the livelihood strategies they are using in it are numerous. A first livelihood strategy is herd management, which includes different actions depending on the time of the year and the performance of the rainy seasons. During periods of good rainfall resulting in high pasture availability, herd sizes are built up as an insurance against hard times (Brown & Crawford, 2009; Nassef et al., 2009). People reason that the more animals they own, the bigger the chances are that some of them will survive through periods of scarcity. However, these large herds are often further aggravating the problem, as they cause a fast depletion of vegetation leading to bigger impact of the drought. Another livelihood strategy is keeping different species and breeds (Nassef et al., 2009; National climate change response strategy workshop, 2009, 4 September). Different species are using different ecological niches and each of them has its specific strengths and weaknesses. By establishing mixed herds, risks are reduced and the vulnerability of the herd decreased. The main advantage of camels over cattle and goats for example, is that they are able to walk large distances without water. An advantage of goats is that they reproduce very fast, making livestock rebuilding easier than with camels or cattle. Another livelihood strategy regarding herd management, occurs when drought is coming. The old, weak or new-born animals are slaughtered or sold, as their chances to survive the drought are very small. In this way the owners can gain something of them, money or nutrition, while otherwise they would die without contribute anything to the households. Livestock raids can be considered as a fourth way of herd management. For centuries this practice has resulted in a redistribution of livestock between communities. However, during the 90s these raids were often the work of criminals, which were gaining economic profit from it (Ibrahim & Jenner, 1996; Pkalya et al.,

2003). Nowadays, livestock raids have become rare and when they occur they are often causing tensions and conflict.

Besides herd management, migration is a major livelihood strategy in the pastoral communities of Wajir district (Chinogwenya & Hobson, 2009). But as the pasture is seriously depleted almost everywhere in the district and the surrounding areas and traditional migration patterns have been disturbed by the proliferation of new water points and settlements, migration as coping strategy is becoming more and more difficult (Interview with ALDEF, 2009, 8 September; Interview with elders, 2009, 11 September). This migration as coping strategy occurs in two ways (National climate change response strategy workshop, 2009, 3 September). In the first case, the entire community, family or household moves from one place to another, creating a new temporarily settlement, like they have been doing for centuries. When the rains were good, they can stay for two months in the same place. However, due to overgrazing and less rainfall, recently they are often forced to move much quicker. During periods of severe drought they are moving as soon as after a week (Interview with ALDEF, 2009, 8 September). A second form of migration is this in which the healthy young men are moving with the healthy animals to another area. Sometimes they stay away for up until six months. The women, children and weak animals are staying behind. In this case, communities, families or households are split and often herds are split as well to spread risks (Chinogwenya & Hobson, 2009; Interview with elders, 2009, 11 September; Nassef et al., 2009). Camels are almost always separated from the other livestock, because their ability to cover much larger areas in their search for pasture. But also the other animals are often divided into multiple smaller herds. Each smaller herd will be brought to a different location. If the conditions in one location are extremely bad, only the smaller herd will severely suffer, while the others may be luckier in another location.

Active water management is also a livelihood strategy adopted to be able to maintain the pastoral livelihood (Chinogwenya & Hobson, 2009). Before the rains are coming, harvesting structures are set in place by the communities, mainly dams and pans (National climate change response strategy workshop, 2009, 3 September). In this way they try to gather as much water as possible and conserve it as long as possible, to be able to get them through a large part of the dry season. The success depends on the amount of rain, the storage systems and the arrival of the rains in time after the dry season. When this fails, they are forced to look for alternatives. Mostly this is migrating to places where there is still water, but there is also a rather new strategy, namely water-trucking (Interview with NEMA, 2009, 15 September). When this is organised by the communities themselves, this can also be seen as a livelihood strategy.

The high capacity for sharing of the Somali society contains another livelihood strategy. When one community, family or household has lost all its animals, they will be helped by others to restart. On

the other hand, surplus animals will be lend to family or friends when these are struggling, in this way social relations are developed and strengthened (Chinogwenya & Hobson, 2009). Having strong social relations is a form of insurance as it is expected to help each other.

A last group of livelihood strategies which can be classified under ‘hanging un’ are those applied during periods of extreme drought. If the other livelihood strategies are failing, animals are dying and the household income is reduced dramatically. This forces the people to look for alternative livelihood strategies (Chinogwenya & Hobson, 2009). They will minimise their consumption and reduce meals and expenses until they are able to rebuild their herds on which household incomes are based. Another alternative is seeking relief assistance to survive these periods.

‘Stepping up’

A second kind of possible livelihood strategies is ‘stepping up’, moving to a more commercial livestock production system where profits can be made (Chinogwenya & Hobson, 2009; HPG, 2009). However, as this requires investments and knowledge about both livestock and economics, this is a possibility for only a very small portion of the population.

‘Branching out’

The third kind of possible livelihood strategies is ‘branching out’, an option favoured by most pastoralists. Livestock remains an important source of income but is supplemented by a variety of other livelihood activities (Chinogwenya & Hobson, 2009; HPG, 2009; Interview with ALDEF, 2009, 8 September). When applying this strategy, pastoralists have two options. They can remain nomads and practising the traditional pastoral livelihood. In this case they will try to diversify their income sources by selling e.g. bush products or by sending some family members to settlements in search of employment. Another option is that the whole family settles themselves in search of alternative income sources. But beside these alternative income sources, the family still owns a herd. This herd is taken care of by one or two family members who are away for often very long periods of time. Another possibility is hiring somebody to do this for them. When this is the case, this livelihood strategy approaches the ‘stepping up’ strategy. Beside the advantage of alternative livelihood sources in settlements, the access to services like education and health care is also much better. This is another important reason to settle for the pastoralists. Also the access to food aid is much easier in the settlements.

‘Moving away’

A last kind of possible livelihood strategies is ‘moving away’. In this strategy, families are moving out of pastoralism completely and are settling, they are becoming dropouts (Chinogwenya & Hobson, 2009; HPG, 2009). The difference with the previous strategy is that they do not own livestock

anymore, maybe with the exception of some small numbers permanently kept in their homestead. Once they are settled they are becoming dependent on alternative livelihoods. However, the working opportunities are very limited (Interview with NEMA, 2009, 15 September; Population census, 2009, 24 August; Population census, 2009, 25 August; Youth workshop on peace, 2009, 23 August) and large numbers are depending on relief food. An important alternative income source is charcoal burning and the cutting of trees for poles to build huts (Interview with NEMA, 2009, 15 September). Like already discussed this poses an increasing burden on the ecological carrying capacity of the district.

Conclusion

The livelihood strategies applied by the pastoral communities, play a major role in the relation between climate change and violent conflict. When they are able to provide a livelihood for the people, thus increasing their adaptation capacity, chances of the occurrence of violent conflict are seriously diminished. The livelihood strategies applied by the communities are mainly focussed on the maintenance of livestock as main income source, as this is what they have been doing for centuries. These strategies have also proven to be the most effective in the past, as opportunities for alternative livelihoods are low. However, the possibility to apply certain livelihood strategies, is to a large extent determined by the livelihood assets of a certain community, family or household and the policies, institutions and processes in place.

3.4.5 Conflict occurrence

The adaptation capacity of the community, to a decrease in ecological carrying capacity and an increased frequency and intensity of droughts, plays a central role in the analysis of the causal relationship between climate change and conflict. If this adaptation capacity is high, people will be able to maintain their livelihood or develop an alternative one. However, when the adaptation capacity is insufficient, people are becoming highly vulnerable and there is a possibility that they turn to violence to cover their needs. This adaptation capacity is determined by the livelihood strategies that can be applied by the communities, families or households. However, the possibility to apply certain livelihood strategies, is to a large extent defined by the available livelihood assets and the policies, institutions and processes in place. The possible and real adaptation capacity of the population in Wajir and the role other actors, like government and NGOs, play hereby, will be analysed in this section.

Pastoralism remains the most sustainable livelihood system on the dry rangelands of Wajir. However, due to climatic changes and other constraints, it is coming under increasing pressure. Adapted livelihood and adaptation strategies are necessary to hold it viable on the long term, together with the development of alternative livelihoods (Interview with ALDEF, 2009, 8 September; Interview with elders, 2009, 11 September; Interview with Oxfam, 2009, 27 August; National climate change response strategy workshop, 2009, 3 September; National climate change response strategy workshop, 2009, 4 September). A central role hereby is attributed to the pastoralist themselves, however, they will need support from other actors, like government and NGOs. Table 3.2 gives an overview of possible livelihood strategies applied by the population and possible actions by government and NGOs. The indicated livelihood strategies are partly based on the livelihood strategies already practiced, like discussed in section 3.4.4, complemented with some other possible livelihood strategies which could improve the adaptation capacity of the population. These strategies can be applied by the population, whether or not with the support of other actors. The strategies' major constraints and the importance for the development of a sustainable future are also indicated. The second part lists actions that can be conducted, mainly by the government and NGO, to support the livelihoods of the population. The major purpose and importance if these actions is also indicated. The importance should be interpreted as follows: -- not important at all, even negative consequences; - not really important; +/- maybe important; + important, ++ very important. These livelihood strategies and actions by government or NGOs, will largely influence the adaptation capacity of communities, families and households. A thoroughly discussion of all these strategies and actions lies out the scope of this research, however, some general comments can be made.

Table 3.2: Overview of possible livelihood strategies / actions, their importance and constraints / purposes

<u>Livelihood strategies applied by the population</u>		
Strategy	Constraints	Importance
Building up of herd size	Lack of money / lack of pasture	--
Reducing herd size	High value attributed to livestock	++
Herd diversification	Lack of money / lack of knowledge	+
Slaughtering / selling weak animals before drought	Lack of market infrastructure / lack of knowledge	++
Livestock raids		--
Migration of whole family	Decrease in ecological carrying capacity / lack of education opportunities / lack of healthcare	+/-
Migration of young men with strong animals	Decrease in ecological carrying capacity	++
Splitting of herds	Lack of knowledge / lack of herdsmen	++
Water harvesting	Lack of money / lack of knowledge / failing rains	++
Water trucking	Lack of money	+
Hay stocking	Lack of money / lack of knowledge	++
Minimising consumption	Health consequences	--
Reliance on relief food	Dependency	--
Income diversification / remaining nomad	Lack of alternative livelihood sources	+
Income diversification / settling	Lack of alternative livelihood sources	+
Alternative livelihood	Lack of alternative livelihood sources	+/-
Agriculture	Lack of water / lack of knowledge	+
<u>Actions by government and NGOs</u>		
Strategy	Purpose	Importance
Sensitisation of pastoralist	Increase knowledge	++
Early Warning Systems	Informing pastoralists of coming droughts, making it possible to prepare	++
Alternative energy sources	Reduce pressure on environment	++
Hay stocking	Reserves during drought	+/-
Investing in water harvesting	Supporting the pastoralists	++
Water trucking	Supplying water during extreme drought	++
Re-seeding of grasslands	Increase ecological carrying capacity	+
Afforestation and reforestation	Increase ecological carrying capacity	++
Rangeland management	Increase ecological carrying capacity	++
Investments in market infrastructure	Improve outlet	++
Livestock vaccination campaigns	Increase health of livestock	+
Mining industries	Alternative livelihood provision	+/-
Adequate policies	Support pastoral livelihood, develop alternative livelihood sources	++
Proper management of settlement and water points	Avoid proliferation	++

The major constraints for the livelihood strategies are a lack of money, lack of knowledge and a lack of alternative livelihoods. This indicates that actions implemented by the government and NGOs should concentrate on the improvement of these factors. The most traditional livelihood strategy of pastoralists is migration, which has proven its usefulness as the pastoral livelihood system continued to exist for centuries. However, at present, migration as coping strategy is seriously undermined by a general decrease in the ecological carrying capacity of the region. This makes rangeland management and actions to increase the ecological carrying capacity, important strategies in supporting the pastoral livelihood. As high grazing pressure is a major constraint for the pastoral livelihood, actions and strategies diminishing this grazing pressure should be performed, like decreasing herd sizes, managing migration patterns and proper management of settlements and water points. A central role should be given to the sensitisation of pastoralists. In this way they can be convinced of the importance of some specific livelihood strategies for a sustainable future of pastoralism. When all pastoralists start applying livelihood strategies which focus on a sustainable pastoralism and their efforts are supported by actions of the government and NGOs, this would seriously increase the adaptation capacity of the population. Thus the chances of the occurrence of violent conflict would be decreased. Through sensitisation they can also actively influence the actions of the government and NGOs. In all this, a shift in actions of government and NGOs from short-term assistance to long-term support should be made.

Chapter 4 Conclusion

The central research question for this study was: To which extent and in which way could climate change in Wajir districts result in an increase in the amount and intensity of conflicts in the region? Hereby three additional research questions were formed: (1) Which factors will influence the ecological carrying capacity of the district besides climate change? (2) What are the livelihood strategies of pastoralists in the district to cope with periods of scarcity? (3) What is the importance of the political, institutional and socio-economic context in the causal relationship between scarcity and violent conflict? In this study an answer was formed by investigating the causal relationships (Figure 2.1) between climate change and violent conflict in the pastoral communities of Wajir district. For this a Sustainable Livelihoods Framework was applied.

Climate change results in three main constraints for the pastoral livelihoods in Wajir: increased frequency and intensity of droughts, affecting the population mainly through water scarcity and pasture degradation; increase in periods with intense rainfall, causing floods; and a decrease in the ecological carrying capacity on the long term. However, the research has shown that climate change is not the only cause of a decrease in ecological carrying capacity. Also a high population pressure, a high grazing pressure and unadapted policies contribute to this decrease in great extent. This gives an answer on the first additional research questions: “Which factors will influence the ecological carrying capacity of the district besides climate change?”. It also indicates that the first causal relationship, between climate change and a decrease in ecological carrying capacity, is real but not straightforward. As the first causal relationship is not straightforward, the relationship between climate change and violent conflict will be neither. According to the causal relationships, will a decrease in ecological carrying capacity lead to an increase in scarcity of natural resources. This relation is rather direct, only when the amount of pastoralist dramatically decreases, this will not be the case.

In the link between an increased scarcity and an increase in violent conflict, plays adaptation capacity a central role. If this adaptation capacity is high, people will be able to maintain their livelihood or develop an alternative one. However, when the adaptation capacity is insufficient, people are becoming highly vulnerable and there is a possibility that they turn to violence to cover their needs. This adaptation capacity is determined by the livelihood strategies of the population. Hereby an answer was formed on the second research question: “What are the livelihood strategies of pastoralists in the district to cope with periods of scarcity?”. The available livelihood strategies for a community, family or household are to a large extent defined by the available livelihood assets and the policies, institutions and processes in place. The availability of livelihood assets is negatively affected by a decrease in ecological carrying capacity and other constraints for the pastoral livelihood. This reduces the adaptation capacity, increasing the chances of conflict occurrence. Also policies, institutions and

processes will influence the adaptation capacity of the population. The high capacity of sharing present within the community has the possibility to both increase and decrease the adaptation capacity, while a lack of planning for the future, unadapted policies and a lack of service provision diminishes the adaptation capacity. This partly answers the third research question: “What is the importance of the political, institutional and socio-economic context in the causal relationship between scarcity and violent conflict?”.

Besides a low adaptation capacity, some other factors play an important role in the arising of conflict. Central herein are some policies, institutions and processes, like the institutional context for access to natural resources and the political system in place which is highly tribalized. Another important factor is the history of conflict in the district and the underlying causes of these conflicts that are still present. However, the arising of conflict does not necessarily mean the escalation of conflict into violence. The work of the Wajir Peace and Development Agency plays a vital role in avoiding this. On the one hand they are initialising a ‘climate of peace’ in the district and on the other hand they are managing conflicts by actively mediating between different parties. This further answers the third research question: “What is the importance of the political, institutional and socio-economic context in the causal relationship between scarcity and violent conflict?”.

All this illustrates that the answer on the central research question: “To which extent and in which way could climate change in Wajir districts result in an increase in the amount and intensity of conflicts in the region?”, is not straightforward. First, an increase in scarcity of natural resources in the district is not only caused by climate change, but also other factors play a major role in this. Second, the link between scarcity and violent conflict, wherein adaptation capacity plays a central role, is very complex and influenced by many factors. Climate change does have the capacity to aggravate challenges already faced by the communities. It also has the capacity to lead to violent conflict when adaptation capacity is limited, other non-climatic causes of violent conflict are in place and conflict management fails. Climate change can be seen as a threat multiplier in Wajir district.

Chapter 5 Samenvatting

5.1 Inleiding

Klimaatwijziging als bedreiging voor de nationale en internationale vrede en veiligheid, is een nieuw paradigma dat veel aandacht krijgt op de internationale agenda. In dit onderzoek zal de waarachtigheid van dit paradigma onderzocht worden voor een specifiek studiegebied, namelijk het district Wajir in de Northeastern Province van Kenia. De belangrijkste levenswijze is er pastoralisme en de bevolking is dus sterk afhankelijk van natuurlijke hulpbronnen. Hierdoor zijn ze kwetsbaar voor een daling in deze natuurlijke hulpbronnen als gevolg van klimaatwijziging. De link tussen klimaatwijziging en gewapend conflict lijkt dan ook snel gelegd: klimaatveranderingen zorgen voor een toename in de schaarste van natuurlijke hulpbronnen en een toename in de competitie hierover, deze toegenomen competitie leidt op zijn beurt tot gewelddadig conflict. De link tussen deze twee ingewikkelde processen kan echter niet op deze eenvoudige wijze worden voorgesteld. Zo zijn klimaatwijzigingen niet de enige oorzaak van een daling in het ecologisch draagvlak en de daaraan gerelateerde stijgende schaarste. Bovendien is schaarste niet de enige factor die kan leiden tot conflict en speelt de politieke, institutionele en socio-economische context hier een belangrijke rol in. In dit onderzoek zullen de factoren die het oorzakelijk verband tussen klimaatverandering en gewelddadig conflict beïnvloeden, worden onderzocht.

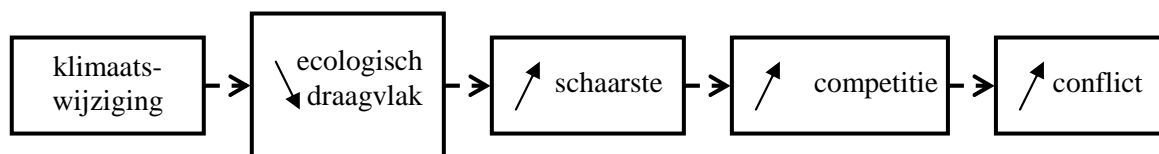
Om dit mogelijk te maken werd er een centrale onderzoeksvraag en drie aanvullende onderzoeksvragen geformuleerd. De centrale onderzoeksvraag is: “In welke mate en op welke manier kan klimaatwijziging in het district Wajir leiden tot een toename in het aantal en de intensiteit van conflicten in de regio?”. De drie aanvullende onderzoeksvragen zijn: (1) Welke factoren zullen naast klimaatwijziging nog een invloed hebben op het ecologisch draagvlak van Wajir? (2) Wat zijn de strategieën die pastoralisten toepassen om om te gaan met periodes van schaarste? (3) Wat is het belang van de politieke, institutionele en socio-economische context in het oorzakelijk verband tussen schaarste en conflict?

5.2 Materiaal en methoden

De data voor dit onderzoek werd verzameld in het district Wajir, gelegen in de Northeastern Province van Kenia. Aangezien de grote meerderheid van de bevolking pastoralist is, zijn ze in belangrijke mate afhankelijk van natuurlijke hulpbronnen, zoals water en graasland, voor hun dagelijkse behoeften. Dit maakt van Wajir district een geschikt studiegebied om de link tussen klimaatwijzigingen en gewelddadig conflict na te gaan. Klimaatwijzigingen in Wajir hebben immers een vermindering van natuurlijke hulpbronnen tot gevolg, waardoor de bevolking zeer kwetsbaar is voor de gevolgen ervan.

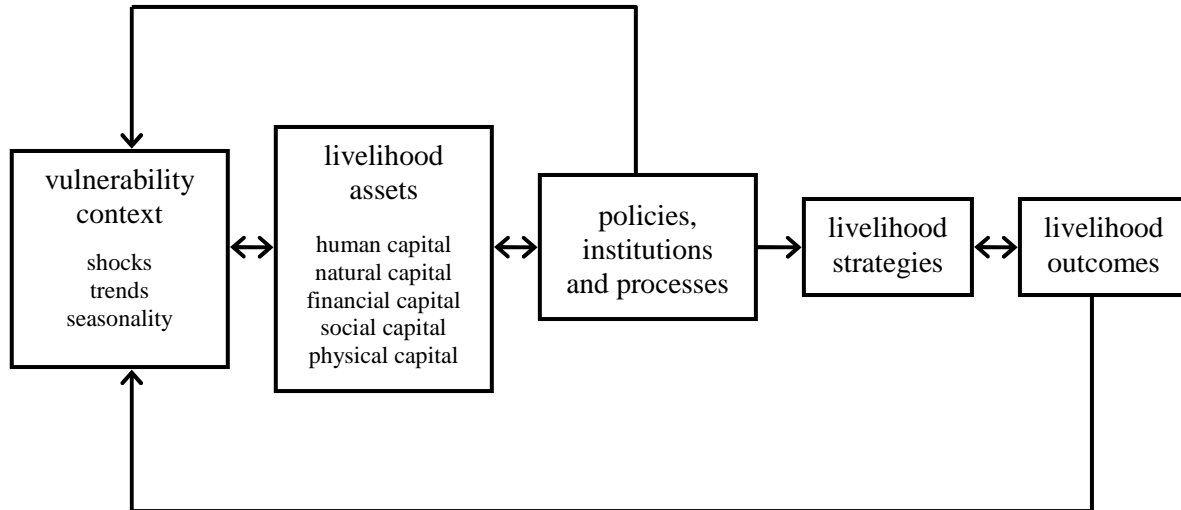
Data werd verzameld op twee manieren. Ten eerste werd een literatuurstudie uitgevoerd om een algemeen beeld te krijgen van de onderzoekscontext, waarbij voornamelijk de focus voornamelijk lag op informatie over Wajir district, pastoralisme, klimaatwijzigingen en conflict. Ten tweede werd veldonderzoek verricht in het district Wajir. Hierbij werd data verzameld over: (1) de traditionele levenswijze van pastoralisten en hoe ze omgaan met periodes van droogte en (2) de aanwezigheid en het karakter van conflicten in de regio.

Bij het verwerken van deze data stonden de centrale onderzoeksvraag en de aanvullende onderzoeksvragen centraal. De mogelijke link tussen klimaatwijziging en gewelddadig conflict wordt visueel voorgesteld in Figuur 1. Deze oorzakelijke verbanden zijn echter niet rechtlijnig en worden beïnvloed door een heleboel andere factoren. Het doel van dit onderzoek is dan ook om deze verbanden en de beïnvloedende factoren te onderzoeken, om zo na te gaan of klimaatwijziging zou kunnen leiden tot gewelddadig conflict.



Figuur 1: Oorzakelijke verbanden tussen klimaatwijziging en gewelddadig conflict

Om dit mogelijk te maken is het noodzakelijk om inzicht te krijgen in de levenswijze van pastoralisten en hoe dit zou kunnen beïnvloed worden door klimaatwijzigingen. Om dit op een gestructureerd manier aan te pakken, wordt een Sustainable Livelihoods Framework (SLF) gebruikt (Figuur 2). In een eerste fase wordt nagegaan hoe kwetsbaar de bevolking is voor klimaatveranderingen en wat de andere beïnvloedende factoren hierbij zijn. Dit komt overeen met de eerste aanvullende onderzoeksvraag en met de link tussen klimaatwijziging en een daling in het ecologisch draagvlak. Dan zal de invloed van al deze factoren op de livelihood assets van de bevolking worden nagegaan. In een volgende fase wordt onderzocht welke strategieën pastoralisten toepassen om om te gaan met periodes van droogte. Dit komt overeen met de tweede aanvullende onderzoeksvraag. Van groot belang hierbij zijn de voor handen zijnde assets, maar ook het politiek beleid, instituties en beïnvloedende processen. Om de derde onderzoeksvraag te beantwoorden, wordt het belang van de politieke, institutionele en socio-economische context bij het ontstaan en escaleren van conflicten onderzocht.



Figuur 2: Sustainable Livelihoods Framework

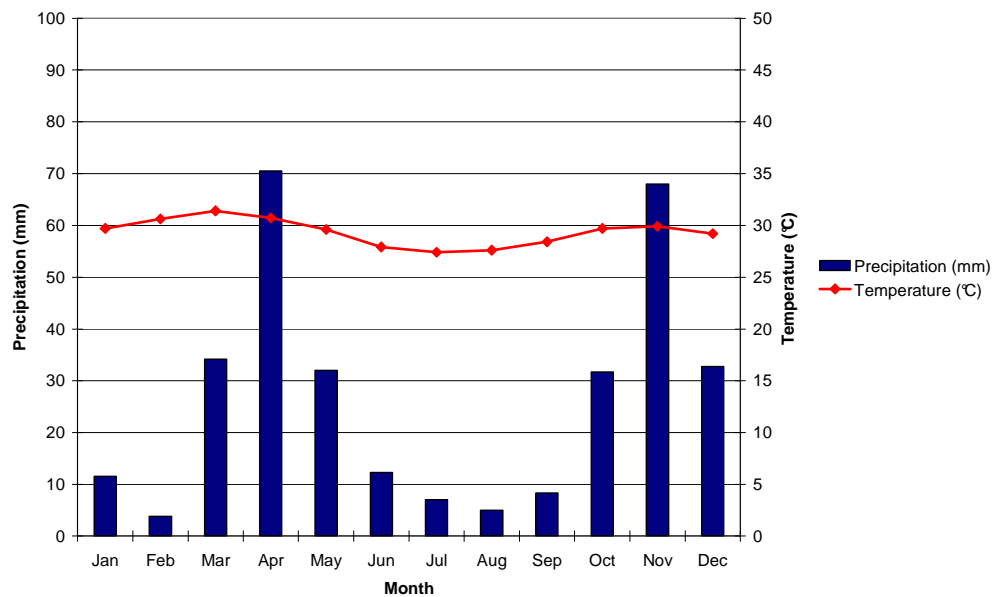
5.3 Resultaten en bespreking

5.3.1 Studiegebied

Figuur 3 geeft het klimatogram van Wajir weer. Het gaat om een zeer arid gebied met hoge temperaturen. De regenval valt grotendeels tijdens twee regenseizoenen: het lange regenseizoen van maart tot mei en het korte van oktober tot december. De vegetatie bestaat er grotendeels uit grassen en struikgewas met hier en daar enkele bomen en wordt gebruikt als grasland door de pastoralisten. Verder wordt het district gekenmerkt door een zeer hoge bevolkingsgroei, met een totale bevolking die wordt geschat op 622 990 in 2010 (KNBS, 2008). Bijna de volledige bevolking behoort tot de Somalische etnische groep en de voornaamste godsdienst is de Soennitische Islam. Een Somalische samenleving is gebaseerd op de verschillende clans, die op hun beurt zijn onderverdeeld in sub-clans, secties en sub-secties (Walker & Omar, 2002). Het niveau waar de gemeenschap zichzelf mee associeert is afhankelijk van de situatie op een bepaald ogenblik. In deze samenleving spelen oudere mannen een zeer belangrijke rol, ze worden door iedereen gerespecteerd en nemen belangrijke beslissingen in naam van hun gemeenschap.

Het politiek systeem in Wajir is in vergaande mate beïnvloed door de strijd tussen clans en sub-clans voor politieke macht, wat overigens het geval is voor heel Kenia. Voornamelijk de strijd voor de leiding over locaties en sub-locaties en voor de parlementszetels zorgde voor grote competitie. De overheid heeft Wajir decennialang gemarginaliseerd, door een gebrek aan investeringen, is er een tekort aan infrastructuur, gezondheidsvoorziening, onderwijs en economische ontwikkeling. Dit vormt een belangrijke beperking voor de ontwikkeling van de regio. Meer dan 70% van de bevolking zijn

pastoralisten die afhankelijk zijn van hun vee voor hun dagelijkse behoeften (Adan & Pkalya, 2005; ALRMP, 2005; Walker & Omar, 2002).



Figuur 3: Klimatogram voor Wajir district (data zijn afkomstig van LEWS, 2009)

Verder wordt het district ook gekenmerkt door een verleden van gewelddadige conflicten. De voornaamste aanleidingen hiervoor waren onenigheid over grenzen, competitie voor politieke macht en de schaarste van natuurlijke hulpbronnen. Deze eerste twee factoren kunnen echter ook gedeeltelijk worden teruggebracht tot competitie over natuurlijke hulpbronnen: toegang tot land is nauw verbonden met toegang tot de hulpbronnen op dat land en politieke macht betekent ook een grotere invloed op beslissingen die gemaakt worden over natuurlijke hulpbronnen. Voornamelijk na het invoeren van het meerpartijstelsel in Kenia, waren politieke verkiezingen vaak de directe aanleiding voor het opflakkeren van conflicten (Ibrahim & Jenner, 1996). In de periode tussen 1992 en 1995 liepen de conflicten tussen de verschillende clans volledig uit de hand met een klimaat van geweld en criminaliteit als gevolg. Als reactie hierop groepeerden enkele gemeenschapsleden zich, wat resulteerde in de vorming van het Wajir Peace and Development Committee (WPDC) in 1994 (Adan & Pkalya, 2006; Ibrahim & Jenner, 1996; Jenner & Abdi, 2000; Menkhaus, 2008). In dit comité zitten vertegenwoordigers van de regering, NGOs, oudere mannen, vrouwen, jongeren, religieuze leiders, Het WPDC bestaat nog steeds maar werd omgevormd tot het Wajir Peace and Development Agency (WPDA).

5.3.2 Klimaatwijziging en conflict

Bijna de volledige internationale gemeenschap is het erover eens dat het klimaat op aarde ingrijpend zal veranderen. Het voorspellen van de exacte aard en omvang van deze veranderingen wordt bemoeilijkt door een heleboel ongekende factoren, maar de gevolgen zullen grootschalig zijn en Afrika zal het hardst worden getroffen. Afrika wordt beschouwd als de meest kwetsbare regio omwille van twee redenen (Boko et al., 2007; Brown & Crawford, 2009; IPCC, 2007a; Stern review, 2006; Nassef et al., 2009). Ten eerste wordt het continent reeds nu gekenmerkt door een bar klimaat met hoge temperaturen en grillige regenval. Door klimaatsveranderingen zullen de temperaturen nog verder stijgen en zal er een algemene daling van de regenval zijn (Boko et al., 2007; Brown, Hammill & McLeman, 2007), wat een hoge druk legt op de bevolking. Bovendien wordt de bevolking ook nog eens geconfronteerd met grote niet-klimatologische beperkingen waardoor hun aanpassingcapaciteiten voor klimaatwijzigingen beperkt zijn en ze hier dus ook kwetsbaarder voor zijn.

Het laatste decennium wordt in de literatuur rond de impact van klimaatsveranderingen steeds meer aandacht besteed aan de gevolgen voor de internationale veiligheid (Barnett & Adger, 2005; Barnett & Adger, 2007; Brown et al., 2007; Brown & Crawford, 2009; Brown & McLeman, 2009; CDC, IISD & Saferworld, 2009; Dupont & Pearman, 2006; Meier, Bond & Bond, 2007; Raleigh & Urdal, 2006; WBGU, 2007). Klimaatwijzigingen zullen het socio-economisch welzijn van de bevolking wereldwijd beïnvloeden: toenemende waterschaarste, afname van voedselzekerheid, gedwongen migraties en een toename in de bevolkingsdruk, toename van de armoede en schade door extreme weersomstandigheden. Deze factoren zullen de levenswijze van mensen ondermijnen, wat kan leiden tot toenemende spanningen en conflicten (Barnett & Adger, 2007; Brown & McLeman, 2009). Een specifieke benadering van deze relatie is gebaseerd op het neo-Malthusiaans model voor de relaties tussen mensen en hulpbronnen (Brown et al., 2007; CDC et al., 2009). Volgens deze benadering worden conflicten veroorzaakt door een toenemende schaarste als gevolg van klimaatsveranderingen. Aangezien de bevolking in Wajir sterk afhankelijk is van natuurlijke hulpbronnen, vormt dit gezichtspunt de meest waarschijnlijke benadering van de mogelijke realiteit in Wajir. Dit model zal in dit onderzoek dan ook als uitgangspunt worden gebruikt.

5.3.3 Klimaatwijziging in Wajir

Terwijl er een algemene daling van de regenval wordt voorspeld voor de meeste delen van Afrika, is het patroon in het oosten van Afrika, en dus Wajir, minder duidelijk (Boko et al., 2007; Bowden & Semazzi, 2007; Nassef et al., 2009; Shongwe et al., 2007). Een algemeen besluit dat met redelijke waarschijnlijkheid zou kunnen getrokken worden, is dat het huidige patroon zich het volgende decennium nog zal voortzetten. Dit betekent minder voorspelbare regenval, frequentere periodes van droogte en heviger regenval (Interview with ALDEF, 2009, 8 September; Interview with ALDEF,

2009, 9 September; Interview with elders, 2009, 11 September; Interview with NEMA, 2009, 15 September; National climate change response strategy workshop, 2009, 3 September; Youth workshop, 2009, 30 August). Aangezien dit onderzoek focust op de korte termijn, zal dit dan ook het uitgangspunt vormen voor de verdere verhandeling. Op lange termijn voorspellen de meeste onderzoeken een toename in de totale regenval. Dit betekent echter niet noodzakelijk een reductie in het aantal droogtes, aangezien ook hevigere regenbuien voorspeld worden. Korte periodes met veel regenval dragen in belangrijke mate bij tot de jaarlijks gemeten regenval, maar indien het gedurende andere perioden langdurig droog blijft, kan droogte nog steeds een probleem vormen.

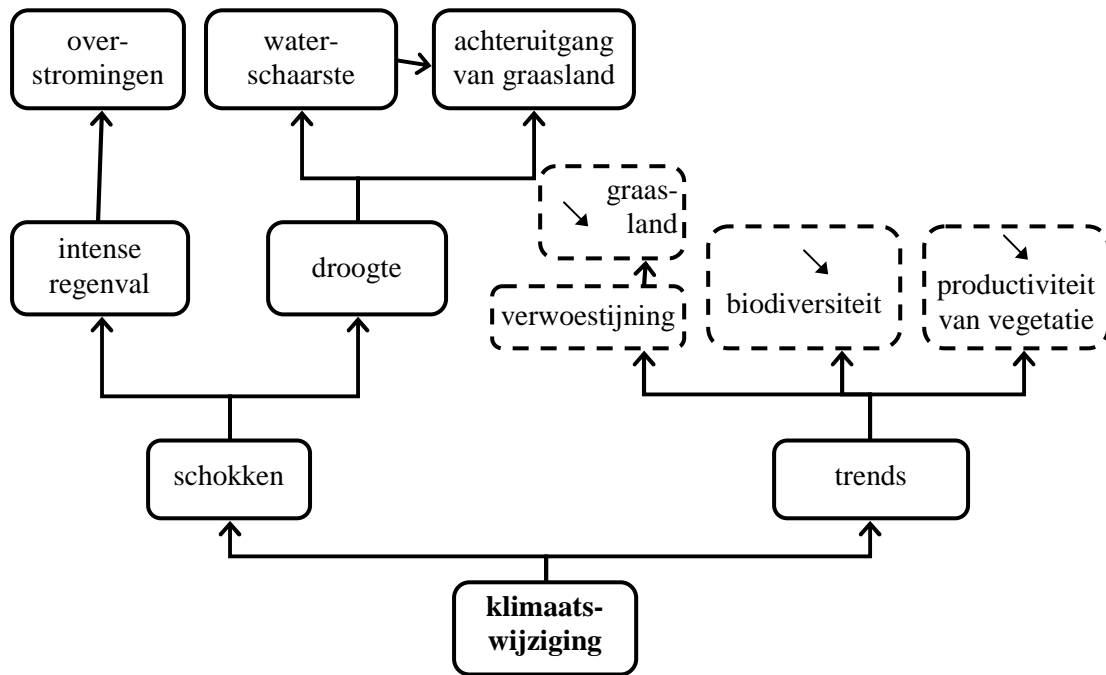
5.3.4 Klimaatswijziging en conflict in Wajir

Figuur 1 geeft de oorzakelijke verbanden tussen klimaatswijziging en gewelddadig conflict weer, gebaseerd op het neo-Malthusiaans model. De eerste stap hierin is dat klimaatswijziging leidt tot toenemende schaarste. Het is echter belangrijk om in te zien dat klimaatswijziging niet noodzakelijk de enige oorzaak hiervan is, verder onderzoek is dus nodig. Ook de link tussen toenemende schaarste en gewelddadig conflict is niet direct en zal worden beïnvloed door allerlei factoren. In dit deel van het onderzoek zullen de factoren die deze oorzakelijk verbanden beïnvloeden, worden besproken. Hierbij wordt een SLF gebruikt zoals weergegeven in Figuur 2.

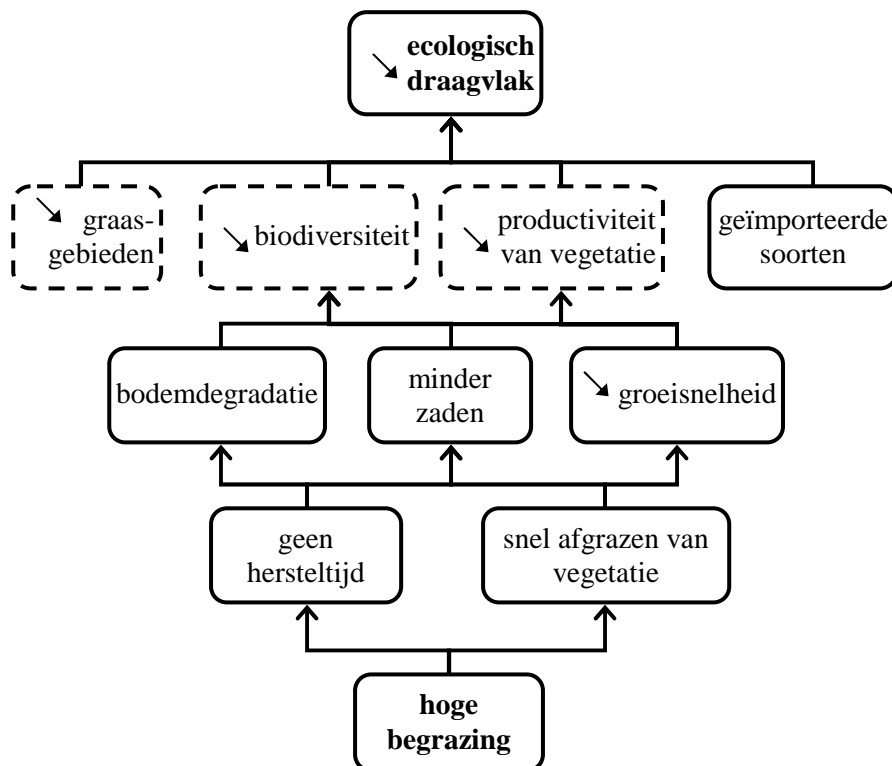
Kwetsbaarheid

Een afnemend ecologisch draagvlak, en de gerelateerde toenemende schaarste, vormen de belangrijkste bron van kwetsbaarheid voor de pastoralisten in Wajir. Eén van de oorzaken van deze daling in ecologisch draagvlak is een toename in de frequentie en intensiteit van droogte, een gevolg van de klimaatsveranderingen. Figuur 4 geeft een overzicht van de belangrijkste gevolgen van klimaatsveranderingen. Op lange termijn zal het ecologisch draagvlak worden aangetast via de trends die het gevolg zijn van klimaatsveranderingen. Deze worden echter ook nog in grote mate beïnvloed door een toenemende begrazing in het district. Op korte termijn zal het ecologisch draagvlak verminderen door waterschaarste, aangezien dit ervoor zorgt dat al het vee moet grazen binnen een radius omheen een waterbron, zoals een boorgat of bron, wat leidt tot een sterke degradatie van de vegetatie in dit gebied.

Figuur 5 geeft weer hoe klimaatsveranderingen en een toename in de begrazing samen leiden tot een afname in het ecologisch draagvlak. Er is sprake van een vertraagde groeisnelheid van de vegetatie, een afname van de zaadproductie en een degradatie van de bodem. Dit in combinatie met een toename in de frequentie en intensiteit van droogte zal leiden tot een afname van de biodiversiteit en de productiviteit van de vegetatie. Ook de totale oppervlakte beschikbaar voor begrazing zal verminderen, wat samen met geïmporteerde plantensoorten verder bijdraagt tot een daling van het ecologisch draagvlak.

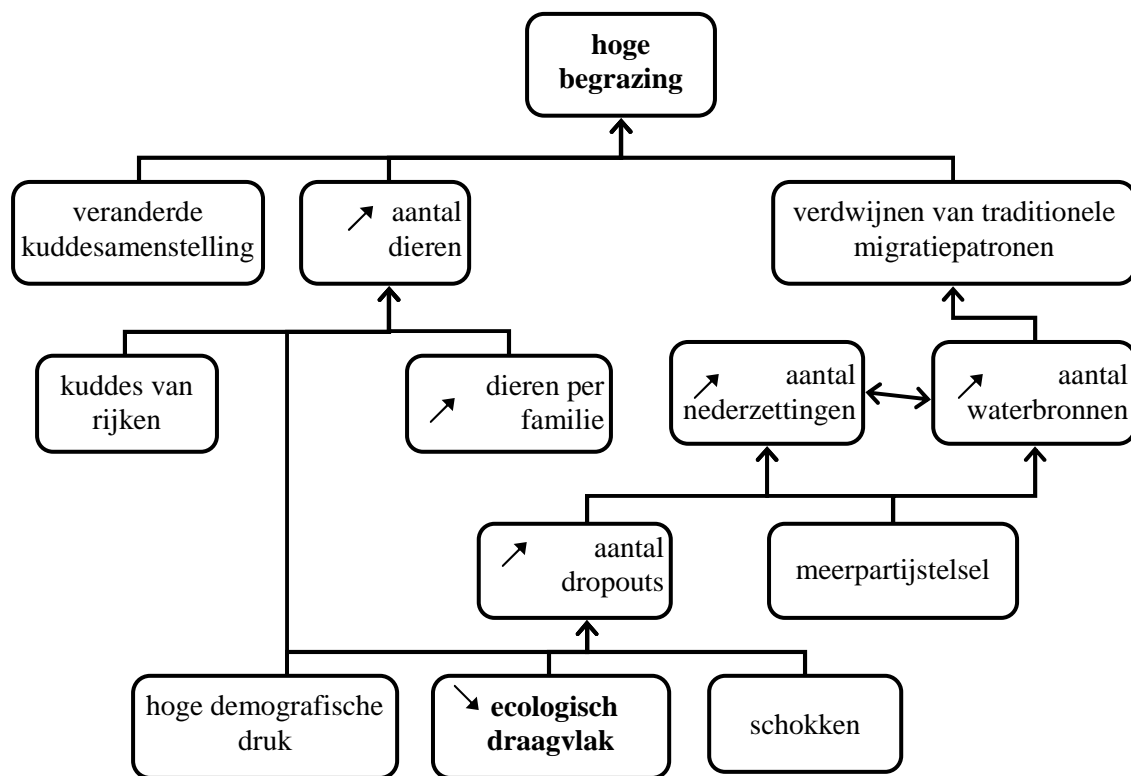


Figuur 4: Belangrijkste gevolgen van klimaatsveranderingen voor Wajir



Figuur 5: Belangrijkste oorzaken van een afname in het ecologisch draagvlak

De oorzaken van deze toenemende begrazing worden weergegeven in Figuur 6. De laatste decennia is er sprake van een veranderde samenstelling van de kuddes. Waar vroeger voornamelijk kuddes met kamelen de norm waren, is er nu een stijging in het aantal rundvee, schapen en vooral geiten. Dit heeft als gevolg dat begrazing rond waterbronnen intenser is, aangezien deze dieren minder lange afstanden kunnen afleggen zonder water dan kamelen. Een tweede factor is een stijging van de totale hoeveelheid vee in het district. Dit wordt mede veroorzaakt door de grote emotionele waarde dat vee heeft voor pastoralisten en het respect dat ermee gepaard gaat om grote kuddes te bezitten.



Figuur 6: Belangrijkste oorzaken van hoge begrazing

Een laatste, misschien wel de belangrijkste, factor is het verdwijnen van traditionele migratiepatronen. Dit betekent dat er bijna overal permanente begrazing is, waardoor het niet langer mogelijk is om tijdens periodes van extreme droogte uit te wijken naar reserve graaslanden en de vegetatie overal onder grote druk staat. Een belangrijke oorzaak van de toename in het aantal waterpunten is een sterke stijging van het aantal nederzettingen en waterbronnen in de laatste decennia, voornamelijk ten gevolge van een aantal politieke processen.

Naast het dalend ecologisch draagvlak zijn er een aantal andere factoren die een belangrijke beperking vormen voor de aanpassingscapaciteit van pastoralisten aan klimaatsveranderingen en dus hun

kwetsbaarheid verder verhogen. Eén hiervan is het gebrek aan marktinfrastructuur in het gebied door de marginalisering door de overheid. Dit zorgt ervoor dat de pastoralisten hun vee enkel kunnen verkopen aan lage prijzen, wat hun koopkracht doet dalen. Een andere beperking is het gebrek aan alternatieve bestaansmiddelen en de hoge afhankelijkheid van voedselhulp.

Impact op livelihood assets

De livelihood assets van de bevolking in Wajir zullen in vergaande mate worden aangetast door een stijging in de frequentie en intensiteit van droogte, een toename van het aantal overstromingen en een daling van het ecologisch draagvlak. In het algemeen zal het menselijk kapitaal dalen. Een belangrijke factor hierbij is een toename van ziektes, door overstromingen en hoge concentraties aan mensen rond waterbronnen tijdens droogte. Een tweede factor is ondervoeding, door een lagere koopkracht, en uitputting, door lange wandelafstanden om graasland of water te vinden. Het natuurlijk kapitaal, voornamelijk water en graasland, is en wordt in vergaande mate aangetast door aanhoudende droogte en de hoge begrazing. Ook het financieel kapitaal zal dalen, voornamelijk door lagere verkoopprijzen. Deze lage verkoopprijzen zijn het gevolg van een aanbod dat de vraag overschrijdt tijdens droogte en de slechte gezondheidstoestand van de dieren. In het slechtste geval wordt het financieel kapitaal sterk negatief beïnvloed door de massale sterfte van dieren tijdens ernstige droogte. Wanneer mensen moeten vechten voor hun leven daalt de solidariteit evenals de bereidheid om anderen te helpen, waardoor ook het sociaal kapitaal zal verminderen. Een laatste vorm van kapitaal is het fysiek kapitaal dat in vergaande mate zal worden beïnvloed, voornamelijk door de soms verwoestende gevolgen van overstromingen. Al deze dalingen in livelihood assets zullen resulteren in een afname van de aanpassingscapaciteiten van de bevolking.

Politiek beleid, instituties en processen

De link tussen de toenemende schaarste en het ontstaan van gewelddadig conflict, zal ook in belangrijke mate beïnvloed worden door het politiek beleid, instituties en processen. Deze kunnen worden onderverdeeld in twee categorieën: degene die de aanpassingscapaciteiten van de gemeenschap beïnvloeden en degene die het al dan niet vormen en escaleren van conflict beïnvloeden.

De aanpassingscapaciteiten worden beïnvloed door drie grote factoren: cultuur, politiek beleid en voorziening van diensten. Een culturele factor die de aanpassingscapaciteit verhoogt, is het vermogen om te delen die sterk aanwezig is in de Somalische gemeenschap. Anderzijds zal deze factor ook zorgen voor een daling in de aanpassingscapaciteit door een daling in de intentie om zijn persoonlijk of familie-inkomen te verhogen. Een tweede culturele factor is het vertrouwen in God. Aangezien pastoralisten volledig afhankelijk zijn van regenval voor hun overleven en dit een factor is die ze niet kunnen beïnvloeden, hebben ze zeer sterk het gevoel dat ze hun eigen leven niet kunnen beïnvloeden. Er is dan ook een groot gebrek aan plannen voor de toekomst, wat hun aanpassingscapaciteit verlaagt.

Het politiek beleid in Wajir zal ook zijn invloed hebben op de aanpassingscapaciteiten van de bevolking. Ongepaste beleidsmaatregelen hebben in vergaande mate de aanpassingsstrategieën van de gemeenschappen sterk gereduceerd, voornamelijk door het beperken van migratiemogelijkheden via het vastleggen van grenzen en het mede veroorzaken van de hoge stijging in het aantal waterbronnen. Een laatste factor die de aanpassingscapaciteit zal beïnvloeden is de voorziening van diensten. Door een gebrek aan investeringen van de overheid, is er een tekort aan onderwijs, gezondheidszorg en infrastructuur. Dit leidt tot onderontwikkeling van de regio en vormt een beperking voor het ontwikkelen van alternatieve vormen van levensonderhoud. Bovendien is er een grote focus op hulp in de korte termijn en dit door zowel de overheid als NGOs. Dit heeft gezorgd voor een ondermijning van de aanpassingscapaciteit van pastoralisten. Investerings in de ondersteuning van duurzaam pastoralisme daarentegen zouden op termijn leiden tot een hogere graad van ontwikkeling in de regio.

De tweede categorie van relevant politiek beleid, instituties en processen, is deze die het ontstaan en escaleren van conflicten beïnvloedt. Een eerste factor bij het beïnvloeden van ontstaan van conflicten door klimaatsveranderingen is de aanpassingscapaciteit van een gemeenschap. Wanneer deze hoog is, zijn mensen in staat om te blijven voorzien in hun levensonderhoud, wanneer dit niet het geval is kan conflict optreden als een vorm van aanpassingscapaciteit. Een belangrijke factor in het ontstaan van conflicten is de toegang tot natuurlijke hulpbronnen. Door het toegenomen aantal nederzettingen is de toegang tot deze hulpbronnen meer en meer gelimiteerd, aangezien toegang bepaald wordt door de clans van de nederzetting. Bovendien zal een afname in het ecologisch draagvlak leiden tot een daling in de aanwezige natuurlijke hulpbronnen. Dit vormt een mogelijke bron van conflict. Ook het politiek systeem dat sterk gebaseerd is op clans, vormt een mogelijke bron van conflicten, aangezien elke clan zoveel mogelijk politieke macht naar zich toe wil trekken.

Het escaleren van conflicten in gewelddadige confrontaties wordt in Wajir district voorkomen dankzij het WPDA. Wanneer een conflict de kop opsteekt in een bepaald gebied, wordt een rapid response team ernaartoe gestuurd. Dit team zal bijeenkomsten tussen de verschillende betrokken partijen organiseren tot een overeenkomst wordt gevonden. Voornamelijk de oudere mannen van verschillende clans en sub-clans spelen hierin een belangrijke rol.

Strategieën

Er zijn heel wat verschillende strategieën die door de gemeenschap worden aangewend om in hun levensonderhoud te voorzien. Een eerste groep strategieën hebben tot doel in staat te zijn om in hun levensonderhoud te voorzien dankzij het verderzetten van hun levenswijze als pastoralist. Belangrijke strategieën hierbij zijn het beheren van de kuddes, migratie en beheren van watervoorraden. Een tweede groep van strategieën is erop gericht om het pastoralisme economisch rendabeler te maken. Dit is echter enkel mogelijk voor een kleine groep, aangezien investeringen hierbij noodzakelijk zijn. Een

derde groep van strategieën is de diversificatie van het inkomen, maar waarbij het vee nog steeds een belangrijke rol toebedeeld krijgt. Hierbij kan het traditionele leven als pastoralist behouden blijven, maar aangevuld worden met alternatieve inkomsten door bv. verkoop van houtskool of inkomsten van familieleden die in de stad werken. Een tweede mogelijkheid is dat de hele familie in een nederzetting gaat wonen en daar andere economische activiteiten uitvoert, terwijl hun kudde wordt gegraasd door slecht enkele familieleden of ingehuurde arbeiders. Een vierde en laatste categorie van strategieën is deze waarbij families het pastoralisme volledig opgeven en in nederzettingen op zoek gaan naar een alternatieve wijze om in hun levensonderhoud te voorzien.

Ontstaan van conflict

De aanpassingscapaciteit van de gemeenschap speelt een centrale rol bij de analyse van de causale relatie tussen klimaatwijziging en conflict. Wanneer de aanpassingscapaciteit hoog is, zullen mensen in staat zijn om hun levenswijze te behouden of een alternatieve te ontwikkelen. Echter, wanneer de aanpassingscapaciteit onvoldoende groot is, worden mensen erg kwetsbaar en is er een kans dat ze geweld gaan gebruiken om aan hun behoeften te voldoen. Deze aanpassingscapaciteit wordt bepaald door de strategieën die kunnen worden toegepast door de gemeenschap, familie of huishouden. De mogelijkheid om bepaalde strategieën toe te passen wordt beïnvloed door de beschikbare livelihood assets en het politiek beleid, instituties en processen. Een centrale rol in de aanpassingscapaciteit wordt gespeeld door de pastoralisten zelf, maar om pastoralisme op een duurzame manier te blijven uitvoeren, hebben ze ondersteuning nodig van andere actoren zoals de overheid of NGOs. Hier zullen kort een aantal belangrijke beperkingen voor de strategieën worden besproken en hoe deze kunnen worden aangepakt.

De belangrijkste beperkingen zijn een gebrek aan geld, een gebrek aan kennis en een gebrek aan alternatieve levenswijzen. Dit geeft aan dat acties die worden uitgevoerd door de overheid of NGOs zich zouden moeten concentreren op het verbeteren van deze factoren. Een andere factor waarop acties van de overheid en NGOs zich zouden moeten richten is het verhogen van het ecologisch draagvlak van de regio, aangezien dit een belangrijke beperking vormt voor pastoralisten. Een centrale rol in dit alles zou moeten gegeven worden aan de sensibilisatie van pastoralisten. Op deze manier kunnen ze enerzijds overtuigd worden van het belang van een aantal specifieke strategieën en kunnen ze anderzijds het beleid van de overheid en NGOs mee vorm geven. Dit zijn slechts een aantal maatregelen die de aanpassingscapaciteiten van de bevolking zouden kunnen verhogen en dus kunnen leiden tot een kleinere kans op conflicten.

5.4 **Besluit**

Klimaatveranderingen zorgen voor drie belangrijke beperkingen voor het leven als pastoralist in Wajir: een toename in de frequentie en intensiteit van droogte, een stijging in het aantal periodes met hevige regenval en een daling van het ecologisch draagvlak op lange termijn. Het onderzoek heeft echter aangetoond dat klimaatwijziging niet de enige oorzaak is van een daling in het ecologisch draagvlak. Een hoge bevolkingsdruk, hoge begrazing en een onaangepast politiek beleid spelen hierin een belangrijke rol. Dit geeft aan dat het eerste causale verband, tussen klimaatwijziging en een daling in het ecologisch draagvlak reëel is, maar niet rechtlijnig. Aangezien dit eerste causale verband niet rechtlijnig is, zal de link tussen klimaatwijziging en gewelddadig conflict dat evenmin zijn.

Aanpassingscapaciteit speelt een centrale rol in de link tussen een toegenomen schaarste en een toename in gewelddadig conflict. Wanneer de aanpassingscapaciteit groot is, zullen mensen in staat zijn op hun levenswijze te behouden of een alternatieve te ontwikkelen. Echter, wanneer de aanpassingscapaciteit onvoldoende is, worden mensen zeer kwetsbaar en is er een mogelijkheid dat ze geweld gaan gebruiken om in hun behoeften te voorzien. Deze aanpassingscapaciteit wordt bepaald door de beschikbare strategieën die een bevolking kan toepassen. De beschikbaarheid van strategieën voor een gemeenschap, familie of huishouden wordt in belangrijke mate beïnvloed door de beschikbare livelihood assets en het politiek beleid, instituties en processen.

Naast een lage aanpassingscapaciteit spelen een aantal andere factoren ook een belangrijke rol in het al dan niet vormen van conflicten. Belangrijk hierbij zijn een aantal politieke beleidsmaatregelen, instituties en processen, zoals de institutionele context voor toegang tot natuurlijke hulpbronnen en het politiek systeem dat georganiseerd is rond clans. Een andere belangrijke factor is de geschiedenis van conflict in het district en de onderliggende oorzaken van deze conflicten die nog steeds aanwezig zijn. Het is belangrijk om in te zien dat het ontstaan van een conflict niet noodzakelijk betekent dat dit zal uitmonden in geweld. Het werk van het Wajir Peace and Development Committee speelt een cruciale rol hierin. Enerzijds zorgen zij voor een ‘klimaat van vrede’ in het district en anderzijds beheren zij conflicten door actief te bemiddelen tussen verschillende partijen.

Dit alles geeft aan dat het antwoord op de centrale onderzoeksvraag: “In welke mate en op welke manier kan klimaatwijziging in het district Wajir leiden tot een toename in het aantal en de intensiteit van conflicten in de regio?”, niet rechtlijnig is. Ten eerste is de toenemende schaarste van natuurlijke hulpbronnen in het district niet enkel veroorzaakt door klimaatwijziging. Ten tweede is de link tussen schaarste en gewelddadig conflict, waarbij aanpassingscapaciteit een belangrijke rol speelt, zeer ingewikkeld en wordt deze beïnvloed door verschillende factoren. Klimaatwijziging kan de uitdagingen waarmee de bevolking reeds geconfronteerd worden nog versterken. Bovendien kan het

leiden tot gewelddadig conflict, wanneer de aanpassingscapaciteit beperkt is, andere niet-klimatologische mogelijke oorzaken van conflict ook aanwezig zijn en het beheer van conflicten mislukt.

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Appendix A : Overview of conducted interviews in Wajir district

Date	Interviewee(s)	Location
19/8/2009	Izzy Birch	Nairobi
19/8/2009	Mohammed Elmi, minister of Northern Kenya and other arid lands	Nairobi
20/8/2009	Dekha Ibrahim	Nairobi
22/8/2009	Workshop on peace with youth of Wajir district organized by WPDA	Wajir town
23/8/2009	Workshop on peace with youth of Wajir district organized by WPDA	Wajir town
24/8/2009	Population census	Wajir town
24/8/2009	Dinner at catholic church	Wajir town
25/8/2009	Population census	Wajir town
25/8/2009	District commissioner	Wajir town
26/8/2009	Police administrator	Wajir town
26/8/2009	Population census	Wajir town
26/8/2009	Henk Van Apeldoorn	Wajir town
27/8/2009	Workshop with youth of Wajir town	Wajir town
27/8/2009	Mohammed Mursal, heath of Oxfam in Wajir district	Wajir town
27/8/2009	Henk Van Apeldoorn	Wajir town
28/8/2009	Meeting with DAWN-members, local partner of Foundation for the Welfare of Wajir	Wajir town
29/8/2009	Sofia, women rights	Wajir town
30/8/2009	Workshop with youth of Wajir town	Wajir town
31/8/2009	ALDEF	Wajir town
3/9/2009	National climate change response strategy workshop for Northeastern Province organised by the Kenyan government	Garissa
4/9/2009	National climate change response strategy workshop for Northeastern Province organised by the Kenyan government	Garissa
7/9/2009	Abdi Billow, WPDA	Wajir town
8/9/2009	ALDEF	Wajir town
9/9/2009	ALDEF	Arbahajan
10/9/2009	Destocking program facilitated by ALDEF	Arbahajan
11/9/2009	Destocking program facilitated by ALDEF	Arbahajan
11/9/2009	Elders of Arbahajan	Arbahajan
12/9/2009	Destocking program facilitated by ALDEF	Griftu
13/9/2009	Destocking program facilitated by ALDEF	Griftu
15/9/2009	NEMA	Wajir town
17/9/2009	Residents of Wajir town, during measuring wells	Wajir town
18/9/2009	Residents of Wajir town, during measuring wells	Wajir town

Appendix B : Map of Wajir district

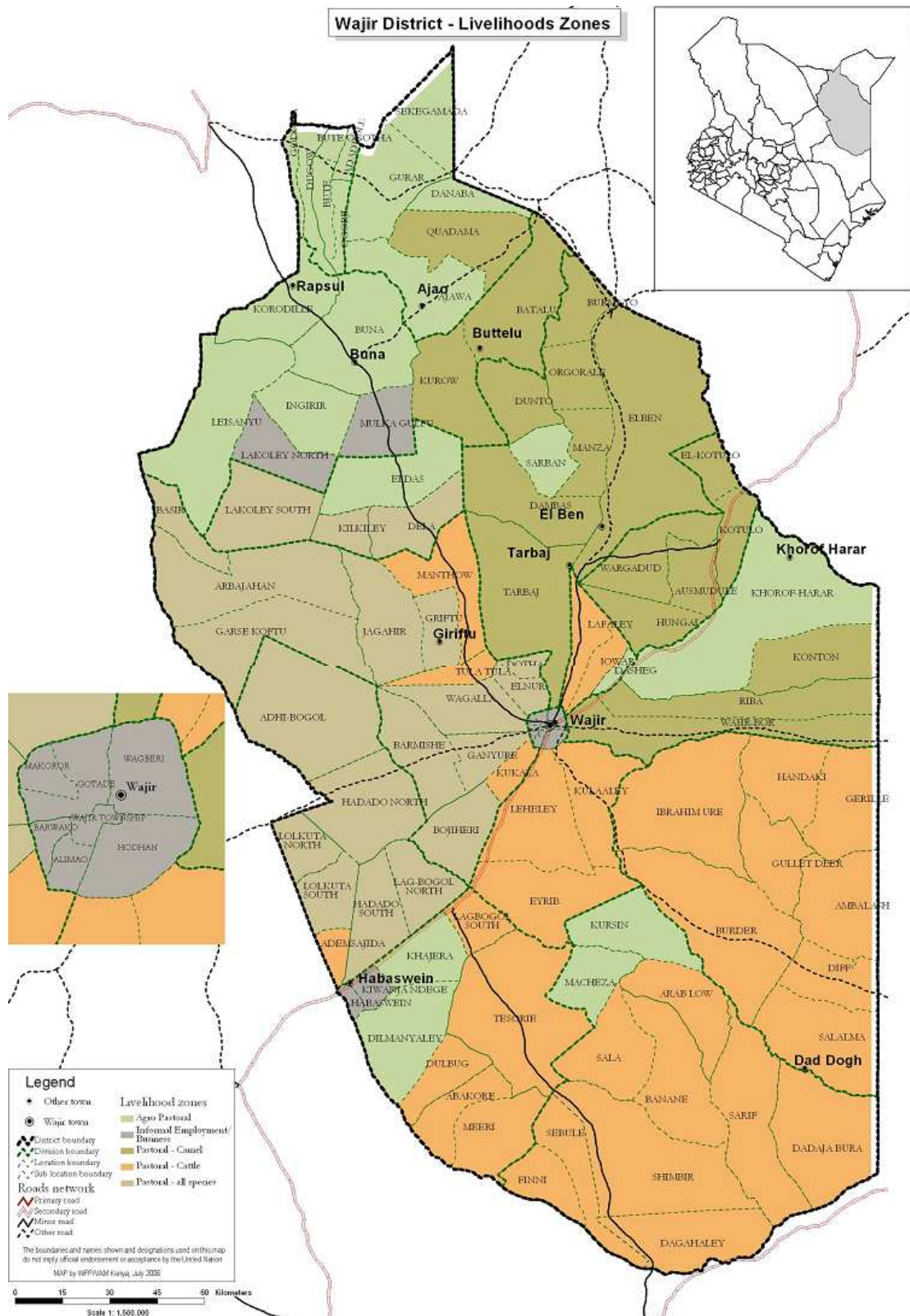


Figure B.1: Map of Wajir district (WFP/VAM Kenya, 2006)

Appendix C : 10-days rainfall for 2002-2009

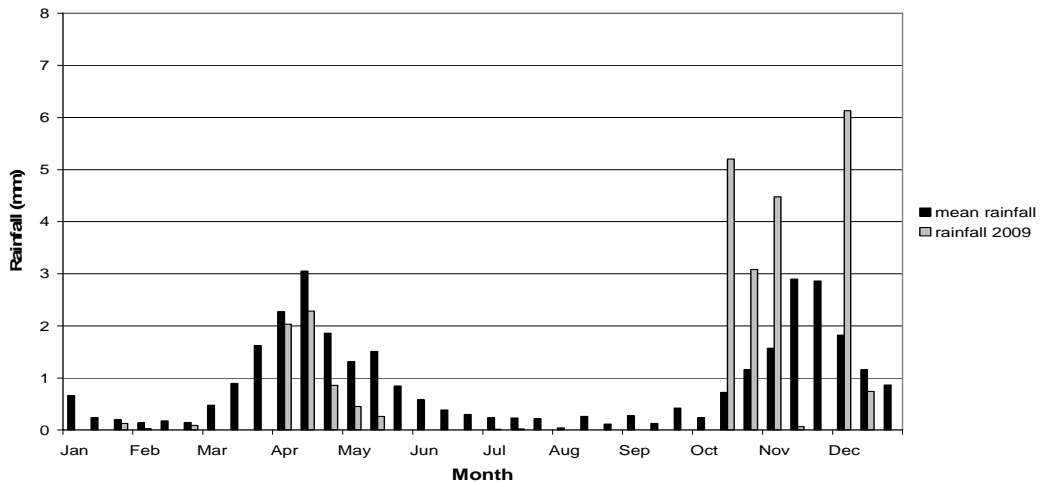


Figure C.1: 10-days rainfall for 2009 and mean 1961-2009 (LEWS, 2009)

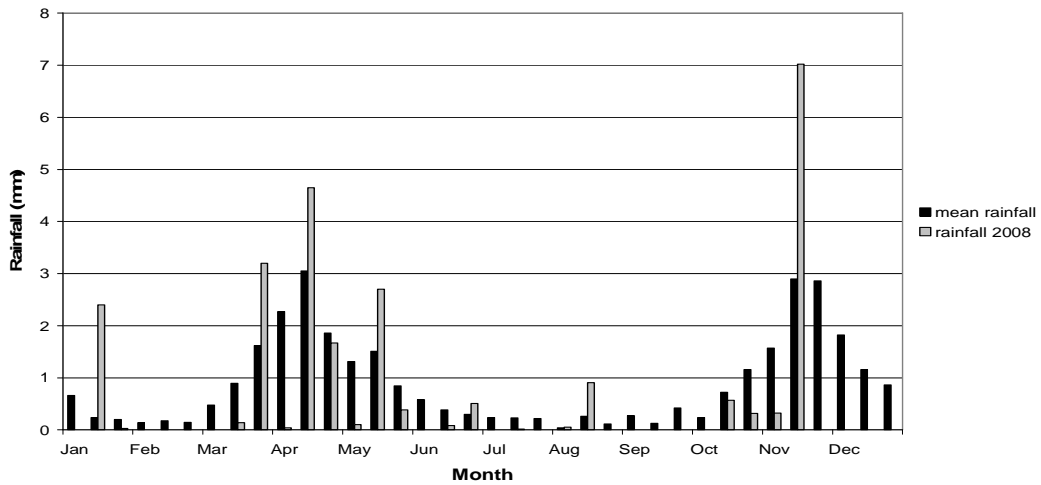


Figure C.2: 10-days rainfall for 2008 and mean 1961-2009 (LEWS, 2009)

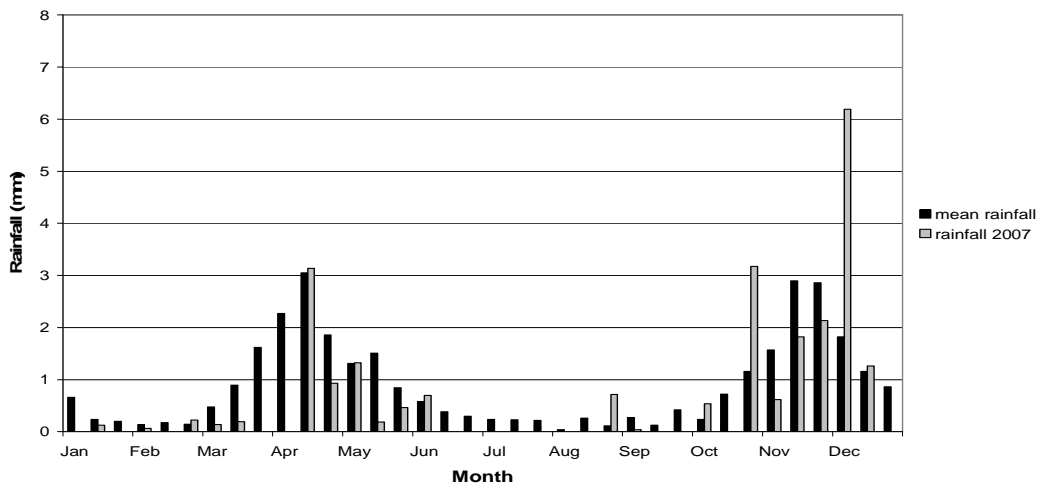


Figure C.3: 10-days rainfall for 2007 and mean 1961-2009 (LEWS, 2009)

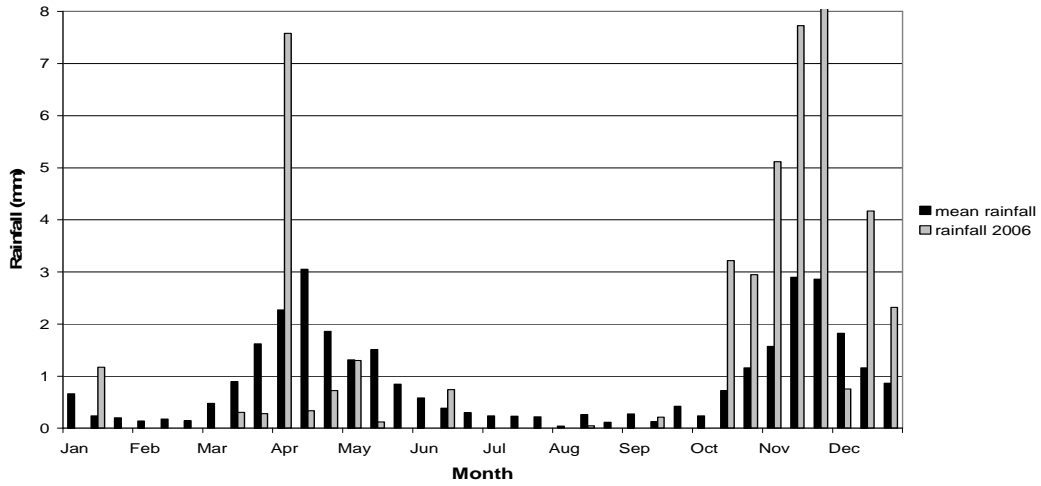


Figure C.4: 10-days rainfall for 2006 and mean 1961-2009 (LEWS, 2009)

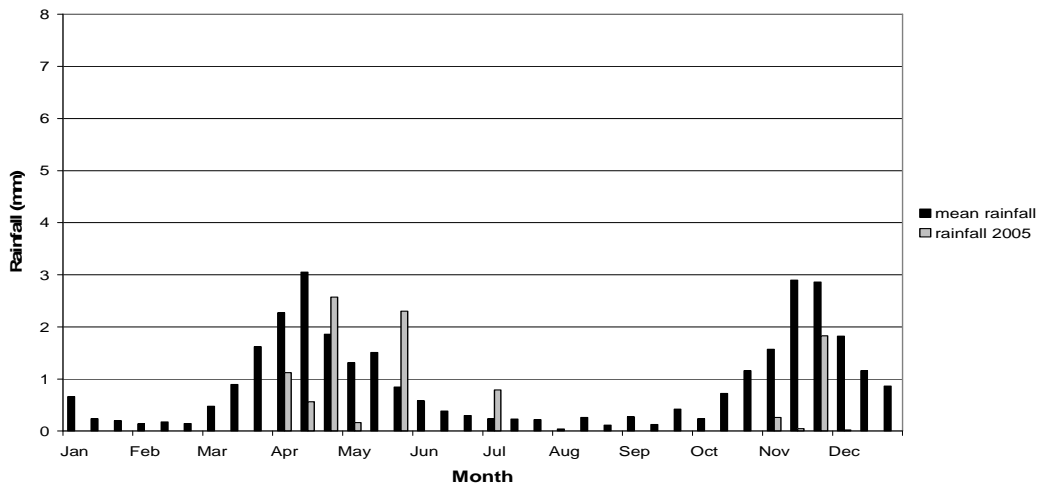


Figure C.5: 10-days rainfall for 2005 and mean 1961-2009 (LEWS, 2009)

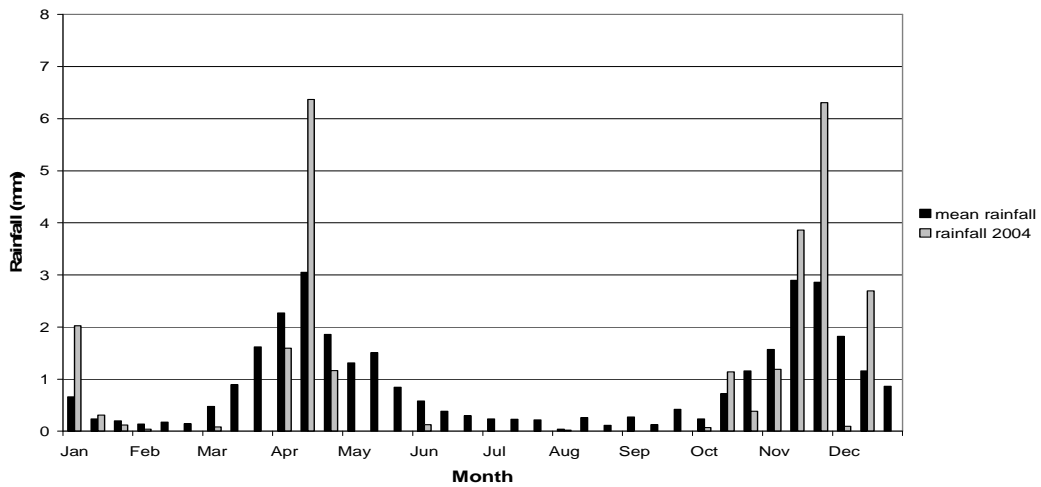


Figure C.6: 10-days rainfall for 2004 and mean 1961-2009 (LEWS, 2009)

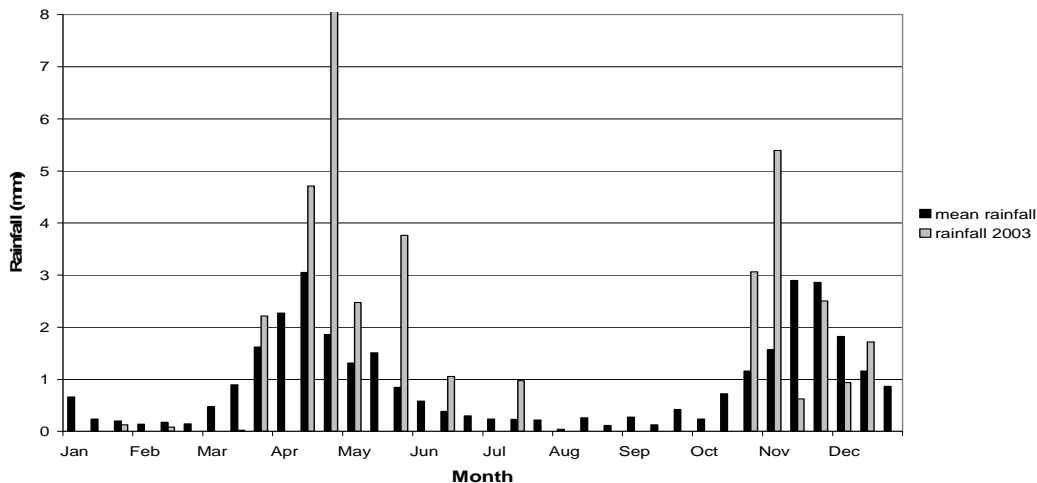


Figure C.7: 10-days rainfall for 2003 and mean 1961-2009 (LEWS, 2009)

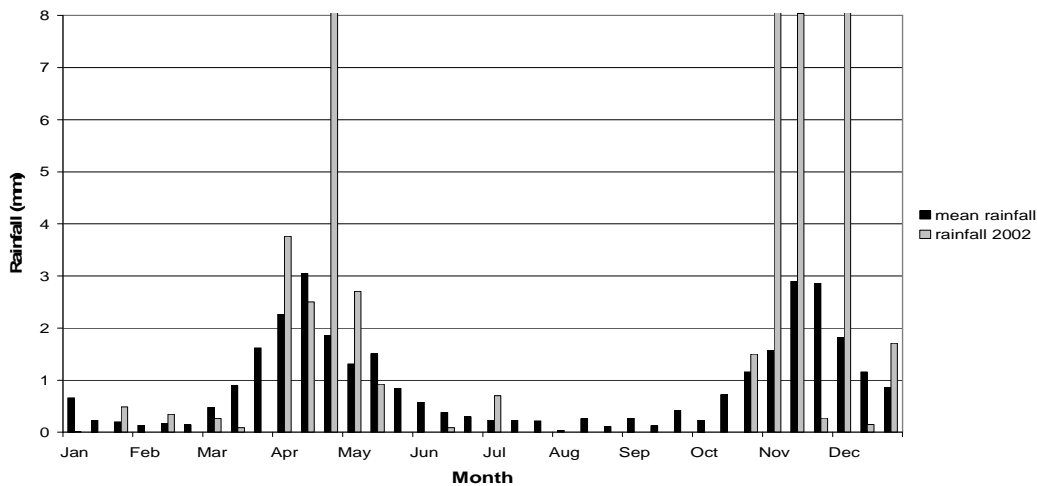


Figure C.8: 10-days rainfall for 2002 and mean 1961-2009 (LEWS, 2009)