

University of Hamburg
Department of Earth Sciences
Institute of Geography

Stakeholder Perspectives on Livelihoods, Vulnerability and Adaptation to Climate Change in Kenya

A Master Thesis
submitted in partial fulfilment of the requirements for the degree
Master of Science (M.Sc.) 'Global Transformation and Environmental Change'
at the University of Hamburg, Germany

by
Elise Remling
Hamburg, August 18th 2011

Supervisors
Prof. Dr. Jürgen Scheffran
Prof. Dr. Udo Schickhoff

Elise Remling (B.A.)

E-Mail: elise_remling@hotmail.com

Public Version

Abstract

Impacts of increased climate variability and change are global concerns. But in Kenya, where large parts of the country consist of arid and semi-arid lands, many livelihoods are highly resource-dependent and the population is chronically exposed to a range of natural hazards and non-climate stressors, they are particularly critical. A continued trend of more frequent and intense droughts and erratic rainfall is expected to have significant impacts on people's livelihoods, possibly exceeding the coping threshold. This is likely to have large impacts on the East African country.

Drawing on fieldwork in Nairobi, Kenya, this thesis examines adjustments that people make to their livelihoods in the face of multiple shocks and changes, with the aim of understanding the implications of these responses for future adaptive capacity and adaptation in the region. It does so by presenting results from nineteen in-depth interviews with relevant stakeholders who work on climate change adaptation related issues in Kenya.

The paper indicates how farmers and agriculturalists, whose livelihoods were identified as being particularly susceptible to climate change, have responded autonomously to the new situation, with policies and government support remaining negligible. Interviews revealed that local options for adaptation strongly depend on and are constrained by the specific socio-economic, cultural and geographical context and are contingent on the assets available to people in order to make adaptive choices. For Kenya, two ways forward are identified: reducing the immediate dependency of livelihood systems on environmental conditions and diversifying livelihood strategies and income sources at the household level. According to the informants, both viable livelihood options can only be achieved through an augmented adaptive capacity at the local level. Arguing from a contextual interpretation of vulnerability, the thesis argues that because vulnerability to the impacts of climate change is spatially variable and context specific, locally defined adaptation goals should take priority over those imposed from outside. A policy response would need to specifically target adaptive capacities and remove obstacles preventing adequate local adaptation. Such measures would be beneficial for human development while not requiring precise climate forecasts, which in the case of Kenya come with considerable uncertainty. The findings shed light on the true adaptation needs of people and illustrate that adaptation policies are unlikely to be successful unless the context specific dimension of local adaptation is taken into account. Although there are challenges to mainstreaming adaptation at different scales, this research shows why it is critical to assess how policies can protect conditions for emergence of livelihood transformation.

Contents

Abstract	I
Contents	II
Figures	V
Maps	V
Tables	VI
Acronyms and Abbreviations	VII
1 Introduction	1
1.1 Starting Point: Problem Diagnosis	1
1.2 Aims, Objectives and Guiding Questions	5
1.3 Structure of Work	7
2 Literature Review and Theoretical Framework	8
2.1 Introduction	8
2.2 The Vulnerability Context	8
2.2.1 Defining Vulnerability	8
2.2.2 Framing Adaptation.....	12
2.2.3 Interpretations of Vulnerability	16
2.3 The Capability Framework	18
2.3.1 Sen’s Capability Approach.....	18
2.3.2 Nussbaum’s Supplementation and Critique	20
2.3.3 Capabilities and Climate Change	21
2.4 The Sustainable Livelihoods Framework	22
2.5 Synthesis and Implications for this Thesis	24
3 Methodology - Operationalising the Framework	29
3.1 Introduction	29
3.2 Setting, Sampling and Description of Participants	30
3.3 Expert Interviews and Specific Procedure of Interviews in this Thesis	32
3.4 Procedures	34
3.5 Data Analysis	34
3.6 Ethical Considerations	36

4	Description of the Area of Study - Kenya in Brief.....	37
4.1	Introduction.....	37
4.1.1	Physical Geography and Natural Environment	37
4.1.2	The People – Demographics and Human Well-being	39
4.1.3	The Economic Dimension	40
4.2	Climate Characterisation	41
4.3	Current and Future Climate Variability and Change	42
4.3.1	Observed Climate Trends and Climatic Variability	42
4.3.2	Future Projections - A Summary of Projected Changes	43
5	Empirical Results.....	47
5.1	Assessing Impacts of Increased Climate Variability on Livelihoods.....	47
5.2	Profiling of Vulnerable Groups	50
5.3	Local Coping Strategies and Constrains.....	52
5.4	Adaptation Options and Needs	55
5.5	Additional Aspects	58
5.5.1	Relevancy of Climate Change	58
5.5.2	Preparedness/Adaptive Capacity	59
5.5.3	Role of the Government and Need for External Help	60
5.5.4	Awareness	61
5.5.5	Relevant Stakeholders for Addressing Climate Change Adaptation	62
5.5.6	Climate Change and Conflict	63
5.6	Difficulties.....	63
6	Discussion and Recommendations	64
6.1	Implications of Climate Change and its Influence on Livelihoods and Development.....	65
6.2	Local Capacities and Responses to Cope with Livelihood Disturbance	66
6.2.1	Integration of Traditional Knowledge and Practices into Adaptation	68
6.2.2	Constraints to Local Responses.....	69
6.3	Institutional and Actor’s Analysis	70
6.3.1	State Actors related to the Government of Kenya	70
6.3.2	Non-governmental Bodies.....	71
6.3.3	Development Partners	72
6.3.4	Private sector, Universities and Research Bodies.....	73
6.4	An Analysis of the Institutional and Legal Framework	73
6.4.1	Policy Genesis and Content Analysis.....	74
6.4.2	Summary of Climate Change Preparedness at the National Level.....	76
6.5	Public Awareness of Climate Change	77
6.6	Implications for Adapting Livelihoods to Climate Change.....	77
6.7	Summary	79
6.8	Recommendations - Identifying Viable Livelihood Adaptation Strategies.....	82

7	Conclusion and Outlook.....	85
7.1	Summary of Findings	85
7.2	Limitations of this Work	86
7.3	Future Areas of Research.....	87
	Acknowledgments	88
	References	89
	Annexes	96
	Annex A - List of Interview Partners in Alphabetical Order	96
	Annex B - Interview Outline.....	98
	Annex C - Quotes from the Interview Partners	101
	Quotes from IP1.....	101
	Quotes from IP2.....	101
	Quotes from IP3.....	101
	Quotes from IP4.....	102
	Quotes from IP5.....	104
	Quotes from IP6.....	105
	Quotes from IP7.....	107
	Quotes from IP8.....	107
	Quotes from IP9.....	109
	Quotes from IP10.....	111
	Quotes from IP12.....	113
	Quotes from IP13.....	113
	Quotes from IP14.....	115
	Quotes from IP15.....	116
	Quotes from IP16.....	116
	Quotes from IP17.....	117
	Quotes from IP18.....	119
	Quotes from IP19.....	120
	Thesis Declaration.....	122

Figures

Figure 2.1: Framing vulnerability to climate change.	10
Figure 2.2: Relations between adaptive capacity, adaptation and coping.	14
Figure 2.3: Idealised version of a coping range describing the relationship between a factor of climate change and threshold exceedance.	15
Figure 2.4: Schematic representation of the capability framework.	19
Figure 2.5: Conceptual similarities between adaptive capacity and the capabilities framework.	27
Figure 2.6: Conceptual framework of this thesis.	28
Figure 4.1: Composition of Kenyan GDP (2010).	41
Figure 4.2: Trends in annual and seasonal mean temperature in Kenya for the recent past and projected future.	44
Figure 4.3: Spatial patterns of projected change in mean annual temperature for 10-year periods in the future under the SRES A2 scenario.	45
Figure 4.4: Trends in annual precipitation for the recent past and projected future.	46
Figure 5.1: Current coping strategies.	53
Figure 5.2: Current constraints to coping.	54
Figure 5.3: Criteria for adaptations.	58
Figure 5.4: Particularly relevant stakeholders regarding climate change adaptation in Kenya.	62

Maps

Map 4.1: Map of Kenya with vegetation cover.	38
---	----

Tables

Table 2.1: Differences of livelihood responses to climate change.	13
Table 2.2: Bases for characterising and differentiating adaptation to climate change.	14
Table 2.3: Two interpretations of vulnerability.....	17
Table 2.4: The ten core human capabilities according to Nussbaum.	21
Table 2.5: Types of capital assets.....	23
Table 3.1: Organisations represented by the interview partners.	31
Table 3.2: Properties of expert interviews conducted.	33
Table 3.3: Table structure.....	35
Table 4.1: Demographics of Kenya.....	39
Table 4.2: Overview of current and future climatic trends in Kenya for two parameters.....	43
Table 5.1: Summary of comments on sectoral impacts of climate change in Kenya.....	48
Table 5.2: Summary of comments on impacts on people’s livelihoods and well-being.	49
Table 5.3: Summary of comments on vulnerable groups.....	50
Table 5.4: Summary of comments on coping strategies.	52
Table 5.5: Summary of comments on constrains for developing coping mechanisms.	54
Table 5.6: Summary of comments on suggestions to enhance coping and adaptive capacity. ...	55
Table 5.7: Summary of comments regarding criteria of promising adaptation options.	57
Table 5.8: Summary of comments on relevancy of climate change.....	58
Table 5.9: Summary of comments on preparedness.....	59
Table 5.10: Summary of comments regarding the role of the government.....	60
Table 5.11: Summary of comments on the need for external help.....	60
Table 5.12: Summary of comments on awareness about climate change.	61
Table 5.13: Summary of comments on relevant stakeholders.....	62
Table 5.14: Summary of comments on climate change and conflict.	63
Table 6.1: Key impacts and associated consequences in Kenya.	64
Table 6.2: Exampeld of impacts on capital assets in Kenya as identified by the informants.....	65
Table 6.3: Examples of local coping strategies.....	67
Table 6.4: Characterisation of coping strategies in Kenya.....	68
Table 6.5: Relation between current coping and future adaptation.....	79
Table 6.6: Summary of key drivers of vulnerability to climate change in Kenya.....	80
Table 6.7: Overview of adaptation actions and their aims.	81

Acronyms and Abbreviations

ASAL	Arid and Semi-arid Land
AIDS	Acquired Immune Deficiency Syndrome
CBO	Community-based Organisation
CCCU	Climate Change Coordination Unit
CIA	Central Intelligence Agency
CSO	Civil-Society Organisation
EAC	East African Community
GDP	Gross Domestic Product
GHG	Green House Gases
GoK	Government of Kenya
HBF	Heinrich Böll Foundation
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
IPCC	Intergovernmental Panel on Climate Change
KCCWG	Kenya Climate Change Working Group
KENFAP	Kenya National Federation of Agricultural Producers
KMD	Kenya Meteorological Department
KSh	Kenyan Shilling
MEMR	Ministry of Environment and Mineral Resources
NCA	Norwegian Church Aid
NCCACC	National Climate Change Activities Coordinating Committee
NCCRS	National Climate Change Response Strategy
NGO	Non-Governmental Organisation
SEI	Stockholm Environment Institute
PACJA	Pan African Climate Justice Alliance
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	United Nations International Children's Emergency Fund

1 Introduction

1.1 Starting Point: Problem Diagnosis

Much has been discussed and written about the new challenges our planet's inhabitants are facing in the 21st century. These include a steadily growing world population, problems of land use and resource distribution and, last but not least, climate change.¹ While all of the above are in one way or another interlinked, global warming can be considered a cross-cutting factor influencing all aspects of human life.

Anthropogenic climate change has been on the agenda of international forums since the early 1990s and efforts to reduce greenhouse gas (GHG) emissions in order to control the accumulation of climate sensitive gases in the atmosphere have discharged into international agreements such as the Kyoto Protocol.² But as the expiry date of Kyoto approaches in 2012, the disillusioning climate summits of Copenhagen (2009) and Cancun (2010) have not lead to a succeeding agreement. As negotiations carry on, and nations quarrel over quotas and details of carbon trading, GHG emissions continue to increase at a furious rate and the climate has begun to change noticeably around the globe. Staying below the frequently postulated 2°C threshold, which was estimated to keep climate impacts at a manageable stage, will soon be out of reach: Climate change has become a reality.^{3,4}

In some regions the effects have not been conceived as being severe. In others however, changed conditions have started to impact people's lives thoroughly. Action has to be taken now to mitigate the impacts of climate change that are already present and to prepare for those that even the most stringent mitigation efforts will not be able to avoid in the future. Thus, adapting to climate change has become essential. While in the beginning the climate change discourse among researchers mainly focussed on impacts and mitigation, it is now increasingly

¹ Generally, climate change refers to "[...] any change in climate over time, whether due to natural variability or as a result of human activity" (IPCC 2007:871). In other words, climate change can be related to internal or external influences, which again can be subdivided into natural or anthropogenic influences. In the sense of this paper it is attributed to human activity, which, by emitting climate sensitive greenhouse gases (GHG), has caused a change in the global atmosphere. This change can either be long-term, or lead to shorter-term climatic variability, which are "variations in the mean state and other statistics [...] of the climate on all temporal and spatial scales beyond that of individual weather events" (IPCC 2007:872).

² Greenhouse gases (GHG) are gaseous constituents of the atmosphere, which occur both naturally and through anthropogenic emissions. Greenhouse gases absorb and emit radiation at specific wavelengths within the spectrum of infrared radiation emitted by the Earth's surface, the atmosphere, and clouds. This property causes the greenhouse effect. Primary GHGs in the atmosphere include water vapour (H₂O), carbon dioxide (CO₂), nitrous oxide (N₂O), methane (CH₄) and ozone (O₃). Others include, sulphur hexafluoride (SF₆), hydrofluorocarbons (HFCs) and perfluorocarbons (PFCs) (IPCC 2007).

³ A 2°C increase of global mean temperatures above pre-industrial levels until the end of this century was regarded as being the threshold to which sensitive ecosystems would still be able to adjust (Adger et al. 2009).

⁴ The term 'threshold' describes the level of magnitude of a system process, or a point, at which sudden or rapid change occurs in such a way that new properties emerge in an ecological, economic or other system (IPCC 2007).

being accompanied by a renewed focus towards adaptation. This also found significant accentuation in the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) (Mertz et al. 2009).

Climate change, in spite of being a global phenomenon, actually has localised impacts, which are specific for each region, with areas relying heavily on the environment and its ecosystem services tending to be more sensitive to climate stress (Scheffran 2011).⁵ At the same time capacities to adapt are unevenly distributed between countries and amongst societies and communities (Adger et al. 2007). Authors agree, that “[g]roups [which] are already marginalised bear a disproportionate burden of climate impacts, both in the developed countries and in the developing world” (Adger 2006:273). Thus, while mitigation solemnly makes sense on a global level, adaptation to climate change calls for very local solutions. This makes policy mainstreaming and cooperative action a difficult task. It also calls for localised analysis to properly develop effective coping mechanisms.

Therefore, although the greenhouse gases, which are causing the climate to change, are mainly emitted by the industrialised countries, the impacts of climate change are expected to be more severe in developing countries.⁶ These are likely to experience the effects of climate change differently from developed countries, not only due to differences in the projected change of climate parameters but also because vulnerabilities and adaptive capacities vary greatly between nations and regions (Adger et al. 2007). Mertz et al. (2009) argue that this is because (1) large parts of developing countries lie in regions which already experience high temperatures, therefore, even a minimal increase in temperatures is likely to cause significant evaporation losses. Additionally, rainfall is often projected to decrease. The physical impacts are thus expected to be significant. (2) Developing countries are often highly dependent on the agricultural sector as a means for income, livelihoods and employment. (3) As many people are impoverished, they are being hit harder by the impacts of changed climate and thus more vulnerable. (4) The adaptability is weakened due to limited economic and technological capacities. Climate change, then, is ‘just’ another stressor the system has to cope with.⁷ Consequently, while impacting all regions, climate change will substantially increase the burden on those people who are already more vulnerable to climate extremes and the major share of the applied load will be carried by these already sensitive regions (Adger 2006).

Particularly countries in the global south, despite their insignificant contribution to GHG emissions, are expected to be severely affected. One continent, which stands out in comparison

⁵ Ecosystem services are processes or functions of nature’s ecosystems which have value to individuals or society at large. The services can be clustered into four groups: 1) *supporting* services such as pollination, nutrient cycling, productivity or biodiversity maintenance; 2) *provisioning* services such as food, fuel, fibre or fresh water; 3) less obvious, *regulating* services such as climate regulation, flood protection or carbon sequestration and, 4) *cultural* services such as spiritual, aesthetic, recreational, educational or cultural benefits (Leemans 2009; IPCC 2007).

⁶ A discussion about the appropriateness of the terms ‘developing’ or ‘developed’ countries or alternative labels, interesting as it is, falls outside the scope of this paper.

⁷ In this regard Mortimore (2010:135) introduces the term ‘adaptive poverty’.

to others with regard to climate change, is Africa (Sørensen et al. 2009). Natural systems - projected to be heavily impacted by a changed climate - form the economic basis of most African countries, “[...] from which the majority of the population derives their livelihood” (Murphy & Magrath 2006:6). The already harsh living conditions, are worsened by a number of non-climate stresses, such as poverty, corruption, low literacy rates, little access to basic health services, governance issues, and conflict. All of these factors combine to weaken people and cause communities to have a low adaptive capacity which thus heightens the continent’s vulnerability to global warming, making it one of the most vulnerable continents to climate change and climate variability (Boko et al. 2007).

As a regional driving force in terms of economic development as well as in reference to democracy and human rights, Kenya takes a lead in numerous regional processes, such as within the East African Community (EAC) and is often described as holding a key role in Eastern Africa.^{8,9} The presence of many important multilateral bodies such as the United Nations Headquarters, which are located in the country capital, Nairobi undermine its importance for the region. Climate preparedness thus has a more than national relevance: The country can be considered as being highly influential and a strong stabilising factor in this rather unstable region, which includes countries such as Djibouti, Eritrea, Somalia, Sudan. If climate change causes stress to social systems and thus relates to the stability or the functioning of a state, as suggested by a number of scholars (Barnett & Adger 2007; Scheffran 2011; Scheffran & Battaglini 2011) and Kenya sets the tone in Eastern Africa, the country can be considered a key stone whose actions and their outcomes will have impacts across national borders. Preparing the country for climate impacts is thus a matter of pressing concern, not only for the country itself but for the entire region.

While Kenya’s economic performance is exceeding that of its neighbours, there are several factors which make it a vulnerable country: About 80% of the country’s area consists of arid and semi-arid lands (HBF 2010; UNDP 2007) which are notably more exposed to the impacts of climate change and expected to experience an amplified effect (Sørensen et al. 2009). Considering the labour force in the year 2007, 75% of employees were working in the agricultural sector, mainly in the production of tea, coffee, corn, wheat, sugarcane, fruit, vegetables, dairy products, beef, pork, poultry and eggs, which contributes 22% to the Kenyan GDP. Export commodities are mainly tea, horticultural products, coffee, petroleum products, fish and cement (CIA 2011). This stresses the fact that a change in climate, especially in

⁸ The East African Community is a regional intergovernmental organisation comprising of five east African countries Burundi, Kenya, Rwanda, Tanzania, and Uganda. It seeks to promote cooperation in political, economic and social fields and boost regional trade and commerce. The headquarters of the EAC are based in Arusha, Tanzania (EAC 2011).

⁹ The region of Eastern Africa comprises of Burundi, Djibouti, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Sudan, Uganda and Tanzania.

precipitation patterns would have a huge impact on Kenya. According to the Stockholm Environment Institute (SEI) (2009) the impact of climate change will have a tremendous impact on the country's economy. Concluding, it can be stated that although Kenya can rightfully be described as the regional hub for trade and finance in the Eastern African Region, it is still remarkably dependent on agriculture and related sectors, causing its economy to be highly sensitive to any change in the ecosystems. It is important to keep in mind, however, that "[t]hose affected by climate change are in the first place human beings" (Scheffran 2011:745). Therefore, besides impacting the country's economy, it is first and foremost its people who will be severely impacted as the dependence of their livelihoods is closely connected to ecosystems. Disruptive climate change could thus contribute to a loss of livelihood security. This is also reflected in the current famine, in which an "estimated 2.4 million people [in Kenya] are food insecure, mainly in pastoralist and agro-pastoralist areas in northern, eastern and north-eastern pastoral areas and in south-eastern and coastal lowlands due to late and erratic 2011 long-rains" (GIWES 2011).

For Kenya the need for policies promoting adaptation in the face of changing hydro-climatic conditions has amongst others been attested by the Heinrich Böll Foundation East & Horn of Africa Office (2010), which, after analysing Kenya's vulnerability concerning climate change, as well as related policies, legislation, institutions and political framework, concludes that "[...] existing policies, legislation and institutions are not only weak but inadequate to deal with climate change. There is need for an exclusively climate change policy and legislation [...]" (HBF 2010:57).

According to Smit and Wandel (2006:289), "[t]here has been considerable scholarship in the climate change context on calculating indices of vulnerability and adaptive capacities, and on evaluating hypothetical adaptations, yet the practical applications of this work (in reducing vulnerabilities of people) are not yet readily apparent". This raised the question of how to design adequate policies and integrate adaptation into national planning processes. Generally, there is a need "for a better understanding of the actual and potential adaptation needs in developing countries" (Mertz et al. 2009: 747). There are a number of associated difficulties: First and foremost, there are huge uncertainties concerning scenarios of future climate change in Africa making it difficult to predict local-level outcomes. Consequently, implementing adaptation measures relying solemnly on these projections could lead to maladaptation, because either climate changes turn out different from the forecasted ones or, adaptation options lack context specification, ignoring people's individual situation and needs.¹⁰ Second, along this line, Adger (2006:276) highlights the fact that "[v]ulnerable people and places are often excluded

¹⁰ For reason of simplicity, the term 'maladaptation' will be used in this thesis to denote inappropriate responses to climate change, which instead of reducing vulnerability may inadvertently lead to increased vulnerability in the long term (Jones et al. 2010).

from decision-making and from access to power and resources. Consequently policy interventions to reduce vulnerability need to be able to identify vulnerabilities within social-ecological systems, to recognise the mechanisms, which cause vulnerability in the first place, and to redress marginalisation as a cause of social vulnerability. Vulnerability thereby challenges the design of good governance to promote resilience to minimise exclusion thereby reducing both the severity of perceived vulnerability and its structural causes“. Finally, even if the projections were correct, there are no definitive ways to tackle the impacts of climate change across the globe, across the African continent, or even across a country, for any solutions must be context specific. Selecting which adaptation options to implement, must be based on the knowledge of local conditions framing the impact. Examining local perceptions therefore provides important complementary knowledge to climate science and can enable the formulation of effective adaptation strategies.

In light of this, this Master thesis addresses the topic of climate-related vulnerability and policymaking in Kenya. Based on qualitative stakeholder information instead of looking into *what is there*, the focus of the research will rather have a demand-driven perspective.¹¹ It seeks to investigate what - according to relevant stakeholders - are the impacts on livelihoods felt by the people; how they act in order to manage these and what the specific local challenges are. Therefore, what can actually be done to limit the impacts of climate change in Kenya. At the centre of the research interest lies the question of what livelihood capabilities are needed to ensure adaptive capacity in the face of hydro-climatic change and what kind of legal and institutional framework is required to support these viable livelihoods options.

1.2 Aims, Objectives and Guiding Questions

The aim of this thesis is to gain a better understanding of stakeholder perceptions of climate change impacts on people's livelihoods in Kenya, to document the conditions that people have to deal with, and how they do so, including the factors and processes that constrain their choices. Opportunities to reduce future vulnerabilities and suggestions on how to tackle this on a national level are sought for with the stakeholders. To achieve this aim, the following objectives were pursued, which are threefold: (a) to identify and examine the impacts current climatic changes have on people's lives in Kenya, (b) to understand what livelihood capabilities people are lacking in order to be able to react and adapt to the changes and (c) to examine what types of policies and institutions would be necessary to ensure sustainable adaptation and build resilience.

¹¹ According to the terminology proposed by the IPCC, 'stakeholders' may be viewed as "[a] person or an organization (sic!) that has a legitimate interest in a project or entity, or would be affected by a particular action or policy" (2007:881). In the case of this thesis these are people or organizations who are involved in climate change adaptation in Kenya.

The analytical framework (Fig. 2.6) builds on the vulnerability context, as well as on the capabilities and sustainable livelihoods framework, putting particular emphasis on access to resources, local strategies and institutions. The goal of the methodology is not to produce a score or rating of a particular community's current or future vulnerability but rather, to attain information from the stakeholders on the nature of livelihood vulnerability, its components and determinants, in order to identify ways in which the adaptive capacity can be increased and exposure-sensitivities decreased. The key questions that guided the research can be summarised as follows:

Primary research question

How does climate change affect the well-being of people in Kenya, what coping capacities are present and what can be done in order to identify means of implementing adaptation initiatives or enhancing adaptive capacity?¹²

Sub-questions

- 1) How are people impacted by the observed climatic changes?
Which aspects of their well-being are affected?
Which groups are particularly vulnerable and why?
- 2) How do people currently cope with the impacts – what adaptation options already exist – how could they be improved?
- 3) How can the adaptive capacity be enhanced?
What are long-term adaptation options to the impacts of climate change that are considered relevant by the stakeholders?
What are stakeholder's recommendations to improve capacity building of local communities, governments, international and local organisations in Kenya in the face of environmental change?
- 4) Who are the important stakeholders regarding this issue? Regarding their engagement, are they included sufficiently?
What role does the government play?
What are stakeholder's recommendations to improve national/regional policies on climate change adaptation, water management and security issues?
Except for concrete policies and regulations, are there other forms of institutional developments or forms of governance recommended by stakeholders (e.g. round tables, traditional conflict-solving mechanisms)?

¹² There exist many formulations and definitions of human well-being. Here, I use the term as outlined by Leemans (2009) who, following the Millennium Ecosystem Assessment, judges people to be well if they are secure, have a basic material minimum for a good life, good health, good social relations and freedom and choice.

This thesis hopes to contribute to a better understanding of adaptation to global warming on a regional scale, furthermore, to add to the ongoing discussion about livelihood adaptation and maybe seek to bridge the knowledge gap between climate change, human security and the role of institutions and policies.

1.3 Structure of Work

Succeeding the introductory part of the paper, the second chapter will give an overview of the state of current research with a review of the literature relevant for the specific research questions, thus establishing the contextual framework for this thesis: It will present the vulnerability and adaptation context as well as, the capability and the sustainable livelihoods framework. Hereafter, the third chapter addresses the research design and the specific interview procedure used in this study. Chapter four subsequently introduces the analytical chapters with a brief overview of the Kenyan situation, considering the geographical circumstances, current climate variability and predicted climate changes. The fifth chapter then presents the results of the empirical work based on stakeholders' views, experiences and resources before the sixth chapter discusses and analyses the results and outlines possible recommendations for policy-making. Finally, the seventh chapter synthesises the findings and draws conclusions with some thoughts on limitations of this work and possible future research prospects.

2 Literature Review and Theoretical Framework

2.1 Introduction

As aforementioned the aim of this work is three-fold: First and foremost, it seeks to identify and examine stakeholder's views on the impacts climate change has on people's livelihoods in Kenya and understand how actors are responding to the disturbance. Second, it wishes to understand what capabilities people are lacking to be able to react and adapt to the changes, and finally, it examines what kind of policy response would be necessary to ensure adaptation.

This chapter provides a review of the current state of research regarding the theoretical framework relevant for this thesis. The literature review will address three areas of research: The first section examines the concept of vulnerability as it has been employed in global change science, and the associated terminology of adaptive capacity and adaptation. The following section then discusses the capabilities framework as developed by Amartya Sen and others as it can be a helpful tool to analyse the well-being of people and to identify gaps which hinder people to adapt to changes in climate. The third section provides a brief overview of the livelihoods framework as a link between vulnerability and adaptation with the capabilities framework. The last section integrates the frameworks and describes the approach of this thesis.

2.2 The Vulnerability Context

2.2.1 Defining Vulnerability

In recent years, a growing number of scholars have dedicated their work to bringing forward exciting research on climate change (Janssen et al. 2006). While the former focus was mainly on measuring the actual change in climate today, questions concerning the impacts of climate change on societies have developed into one of the major research topics in this field, especially within the United Nations Framework Convention on Climate Change (UNFCCC) and among development specialists (Janssen et al. 2006). The most common characteristic of this body of work is the reoccurring emergence of the concept of vulnerability. 'Vulnerability' can therefore be defined as a keyword in global change research.

Generally, vulnerability is a broad term, which has been adopted by different disciplines and various scholarly communities. It is used in economics, psychology or anthropology and conceptualised and interpreted in many different, sometimes incompatible, ways (Adger 2006;

Füssel 2007).¹³ Gallopín (2006:294) states that “[d]epending on the research area, it has been applied exclusively to the societal subsystem, to the ecological, natural, or biophysical subsystem, or to the coupled SES [socio-ecological systems], variously referred [to (sic!)] also as target system, unit exposed, or system of reference”. Even within the field of geography, a generally applicable conceptual framework is not shared among all scholars.¹⁴ Füssel (2007:161) identifies eight different conceptualisations of vulnerability and notes a “[...] considerable confusion around the meaning of the term ‘vulnerability’, in particular in the climate change context [...]”, which has caused extensive discussions and misunderstandings within academia. However, despite its vague understanding, it has not lost its popularity among scholars. In an analysis of the years 1977-2004, Janssen et al. (2006) have shown that the number of publications related to research in vulnerability have grown significantly, with over 140 papers having been published in 2004 alone.¹⁵ The authors see a close connection to the increased interest in global environmental change.

In the context of this paper, vulnerability is theorised to environmental change and conceptualised within a systems perspective as vulnerability of human systems to global change. As such, it originated as a topic of study in geography and natural hazards research (Füssel 2007).

To enable a concise specification, in recent years scholars have increasingly referred to the definition proposed by the Intergovernmental Panel on Climate Change (IPCC), which has come up with an attempt to formalise a definition of vulnerability to climate change. The IPCC proposes that vulnerability is “the degree to which a system is susceptible to, and unable to cope with, adverse effects of *climate change*, including *climate variability* and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its *sensitivity*, and its adaptive capacity” (2007:883, emphasis in the original text).¹⁶

Two relevant aspects of vulnerability are mentioned by a number of scholars, which are also present in the IPCC definition: First, a distinction between the external and the internal side of vulnerability, the latter referring to the vulnerable system itself.^{17,18} Second, and closely related, a separation of socio-economic from biophysical factors. While traditionally the hazard or

¹³ Others include “natural hazards and disaster management, ecology, public health, poverty and development, secure livelihoods and famine, sustainability science, land change, and climate impacts and adaptation” (Füssel 2009:3).

¹⁴ There is a lack of cohesion in a common conceptual framework. It would, however, not be possible to do an exhaustive review of the range of theories of the vulnerability context and their various schools in this paper. Thus I will simply discuss a few recent key approaches. For a more extensive discussion of the different conceptual frameworks, see Adger (2006) and Füssel (2007).

¹⁵ While the topic enjoys broad popularity among scholars in Europe, North America and Australia, academic contributions from developing countries are still an exception (Janssen et al. 2006).

¹⁶ Vulnerability does not have to be imperatively negative. Gallopín (2006:295) discusses cases where vulnerability can have a positive outcome leading to a beneficial transformation in the long-term “[...] such as the emergence of a given social group from chronic poverty or the collapse of an oppressive regime”.

¹⁷ In the case of climate change it is debatable whether the stress can be classified as internal, external, or both. This discussion, however, is beyond the scope of this paper.

¹⁸ The distinction between internal and external aspects of vulnerability has been criticised amongst others by Robins (2010) who proposes a causality-based integrative approach to vulnerability.

external stressors have been studied by natural scientists, recent research has increasingly included perspectives from social sciences, which examine the internal, socio-economic side of vulnerability (Bohle & Glade 2008; Füssel 2007, 2009).

Although the debate is still ongoing, scholars are consistent in that there are several central concepts related to vulnerability. In line with this, in the most recent report of the IPCC (2007), vulnerability to climate change is broken down into three parameters: *Exposure*, *sensitivity* of a system to the impact and its *ability to cope* (also referred to as adaptive capacity). The three parameters are depicted in Figure 2.1.¹⁹ The arrows indicate that all three influence each other and their interplay determines the vulnerability of a system.

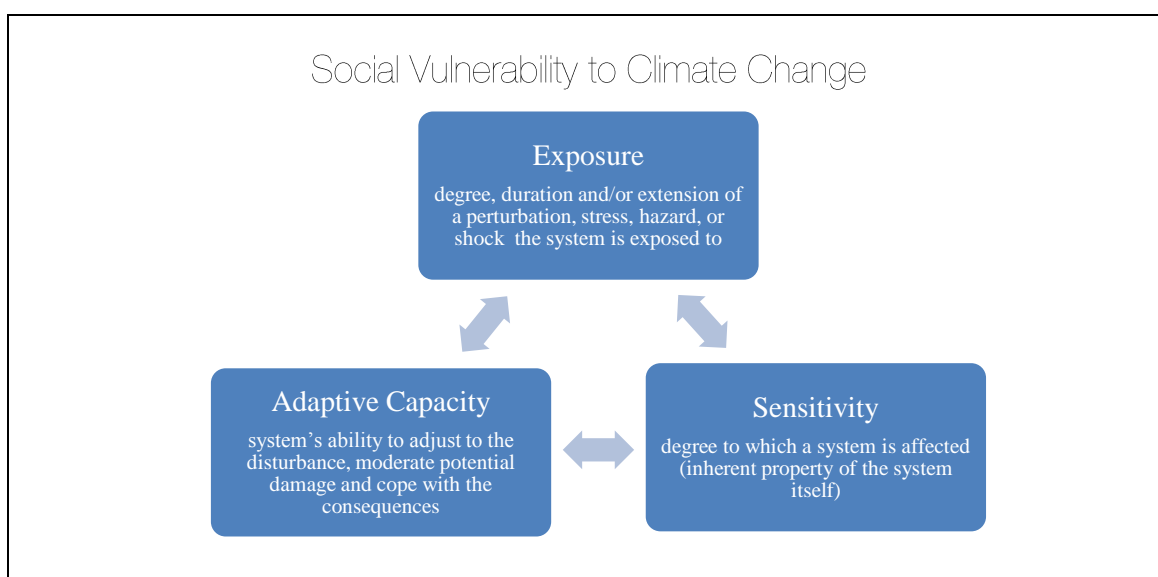


Figure 2.1: Framing vulnerability to climate change.
(Source: Own representation, partly based on Gallopín 2006; IPCC 2007).

According to Gallopín (2006) the parameter *exposure* of a system refers to the degree of a perturbation, stress, hazard or shock, which causes a significant transformation or change to a system, and can happen suddenly or over a longer period of time. Here, the magnitude, frequency and duration play a decisive role.²⁰

While the definition of *sensitivity* varies among authors, it is here defined as the degree to which a system is affected or modified by a disturbance, in our context by climate variability or change. This effect may be either adversely or beneficially as well as direct or indirect and is often linked to a specific location (Gallopín 2006; IPCC 2007).

As Turner et al. (2003:8075) proclaim, “[s]ocial units [...] have different coping capacities, which enable them to respond to the registered harm as well as to avert the potential harm of a hazard”. This third element, *adaptive capacity* (or adaptability) relates to the system’s potential

¹⁹ Some authors externalize exposure as a component of vulnerability, see Gallopín (2006).

²⁰ There exists no concise definition of how thorough the change has to be to be declared as such, see also Gallopín (2006).

or capacity to react to the impacts or transformations related to climate change, moderate potential damages, take advantage of opportunities, or cope with the consequences. More generally, it describes a system's ability to accommodate or deal with exposure or risk (Gallopín 2006; IPCC 2007).²¹ Or, as Adger (2006:270) has put it, "the ability of a system to evolve in order to accommodate environmental hazards or policy change and to expand the range of variability with which it can cope".

Locally, adaptive capacity can be shaped "[...] by such factors as managerial ability, access to financial, technological and information resources, infrastructure, the institutional environment within which adaptations occur, political influence, kinship networks, etc." (Smit & Wandel 2006:287). It refers to the social constellations present that have an impact on the outcome of a certain change. While some decisive factors are set at the local scale, adaptive capacity is also reflected in broader conditions at wider scales, such as the political or the socio-economic system (Smit & Wandel 2006).

Thus, a human system, for example a household, which highly depends on the ecosystem it lives in, will be more *sensitive* to hazards than a household which is less dependent.²² At the same time, a household which is more exposed to hazards will also be more vulnerable, and if the adaptive capacity is high the vulnerability is low (Smit & Wandel 2006).²³ Consequently, as Füssel (2007:156) argues, "[...] 'vulnerability' can only be used meaningfully with reference to a particular vulnerable situation".

It is important to note, then, that vulnerability cannot be generalised. Rather is it closely linked to a place as well as to a specific system. Vulnerability is never static, meaning it is a dynamic concept which changes over time according to the stimulus and its impact, its sensitivity and response of the system (Smit & Wandel 2006). Adger (2006:274) appropriately describes vulnerability as "[...] a dynamic phenomenon often in a continuous state of flux both the biophysical and social processes that shape local conditions and the ability to cope are themselves dynamic". Another important aspect which is often overlooked is the fact that even within one community, the individual vulnerabilities can vary to a great extent: "The poor and wealthy, women and men, young and old, and people of different social identities or political stripes experience different risks while facing the same climate event" (Ribot 2010:49).

There are several difficulties related to the research of social vulnerability or vulnerable systems. According to Adger (2006) these include the measurement of vulnerability, the

²¹ Adaptive capacity is not to be confused with 'adaptness', which refers to the state of adaptation of an organism to a status quo in the environment, e.g. a species of bird, which is well adapted to a highland ecosystem (Gallopín 2006).

²² This is not to say, that developing countries are imperatively more vulnerable. People might actually have developed thorough coping mechanisms, based on traditional local knowledge and a long experience with climatic variability, thus reducing their vulnerability.

²³ An illustrative example referring to flood in a community is presented in Gallopín (2006:289): "The most precarious homes are hit harder by a flood than the solid ones (sensitivity). Oftentimes, the poorest homes are located in the places most susceptible to flooding (exposure). The families with the greatest resources have a greater availability of means to repair water damage (response capacity). The magnitude of the final impact will also depend on the intensity, magnitude, and permanence of the flood (attributes of the perturbation)".

subjectiveness of experiencing vulnerability and surprise and the question of governance. In order to operationalise the vulnerability concept, some scholars have developed so-called ‘vulnerability indices’ in order to carry out vulnerability assessments (Scheffran 2011).²⁴ These quantitative indicators are designed to enable a comparison between different regions or states, but their usefulness and the robustness of the results have been criticised by a number of scholars (Adger et al. 2007; Haddad 2005).

Another concept which is increasingly common in these debates and often interlinked with vulnerability is ‘resilience’, which points to the ability of a system to absorb disturbances and still retain its original structure and function. Having emerged from a more ecological and natural science–driven perspective, it is closely related to the concepts of vulnerability and adaptive capacity. Resilience research also studies disturbances which a system experiences and its response to the impacts related to its coping capacity. While a resilient system is automatically less vulnerable than a non-resilient one, it is deceptive to understand ‘resilience’ imperatively as an antonym of ‘vulnerability’. This has led to confusion within the scientific community in reference to the similarities and differences between the two concepts (Adger 2006; Gallopín 2006; Renaud et al. 2010).²⁵ For clarity, this thesis solemnly refers to the vulnerability concept. For a detailed discussion of the relationship between vulnerability, adaptive capacity and resilience, see Gallopín (2006). For an overview of the resilience concept as such, see Folke (2006).

2.2.2 Framing Adaptation

The *adaptive capacity* previously discussed sets the framework for *adaptation*, which is the actual act of adjusting human and natural systems, to reduce vulnerability or enhance the ability to respond to actual or expected climate stimuli or their effects.²⁶ These adaptation decisions take place within an institutional context, which can act either to facilitate or constrain adaptation (Adger & Vincent 2005). Simplified, the aim of adapting is to ensure that an adequate coping range is established.²⁷ Therefore, the presence of adaptive capacity is a necessary pre-condition for the design and implementation of adaptation strategies.

Obviously, it is important to distinguish what time-scale is considered when referring to adaptation. For the sake of this thesis, we differentiate between *coping* and *adaptation*.²⁸ Eriksen and Kelly (2007:506) criticise that “[w]hile often not explicitly addressed, and often

²⁴ For an extensive discussion of indices see Füssel (2009).

²⁵ While the discussion is necessary and important, it falls outside the scope of this thesis.

²⁶ The term ‘adaptation’ originally derives from the natural sciences, particularly evolutionary biology. It was only later applied to human systems. Similar to ‘vulnerability’ it is now used within social sciences by a number of research traditions such as natural hazards, political ecology, entitlements and food security perspective (Smit & Wandel 2006).

²⁷ The ‘coping range’ can be referred to as the damage threshold to which a system can accommodate, adapt to, and recover from some deviations from ‘normal’ conditions. It varies among systems and regions, does not necessarily remain static (Smit & Pilifosova 2001; Smit & Wandel 2006).

²⁸ While this differentiation is common among scholars, in his study on adapting to drought in the Sahel, Mortimore (2010) challenges this distinction and argues that it has little value in a dynamic and differentiated livelihood context.

assumed to be synonymous, the two are associated with different time scales and represent different processes” (see Tab. 2.1). The first strategy, *coping*, is considered a temporary reactive response, to actually experienced climate variability or stress, such as rainfall variability or drought, whose aim it is to restore a previous state and is rather of short duration.²⁹ They are not necessarily planned or related to global warming as such, rather are they usually involuntary reactions and adjustments. The second, *adaptation*, is associated with longer time scales and points at adjustments as fundamental changes of the systems practices, processes or structures to changes in mean conditions. While the former does not fundamentally alter the system, ‘adaptation’ refers to the establishment of a new coping range and thus a change in the systems state (Gallopín 2006; Mertz et al. 2009; Smit & Wandel 2006). It is important to note that both processes are closely related. Coping mechanisms are an important factor in adaptation. If for example reoccurring stress forces people to constantly apply coping mechanisms, these might develop into durable adaptation strategies (Eriksen & Kelly 2007). If these short-term coping mechanisms have positive outcomes for the communities, they might develop into long-term changes of the human system.

Table 2.1: Differences of livelihood responses to climate change.

(Source: Own representation, based on Gallopín 2006; Mertz et al. 2009; Smit & Wandel 2006).

	Coping	Adaptation
Temporal scope	short-term	long-term
Timing	reactive	anticipatory
Goal	recover, restore a previous state	increase long-term adaptation
Change	short-term adjustments to stress	fundamental change in the system

The IPCC (2007) further distinguishes three types of adaptation: First, anticipatory adaptation (also proactive adaptation), which takes place before the impacts of climate change are experienced. Second, autonomous adaptation (also spontaneous adaptation), which implies an unconscious response to ecological changes in natural systems as well as by market or welfare changes in human systems. Third, planned adaptation, based on an awareness that conditions have changed or are about to change and that action is required to return to, maintain, or achieve a desired state. Figure 2.2 provides an overview of the relation between the different concepts related to adaptation.³⁰

Therefore, one can undoubtedly state that adaptations manifest themselves in a number of forms which is why characterising adaptation and adaptive capacity can be a challenging task (Jones et al. 2010). It can be undertaken by various social agents (e.g. a household, community,

²⁹ A drought is defined as a persistent state of serious hydrological imbalance (deficiency) that thoroughly affects land resources and production in a certain area, caused when precipitation is consistently below normal recorded levels (IPCC 2007).

³⁰ All these adaptation types refer to individuals or societies. In contrast to them, biological adaptation is always reactive (Adger et al. 2007).

government, or state actor) and occurs at multiple scales (e.g. local, regional and national). An example of how to characterise different adaptations according to numerous attributes is provided by Smit and Pilifosova (2001), outlined in Table 2.2. The concept can be differentiated by timing or degree of planning involved. Following the terminology proposed by the IPCC it can be either anticipatory or reactive in response to impacts, and, depending on the degree of spontaneity, can be autonomous or planned (Adger & Vincent 2005; Jones et al. 2010).

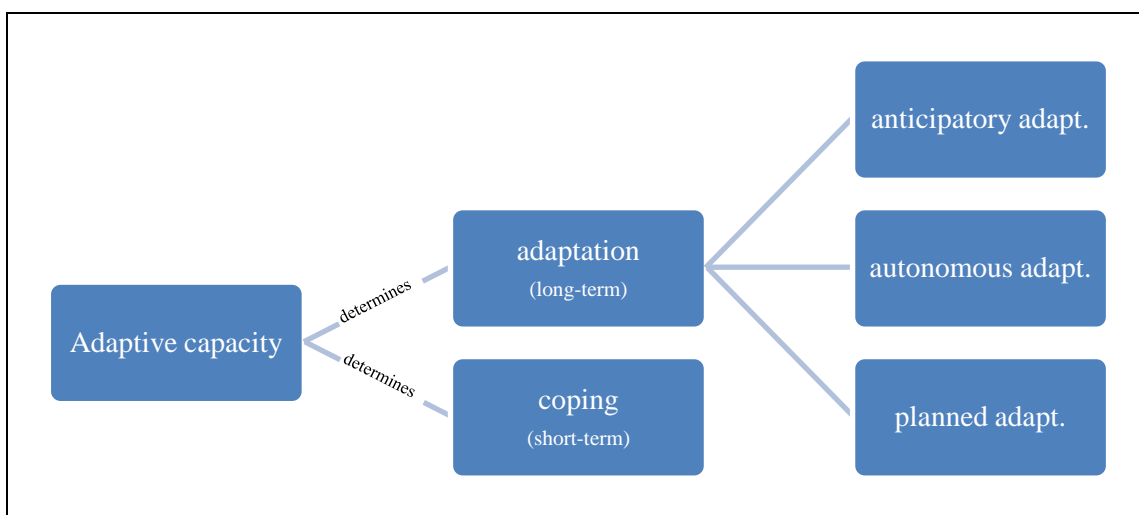


Figure 2.2: Relations between adaptive capacity, adaptation and coping.
(Source: Own representation, partly based on Gallopín 2006; IPCC 2007).

Table 2.2: Bases for characterising and differentiating adaptation to climate change.
(Source: Own representation, adapted from Smit et al. 1999, quoted from Smit and Pilifosova 2001).

General Differentiating Concept or Attribute	Examples of Terms
Purposefulness	Autonomous ↔ Planned
	Spontaneous ↔ Purposeful
	Automatic ↔ Intentional
	Natural ↔ Policy
	Passive ↔ Active
Timing	Anticipatory ↔ Responsive
	Proactive ↔ Reactive
Temporal Scope	Short-term ↔ Long-term
	Tactical ↔ Strategic
	Instantaneous ↔ Cumulative
Spatial Scope	Localised ↔ Widespread
Function/Effect	Retreat – Accommodate – Protect
	Prevent – Tolerate – Spread – Change – Restore
Form	Structural – Legal – Institutional – Regulatory – Financial – Technological
Performance	Cost – Effectiveness – Efficiency – Implementability - Equity

Any human system is continually responding to environmental stress and has developed a coping range, a capacity of a system to accommodate variations in climate conditions (Fig. 2.3).³¹ The core of the coping range contains beneficial outcomes, towards the margins (upper/lower limits of tolerance of the coping range) outcomes become negative but remain tolerable. The graphical representation, as a hypothetical example, illustrates how the coping threshold might be exceeded under climate change, if a specific factor, take for example rainfall, constantly transgresses a hypothetical upper or lower critical threshold. If the ability to cope is held constant and no adjustments are made vulnerability will increase to extreme levels (Option 1).³² Adaptations can ameliorate the adverse effects by widening the coping range (Option 2).

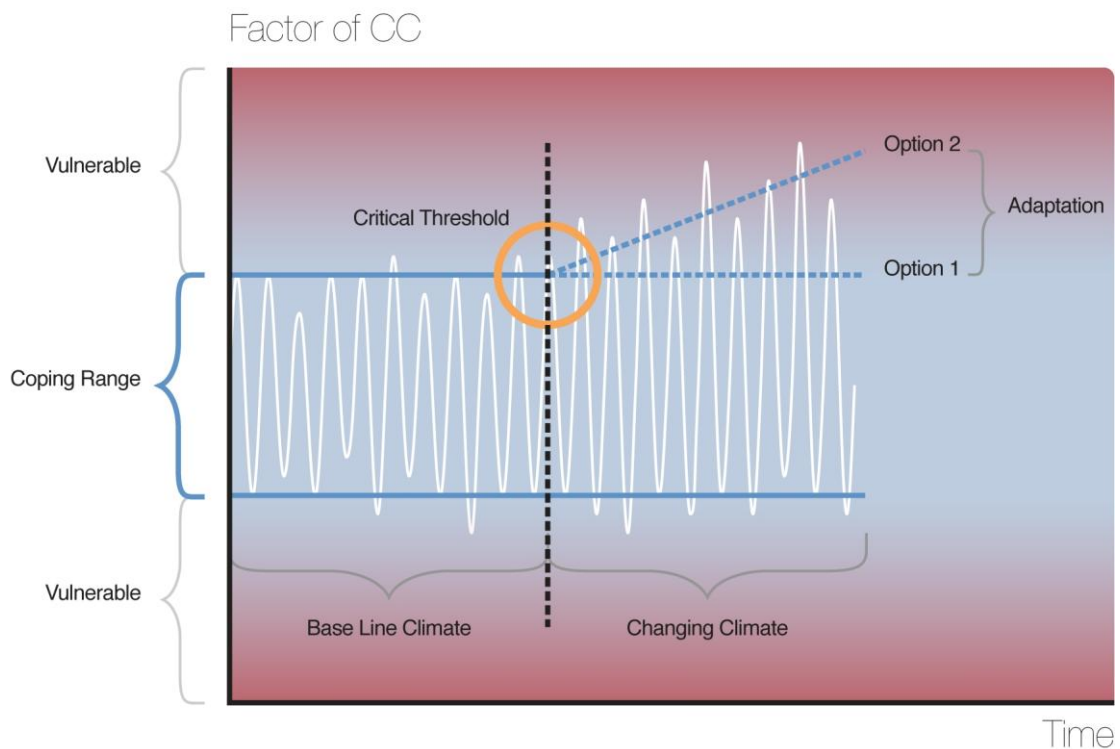


Figure 2.3: Idealised version of a coping range describing the relationship between a factor of climate change and threshold exceedance, and how adaptation can establish a new coping range, reducing vulnerability to climate change.

(Source: Own representation, adapted and expanded from Carter et al. 2007).

As a conclusion of this section it can be stated that adaptation, while occurring through actions at local scale, is framed by the adaptive capacity or adaptability. Likewise this is set in a broader sphere, which either facilitates or constrains the ability to adapt.

³¹ It is important to bear in mind that the coping range always relates to a specific stressor and system, and not generally to climate change (Carter et al. 2007).

³² This may even hold true when, for example, a pastoralist community is highly adapted to its environmental surroundings, in other words has a wide coping range. Such a community might nevertheless have little internal capacity to adapt to new, changed environmental conditions, stresses and shocks (Robinson & Berkes 2011).

2.2.3 Interpretations of Vulnerability

As discussed above, vulnerability is influenced by a number of factors related to the geographical, hazard- and context-specific, as well as to the socio-political context. Which factors are considered more relevant, depends on the research project as well as on the way research is being conducted. This implies that vulnerability can be interpreted in different ways. Two distinct interpretations of vulnerability have been distinguished by a number of scholars, which are central to keep in mind for they imply different policy responses, namely ‘contextual vulnerability’ and ‘outcome vulnerability’.³³ According to Füssel (2009:4) they “are based on different conceptual frameworks [...] and they suggest different strategies for reducing vulnerability”.

The differentiation between vulnerability as an outcome and vulnerability as a context in which climate risks are dealt with and adapted to, suggested by O’Brien et al. (2007), roughly corresponds to the end-point and starting-point distinction proposed by Kelly and Adger (2000). The differences between the two interpretations are summarised in Table 2.3.

‘Starting-point’ as well as ‘contextual vulnerability’ define “[...] vulnerability as a pre-existing state generated by multiple factors and processes, such as political or economic marginalisation, that conditions the ability to respond to stress” (Eriksen & Kelly 2007:505). Thus, any policy response would aim at reducing vulnerability as part of a broader social development and as such consider the role of rights and entitlements, governance³⁴ and institutions relevant for the internal characteristics of the vulnerable system or community, thereby reaching beyond the immediate impacts of climate change. The ‘outcome’ or ‘end-point’ view sees vulnerability as a linear result of climate change impacts and aims at reducing these direct and indirect impacts, for example through mitigating GHG emissions. It follows that, while the starting-point conceptualisation refers to vulnerability as being rather defined by generic determinants, end-point interpretations connect determinants to a particular context or hazard type (Füssel 2007; O’Brien et al. 2007; O’Brien & Wolf 2010). While both concepts presented above are useful, it is argued here in line with Barnett (2010), that end-point interpretations are of less utility for purposeful adaptation because they tend to overlook local factors that may be as important for adaptation as the biophysical impacts. Such a perspective might reduce adaptation to building local capacity through technological adaptations, such as irrigation schemes or drought tolerant crops, instead of addressing the fundamental causes of vulnerability (O’Brien et al. 2007).

³³ In a recent publication O’Brien and Wolf (2010) have proposed a third, values-based, perspective on vulnerability, criticizing that cultural, psychological, religious, and spiritual factors – in general subjective dimensions of climate change – are often ignored by the other approaches. While being a truly interesting suggestion, it lies beyond the reach of this thesis.

³⁴ ‘Governance’ refers to processes through which we engage with our environment and the rest of society and includes those activities which make a “purposeful effort to guide, steer, control or manage sectors or facets of societies” (Kooiman 1993:2 as cited by Adger et al. 2009:5ff).

Table 2.3: Two interpretations of vulnerability.

(Source: Own representation, adapted and expanded from Eriksen & Kelly 2007; Füssel 2007; O'Brien et al. 2007).

	Outcome/End-point interpretation	Contextual/Starting-point interpretation
Root problem	Climate change	Social vulnerability
Policy context	Climate change mitigation, compensation, technical adaptation	Social adaptation, sustainable development
Illustrative policy question	What are the benefits of climate change mitigation?	How can the vulnerability of societies to climatic hazards be reduced?
Illustrative research question	What are the expected net impacts of climate change in different regions? What can be done to protect the population?	Why are some groups more affected by climatic hazards than others? What can be done to strengthen people's own capacity to respond and adapt? What determines levels of vulnerability?
Vulnerability and adaptive capacity	Adaptive capacity determines vulnerability	Vulnerability determines adaptive capacity
Reference for adaptive capacity	Adaptation to future climate change	Adaptation to current climate variability
Starting point of analysis	Scenarios of future climate hazards	Current vulnerability to climatic stimuli
Analytical function	Descriptive, positivist	Explanatory, normative
Main discipline	Natural sciences	Social sciences
Meaning of 'vulnerability'	Expected net damage for a given level of global climate change → linear result of the projected impacts of climate change on a particular exposure unit	Susceptibility to climate change and variability as determined by socioeconomic factors → processual and multidimensional view of climate–society interactions
Policy intervention	Minimise particular impacts that have been quantified and measured → reducing greenhouse gas emissions (mitigation) Reduce exposure → through technical and sectoral adaptation measures to limit negative outcomes, e.g. introduce drought-resistant seeds or infrastructure changes	broader scope of policy interventions → alter the context in which climate change occurs, so that individuals and groups can better respond to changing conditions

The other, contextual or starting-point perspective proposes that a group's vulnerability is not determined solemnly or primarily by climate, but rather by a range of social, economic and political factors inherent to the system and can be considered key for understanding how countries cope with and adapt to climate change and related variability. According to Brooks et al. (2005:153) "[...] these are developmental factors including poverty, health status, economic inequality and elements of governance, to name but a few". These different generic determinants of vulnerability give a hint at what might be the root causes of a limited adaptive capacity, and thus a foundation on which specific measures for reducing vulnerability and facilitation adaptation can be established. The "[...] assessments of "generic" vulnerability can

tell us how well equipped a country is to cope with and adapt to climate hazards” (ibid. 153).³⁵ From a starting-point perspective, top-down adaptation projects are likely to fail if they leave these structural factors, which frame the vulnerability of a community or household, remain fundamentally unchanged. If adaptation approaches are to be meaningful, the structural factors hindering the advancement of vulnerable groups need to be addressed.

2.3 The Capability Framework

2.3.1 Sen's Capability Approach

In 1999, Amartya Sen, scholar of development and welfare economics, devoting his career to developing norms of justice, published his groundbreaking work ‘Development as Freedom’, drawing together thoughts he had been presenting in lectures and writing about since the early 1980’s (Gasper 2006; Sen 2004). Closely related to issues of social justice, particularly in relation to gender aspects, his approach has captured the interest of many researchers, policy makers and other public actors.³⁶ Pioneering this capability approach, which was further developed by others, Sen’s basic proposition is that development cannot be measured in GDP or other indicators, but that true development requires every person’s access to real freedoms, “[...] freedoms which people have to achieve prioritized outcomes” (Gasper 2006:3).³⁷ Therefore, the goal of development should avoid focussing on economic aspects only, but development should be seen as the expansion of real freedoms that people enjoy. Sen believes that the focus should be on the freedoms generated by commodities, rather than on the commodities seen on their own (Nussbaum 2003; Sen 1999).

Sen (1999) proposes two core concepts, *capabilities* and *functionings*. In his understanding, *functionings* are the things a person might value to do or be in his life, such a being healthy or actively practising a religion. *Capabilities* on the other hand, are the “[...] alternative combination[s] of *functionings* that are feasible for [the person] to achieve” (Sen 1999:75, italics added). The set of capabilities available to a person are the real opportunities, or attainable alternative lives this person has (Gasper 2006). In other words, capability is the freedom of every person to find out which culture and form of life he or she would like to pursue. Accordingly, having the capabilities at one’s disposal, which are necessary to lead a fully functioning life allowing one to choose one’s lives for oneself is essential (ibid.).³⁸ Which

³⁵ If further extended this perspective suggests, that “[...] people are vulnerable to the extent that climate change influences not only their objective, exterior world, but also their subjective, interior world” (O’Brien & Wolf 2010:233).

³⁶ The capability literature is highly diverse and there are several related bodies of work, as for example the climate justice discourse. Presenting a comprehensive overview is beyond the scope of this paper.

³⁷ Following Gasper, who suggests to rather use the term “capability approaches” (2006:16) than speaking of one approach, I here use the term ‘framework’.

³⁸ As one example Sen argues, that a person (a) which chooses to fast might have the same functioning concerning eating habits, but a person (b) who is forced to starve is lacking the capability-set of person (a) and does not have the freedom to choose. “Fasting is not the same thing as being forced to starve” (Sen 1999:76), it is the choice of not eating while there is food available.

functionings a person realises, then, depends upon her own will, but only when the relevant capabilities to function are present, human dignity can be assured. Summarising this thought, capabilities are the frame in which individuals have the opportunity to choose functionings. The relationship between the two concepts is depicted in Figure 2.4.

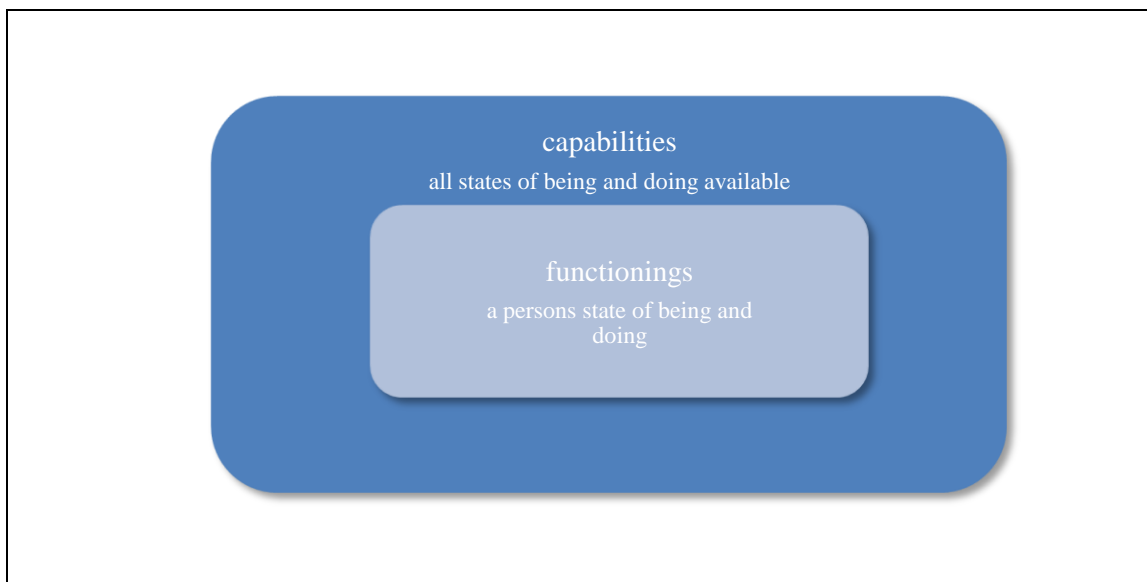


Figure 2.4: Schematic representation of the capability framework.
(Source: Own representation, based on Sen 1999).

While Sen mentions five ‘instrumental freedoms’, such as political freedom, economic facilities, social opportunities, transparency guarantees, protective security, as well as a variety of economic and social rights (1999), he refuses to commit to a core group of pre-set entitlements (Gasper 2006; Sen 2004; Robeyns 2006). Instead he provides a broad list of basic individual, social liberties and freedoms because “[...] pure theory cannot ‘freeze’ a list of capabilities for all societies for all time to come, irrespective of what the citizens come to understand and value” (Sen 2004:78). According to Nussbaum (2003:44), he finds that nations or communities “[...] should be allowed to settle these matters for themselves.”

Having said this, it has to be highlighted that Sen’s approach “[...] is not a theory that can *explain* poverty, inequality or well-being; instead, it provides concepts and a framework that can help to *conceptualise* and *evaluate* these phenomena” (Robeyns 2006:353, italics from original). In other words, it is an evaluative framework. As such the capabilities approach presents an alternative to measures of human development as crude economic indicators of growth, which Sen argues are bad indicators for quality of people’s lives because they tell very little about their actual well-being. It can be used as a tool to evaluate a situation with the real opportunities it offers, to identify people’s real needs and urgent entitlements.

Sen considers “[...] development as the expansion of citizens’ capabilities [...]” (Evans 2002:55) and his ideas have in fact had an impact on the way development is perceived today. While the

GDP as an example of looking at material progress of a country, is still being consulted on the international stage, the formulation of new measures such as the Human Development Index (HDI) used in the Human Development Reports clearly show that Sen's approach has brought about a shift in the mind-set of how to measure quality of life across nations (Nussbaum 2003).

2.3.2 Nussbaum's Supplementation and Critique

Sen's vagueness has been criticised by a number of scholars, who find his ideas under-defined, imprecise and thus lacking applicability (Robeyns 2006; see also Gasper (2006) for an overview of critique). One of them is Martha Nussbaum who condemns his version as being "hopelessly vague" (2003:47), and thus not making the approach really productive for political implementation of basic social justice. She has adjusted Sen's approach and offers a differing version of the theory. Her main critique is the fact that Sen refuses to specify a list of the most central capabilities which are universal for all societies and people and reflect the conception of basic justice. Therefore, she developed a "concrete focus on attainable functionings in a life" (Gasper 2006:1). In contrast to Sen who looks at the freedoms generated by commodities, for Nussbaum the central question when addressing capabilities is the question 'What are people actually able to do and be?' (Nussbaum 2003:36). The ten central human capabilities according to Martha Nussbaum (2003) are presented in Table 2.4.³⁹

While providing a clear list of central capabilities, Nussbaum does not imply that the list is static, rather she indicates that it should undergo a constant validation process in which capabilities can be added or others placed aside (Nussbaum 2003). Concerning the implementation and more precise specification of these universal fundamental entitlements, she leaves it to each community (e.g. a nation) itself to be able to take into account local and cultural differences (ibid.).⁴⁰ This implies that political participation is central, both as an entitlement in itself, and also as a tool for a transfer in implication from theory to practice.

Her version of the approach is just as closely linked to the idea of human rights as Sen's. In her understanding 'capabilities' are "abilities or opportunities to act and choose" (ibid. 25) and as such fundamental entitlements.⁴¹ People should be entitled to the ten capabilities, they are "[...] occasions for choice, areas of freedom" (ibid. 28) people have. This does not necessarily imply that people have to make use of them, meaning that the goal of a state should be that citizens, for example, should have the capability to religious functioning but are not forced to practice a religion (Nussbaum 2003).⁴²

³⁹ For a detailed discussion of the list, see Nussbaum (2003:41ff).

⁴⁰ Other suggestions on how to select the relevant capabilities have been put forward by Sabina Alkire and Ingrid Robeyns, amongst others (Robeyns 2006).

⁴¹ Interestingly, within this general context, economic well-being or financial assets are only figured into the eighth capabilities on Nussbaum's list of central capabilities, it is not explicitly named as a central capability.

⁴² "[...] endorsing the capabilities list does not require [the people] to endorse the associated functioning as a good in their own lives [...]" (Nussbaum 2003:49).

Table 2.4: The ten core human capabilities according to Nussbaum.

(Source: Own representation, based on Nussbaum 2003).

1. Life
2. Bodily Health
3. Bodily Integrity
4. Senses, Imagination, and Thought
5. Emotions
6. Practical Reason
7. Affiliation Being able to live with and toward others Having the social bases of self-respect and non-humiliation
8. Other Species (animals, plants, nature)
9. Play
10. Control Over One's Environment Political Material

By extending the original five capabilities to ten relevant ones she notes as being “[...] central requirements of a life with dignity” (ibid. 40). She argues that the “central capabilities are fundamental entitlements inherent in the very idea of minimum social justice, or a life worthy of human dignity” (Nussbaum 2011:24ff). No central capability is more important than the other, suggesting that if all but one are supported by a government, this still implies that the state fails to act fully just regardless of how eager they pursue the other capabilities (Nussbaum 2003).

Nussbaum argues that these “[...] central entitlements are prepolitical, belonging to people independently of and prior to membership in a state; and they generate constraints that political institutions must meet, if they are to be even minimally just” (ibid. 25). In this point she differs greatly from Sen in that she sees a “conceptual connection” (ibid. 26) between these entitlements (basic human rights) and the responsibility of a nation state. From her point of view, if a state seeks to be just, its central goal and thus its main duty should be to legally enforce and defend the citizens’ ten central capabilities. The reverse conclusion is that a society is unjust unless the capabilities to function are present. A nominal right based in a constitution is worthless without exercising this right in the sense of a citizen’s capability (Nussbaum 2011). Additionally, Nussbaum emphasises that, while it is the duty of any state or trans-global organisation to assure and secure these entitlements for all people, there is also a ‘collective obligation’ (ibid. 26) meaning that they must also be secured by the people themselves.

2.3.3 Capabilities and Climate Change

While, as aforementioned, the capabilities framework originated in welfare economics and development studies, it was further broadened and transferred to other disciplines. Marlene Roy and Henry David Venema (2002) from the International Institute for Sustainable Development in Canada extended this discussion by combining Sen and Nussbaum’s capabilities approach

with the issue of climate change and the ability of women to adapt to it. In their paper, Roy and Venema present a study conducted amongst women in rural India and argue that they are particularly vulnerable to climate change impacts and thus less able to adapt. “The roles and activities of women and men are socially constructed, and gender-differentiated. Climate adaptation and mitigation strategies need to appreciate the different realities of women and men, in order to identify positive solutions for both” (Roy & Venema 2002:78). They conclude that by transferring Sen’s and Nussbaum’s approach to vulnerability assessments, the situation of the rural women can be improved and therefore their vulnerability to the risks of climate change reduced while at the same time enabling them to gain the capabilities necessary to act as their own agents of change.

This connection drawn by Roy and Venema is relatively new and research on possible links between climate change adaptation and the capabilities approach has only emerged recently. Although this thesis does not focus on women, the concept is transferred to climate change adaptation in Kenya. This thesis thereby supports Roy and Venema’s idea, arguing that the capabilities approach can be a helpful tool to analyse the well-being of people and to identify gaps which hinder people to adapt to changes in climate.

2.4 The Sustainable Livelihoods Framework

A third concept that shall be considered here is the livelihoods framework, which gained popularity among development and poverty researchers since the late 1990s (Bohle 2009). Representing a bottom-up perspective on development which is people-centred and promotes participatory principles, it proposes action at community level to address poverty and prevent future vulnerability, rather than concentrating on the government-level (Bohle 2009; Jones et al. 2010). Having said this, livelihood approaches are closely related to the capability framework, as livelihoods provide the basis for the set of capabilities available, while at the same time capabilities enable livelihoods to be gained.

According to the terminology proposed by Chambers and Conway (1991:5), “[a] livelihood in its simplest sense is a means of gaining a living”. More detailed they suggest that, “[a] livelihood comprises the capabilities, assets [...] and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets [...]” (Chambers & Conway 1991:6) while not undermining the natural resource base for future generations. Sustainability is “[...] a function of how assets and capabilities are utilised, maintained and enhanced so as to preserve livelihoods [...]” (Bohle 2009:525). This also implies that sustainable livelihoods are more capable of accommodating shocks and consequently, adapt to climate change.

The promotion of “[...] sustainable livelihood security is very closely connected with the concept of human security, putting people at the centre and taking equity, human rights, capabilities and sustainability as its normative basis [...]” (Bohle 2009:528). If people’s livelihoods are secure, human individuals are also stable and less vulnerable.

Livelihood strategies consist of a range and combination of activities and choices people do to meet their livelihood goals and which together provide a variety of procurement strategies for food and cash. Classical examples consist of agriculture, pastoralism or wage labour (Jones et al. 2010), however, in practice they often consist of “repertoires” (Chambers & Conway 1991:7) or “mixes” of activities, including stinting, hoarding, protecting, depleting, diversifying, claiming and moving (ibid. 11). By their very nature, livelihood strategies are dynamic and changeable over time, adjustable with new knowledge and information, and constrained by resource access. People’s livelihood choices are made under the considerable influence of the governance environment (policies, institutions and processes), as well as the asset base people have. These assets are resources that people can make use of in order to achieve their livelihood goals, extending beyond material categories, and in the absence of them they can hamper livelihoods. The capital assets which are necessary for a livelihood include natural, physical, social, financial and human assets (see Tab. 2.5). Even when people have few assets people possess agency and can take an active role in responding to and enforcing change. Bohle (2009) suggests, that this hints towards „[o]ne of the major strengths of the livelihood approach [in] that it views the poor and vulnerable not as passive victims, but highlights the active or even proactive role to secure their living in contexts of uncertainty, risk, stress and shocks” and as such marks a shift towards actor-oriented perspectives.

Table 2.5: Types of capital assets.

(Source: Own representation, partly based on Jones et al. 2010).

Natural assets	Land, forest products, water, biodiversity
Physical assets	Livestock, shelter, tools, materials, infrastructure like transportation, energy, mechanical inputs
Social assets	Support, influence and other benefits from extended family and other social networks
Financial assets	Income, remittances, access to credit, savings, livestock
Human assets	Education, skills, knowledge, ability to labour, good health

The livelihoods framework can be linked to social entities on different levels (Chambers & Conway 1991), in this thesis it is associated with the unit of the household.⁴³

The linkages between climate change and people’s livelihoods are numerous. On the one hand assets determine how people can react to change and adjust their livelihoods. On the other hand, by impacting ecosystems, a change in the climate can also signify a change in asset status, thus

⁴³ A household includes all members of a human group who share the same hearth for cooking (Chambers & Conway 1991).

putting increasing pressure on households' asset base, particularly of those who have a high dependency on natural resources. Climate change undermines what people do to make a living during normal times, and thus presents a livelihood disturbance, and can even impact livelihood security when the coping range is exceeded under climate change, unless people are resilient to a wide range of perturbations. Additionally, local coping capacities and constraints as well as the adaptive capacity of a household or community depend on the well-being of the people in question and thus their very livelihoods. Livelihood systems can be considered key determinants.

These aspects provide the link between the three concepts. Therefore, the terms 'assets', 'capabilities' and 'adaptive capacity' that the different approaches bring forward overlap significantly, although each approach tends to have a particular focus (Jones et al. 2010). There is often a disconnection between community needs and the policy process, which can be bridged with such a livelihood perspective. As such a framework calls for maintaining or enhancing its capabilities and assets both now and in the future to safeguard livelihood security, it automatically enhances the capacity to cope with climate-related shocks. Livelihoods help understanding vulnerability to climatic risks and provide a useful starting point to relevant adaptation strategies for climate change. Such an approach has been taken amongst others by the Food and Agriculture Organization (FAO) (Selvaraju et al. 2006). The next section identifies the conceptual linkages between the concepts presented above and elaborates the approach used in this thesis.

2.5 Synthesis and Implications for this Thesis

There is growing consensus among the scientific community that anthropogenic climate change will cause transformations in the biophysical systems which will consequently affect ecosystem services, water resources, and food production, all of which are closely related to human livelihoods. Although there is considerable uncertainty about the *degree* of future change, there is consensus that the effects on human systems will have implications for individuals, communities, regions, as well as nations. As individuals and communities are facing both rapid change and increasing uncertainty, it impacts livelihoods and the well-being of people and thus can also have significant implications for human security.⁴⁴ Bohle (2009:525) highlights the fact that „[...] state security will be precarious (and empty) unless based on and consistent with the security of individuals [...]“, thus providing a link between livelihood security and the stability

⁴⁴ Human security, as outlined by O'Brien and Leichenko (2007:3), relates to “[...] the well-being of individuals, including both freedom from fear and freedom from wants. As a concept, human security refers not only to security from physical violence, but also to food security, livelihood security, environmental security, health security and energy security”. Following these lines of thinking, human security applies to the security for the individual, rather than the state. From a capabilities perspective however, in contrast to the perspective of 'freedom from fear and wants, human security implies "freedom to", especially the freedoms to act and to attain" (Bohle 2009:526). Free people Therefore are able to take action on their own behalf.

of a state. However, as O'Brien and Leichenko argue that "[...] the issue of climate change has been widely discussed and debated among scientists and policymakers as an environmental issue, rather than as human security issue".

A link between climate change, vulnerability and development has often been drawn within academia and after making its way into international forums, it has recently begun to influence policymaking and international development programmes as well (Jones et al. 2010; McGray, Hammill & Bradley 2007; Mertz et al. 2009). The achievement of the Millennium Development Goals (MDGs) is seen as being critically dependent on successful adaptation to climate change (Dumaru 2010; Mertz et al. 2009).⁴⁵ The establishment of the 'Adaptation Fund' on international level highlights the fact that adaptation is considered a pressing issue.⁴⁶ In the Third Assessment Report of the IPCC, Smit and Pilifosova (2001:899) already postulated that the "[a]bility to adapt clearly depends on the state of development". But in contrast to understanding development as pure economic development, it is argued here, in line with Sen and Nussbaum, that the development is the freedom of having the capabilities to choose. As such, the enhancement of adaptive capacity involves similar requirements as promotion of sustainable development and equity (Smit & Pilifosova 2001).

The livelihoods framework is useful for understanding vulnerability as it emphasises the importance of looking at an individual's capacity for managing risks, as well as the external threats to livelihood security, such as climate change. There is a close relationship between livelihoods on the one hand and vulnerability and adaptive capacity on the other: Generally people's vulnerability is lower when livelihoods are sustainable (Ribot 2010). Aiming to reduce vulnerability and increase resilience of livelihoods to shocks as well as stresses through development work, also enhances the adaptive capacity (Jones et al. 2010). Thus livelihood adaptation shall be considered particularly relevant, as it enables people to cope for themselves, as Jones et al. (2010:17) suggest, "[a]ll livelihoods interventions therefore have the potential to promote adaptive capacity".

In operationalising the frameworks, it is assumed that climate change exposure has an effect on the people in Kenya, either positively or negatively, depending on the specific vulnerability, which is not only related to the assets people own but also to the "[...] accountability and effectiveness of institutions and, for many population groups, long-term processes of social, economic and political marginalisation. [...] Access to education, health care, agricultural services, justice systems and conflict resolution mechanisms are other key determinants of vulnerability" (Jones et al. 2010:3). Further it is ascertained that people will respond to these

⁴⁵ The Millennium Development Goals (MDGs) form a blueprint by the target date of 2015 agreed upon by all UN member states as well as development aid agencies which includes eight goals, ranging from fight extreme poverty to reducing the spread of HIV/AIDS and providing universal primary education (Sørensen et al. 2009).

⁴⁶ The Adaptation fund is a financial instrument which was established under the UN Framework Convention on Climate Change (UNFCCC) by the Parties to the Kyoto Protocol, to finance concrete adaptation projects and programmes in developing countries which are Parties to the Kyoto Protocol.

changes in climate, if they have sufficient adaptive capacity to do so. This nested nature of decision-making regarding adaptation and coping, is embedded in the social, economic, institutional and political structures against which the adaptive response will be played out. People can cope, if they have a certain level of human and social capital and alternative economic activities are present, in other words, have the ability to shift to other economic activities in response to for example reduced agricultural income resulting from adverse climatic conditions such as drought, or cope in a different way. Or as Adger and Vincent put it, “[a]daptive capacity in effect gives a picture of the adaptation space within which adaptation decisions are feasible [...]” (2005:401). This may apply for an individual, household or community. Thus it is essential that people have the opportunity to determine the adaptations necessary for functioning in their own communities.

In an early paper by Adger and Kelly (1999) a link between entitlements and vulnerability was already drawn. Following their lines of thinking, this thesis argues that it is important to consider the ‘entitlements’ people have, the framework which determines their ability to respond and cope with climate stressors. This structural framework either facilitates or constrains people’s ability to react. But whereas Adger and Kelly used the term ‘entitlements’ to define material assets, here it is referred to Nussbaum’s extension of the capabilities approach which also considers non-material aspects of human welfare and propose that the ten capabilities (and maybe even more factors not on her list) are crucial for enabling people to respond to changes in the climate. Examining vulnerability to climate change through a capabilities framework broadens the perspective and draws the attention towards the core problems hindering the ability of people to respond.⁴⁷ This study follows an entitlement-based explanation of vulnerability, which highlights the role of institutions, people’s well-being, class, social status and gender as key variables.

Against the dominant emphasis on outcome vulnerability, often interlinked with a top-down approach, this paper suggests a search for adaptation options at the local scale, in combination with the capabilities approach and the livelihoods framework. By doing so, it pursues a starting-point perspective on vulnerability, arguing that conditions beyond the simple socio-economic factors mediate the capacity to adapt. Adaptation, then, is a concrete expression of adaptive capacity. Preparing a country such as Kenya for future changes in climate should omit simply focussing on robust adaptations, but on enhancing adaptive capacity, for example by promoting policies that support livelihoods as well as strengthening the institutions that enable populations to access and support livelihoods assets. Along this line Jones et al. (2010:17) have suggested that “[t]he characteristics of adaptive capacity are also closely linked with some elements of the livelihoods framework, as both emphasise the need to consider a variety of assets, as well as

⁴⁷ It is important to note here that the capabilities approach transferred to climate change adaptation does not simply refer to individual capabilities, but also community capability and functioning.

accountable institutions as part of good governance”. Often climate change adaptation projects tend to focus on risk or vulnerability assessments and mainstream climate change at the sector or macro level (Dumaru 2010). But as argued, it is the community level scale where climate change will be experienced most by people, and to which they will have to adapt.

Following these lines of thinking, the proposed conceptual framework and terminology of Nussbaum and Sen can not only be applied to the climate change context, as done by Roy and Venema, but the differentiation between adaptive capacity and adaptation corresponds to the distinction in capabilities and functionings proposed by Sen and others as adaptation processes are specific to the social, economic and political context in question.⁴⁸ Operating within the vulnerability context, people choose and implement livelihood strategies under the considerable influence of policies, institutions and processes. The similarities of the two concepts are summarised in Figure 2.5. Both assume a necessary precondition, from which actions may result. Figure 2.6 summarises the conceptual framework of this thesis.

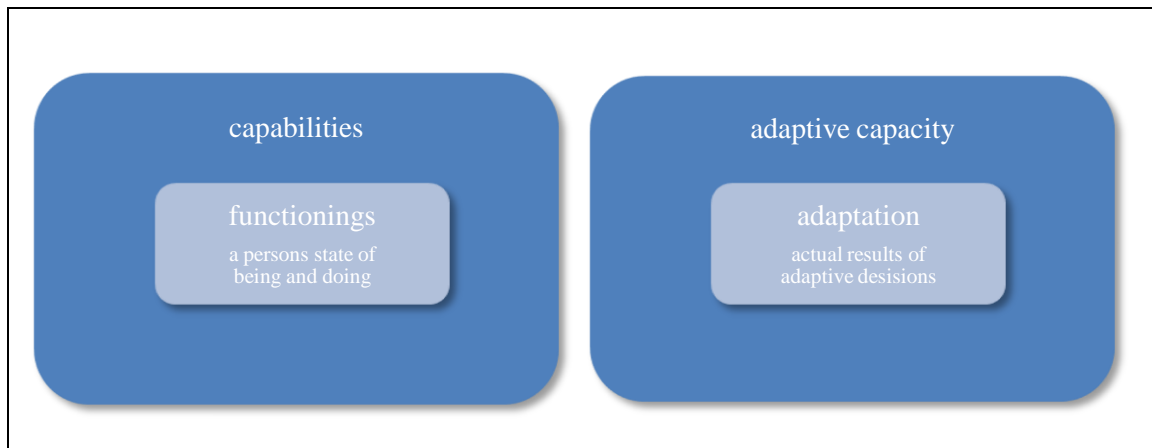


Figure 2.5: Conceptual similarities between adaptive capacity and the capabilities framework.
(Source: Own representation).

⁴⁸ Adger and Vincent (2005:400) argue that “[g]overnment policies and individual adaptations are not independent of each other – they are embedded in governance processes that reflect the relationship between individuals, their capabilities and social capital, and the government”. Following these lines of thinking, I argue, that governance structures within a country are key for adaptive capacity.

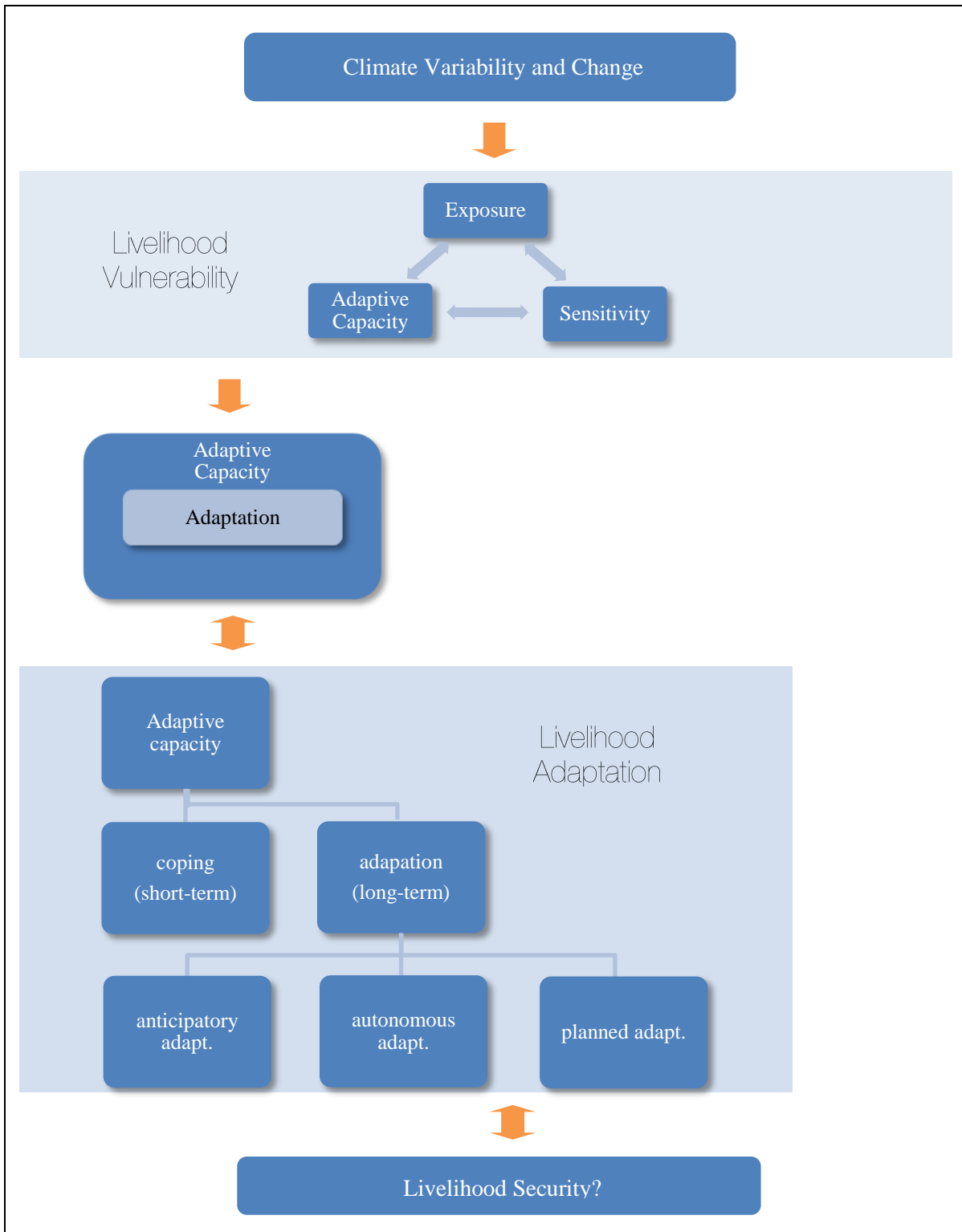


Figure 2.6: Conceptual framework of this thesis.
 (Source: Own representation).

This overview of relevant literature provided the theoretical background for the work presented in this thesis. The next chapter will indicate the methodology used in this study.

3 Methodology - Operationalising the Framework

3.1 Introduction

The goal of this chapter is to discuss the methodology used in this study to address the aforementioned objectives of this study, namely (a) the identification and examination of the climate change related impacts on Kenyans, (b) the stakeholders understanding of what people lack to improve their coping mechanisms to the changes and (c) the examination and vision towards possible policies and institutions to climate proof vulnerable areas in Kenya.

The information required to meet the objectives of this study included general data and information on climate change in Kenya and the national setting, but at the same time, specific information on the impacts on the ground in local communities. To tackle these aims the study methodology consisted of a range of qualitative methods such as literature review, internet research, analysis of secondary data, as well as stakeholder interviews.

The first phase involved a literature research to obtain theoretical background information on climate change vulnerability, adaptation, capabilities, the livelihoods perspective, and Kenya in particular, as well as on the method applied. Sources of information included research articles in peer-reviewed journals, official government reports by the Kenyan government as well as international reports from organisations such as the United Nations, the World Bank, international NGOs and other documents relevant for the topic.

As the issues in question touched the very livelihoods of the people, their perceptions and problems as well as their suggestions for policymaking, this study preferred a qualitative over a quantitative approach. Therefore, the second phase of the research consisted of a field-based quantitative study to understand the factors which shape vulnerability, coping strategies and limit adaptive capacity. Interviews were carried out with nineteen interviewees in Nairobi, Kenya. There are very few assessments that have attempted such an analysis at the national scale in Kenya, literature either highlights the theoretical concepts or goes into detail focusing on one small area of Kenya. There is a lack of studies trying to bridge these bodies of work. Thus this thesis provides a preliminary stakeholder analysis on which further studies can be built. The next section will highlight how participants for the interviews were selected.

3.2 Setting, Sampling and Description of Participants

The primary research was undertaken during fieldwork in Kenya, which was conducted in the country's capital, Nairobi and ran for 5 ½ weeks from March 21st until May 1st 2011. Primary research involved the collection of data through semi-structured interviews.

Instead of exploring the regional and local context, it was attempted to pursue interviews with a broad variety of stakeholders at national level, such as officials and staff members of government bodies, the scientific, and business community and local, national and international NGOs as well as CBOs. By interviewing stakeholders from a wide range of groups, it was aimed at both, getting insights into constraints and opportunities of people as well as a comprehensive picture of the demands, needs and expectations of stakeholders concerning adequate policymaking in the county, thus bridging the gap between both international and local expertise.

Following Gläser and Laudel (2009), interview partners for expert interviews should be chosen by answering four core questions: 1) Who has the relevant information?; 2) Who is most likely to be capable of providing accurate information?; 3) Who is most willing to give information?; and 4) Who is available for an interview? Therefore, prior to the fieldtrip suitable informants were sought-for purposefully according to these criteria via internet research. Once a potential informant was identified, contact was made via email with a letter of introduction informing about myself, the research project and spelling out the frame of a possible interview and asked who else they would recommend to contact. As the received feedback from the emails was very limited and finding interview partners willing to participate was challenging, the question of gaining access to people proved to be the most difficult one.⁴⁹ However, once the research got started with only a few initial contacts, subsequent contacts were made through 'snowballing' with respondents' recommendations during the ongoing research, corresponding to the method described by Reuber and Pfaffenbach (2005).⁵⁰ Although bringing the process forward, as a result, it may be possible that sampling bias has resulted in a set of respondents that are more connected and informed than others.

In Nairobi, interview partners were informed about the topic of the research and the particular interest in having them specifically as informants either per email or telephone. When possible, a short research outline with the central questions guiding the interview was forwarded to them by email, to enable them to prepare for the meeting.

During the fieldtrip in Nairobi, nineteen semi-structured interviews were carried out in total (see Tab. 3.1). Interviews lasted between twenty minutes and over two hours. Additionally, one conference of the Kenya Climate Change Working Group (KCCWG) was attended. Interview

⁴⁹ Interestingly this method of contacting possible interview partners via Email did not seem to work either for the topic or within the Kenyan context. Thus prior to the fieldtrip no meetings could be arranged, wherefore I had to adjust the sampling and remain fairly open, allowing for maximum flexibility and following new leads during the fieldwork.

⁵⁰ Sometimes also referred to as 'snowball sampling' or 'chain sampling'.

partners came from research institutions, such as the Institute of Diplomacy and International Studies (IDIS), the Institute of Geography and the Department of Meteorology, all at the University of Nairobi. Local NGOs & CBOs included Eco-Build Africa Trust, the Mainyoito Pastoralist Integrated Development Organization (MPIDO), the Ecological Society for East Africa, the National Council of community-based organisations and Kariobangi South Welfare & Slums Housing Association (KASWESHA Housing Cooperative Society). The group of international organisations was represented by Practical Action, Norwegian Church Aid, Oxfam, ActionAid International Kenya, Heinrich Böll Foundation East & Horn of Africa, UNDP and UNEP. Government related bodies included the Kenya Meteorological Department and actors from the national level involved Kenya Climate Change Working Group (KCCWG), Kenya National Federation of Agricultural Producers (KENFAP) and the Pan African Climate Justice Alliance (PACJA). For a detailed overview of the interview partners see Annex A.⁵¹

Table 3.1: Organisations represented by the interview partners.

Organisations of Interview Partners		
	International/Regional	National
Research Institutions		<ul style="list-style-type: none"> Institute of Diplomacy and International Studies (IDIS) Institute of Geography Department of Meteorology
International Organisations	<ul style="list-style-type: none"> UNDP UNEP 	
NGOs	<ul style="list-style-type: none"> Ecological Society for East Africa Practical Action Norwegian Church Aid Oxfam ActionAid International Kenya Heinrich Böll Foundation East & Horn of Africa 	<ul style="list-style-type: none"> Eco-Build Africa Trust Mainyoito Pastoralist Integrated Development Organization (MPIDO)
CBOs		<ul style="list-style-type: none"> National Council of community-based Organizations Kariobangi South Welfare & Slums Housing Association (KASWESHA Housing Cooperative Society)
Government related bodies		<ul style="list-style-type: none"> Kenya Meteorological Department
Others		<ul style="list-style-type: none"> Kenya Climate Change Working Group (KCCWG) Pan African Climate Justice Alliance (PACJA)

While fieldwork has covered a wide spectrum of important stakeholders, there is a bias towards international and national NGOs and there were hardly any government representatives covered. This is due to the fact that none of the representatives contacted, such as Members of Parliament

⁵¹ This does by no means imply, that the interview partners' opinion is demonstrative of group/organisation opinion (they are members of), they do not represent the Kenyan public, nor does it mean that the essence of the interviews represent the truth about climate change in Kenya.

or Officers at the Climate Change Coordination Unit at the Prime Minister's Office were available for an interview. Additionally, as research emphasised on livelihoods and well-being, therefore, the business community was not considered central to this study. This should be kept in mind as it may affect the findings.

3.3 Expert Interviews and Specific Procedure of Interviews in this Thesis

This study delves into climate change related impacts on people's lives in Kenya, their coping strategies and possible improvements in national policies. For several reasons relevant information could not be obtained from research journals: 1) Although droughts and famine have been present in Kenya for decades, climate change adaptation has emerged to the desks rather recently and is in itself rather novel, the field of research has not been intensively studied so far; 2) Although Kenya can be considered to be comparatively well studied, there are no investigations regarding the specific area of interest. Thus, interviews were important for supplementing information available in written sources, allowing the consideration of livelihoods, poverty, localised climate impacts and coping strategies which are often left out entirely or only touched marginally in official documents and reports. While a comprehensive community-based vulnerability assessment, which would be ideal to truly undertake a participatory, 'bottom-up', experience-based assessment, was not possible under the time and resource constraints of this thesis, a partial analysis was conducted with available interview partners working on the ground. The expert interview method was thus chosen to gain undiscovered information from stakeholders involved in climate change adaptation issues, otherwise inaccessible. In line with Dunn (2008) reasons for conducting interviews, for this study were to a) fill a gap in knowledge that other methods are unable to bridge efficaciously, b) investigate complex behaviours and motivations, c) collect a diversity of meaning, opinion and experiences.⁵²

In an expert interview, 'experts' are presented with questions in a theme-focused conversation to which they can answer and comment freely (Mieg & Näf 2005). The focus lies on the factual connections regarding the related subject matter, in this case stakeholder views on climate change impacts and adaptation needs in Kenya. The term 'expert' in this research project is understood in reference to Mieg and Näf (2005) who suggest that an expert is a person who disposes of specific competence/knowledge in/of a certain field due to many years of experience.

⁵² In some cases it can be particularly useful to conduct interviews, when a method is required which shows respect for and empowers those people who provide the data, in contrast to simply being observed or if they were completing a questionnaire (Dunn 2008). While this would have been the case if I had interviewed people directly affected by climatic changes, it was not a motive in this study as I focussed on stakeholders not personally involved.

The interviews were carried out as semi-standardised (or semi-structured). While following the common outline (see Annex B) and thus having to some degree a predetermined order, questions were changed and slightly customised to better suit the specific expert of each interview and ensuring flexible questioning. Mostly open-ended questions were used so the interviewees could relate to what he or she considered being most important - freeing participants from having to make constrained responses from a limited set of options. Leading questions were avoided as far as possible.

Table 3.2: Properties of expert interviews conducted.
(Source: Own representation).

Intention	Gain expert knowledge about the topics of interest
Structuring	Semi-structured
Degree of flexibility	High
Number of participants per interview	One or two
Kind of questions	Mainly open
Way of communication	Oral and face-to-face

Prior to the fieldtrip a catalogue of questions to provide a reference framework was developed. Questions were clustered into thematic groups and brought into a hierarchical structure, to assure that the most important issues would definitely be addressed. The first part of the interviews started with easy-to answer, descriptive questions concerning general matters aimed at getting an overview of the interviewees work and organisation as well as to warm up. This was done by asking introductory questions about the organisation and its aims as well as general questions about observed climate change in Kenya. The second part of the interview continued with more abstract or reflective issues and consisted of open ended questions addressing key vulnerabilities, coping strategies and suggestions for improvement and leaving more sensitive aspects (e.g. concerning the role of the Kenyan Government) to the end of the meeting, thus allowing “[...] for conversational development towards more sensitive issues” (Dunn 2008:85). After a first drafted interview outline the thesis supervisor commented on the interview design which was subsequently reviewed.

Exposure, sensitivities and determinants of adaptive capacity pertinent to Kenyan communities, were identified from interview partners themselves. This part was thus particularly flexible and varied greatly between the different interviews. The final part of the interview consisted of clarifying questions, additionally the interview partners were given the opportunity to mention additional aspects which had not been addressed during the interview as well as ask questions in return. An overview of the interview outline is given in Annex B.

3.4 Procedures

To keep record of the meetings, thirteen of the nineteen interviews conducted, were audio recorded with a dictation machine. Additionally, notes were taken with important details, such as the duration, atmosphere and place of the interview as well as the key points addressed. A short post-scriptum was noted down after each interview the same evening, containing the duration, place, atmosphere and any particularities of the meeting that might be relevant. In cases where recording was not possible or where interviewees expressed concerns, a summarising protocol was taken down instead of recording and a post-scriptum was noted down on the same day of the meeting, a summary reconstructing the interview as precise as possible from the hand-written notes. While this method has the advantage of being less time-consuming than a transcript, it necessarily comes with a reduction of the content of the interview. Since the writer of the protocol decides what is relevant for the research project and which parts can be left out it is already being interpreted and the content reduced in the process. It can thus be described as being a more selective way of processing an interview (Reuber & Pfaffenbach 2005). After the first three interviews, due to new information and experiences obtained, the interview outline was reviewed. Some changes in the wording of questions and focus of sub-topics fed back into a slightly adjusted interview design. Some questions were subsequently left out entirely, such as the question regarding migration for the first three informants had been unable to answer the question and could not relate it to the issue of climate change.

3.5 Data Analysis

After the completion of the fieldtrip, a detailed transcript was written up by the author to prepare for the coding and facilitate further analysis.⁵³ Subsequently a coding process categorised data in terms of research questions and emergent themes. Coding was used in this study to reduce and organise the collected data of the interview transcripts and to develop an analytical structure. Coding was used in the sense of Meghan Cope who defines coding as “[...] a way of evaluating and organising data in an effort to understand meanings in a text” (Cope 2010:441). It helps to reduce the complexity of qualitative data which in the beginning is difficult to interpret, chopping the large amount data into manageable packages. It provides a first access to the data and helps the researcher to become more familiar with the self-generated information. With its help, the researcher can identify patterns and themes in the conducted interviews, also enabling her to make new connections and develop new questions which

⁵³In this study it was abstained from producing a verbatim transcript, including nuances of accent and non-verbal communication. Owing to time and scope of this work no ethnographic moments of the interview were considered relevant for the research questions, nor did the author aim at conducting a discourse analysis. An exact textual replication would have made a search for key-terms (if noted down in vernacular) difficult. Additionally, as a number of scholars have pointed out, an exact transcript might portray informants “in a way that reproduces negative images and stereotypes” (Dunn 2008:99), this being particularly the case with a local vernacular or differences in grammar.

otherwise would hardly be possible. Cope understands coding not as something “[...] that is done *after* data collection; rather, the practices of data collection and analysis can be seen as blending together, affecting each other, and, through their mutual impact, they help contribute to more rigorous conclusions” (ibid. 442).

In this research project the software MAXQDA⁵⁴ was used to assist in identifying emerging trends from the transcripts and summarising protocols and in aiding the data interpretation to formulate themes. It is important to note, that these computer-based programmes are not for analytical purposes, but rather for supporting the structuring and organisation of text-based material (Diaz-Bone & Schneider 2003). Although computer-based, the coding itself was done manually. The coding did not follow a linear path, codes were rather tentative: Some of the initial sets of codes preliminary developed were extended, subcategorised or merged into new categories with other temporary codes, allowing for prejudice-free categorisation.⁵⁵ Additionally, the programme facilitates a comprehensive documentation, thus encouraging an enhanced transparency of the research process (Diaz-Bone & Schneider 2003). To follow up on the coding process so called ‘memos’ were taken down, allowing for reconstruction and understanding of the formation of categories and subcategories. A final coding system was developed in this circular analytical process. The final codes merged into certain themes (e.g. ‘coping strategies’), and then all similarly coded sections were retrieved and exported as text documents to facilitate further analysis. Interview sections, which did not address issues relevant for the research questions were not coded and thus left out in the further analysis (Dunn 2008).

Following the coding process, a manifest content analysis was done to seek meaning from the data. For that purpose, tables were developed following the methodology proposed by Mayring (2002), in order to analyse the content in a three step procedure. An example is given in Table 3.3. For matter of convenience as well as purposes of confidentiality a numbering system was established and interview partners were numbered from IP1 to IP19. Column ‘Interview’ refers to the stakeholder who was interviewed, while ‘Quote’ is the section, on which the paraphrase is based. Occasionally, additional lower case letters, such as ‘a-b’, refer to different sections in the interview where statements on the subject were made. The quotes are listed in full in Annex C. Furthermore the table includes a paraphrase, as well as a generalisation column (Mayring 2002).

Table 3.3: Table structure.

(Source: Own representation, based on Mayring 2002).

Interview	Quote	Paraphrase	Generalisation
IP3	Q1	- Kenya is a water stressed country, sectors that are impacted 1) agriculture (critical in assuring food security), 2) the energy sector (will be severely impacted 70% hydropower), 3) transport	- agriculture, energy sector, transport

⁵⁴ The MAXQDA version used in this study was 10 R160410.

⁵⁵ This process of unrestricted coding was first named ‘open coding’ by Strauss (Cope 2010:445).

3.6 Ethical Considerations

The permission to record the interview was in all cases asked before the interview started. If the informant showed or articulated discontent, the interview was not recorded and only notes were taken down. Interview partners were informed beforehand that should parts of their interview be used in a publication, they would be informed beforehand and asked for authorisation. Due to the numbering system, statements made and opinions given cannot be traced back to the individual interview partners. After completion the report will be made available to those informants who request them.

To contextualise later discussions, the following chapter provides a brief overview of the socio-economic situation in Kenya as well as an overview of the current climate and future projections.

4 Description of the Area of Study - Kenya in Brief

4.1 Introduction

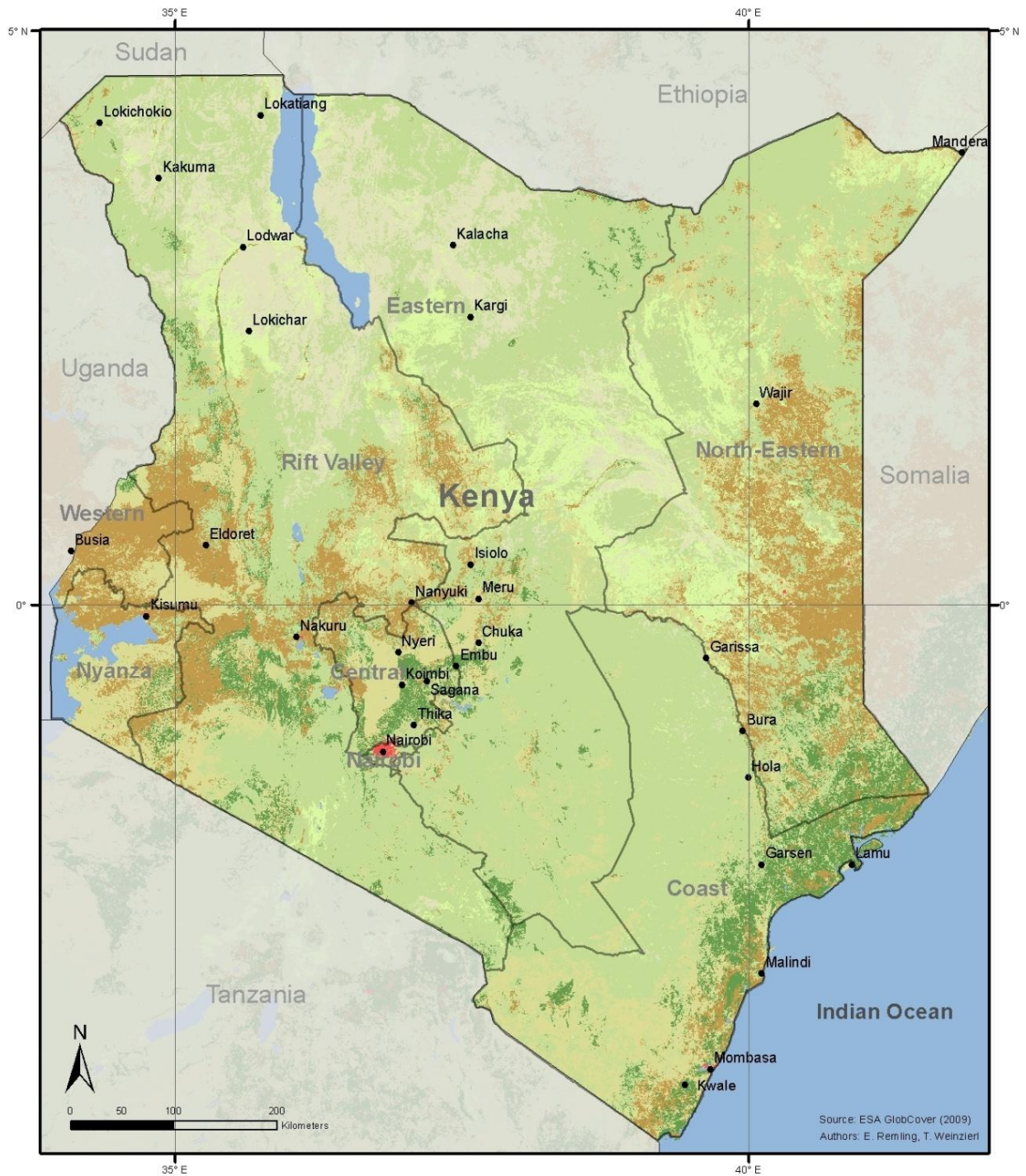
The east African Republic of Kenya stretches from latitudes 6° south to 6° north over an area of 580,367 km² (CIA 2011) and is divided in two equal halves by the equator, which runs about 145km north of its capital Nairobi. As part of the Horn of Africa region, it borders Tanzania in the South, Uganda in the West, Sudan and Ethiopia in the North, and finally, Somalia in the East (see Map 4.1). The two major cities are Nairobi, founded by the British in the central region, with 3.375 million and Mombasa, located at the coast, with 966,000 inhabitants (CIA 2011).⁵⁶ Official languages spoken are English and Kiswahili and numerous indigenous languages, reflecting the country's ethnical diversity. The ethnical groups speak different languages and vary in culture and beliefs, resulting in Kenyan culture being rather regionally based than nationally (Wong, Roy & Duraiappah 2005), with Kikuyu and Luhhya/Luo being the two biggest groups (see also Tab. 4.1) (CIA 2011). Formerly a British colony, Kenya gained independence from the United Kingdom in 1963.

4.1.1 Physical Geography and Natural Environment

Kenya's physical geography has several notable features. The environmental diversity is high, ranging from the Indian Ocean in the East to Lake Victoria's shores in the West, from arid dry lands in Turkana's North to the great plains Mara in the South. The topography is lowest in the coastal plains and slowly rises towards the Kenyan highlands in the West, which are bisected in two by the Rift Valley running from north to south. Kenya's highest point, Mount Kenya, lies in the eastern section of the Rift Valley (HBF 2010; Wong et al. 2005).

As can be seen in Map 4.1, a narrow belt of forest stretches along the fertile area along the coast, additionally, some forested areas extend around central and western Kenya. While fertile grasslands dominate the southwest and forests of the Kenya Highlands, the central northern and north-western parts of Kenya are extremely dry, while most of the inland regions consist of semi-arid, bush-covered plains (HBF 2010; Wong et al. 2005). Around 80% of the country comprises of arid or semi-arid lands, where pastoral farming is the dominant livelihood and nearly half of the livestock population of Kenya are found (UNDP 2007). According to the CIA Factbook (2011), only 8.01% of the land is arable of which in 2008 only 1,030 km² were under irrigation.

⁵⁶ Estimated numbers are given for the year 2009.



Map 4.1: Map of Kenya with vegetation cover.
 (Source: Map created by the author).

4.1.2 The People – Demographics and Human Well-being

The population of Kenya is estimated at around 39 million (CIA 2011), of which about 22% live in urban centres or rural towns, such as Nairobi, Mombasa, Nakuru and Kisumu.

Population density differs significantly, with 80% of Kenyans concentrated on 17% of the land area, with as much as 280 inhabitants or more per km² in western areas of the country where there is a more beneficial climate. The unfavourable areas of the north and northeast are scarcely populated, seldom reaching more than 8 people per km² (Wong et al. 2005).

The average life expectancy at birth is 55 years and 43% of the population is under the age of 15 (UNDP 2011, see also Tab. 4.1). In 2006 30% of the population was undernourished and in 2008 only 59% had access to improved drinking-water sources. Concerning the HDI, Kenya is ahead of all its neighbouring countries in Eastern Africa, but with 0.47 it still counts as a country with low human development and ranks 128 of 169 (UNDP 2011).

Table 4.1: Demographics of Kenya.

(Source: Own representation, data source CIA 2011; UNICEF 2011; The World Bank 2011; UNDP 2011).

Demographics of Kenya	
Population	
Population, total (2009)	39,802,015
Population ages 0-14 (% of total) (2009)	43%
Population ages 15-64 (% of total) (2009)	55%
Population ages 65 and above (% of total) (2009)	3%
Percentage of population urbanised (2009)	22%
Adolescents Population (aged 10-19), as a proportion of total population (%) (2009)	23%
HDI ⁵⁷ value (2010)	0.470
Ethnic groups	
Kikuyu	22%
Luhya	14%
Luo	13%
Kalenjin	12%
Kamba	11%
Kisii	6%
Meru	6%
Other African	15%
Non-African (Asian, European, Arab)	1%
Education	
Total adult literacy rate(2005-2008)	87%
Primary school net enrolment/attendance (2005-2009)	74%
Secondary education, net enrolment ratio, total (2005-2009)	49%
Mean years of schooling (of adults >25) (2010)	7.0 years

⁵⁷ The Human Development Index (HDI) was developed to serve as a frame of reference for both social and economic development, expressed as a value between 0 and 1. It composes of a education component (measured by mean of years of schooling for adults aged 25 years and expected years of schooling for children of school going age), life expectancy at birth, a wealth component and a standard of living component (measured by GNI per capita (PPP US\$)) (UNDP 2011).

Continued Demographics of Kenya	
Health	
Life expectancy at birth (2009)	55 years
Estimated percentage of adults (15-49 years) living with HIV/AIDS (2009)	6.3%
Prevalence of undernourishment in total population (% of population) (2006)	30%
Water and Sanitation	
Percentage of population using improved drinking-water sources (2008)	total 59% urban 83% rural 52%
Percentage of population using improved sanitation facilities (2008)	total 31% urban 27% rural 32%
Labour	
Labour force agriculture (2007 est.)	75%
Labour force industry and services (2007 est.)	25%
GDP	
Composition by sector (2010 est.)	agriculture 22% industry 16% services 62%
GDP per capita average annual growth rate (%) (1970-1990)	1.2%
GDP per capita average annual growth rate (%) (1990-2009)	0.2%
Others	
Number of phones per 100 population (2008)	42
Number of internet users per 100 population (2008)	9
Percentage of population below \$1 a day (1994-2008)	20%
Proportion of seats held by women in national parliaments (%) (2010)	10%
Refugee population by country or territory of asylum (2009)	358,928.0
Refugee population by country or territory of origin (2009)	9,620.0
Pop. affected by natural disasters ⁵⁸ (average per year, per million people) (2009)	94,526

4.1.3 The Economic Dimension

As can be seen in Table 4.1, in 2010 the agricultural sector contributed 22% to the GDP, indicating a high dependency on ecosystems. Industry and services contributed 16 and 62% respectively (CIA 2011; World Bank 2011).

Owing to the diverse physical environment, livelihood conditions are diverse. While the Kenyan Highlands, around Mt. Kenya and the Aberdares “comprise one of the most successful agricultural production regions in Africa” (CIA 2011) and are densely populated, the economic potential varies countrywide depending in the ecosystem types and in “[...] much of northern and northeast Kenya is arid and semi-arid with sparse population” (Wong et al. 2005:6). In these regions pastoralism is the principle mode of production, where people follow seasonal migration patterns in search of pasture for their livestock, mainly consisting of cattle, sheep and goats.

⁵⁸ Natural disasters include droughts, earthquakes, epidemics, extreme temperatures, floods, insect infestations, storms, volcanoes and wildfires (UNDP 2011).

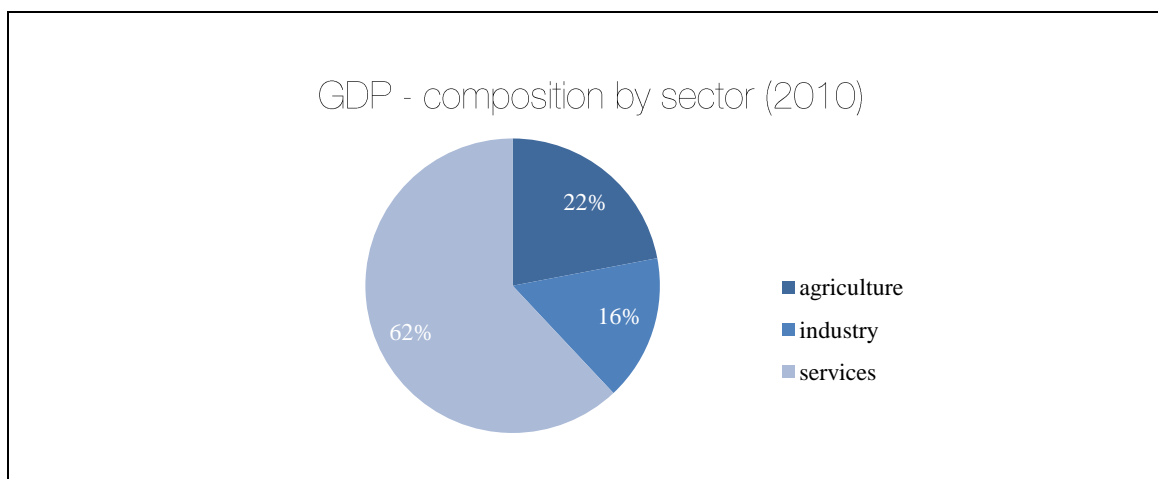


Figure 4.1: Composition of Kenyan GDP (2010).
 (Source: Own representation, data source: CIA 2011).

In 2007 about 75% of Kenyans worked in agriculture, thus depending directly on agriculture for their livelihoods (CIA 2011). As agricultural activity depends directly on biodiversity and ecosystems, it can be considered highly sensitive to climate change, particularly in a dry county like Kenya.

While Kenya’s economic performance exceeds that of most other African countries, poor governance structures, corruption, increasing economic inequality and environmental degradation have deteriorated the benefits. Erratic rainfall and reoccurring droughts have contributed to the negative trend. Wong et al. (2005:8) argue that “Kenya’s economic performance has been hampered by corruption, especially noticeable in the judicial system, and by the reliance on several primary products whose prices have remained low”. The heavy reliance on primary products is reflected in the commodities which are exported, namely tea, horticultural products, coffee, petroleum products, fish and cement. Import products consist of machinery and transportation equipment, petroleum products, motor vehicles, iron and steel, resins and plastics (CIA 2011).

4.2 Climate Characterisation

Kenyan climate is complex and naturally dynamic, including high temporal and spatial variations. Generally, Kenya can be characterised as having a tropical climate, with exceptions being the semiarid to arid areas in the northern regions and inland, towards the eastern edge of the East African Plateau and the Rift Valley, it is moderated by diverse mountain ranges. Average temperatures show strong differences with the temperate central highland (average 15°C) being significantly cooler than the coastal plains (29°C) (McSweeney, New & Lizcano 2008; SEI 2009).

While temperatures vary little throughout the year, rainfall, driven mainly by the southward and northward migration of the Inter-Tropical Convergence Zone (ITCZ), falls seasonally in two rainy seasons (Speranza et al. 2010). The ‘short’ rainy season, starts in October and lasts until December, while the ‘long’ rains fall from March to May, contributing more than 70% of the annual rainfall. The duration and intensity of the rain can vary considerably, but usually during these periods Kenya receives between 50-200mm per month (McSweeney et al. 2008; SEI 2009).⁵⁹

Mean annual rainfall shows a wide spatial variation, ranging from about 200mm in the arid northwest and eastern parts to areas with rainfall between 1200-2000mm in the Central Highlands east of the Rift Valley and on the shores of Lake Victoria. Two thirds of the country receive less than 500mm of rainfall per year and therefore fail to support crop cultivation (HBF 2010). While the whole region is characterised by high inter-annual precipitation variation in the strength and timing of these rains, the variability is highest in the arid and semi arid land (ASAL) areas in the north and north-west (SEI 2009).

Regarding natural hazards, a number are experienced in Kenya, of which the most prevalent ones are mainly weather related. They include floods, droughts, landslides, lightening/thunderstorms, wild fires, and strong winds. Droughts are more common in eastern and north-eastern Kenya, parts of Rift Valley and coast provinces.⁶⁰ Droughts occur on a cyclic basis, with major ones every ten, and minor ones almost every three to four years. Seasonally present floods are experienced in various regions, especially along the flood plains in the Lake Victoria basin in the West and along the Tana, Kenya’s major river (UNDP 2007).

4.3 Current and Future Climate Variability and Change

Kenya has already experienced weather events in terms of floods and droughts which are more frequent and/or intense than previous experiences (GoK 2010). As is argued in this study, the resulting impacts experienced now point to the future consequences on the environment, production systems, and livelihoods. This section will briefly review the observed and projected climatic changes for the region that have been summarised by recent literature.

4.3.1 Observed Climate Trends and Climatic Variability

Available data show that the mean annual temperature in Kenya has increased by 1°C since 1960, in average the warming is 0.21°C per decade. This trend is more significant between March and May, with a rate of 0.29°C per decade, and with 0.19°C per decade comparably less

⁵⁹ Variations in ocean sea-surface temperatures associated with a fluctuation of a global-scale tropical and subtropical surface pressure in the Indian ocean, is termed the El Niño Southern Oscillation (ENSO), which influences movements of the ITCZ and causes rainfall anomalies, which are wetter (El Niño) or dryer (La Niña) than average season (McSweeney et al. 2008; Speranza et al. 2010).

⁶⁰ For a more extensive discussion of drought occurrences and a recent history of natural disasters in Kenya, see UNDP 2007.

in June to September (McSweeney et al. 2008). Concerning spatial variation, the increase in temperatures is relatively higher over the northern parts of the country than in other parts, particularly from October to February (GoK 2010).

In accordance with this, observations of daily temperature show a significant increase in the frequency of hot days, and major increasing trends in the frequency of hot nights. At the same time the annual frequency of cold days has decreased significantly, particularly between September and November, while the frequency of cold nights has decreased more rapidly and significantly in all seasons (McSweeney et al. 2008).

Although some positive rainfall anomalies have been observed over the north-eastern sector of eastern Africa (Sørensen et al. 2009), changes in annual and seasonal rainfall over Kenya remain uncertain, since observations since 1960 show no statistically significant trends. Within the noise of natural climate variability, climate scientists have detected an increasing, however, not statistically significant trend in the proportion of heavy rainfall events (McSweeney et al. 2008).

Table 4.2: Overview of current and future climatic trends in Kenya for two parameters.

Source: Own representation, based on data from McSweeney et al. 2008.

Recent trends		Future trends	
temperature +	precipitation o	temperature +	precipitation +
+ increase	- decrease	o no change	

4.3.2 Future Projections - A Summary of Projected Changes

As for other countries the future impacts of climate change in Kenya are derived from downscaled Global Climate Models (GCM). It has to be acknowledged, that while there is an increasing understanding of climate change and the models themselves are constantly improving, projections of future climate change are associated with significant limitations and difficulties.⁶¹ Mertz et al. (2009:745) highlight that “increasingly reliable regional climate projections are now available for many regions of the world, although the extent of available downscaled projections for many developing countries still lag behind those for the developed world”. One central problem consists in the many gaps and deficiencies in climate records in Africa. Additionally, as Christensen et al. (2007) point out, global models do not include vegetation feedbacks and feedbacks from dust aerosol production.

⁶¹ It is impossible to make precise statements about the exact changes that are going to happen, however, models are robust in that the Kenyan climate is going to change. It is essential to recognize this uncertainty, not to ignore it.

Generalising the impacts of climate change in Kenya is impossible, as regions will be affected differently and there is considerable uncertainty regarding the precipitation patterns.⁶² Despite these uncertainties, the next section will give an overview about the projections in temperature, precipitation and extreme events as provided by the current estimates.

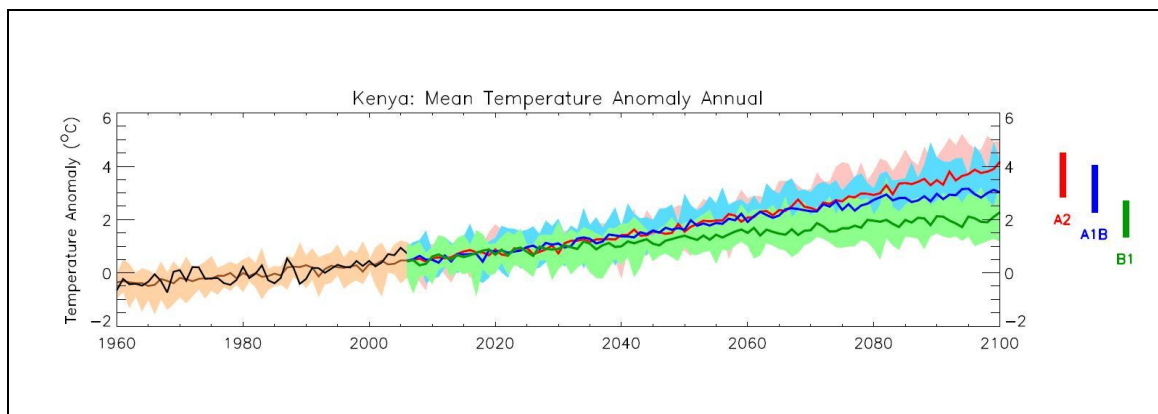


Figure 4.2: Trends in annual and seasonal mean temperature in Kenya for the recent past and projected future (relating to three IPCC emission scenarios). All values shown are anomalies, relative to the 1970-1999 mean climate.⁶³

(Source: McSweeney et al. 2008:7).

Christensen et al. (2007) project that throughout the continent Africa is very likely to experience a warming trend during this century, with drier subtropical regions warming more than the moister tropics, whereas the degree is very likely to be larger than the global, annual mean. In line with this, regarding temperature in Kenya, as can be seen from Figure 4.2 and 4.3, positive temperature changes are projected. The mean annual temperature is estimated to increase by 1.0-2.8°C by the 2060s, and 1.3-4.5°C by the 2090s. The frequency of days and nights that are considered ‘hot’ in current climate is also projected to increase (McSweeney et al. 2008).⁶⁴ Additionally, “[a]ll projections indicate decreases in the frequency of days and nights that are considered ‘cold’ in current climate. These events are expected to become exceedingly rare, and do not occur at all under the highest emissions scenarios (A2 and A1B) by the 2090s” (McSweeney et al. 2008:3).^{65,66}

⁶² “Model simulations show wide disagreements in projected changes in the amplitude of future El Niño events (Christensen et al. 2007). East Africa’s seasonal rainfall can be strongly influenced by ENSO, and this contributes to uncertainty in climate projections, particularly in the future inter-annual variability, for this region” (McSweeney et al. 2008:3).

⁶³ The „Black curves show the mean of observed data from 1960 to 2006, Brown curves show the median (solid line) and range (shading) of model simulations of recent climate across an ensemble of 15 models. Coloured lines from 2006 onwards show the median (solid line) and range (shading) of the ensemble projections of climate under three [IPCC SRES] emissions scenarios. Coloured bars on the right-hand side of the projections summarise the range of mean 2090-2100 climates simulated by the 15 models for each emissions scenario” (McSweeney et al. 2008:7).

⁶⁴ “The temperature threshold for a ‘hot day’ in any region or season is defined by the daily maximum temperature (TX) which is exceeded on the 10% warmest of days in the standard climate period (1970-99)2. The TX90p index is then defined as the frequency with which daily maximum temperature exceeds this threshold in any month, season or year” (McSweeney, New & Lizcano undated:5).

⁶⁵ Emissions scenarios represent “plausible representation[s] of the future development of emissions of substances that are potentially radiatively active (e.g., greenhouse gases, aerosols), based on a coherent and internally consistent set of assumptions about driving forces (such as demographic and socio-economic development, technological change) and their key relationships” (IPCC 2007:874).



Figure 4.3: Spatial patterns of projected change in mean annual temperature for 10-year periods in the future under the SRES A2 scenario. All values are anomalies relative to the mean climate of 1970-1999.
 (Source: McSweeney et al. 2008:8).

For East Africa, including Kenya, statistical downscaling of precipitation consistently indicates that mean annual rainfall is likely to increase, with the range spanning between changes of -1 to +48% by the 2090s (see Fig. 4.4). These increases in total rainfall are estimated to be largest in October – December, with -3 to +49mm per month, while the greatest proportional changes are projected for January and February (-7 to +89%) (McSweeney et al. 2008:3). While this might sound promising, models are consistent in that the proportion of annual rainfall that falls in heavy events will increase. This increase is estimated to span from 1 - 13% in annual rainfall by the 2090s. The models consistently project increases in 1- and 5-day rainfall annual maxima by the 2090s of up to 25mm in 1-day events, and 3 to 32mm in 5-day events (McSweeney et al. 2008).

Concerning extremes, Christensen et al. (2007:871) highlight that “[r]esearch on changes in extremes specific to Africa, in either models or observations, is limited”. Nevertheless some statements can be made. Regarding Kenya two risks are estimated to increase in likelihood, more precisely droughts and floods. While Kenya may not experience significant changes in mean annual rainfall, rains are expected to occur in heavier downpours, resulting in soil erosion and flooding and less reliable, resulting in drought periods. The occurrence of these events is likely to increase in the region (McSweeney et al. 2008).

⁶⁶ The temperature threshold for cold days and nights in any region or season are defined by the daily maximum temperature (TX) below which the 10% coldest days and nights in the standard climate period (1970-99) fall (McSweeney undated).

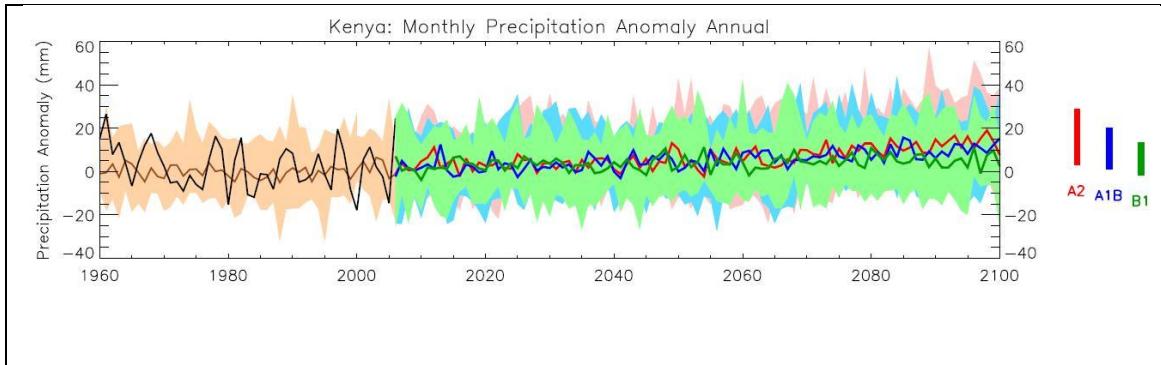


Figure 4.4: Trends in annual precipitation for the recent past and projected future (relating to three IPCC emission scenarios). All values shown are anomalies, relative to the 1970-1999 mean climate.

(Source: McSweeney et al. 2008:9).

Additionally, it has to be taken into account that, while Kenya might experience more average annual rainfall, the projected increase in temperature will lead to an increase in potential evapotranspiration, probably overwhelming any net increase and even leading to a reduction of soil moisture (Sørensen et al. 2009). Therefore, in the future water stress will most likely be an even larger problem than currently.

5 Empirical Results

In this chapter results of the stakeholder interviews are presented following the methodology explained in the third chapter, in a relative descriptive way. Overviews of the results are presented in Tables 5.1 to 5.14 and will be discussed in the following chapter. An overview of the types of questions that were asked during the interviews are presented in Annex B.⁶⁷ It has to be noted, however, that a number of themes arose during the interviews, not all of which had been addressed by interview questions. Thus, classifying and analysing the interviews along questions would oversee important statements and themes. Thus, with the help of MAXQDA a coding system as described in the third chapter was developed. Search words were grouped to codes in order to identify comments on the different topics. Based on the provided information by the interview partners, the following main themes, which occurred during the interviews, were identified and further subdivided. These reoccurring topics were (a) the impacts of climate change on livelihoods, (b) vulnerable groups, (c) coping strategies and adaptation challenges, (d) the role of the government and other relevant stakeholders, (e) the way forward. The following section will briefly present the results, the quotes from which the statements were paraphrased can be found in Annex C.

5.1 Assessing Impacts of Increased Climate Variability on Livelihoods⁶⁸

The projected changes in temperatures, precipitation patterns and increases in the frequency and/or intensity of extreme weather events will have varied impacts on natural and human systems in Kenya. As of now, practically, all nineteen interview partners observed increased frequency and severity of extreme weather events such as droughts and floods, and, related to those primary impacts, reduced water availability and were concerned about current and future consequences. These perceptions of impacts are in accord with the ones proposed by studies and government papers (GoK 2010; HBF 2010).

Regarding the consequences of climate change, it was difficult to subdivide, as some interview partners considered impacts on sectors (see Tab. 5.1), while others referred to livelihoods (see Tab. 5.2). It has to be noted, however, that many statements made could also fit to another

⁶⁷ It has to be taken into account, however, that as the degree of openness in the interviews was very high and thus the formulation of the questions varied greatly.

⁶⁸ Here, I use 'impacts' of climate change following the definition outlined by the IPCC (2007:876) which refers to "[T]he effects of climate change on natural and human systems", caused by its exposure to the change.

subcategory. This highlights the cross-cutting impact of climate change. For clarity some tables are split simply to accommodate the large number of sub-issues that arose in the interviews. Most informants identified agriculture and pastoralism to be particularly impacted. Other sections that were often identified were Kenya's high dependency on hydropower for electricity production and the direct impact on the country's economy. While negative impacts for agriculture and livestock production were attributed to rural areas, some informants were also concerned about the impact on urban areas, particularly in slum areas. The tourism sector was also identified as being impacted by a changing climate.

Table 5.1: Summary of comments on sectoral impacts of climate change in Kenya.

Interview	Quote	Paraphrase	Generalisation
General Statements			
IP3	Q1	- Kenya is a water stressed country, sectors that are impacted 1) agriculture (critical in assuring food security), 2) the energy sector (will be severely impacted 70% hydropower), 3) transport	- agriculture, energy sector, transport
IP4	Q1 a-b	- we used to think that the problem is only located in the arid and semiarid areas, but now we realised that the problem of climate change also impacts the agricultural districts, the whole country is vulnerable, degree of vulnerability becomes more severe as you go to the ASALs, but much of the agricultural districts are just as vulnerable - agriculture, the other one is pastoralism and the other one is water, those are the three sectors of the economy which will be hardest hit by any changing climate	- agricultural districts and pastoralist areas, water
IP6	Q1	- shortage of rains which means there is a shortage of water, which affects pasture, it affects farming, food insecurity causes famine a national disaster, also prolonged periods of drought, which have caused deaths	- shortage of water affects farming and thus food security, droughts have caused deaths
IP8	Q1	- natural resources, farming, tourism: mostly the agricultural sector, it's also affecting tourism because of the increasing tendency of human-wildlife conflict and pastoralists and farmers are demanding more of the conservation areas...	- agriculture, tourism, pastoralists
IP9	Q1 a-b	- different sectors are most hit: agriculture, livestock, the impact is high mostly within the agricultural sector, within the poor rural communities, but it depends in which region a community or people are living in, in urban areas the impacts are not that hard felt because people have adaptive capacity, if there is no water they will buy water or something, but in rural areas where maybe the only source of water is a stream which then dries and people have to walk 20km to get to a source of water, so the impacts in rural areas are more adverse, there is a lot of conflict issues over natural resources, particularly water resources, so that in itself becomes an issue even when not directly related to [cc] but you can see the consequences of reduced rainfall and therefore conflicts with people wanting to acquire certain resources for their benefits - water towers are endangered, rivers are becoming seasonal as opposed to permanent, number of human-wildlife conflicts are increasing, increase of water borne diseases	- water towers are being affected, rivers are becoming seasonal, number of human wildlife-conflicts is increasing - agriculture, pastoralism, agriculture, poor rural communities, water borne diseases
IP13	Q1	- climate change impacts on all sectors, at least in Kenya all sectors are affected by climate change: energy, water, agriculture, livestock and fisheries, conservation, pastoralism and conflict over natural resources, health, forestry, tourism and trade, education, infrastructure and housing	- energy, water, agriculture, livestock/pastoralism, fisheries, health, tourism, education, infrastructure, housing, forestry
Detailed Impacts Regarding Energy			
IP3	Q2 a-c	- Kenya has been depending on hydro-energy for 70%-80% of its energy, this will pose a serious problem politics need to address now, emergency power producers can provide 30-40% of emergency power, but it is produced on heavy diesel, which is very expensive, electricity costs have gone up causing energy poverty, particularly amongst urban poor	- energy production is at stake, emergency power is expensive, this has severe impacts on the economy
IP4	Q2	- heavy reliance on hydropower, e.g. at the River Tana which is endangered by melting glacier on Mt. Kenya	- hydropower is at stake
IP6	Q2	- a central issue will be hydropower, already during recent droughts main industries had to be shut down during the day to save energy and they had night shifts for those who are highly power dependent, already now power is biggest issue in expenditures	- industries affected by lack of power, impact on economy
IP7	Q2	- there were water and electricity shortages two years ago in Nairobi, this will increase in the future	- electricity shortages, even in Nairobi
Detailed Impacts on Urban Areas			
IP2	Q3	- in 2009 for the first time there were also food shortages in urban areas	- food shortages also in urban areas
IP3	Q3	- And actually also the urban poor, the people in the informal settlements, Because if it's water, then you are paying 3-4 times more. Then energy, if it's electricity, if it is food, when there is a drought or famine they pay 3,4,5,10 times.	- energy and water bills increase, food gets more expensive, increase
IP5	Q3	- pastoralists in search of pasture have been forced to move their animals into cities such as Nairobi	- pastoralists seeking pasture in city
IP6	Q3 a-b	- there are severe impacts on urban areas: when the rains come heavy downpours after prolonged drought, there is a lot of flooding even in the slums, there is severe flooding, which complicates things, then there is no clean water for drinking, the infrastructure in the cities (sewage system) is not planned to withstand or to control the impacts - and during dry periods there is a lot of dust, which comes with all kind of diseases - people living in urban areas are vulnerable in different ways because of the different economic, the urban poor depend on the wages, environmental issues in the slums are worse	- flooding in urban areas, particularly in slums, causing lack of clean drinking water, during dry spells increase in dust and related diseases
IP9	Q3	- there is an increase of water borne diseases in urban areas	- increase of water borne disease

Continued Summary of comments on sectoral impacts of climate change in Kenya			
Impact on Tourism			
IP8	Q4	- climate change is indirectly affecting tourism because of the tendency of human-wildlife conflict is increasing, pastoralists and famers are demanding more of the conservation areas	- human wildlife conflict increase, affect on tourism
IP9	Q4	- tourism will be affected and it's maybe being affected as of now, as it is based on safari tourism (it is expected to find a particular species of animal, e.g. elephants and you find none because they moved and you have to go kilometres and kilometres as you are tracing them), that affects the economy of the country	- (safari) tourism
IP13	Q4	- one of the sectors that is suffering a lot is the tourism sector, the recent temperature increase affects our animal population our game parks and national parks	- tourism, as wildlife populations are affected

According to the interview partners, impacts of climate change on the well-being of people are varied and numerous. Interview partners mentioned the following observed impacts and consequences on people's lives: food and water security, economic security and educational security are particularly impacted by climatic changes in Kenya (see Tab. 5.2). A number of interviewees also reported that climate change impacts on health issues, such as spread of malaria into previously malaria-free areas (rising temperatures), water borne diseases (heavy rains and floods) as well as lack of clean water and hygiene (drought periods). In this regard one respondent even drew a connection to the stability of the Kenyan state, quoting that „[I]f individuals are insecure there is no way you can speak about national security“ (IP5Q17b).

Table 5.2: Summary of comments on impacts on people's livelihoods and well-being.

Interview	Quote	Paraphrase	Generalisation
IP3	Q5	- climate change is threatening livelihoods	- climate change threatens livelihoods
IP6	Q5	- In Turkana, people have been dying because of the drought when there is no water there is no pasture, that has also impacted on farming, - Because even their lives [are affected], when there is no water there is no pasture. That has also impacted on farming. So there is food insecurity in the country.	- deaths - the livelihoods are affected
IP8	Q5	- food insecurity, decreasing stocks of livestock, water scarcity, fodder scarcity - impacts on communities: people who have got skill, who are energetic, they move to towns and other areas, the people who are left behind are the elderly, and the women	- decreasing stocks, food insecurity, water scarcity, fodder scarcity
IP9	Q5	- wildlife have to move to a greater distance to look for water and therefore conflicts with communities increase	- increase of human-wildlife conflicts
IP10	Q5 a-b	- economic power of the community has gone down, cultural aspects of the community are changing (e.g. certain rite de passage cannot be conducted during dry spells), soil erosion (when there is not enough vegetation livestock will still step and break the soil further) quality of soil, the quality of vegetation all these things have changed to great extent, new diseases - it affects generally the nutrition people and thus the health in general, it affects democratic processes in the county in terms of voting participation, when people are on the move it impacts education	- economic power, soil erosion, quality of soil and vegetation, new diseases
IP12	Q5	- the community is indirectly affected by the change of the rain seasons through the following issues: in 2009 the community had no electricity for several months due to the severe droughts the hydropower stations did not operate fully, and they experienced shortages in water supply, water and electricity bills have been rising, which effects the local economy thoroughly, being cut off electricity, no communication came through (radio), impacts on health in the community (rains increase in water borne illnesses and in dry spells due do the lack of clean water limit hygiene), food shortages were also felt - directly affected, because less rain means less cloud cover and more sun and rise in temperatures leads to extremely high temperatures in the poorly insulated metal shacks in the slums - climate change is a cross-cutting issue	- shortages is water, electricity, effect on economic situation, cut off from information, health impacts, food shortages
IP13	Q5	- climate change affects education, people are so occupied with sustaining their livelihoods, that they are not able to educate their children - climate change has really disorganised us - there is more conflicts in the families than before, because there are no resources, no food, that has affected the family unit. And when you affect the family unit, they... affect the community, the society and the nation. To me it is much farer reaching than we could see.	- impact on education, increase of conflicts among family members
IP14	Q5	- climate change entrenches poverty and productivity, it increases poverty levels - increase of wildlife-human conflicts as they both struggle for water and pasture	- climate change increases poverty - increase of human-wildlife conflicts
IP18	Q5	- climate change has a social dimension, an economic dimension, a well-being dimension, so very quickly, what was just delayed rains can turn into school drop outs	- social dimension, economic dimension, well-being, education
IP19	Q5	- the impacts that we've seen from climate change are hampering development efforts	- climate change hinders development
Food			
IP2	Q6	- in 2009 there were 10 mil people affected by food scarcity	- food insecurity
IP3	Q6	- food, water, electricity	- food, water, electricity
IP6	Q6	- food insecurity, livelihood as such	- food insecurity

Continued Summary of comments on impacts on people's livelihoods and well-being			
IP13	Q6	- food insecurity, less wild fruits to diversify nourishment	- food insecure, decreased nutritious diversity
IP15	Q6	- the biggest vulnerability for all of us is food	- food insecurity
Health			
IP3	Q7 a-b	- malaria is a bigger threat than even HIV/Aids, driven by climate change the areas affected have moved from just the lowlands or the areas around the lakes where it has been prevalent to the highlands, so people are forced to spend more money on medical bills than previously	- spread of malaria
IP9	Q7	- with the decrease of water resources we are having water borne diseases	- water borne diseases
IP10	Q7	- physiological aspects of the whole climate change issue	- psychological aspects among pastoralist communities
IP12	Q7	- the health in the community is affected, during heavy rains there is an increase in illnesses and during dry spells a lack of hygiene due to lack of clean water	- increase of diseases with heavy rains, lack of hygiene when little water
IP13	Q7	- more diseases in the family	- increase of diseases in families
IP14	Q7	- as the temperatures in the highlands have increased, mosquitoes are becoming common in areas were formerly there were none (highland malaria)	- spread of malaria
IP18	Q7	- diseases and pests increase with floods	- increase of diseases with floods

5.2 Profiling of Vulnerable Groups

The adaptive capacity, and thus the vulnerability varies considerably among regions, and socio-economic groups. While, according to the interview partners, impacts are felt country-wide, certain groups are more vulnerable and thus disproportionately more affected than others (Tab. 5.3). Based on the knowledge and experiences of the stakeholders, the most disadvantaged groups include agriculturalists and pastoralists. Reasons for their particular vulnerability are the climate-sensitive livelihood strategies. Finally, some interviewees also reported on gender related impacts and expressed concern about women being particularly affected by climatic changes, because of their social situation, gender-specific roles in society, work and domestic life regardless of impacts of climate variability and change. Regarding water shortages for example they are particularly affected, as fetching water is part of their traditional chores and it is them who travel long distances in search of water. Additionally, as able-bodied men move into towns in search for alternative income, women are left behind with children and elderly to care for.

Table 5.3: Summary of comments on vulnerable groups.

Interview	Quote	Paraphrase	Generalisation
Agriculturalists			
IP4	Q8 a	- problem is also very present in the agricultural areas, the problem is very real for agricultural populations, water scarcity affects them directly, causing decreasing yields	- water scarcity affects agriculturalists directly
IP6	Q8	- the most hard hit is the agricultural sector and the water sector, as well as pastoralism (livestock), forestry (because of fires) and that affects the economy of the country	- agriculture
IP8	Q8 a	- farmers are hit, they lose their seeds and fertilisers, because whenever they expect rains they plant, some of them take loans, and then when it does not rain as expected they lose their seed, they lose their fertiliser	- farmers take loans for seeds and fertilisers and when rains come delayed they are double affected
IP15	Q8	- farmers mostly do rain fed agriculture, which makes them vulnerable	- dependency on rain fed agriculture makes them vulnerable
IP17	Q8	- Agriculturalists livelihoods are dependent on rain fed agriculture, any change in rainfall causes serious trouble, because they don't have the capacity to do anything else, their basic source of livelihood is agriculture, if that is affected they cannot go to the markets to get the other basic commodities, poverty is being aggravated by climate change issues	- livelihood dependency on rainfall

Continued Summary of comments on vulnerable groups			
IP18	Q8 a	- famers having to replant, because they cannot time the seasons well and even when you plant and the rains come they are too short and the dry spells are too long, for a farmer to secure even one harvest they probably have to do two or three plantings, because of the way the rains is behaving. So in many ways we realise that the world changes and the weather and the climate and the seasons that was impacting on the well-being of our communities.	- farmers have to replant when the rains don't come
IP19	Q8 a	- smallholder farmers mainly rely on rain fed agriculture and of course that with the productivity and the impacts of climate change you find the yields get are smaller so what the farmer harvest is insignificant.	- high dependency on rainfall, decreasing yields
Pastoralist livelihoods			
IP3	Q8	- pastoralists a lot, they have been marginalised for a long time, lack access to information, even through radio, papers, news, they don't have reserves, either in cash, or in others... they are not diversified in their economy	- pastoralist (have been marginalised, lack access to information, no reserves, no diversified economy)
IP5	Q8	- people in the ASALs are more vulnerable, in two main ways: 1) the regions have been marginalised, there has been too little investment so people do not have options to diversify their livelihoods, they have to depend on nature to provide them with resources; 2) largely because of lifestyles, they have hardly changed their lifestyle, they are still within the tradition mechanisms of surviving, closely related to nature, so if there is a problem with the ecosystem they are more affected - it happens now that those who are more vulnerable are moving into areas where people are less vulnerable, thus bringing with them their vulnerability, e.g. the movement of the Maasai into agricultural areas, causing conflict between the agriculturalists and the pastoralists	- people in the ASALs are more vulnerable because of marginalisation and heavy reliance on ecosystem - this vulnerability is sometimes transferred to less vulnerable areas
IP6	Q8	- people living in ASALs areas, their livelihood is pastoralism, they have large herds of cattle and when climate change hits, like droughts the effect is severe	- their main asset: cattle makes them vulnerable
IP8	Q8 b	- most affected are pastoralists, because they live in the ASALs, and settled agro-pastoralists are also very much affected	- the areas from which they derive their livelihood are much affected
IP10	Q8	- pastoralist people only have livestock, that is the sole livelihood system, looking at the geographical setting of these communities, they live in the ASALs where even crops and farming is something that is quite impossible, so livestock will remain the only liable kind of an adaptation mechanism for this community - pastoralist issue are hard to bring to a legislation level, because of years of marginalisation and because a voice of the minority which is not often taken seriously by the government and legislators, a neglect of the voices of these people, when drought affects a community they sometimes forget to take care of our livelihoods, the livelihoods that are the animals if people lose livestock lose their livelihood, they won't get food, education, hospitalisation, good nutrition, school fees by exchanging animals, so basically a cow to these people is everything - when they design relive projects, the relieve projects will concentrate on people saving the lives of the people, forgetting that if they save the life of these people at this moment it is not sustainable, because they have not saved the life of their livestock, which makes all programmes unsustainable	- geographical setting and livestock as sole livelihood source makes them vulnerable - pastoralist have been marginalised
IP15	Q8	- pastoralists are extremely vulnerable, since they are highly dependent on the weather, if it is dry then they have a problem, if there is too much rainfall, they have a problem	- high dependency on weather
IP16	Q8 a-b	- pastoralists have an overreliance, they depend too much on cattle, there are more losses on cattle than on other stocks (camels, sheep, goats), given the biological nature of cattle, they require a lot of pasture, and water more frequently, thus when we have a drought they are the first stock to be affected when others are still fine. Yet, that is where people have put their assets into, cattle is their main asset - security issue make them vulnerable - compared to the rest of Kenya they have been least developed, they have been neglected by the central government for many years, a system of marginalisation by the central government - only dependence on livestock because other options are limited, e.g. can't do fishing, because the market infrastructure in terms of roads is not there	- high dependency on cattle makes pastoralists very vulnerable - they live in the least developed areas and have been neglected by the government
Women			
IP8	Q8	- the burden on women, their workload increases because of climate change, they tend to spend more time looking for water and food	- women's workload has increased with climate change, spend more time looking for food and water
IP10	Q8	- women have particularly been affected, in pastoralist communities men will move for long distances, they leave behind women, children and sick animals, this affects the nutrition of the children and women, also in pastoralist areas there is no tap water, or boreholes people depend on water from the rivers, but most of the rivers in Maasai land are seasonal rivers, it's women who are expected to look for water by all means to feed their people the longer the drought, the longer the water problem in that area, the distance that these women walk to get water is sometimes is just unimaginable, they will walk for long distances	- women particularly affected, pastoralist women stay behind with children and sick animals
IP10	Q8	- women have particularly been affected, in pastoralist communities men will move for long distances, they leave behind women, children and sick animals, this affects the nutrition of the children and women, also in pastoralist areas there is no tap water, or boreholes people depend on water from the rivers, but most of the rivers in Maasai land are seasonal rivers, it's women who are expected to look for water by all means to feed their people the longer the drought, the longer the water problem in that area, the distance that these women walk to get water is sometimes is just unimaginable, they will walk for long distances	- women particularly affected, pastoralist women stay behind with children and sick animals
IP13	Q8	- today women are spending more time to look for water and children are spending more time going to look for water for animals, it is the women and children who are more affected by the changed and changing climate in this country	- women and children spend more time looking for water
IP18	Q8 b	- women headed households clearly are affected, both from an energy perspective but also from a livelihood perspective	- women headed households
IP19	Q8 b-c	- climate change affects men and women very differently, women are one of the groups who are mostly affected by climate change, most of the women actually rely on smallholder kind of farming to provide for their families for subsistence farming and maybe do some little bit of business from the farms, in some regions 80% of smallholder farmers are women, women are involved in traditional chores (fetching water, taking care of a sick person), the whole spectrum of unpaid care work, and with the issue of climate change this has become harder because the quality of water has reduced, if a woman is taking care of someone it is even more difficult, women have to go longer distances to fetch water, because the cycle of drought that we have been experiencing in our country now it's every year, women take up most of the burden (look for food, look after the children), climate change affects women differently than the men - also they are more vulnerable because they are not included in planning-processes for projects, because maybe they do not have the time because of the work they are supposed to be doing at home, cultural context additionally makes it more difficult - women are in charge of the provision of water in their homes and have to walk increasingly long distances, which affects their health, they deteriorate, physically	- women more affected than men, in charge of unpaid traditional chores (taking care of children, elderly and sick, fetching water, organising meals) make them heavily affected, particularly fetching water has become very difficult

5.3 Local Coping Strategies and Constrains

A number of coping strategies were reported by the interview partners in order to deal with the impacts of climate variability, which people are already implying. Table 5.4 presents promising coping strategies to current climatic variability in Kenya and Figure 5.1 provides a count of the number of times the different coping strategies were identified in the interviews (only the most commonly named are listed). The strategies that were mentioned the most were a change in the composition of livestock, from cattle to smaller stocks, such as sheep and goats; increased water availability through water harvesting, improved water storage or deeper boreholes; remittances from relatives living in urban areas as well as abroad; a reintroduction of traditional food crops such as sorghum, cassava or millet, adjustments in agricultural practices such as early seeding or planting seasons and destocking programmes during drought periods.⁶⁹ Additionally, strengthening inter-communal networks to increase coping, facilitating mobility, reintroduction of traditional livestock breeds, a shift in working hours, migration, diversification of livelihoods and a shift from rain-fed to irrigated agriculture were mentioned by the interviewees as current response strategies to climate variability. Only two of them, destocking programmes and the facilitation of mobility are related to the Kenyan Government.

Table 5.4: Summary of comments on coping strategies.

Interview	Quote	Paraphrase	Generalisation
IP3	Q9	- for example, if I live in Nairobi I earn X KSh, I have my two, three brothers also educated and working. So my mom is retired, she is back in her farm, if her farm doesn't do well we send her some money every end of the month. That is not true to everyone! Or I am able to buy her some solar panels, improve her daily farming. She is one in a million. She herself is not even able to adapt.	- remittances
IP6	Q9	- often people have very limited options and are stuck with their livelihood, for pastoralists it is not easy for them to change their livelihoods - in the Western part of Kenya people used to have one planting season now they have two planting seasons - adapting the food crops: shift back to traditional crops such as cassava and millet - off-take programmes by the government for destocking	- adjustment of planting seasons - shift to traditional crops (cassava/millet) - destocking programmes
IP8	Q9 a-b	- pastoralists are turning in to keeping small stock, goats particularly, more herds of camels than before, transition towards keeping small stock and keeping other forms of livestock like camels that can use various levels of vegetation resource - Strengthening inter community networks for sharing of resources - government officials negotiate mobility and thus facilitate pastoralists to move to Uganda - families who have relatives outside their local communities who send back of money, remittances increase their adaptive capacity, these are from both major towns in Kenya and also from outside, those outside the country realise more benefits	- change in livestock from cattle to goats, camels - strengthening inter-communal networks to increase coping - facilitate mobility - remittances
IP10	Q9	- traditional breeds of livestock are being reintroduced and people keep more sheep and goats instead of cattle	- reintroduction of traditional livestock breeds as well as composition of animals (from cattle to cheep, goats)
IP12	Q9	- during the electricity failure students started working at night when electricity was provided, collecting water in huge drums, so to store for drought periods, electricity saving	- increase water storage - shift working hours
IP13	Q9	- diversification of food crops, and shift back to traditional crops such as sorghum, cassava, millet - shift towards goats instead of cattle - water harvesting, sand dams in combination with a nursery of fruit-trees to diversify livelihoods - early seeding which means before the rains come you establish sorghum in a seed bed to bridge the gap between growing and maturing	- reintroduction of traditional crops (sorghum, cassava, millet) - shift from cattle to goats - water harvesting - diversification of livelihoods - adjustment in agricultural practices (early seeding)

⁶⁹ 'Destocking' can be described as a livestock intervention in pastoralist areas, which is often done by governmental bodies as a means of emergency relief. Such programmes consist in intentionally removing live animals from a drought prone or drought-affected area aiming to prevent substantial capital losses for pastoralists or agro-pastoralists. In contrast to other species, which can both browse, graze, and hence survive longer when pasture is depleted; the narrow feeding habit of cattle makes them extremely vulnerable to the scarcity of forage and water. Hence they are often the first to die in a drought. Government pays cash (or in some cases grain) in exchange for the severely weakened but otherwise healthy cattle, which are subsequently slaughtered and processed. The meat is then redistributed to former livestock owners or other groups of malnourished and vulnerable people.

Continued Summary of comments on coping strategies			
IP14	Q9	- planting of drought tolerant crops, shift from cattle to smaller livestock (sheep and goats), shift from rain fed agriculture to river line migration, boreholes have now to be dug much deeper: 200-250 meters	- shift from cattle to smaller stocks - shift to irrigated agriculture - depth of boreholes
IP15	Q9	- when there is some eminence of drought government buys livestock and then they slaughter them, and that food goes the pastoralists, it is done by the government. And right now it's quite successful because now they don't lose their livestock thy get money. So that now when things improve they go and buy more animals. Instead of letting them to die. And that's one of the coping mechanisms. Then most of them when it becomes so difficult they migrate. And they go to look for jobs and then make some remittances to those who live home.	- destocking programmes during drought - migration - remittances
IP16	Q9	- 1) move to smaller stocks, like sheep and goats which are more drought resistant - 2) enhance water harvesting, surface runoff as well as tap ground water	- shift to smaller stocks - water harvesting
IP17	Q9	- remittances are a key strategy, not just from abroad, but from urban areas e.g. children working in Nairobi who keep funding their families in rural areas, that is probably the only coping strategy at the moment	- remittances

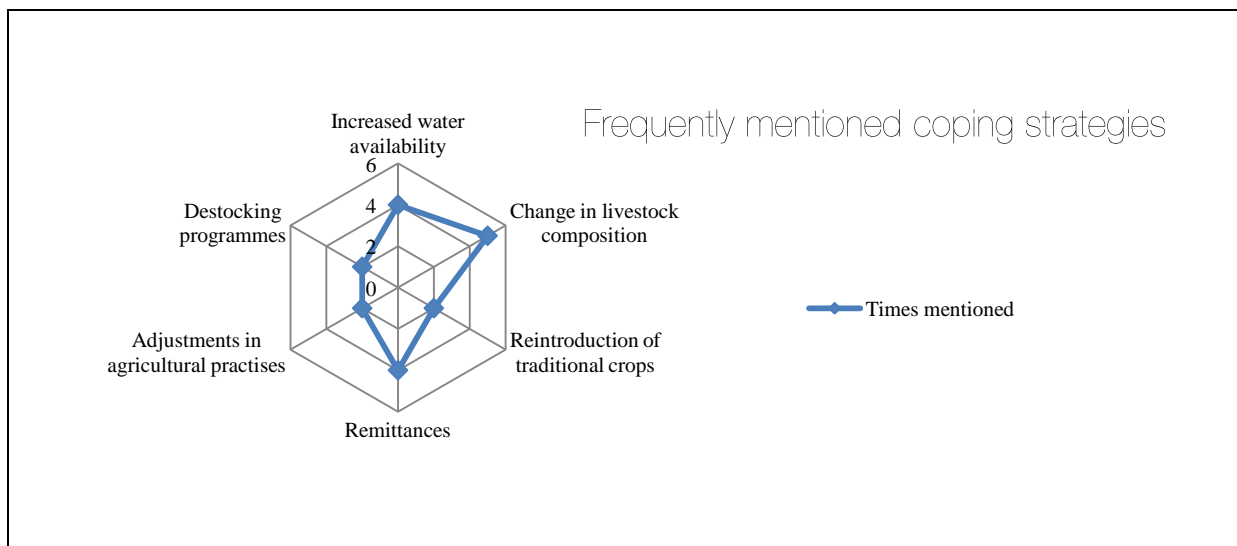


Figure 5.1: Current coping strategies.

There are several limitations to developing coping strategies, which hinder people to seek alternative livelihood programmes (see Tab. 5.5). Constraints which were frequently mentioned were a lack of education, training and information, a lack of financial capital and, particularly for pastoralists, mobility, which used to be a core coping strategy, is increasingly restricted (see Fig. 5.2). This relates to another constraint which is the erosion of traditional coping capacity due to interference from outside, or due to climate stressors which have exceeded the coping threshold. Interviewees also mentioned beliefs and social and cultural values to affect the choice of coping responses, for example in pastoralist communities where cows represent wealth more than just economic wealth and play a key role in cultural and social institutions, people will not very likely get rid of all their cattle as proposed by government programmes.

Table 5.5: Summary of comments on constrains for developing coping mechanisms.

Interview	Quote	Paraphrase	Generalisation
IP6	Q10	- lack of adaptation options in rural areas, the dependence on nature out there is just unbelievable	- lack of options
IP8	Q10 a-b	- in pastoral areas a key coping strategy was mobility, but livestock mobility has been affected by increased population and by uncertainties in rainfall, areas which used to receive rainfall are not receiving rainfall for the generation of fodder and water availability, Therefore regions where they used to go to in times of droughts are failing, the regeneration of vegetation is not happening, the natural seed bank in the soil is interfered with, because the seeds are not regenerating due to the intensity of the droughts and the frequency of grazing - the other thing is the development approach that people have adopted, for a long time development in pastoral areas aimed at settling, thus interfering with the traditional lifestyle and natural resource management systems - when illiteracy levels are very high, like in Turkana e.g. 80%, that is a hindrance for migration, in terms of skills to survive in a different environment and to compete effectively, education and skills of the people should be improved to facilitate migration, so one intervention could be to encourage more pastoralists to move out of that area and find other opportunities, but that can only be achieved through improved education	- livestock mobility (a traditional coping mechanism) has been hindered - interfering with the traditional lifestyle - lack of education and skills hinders people to seek new opportunities
IP10	Q10 a-c	- people can adjust their lifestyle to some extent, but not completely, there is no way Maasai can survive without cattle, a Maasai without cattle will not be Maasai, a cow has an economic value but has more social and cultural values to a Maasai than the economic value - land tenure systems have changed, now the grazing space for animals is reduced, Therefore consumption of grass and pasture is now quite high because they cannot move, e.g. cross border policies, no grazing in national parks and government forest areas, individual ranches have impacted traditional coping strategies quite negatively, the more mobility is restricted the higher the vulnerability of these people - capital, e.g. seed money to initiative farms - training, e.g. a pastoralist community has no idea of agriculture, value addition - value addition for cows, when it's alive and when it's dead, e.g. manure... that manure as a fertiliser, to light our homes, produce biogas, open up our markets, for example for hides, horns, skin, bones attached use it to make glue and other things - build the capacity of these people, provide them with capital to initiate alternative livelihood programmes	- there are some cultural constrains to coping - traditional grazing space has been reduced and mobility restricted (both traditional coping strategies) - lack of capital - lack of training - lack of markets
IP12	Q10	- information is generally not well passed, no flow of information from the administrative, it is up to the NGOs and CBOs to inform themselves and spread the news in their community - only support when there is an acute health problem, e.g. cholera outbreak short term assistance by the government, but there is no long-term capacity building efforts	- lack of information - no long term capacity-building
IP14	Q10	- information provided by the Kenya Meteorological Department does not get through to the people, most farmers – if they can read do not read English newspapers	- lack on information
IP15	Q10	- 1) lack of financial recourses - 2) poverty levels are high and hinder adaptation - 3) priority, other issues are considered more urgent to address at local level	- lack of financial recourses, poverty hinders adaptation
IP16	Q10 a-b	- cultural issues hinder some coping strategies implemented from above, e.g. pastoral communities are reluctant to destocking programmes (buy animals from pastoralists, slaughter livestock and distribute as relive food) - droughts have become too frequent, they have eroded people's coping systems, they don't have enough time to recover, by the time your livelihood sources start recovering another one hits	- centralised strategies, e.g. destocking programmes ignorant of cultural aspects - frequency of droughts has caused erosion of the coping systems
IP17	Q10 a-b	- the traditional society was very structured and the coping strategies in those days were strictly monitored by the community, currently there's no collective responsibility as far as food issues are concerned, people now have the title deeds, restricting migration - erosion of traditional systems, the society is changing - poverty has eroded people's capacity - need to have that shift from food aid to structured development, with the people, we need to strengthen their own systems, participatory action, we need to go there not with our own ideas but use their ideas - we need to empower communities to be able to ask for these funds - we need to beat corruption	- erosion of traditional mechanisms - livestock migration is being restricted now - poverty erodes capacity to respond - lack of power and ability of communities - corruption

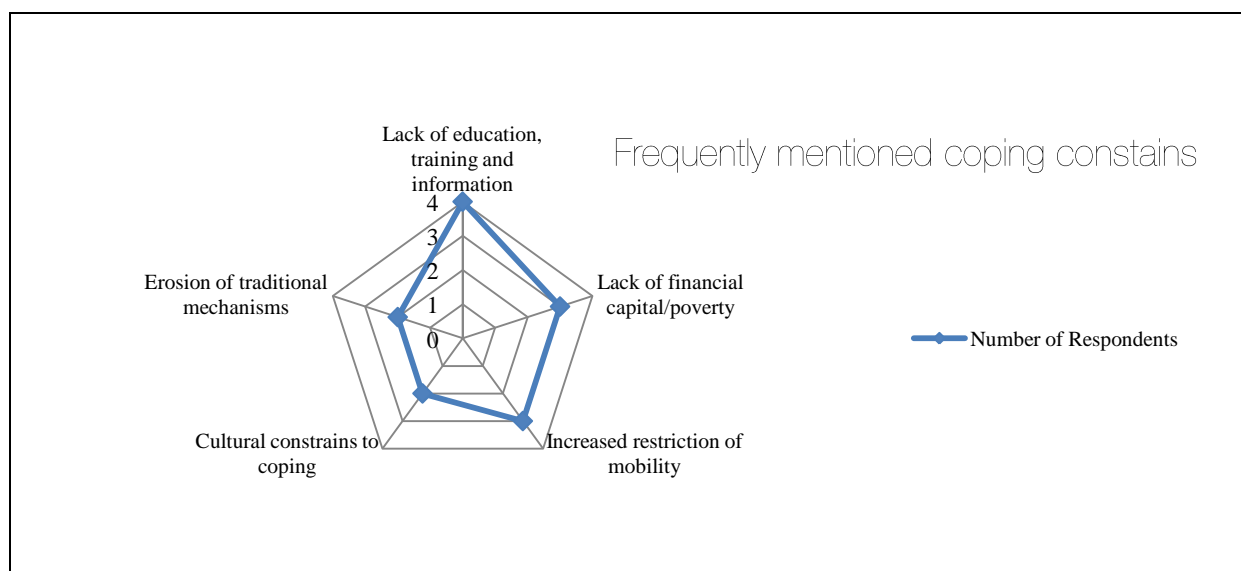


Figure 5.2: Current constraints to coping.

5.4 Adaptation Options and Needs

Table 5.6 presents suggestions made by interview partners regarding increased coping capacity and better adaptation. The wide array of answers given by the participants cut across sectors, scales as well as actors and make a generalisation difficult. Some interviewees mentioned concrete ‘hard’ adaption measures such as the introduction of drought-resistant, traditional or early maturing crops or the provision of improved water availability. Other respondents focused more on issues of governance, training and capacity development, which increase coping capacity and thus the general ability of a population to respond. Examples of these ‘soft’ measures include the promotion of economic diversification, training programmes and the creation of markets.

Table 5.6: Summary of comments on suggestions to enhance coping and adaptive capacity.

Interview	Quote	Paraphrase	Generalisation
IP1	Q11	- concerning adaptation to climate change: the greatest need is to raise awareness amongst the people	- awareness raising
IP2	Q11 a-b	- providing economic opportunities for vulnerable individuals, there needs to be an increase in the spectrum of livelihood possibilities, especially for pastoralists	- provide economic opportunities
IP3	Q11	- irrigation agriculture is a critical element in assuring food security for Kenya	- irrigation agriculture
IP4	Q11 a-d	- Kenya needs to approach climate change in a much more deliberate way - finding crops which are early maturing, making water available to the population, improvement in infrastructure, because if you improve the infrastructure it means you increase the mobility of the population, so people can cope, also you can transfer food more easily between the districts which have plenty of food and the districts which are in short supply - crop insurance, insurance schemes for livestock, deliberate efforts by the government to assist the farmers with mechanisation, schemes for micro-credit, national coordinated effort to support agriculture instead of wanting to industrialise - reorganise the pastoralists and make them realise that they have to keep quality livestock, - not quantity. That is very difficult but it can be done. - during the seasons when there is a lot of rainfall we need to have a very coordinated programme of water harvesting, in a serious way, by building dams - We need a government which is very determined to bring change to the pastoral areas and which tries to measure financial resources to resettle the nomadic people, to give them water on a more regular basis and to cut down the livestock numbers. That one is very difficult 'cause you are going against the culture of the people. But if you make water available and you encourage some of them to practice agriculture, if it is possible to practice agriculture and you also organise to purchase the excess livestock and you bring livestock insurance and things like that these are some of the ways you can bring an adaptation to drought - a programme of water harvesting, the building of small dams, for the whole country	- approach climate change in a much more deliberate way - transition to crops which are early maturing - increase water availability - improve infrastructure to increase mobility of the population - agricultural development - crop insurance, insurance schemes for livestock - schemes for micro-credit - water harvesting - make pastoralists shift towards quality livestock, instead of quantity/cut down on livestock numbers
IP5	Q11	- government must invest in marginalised areas, invest in irrigation, provide watering points, provide alternative feeding mechanisms, provide access opening them up, so that once there's abundance in one area food can also be moved to other areas, these are things that must be addressed policy wise, if we invest in these areas we decrease the vulnerability of these people, and enable them to take care of themselves, it is just a question of giving them the atmosphere, the environment, the ambience in which they can operate and do their thing, government needs to facilitate an environment in which they can live - cushions the environment through irrigation, reduce rain dependency, tap the water, e.g. roof catchments, educating the people and empowering them - very important is the question of poverty	- investments in marginalised areas to decrease vulnerability to enable to take care of themselves - provision of water through water points and water harvesting - education - poverty reduction - reduce rain dependency: irrigation agriculture - alternative feeding mechanisms
IP6	Q11 a-b	- it is central to build people's capacities in adaptation on climate change then we wouldn't have these issues - we need to have these awareness programmes and advice people on how to change their livelihoods, so you start from the community - grow other crops, cash crops like sisal - government must be proactive, providing water - minimise population growth and thus reduce pressure on the existing resources - crop insurance	- capacity building - awareness programmes and advice people to change their livelihoods - shift to cash crops - provision of water - minimise population growth - crop insurance
IP8	Q11 a-e	- harvest rainfall water to improve the rainwater recharge rate - not just raising awareness, working with these people to internalise the planning process in terms of resource management, water management, fodder management and livestock management, improving the planning cycles, make sure that people are within the planning process, learn from them, facilitate community planning, it is very important to increase capacity - further negotiations at high level, between the governments to facilitate mobility - provide the infrastructure for communication, to inform pastoralists where it rained, where there's pasture - strengthening of social networks, between the community institutions and between community institutions and other service providers, the government, the external agencies like NGOs, communities and households should be able to link up with and enrich other agencies for support the government agencies they are acknowledging their services for livestock protection against diseases. Services for water having equipment to pump water from the well at community or at household level, to pump water for irrigation.	- improve resource, water, fodder and livestock management - increase participation in planning processes, thus increase capacity - facilitate further trans-boundary mobility - provide communication infrastructure (mobile phone), so people can be informed - strengthening of social networks (among community institutions and between them and service providers, government agencies, NGOs) - increase ability to diversify sources of income - improve environmental governance, make management structures at the district and

Continued Summary of comments on suggestions to enhance coping and adaptive capacity			
		<ul style="list-style-type: none"> - increase abilities to diversify sources of income, e.g. community initiatives without external support now are identifying these natural resources, like wild fruits which were not being sold before they are now selling it, utilisation of the local resources. - NGOs make deliberate interventions. Like diversifying sources of income. For example... one NGO is promoting harvesting and extraction of Aloe. So they're supporting the communities to extract that and make it into various products. And various groups of women and men are now involved in that. They've lost their livestock to droughts. But aloe is a drought tolerant crop. So they are now cultivating managing, they reorganise it as a resource that they can use to earn some income. - environmental governance is a major issue, management structures at the district level and even the community level are not very inclusive, exclusion of certain individuals or sections of the community, - the linkages between central institutions or chiefs and the sources of scientific information is very poor, there is mistrust between the scientists and these traditional people, an effort should be made because they are a key link to the community, such key persons should be enabled to access scientific information in forms that they can interpret and pass it, because however accurate the information, it seldom reaches the people, strengthen these links for proper dissemination of information - government should do a thorough mapping of vulnerabilities across the counties, to strengthen each county to develop their own guidelines for dealing with climate change, it would be very difficult to come up with a proper solution from Nairobi - address groups within a community that have good institutions they relate to and they link up with quite well, find out which institutions serve women well, which institutions have various classes of people in them, you know the very poor and strengthen these institutions that are understanding the categories of their region, it is not useful to found new institutions but rather merge climate change adaptation into already existing institutions that already reach people, e.g. a church, work with this particular church, support this particular group of people, they relate well, there's trust between the community and that particular institution 	<ul style="list-style-type: none"> community level more inclusive - key actors within communities, such as central institutions or chiefs, should be addressed and enabled to access scientific information - strengthen each county to develop their own guidelines for dealing with climate change, no ready-made solutions from Nairobi - strengthen institutions that are understanding the categories of their region and work with them - find alternatives means of income - address governance issues
IP9	Q11	<ul style="list-style-type: none"> - the humanitarian sector does not respond well to issues of climate change, for example in Turkana during a drought and they send dry maize and beans, people are expected to cook the dry maize and dry beans with water and there is no water, our response in the humanitarian sector is ineffective, we need to start thinking long term, the money that was poured out to the humanitarian sector could go into developing these areas, such would be a better approach to adapt - Kenya Agricultural Research Institute has done a lot of research on alternative crops, sorghum, millet and now they need to promote these fruits, tell people who are used to maize, that we are not having contestant rainfall, so they should change the variety of maize, can we change to sorghum, millet and introduce these type of foods gradually to the market - NGOs are doing a lot of advocacy work, awareness work, so the people realise climate change is real, it is going to impact in this and this way, but we need to move differently than just making noise and blaming developed countries, we need to move, as individuals, as NGOs - in as much as we are talking about adapting and all that we actually need to start with small simple things we can do and other than waiting for humanitarian help from abroad 	<ul style="list-style-type: none"> - improve response of humanitarian aid - promote alternative food crops (millet, sorghum) and create market opportunities - raise awareness - advocacy and awareness work - start with small, simple things
IP10	Q11 a-b	<ul style="list-style-type: none"> - land tenure, land management should be looked at, we should stop subdividing land into small portions that are not valuable; there should be policies against forest destruction in the upper areas so that way we can get the flow of water; they should improve water development policies, water can really reduce the vulnerability of communities; for women, if they have access to water, they can diversify their livelihoods and reduce their heavy dependence on livestock - these alternatives should be 1) compatible with the lifestyle of the people, 2) adjustable to the arid and semiarid environment, so alternatives should be alternatives that are practical in our own setting, cause our context is unique, our context is diverse, something that is quite adaptive to our environment - policies 1) cross border policy that will allow animals to move freely from one area to another, allow mobility; 2) wildlife-community conservation agreement, to allow livestock to graze in the national parks in a coordinated manner, - go back to indigenous coping-mechanisms, e.g. increase indigenous livestock (sheep, goat, cattle) which is more resilient to drought - have small areas as conservancies, eco-tourism to conserve land and the natural ecosystem - women could do beadwork, find a market for cultural artefacts - supply water sufficiently so communities can have small farms for subsistence purposes, to improve their food security at home 	<ul style="list-style-type: none"> - improve land management - improve water development - diversify livelihoods - increase trans-boundary migration - reintroduce traditional livestock - promote community conservancies/eco tourism - create market for beadwork to diversify income sources - increase water availability to improve food security
IP12	Q11	<ul style="list-style-type: none"> - finances, knowledge transfer e.g. through training so solutions are not forced to them but they can do it in their own way, improve water harvesting, government should also approach the communities on their own, not only react on demand 	<ul style="list-style-type: none"> - improve knowledge transfer - water harvesting - improve financing
IP13	Q11 a-b	<ul style="list-style-type: none"> - 1) provide for water: there is potential for sandy dams, hard dams, road and roof catchment - 2) train people to change lifestyles to diversify livelihoods, e.g. training centres for families to be getting information and to enable them to implement - 3) change attitudes in terms of food crops, e.g. less maize - 4) take efforts to a more sustainable level, they need to harvest water for a purpose, plan a water harvesting structure where they find a specific need is what they lack, e.g. plant trees plant food crops - 5) training in value addition and marketing, enable community group to have e.g. a value chain of fruits 	<ul style="list-style-type: none"> - improve water (water harvesting) - train people to diversify livelihoods - transition to other food crops - training in value addition and marketing
IP14	Q11	<ul style="list-style-type: none"> - 1) train people so they understand the change, if they are not aware of the constant change that is going to happen they will not be able to make proper decisions and plan ahead - 2) solutions need to be developed to the acute problems present, e.g. soils that are not that fertile anymore and dryer - 3) a food support system needs to be implemented 	<ul style="list-style-type: none"> - train people to enable them to plan ahead - build food support systems
IP15	Q11	<ul style="list-style-type: none"> - 1) we need serious diversification of livelihoods, now pastoralists rely entirely on livestock, there is need to diversity - 2) insurance for livestock where they insure and if there is loss of livelihoods they are compensated 	<ul style="list-style-type: none"> - diversification of livelihoods - livestock insurance
IP16	Q11	<ul style="list-style-type: none"> - 1) train people to understand the situation and then discuss solutions that can be done to deal with this - 2) try to diversify, do small business, e.g. commercialise livestock production systems, do fishing, collect fruits - 3) small scale farming - at the national level put in place policy frameworks, concrete programmes on climate change adaptation, that they have to assist people to adapt, assure that policies that we formulate take into consideration climate change issues, address some of these other issues like infrastructure 	<ul style="list-style-type: none"> - train people to understand the situation and discuss solutions - diversify income sources - small scale farming to improve food security - develop policy frameworks and programmes that assist people to adapt

Continued Summary of comments on suggestions to enhance coping and adaptive capacity			
IP17	Q11	<ul style="list-style-type: none"> - move away from maize to traditional indigenous, drought resistant crops, traditional crops is the way to go - create a market for drought resistant crops, improve the whole chain, marketing - organise the local farmers into a cooperative society - water harvesting has to be emphasised, e.g. roof catchments, sand dams, linked to drip irrigation - increase indigenous knowledge value - use the elder's networks to influence the communities and inform them 	<ul style="list-style-type: none"> - transition to indigenous, drought resistant crops - create a market, improve value chain - water harvesting and improved irrigation - use traditional institutions (e.g. elders) to reach and influence communities
IP18	Q11 a-b	<ul style="list-style-type: none"> - to address the issues you need to have a community wide approach, but the community is so fragmented into small subgroups you need to provide a forum where they can come together, building that forum is really the bigger challenge - make any meaningful action and for it to have an impact on the bigger picture, you need to involve more than a group of 30 people, you need to do it broader, wider and more inclusive - to address the vulnerabilities and build resilience, you need to inform that plan from a contextual perspective - climate change and governance are really two sides of the same coin. I believe that part if you're going to respond effectively to climate change then you need to get governance right, whole question of leadership needs to be addressed 	<ul style="list-style-type: none"> - improve governance and address questions of leadership - build resilience - be inclusive, have a community wide approach
IP19	Q11	<ul style="list-style-type: none"> - improve water storage, e.g. earth pans, sand dams, rock catchment - promotion of drought resistant/escaping crops - agro forestry - sustainable agriculture, championing for non conventional methods of agriculture, putting more emphasis on using traditional crops 	<ul style="list-style-type: none"> - improve water storage and water harvesting - promote traditional, drought resistant crops - agro forestry - sustainable agriculture

Some informants associated viable adaptation options with a number of criteria (see Tab. 5.7). Concretely, options were considered promising when able to adjust to local conditions, compatible with natural processes and in accordance with natural processes, to mention the most commonly named (see Fig. 5.3).

Table 5.7: Summary of comments regarding criteria of promising adaptation options.

Interview	Quote	Paraphrase	Generalisation
IP10	Q11 a-b	- these alternatives should be 1) compatible with the lifestyle of the people, 2) adjustable to the arid and semiarid environment, so alternatives should be alternatives that are practical in our own setting, cause our context is unique, our context is diverse, something that is quite adaptive to our environment	- compatible with cultural practices, able to adjust to local conditions, in accords with natural processes
IP12	Q11	- solutions are not forced to them but they can do it in their own way	- compatible with cultural practices
IP13	Q11 b	- take efforts to a more sustainable level	- sustainable
IP14	Q11	- solutions need to be developed to the acute problems present, e.g. soils that are not that fertile anymore and dryer	- able to adjust to local conditions, in accords with natural processes
IP18	Q11 a-b	<ul style="list-style-type: none"> - to address the issues you need to have a community wide approach, but the community is so fragmented into small subgroups you need to provide a forum where they can come together, building that forum is really the bigger challenge - to address the vulnerabilities and build resilience, you need to inform that plan from a contextual perspective 	<ul style="list-style-type: none"> - inclusive, have a community wide approach - have a contextual perspective, able to adjust to local conditions

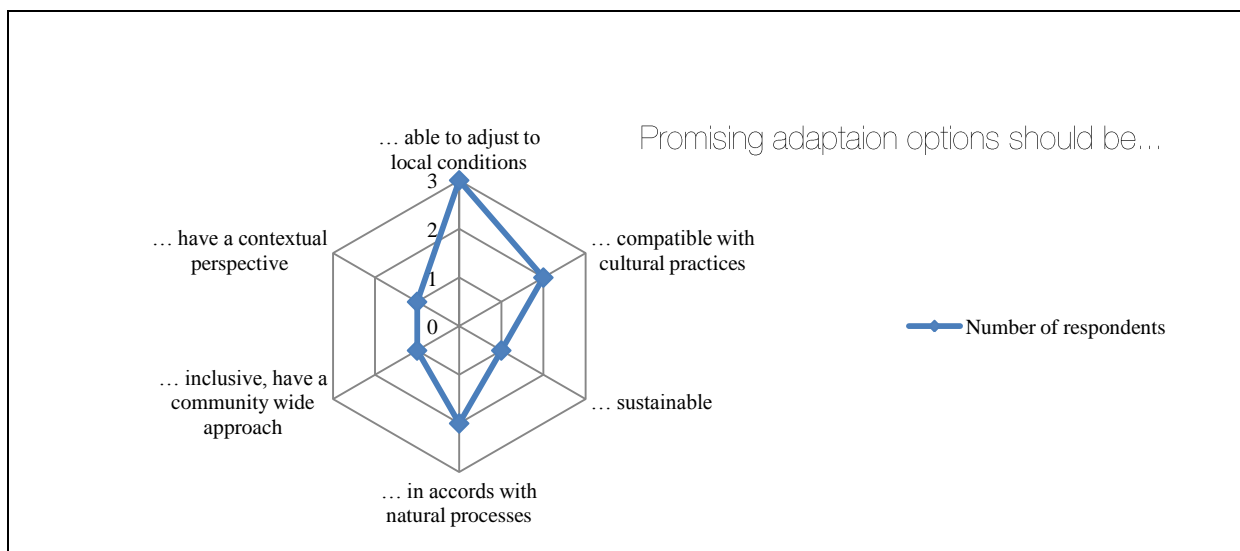


Figure 5.3: Criteria for adaptations.

5.5 Additional Aspects

Other aspects, which came up during the interviews and are considered relevant for further discussion will be summarised in the following section.

5.5.1 Relevancy of Climate Change

Of the thirteen informants, who addressed the issue of how relevant climate change can be considered for Kenya, all were consistent in that it is very or extremely relevant for the country. Some of the most significant reasons mentioned were the severe impacts on the well-being of communities, particularly the poor, being a problem-multiplier and additionally hindering development and humanitarian aid. A link between climate change and economic growth was also drawn (see Tab. 5.8).

Table 5.8: Summary of comments on relevancy of climate change.

Interview	Quote	Paraphrase	Generalisation
IP1	Q12	- climate change will have huge importance for Kenya in the future and be a key issue	it is very relevant
IP3	Q12	- it is very, very important, simply because climate change is threatening livelihoods	- climate change is very relevant
IP4	Q12	- you realise the importance of climate change for Kenya when you look at the future, when you look at the resource, when you look at the population and you look at the future, you realise that the rate at which we are using the resources will inevitably lead to a lot of friction in the future, as climate changes the vulnerability increases and the sustainability also flies out of the window, that is a development challenge, now we have got a warning [e.g. severe droughts] which is already very real in some areas, that is a great challenge for planners	- climate variability observed now gives a hint at future developments, friction is very likely one the resources get scarcer, climate change a great challenge for planners
IP6	Q12	- climate change is really relevant, because the severe impacts of climate change on Kenya, it will be hitting Kenya at the most, even the government has now realised that	- climate change is really relevant because of the severe impacts
IP7	Q12	- although other issues might seem to be more demanding and acute, but change is already very present in Kenya and climate change is cross cutting so many sectors and interlinked with so many issues such as medical services, food security, the cost of inaction is much higher than if you start to act	- climate change is very relevant, impacts are here to stay, if nothing is done impacts and costs will be high
IP8	Q12	- Kenya's economy stagnates economically due to the droughts, because people lost their assets and that affects our economy another overwriting challenge is poverty which increases susceptibility to the impacts of climate change	- it is relevant, because it impacts poor people and the country's economy
IP9	Q12	- considering that the country is already seeing the reduced in rainfalls, which are alarming it should be considered important	- climate change is relevant
IP10	Q12	- climate change is cross-cutting many aspects of people's lives and multiplies marginalisation and vulnerabilities	- it is relevant, particularly for pastoralist communities

Continued Summary of comments on relevancy of climate change			
IP13	Q12	- climate change is currently contributing significantly to the difficult situation of Kenya	- climate change multiplies problems
IP14	Q12	- climate change is extremely relevant, but until now has not been taken seriously enough	- climate change extremely relevant
IP15	Q12	- being an environmental issue it is not as sensational as other discussions, but it is very important	- climate change is important
IP17	Q12	- in leader's minds it may not be central, but everything people do is impacted by climate, the changes in variability Kenya is experiencing, the extremes being more frequent, the intensity is getting worse is a look into the future, for the Kenyan population the focus is on now, which is variability rather than climate change, but the signals of variability are signals of climate change, everything people do is impacted by climate change	- current variability has severe impacts and hints at future developments, everything people do is impacted, making climate change very relevant
IP18	Q12 a-b	- communities are bearing witness to changes that are taking place – even within their lifetime, climate change is extremely relevant, because it is impacting the well-being of communities and is an injustice on the life of vulnerable communities, development and humanitarian programmes are being impacted by climate change	- climate change is relevant, because it impacts well-being of people hinders development and humanitarian work
IP19	Q12	- it is very important, but not given adequate attention, major challenge when it comes to climate change is the issue of resources	- climate change is relevant

5.5.2 Preparedness/Adaptive Capacity

Table 5.9 indicates the variety of opinions regarding the preparedness to deal with the climatic variability. What needs to be recognised here is that the answers refer to different scales and actors and their adaptability. Generally, informants were considerably pessimistic about the preparedness. The first point to note is that most of the stakeholder responses express concern about the political goodwill to actually start responding from a strategic perspective.

Table 5.9: Summary of comments on preparedness.

Interview	Quote	Paraphrase	Generalisation
IP3	Q13	- adaptive capacity is at very different levels, people are left to learn to cope, learn to develop coping mechanisms for themselves, there is no response strategy as such, Kenya is not able to do this	- adaptive capacity is at different levels, people cope for themselves, no strategic support by the government
IP4	Q13	- we now have a policy, but it is one thing for a government to have a policy, it's another thing to be able to execute that policy into a strategy, because that means you have to have money and a plan, which is agreed, it is very difficult to get a country like this to agree on a very deliberate plan over the next 20, 30, 40 years as to what should be done, a lot of these things are theoretical, you can have a good minister and a plan. But if you are not operating from the office of the president you are disadvantaged. Because when you come to present your policy or your strategy it is being considered side by side with other ministries and so it may not be given the priority it deserves.	- it is one thing to have a strategy, and the other to give the issue proper priority
IP8	Q13	- government is starting to recognise there's a problem and it has reached the top of the political agenda (e.g. the prime minister's office has taken it very seriously), but as a country Kenya is very far from being prepared to deal with the challenge of climate change, we are not quite there in terms of preparation	- it has reached the political agenda, but Kenya is very far from being prepared
IP14	Q13	- people simply stick to trial and error, a natural response not informed by science, generally the capacity to adapt is not there due to poverty and powerlessness they have less capacity to react, lack of financial resources leaves them with little options at the same time climate change increases their poverty	- people stick to trial and error, in a natural response, the capacity to adapt is not there, due to powerlessness, poverty, people have very limited options
IP15	Q13	- very difficult scenario in terms of political structure, the coalition government does not agree generally on issues, that is a problem - even if there is a good strategy on climate change but now it is in paper, the implementation is a problem	- even with the strategy in place, implementation and political structure remains a challenge
IP17	Q13	- there is money, but it's not going to the right places, the planning is not done very well, the preparedness is not there, other pressing issues, poverty is a bad, bad problem in this country. So if I can do something else now and hope that that forecast is wrong, I think we are not very well prepared. We are not a contingency planning country yet...	- financial resources are there, but planning and preparedness is not there
IP18	Q13	- pastoralist communities who know their extended dry periods, or dry spells and that sometimes the weather does change and sometimes the rains don't come as frequently, some of those people have been able to find ways, because basically what they do is to extend the coping, they understand first and foremost, they appreciate that we need to cope. So for them there has been some challenge, they may have to change some styles, like for instance they need to introduce pasture management. But for communities where they don't even know what is affecting them. So part of the problem is even to get them to appreciate that something has changed, to make them climate aware. There is something deeper and more systemic, so you need to start thinking: Coping! And that for me is where the bigger challenge is. - Pastoralist groups, are likelier to start adapting, because coping has been part of their system. It's something they've been doing. But somebody... in a high potential agricultural area... they are not quite sure... what's changing and whether that change is systemic. They just think the rains this year were bad. They don't realise that the rain has been bad for the last ten years. How do you help them appreciate that there is something systemic that is changing so they can even start thinking about coping? That for me is actually the bigger challenge.	- some people have found ways, they extend their coping - people who are not aware and not used to adjusting and not informed will not start adjusting

5.5.3 Role of the Government and Need for External Help

Different perceptions existed in the understanding of the role of the Kenyan Government and the effectiveness of its work (see Tab. 5.10). In terms of Kenya's capacity to deal with climate change adaptation by itself, participants found that external help in terms of funding is definitely needed, but the majority also expressed the need of international support in terms of capacity building and training. A lack of goodwill among the government was also mentioned (see Tab. 5.11).

Table 5.10: Summary of comments regarding the role of the government.

Interview	Quote	Paraphrase	Generalisation
IP8	Q18	- the government is lacking behind, lacking behind these interventions, adaptation initiatives are being tried, but ahead of policy, so people are making mistakes, there is no clear guideline on directing people, government should be proactive and try to work with NGOs who are piloting these things, to mainstreaming properly guide communities on resource utilisation, building capacity... and invest more into developing the product.	- government is lacking behind, adaptation initiatives are ahead of policy, government should be proactive and work with the NGOs
IP9	Q18 a-b	- a positive thing is that the government has come up with this document, KCCRS, but I am not sure how we are going to implement it, I am not sure we have the resources or at which state we are going to implement it. I know the government has put into programme at the PM office there is a climate change coordination unit, there is also a unit at the department at the ministry of environment. But that is just a starting point! Which is a good thing! Then the other good thing that I know is that the government is trying to network with NGOs and CSOs and saying that "You are the actors on the ground, you're the people who are dealing directly with these people who are affected by climate change So let's team together, show me what information you have, how we can fill the gaps." That in itself is a positive step. - I see efforts by the government, which is a positive sign, but I am not sure to what extent the finance ministry would give priority to address climate change issues, there may be willpower from the ministry of environment in coming up with strategies, maybe they need more willpower, I don't know from whom..	- government has come up with a strategy, and is now trying to network with the NGOs and CSOs, so there are efforts, but it is not a priority
IP10	Q18	- government is not appreciating the techniques and skills that are available in the civil society, practically the government has resources if they want to help the people and reduce vulnerability, there is little impact on the ground, I really wish we could take our discussions with the government to practically help the people on the ground, not just meetings, conferences, but practically address adaptation issues on the ground, once we've done that then I think we are good to go with the government, we need to stop doing a lot of talking and doing a lot of practical work	- government is not working on the ground and not working together with the civil society
IP16	Q18	- government has not done enough, we have worked with them on a number of things, that's an indication that they are very serious on the whole thing	- government has not done enough, but is now starting to take cc seriously

Table 5.11: Summary of comments on the need for external help.

Interview	Quote	Paraphrase	Generalisation
IP3	Q14	- largely yes, if there is political goodwill, there research studies available and competent Kenyans working on issues of climate change, but there is a lack of coordination, causing people to work at cross purposes and compete for donor funds on climate change and party issues	- theoretically yes, but more coordination is needed
IP4	Q14	- the potential is there but there is lack of information and enthusiasm, people are left to their own resources, there is a hope that things will happen, but they don't, you need active participation by the government to make sure that things will happen in the right direction	- the potential is there, but due to a lack of enthusiasm and information nothing happens
IP5	Q14	- Kenya needs external support, because the environmental issue is big and it needs more resources which Kenya doesn't have	- Kenya needs external financial support
IP6	Q14	- Kenya will always believe it can manage it by itself but it cannot, international help such as from UNEP and the donor community is needed, we need an international way of collaborating in all these issues	- Kenya needs international help
IP8	Q14	- there is need for support at various levels, 1) capacity development in terms of building the skills of the government extension people, internally government people do not appreciate participatory approaches have not sunk into government training institutions; 2) improving the equipment and communication (there are no fast channels of accessing information)	- there is need for external support, in terms of financial support as well as capacity development and training
IP9	Q14	- Kenya could manage based on own capacity if adaptation efforts are integrate into other sectors (example health), instead of dealing with the factors as an entity on its own, so yes Kenya could deal with it, but I am not sure to what extent, internal resources need to be mobilised rather than just wait for the government agencies or donors to help us in adaptation	- generally yes, but there are several factors hampering it
IP15	Q14	- our level of capacity is quite low, we require massive resources for this adaptation	- massive resources are needed because Kenya's own capacity is quite low
IP18	Q14	- external help will be critical, government has too many competing priorities, Kenya cannot secure adaptation without significant inputs from outside, additionally it is a moral question	- external help will be critical

5.5.4 Awareness

Interview partners stated that generally the awareness about climate change has been on the rise in Kenya, information has been channelled through media, such as radio and print media, and currently people are relatively well informed about general impacts of climate change such as sea level rise or droughts. However, some were concerned about limited understanding of the long-term developments of climate change, particularly among pastoral communities, thus limiting their capability to plan ahead. An overview of the comments is shown in Table 5.12.

Table 5.12: Summary of comments on awareness about climate change.

Interview	Quote	Paraphrase	Generalisation
IP3	Q15 a-c	- people know about climate change, awareness generally is quite high, but not always taken seriously at the government level, there are some groups which might not know about climate change, but they do notice that something is happening	- awareness is high
IP4	Q15	- awareness has been created over the past 15 years	- awareness has been created
IP6	Q15	awareness levels vary across the country, in Nairobi there is high awareness, in rural areas lower, but adaptation is seen as a rural issue which is wrong	- generally awareness about climate change is there but responses are inadequate
IP7	Q15	- since the rains have not arrived the changes are very present, generally information has been made available and channelled to the population, particularly the youth	- awareness is there
IP8	Q15 a-c	- the level of awareness is now there, but the adequate response is still missing, in remote communities maybe people do not understand the science behind it, but they are aware that something is happening	- awareness is there
IP9	Q15 a-c	- people know climate change is real, they know the drastic impacts like sea level rise and drought, but they do not see the link to their own ecosystems, or to what people are doing or the other countries in terms of GHG emissions, because we are not the ones who are polluting	- awareness there but this does not necessarily alter the behaviour towards more sustainability
IP10	Q15 a-b	- pastoralists are aware of the changes, they are conscious about the happenings, they do not understand the concept of climate change, but if you relate it to the impact, then they understand it quite perfectly	- people are aware that something is happening to the climate
IP14	Q15	- the impact and amount of damage that will be caused by climate change is not thoroughly understood by many people, it is very hard to reach people and there is a serious need for the simplification of the information provided to the farmers, for they are not reached by radio or newspapers	- still a lack of thorough understanding
IP15	Q15	- awareness is rising and discrepancies between awareness in Nairobi and rural areas is shrinking	- awareness is rising
IP16	Q15	- in pastoral areas awareness is very low, no awareness about the long-term trend of change, hindering appropriate adaptation, but they see it happen, it's only that they can't tell why it is happening the way it is	- long-term climate change not well understood in rural areas
IP17	Q15	- communities may not know that it is called climate change but they are observing changes, at the planning level awareness is high	- awareness there at the planning level, communities know something is happening, might not know the background to climate change
IP18	Q15	- good effort has been done to raise awareness, but there is still a lack of true understanding, communities need to be taken through a process whereby they see historically this is what has been happening, even in government bodies officers may not be well informed	- effort has been made, but there is still lack of understanding in communities and amongst government officials
IP19	Q15	- women farmers are less included in climate hearings and information programmes	- rural women less aware

5.5.5 Relevant Stakeholders for Addressing Climate Change Adaptation

The results of the interviews show that there are several actor groups considered to be key stakeholders relevant for addressing climate change and particularly adaptation in Kenya (Tab. 5.13 and Fig. 5.4): (a) Government actors such as members of parliament as well as relevant ministries and departments and, related to that policy makers. (b) Civil society, including CBOs, organisations working at the grassroots and communities and community networks. (c) The private sector, such as energy and water companies as well as the financial sector. (d) The scientific community. (e) NGOs. In addition to these, media, military and the donor community were also considered important by some interviewees.

Table 5.13: Summary of comments on relevant stakeholders.

Interview	Quote	Paraphrase	Generalisation
IP1	Q16 a-b	- energy + water sector, military, livestock, the scientific community, NGOs (at the grassroots level), policymakers, ministries, elders (have a lot of knowledge about degradation of environment and the communities)	- energy and water sector, military, pastoralists, scientific community, NGOs, policymakers, ministries, elders
IP3	Q16	- government, private sector and media	- government, private sector, media
IP4	Q16	- government, private sector, CBOs such as women groups in rural areas, financial sector	- government, private sector, CBOs, financial sector
IP6	Q16	- government, farmers, civil society, donors, communities, pastoralists, policy makers	- government, farmers, civil society, donors, communities, pastoralists, policy makers
IP12	Q16	- CBOs and grassroots organisations, community networks, government, forest department (to advise people in what trees best to plant), science community (training and knowledge transfer)	- CBOs/grassroots organisations, community networks, government, forest department, science community
IP13	Q16	- communities, MPs, parliament	- communities, MPs, parliament
IP17	Q16	- government, development NGOs, communities, science	- government, NGOs, communities, science

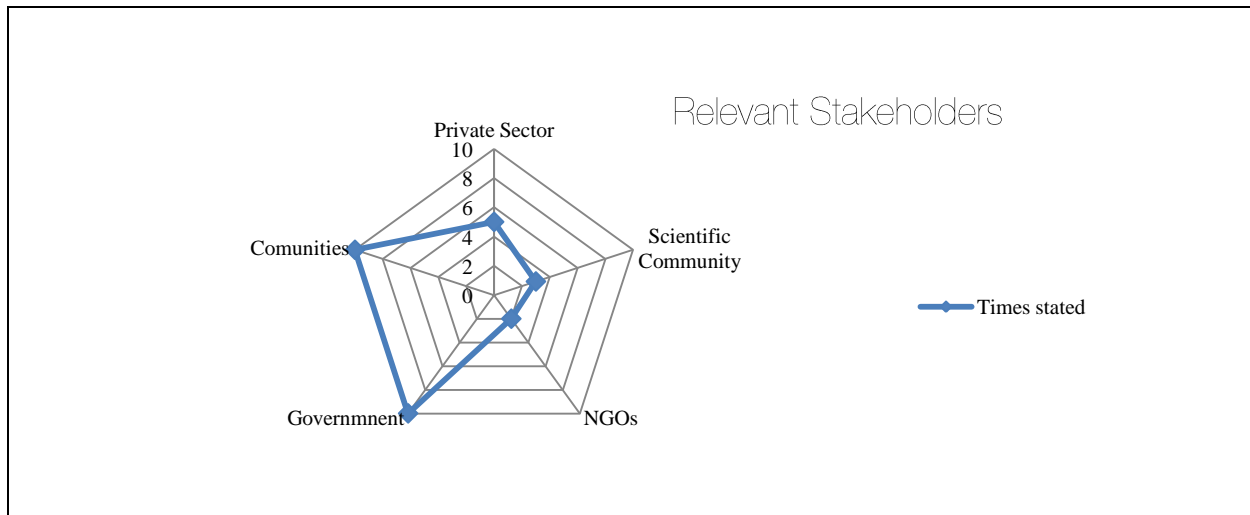


Figure 5.4: Particularly relevant stakeholders regarding climate change adaptation in Kenya.

5.5.6 Climate Change and Conflict

A number of interview partners expressed concern about climate related conflicts in the region (see Tab. 5.14). The main source of quarrel was seen in the lack of sufficient water. Conflict parties that were frequently named were pastoralist and agricultural communities. Another type of conflict, which has significantly increased according to the informants are human/wildlife conflicts. These conflicts are expected to increase and rainfalls increasingly become uncertain.

Table 5.14: Summary of comments on climate change and conflict.

Interview	Quote	Paraphrase	Generalisation
IP3	Q17	- there have been conflicts related to droughts, people are forced to move with cattle to a place 100-200km away, and there are people living there, stress on the environment is increased, also if people lose their source of livelihood, have to look for other means of living, if they have no skills or education they can't get a job in town as a guard, so some engage in cattle rustling because it is profitable	- conflicts related to droughts, cattle rustling
IP4	Q17 a-b	- there is a huge correlation between resource scarcity and conflict, in some of the pastoral districts you already have quite severe conflicts, there is not enough water, so there are some seasons when there is a lot of conflict among the pastoral nomadic peoples, in the past (40 years ago) the conflicts were containable, they would come and invade their neighbours with spears, but now they are using Kalashnikovs, AK47 rifles, these conflicts are likely to increase with a changing climate, If policymakers should look at climate change not as an environmental issue but as a security issue - climate change and the related conflicts also pose a security issue for the nation state because conflicts don't end at international boundaries, extends into our neighbours, Somalia and Ethiopia and Uganda, in the pastoralist areas although there are boundaries nomads cross the boundaries in search of water, that is assuming that there is enough water, but if the water becomes inadequate this could lead to international conflict	- huge correlation between resource scarcity and conflict due to lack of water - conflicts are likely to increase with climate change - climate change should be looked at as a security issue - also transboundary conflicts
IP5	Q17 a-b	- there is increased conflict between agriculturalists and pastoralists, when pastoralists are forced to move into certain areas for pasture - when people are vulnerable and they cannot adapt their human insecurity is endangered, and if individuals are insecure there is no way you can speak about national security, because national security is derived from the individual security, vulnerability of the individual means there's no national security, our security is vulnerable as long as three quarters of our people are vulnerable, indeed three quarters of our people are vulnerable, individual security, environmental and climate change has a lot of impact because three quarters are poor due to mere than 80% ASALs and no investment has been put there to cushion the changes	- increased conflict between pastoralists/agriculturalists - if individuals are insecure, that impacts national security
IP10	Q17	- climate change also brings is conflict, conflict over natural resources really comes up during drought because after a drought animals have died, people have to restock, so they to conduct cattle rustling, which used to be a game, but now it is a practice that they conduct every other time, it brings a lot of killings, because the competition fights, this really affects peace in general, the more frequent these droughts come, the more frequent the conflicts in these areas, the more intense, the more sophisticated, it brings a lot of intercommunity conflict in these areas - conflicts in relation to scarce recourses, also when there is limited water and grass remaining people move animals to come and stay close to the national parks, so that they can get the animals into the national park, causing conflicts with Kenya Wildlife Service ranger - increase in human-wildlife conflicts, because wildlife can cross over to Maasai land while they cannot	- climate change brings conflict over natural resources - there are conflicts between: pastoralist communities pastoralists/KWS human/wildlife
IP14	Q17	- with regard to conflicts amongst farmers or farmers and pastoralists the key aspect here is water, e.g. formerly permanent rivers have become seasonal, there are many upstream-downstream conflicts, the number of destructive conflicts have definitively increased - there are definitively more conflicts, not much cooperation	- water scarcity causes conflicts between pastoralists/agriculturalists, upstream/downstream
IP15	Q17	- some conflicts, for instance in areas where pastoralist bring all their animals to the water points, which are owned by farming communities, there have been even conflicts were there has been loss of lives	- violent conflicts at water points

5.6 Difficulties

There were several difficulties in structuring the results of the interviews. Given that interviews were semi-structured, highly flexible and varied greatly, no uniform reporting was possible. Therefore, no simple, question-guided structure could be implemented. Several aspects were particularly difficult to distinguish: The informants did not always draw a clear differentiation between suggested adaptation and already implemented coping. This was also the case regarding a differentiation between impact and vulnerability. Succeeding this chapter, the next section will discuss the results presented.

6 Discussion and Recommendations

This chapter draws on the preceding theoretical themes and empirical findings in more detail, in order to discuss the prospects for future adaptation.

Less and more variable precipitation and higher temperatures are the main changes that have been experienced in Kenya so far and are expected to further increase in coming years. The impacts of these changes result in extended periods of drought and floods. Some impacts have long-term and chronic consequences (e.g. declining productivity of agricultural land), while others are rather episodic (e.g. floods). As discussed in chapter four, due to the combination of Kenya's particular geographical exposure with low levels of human development, high dependence on agriculture, weak institutions and exceptional levels of inequality, its people are extremely vulnerable to the effects of climate change (see Tab. 6.1).

Table 6.1: Key impacts and associated consequences in Kenya.

	Climate stimulus	Direct Impact	Indirect Impact
Increasing Temperatures	reduced water availability and change in drought patterns	decreased water and pasture availability temperature tolerance of many plants and animals exceeded, pressure on power production	low crop and livestock productivity, decline in harvest yields, food and nutritional insecurity, hunger and malnutrition, ill health, particularly cattle, disruption to business continuity due to electricity shortages, impact on economic standing
Changing Precipitation Patterns		loss of vegetation scarcity of pasture for fodder and drinking water	human health and lives of livestock impacted
Increase in Extreme Weather incidents	flooding	soil erosion; flood damage (to infrastructure, settlements, and assets); poverty; spreading of diseases disease, urban drainage systems fail to cope with sudden downpours	spread of diseases such as malaria and other water borne diseases, livestock diseases and pests, potential increase in insect and parasite populations and infestations

While drought conditions have always been a recurring feature in the history of the region, the occurrences of persistent dry periods have become more frequent and hard-hitting than before:

„The biggest issue in this country is one: drought. Long ago... we used to have droughts which lead to famine... like after [...] normally ten years. These droughts have been now coming... in the beginning it was after seven years, then in came back every five years, then in the last 20 years a drought every four years, the last 10 years a drought every three years, now every two years. Now it shows that it might be repeated every two years. And [this is] a serious drought, were animals die and you have to take relive food. So droughts have really caused serious damage to over 80% of Kenyans who rely on rain fed agriculture to

sustain their livelihoods. In fact there used to be specific times when the rains came, that no longer holds, that's a fact. You'd know if the April rains [are] not enough you can be sure that the October rains will be enough. These days you don't know which is which. That is how Kenyans are so concerned about droughts. [...]" (IP13Q19).

Kenya used to experience a drought every decade, leaving sufficient time for ecosystems and communities to recover, but the interval between droughts has contracted increasingly, leading to periods of extreme water deficiency every one to two years. Respondents in Nairobi therefore perceive a change in the type and severity of shocks and stressors, which are explained as having a negative impact on people's assets such as livestock and farmland. Climate change thus profoundly disrupts livelihoods.

6.1 Implications of Climate Change and its Influence on Livelihoods and Development

For Kenya, these observed changes have widespread impacts. These are more significant in parts of the population with high resource-dependency, such as farmer, and particularly pastoralist communities in more environmentally and socially marginalised areas of Kenya. The linkages between climate change and people's livelihoods are numerous. However, there is considerable social variation concerning sensitivity to the impacts of climate change, as well as people's ability to adjust their livelihoods.

Reconsidering the capital assets related to the livelihoods framework (Jones et al. 2010), we can summarise that according to the statements made by the interviewees, climate change impacts all spheres of assets people (see Tab. 6.2): Of the natural assets, water, land and biodiversity were named to be impacted. Infrastructure and energy are physical assets which are influenced in particular. Regarding livestock, a huge impact can be seen on financial assets, mainly - but not exclusively - among pastoralists. Consistent throughout all stakeholders is the notion that social and human capital are thoroughly damaged, particularly education, health and networks generating further vulnerability.⁷⁰

Table 6.2: Examples of impacts on capital assets in Kenya as identified by the informants.

Natural	water, land, biodiversity
Physical	infrastructure, energy
Social	extended family and other social networks, increase of conflicts among family members
Financial	livestock, economic power
Human	education, good health

⁷⁰ The interviews revealed, that livelihoods are much more than "a means of gaining a living" (Chambers & Conway 1991:5). For example a cow to the Maasai people is much more than a means of gaining food and income, rather does it give meaning to that person's world (IP10). Disregarding these non-material, needs-based, subjective and psychological dimensions has been identified as one shortcoming of the livelihoods approach, as Bohle (2009:528) proposed, "[l]ivelihoods are equally about the circulation of information, the management of skills, and the affirmation of personal significance, identity and status".

As climate problems such as recurrent drought exacerbate the many existing problems in the region, they cause the country to fall back and hinder progress (see also section 6.4.3). Therefore, as expressed by the interview partners, climate change for the country is not only an environmental, but a complex development issue.

6.2 Local Capacities and Responses to Cope with Livelihood

Disturbance

People adopt and modify livelihood strategies as a response to environmental stress, of which climate variability and climate change are two examples. As aforementioned, droughts and erratic rainfall are the most significant and frequent environmental stressors present. In a drought prone country like Kenya, communities have always been coping with climate variability and extremes, but whereas formerly communities had time to adjust and develop coping strategies over centuries, people are now experiencing changes in water patterns that require immediate adjustments in their practices. But to what extent are people able to respond to the changes?⁷¹

Interestingly, while informants considered impacts for both, economic sectors and livelihoods/well-being, the coping strategies which were mentioned referred entirely to the local, in other words, the household or community level. According to the stakeholders, some examples of adjustments people make in their livelihoods currently applied by communities include changes in livestock-keeping practices, agricultural practices and livelihood diversification.⁷² There rarely is only one coping option available, so people oftentimes pursue a number of options. Whether a household or a community is able to respond well to climate change depends on a number of non-climatic factors such as conflicts, lack of access to markets and key resources, infrastructure and restrictions on mobility. As rural livelihoods were considered particularly at risk, by far the majority of coping strategies mentioned by the interviewees had a rural focus, while efforts in urban settings appear to be very limited (see Tab. 6.3).

As expressed by the respondents, remittances from relatives engaging in wage labour in urban centres or even abroad, improve income levels of households and can thus provide an important buffer against environmental stress. Interestingly though, while remittances were considered

⁷¹ It is important to bear in mind that as people are often influenced by multiple stressors such as droughts and plant as well as livestock diseases simultaneously, it can often be very complex to identify a specific climate stimulus as a direct driver of strategies.

⁷² Livelihood diversification is understood as the act of seeking to build up income streams that have different risk attributes, therefore ensuring that some income streams remain reliable when others diminish. In Kenya this implies that households have a portfolio of natural resource based as well as other livelihood activities, as a means of reducing their dependence on one source of income as well as to diminish resource dependency, resources and thus decrease sensibility to climate exposure.

relevant, (labour) migration was not mentioned as a major livelihood strategy, neither did informants consider it to be particularly relevant for future adaptation when specifically asked. Although sometimes overlapping, two types of coping strategies can be distinguished: Response practices employed locally and adaptation practices introduced by national development, research and extension organisations. However, it is evident that the latter is, by far, outnumbered by the community-based efforts. For Kenya, the support that is available from the government was often categorised as being inadequate or entirely missing by the informants: “[I]n those areas the government frontline, the government extension is very thin. So very remote communities, [which] are removed from the centre, don’t have the access to [...] information” (IP8Q10). In the absence of planned or guided adaptation by the Kenyan Government (see chapter 6.4), people have autonomously (in some cases with support from mostly international institutions) developed mechanisms to cope with the adverse effects of changing climatic conditions at the household and community level.⁷³ Communities across Kenya are starting to learn how to live with the reality of increased climate variability, coping as best as they can to its impacts. Accordingly, coping strategies are not the result of a deliberate policy decision, nor are they driven by an awareness that conditions are about to change. Rather are they reactive to the concrete impacts people or communities are experiencing. As one respondent has put it: “It is a natural response, not informed by science, that people just do” (IP14Q13).

Table 6.3: Examples of local coping strategies.

Type of Adjustment	Examples
Changes in Livestock-Keeping Practices	<ul style="list-style-type: none"> • Change in herd composition from cattle to smaller stocks (goats, sheep) • Reintroduction of traditional livestock breeds • Facilitate mobility (by government bodies) • Destocking programmes (by government bodies)
Changes in Agricultural Practices	<ul style="list-style-type: none"> • Reintroduction of traditional crops (sorghum, cassava, millet) • Adjustment of planting seasons • Adjustment in agricultural practices (early seeding) • Water harvesting and shift to irrigated agriculture
Livelihood Diversification	
Individual Level Adjustments	<ul style="list-style-type: none"> • Shift in working hours
Others	<ul style="list-style-type: none"> • Remittances • Migration • Strengthening local institutions and inter-communal networks to increase coping capacity • Water harvesting, Increased water storage, increased depth of boreholes

⁷³ As Adger et al. (2005:77ff) point out, it is important to bear in mind that “[t]hese levels of actions take place within hierarchical structures such that the levels interact with each other. Thus, individual adaptation actions are not autonomous: they are constrained by institutional processes such as regulatory structures, property rights and social norms associated with rules in use”. Obviously, this holds true also for coping options.

Hence, decisions regarding coping strategies are currently undertaken at the local scale, by private individuals as well as by local communities and institutions, sometimes with the support of national or international organisations. The Kenyan Government however, is no key actor regarding the support of coping mechanisms. As one interview partner has put it: “Government is lacking behind [...] these interventions. [T]here’s no clear guideline on directing people [...]. I think [the] government should be proactive and try to work with NGOs who are piloting these things, to [...] properly guide communities on resource utilisation, building capacity [...]” (IP8Q18).

Following the differentiation proposed by Smit and Pilifosova (2001), the coping strategies to climate variability in Kenya identified by the informants can be characterised as being autonomous and natural, without much intervention by public agencies, rather than planned and policy driven. They are implemented on a very local level, which makes sense as vulnerability to the impacts of climate change is highly spatially variable, and initiatives are taken by private actors rather than by the government. Nevertheless, these findings indicate that there is a serious gap between local adaptation practices and government support, this indicates where additional work is needed. Table 6.4 illustrates some of the characteristics of current coping strategies mentioned by the interview partners.

Table 6.4: Characterisation of coping strategies in Kenya.

Purposefulness	autonomous
Timing	responsive
Temporal Scope	short-term as well as long-term
Spatial Scope	localised

6.2.1 Integration of Traditional Knowledge and Practices into Adaptation

While underdevelopment can fundamentally constrain adaptive capacity, the ability to adapt does not solemnly depend on the state of development. One of the main messages of a study regarding adaptation to climate change in the Sahel is that capacities of poor households and local knowledge should not be underestimated as it is commonly done (Mortimore 2010). Speranza et al. (2010) show that local knowledge contributes to the understanding of issues related to climate variability and change in the Kenyan district of Makueni and that it also influences local actors’ decisions on whether to adjust their practices.⁷⁴ This opinion is reflected in the informants views of this study: When addressing consequences of potential impacts of projected climate change and adaptation actions, interview partners suggested that people

⁷⁴ Makueni district covers an area of 7,965.8 km² and is located in the south-eastern part of Kenya with Nairobi to the northwest and Mombasa to the southeast. In the region, of which about 63% comprises of semi-arid areas, most people derive their livelihood from agro-pastoralism, thus engage in rain-fed agriculture and livestock keeping (Speranza et al. 2010).

should build on their traditional knowledge and experiences with past extreme-weather events and variability. One interview partner put it very clearly: “I think those [traditional practices] should be reinforced!” (IP8Q9). Several interview partners also mentioned the role of social networks, community ties and traditional practices in maintaining adaptive capacity:

„[P]art of what enabled the traditional communities to adapt was because they had this collective setting where they would reflect collectively and decide collectively. And there was some collective wisdom. Nowadays, with increasing fragmentation of households you don't have that collectivity and no one is investing in the collectivity. People are actually investing in the fragmentation. So there is no sufficient social capital to allow for communities to think as an institution. They think as households and they act as households. So at what point in time can you cope? Because the reality is that the future will be affected by serious variability. The only way you can respond to that variability is if you can collectively monitor, engage and respond to that variability” (IP18Q19).

Participants provided examples of changing customs because of migration, land rights issues (privatisation) and, more generally, influences of the mainstream culture on the traditional lifestyle, deteriorating social networks.⁷⁵ Additionally, as stated by various interview partners, some of the traditional coping strategies have been undermined or are no longer available as population pressure increases on limited land and water resources and regularly reoccurring droughts have further exhausted traditional coping mechanisms. They suggested traditional food storage methods and promoting a return to traditional crops such as cassava, sorghum and millet which became “out of fashion” under the colonial administration (IP17Q11a).

6.2.2 Constraints to Local Responses

Often it is taken for granted in studies of local adaptation that people simply need access to new knowledge, technology and financial resources to adjust their livelihoods, when in actual fact people's options and ability to adapt may be constrained by a range of structural and historical factors. Drawing back on the capability framework (section 2.3) this means people lack certain freedoms of choice in order to choose adaptations.

In some cases interview partners expressed concerns about issues that limit the scope of choices people can make in order to reduce their vulnerability and seek feasible adaptation options.⁷⁶ Major challenges which hinder people to seek new opportunities are limited knowledge of risks

⁷⁵ One interviewee stated the following regarding the erosion of traditional customs and coping strategies: „[T]he traditional society was very structured, very dictatorial and you had to do things according to the norms. So people were supposed to do stuff, you were supposed to store food you were supposed to do all sorts of things. There was always a reserve. So the coping strategies in those days were strictly monitored by the community. Currently we have individualism. Everybody is an individual. And then the rights issue, you have a right to do whatever you wish to do. So there's no collective responsibility as far as food issues are concerned. So that's one issue. The other thing is the land tenure system. It was a communal thing. You would move from one area to the other without any problems, because the land was shared. Migration now is not an option. Because people have the title deeds, you can't move to another place. And then the intensity of the droughts is also kind of increasing. In the area we are working at we have sometimes five years of consecutive drought. Five years without rain, that would test anybody! [...] The traditional ways are now being [changed]. The way we used to preserve meat for instance, we'd dry the meat in the sun or we'd smoke it. Now people buy meat and put in the fridge and that doesn't last too long. But dried meat would last a very long time” (IP17Q10a).

⁷⁶ Adger et al. (2007:733) refer to limits as “[...] the conditions or factors that render adaptation ineffective as a response to climate change and are largely insurmountable”.

and lack of training, information and skills. In other cases interference with or erosion of traditional lifestyle and coping strategies was discussed, such as a reduction of traditional grazing space and in line with that, increasingly restricted livestock mobility. Adaptive choices are further constrained by limited financial resources (poverty) as well as by economic (lack of markets), institutional (lack of community power, corruption) or cultural barriers. In summary, interview partners found constraints mainly regarding social, human and financial assets, rather than physical or natural assets.

As identified by the informants centralised strategies, imposed from outside are not always well embedded in the local needs and goals. Destocking programmes, for example, promoted by the government, which are oftentimes ignorant of cultural aspects, resulting in simply unviable adaptive solutions: “[We have] commissioned a research that will be looking into why pastoral communities are reluctant to do destocking. We want to understand, of course we know it is a lot of cultural issues, but we also want to engage in a deeper way. To understand why it is that when we talk about destocking they don’t want to do that and they wait [until] it’s too late into the drought that they are taking very weak animals to the market and most of them they don’t sell. In other cases we lose the livestock and the keeper. So we are trying to understand why is it that there is this resistance to destocking“ (IP16Q10a).

6.3 Institutional and Actor’s Analysis

Smit and Pilifosova suggest that “[h]uman system adaptation can be motivated by *private* or *public* interest [...]. *Private* decisionmakers (sic!) include individuals, households, businesses, and corporations; *public* interests are served by governments at all levels” (2001:883, italics added). While being active agents of adaptation themselves, they can also assist and support different entities to adapt. Following these lines of thinking, external as well as local institutions can play a key role in determining what options households have to cope and adapt. The following sections will therefore consider external and institutional actors relevant in Kenya.

6.3.1 State Actors related to the Government of Kenya

Two government ministries are directly involved in current climate change related activities, namely the Ministry of Environment and Mineral Recourse (MEMR) and the Ministry of Forests and Wildlife.⁷⁷ Under the MEMR, the National Environment Authority (NEMA) is in charge of coordinating and supervising all policies related to the environment in Kenya (HBF 2010). Another body affiliated with the government is the Kenya Meteorological Department (KMD) in charge of collecting, analysing and disseminating weather data and climate related

⁷⁷ Other ministries indirectly involved include the Ministry of Land, Ministry of Water and Irrigation, the Ministry of Northern Kenya and other arid lands, the Ministry of Fisheries, the Ministry of Tourism, the Ministry of Public Health and Sanitation, the Ministry of Agriculture and the Ministry of Energy (HBF 2010).

information (GoK 2009). To initiate and coordinate climate change related activities the National Climate Change Activities Coordinating Committee (NCCACC) was established. It consists of 25 members from the listed ministries as well as from universities, the private sector and local authorities. The NCCACC, however, lacks any legislative powers (HBF 2010).

Similar to the role of the NCCACC, the purpose of the Climate Change Coordination Unit (CCCU) is to “coordinate [...] national effort that will ensure that the country is prepared for climate change” (Embassy of Denmark 2010). The CCCU was established in 2008 under the office of the prime minister of Kenya with support from the Danish embassy in Nairobi. The establishment of the CCCU caused ambivalent effects. On the one hand the CCCU has increased pressure on the MEMR to make climate change a priority. On the other hand, the overlapping purposes of the CCCU and the National Climate Change Secretariat of the MEMR have led to mismatches among these different governmental bodies. The disagreement mostly concerns issues of competence, leadership and the distribution of financial resources. Especially the latter is critical as international donors and development partners increasingly provide financial assets to initiate and support measures of adaptation and mitigation (IP17Q19). Sound environmental management with regard to climate change is thus hindered by inadequate and unclear administrative boundaries.

6.3.2 Non-governmental Bodies

A significant number of non-governmental institutions are in one way or another handling topics related to climate change in Kenya. In what follows, two particularly relevant actors are discussed. For a more extensive list of organisations, see Ochieng and Makoloo (2009).

An important non-governmental actor is the Kenya Climate Change Working Group (KCCWG), founded in 2009 by a number of civil society organisation as well as donor groups (HBF 2010; IP13; Ochieng & Makoloo 2009). The impacts of changed weather patterns observed in various sectors of the country’s economy called for urgent action. Founding partners realised that people were acting on their own rather than pooling knowledge and intervening in a joint manner. Government negotiators went to international meetings without sufficient knowledge of global and local impacts of climate change. Also, there was a lack of communication between the local and the national level (IP15; IP13). Today the KCCWG can be described as Kenya’s central roundtable on climate change related issues, bringing together about 250 member organisations and thereby acting as a pillar for advocacy at national level. Members have organised themselves into nine thematic groups, which reflect the major sectors of Kenya’s socio-economic development. (KCCWG undated).⁷⁸ Further, the KCCWG aims at bridging the gap between actions at international and national level as well as between the civil

⁷⁸ The nine groups are: 1) agriculture, livestock and fisheries; 2) urbanization, housing and infrastructure; 3) water; 4) forestry; 5) energy; 6) tourism, trade and industry; 7) Conservation, Pastoralism and Conflict over Natural resources; 8) Health and 9) Education (KCCWG undated:2).

society, the private sector and the government. Regarding state participation, only two government-related bodies actively support the group, namely the Kenya Meteorological Department (KMD) and the Multi-lateral Environmental Agreements Division of the MEMR (KCCWG undated). There has been some cooperation and networking with the Parliamentarian's Network on Renewable Energy and Climate Change and the Office of the Prime Minister (IP15; IP13). The KCCWG aims to advocate and campaign "for a positive policy and legislative framework that takes into account the effects of climate change on human development" (KCCWG undated). For that purpose the KCCWG and its supporters have developed a drafting of the Global Warming Bill, also called Climate Change Bill, for Kenya (Ochieng & Makoloo 2009) (see 6.4.1).

The Pan African Climate Justice Alliance (PACJA) is another relevant non-governmental actor in the climate change discourse which is pushing for government action in Kenya. PACJA, based in Nairobi, is a coalition of more than 300 diverse organisations from 45 African countries, aiming to unify civil society efforts across the continent (Mwenda & Awudi 2010). Its members seek to advocate and lobby for an integration of climate change policies, practices and laws into sustainable development and poverty reduction strategies in Africa. Focussing its attention more on the international level, PACJA regularly takes part in international meetings and conferences, such as the Conference of Parties or United Nations Climate Change Conferences (IP15; IP13).

6.3.3 Development Partners

Given its wide array of impacts on and interactions with wider development, climate change will also inevitably have considerable implications for humanitarian and development interventions. Within Kenya, humanitarian aid and development agencies have already acknowledged this fact and have been active in helping enhance communities' capacity to adapt to a changing climate, as their core goals were undermined by the changes:

"So in many ways we realised that the changes in weather, climate and the seasons were impacting on the well-being of our communities. [...] The droughts would extent for longer periods. [...] Or sometimes it would rain, heavy floods [...]. So we realised that our communities are now challenged to even adapt to what is going on around us. So even in our disaster response and our recovery activities it was very clear that climate change was impacting on the communities. So our humanitarian efforts were being challenged by this new dynamic, this new variability that was forcing us to think differently and respond differently. So both the humanitarian work and also our development work [were] being affected by climate change. [...] So we are seeing our development programming being impacted by this new reality. Our humanitarian work was also being impacted by this new reality" (IP18Q20).

Therefore, development institutions including Norwegian Church Aid, Practical Action, Oxfam and ActionAid International, have identified climate change adaptation as a key priority for

their work (IP8; IP16; IP181; IP19; NCA 2009). Realising that their core humanitarian and development efforts were being challenged by the dynamics of climate change, issues of climate change adaptation made it to the top of their agenda and they have begun to integrate adaptation into their development assistance (see Orlove 2009). Many of these organisations are currently involved in advocacy work at national level, for example when developing the climate change bills and at international level, when attending Conferences of Parties (COP). They are also members of the KCCWG (HBF 2010; IP18; IP16; Orlove 2009). Besides increased involvement in implementing various climate change adaptation projects and advocacy work, there is also an active discussion among development aid agencies in Kenya about integrating Disaster Risk Management (DRM) approaches with climate change adaptation (Mitchell et al. 2010; Njuki & Onyango 2011). These have recognised that the adaptive challenge faced by affected populations in Kenya is not solemnly the long-term trend itself, but also includes the unpredictable extreme events.

6.3.4 Private sector, Universities and Research Bodies

A number of private sector firms have increasingly indicated interest regarding climate change. Until now, however, this interest has focuses mainly on emission-reduction related projects under the Clean Development Mechanisms (CDM).⁷⁹ Others have addressed issues through corporate social responsibility (HBF 2010). Regarding adaptation, however, there remains very little action from the side of the private sector.

A number of research institutions are engaged in climate change related matters, through research and training activities, both from universities and other institutions (HBF 2010). As interviews with partners from university bodies have shown, there lies great capacity amongst university members. However, an integration and close cooperation with civil society organisations such as KCCWG or PACJA does not seem to be practiced currently (IP17).

6.4 An Analysis of the Institutional and Legal Framework

The IPCC suggests that “[...] there is an important role for public policy in facilitating adaptation to climate change. This includes reducing vulnerability of people and infrastructure, providing information on risks for private and public investments and decision-making, and protecting public goods such as habitats, species and culturally important resources” (Adger et

⁷⁹ The Clean Development Mechanism (CDM) was established under the UNFCCC Kyoto Protocol with the intention to assist Non-Annex I (signatory developing) countries, which have no emission targets under the protocol, in achieving sustainable development and to participate effectively to the goals of the Kyoto Protocol. GHG emission reduction projects in developing countries are financially supported (IPCC 2007).

al. 2007:731). In light of this, the next section gives an overview of the current situation regarding climate change relevant policies in Kenya.⁸⁰

6.4.1 Policy Genesis and Content Analysis

In April 2010, the National Climate Change Response Strategy (NCCRS) was presented by the Government of Kenya, whose vision “is for a prosperous and climate change resilient Kenya” (GoK 2010:5). The strategy is Kenya’s key document for a climate change agenda (2010-2030) with the aim to inform nationwide climate change programmes and activities, “[...] ensuring that adaptation and mitigation measures are integrated in all government planning and development objectives” (GoK 2010:44). The strategy lists eight objectives that the government will be pursuing. These include enhancing the understanding of physical climate change and climate change negotiations, promoting international agreements and policies, assessing evidence and impacts of climate change as well as the vulnerabilities present in Kenya; the recommendation of robust adaptation and mitigation measures and providing an action plan coupled with a resource mobilisation plan. Spearheaded by the national Ministry of Environment and Mineral Resources (MEMR), the strategy evolved from a participatory process involving “two national workshops, nine regional workshops as well as workshops with parliamentarians and clusters of stakeholders including the government, private sector, civil society organisations, development partners, youth groups, women’s groups, faith based organisations and the media, among others” (GoK 2010:3). The strategy promotes a programme of action, divided into two steps. The first step is to address the limited climate change awareness among the Kenyan public by establishing education programmes and information campaigns. The second step is to develop an institutional framework which includes the public and all stakeholders in order to clarify competences and responsibilities of different sectors and actors as well as to “combat impacts of climate change” (GoK 2010:44).

Surprisingly, the NCCRS does not seem to consider the CCCU of the Prime Minister’s office a relevant player in governing climate change as the NCCRS only mentions the existence of the CCCU without further elaboration (GoK 2010).

Since October 2009, organisations under the auspices of the KCCWG, (see section 6.3.2) attempt to set up a legal framework addressing issues of climate change (Ochieng & Makoloo 2009). For that purpose a climate change bill has been developed which is currently in the fourth revising process and whose objective is to “[...] provide a framework for nationwide

⁸⁰ As this thesis is related to a doctoral dissertation “Climate Change and Social Instability in Africa – An Integrated Approach to Land Use Conflicts in Kenya” by Janpeter Schilling from the Research Group ‘Climate Change and Security’ (CLISEC) at the Institute for Geography, University of Hamburg, the following sections (6.3 and 6.4) have partly been filed for a Summer School paper submitted at the ‘United Nations Summer Academy on Social Vulnerability: Climate Change and Fragile States: Rethinking Adaptation’ in Munich, 18-22 July 2011. Schilling, J. & Remling, E. (2011): Local Adaptation and National Climate Change Policy in Kenya: Discrepancies, Options, and the Way Forward.

focused actions for mitigating and adapting to changing climate, development under the changing climate and combating the impacts of climate change on various sectors of the economy” (KCCWG 2010:5).⁸¹ The development started with desk studies which analysed the current acts and laws related to the environment. From there a first legal framework and a bill were drafted. After having undergone the current revision process, the bill is expected to be presented to parliament until October 2011 (IP13; IP6). The coalition behind the bill is currently looking for a member of parliament to sponsor the proposed framework. However, until now there has been little support by the government (IP3; IP14; IP13).

The Kenya Vision 2030, a blueprint for long-term national planning, is often referred to when issues are raised concerning the country’s future (IP3; IP14; IP13). Agreed upon in 2007, it draws the line of approach for Kenya’s development from 2008 to 2030. Yet, neither the vision itself (GoK 2007), nor the First Medium Plan (GoK 2008) contains a detailed discussion of climate change impacts on Kenya. This is surprising as the paper does address issues of macroeconomic stability, enhanced equity and wealth creation opportunities for the poor, infrastructure, energy, land reform, human resources development and security, all of which will be severely impacted by climatic changes (HBF 2010; SEI 2009; UNDP 2007). The above described National Climate Change Response Strategy (NCCRS) acknowledges that the Vision 2030 fails to address “climate change adequately” (GoK 2010:47). Further the NCCRS recognises that the aims of the Vision 2030 will be difficult to accomplish without taking the impacts of climate change into account. Therefore, the NCCRS suggests revising the vision, as well as other strategic development plans to be streamlined with the NCCRS (GoK 2010).

Kenya’s New Constitution, enacted in August 2010, has mainly been received well by international institutions as a significant step towards more democracy (see Jansen & Lerch 2010; Oesterdiekhoff 2010). The new structures intend to intensify the supervision of the executive branch and to increase the autonomy of the judicial branch (Oesterdiekhoff 2010). Basic human rights will be strengthened and extended. However, concerns have been raised about the implementation that is currently underway and the technical challenges, such as the transformation of nine provinces into 47 new counties. These will have to be overcome (Jansen & Lerch 2010; Oesterdiekhoff 2010). According to the interview partners, the decentralised character of the new constitution could have two effects: On the one hand it could help decrease the discrepancies between national strategies and local adaptation, as it devotes power from the centralised government to the people, giving responsibility to the citizens by strengthening local autonomy (IP3; IP6). This decentralisation may help to improve local responses to climate

⁸¹ Within the African context only South Africa and Nigeria have developed a legal framework with regard to climate change so far (IP15; IP13).

change, as decisions are taken within the regional context (IP17). On the other hand the new constitution has the potential to „devolve corruption“ (IP18).

6.4.2 Summary of Climate Change Preparedness at the National Level

While in Kenya, non-state actors such as non-governmental organisations, corporations, international organisations, as well as individuals have begun to take on the issue of climate change adaptation and thus have (even without knowing) put the issue of climate justice on the agenda, the challenges have generally not been recognised adequately by the Kenyan Government. Yet, this thesis agrees with Nussbaum (2011:26) who stated that the duty “[...] to secure human capabilities [is] assigned to states”. It is therefore an ethical duty, rather than a political one, to enforce and promote adaptation to climate change.

Nevertheless, it has to be acknowledged that climate change has made it to the political agenda of Kenya to some extent and several governmental bodies are addressing the issue. Competences have been built in order to understand and tackle the effects of climate change. However, until now very few (if any) steps have been taken towards a broad support for policies or legislation so far. Assisted by international partners, the Kenyan government has produced a few policy documents directly or indirectly related to climate change. Concurrently, non-governmental organisations have started to pool resources to address the issue. However, so far state policies have done little to strengthen local adaptation. They have not caused mal-adaptation either, but still significantly limit adaptation options, especially for pastoral communities. For decades, pastoralists in Kenya have faced political, economical and social marginalisation. The government now attempts to integrate the marginalised regions into the national context and to promote adaptation. Yet, there is a lack of successful implementation, which can be attributed to three major reasons. First, Kenya is missing a legal framework that deals directly and explicitly with climate change. In addition, several government bodies concerned with issues of climate change have no or insufficient legislative power. Second, a lack of cooperation and harmonisation exists not only among governmental bodies, but also between the government, the private sector and the civil society hinders utilisation of all competences and perspectives (see also section 6.3). Third, measures to strengthen climate change adaptation are promoted by individual actors⁸² rather than being supported by a unified consensus (HBF 2010).

⁸² These being mostly well know high profile personalities such as Hon. Raila Odinga (Prime Minister), Prof. Wangari Maathai (awarded the Nobel Peace Prize in 2004), Prof. Richard Odingo (former Vice-president of the IPCC) amongst others (HBF 2010).

6.5 Public Awareness of Climate Change

Overall, knowledge in communities regarding possible impacts of climate change is increasing. Even when the concept of climate change as such is not completely understood by some people, they have significant experience with current and past climate variability and with the effectiveness of applied adaptation measures, to enable them to advice on potential future adaptations. One problem is the fact that climate change occurs in long timescales. Particularly in Kenya, where people have always been faced with climatic variability, it is difficult to differentiate climate change impacts from natural variability and make people realise that the change is nothing temporary. Therefore, sustainable implementation of viable adaptation options depends heavily on disseminating climate information in a usable format. At national level, the Kenya Meteorological Department (KMD) generates weather and climate information and circulates it via mass media, such as newspapers and radio. While it is aimed at informing farmers, livestock holders and community associations at the local level, the information provided hardly allows the end users to make pro-active decisions. According to the informants this is due to a lack of easily understandable or usable formats. They suggest that, weather and climate forecast information products at national level need to be tailored to match local user's needs with an inclusion of concrete response options.⁸³ The following section will discuss viable adaptation options to the impacts of climate change as considered relevant by the stakeholders.

6.6 Implications for Adapting Livelihoods to Climate Change

As discussed above, current climate variability affects diverse aspects of livelihoods and sectors in different ways and the impacts are expected to increase with progressing climate change. The coping examples given by the informants show that there is considerable potential for adaptation at the local level, however, coping strategies currently followed to adjust to climate variability may be insufficient for expected future changes in Kenya or might be eroded due to

⁸³ One very interesting project in this regard was mentioned by an interview partner: „What we were doing in those projects was [...] have the Kenya MET, Peter Ambenje group coming out with their seasonal forecast. Then we get the traditional people telling us what they think is going to happen. So we'd have two forecasts, independently developed. Then we sit together and work on consensus. You can imagine people with M.Sc's and PhDs sitting with guys who have never gone to class. But it is a facilitated consensus we are talking about. So if Peter says "It's going to rain in this part of the region from this part, in this time!" then he has to explain to us in very clear terms why he thinks that's the case. Then the old people, the traditional people would also say "No, it's not going to rain!" they say why they say it's not going to rain. So back and forth and argue and talk and then we agree that this is what is happening. So it's a meeting of minds, consensus development. But first of all we had to demystify both sides. The traditional, indigenous people didn't have faith in science. The science obviously don't have faith in these things, they say they are using voodooism to help these things. To bring them together to one table, we had to do a lot of talking and stuff. So we even went as far as validating the knowledge from the indigenous communities. "What plant are you using?" Then they get a botanist. The botanist looks at the physiology of that plant and links that to moisture in the atmosphere and the behaviour of that. So there is a scientific link between the indicator, which is a plant, and rainfall. They use winds, to get the meteorologists say "This is actually what we do!" If it is blowing from Lake Victoria it's carrying moisture, it's likely to rain. So a meeting of minds, so people started seeing that although these guys go to the forest to make it look.... they are actually doing science. So that's what we did and that project got a lot of attention" (IP17Q11b).

frequent stress as already the case in some pastoral districts. Supplementing short-term coping, with long-term adaptation should therefore be imperative.

Although predictions or estimates of likely future climate change in Kenya come with some uncertainty (see 4.3), interview partners were consistent in that future adaptation is essential. Potential adaptive responses referred to by the interview partners include a wide range of options, encompassing sectors and different communities.⁸⁴ In terms of geographic scale, the largest body of suggestions made by the informants for future adaptation were targeted at the community level. Relatively few suggestions aimed at creating change at the national level, and even fewer were taking the international into account. So what type of adaptation do stakeholders suggest?

Adger et al. (2007:720) hold, that “[a]daptation practices can be differentiated along several dimensions: by spatial scale (local, regional, national); by sector (water resources, agriculture, tourism, public health, and so on); by type of action (physical, technological, investment, regulatory, market); by actor (national or local government, international donors, private sector, NGOs, local communities and individuals); by climatic zone (dryland, floodplains, mountains, Arctic, and so on); by baseline income/development level of the systems in which they are implemented (least-developed countries, middleincome (sic!) countries, and developed countries); or by some combination of these and other categories”.⁸⁵ This poses a difficulty in structuring the disarray and diversity that characterises adaptation options proposed. For the sake of this thesis, however, the focus has not been on assessing and classifying all possible options. Rather it will focus on the aim of the actions proposed by the interviewees while taking into account the theoretical framework introduced in the second chapter.⁸⁶

While some concrete adaptation measures, such as improvements in water provision, are frequently named, one theme that is reoccurring within the pattern of responses is ‘increase adaptive capacity’. This is a more comprehensive approach, for it implies that generally the capabilities of people have to be addressed to enable them to adapt for themselves. This distinction is relevant according to Adger et al. (2005:78), who postulate that a differentiation between “[...] increasing the ability of individuals, groups, or organisations to adapt to changes, and implementing adaptation decisions, i.e. transforming that capacity into action” is important. While the former are concrete measures, the latter address the drivers of generic vulnerability, inherent to the system, in other words, non-climate stressors such as poverty and limited access

⁸⁴ Obviously this list of potential adaptation measures cannot be comprehensive, but simply represents the interviewee's point of view.

⁸⁵ Smit and Wandel (2006:288) suggested that adaptations can also be distinguished “[...] according to the degree of adjustment or change required from (or to) the original system [...]”, e.g. simple, substantial, even more substantial adaptation.

⁸⁶ For an overview of possible actions to climate proof drylands, see Sørensen et al. (2009) who provide a draft exposure profile with options for action and specific adaptation options developed by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH.

to information. This is in accordance with the contextual or starting-point interpretation of vulnerability, introduced in section 2.2.3.

Table 6.5: Relation between current coping and future adaptation.

	Current Coping Strategies	Future Adaptation
Timing	reactive	anticipatory
Level	community level, sometimes supported by NGOs	local level, but policy driven, supported and guided by the government
Actors	private	private and public
Purposefulness	autonomous	planned

Livelihood adaptation can be motivated either by private or public interest (see introduction 6.3). Private decision makers include individuals, households, businesses and corporations while public interests are served by governments at all levels. The analysis of the previous sections has shown that, from a policy perspective as well as from the government level, there is very little support regarding climate change adaptation. However, interview partners were consistent in that the government has to start taking concrete action. Many informants suggested anticipatory adaptive strategies to be implemented through public policy (see Tab. 6.5).

Informants answers regarding Kenya’s preparedness to deal with the impacts of climate change related to the national level and highlighted that the state simply lacks the adaptive capacity to cope with the challenges imposed by climate change in addition to their usual plight, or simply lacks political goodwill (see sections 5.5.2 and 5.5.7). Consequently, interviewees considered large-scale external support necessary.

The statements made by the informants regarding relevant stakeholders in the climate change adaptation context also show that the government, as well as communities themselves, are considered relevant. This indicates that interview partners suggest collaboration with the people on the ground. Interviewees were concerned about gaps in stakeholder participation in the planning, design, implementation and monitoring of projects, which highlights the fact that according to them governance plays a decisive role when considering future adaptation. The aforementioned findings, point to a fundamental gap between local needs and state capacity.

6.7 Summary

To summarize the results made so far and to link it to the vulnerability framework introduced in the second chapter, elements of vulnerability in Kenya are manifested at multiple levels, as outlined in Table 6.6. In terms of *exposure*, Kenya is experiencing increased negative impacts associated with weather related events such as floods, droughts and change in rainfall patterns (see Tab. 6.6). Impacts of these events are often worsened by unsustainable human actions and practices of challenging conditions. In Kenya *sensitivity* refers to the overall level of social

development including health, high levels of poverty, food insecurity and limited availability of basic services. Major challenges are malaria and HIV/AIDS. Sensitive groups across the country include pastoralist groups and agricultural communities relying on rain-fed agriculture. Gender disparities were also identified to contribute to sensitivity by limiting access of women to resources including land. All interview partners were concerned about limited *adaptive capacities* available for people to deal with future exposures. In general, the capacities were identified to be low and major challenges include limited access to resources that could help in responding to threats at the community level such as functioning community networks, limited access to training and technologies to reduce dependence on natural resources and enhance alternative livelihood options and land tenure issues. It is also important to note the reduced capacity in communities, which are repeatedly faced with disasters, particularly prolonged droughts.

Table 6.6: Summary of key drivers of vulnerability to climate change in Kenya.

Vulnerability driver		Example of vulnerability
Exposure	Nature and frequency of natural disasters	<ul style="list-style-type: none"> • Increased occurrence of drought and overall change in precipitation patterns • Flooding (including flash floods)
Sensitivity	Livelihood options and strategies	<ul style="list-style-type: none"> • People with limited access to resources for migrants, widows, disabled people with higher level of poverty and food insecurity • People sick with malaria, HIV /AIDS • Farmers and families depending on rain-fed agriculture and subsistence farmers • People with limited access to resources and higher level of poverty and food insecurity • Exploitation of migrants in urban areas • Population living in urban slums • agricultural communities depending on rain-fed agriculture • pastoral communities depending on water and pasture
Adaptive Capacity	Lack of capital (social, physical, financial, human, and natural)	<ul style="list-style-type: none"> • Decreasing well- functioning community networks • Limited access to services such as health care and sanitation • Lack of irrigation systems and limited water storage • Limited access to knowledge and technologies to deal with changing exposure • Migration of local people (changing social networks) • Reduced social security after disasters (i.e. food, health, sanitation) • Reduced natural coping patterns • Social insecurity • High incidence of poverty • Conflicts related to water and land

Kenyans have used a number of livelihood strategies spanning diversification, adjustments in agricultural and pastoralist livelihoods in order to deal with current changes. All over the country measures are already being implemented, generally as autonomous actions at the household or community level. These actions mostly include changes in agricultural or livestock-keeping practices and are partly supported by international aid agencies. However, there is no single solution or adaptation measure, which would resolve problems countywide

caused by current climate variability and enhances adaptive capacity for the future. How then bridge the gap between local needs and national policy?

Interview partners recognised the need to improve the situation of the most vulnerable Kenyans, which are already significantly affected by current challenges and exposures. Such groups include pastoralist communities and farmers practicing rain-fed agriculture. Both livelihood types are highly sensitive to changes in climatic patterns and natural resources. As reported, many of these people have become even more vulnerable through repeated exposures as their coping capacities are further undermined. While pastoralists, for example, may cope with one or two consecutive droughts, constantly reoccurring droughts may result in all of their reserves being depleted. Another vulnerable group, which was frequently mentioned are Kenyan women, who are taking care of children and elders, typically have a low purchasing power and no land ownership. This group is highly vulnerable regardless of climate variability and weather-patterns. Major strategies to improve the situation of these vulnerable groups include adoption of alternative activities (e.g. crafts, trades, processing). For agriculturalists, production diversification, water harvesting, and food processing were suggested. Hard measures such as construction of water collecting facilities, including wells, dams and water conservation systems were also identified as priorities to address sensibilities.

Many interventions considered relevant by the interview partners for future adaptation contribute to increasing adaptive capacity and address the underlying drivers of sensitivity in the face of a climate change, rather than merely promoting adaptation concerned with physical assets and infrastructure and thus altering the exposure (see Tab. 6.7). Core capabilities, which interview partners considered lacking are distributional inequalities, health or education, mobility and political participation. Generally, according to the interviewees, the package of viable measures should be able to adjust to local conditions and be compatible with cultural practices and beliefs as well as in accordance with natural processes.

The thesis now proceeds with examining how the results presented can frame policy responses on adaptation to climate change in Kenya.

Table 6.7: Overview of adaptation actions and their aims.

(Source: Own representation, partly based on Adger, Arnell & Tompkins 2005).

Objective of Adaptation	Examples
Altering the exposure	investing in hazard preparedness and undertaking climate change mitigation activities
Reducing the sensitivity	increased reservoir storage capacity, planting hardier crops that can withstand more climate variability, ensuring that new buildings in flood plains are constructed with a floodable ground floor
Increasing adaptive capacity	generic actions which not only aim to enhance well-being and increase access to resources or insurance, but also include specific measures to enable specific populations to recover from loss, may include communicating climate change information, building awareness of potential impacts, maintaining well-being, protecting property or land, maintaining economic growth, or exploiting new opportunities

6.8 Recommendations - Identifying Viable Livelihood Adaptation Strategies

The interviews revealed that stakeholders see an important role for public policy in facilitating adaptation to climate change. According to Adger et al. (2007:731) this can include “[...] reducing vulnerability of people and infrastructure, providing information on risks for private and public investments and decision-making, and protecting public goods such as habitats, species and culturally important resources”. What then are robust, policy-relevant conclusions regarding feasible means of reducing vulnerability and facilitating adaptation at the local level in Kenya?

Although an impressive variety of coping initiatives has been undertaken across the country, such responses are not equally useful and/or feasible: 1) No single set of adaptive policy recommendations can be universally, or nationally appropriate, as the impacts of climate change are highly spatially variable, as well as cultural and geographical realities, the sensitivity and capacities of the people. This is particularly the case in a country like Kenya, where geography, climate, livelihoods and cultures vary considerably. Top-down strategies, no matter if implicated by government or development agencies alone, appear to be largely insufficient to deal with climate change impacts. 2) As an additional note of caution it has to be mentioned that another problem with infrastructural or technical adaptations streamlined from above could also be that they might further increase inequality within or among regions or social groups, as suggested by O’Brien et al. (2007). For Kenya, this might be particularly relevant as ethnical groups and tensions in connection with corruption might favour such decision-making. Following this line of thinking, adaptation needs to be developed at the scale of households and communities.

As a prerequisite, such a legal framework and policy would need to clearly define competences and responsibilities among state bodies involved in the management of national adaptation to climate change which, as we have seen, is not the case so far. It might be of use to develop a catalogue of best practise examples and exchange experiences with different coping strategies and long-term adaptation. However, the stakeholders have suggested an orientation towards non-climate stressors. Consequently, what needs to be addressed is enhancing people’s adaptive capacity. This raises the question of how to link localised adaptation actions and national policy, in short, how to concretely mainstream adaptation into policy.⁸⁷

⁸⁷ The analysis of Adger et al. (2007:731) emphasizes that within the climate change context, “[...] ‘mainstreaming’ has been used to refer to integration of climate change vulnerabilities or adaptation into some aspect of related government policy such as water management, disaster preparedness and emergency planning or land-use planning”.

As Adger et al. (2007:731) have recognised, “the distribution of adaptive capacity within and across societies represents a major challenge for development and a major constraint to the effectiveness of any adaptation strategy”. Therefore, while certain adaptive responses such as improving infrastructure in formerly marginalised areas might be useful, the focus should be different: Drawing back on the relationship between adaptation and adaptive capacity introduced in section 2.5, for adequate adaptation choices taking place, as argued here, it is crucial to create the climate in which these options can be taken, thus to create the right conditions. In reference to Nussbaum (2011) regarding the function of a state, the government needs to create and protect contexts of choice for its citizens. An appropriate way forward for policy would thus be to dismantle constraints to, and enable the flexible practice of adaptive strategies and to create an enabling environment, where locally defined adaptation goals should take priority over those imposed from outside. Such an approach would be in contrast to centralised strategies, „which are top-down, and treat communities as homogenous entities for the purpose of both research and policy“ (Dumarú 2010:751).⁸⁸ Empowering people at the local level would also decrease dependency on state interventions or on external aid in the long-term. In accordance with Smit and Pilifosova (2001), it is asserted that this enhancement of adaptive capacity involves similar requirements as promotion of sustainable development. A viable pathway should therefore respond to the current and future impacts of a changing climate, while simultaneously paying attention to the overall development needs and priorities of the country. The goal should be to create livelihood conditions which enable people to respond to climate change by addressing the linkages between development and vulnerability. In this respect, development policy must itself adapt to greater flexibility under uncertainty.⁸⁹

As aforementioned, confidence in local climate predictions for Kenya should be managed with great caution. Therefore, as Mertz et al. (2009) have pointed out, it is difficult to design policies in anticipation of change. “[...] [I]nvestments in adaptation to anticipated change might be wasted or even counterproductive if predictions turn out to be wrong. This is especially crucial in developing countries, where the capacity for investment and later remedial actions to correct mistakes is limited” (ibid. 747). This points at a particular benefit of the suggested vulnerability-reducing policy approach, because efforts would not require precise climate forecasts, which – as discussed before – come with considerable uncertainty for Kenya.

Additionally, special attention will have to be paid to the following points:

- It is critical to provide people with access to information about climate change in general and the specific projections for the region they live in. This information should

⁸⁸ Currently such a community-based approach (CBA) to climate change adaptation is promoted by a number of development experts, such as the International Institute for Environment and Development (IIED). However, it can be considered a very recent development and research on theory and practice is still emerging. A few pilot projects have been initiated, such as the ‘Capacity Building to Develop Adaptation Measures in the Pacific Countries Project’, the ‘Fiji CCA Project’, the ‘WWF Climate Witness Project’, and the ‘Red Cross Preparedness for Climate Change Programme’. However, written material about the topic is still limited and poorly informed by theory or evidence (Dumarú 2010).

⁸⁹ A discussion on these kind of responses slowly emerging in Kenya as we have seen in section 6.3.3.

be spread in ways, which reach the communities, in a format that people can understand.

- As people who understand the local culture as well as conditions are best placed to develop appropriate and sustainable adaptation measures, adaptation must be rooted in assessments where local people evaluate their own situations and needs.
- Governance practices and public participation needs to be changed: All relevant stakeholders should be incorporated in selecting and implementing adequate adaptation strategies as well as developing policy responses.
- Practical climate change adaptation initiatives should be integrated with other programmes, to enhance adaptive capacity. Consequently, any climate change policy should be integrated into existing national policies, rather than being addressed separately.
- Adaptation efforts should focus on strengthening existing formal and informal institutions, particularly community-based structures, and the ability of people to form new networks and participate in climate change planning processes.
- The gap between local knowledge of climate change impacts and livelihood responses and relevant decision-making processes, should be bridged in order to assure that policies and programmes are grounded in local realities. As discussed above (section 6.3.1) the enactment of the new constitution represents a chance in this regard.

7 Conclusion and Outlook

This chapter summarises the findings of this thesis. It concludes with some remarks on the limitations of this study before giving an outlook for further research.

7.1 Summary of Findings

Building on fieldwork conducted in Nairobi, Kenya, this thesis presented an analysis of nineteen in-depth interviews with relevant stakeholders and addressed their perceptions of climate change impacts on people's livelihoods in Kenya and the kind of actions taken to tackle the impacts. It has highlighted people's knowledge and capacity, while also assessing the constraints they face and their key vulnerabilities. Further, it has analysed adaptation options suggested by the informants as has provided recommendations for policy-making.

The livelihoods of many Kenyans are rooted in the productivity of ecosystems and are thus thoroughly affected by climate change. The interviews have shown that climate change already has severe negative impacts on livelihoods and people's well-being, with this year's famine representing only the tip of the iceberg (GIEWS 2011). Kenyans already have to deal with the impacts, until now however, mainly without government support. While most communities are adapted to normal climatic conditions and moderate deviations from this norm, climate change, with increased climate variability and extreme weather events, is likely to exceed the present coping range and thus may exceed the adaptive capacity.

Options for responding to changing climate conditions vary significantly, depending on the socio-economic, cultural and geographical context. In practice, the analysis has shown that there is not necessarily a conscious process through which coping strategies and adaptations are selected and implemented, rather do people deal with the change and simply react the best they can. According to the terminology proposed by the IPCC (2007), this may be viewed as autonomous adaptation, thus an unconscious response to ecological changes in natural systems. While these measures are natural and necessary, it has been argued that adaptation, as part of policy and conscious decision-making processes, should support efforts countywide and enable people to share best practice examples. Adaptation must take place at the local level to be effective a policy response should be more a matter of facilitating and supporting adaptation of current practices rather than imposing nationally decided adaptation options. Following Smit and Pilifosova (2001), it is asserted that the mainly autonomous coping strategies followed by people in Kenya form a baseline against which the need for planned anticipatory adaptation can be evaluated. Additionally, structural causes limiting the current coping range as mentioned by

the informants, will also frame long-term responses to climate change. The factors determining present-day conditions of social vulnerability, either facilitating or constraining short-term coping should be the entry point for any policy on sustainable adaptation. The success of promoting adaptation to climate change will also depend on the degree to which policy makers make use of the expertise on climate change assembled in Kenya, both traditionally and within local, regional and national organisations.

Successful national adaptation efforts require careful analysis and should be integrated into wider development programmes. As the analysis has shown, besides robust adaptations, enhancing adaptive capacity is considered relevant. Adaptation which focuses on community-based approaches should be favoured, aiming at reducing poverty, diversifying livelihoods and empowering people to manage their own communities. The central question should therefore consider how people can achieve stable and secure livelihoods in the face of climate change.

It is important to understand and to strengthen local adaptive capacity so people can take adaptation decisions for themselves and in their context. This is not only necessary in order to improve local conditions but also to avoid destabilisation of the country itself and furthermore of the East African region, within which Kenya is highly influential.

7.2 Limitations of this Work

This paper was written as a Master's Thesis and thus the scope of this study is, owing to the little time available and at the same time ambiguous research objective, limited. Five months is less time than may be ideal for a comprehensive study of coping responses and possible adaptations in the face of changing hydro-climatic conditions in Kenya. But the time and resources allocated for this thesis did not allow for a more comprehensive study to be carried out. First and foremost, as the primary research focussed on informants at the national level, while allowing for a broad overview of the problems Kenya is faced with, this also comes with a price: The interview partners, while working on the grassroots level, are themselves not directly affected. Consequently, they represent experts, but their views must be considered carefully and might not reflect the opinions and ideas of people in the many areas of the country, where the impacts of climate change are felt. In future research the people's voice should thus be differentiated to a greater extent.

Second and closely related to the first point, as the sampling was done via 'snowballing', while this choice was well motivated, the selection of interview partners may be biased towards a set of respondents who are more connected with each other. Stakeholders not connected to the 'network' in Nairobi and/or affiliated to KCCWG were subsequently not sampled, but would doubtlessly have been valuable sources of information.

Thirdly, in the beginning of the fieldwork, the list of interview questions was very broad, necessitating revision and simplification. This caused some of the initial interviews to be rather general and vague. The problem was however mended due course.

Finally, as interviews conducted for this study showed, a concise definition of and clear differentiation between terms was often lacking, particularly between ‘adaptation/coping’ and ‘impacts/vulnerabilities’. This sometimes made it difficult to assess what informants really meant, and raises the point that it would be worth taking a closer look at the discourse on climate change at the national level in Kenya as well as within the institutions and organisations. Such a discourse analysis was beyond the scope of this thesis, but would doubtlessly be warranting.

7.3 Future Areas of Research

Besides the issues mentioned in the previous section as rewarding future research, several additional points shall be considered here. Given that the ability to adapt also depends on social networks and interviewees stressed their importance for coping, it would be valuable to document what kind of support structures – informal and formal – exist for vulnerable people at the local level, and, how these can be strengthened.

Following that line of thought, an assessment of sources of formal and informal support for coping mechanisms and the items of assistance received, as for example food, cash loans, information and training would be important. Research should also assess how people on the ground access relevant information and which of these channels are most useful and have the potential for expansion. Further investigating and documenting the decision-making processes within the communities would also be a valuable addition to current knowledge.

As the stakeholder interviews revealed, enormous potential of knowledge is assembled amongst Kenyans across the country as to how to adjust livelihood strategies to changing conditions. An expanded survey could create original knowledge, put the whole matter on a broader foundation and feed into a ‘menu of recommendations’ which could subsequently enable exchange and discussion of best practise examples.⁹⁰ Additionally, this would make the evidence base even more robust and relevant for policy actors at the national level to respond to.

⁹⁰ Such a survey could also have the effect of showing respect for local knowledge and empower people similar to suggestions made by Dunn (2008).

Acknowledgments

This study has benefited immensely from advice, information, and assistance generously provided by many people. While it is impossible to mention all by names, the following have been of great assistance towards my success in this work.

First and foremost I would like to thank all interview partners in Nairobi who took the time and patience to speak to me. Without these experts and the insights they shared, this report would certainly not be as vivid and comprehensive as it is now and might not have been written at all. In particular, I would like to mention Hezron Gikanga of the Heinrich Böll Foundation East & Horn of Africa for his interest, open-mindedness and cheerful support as well as for opening many Nairobi doors for me; Eric Kisiangani of Practical Action for his unconventional and new ideas on livelihood impacts for making me think in ways I would have never considered before and Meitiaki Soikan of Mainyoito Pastoralist Integrated Development Organization (MPIDO) for his kind and honest insights on the struggle of Maasai pastoralists as well as for the wonderful mandazis.

Furthermore, I would like to acknowledge funding by the Hans-Böckler-Foundation without which I would have never been able to meet these inspiring people. My supervisor Prof. Jürgen Scheffran also deserves a most special thank you for his guidance and support throughout the process as well as Janpeter Schilling for the constant exchange about our ongoing work. I am most grateful to Björn, Thomas and Mara for their comments, which helped considerably to improve the presentation of my work.

Lastly, to Memi, Bjarne and Helene who have been pillars of my success and accompanied me during this process.

References

- Adger, W. N. (2006): Vulnerability. In: *Global Environmental Change*, Vol. 16. Pp. 268-281.
- Adger, W. N., S. Agrawala, M. M. Q. Mirza, C. Conde, K. O'Brien, J. Pulhin, R. Pulwarty, B. Smit & K. Takahashi (2007): Assessment of adaptation practices, options, constraints and capacity. In: Parry, M. L., O. F. Canziani, J. P. Palutikof, P. J. van der Linden & C. E. Hanson (eds.): *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. Pp. 717-743.
- Adger, W. N., N. W. Arnell & E. L. Tompkins (2005): Successful adaptation to climate change across scales. In: *Global Environmental Change*, Vol. 15. Pp. 77-86.
- Adger, W. N. & P. M. Kelly (1999): Social Vulnerability to Climate Change and the Architecture of Entitlements. In: *Mitigation and Adaptation Strategies for Global Change*, Vol. 4. Pp. 253-266.
- Adger, W. N., I. Lorenzoni & K. O'Brien (2009): Adaptation Now. In: Adger, W. N., I. Lorenzoni & K. O'Brien (eds.): *Adapting to Climate Change. Thresholds, Values, Governance*. Cambridge: Cambridge University Press. Pp. 1-22.
- Adger, W. N. & K. Vincent (2005): Uncertainty in adaptive capacity. In: *C. R. Geoscience*, Vol. 337. Pp. 399-410.
- Barnett, J. (2010): Adapting to climate change: three key challenges for research and policy—an editorial essay. In: *Wiley Interdisciplinary Reviews: Climate Change*, Vol. 1. Pp. 314-317.
- Barnett, J. & W. N. Adger (2007): Climate change, human security and violent conflict. In: *Political Geography*, Vol. 26. Pp. 639-655.
- Bohle, H.-G. (2009): Sustainable Livelihood Security. Evolution and Application. In: Brauch, H. G., U. Oswald Spring, J. Grin, C. Mesjasz, P. Kameri-Mbote, N. C. Behera, B. Chourou & H. Krummenacher (eds.): *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts. Hexagon Series on Human and Environmental Security and Peace*, Vol. 4. Berlin, Heidelberg and New York: Springer-Verlag. Pp. 522-528.
- Bohle, H.-G. & T. Glade (2008): Vulnerabilitätskonzepte in Sozial- und Naturwissenschaften. In: Felgrentreff, C. & T. Glade (eds.): *Naturrisiken und Sozialkatastrophen*. Berlin: Springer-Verlag. Pp. 99-119.
- Boko, M., I. Niang, A. Nyong, C. Vogel, A. Githeko, M. Medany, B. Osman-Elasha, R. Tabo & P. Yanda (2007): Africa. In: Parry, M. L., O. F. Canziani, J. P. Palutikof, P. J. van der Linden & C. E. Hanson (eds.): *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. Pp. 433-467.

- Brooks, N., W. N. Adger & P. M. Kelly (2005): The determinants of vulnerability and adaptive capacity at the national level and the implications for adaptation. In: *Global Environmental Change Part A*, Vol. 15. Pp. 151-163.
- Carter, T. R., R. N. Jones, X. Lu, S. Bhadwal, C. Conde, L. O. Mearns, B. C. O'Neill, M. D. A. Rounsevell & M. B. Zurek (2007): New Assessment Methods and the Characterisation of Future Conditions. In: Parry, M. L., O. F. Canziani, J. P. Palutikof, P. J. van der Linden & C. E. Hanson (eds.): *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. Pp. 133-171.
- Chambers, R. & G. Conway (1991): *Sustainable Rural Livelihoods: Practical Concepts for the 21st Century*. Brighton: Institute of Development Studies.
- Christensen, J. H., B. Hewitson, A. Busuioc, A. Chen, X. Gao, I. Held, R. Jones, R. K. Kolli, W.-T. Kwon, R. Laprise, V. Magaña Rueda, L. Mearns, C. G. Menéndez, J. Räisänen, A. Rinke, A. Sarr & P. Whetton (2007): Regional Climate Projections. In: Solomon, S., D. Qin, M. Manning, Z. Chen, M. Marquis, K. B. Averyt, M. Tignor & H. L. Miller (eds.): *Climate Change 2007: The Physical Science Basis. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. Pp. 847-940.
- CIA - United States Central Intelligence Agency (2011): *The World Factbook 2011. Country Profile Kenya*. Online at: <https://www.cia.gov/library/publications/the-world-factbook/index.html> (last accessed: 4 June 2011).
- Cope, M. (2008): Coding Qualitative Data. In: Hay, I. (ed.): *Qualitative Research Methods in Human Geography*. Oxford: Oxford University Press. Pp. 223-233.
- (2010): Coding Transcripts and Diaries. In: Clifford, N., S. French & G. Valentine (eds.): *Key Methods in Geography*. Los Angeles: Sage. Pp. 440-452.
- Diaz-Bone, R. & W. Schneider (2003): Qualitative Datenanalysesoftware in der sozialwissenschaftlichen Diskursanalyse - Zwei Praxisbeispiele. In: Keller, R., A. Hirsland, W. Schneider & W. Viehöver (eds.): *Handbuch Sozialwissenschaftliche Diskursanalyse, Bd. 2: Forschungspraxis*. Opladen: Leske + Budrich. Pp. 457-494.
- Dumar, P. (2010): Community-based adaptation: enhancing community adaptive capacity in Druadrua Island, Fiji. In: *Wiley Interdisciplinary Reviews: Climate Change*, Vol. 1. Pp. 751-763.
- Dunn, K. (2008): Interviewing. In: Hay, I. (ed.): *Qualitative Research Methods in Human Geography*. Oxford: Oxford University Press. Pp. 79-105.
- EAC - East African Community (2011): *History of the EAC*. Online at: <http://www.eac.int/about-eac/eac-history.html> (last accessed: 5 June 2011).
- Embassy of Denmark in Nairobi & Ministry of Foreign Affairs of Denmark (2010): *Danish Activities in Relation to Climate Change and Renewable Energy*. Online at: <http://www.ambnairobi.um.dk/en/menu/development/climatechange/danishactivitiesinrelationtoclimatechangeandrenewableenergy> (last accessed: 4 June 2011).
- Eriksen, S. & P. Kelly (2007): Developing Credible Vulnerability Indicators for Climate Adaptation Policy Assessment. In: *Mitigation and Adaptation Strategies for Global Change*, Vol. 12. Pp. 495-524.
- Evans, P. (2002): Collective Capabilities, Culture, and Amartya Sen's Development as Freedom. In: *Studies in Comparative International Development*, Vol. 37. Pp. 54-60.

- Folke, C. (2006): Resilience: The emergence of a perspective for social-ecological systems analyses. In: *Global Environmental Change*, Vol. 16. Pp. 253-267.
- Füssel, H.-M. (2007): Vulnerability: A generally applicable conceptual framework for climate change research. In: *Global Environmental Change*, Vol. 17. Pp. 155-167.
- (2009): Development and Climate Change. Background note to the World Development Report 2010. Review and Quantitative Analysis of Indices of Climate Change Exposure Adaptive Capacity, Sensitivity and Impacts. Potsdam: Potsdam Institute for Climate Impact Research.
- Gallopin, G. C. (2006): Linkages between vulnerability, resilience, and adaptive capacity. In: *Global Environmental Change*, Vol. 16. Pp. 293–303.
- Gasper, D. (2006): What is the Capabilities Approach? Its Core, Rationale, Partners and Dangers. The Hague: Institute of Social Studies.
- GIEWS - Global Information and Early Warning System & Food and Agriculture Organization of the United Nations (2011): Countries Requiring External Assistance for Food. Online at: <http://www.fao.org/giews/english/hotspots/index.htm#KEN> (last accessed: 15 June 2011).
- Gläser, J. & G. Laudel (2009): Experteninterviews und qualitative Inhaltsanalyse als Instrument rekonstruierender Untersuchungen. Wiesbaden: VS Verlag für Sozialwissenschaften.
- GoK - Government of Kenya (2007): Kenya Vision 2030 - A Globally Competitive and Prosperous Kenya. By: National Economic and Social Council of Kenya & Ministry of Planning and National Development. Nairobi: Government Press.
- (2008): First Medium Term Plan (2008-2012) By: Government of Kenya. Nairobi: Government Press.
- (2009): Effect of Climate Change in Kenya. Adaptation and Mitigation Measures. From Kenya to Copenhagen. By: Ministry of Environment and Mineral Resources. Nairobi: Government Press.
- (2010): National Climate Change Response Strategy. By: Ministry of Environment and Mineral Resources. Nairobi: Government Press.
- Haddad, B. M. (2005): Ranking the adaptive capacity of nations to climate change when socio-political goals are explicit. In: *Global Environmental Change*, Vol. 15. Pp. 165-176.
- HBF - Heinrich Böll Foundation East and Horn of Africa (2010): Climate Change Vulnerability and Adaptation Preparedness in Kenya. Nairobi: Heinrich Böll Stiftung.
- IPCC - Intergovernmental Panel on Climate Change (2007): Appendix I: Glossary. In: Parry, M. L., O. F. Canziani, J. P. Palutikof, P. J. van der Linden and C. E. Hanson (eds.): *Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. Pp. 869-883.
- Jansen, S. & A. Lerch (2010): Die neue Verfassung Kenias „auf einen Blick“. Nairobi: Konrad-Adenauer-Stiftung.
- Janssen, M. A., M. L. Schoon, W. Ke & K. Borner (2006): Scholarly networks on resilience, vulnerability and adaptation within the human dimensions of global environmental change. In: *Global Environmental Change*, Vol. 16. Pp. 240-252.

- Jones, L., S. Jaspars, S. Pavanello, E. Ludi, R. Slater, A. Arnall, N. Grist & S. Mtisi (2010): Responding to a changing climate. Exploring how disaster risk reduction, social protection and livelihoods approaches promote features of adaptive capacity. Working Paper 319. London: Overseas Development Institute.
- KCCWG - Kenya Climate Change Working Group (2010): Climate Change Bill 2010 [3rd Preliminary Draft]. Nairobi: Obtained from Joseph Ngondi, Programme Officer of Kenya Climate Change Working Group (KCCWG) on 18 April 2011 via personal communication.
- KCCWG - Kenya Climate Change Working Group (undated): Brief Narrative about the Kenya Climate Change Working Group (KCCWG). Nairobi: Obtained from Joseph Ngondi, Programme Officer of Kenya Climate Change Working Group (KCCWG) on 18 April 2011.
- Kelly, P. M. & W. N. Adger (2000): Theory and practice in assessing vulnerability to climate change and facilitating adaptation. In: *Climatic Change*, Vol. 47. Pp. 325-352.
- Leemans, R. (2009): The Millennium Ecosystem Assessment: Securing Interactions between Ecosystems, Ecosystem Services and Human Well-being. In: Brauch, H. G., U. Oswald Spring, J. Grin, C. Mesjasz, P. Kamari-Mbote, N. C. Behera, B. Chourou & H. Krummenacher (eds.): *Facing Global Environmental Change: Environmental, Human, Energy, Food, Health and Water Security Concepts*. Hexagon Series on Human and Environmental Security and Peace, Vol. 4. Berlin, Heidelberg and New York: Springer-Verlag. Pp. 53-62.
- Mayring, P. (2002): *Einführung in die qualitative Sozialforschung: Eine Anleitung zu qualitativem Denken*. Weinheim: Beltz.
- McGray, H., A. Hammill & R. Bradley (2007): *Weathering the Storm. Options for Framing Adaptation and Development*. WRI Report. Washington, DC: World Resources Institute.
- McSweeney, C., M. New & G. Lizcano (2008): *UNDP Climate Change Country Profiles: Kenya*. Online at: <http://country-profiles.geog.ox.ac.uk> (last accessed: 3 January 2011).
- McSweeney, C., M. New & G. Lizcano (undated): *UNDP Climate Change Country Profiles. Documentation*. Online at: <http://country-profiles.geog.ox.ac.uk> (last accessed: 3 January 2011).
- Mertz, O., K. Halsnaes, J. E. Olesen & K. Rasmussen (2009): Adaptation to Climate Change in Developing Countries. In: *Environmental Management*, Vol. 43. Pp. 743-752.
- Mieg, H. A. & M. Näf. (2005): *Experteninterviews*. Zürich: Institut für Mensch-Umweltsysteme (HES), ETH Zürich.
- Mitchell, T., M. Ibrahim, K. Harris, M. Hedger, E. Polack, A. Ahmed, N. Hall, K. Hawrylyshyn, K. Nightingale, M. Onyango, M. Adow & S. Sajjad Mohammed (2010): *Climate Smart Disaster Risk Management. Strengthening Climate Resilience Discussion Series*. Brighton: Institute of Development Studies.
- Mortimore, M. (2010): Adapting to drought in the Sahel: lessons for climate change. In: *Wiley Interdisciplinary Reviews: Climate Change*, Vol. 1. Pp. 134-143.
- Murphy, M. & J. Magrath (2006): *Africa – Up in smoke 2. The second report on Africa and global warming from the Working Group on Climate Change and Development*. Working Group on Climate Change and Development. London: The New Economics Foundation.

- Mwenda, M. & G. Awudi (2010): Are they really financing climate change in Africa? African climate dialogue briefing series 1. Nairobi: Pan African Climate Justice Alliance.
- NCA - Norwegian Church Aid (2009): Best Practice in Climate Change Programming. In: Crouch, M. (ed.): Norwegian Church Aid Kenya. Nairobi: Norwegian Church Aid.
- Njuki, E. & M. Onyango (2011): Presentation on Climate Smart Disaster Risk Management. Conference Meeting: Strengthening Climate Resilience at the Intercontinental Hotel, Nairobi, 19 April 2011.
- Nussbaum, M. C. (2003): Capabilities as Fundamental Entitlements: Sen and Social Justice. In: *Feminist Economics*, Vol. 9. Pp. 33-59.
- (2011): Capabilities, Entitlements, Rights: Supplementation and Critique. In: *Journal of Human Development and Capabilities*, Vol. 12. Pp. 23-37.
- O'Brien, K. L., S. Eriksen, L. P. Nygaard & A. Schjolden (2007): Why different interpretations of vulnerability matter in climate change discourses. In: *Climate Policy*, Vol. 7. Pp. 73-88.
- O'Brien, K. L. & J. Wolf (2010): A values-based approach to vulnerability and adaptation to climate change. In: *Wiley Interdisciplinary Reviews: Climate Change*, Vol. 1. Pp. 232-242.
- O'Brien, K. L. & R. M. Leichenko (2007): Human Security, vulnerability, and sustainable adaptation. Background Paper commissioned for the Human Development Report 2007/2008: *Fighting Climate Change: Human Solidarity in a Divided World*. New York: United Nations Development Programme.
- Ochieng, B. O. & M. O. Makoloo (2009): Climate Change Adaptation and Mitigation. What organizations in Kenya are doing. Institute for Law and Environmental Governance (ILEG) Conference Report, Online at: <http://www.ilegkenya.org/pubs/docs/NGOs%20Booklet%20Final.pdf> (last accessed: 4 June 2011).
- Oesterdiekhoff, P. (2010): Kenias neue Verfassung - Chancen der "Zweiten Republik". Nairobi: Friedrich Ebert Stiftung.
- Orlove, B. (2009): The past, present and some possible futures of adaptation. In: Adger, W. N., I. Lorenzoni and K. L. O'Brien (eds.): *Adapting to Climate Change. Thresholds, Values, Governance*. Cambridge: Cambridge University Press. Pp. 131-163.
- Renaud, F. G., J. Birkmann, M. Damm & G. C. Gallopín (2010): Understanding multiple thresholds of coupled social-ecological systems exposed to natural hazards as external shocks. In: *Natural Hazards*, Vol. 55. Pp. 749-763.
- Reuber, P. & C. Pfaffenbach (2005): *Methoden der empirischen Humangeographie*. Braunschweig: Das Geographische Seminar.
- Ribot, J. (2010): Vulnerability Does Not Fall from the Sky: Toward Multiscale, Pro-Poor Climate Policy. In: Mearns, R. & A. Norton (eds.): *Social Dimensions of Climate Change. Equity and Vulnerability in a Warming World*. Washington, DC: The International Bank for Reconstruction and Development /The World Bank. Pp. 47-74.
- Robeyns, I. (2006): The Capability Approach in Practice. In: *The Journal of Political Philosophy*, Vol. 14. Pp. 351-376.

- Robinson, L. W. & F. Berkes (2011): Multi-level participation for building adaptive capacity: Formal agency-community interactions in northern Kenya. In: *Global Environmental Change*, Vol. 21. Pp. 1185-1194.
- Roy, M. & H. D. Venema (2002): Reducing risk and vulnerability to climate change in India: The capabilities approach. In: *Gender & Development*, Vol. 10. Pp. 78-83.
- Scheffran, J. (2011): The Security Risks of Climate Change: Vulnerabilities, Threats, Conflicts and Strategies. In: Brauch, H. G., U. Oswald Spring, P. Kameri-Mbote, C. Mesjasz, J. Grin, B. Chourou, P. Dunay & J. Birkmann (eds.): *Coping with Global Environmental Change, Disasters and Security. Hexagon Series on Human and Environmental Security and Peace*, Vol. 5. Berlin, Heidelberg and New York: Springer-Verlag. Pp. 735-756.
- Scheffran, J. & A. Battaglini (2011): Climate and conflicts: the security risks of global warming. In: *Regional Environmental Change*, Vol. 11. Pp. 27-39.
- Schilling, J. & E. Remling (2011): Local Adaptation and National Climate Change Policy in Kenya: Discrepancies, Options, and the Way Forward, submitted. Working paper CLISEC-14, Research Group Climate Change and Security, University of Hamburg.
- SEI - Stockholm Environment Institute (2009): The Economics of Climate Change in Kenya: Final Report submitted in advance of COP15. Oxford: Stockholm Environment Institute, Oxford Office.
- Selvaraju, R., A. R. Subbiah, S. Baas & I. Juergens (2006): Livelihood adaptation to climate variability and change in drought-prone areas of Bangladesh. Developing institutions and options. Case Study 5. Rome: Food and Agriculture Organization of the United Nations.
- Sen, A. (1999): *Development as Freedom*. Oxford: Oxford University Press.
- (2004): Elements of a Theory of Human Rights. In: *Philosophy & Public Affairs*, Vol. 32. Pp. 315-356.
- Smit, B. & O. Pilifosova (2001): Adaptation to Climate Change in the Context of Sustainable Development and Equity. In: McCarthy, J. J., O. F. Canziani, N. A. Leary, D. J. Dokken & K. S. White (eds.): *Climate Change 2001: Impacts, Adaptation, and Vulnerability- Contribution of Working Group II to the Third Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge: Cambridge University Press. Pp. 877-912.
- Smit, B. & J. Wandel (2006): Adaptation, adaptive capacity and vulnerability. In: *Global Environmental Change*, Vol. 16. Pp. 282-292.
- Sörensen, L., A. Trux, A. Durchrow & R. Bodemeyer (2009): Running dry? Climate change in drylands and how to cope with it. Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH. München: oekom verlag.
- Speranza, C. I., B. Kiteme, P. Ambenje, U. Wiesmann & S. Makali (2010): Indigenous knowledge related to climate variability and change: insights from droughts in semi-arid areas of former Makueni District, Kenya. In: *Climatic Change*, Vol. 100. Pp. 295-315.
- The World Bank (2011): World Development Indicators (WDI). Online at: <http://data.worldbank.org/indicator> (last accessed: 4 June 2011).

- Turner, B. L., R. E. Kasperson, P. A. Matson, J. J. McCarthy, R. W. Corell, L. Christensen, N. Eckley, J. X. Kasperson, A. Luers, M. L. Martello, C. Polsky, A. Pulsipher & A. Schiller (2003): A framework for vulnerability analysis in sustainability science. In: Proceedings of the National Academy of Sciences of the United States of America, Vol. 100. Pp. 8074-8079.
- UNDP - United Nations Development Program (2007): Kenya Natural Disaster Profile. Online at: <http://mirror.undp.org/kenya/KenyaDisasterProfile.pdf> (last accessed: 25 June 2011).
- UNDP - United Nations Development Programme (2011): Kenya. Country profile of human development indicators. Online at: <http://hdrstats.undp.org/en/countries/profiles/KEN.html> (last accessed: 4 June 2011).
- UNICEF - United Nations International Children's Emergency Fund (2011): Country statistics: Kenya. Online at: http://www.unicef.org/infobycountry/kenya_statistics.html (last accessed: 4 June 2011).
- Wong, C., M. Roy & A. K. Duraiappah (2005): Focus on Kenya. United Nations Environment Programme & International Institute for Sustainable Development. Nairobi: United Nations Environment Programme and International Institute for Sustainable Development.

Annexes

Annex A - List of Interview Partners in Alphabetical Order ⁹¹

Name	Organisation and Position	Focus of interview/Main Topics
Mr. Ambenje, Peter	Kenya Meteorological Department, Deputy Director of Forecasting	Observed and future trends, impacts on Kenya
Mr. Gikanga, Hezron	Heinrich Böll Stiftung East & Horn of Afrika, Regional Environment Programme Officer	Stakeholders, role of government, conflicts, legislation, suggestions for adaptation
Mr. Kamudhayi, Ben Ochieng (Dr.)	University of Nairobi, Institute of Diplomacy and International Studies (IDIS), Lecturer	Environmentally related conflicts in Kenya, link human and national security, role of government
Mrs. Kiplagat, Nirina	United Nations Development Programme (UNDP) Kenya, Programme Officer Peace Building and Conflict Prevention Unit	Conflict in Kenya and relation to climate change, governance and political situation
Mr. Kisiangani, Eric	Practical Action, Project Coordinator – Climate Change	Impacts on livelihoods, coping strategies, necessary capabilities, role of government
Mrs. Lumosi, Caroline	Ecological Society for East Africa, Project Officer	Impacts on ecosystems, role of government, legislation
Mrs. Magero, Michelle	ActionAid International Kenya, Project Officer Women's Right's Theme	Impacts on women, coping strategies and gender aspects regarding vulnerability
Mr. Mbole, Paul	Norwegian Church Aid, Programme Coordinator Kenya Programmes	Impact on well-being, preparedness of people, coping strategies, role of aid organisations
Mr. Mutiso, Stephen	Oxfam, Disaster Risk Reduction Project Manager Kenya Programme	Vulnerable groups, particularly pastoralists
Mr. Mutunga, Kanywithia (Dr.)	Kenya National Federation of Agricultural Producers (KENFAP), Chief Executive Officer	Impact on agricultural sector, coping strategies and limitations, adaptation needs
Mr. Mwenda, Mithika	Pan African Climate Justice Alliance (PACJA), Coordinator	PACJA, KCCWG, role of government, legislation
Mr. Ngondi, Joseph	Kenya Climate Change Working Group (KCCWG), Programme Officer	Impact on Kenya and people's well-being, KCCWG, legislation, coping strategies and needs, adaptation needs
Mr. Njarage, James and his Group	Kariobangi South Welfare & Slums Housing Association (KASWESHA Housing Cooperative Society)	Impact on community (urban), information channels, role of government, coping options and limitations
Mr. Njoroge, Waiganjo	United Nations Environment Programme (UNEP), Major Groups Outreach UN Campaign for Climate Change	Role of government

⁹¹ Due to reasons of confidentiality, information concerning timing and duration of the interview, as well as the interviewee code has been omitted in this public version.

Continued List of Interview Partners

Mr. Odingo, Richard (Prof.)	University of Nairobi, Professor and Ex Vice-President IPCC	Observed and future trends, impacts on Kenya, vulnerable sectors
Mr. Ouma, Gilbert (Dr.)	Department of Meteorology, University of Nairobi, Professor	Preparedness of Kenya to deal with climate change, information channels, coping strategies, adaptation needs
Mr. Riiri, Munene	National Council of community-based Organizations, Secretary General	CBOs related to climate change
Mr. Soikan, Meitiaki	Mainyoito Pastoralist Integrated Development Organization (MPIDO), Programme Officer	Impacts on pastoralist communities, coping options limitations, stakeholder involvement, adaptation needs
Mr. Wamae, Titus and Mr. Omenya, Alfred (Dr.)	Eco-Build Africa Trust, Programmes Officer and Director	Impacts on Kenya, KCCRS, coping strategies and needs, legislation

Annex B - Interview Outline

Introductory Part

Personal background and role of organisation

- What is the aim of your organisation?
- In what regions is [name of organisation] active/involved?
- Who does [name of organisation] work with?
- You are the [position] of [name of organisation]. What do you do in this position/function?
- Since when have you been involved with the topic of cc (adaptation)?
- In what way is (local/regional) cc part of your everyday work?

Main Part

Climate change in Kenya

- How would you estimate the impact of current cc on Kenya (observed trends)?
 - What are the major changes that have taken place during the past years?
 - How has this impacted Kenya as a country?
- Where do you see the greatest future impacts (future projections)?
- How relevant do you see cc for Kenya compared to other problems?

Kenya's vulnerability & relation to security issues

- How would you assess Kenya's preparedness to deal with cc impacts?
 - From your point of view, what major challenges does Kenya face? Which sectors are particularly susceptible to cc?
- How would you estimate the adaptive capacity to cc in Kenya?
 - What are particular strengths or weaknesses?
 - From your expertise, how aware are Kenyans of cc?
- To your estimation, will environmental conflicts become more likely? Why?
 - Is the likelihood of conflicts increased due to cc?
- Does cc have an impact on the security for the individual (human security)? How (e.g. food, water, health, conflict)?
 - On social group, the community, organised national or ethnic entity?
 - How are these interconnected?
- To what extent is environmental change a security issue in the governmental agenda?
 - Would you say that cc poses a national security issue in Kenya? Or does it only affect human security?

- Does it threaten political/social stability?
- Where do you see the link between cc and security?
- If yes, what could possible implications for Kenya's national security be?
- What would appropriate strategies for the prevention of security risks, the management of environmental conflicts and the stabilisation of Kenya be?
 - How could problem-solving capacities be strengthened?

Capabilities Framework

- How do changes in the climate system, and related ecological systems, impact capabilities of Kenyans?
 - How does cc affect the well-being, income, infrastructure and functioning of people's lives in Kenya?
- How do the people deal with the impacts (climatically induced drought periods, decreasing or irregular precipitation)?
- What are people's abilities to act?
 - What are coping strategies as a response to climate-related changes?
 - Would you be able to recognise certain patterns of coping?
 - What are important capabilities that are lacking?
- According to your expertise, are there certain groups which are clearly more affected than others'?
 - If yes, which ones? And why, what are the causes?
 - Are you aware of cases where this has lead to conflict/cooperation?
 - Positive example where people were able to deal with resource shortages?
- What is needed to enable people to deal with cc impacts?
 - Which capabilities are necessary for people to adapt to the changing environment?
 - What can be done to reduce people's vulnerability and help them adapt to the changing circumstances?
- What would your recommendations be to improve national/regional policies on cc adaptation?
 - How could vulnerabilities be reduced and resilience to the impacts of cc built?

Migration (taken out after the first interviews)

- What are the main drivers for migration within Kenya?
 - Is environmental change an important factor in the decision to migrate?
 - Where do people migrate from and where to?
- Do you see a link between internal migration movements in Kenya and cc?
 - What are environmental push factors that are related to cc?
 - Would you say that environmentally-triggered migratory stress is enforced by cc?
 - What other options for action (a part from migrating) do actors have?
 - Difference between climate refugees (entitlements)/environmental migrants/ environmentally displaced persons?
- Are there sufficient political response mechanisms and institutions?
 - What protection/assistance mechanisms exist?
 - What is the role of IDP camps in this regard?
 - Is external help useful or needed to protect against cc?
- To what extent is migration related to conflicts (in source or target region)?

Recommendations, demands, needs and expectations concerning adequate policy making

- What policies and institutions could address and prepare the country to handle the projected impacts of cc?
 - What actions could be taken on a sub-national level?
- What are important stakeholders regarding this issue?
 - Personally, what is your opinion regarding their engagement, are they included sufficiently?
 - What role does government play?
- Does there seem to be much interest in cc issues in the general public?
 - Would you consider political participation a key issue in cc adaptation?
 - How can participatory approaches be strengthened?

Concluding Part

- Before we come to a finish, I would like to know whether from your point of view we missed something essential. Are there any gaps we didn't address you would like to mention?
- Do you have any questions regarding my research or myself?

Annex C - Quotes from the Interview Partners

The first column refers to the quotation number of a statement given in chapter 5, while the second column refers to the paragraph in the specific interview. Questions (in bold) asked by the author are in some cases included, to sustain the context in which the statement was made. As some words or phrases arose during the interviews which might be culturally common or location names, not known to the author, some sections include an '(?)' indicating that the exact spelling of the word is not clear.⁹²

Quotes from IP1

Q11	§35	concerning adaptation to climate change: the greatest need is to raise awareness amongst the people
Q12	§36-41	How relevant do you see climate change for Kenya compared to other problems? <ul style="list-style-type: none"> • it will have a huge importance for Kenya in the future • will be a great issue • there are so many small farmers which will be affected by precipitation changes • e.g. Mt Kenya's glaciers are melting which will pose a serious threat to the people living downstream the rivers • river levels will go down
Q16	a §25	the Department reports to a committee which belongs to the Prime Minister's Office and if the forecasts are peculiar, a meeting with all relevant ministries and stakeholders is being called in (energy + water sector, military, livestock)
	b §45-51	important stakeholders concerning adaptation and policy are <ul style="list-style-type: none"> • Scientific Community • NGO → at the grassroots level • Policymakers • Ministries • Elders → have a lot of knowledge about degradation of environment • e.g. old rules: when a tree was cut down, you had to plant 2 new ones

Quotes from IP2

Q3	§62-63	in 2009 there were 10 mil people affected by food scarcity <ul style="list-style-type: none"> • new to this issue: for the first time there were also food shortages in urban areas
Q6	§62-63	in 2009 there were 10 mil people affected by food scarcity <ul style="list-style-type: none"> • new to this issue: for the first time there were also food shortages in urban areas
Q11	a §31-32	building economic development <ul style="list-style-type: none"> • providing economic opportunity for vulnerable individuals
	b §67-68	climate has not been addressed sufficiently <ul style="list-style-type: none"> • there needs to be an increase in the spectrum of livelihood possibilities, especially for pastoralists

Quotes from IP3

Q1	§27-29	Where do you see the greatest impacts on Kenyan sectors, where do you see Kenya being most vulnerable to climate change? I think... from the different kind of work that we've been doing... agriculture, last year we did a study on irrigation agriculture, Kenya is saying it's moving from rain fed to irrigated agriculture [...] yet the reality is, that Kenya is a water stressed country, upstream we don't put in place any measures to harvest water (...), we have 2-3 ministries handling water, The Ministry of Water and Irrigation is the one in charge of irrigation, yet the money [...] was going to the Ministry of Agriculture, which doesn't have engineers to do irrigation. So I see a lot of policy, good ideas, good intentions but not well thought out. So irrigation agriculture is a... critical element in assuring food security for Kenya. But how are we doing it in light of climate change? Are we putting a cart before the horse? I don't know. So agriculture is a very important in terms of food security. Two is energy, if Kenya wants to become an industrialised country by 2030 it needs to diversify its energy mix... How is the mix at the moment, more or less? well... in a normal year in terms of rainfall, 70% hydro. If there is no rain we have emergency power producers like now doing 30-40% of emergency power, which is heavy diesel, very expensive.[...] If you look at the potential for clean energy, and clean energy doesn't mean nuclear [...]. You have up to 3, 4 thousand megawatts potential of geothermal in the rift valley, that's part of the work that we've done, we have up to 5 to 6 thousand megawatts of wind up in Lake Turkana [...], so you have also got lots of solar, so you can easily get 10.000 megawatts from the sun, from geothermal, from wind. And 10.000 should be sufficient for the next 20-30 years [...]. The third sector would be transport. Transport for two reasons: If you look at the statistics of Kenya [...] one of the issues is that 60-70% of the population is under 35. This population is urbanising. This population is unemployed and moving to towns. One of the projects that the government has to sustain this is self-employment, medium and small micro-enterprises; and this needs some source of energy to power the small industries that they are beginning.... If this happens, [...] in different counties which are urbanising then you need to think about critical urban transport solutions.
Q2	a §13	We are seeing a lot of changes in terms of ... climatic cycles, we had a big drought in 2009 ... we are currently having a drought here and if Kenya has been depending on hydro for 80% of its energy then ... policymakers need to really think through this.
	b §30-31	How is the mix at the moment, more or less? well...in a normal year in terms of rainfall, 70% hydro. If there is no rain we have emergency power producers like now doing 30-40% of emergency power, which is heavy diesel, very expensive.[...] If you look at the potential for clean energy, and clean energy doesn't mean nuclear [...]. You have up to 3, 4 thousand megawatts potential of geothermal in the rift valley, that's part of the work that we've done, we have up to 5 to 6 thousand megawatts of wind up in Lake Turkana [...], so you have also got lots of solar, so you can easily get 10.000 megawatts from the sun, from geothermal, from wind. And 10.000 should be sufficient for the next 20-30 years [...].

⁹² Information which relates to the informants identity is omitted in this public version.

	c \$45	And actually also the urban poor. The people in the informal settlements. Because if it's water, then you are paying 3-4 times more [...]. Then energy, if it's electricity [...], if it is food, when there is a drought or famine they pay 3,4,5,10 times, medical needs, malaria has moved to zones where I usen't to be... in the highlands, so I am spending more money on medical bills than previously. We don't have very good social safety nets in this country...that's it...
Q3	\$45	And actually also the urban poor. The people in the informal settlements. Because if it's water, then you are paying 3-4 times more [...]. Then energy, if it's electricity [...], if it is food, when there is a drought or famine they pay 3,4,5,10 times, medical needs, malaria has moved to zones where I usen't to be... in the highlands, so I am spending more money on medical bills than previously. We don't have very good social safety nets in this country...that's it...
Q5	\$25	[...] From where I sit [climate change] is very, very important. Simply because climate change is threatening livelihoods. [...]
Q6	\$41-42	[...] Looking at the average Kenyan, which issues of their livelihood are most likely to be impacted by climate change? Food..., water, energy, which electricity... a lot. Yes, those three. For they don't travel much [...] those are other side issues...
Q7	a \$56	[...] From the statistics I read that malaria is a bigger threat than even HIV/Aids... This is driven by climate change, this has moved from just the lowlands or the areas around the lakes where it has been prevalent to the highlands. That's a threat to national security. [...]
	b \$45	And actually also the urban poor. The people in the informal settlements. Because if it's water, then you are paying 3-4 times more [...]. Then energy, if it's electricity [...], if it is food, when there is a drought or famine they pay 3,4,5,10 times, medical needs, malaria has moved to zones where I usen't to be... in the highlands, so I am spending more money on medical bills than previously. We don't have very good social safety nets in this country...that's it...
Q8	\$43-44	Would you say that there are certain groups more vulnerable to climate change than others? Yes. Like talk to the fishermen [...]. The fisher folk, at Lake Victoria [...] also along the coast. The pastoralists also a lot, they have been going to extremes. They don't understand this. They have been marginalised for a long time, access to information, even through radio, reading papers, the news, they are not very much aware of what is happening but they can tell that something is wrong. They don't have reserves, either in cash, or in others... they are not diversified in their economy.
Q9	\$38	for example, if I live in Nairobi I earn X KSh, I have my two, three brothers also educated and working. So my mom is retired, she is back in her farm, if her farm doesn't do well we send her some money every end of the month. That is not true to everyone! Or I am able to (...?) buy her some solar panels, improve her daily farming... She is one in a million. She herself is not even able to adapt...
Q11	\$28	So irrigation agriculture is a... critical element in assuring food security for Kenya.
Q12	\$24-25	... I think I'd want to answer the question in two ways... One: From where I sit it is very, very important. Simply because climate change is threatening livelihoods. And even though the country says, by 2030 it should be a middle income country so it wants to be industrialised. So there are two things that I asked the consultant, to look at the Vision 2030 and how this looks at climate change, meaning that you are transitioning from an agricultural economy to a middle income, industrialised country. What are the pathways to industrialisation, that make sure that we take care of the environment? A low carbon economy, yes...how is it incorporated in the different strategies and the papers that are coming up in relation to Vision 2030? Very little...
Q13	\$37-38	How well do you think is Kenya able to adapt to these changes or impacts, at the moment in the current situation? I think at very different levels... for example, if I live in Nairobi I earn X KSh, I have my two, three brothers also educated and working. So my mom is retired, she is back in her farm, if her farm doesn't do well we send her some money every end of the month. That is not true to everyone! Or I am able to (...?) buy her some solar panels, improve her daily farming... She is one in a million. She herself is not even able to adapt... So it is a very individual question? Yes! [...] If I look at the even CCRS, even the energy act, or the water act, or [...] or the housing I don't think we have a housing policy, we don't even have a food policy. People are left to learn to cope, learn to develop coping mechanisms for themselves. We don't have a disaster response strategy as such. So I don't think... Kenya is able to do this.
Q14	\$57-58	Would you say that Kenya is able to tackle these issues by itself, or is external help needed? Largely yes, if there... as I keep on saying, if there is political goodwill. Because there are lots of research studies, lots of Kenyans in here and out there who are working on issues of climate change. But this is not coordinated in the first place. People are working at cross purposes. People are competing for donor funds on climate change. People are competing on party issues. To a large extent, I believe yes. If people are serious... If you look at how much tax was raised, internally, they say "it's god's will, this is why this happened", we will not maintain our infrastructure, we will not invest ... in forelooking technologies... for example... [...] what would be the incentives for transition into a low carbon economy within Kenya... if Kenya would strike oil, I think the whole climate awareness and political voodoo ... would actually be trashed. That's what we feel... so we've been looking at those things and thinking... climate change, yes, is it just for political mileage from some certain people, within certain political setups. ... It is a global issue, yes, so I also want to be identified with this, but in reality I am doing quite little... which is an interesting perspective because if you look at how Ethiopia, Meles Zenawi he is the spokesperson for the African group, has been able to use climate change to legitimise himself in the international community, but still maintains a very repressive regime [...]
Q15	a \$18-19	[...] If I go back to the study, perceptions... people know about climate change, awareness is quite high, within certain sectors , but there is also (...?) when we have a drought or a certain catastrophic event you just administer it to climate change, which is wrong in doing things , also because... sorry to say this, Africans do not plan for the future, they say "it's god's will, this is why this happened", we will not maintain our infrastructure, we will not invest ... in forelooking technologies... for example... [...] what would be the incentives for transition into a low carbon economy within Kenya... if Kenya would strike oil, I think the whole climate awareness and political voodoo ... would actually be trashed. That's what we feel... so we've been looking at those things and thinking... climate change, yes, is it just for political mileage from some certain people, within certain political setups. ... It is a global issue, yes, so I also want to be identified with this, but in reality I am doing quite little... which is an interesting perspective because if you look at how Ethiopia, Meles Zenawi he is the spokesperson for the African group, has been able to use climate change to legitimise himself in the international community, but still maintains a very repressive regime [...]
	b \$26-27	[...] in terms of... perceptions, there is adequate awareness about how serious climate change and climate change related events are, [...] the weather has changed [...].
	c \$44-45	[...] The pastoralists also a lot, they have been going to extremes. They have been marginalised for a long time, access to information, even through radio, reading papers, the news, they are not very much aware of what is happening but they can tell that something is wrong.
Q16	\$62-63	Who do you think are important stakeholders concerning this topic? Actually government itself. Government needs to talk to itself, seriously. And I don't want consensus... But I want a broad agreement that climate change is an issue. That climate change does not belong to ODM or PNU. It's an urgent issue and if you don't speak with one voice, then that's timis (?) efforts... Ownership... of the agenda... Cause we can only so much. For example with the bill. We've spent quite some money on the climate change bill. Government either needs to take up that or someone needs to sponsor the bill or it becomes a private members bill, but I needs to have broad ownership within parliament. Two is the private sector and media.
Q17	\$46-47	What is your opinion regarding the connection between resource scarcity and conflict? You read it everywhere in the papers... that seems to be a very prominent issue at the moment, people say that due to drought there have been conflicts, would you agree to that? Yes. Because, well, simply these guys can't get water here, (...?) the well have dried up, it is not in the Charta to sell or destock so I move with my cattle to a place 100-200km away from here, and there are people living there, so I am stressing the environment. So, yes it is. But also instability in the region that has made arms quite easily accessible, not just spears and anything else... I can sell my 40...20 cattle and get a gun with 10 rounds of ammunition. Or if I am (...?) living with my cattle here, then I have to look for other means of living. I have no skills. I can't get a job in town as a guard, or... so I will go into an industry that has been making a lot of money: Cattle rustling. Stealing from other people... Get the livestock... There are always people willing to buy that [...] So yes, there is a huge correlation between resource scarcity and conflict. And not just intra- or inter-community, inter-country, also across borders... quite a lot. [...] So you would say that climate change is a security issue? It should... If I was a policymaker I would basically look at climate change not as an environmental issue but as a security issue. That is what I would do... Because if you look at our budget, 6/700 million KSh... a good percentage maybe 100 billion, about 20% of our budget goes towards security and security related issues. That would also insure that it gets adequate support and funding in the budget and allocation process [...].

Quotes from IP4

Q1	a \$12-13	Well, where do you see the greatest problems if you think about climate change in Kenya? Now you see, to begin with we used to think that the problem is only located in the arid and semiarid areas, what we call in Kenya ASAL [...], but now we realised that the problem of climate change... struggles the agricultural districts, 'cause in the agricultural districts and the pastoral districts... where climate change is [enhanced] manmade, which it is anyway, it is anthropogenic... because of the... very intense use of land and carelessness, soil degradation and degradation of vegetation, removal of forest land and so on... agriculture has problems... because over the last 40 years we have expanded agriculture so much we have destroyed lots of forest areas... in the quest
----	--------------	---

		for more and more arable land which we don't use so well... and that is really part of the story, the anthropogenic aspect. So you could almost say that now the whole country is vulnerable... and when we look at the map of the whole country you realise that... virtually the whole country is vulnerable. Cause the degree of vulnerability becomes more severe as you go to the ASALs, but I would say that much of the agricultural districts are just as vulnerable. 'Cause we are beginning to see the impact of our own... carelessness, maybe... to much risk taking. So climate change is now a reality. Not just in the ASALs but also in the rest of the country...
	b §23-24	What do you think are vulnerable sectors within Kenya which are especially going to be affected by climate change? Two sectors especially... no three sectors... one is agriculture, the other one is pastoralism and the other one is water. Those are the three sectors of the economy which will be hardest hit by any changing climate. Kenya is very, very arid so to speak... you know, there... are very large areas which are not very productive, which are arid, [where] we don't get enough rainfall. And as the population is increasing... you have a serious of maps here [in the atlas] which show the position which we are facing: In 1950 according to the population we have 9.6 hectares available per person. In 1960 it is reduced to 7.2. In 1970 it is now reduced to 5.2 hectares per person. By 1980 that had come to 3.6. And 1990 2.5. By 2000 1.9. By 2005 1.7. In 2015 it should be 1.3. So land is not always going to be available. So there will be population pressure... And that population pressure will be felt in terms of shortages of water... [...]
Q2	§24	[...] You rely on these catchment areas, and if the glaciers like on the top of Mt Kenya provide water for the dry season, but the glaciers are melting, so the catchment areas for the River Tana are reducing. And then you see the country is relying on the River Tana for hydroelectricity. And there is not enough water. Period, it is just that simple. There is not enough water... and very soon... we need the water for hydropower production, we need the water for irrigation, we need the water for pastoralists, we need the water of the River Tana for fisheries... so all these comparing interests... [...] So the problem of... water scarcity is very real. [...]
Q8	a §33-34	So you would say that the pastoral population is mostly affected by climate change? No. I was deliberately concentrating on the area with the largest problem. But when you come into the agricultural areas, the problem is also there. The problem is very real... for agricultural populations. Decreasing yields for example. From one year to the next... decreasing crop yields. And also even the issue of water scarcity... it is for the whole country it is not just for the pastoral areas. [...]
Q11	a §36	Well climate change as a concept... is new. And we need to... approach it in a much more deliberate way. And one of the things that they are talking about is... there's a lot of talk about adaptation. [...] you must go up the scale! [...] Once you are through with the arid and semiarid areas now you have to come to the agricultural districts. How can you... adapt, increase adaptation in the agricultural areas? First you start with the marginal agricultural areas; there the adaptation is just a matter of finding for example... the crops which are early maturing, making water available to the population. And of course... when you are dealing with something like climate change one of the things which is always forgotten is the improvement in infrastructure. Because if you improve the infrastructure it means you increase the mobility of the population. And it means that people can cope. For example in the middle of a very bad famine people migrate, you know... in order to cope. And that is one way of adaptation. Also you can transfer food more easily between the districts which have got plenty of food and the districts which are in short supply of food. So there are other aspects of the... of the economy which equally need attention. And then also in the agricultural districts there is a lot of talk about reforestation and also better use of the land. But a lot of those discussions are still very theoretical... I've been in the game for a long time, for 40 years and we've talked about agricultural improvement, agricultural development. But when I look at the agriculture in this country I find that... there is less investment in agriculture now, compared with 40 years ago. And this you see... most developing countries believe that they must invest in industrialisation... to be able to provide employment for the urban populations. And they make agriculture suffer. There has also been a transformation in agriculture in such a way that people grow less food, and they go for the sort of more interesting crops, cash crops, like tea, like coffee and so on and now they are talking about flowers, growing cut flowers for Europe. It's true that this may bring money to the country. But is this money made available for the economic development in other sectors? So you need to balance out some of these issues. [...]
	b §38	Well we are talking about adaptation... There are many, many areas... involved. One of them [...] is crop insurance. And not just crop insurance, I also talked about insurance schemes for livestock. And [...] one thing which is missing is deliberate efforts by the government to assist the farmers with mechanisation and tools like that. You know, the farmers are just left to their own... they are left to suffer. In a country like Brazil you find that there are schemes for micro-credit for example for the farming population, there are schemes for availability of inputs in agriculture, fertilisers, pesticides and things like that. And there are schemes for mechanisation, small tractors and things like that. [...] To increase the availability of food. [...] Here in Kenya the farmers are left to their own resources. [...] Government is lethargic. It is not interested in busting the agricultural economy. They have got some theoretical idea that they should industrialise. So they are spending a lot of money on industrialisation and you see the agriculture is getting a very small percentage of the national budget. So... Agricultural output is going down. If you take out the tea, if you take out the coffee if you take out the cut flowers. You'd be amazed to find that the rest of agriculture is really going down. Going down very dramatically. And that is a sector which can be made more productive. There are many ways of making it productive. You need a programme. We don't need a Ministry of Agriculture which is so lethargic, they are not interested! They are concentrating on one crop and that is maize... and maybe wheat. And so the ministers go 'round saying "Oh, we have made fertilisers for agriculture. We have made fertiliser available for the maize farmers; we have made fertiliser for the wheat farmers!"... What about the other farmers? You need improvement and inputs all-round... yes, whether it is mechanisation or whether it is the availability of fertilisers and so on. It should be all-round; it should be a national coordinated effort!
	c §27-28	What capabilities would these pastoralists need to adapt in a different way? I don't have a ready medicine... but what I can see is... we'll have to reorganise the pastoralists and make them realise that they have to keep quality livestock, not quantity. That is very difficult... but it can be done. And one way it can be done is... during the seasons when there is a lot of rainfall we really just have to have a very coordinated programme of... water harvesting. Water harvesting in a serious way, by building dams... if you go to Makueni, which is south of Machakos, you'll find that the people are building what we call sand dams... In other words you may find a dry river bed and you think that there is no water in the river, but below the sand there is... a lot of water, which can be used for livestock and so on and so forth. This is the kind of thing that we will need to do for the pastoral areas. We need a government which is very determined to bring change to the pastoral areas and which tries to measure financial resources... to resettle the nomadic people, to give them water on a more regular basis and to cut down the... livestock numbers. That one is very difficult 'cause you are going against the culture of the people. But if you make water available and you... encourage some of them to practice agriculture, if it is possible to practice agriculture... and you also organise to purchase the excess livestock and you bring livestock insurance and things like that... these are some of the ways you can bring an adaptation to drought...
	d §34	[...] And also even the issue of water scarcity... it is for the whole country it is not just for the pastoral areas. If you... go into a programme of water harvesting, the building of small dams, you should do it for the whole country. Not just... because there is a quiet graduation from the agricultural... You know the areas which contain large numbers of populations, and as you move from semiarid to arid the problem is still there. So on the agricultural side it is there and you need to address it on the pastoral side it is there and you need to address it.
Q12	§14-15	And... how important do you see climate change really for Kenya in relation to other problems that the country is facing? You begin to realise the importance of climate change when you look at the future... for me I don't care because I am an old man, but what will happen to our children? You see, when you look at the resource, when you look at the population and you look at the future... you realise that the rate at which we are using the resources... will inevitably lead to a lot of friction in the future. So it is this issue of sustainability which will become very important... because you realise that... as climate changes and climate changes gradually, it is not something which happens over night... but as climate changes the vulnerability increases and the sustainability also flies out of the window. So you have a development challenge! That is really how we see it... you could say now we have got a warning. And the warning is already very real in some areas which suffer from very severe drought. Right now as we are talking the rains have just come. But there are various districts which haven't even seen a drop of rain, like Turkana and so on... In fact in the paper today somebody is screaming that the president should declare drought a national disaster... today in the paper! [...] So when you are in Nairobi and there is some rain and when you go to western Kenya and it is the rainy season it looks all right, but when you look at the complete picture given the rainfall forecast for the rest of the... it is the main rainy in the country, it is in March, April and May... you see that the forecast is not good and there are many areas which are going to get below normal rainfall. So drought is just round the corner... So if you are a farmer and you are planting some crops... if you are in western Kenya and the lake region and so on... you know that you'll get a crop. But if you are in the ASALs you know that your crop might fail. And certainly for the main rainy season the crops will fail... because of inadequate rainfall... so the vulnerability will still be there. So it is something which if you are a planner you worry about night and day because you know that... you are supposed to make the best of decisions. But if you look at a map of the country and you look at the areas... where there is already famine... even the last three months they are already suffering from famine... and they may not get enough rainfall and therefore the famine will continue and the food shortage will continue. Those are the vulnerable areas. Those are the areas where year after year the story is repeated. You have some rainfall; you may even have floods! [...] And floods come with a fever which attacks livestock and then is passed on to human beings... So droughts and floods are alternating all the time...
Q13	§19-20	How would you assess Kenya's preparedness to deal with these impacts that we just talked about? [...] And I can look back and say that over the last... 15 years or so we have achieved our aim which is to... make people aware that there's climate change and that what we are observing are not temporary events and that... government should start responding! You know to be able to do that, it's not been easy, but now you've seen that the government has got a policy document... and out of that document we may have a strategy. Some of this... has been made possible by assistance from abroad... they may have been done it prematurely... that's my view. But at least we now have a policy. And you see it is one thing for a government to have a policy, but it's another thing to be able to execute that policy into a strategy. Because that means you have to have money. And you have to have a plan, which is agreed. And it's very difficult to get a country like this to agree on a very deliberate plan over the next 20, 30, 40 years as to what should be done. So you see, a lot of these things they are theoretical... because... you can have a very good minister and you can have plan. But if you are not

		operating from the office of the president you are disadvantaged. Because when you come to present your policy or your strategy it is being considered side by side with other ministries... and so it may not be given the priority it deserves. So that is the problems that I see... But most developing countries are undergoing the same kind of steps. That awareness has been created, there have been studies that show the most vulnerable areas... and on a day to day basis we have the problem, like droughts. Droughts are beginning to be very frequent. That the kind of drought we are having... from last year to this year, the last time we saw something like that was in 1984. It's a very bad drought. A very large part of the population is affected. And you need food relief and famine relief in... some of the districts...
Q14	§39-40	And do you think Kenya is able to tackle this by itself or do you think it will need external help from UN organisation or other development agencies, or do you think that the potential is actually there? The potential is there but... I think there is lack of information and lack of enthusiasm... for the development for the people. The people are left to their own resources. And there is a hope that things will happen. But things don't happen! So you need active participation by the government to make sure that things will happen in the right direction... in the right direction...
Q15	§20-23	[...] Ah... you know I've been [information which relates to the informants identity]... in the county that climate change is there, to stay and therefore we should be preparing for it. And I can look back and say that over the last... 15 years or so we have achieved our aim which is to... make people aware that there's climate change and that what we are observing are not temporary events and that... government should start responding! [...] Yea there is awareness, there is awareness. And there are some feeble efforts to respond... in terms of land use. In terms of... trying to stop deforestation. But it takes time for this to bear fruit!
Q16	§41-42	So the government has a lot of work, what other stakeholders are very central concerning adaptation to climate change? You know the private sector is very important. I would direct, and bypass the government, I would go to the people. To the women groups in the rural areas. If they are given inputs for their farming, if they are encouraged to have micro-credits... This is what has happened in Bangladesh. Bangladesh is being quoted everywhere because of the Grameen Bank. And the Grameen Bank was what we call the poor man's bank or the poor women's bank and it has produced wonderful results! Because if farmers in the rural areas have got access to credit it is amazing what they can do. It is amazing what they can produce. There is some talk about micro-credits and so on in the rural areas of Kenya. But they are very inadequate. They are very inadequate! There is nothing as determined as what has happened in Bangladesh. And if I was Minister for Agriculture I would invite Bangladesh to come and help us to put real micro-credit into practice. [...]
Q17	a §24-26	[...] But we have so little water. So in some of the pastoral districts you already have quite severe conflicts... absence of adequate water... even in from... small rivers and streams which may be seasonal... There's not enough water, so there are some seasons when there is a lot of conflict among the pastoral nomadic peoples. And you find that in the past, 40 years ago, the conflicts were containable. You know... they would be cattle raids among the nomadic people and they would be using spears, they would come and invade their neighbours with spears. But now they are suing Kalashnikovs, AK47 rifles. So that kind of conflict is becoming very real and I think the government tries very hard... to disarm the pastoralists. But some are rather... they still get the rifles... [...] This is a commercialisation... and it is very, very evident in the pastoral areas... And would you say that these conflicts are likely to increase with a changing climate? Certainly. Certainly they will increase... and we just have to be very much aware of them and how to prevent the increase... the approach which has been used by the government by just collecting the rifles, sending the police and the army to look for the rifles... [...] But this is a temporarily solution. So we may need to adopt more sensible policies, in other words... disarming pastoral populations... at the end of a drought, normally the conflicts are very furious at the end of a drought. Because at the end of a drought most of the pastoralists have a lost anything up to up to 90% of their livestock... And... when you have rains coming they want to restock. They believe so much in livestock, they want to restock. So they raid their neighbours... to start anew... In some areas this kind of approach is no longer possible. I think here across towards Maasai land... the Maasai have adopted different tactics now... they... keep more sheep and goats [instead of cattle], although their life is very much tied to cattle... But those who are in the semiarid districts they tend to keep more sheep and they've even gone to camels. They are now keeping camels. [...] That one I call a very good adaptation! You know when they realise that the environment is against them they change their practices...
	b §29-32	Would you say that the change in climate and the related conflicts also pose a security issue for the nation state? Does that influence the stability of Kenya? It does. It does because... the conflicts don't end at the... international boundaries. Quite often conflict extends into our neighbours, Somalia and Ethiopia and Uganda. In these pastoral nomadic areas... there's always a bit of conflict. Yes. And you know, in the pastoralist areas although we have boundaries we allow nomads to cross the boundaries in search of water... that is assuming that there is enough water. But if the water becomes inadequate this could lead to international conflict. Yes, so transboundary security problems will be there! And we should be thinking about them and should be working out strategies. What about problems within the country, intrastate conflict? Yea, yea. There is quite a bit of that. But fortunately it is being attended to. There is this organisation called IGAD [Intergovernmental Authority on Development] [...]. They have their offices here in Nairobi. I work with them a lot. IGAD as an organisation started as intergovernmental organisation on drought... intergovernmental body on drought... although now the title was change to intergovernmental body on development. But drought is very much at the centre at that development. And the problem of what to do with the pastoral population is very much there. And they even have a department dealing with conflict...

Quotes from IP5

Q3	§19	[...] But within the change of the climate there is a problem. These people are now looking more towards water, looking more towards pasture for their livestock. This has even made the Maasai now move all the way from their countryside into Nairobi town... which is... let me say they are neglecting the by-laws of the city. Because the by-laws of the city... state very clearly that animals are not supposed to be herded. But what option do they have... for their very survival? See, if we are talking about environmental conflicts we are talking about the very survival of people, their livelihoods! And it's not a question of whether it's comfortable or not. It's about their very living. [...]
Q8	§21	[...] Cause those ones in the semi and arid areas are more vulnerable. They are more vulnerable in two main ways. One, there is little investment so there is no diversity; they still have to depend on nature to provide them with resources... The people in the other areas have diversity there are industries that have been built, there are roads so you can put business. In those areas nature has to provide you. So that is one reason. Those areas have been marginalised, there has been no additional capital put in to help them survive. The second reason is largely because of lifestyles. That the people in those marginalised areas, because of lack of investment, they have hardly changed their lifestyle... so they are still within the tradition mechanisms of surviving. And those traditional mechanisms of survival are very closely related to nature. So if there is a problem with the ecosystem... they are more affected. So from that perspective... Some people are cushioned, others are not cushioned... within this mark of environmental crisis that we are having. So those who are cushioned are less [vulnerable], but those who are not cushioned are very vulnerable. But it happens also now... that we are seeing that those who are more vulnerable are also moving into areas where people are less vulnerable, thus bringing with them their vulnerability. For example the movement of the Maasai into these areas... threaten those farmers also, because their cows eat their cabbages. And so there is now... conflict between the agriculturalists and the pastoralists. You see these are the new dimensions that are also coming nearer. In certain areas where... there's a certain level of investment in agriculture and they are neighbouring these areas that are affected...
Q11	§33	One, we must... urge the government to invest in these areas. And there are... ways to invest in these areas. [...] We have also to invest in irrigation of these areas, provide watering points, provide alternative feeding mechanisms, for these... owners of these animals. And that can be done! And also provide access to these... regions by opening them up, so that once there's abundance in one area food can also be moved to... other areas. Why should we have abundance and then there are also starvation cases in another? So these are things that must be addressed policy wise... in order to increase our security level. It is cheaper! It is cheaper in fact... more than employing and maintaining soldiers everywhere [...] Cause even the United States itself has never managed with all the massive resource to control its borderline... with Mexico... despite the technology. Even Israel has not managed with the Palestinians... despite the massive technology that they have! Which Kenya cannot come up with... even a third of that... if we invest in these areas we decrease the vulnerability of these people. And they can take care of themselves. It is just a question of giving them the atmosphere, the environment, the ambience in which they can operate and do their thing. They are very hard working people, like the Somalis... oh... if you go to those places they are very creative! so that's what the government needs to do, to facilitate an environment in which they can live. The second thing that the government must do is to rethink... and diversity. But it's not the highlands only. Action can also be done in these arid and semiarid areas, so that that cushions the environment maybe through irrigation and so on... So we do not need to depend on water [rain] fed agriculture. We can also depend on irrigation agriculture. And we tap the water. There's plenty of rains like now. Water is just... maybe going to the Indian Ocean... or wherever it goes. It's wasted! I think that water if we tapped on every roof in this country... there will be plenty of water! Which can then alternatively be used... Thirdly I think... in terms of... educating the people and... empowering them. So that they also look at things a little differently. And also providing services which they need. There is livestock there but there's very little support from the government. And this livestock is thriving. If the government could take extension officers there and so on this would assure that they are thriving that this people are doing very well... if they do well... Then there are also issues of regional... regional issues which can only be

		tackled by government. 'Cause some of the issues that arise are arising from different countries which is now the government that can deal with. There are problems with Uganda because the Karamoya come from Uganda, we have problems with Sudan 'cause the Atoposas (?) and... we have problems with Ethiopia because there is also... So if those ones can only be tackled by lateral agreements... and that's where we need government, now working! Not a government that is sleeping in Nairobi and saying "All is well!" because they are getting richer. The last, very important thing... is the question of poverty must be addressed in this country! There are people who are getting richer every day at the expense of the majority of Kenyans. Through illegal means... theft of... resources that the government could use. I think that this needs to be addressed... If it is not it is a reset before... vulnerability that more and more people are getting vulnerable in the city here and that means insecurity... they will never be secure...
Q14	§38-39	Do you think that with empowering these communities and changing things Kenya is able to deal with these issues on its own or does it need external help? Surely the issues of the environment are huge! And... they are not... they don't respect borders. So Kenya cannot deal with them in isolation. Kenya has to involve its neighbours, the region and the rest of the international groups. There is no other way... it needs more resources that it can deal. And it is such a big, huge issue, the environmental issue is big! Ya! It can also spend its resources on small things like... rehabilitating of the Mau and other forested regions. But it still needs support from the bigger world. 'Cause we don't really have the huge resources that this may require. You see cleaning just Nairobi River as seen the other day... requires something like 4 billion. The Kenyan government doesn't have 4 billion to spend on cleaning... just a small river, you know... Rehabilitating Lake Victoria from the water hyacinths and the pollution. [...] So that's why Kenya needs support... external support.
Q17	a §21	[...] For example the movement of the Maasai into these areas... threaten those farmers also, because their cows eat their cabbages. And so there is now... conflict between the agriculturalists and the pastoralists. You see these are the new dimensions that are also coming nearer. In certain areas where... there's a certain level of investment in agriculture and they are neighbouring these areas that are affected...
	b §28-31	And to what extent would you say that these environmental changes and the related conflicts pose a threat to the security of Kenya as a nation? For obvious reasons... are vulnerable. And now we are talking about... human insecurity, not national security! National security is meant as the army... I will not comment 'cause you are a German citizen... [Lucy laughs] Ah... So national security is there, although we also have problems of law and order over here and over there. I think the security is not well trained and something like that. However, human security is a problem. It has not been addressed. People are very... they lack food, they lack health services, they lack education. They lack all the necessities that can make them happy! So if they are not secure... what security are we talking about? [...] Well do you see a connection between vulnerable groups and human security and the national? Definitely! If individuals are insecure there is no way you can speak about national security. 'Cause national security is derived from the individual security. I think it should be... well thought as an aggregate of the individual security. If individuals are secure then there is national security. Vulnerability of the individual means there's also no national security. Because this dream that we have of uniformed policemen, we have helicopters flying all over the place... I think it's fundable National security cannot exist without human security. That's the bottom line! And indeed in modern thinking that has now come into the heads of all the people who are thinking well. Except some old guards who have stagnated, the ones who still think that helicopters flying... provide security. Our security is vulnerable as long as three quarters of our people are vulnerable. And indeed three quarters of our people are vulnerable! They do not have individual security. So they are looking for ways to survive and if people are operating at survival level you surely do not expect there to be security... They are always vulnerable... either from their neighbour who looks at the little they have gained or they are always vulnerable... from the environment itself which can designate their livelihood. So from this perspective... we really know that environmental and climate change has a lot of impact because three quarters have poor due ... more than 80 something percent... is actually... semiarid and arid and no investment has been put there to cushion the changes that nature can bring. None. None! Not even a road!

Quotes from IP6

Q1	§16-17	Coming to Kenya and climate change... according to your expertise what are the major impacts for the country, where are the core issues that need to be addressed? We have issues... Like... now we have these prolonged periods of drought. That was like... last year... communities are saying "Now, what's happening?" In Turkana... a part of Kenya, people have been dying because of the drought... there's no water... the government was saying... there is this off take programme for the livestock, so they are providing incentives... to buy livestock, so that they slaughter... Just for the communities to get this income. Because even their lives... there is no water there is no pasture... There has been a lot of... so that has also impacted on farming. So there is food insecurity... in the country. And even... I think just last... should have been January or there about... the government was pushed to declare famine a national disaster. Ya...? So, one is a shortage of rains which then means... there is a shortage of water... it affects pasture, it affects... farming. Yea? There is a lot of deforestation... and... like last year... we have our water towers...and one of the major water towers, Mau... Mau forest... and there has been debate... there is politics and the environment... people, they don't see the value of the environment... but when you get the impacts... you really see how we are going... Ah... so the whole issue in Kenya overall is like... people really don't appreciate this issue... because... unless they are hit... 'cause then they realise now we have this very severe impacts of climate change...
Q2	§88	problem hydropower: during droughts main industries had to be shut down during the day <ul style="list-style-type: none"> • night shifts for those who are highly power dependent • power biggest issue in expenditures
Q3	a §29-31	There are severe impacts... you know like... after this prolonged drought then when the rains come... they're heavy downpours... and there is a lot of flooding even in the slums... I can tell you... we are constructing Bio-latrines in Mokuru (?) for a water and sanitation programme. And there is severe, severe flooding when it rains. So it complicates things... now it means there is no clean water for drinking there is no security in those slums... it's very difficult... so it should be water, it should be flooding... I think the main one is flooding... and also because if our systems, our infrastructure in the cities... it is not planned... it does not meet... it's not planned to... meet those impacts or to control the impacts... Which part of the infrastructure especially? The drainage... like the sewage systems... you know, when there is floods the whole thing is complicated... especially in the slums! They can't even take water. And you can't go in those slums when it rains... it's very difficult. Yes. And then dust, like when it dries there is a lot of dust. And it comes with all kind of diseases and all those issues.
	b §32-37	And would you say that people living in urban areas are vulnerable in different ways than people in the countryside? It's true. [...] One I think it is because of the different economic... of course in slums... you know there is... poor people... and they depend on the wages... so, and they have their priorities different from... those people living up country... These are people looking only for... if they get the wages, if they get money they are buying food. They don't look at the quality of water, they don't care about the sanitation... because they are poor! Other than people in the village, of course there are some systems, there are some adaptation mechanisms in the rural areas. There are some trees of course there are not many but there are some trees... there you know... is not congested like in the slums it is spread out... so it kind of minimises the impact. They are not so much affected... like the people in the slums. Even the food we eat in Nairobi we get from the (...)?... so people in the slums really depend on... they don't look at these environmental issues... first priority is to have food. So if there is floods they don't say "Oh, this is my adaptation measure" because they are renting the house. But the people in the up county, they kind of make a different way of adaptation... they put some flower beds... you know... they lift the... what is it called... these things on the walls... we are doing a study in Mombasa it was very interesting how those people adapt... they even... dig some trenches... to clear the water. They even lift... their... walls... they lift the floor... so they put some mud up to some level... yea... so when it floods it hits the...stones... it can't enter the houses... And that is against floods from the ocean or from the rivers coming down? From the oceans... or throughout the oceans... areas, towards the oceans... So I think in terms of adaption I think people in up-country they are more resilient than people in... urban centres... in the slums... In which regard would you say they are more resilient? I think it's because of also... the power... the economic power... or just the environmental issues... environmental issues I think in the slums are worse... than in... rural areas...
Q5	§16-17	Coming to Kenya and climate change... according to your expertise what are the major impacts for the country, where are the core issues that need to be addressed? We have issues... Like... now we have these prolonged periods of drought. That was like... last year... communities are saying "Now, what's happening?" In Turkana... a part of Kenya, people have been dying because of the drought... there's no water... the government was saying... there is this off take programme for the livestock, so they are providing incentives... to buy livestock, so that they slaughter... Just for the communities to get this income. Because even their lives... there is no water there is no pasture... There has been a lot of...

		so that has also impacted on farming. So there is food insecurity... in the country. [...]
Q6	§26-27	And... which sectors within Kenya are most vulnerable to the changes that are happening? One is pastoralism... it is hard hit... seriously... then farming... it is [also] hard hit... like drought... prolonged droughts are very severe. This affects even the water sector, certainly the livestock, the water sector, the agricultural sector... tourism not so much... ah... then forestry, because then... you know when... there's prolonged drought then there is fires and these issues... but the most hard hit is the agricultural sector... and the water sector... and of 'cause then it affects the economy of the country...
Q7	§31	The drainage... like the sewage systems... you know, when there is floods the whole thing is complicated... especially in the slums! They can't even take water. And you can't go in those slums when it rains... it's very difficult. Yes. And then dust, like when it dries there is a lot of dust. And it comes with all kind of diseases and all those issues.
Q8	§44-45	And... which aspects would you say of Kenyans livelihoods are especially susceptible to climate change...? Impacted... you know... in Kenya we have... over 80% arid and semi-arid areas... so... and those people living in those areas... their livelihood is pastoralism... and people have... large herds of cattle. And in terms of... when climate change hits, like droughts... the affect is severe... that's why we are saying there's these response programmes sometimes they can't suffice... (..?) the off take programme where they buy cattle... and then they pay for slaughter... and they give the meat to the... community... it also affects water and it... seriously affects agriculture... yea... and this thing is translates into consequences and then it affects our economy and then the food prices go up... the moment we don't have food, the moment there's food insecurity... it means you also... the livelihoods... life becomes very expensive... yea... so these are two major livelihoods... agriculture and livestock.
Q9	§45-47	[...] And in terms of... when climate change hits, like droughts... the affect is severe... that's why we are saying there's these response programmes sometimes they can't suffice... (..?) the off-take programme where they buy cattle... and then they pay for slaughter... and they give the meat to the... community... [...] And what are people's abilities to act... for example during droughts, what can they do, what options do they have to react? We did a study on... adaptation in north-eastern... and in this ASALs... arid and semi-arid areas... and many times people don't have options... these people are stuck with these livelihood... support systems... like when you talk of the pastoralists... even historically... it's not easy for them to change their livelihoods... even if you tell them. Even if you are providing that money... to buy the cattle at that price and slaughter for them to have meat they will say "No". So many times the nomadic are pushed until when there's no option... yea... Even for agriculture... you know... we've had this... when there is this prolonged drought... so the period of planting is always passed. You'd assume we can change our food crops. But then that's normally very difficult. We depend on maize and wait for that season for maize... But sometimes... in the Western part of Kenya people have now changed... they used to have one planting season now they have two planting seasons, that's an adaptation measure. They also... a long time ago... they used to grow cassavas and all those things. Then they moved to maize... but then I think they are going back to that. They can now grow cassavas they can grow some millet... so [...] they are adapting the food crops... and then... because also the planting season has changed, they have also moved the planting season. They can plant twice in a year... but for the pastoralists I think it is still very difficult... it is still very difficult for them to adapt.
Q10	§66-67	lack of adaptation options in rural areas • dependence on nature out there is just unbelievable
Q11	a §48-53	What would help people to be able to cope with these changes, what would be needed for them to adapt better? I think is... one... we always say [to] the government... that we need to have these awareness programmes... where we are telling people, "This is a reality and we must face it! Yes, so what do we do? If you can't avoid we need to adapt! And this is how we need to adapt". To have these awareness programmes where we are saying we don't have to stick on your livelihood... such as livestock... on pastoralism, you can always change... You can grow some other crops, cash crops... like sisal... I know you can... make some money... [...] in those arid areas... and then to provide also... live support systems. Like water, we need to have... water in those areas. The government must be proactive... providing that water. I know they are... implementing... there is some goodwill from the government... I have seen the Minister of Water... in those Turkana areas trying to officially open those water points... We need to... I think we need to increase our fastest cover. And this must start from the community... and even when you are doing the forest act or the forest policy... there is one aspect of community quite special... in the act it's very clear it shows how you can help the communities. The communities must appreciate what we are trying to tell them. We are telling them to plant trees. Why should they plant trees? So one is we need to have awareness. Two, the government must also be proactive, 'cause it is a government for the people. Three: we must have laws. These laws will help us to achieve what we are looking for. Like the... forest act... I think it is very comprehensive. It looks at how the forest can spread; how the communities can participate in forest conservation. It provides incentives. You know? Then we have also the forest guidelines where they're saying... you need to have like how many trees on your land. Even a plot you need to have these [amount of] trees... so we need to have awareness... or seen in agro forestry... that you can plant your crops while you can also grow your trees on the same land. Yea. I think also we need to minimise... population growth. You know the moment you have this high population growth it mean we put pressure on the existing resources. [...] So that would be more the mitigation side...? Yes, yes! Another thing maybe is to have this... you need to have like insurance! Yea? That is not something we wait for and then we give aid to the communities... it's insured. Let's have something... let's say "If this happens then you are insured against these impacts of climate change". You know people would appreciate. But you know... we are enemies... of our own. We are the causes of this climate change... You mean insurances against crop failure..? Yes!
	b §57	[...] Often... we leave out the people affected. Yea. We leave out the people affected... because if you build... their capacities in adaptation on climate change and mitigation... then we wouldn't have these issues...
Q12	§18-19	How relevant do you think is climate change for Kenya in comparison to other problems such as poverty or urban development? It's really relevant... and why? Because now even the government has realised that... And even at the Prime Minister's office... they've put a desk for climate change. There was an advert... even for a... director of climate change at the Ministry of Environment... And... you can see also from the negotiations... I think we have changed! So after even the government is given the strategy it shows some level of appreciation. I mean they realise we need to have a strategy on climate change... because the severe impacts of climate change... but of course still we are not... at that... level of the international community. We are trying of course... even the government is also supporting the planting of trees in Mau... but that's not enough! 'Cause of course Kenya... and we are known for go-round politics... any political issue it overwrites "environmental issues". So even Mau resettlement plans and wherever... people are now thinking of politics. So we have been pushed out of this forest, of our community... but I must say... at least to some level, and I think because of the impacts, the government has realised this thing is hitting us at the most. And also because of international pressure... when other governments and donors are saying "You know you have to conserve this forest" Then they threaten even to... sanction, so I think it has moved... but not to that level that we'd want to. [...]
Q14	§62-63	Ah... Kenya will always believe it can do it, but it not! [laughter] But I think we need some support. Just take the Mau forest you know those people who are... evicted or whatever. If you're evicting people you need to give them alternative... land... you know... because... it becomes a human rights issue [...] They will ask you "Now, where are we going?" And that's where now Kenya lacks behind... there is no clear linkage of how to... (..?) each other. That's where we need support! Like I know UNEP has played a very big role in Mau. And the support of the donor community, otherwise without that support... we wouldn't have managed to even remove the first batch of people from the Mau forest. So conservation... and you know also you must appreciate that environmental issues and climate change issues are global issues. They are not... village level or local level issues... I think we need an international way of... collaboration in all these issues. Otherwise if one can't retain it the other one will be affected...
Q15	§79-81	<ul style="list-style-type: none"> the awareness of Kenyans is mixed people in Nairobi aware upcountry: many people never been reached, you do not reach them with newspapers, you need to go into the field e.g. with extension officers and in some cases even the people who have been reached, have been reached wrongly different outreach is needed: people believe that adaptation is a rural issue new advocacy needed: disaster response is not proactive, even people who should capacitate others sometimes have very little knowledge
Q16	§54-55	What stakeholders would be important to... take part in such an implementation... apart from the government... which other organisations would need to... work together. I mean there is the KCCWG, but... does that include all the necessary stakeholders? It doesn't... it doesn't include all the stakeholders. I think it is important what you are saying: The government, yes. Secondly we need to have the farmers. Ah... The civil society plays a very critical role in Kenya. Or even human rights you know [...] even in environmental issues. But we need to be proactive. Donors are important stakeholders in these things. They need to... not just look at the human rights... look at someone who was abused... also this climate change I think it is a human rights issue! Because the way you are affected... we will start to fighting with ourselves. People fight over the resources. Over water! Last year... it was the longest drought season. And people were fighting all over. We were seeing even herds of cattle in Nairobi... they were coming because there was no pasture [...] and then you fight! ... I think then the government, the civil society... the communities... maybe the farmers, the pastoralists those are important people! Because then we are looking at the policy makers and then we looking at the people who are affected.

Quotes from IP7

Q2	§53	Nairobi <ul style="list-style-type: none"> • will be directly and indirectly affected • 2 years ago during drought there were water and electricity shortages
Q12	§36-42	Might other issues be more important for Kenya? <ul style="list-style-type: none"> • yes, others might be more demanding and more acute • but many aspects medical services, food security now or in the future related to climate change • the change is already very present in Kenya • climate change is cross cutting so many sectors → interlinked with so many issues • "climate change is here to stay" • "the cost of inaction is higher than if you start to act"
Q15	§43-50	<ul style="list-style-type: none"> • rains have not arrived → very present • youth is quite aware → Africa Youth Initiative (AYI), reaching out to people through music • information has been channelled quite a lot • information has been available, but nevertheless a study about people's awareness would be good • now the focus needs to be on solutions

Quotes from IP8

Q1	§15-16	So where do you see the greatest impacts of climate change for Kenya in general? Ah... sector wise... well, Kenya is... known to be an agricultural country. So... and the effects of rainfall... very much affected, they affect the... agricultural sector... mostly. You see, it's also affecting tourism... because of... what we are realising lately is that... the tendency of human-wildlife conflict is increasing, the pastoralists, the farmers are demanding more of the conservation areas... The syllable impacts have not yet been realised in Kenya, but I think the issues of natural resources, farming, tourism... I think are of...
Q4	§16-17	[...] You see, it's also affecting tourism... because of... what we are realising lately is that... the tendency of human-wildlife conflict is increasing, the pastoralists, the farmers are demanding more of the conservation areas... The syllable impacts have not yet been realised in Kenya, but I think the issues of natural resources, farming, tourism... I think are of...
Q5	a §22-23	So looking at the individual people, which aspects of their livelihoods are affected, which are most vulnerable? I feel the area of food security... is key... across the whole country you know, we have... we are seeing more crop failures, particularly in the... arid and semiarid areas, we are seeing... decreasing stocks of livestock... so the area of food security is... I think is going to be affected more. We are seeing water... becoming really a challenge! For example in most Kenyan dry lands we find that whenever we have a drought the NGOs the government rush in to drill... boreholes, to tap into underground water... that's you know... from the study that we did... most of these boreholes are drying up, and the interventions have been to go there and deepen them... So water scarcity is another key challenge... and... in northern Kenya, we are seeing... you know... livestock raiding has been a tradition of them... but there is more conflict... I should not attribute it to climate change, but I think resource scarcity water and fodder scarcity is... being felt more than before...
	b §39-40	And what impacts does this have on communities, their networks, or their way of life? ... Ok, in Mendera for example, what we saw is... one... those people who have got skill, that are energetic. They are moving. They move to towns and other areas. And the people who are left behind are the elderly. Are the women... And the elderly lack support, they lack (...?) they've got one cow, two cows their cows then get to die... What we also found out in Turkana... was that these frequent droughts, severe droughts, what it has done is in Turkana people used to... depend on wild fruits. They depend on wild fruits for survival during droughts. But what is happening right now... the fruits where... the women were the one who were involved in collecting the wild fruits. But right now men are also going in to collect the wild fruits and there is a commercialisation of these fruits... now... they are not being used for the family, for feeding the family, they are used to be to be sold. And men are getting into that more and... Women are getting affected... that's one issue the women raised...
Q8	a §42	What our assessment in Turkana showed... it affects both! But... women tend to spend more time looking for water. Women tend to spend more time now looking for food. The burden, the workload increases because of this climate change [...]
	b §37-38	So are there other groups which are also severely affected by climate change or would you say that the pastoralists really stand out within Kenya...? I think there are many other groups. On top of pastoralists... most of the arid and dry lands are pastoralists one way or another. They keep livestock and do some cropping, even if you go to the eastern Kenya. So the settled agro-pastoralists are also very much affected, there is a loss of crops and so on. Let me say the most vulnerable people that have really suffered here are the pastoralists and agro-pastoralist groups. And... that has got a rip-off effect... Other areas... in Kenya you find that the farmers... are losing their seeds are losing their... fertilisers... whenever they expect the rains. For example they were told just in central Kenya here... that farmers were advised to plant by the extensions (what does that mean?). People and farmers went in to plant... some of them had taken loans. And it didn't rain, it rained in March, April. So they lost their seed, they lost their fertiliser. So I think it's affecting... other areas.
Q9	a §29-32	So what options do pastoralists at the moment have when there is a drought, what can they do? Yea... we ask that question, it is just really a challenge! But I think they are trying to... survive... One is... most of the pastoralists are turning in to keeping small stock, goats particularly. They're also keeping... more herds of camels than [before]. So this transition towards keeping small stock and keeping... other forms of livestock like camels that can use various levels of vegetation resource. The other one that we have noticed in Uganda... is forcing peaceful coexistence with the neighbours. Strengthening... inter community networks for sharing of resources. For example the Turkana in Kenya are being facilitated even by government officials to move to Uganda, and the government officials [are] negotiating mobility... with the Ugandan counterparts... I think it is a trend that we feel... [...] I think it should be strengthened really! Those negotiations at high level, between the governments. Because you know these boundaries have been put there, these people have been divided, a brother has been divided from a cousin... and whenever there is scarcity there is hostility. And not just hostility between these communities, there is hostility between states! So the more the region realises that this is a problem and... they should... create awareness, plan negotiations... and create awareness among communities for sharing... for this tradition of practices to continue...
	b §42-44	So you would say that these traditions of practices in general are actually a sustainable way of living in the area? I think, at the moment... those... I think those should be reinforced! Other support ways can come in, of course like... even along the... mobile routes... the facilities should be provided. For example there should be some interventions, like water. Security should be provided for... enterprises for businesses to develop so that they can get supplies and so on. And then the other thing is improving communication. Improving communication is very important because what we learned in Mendera and Turkana is that even use of mobiles... informs pastoralists where... it rained, where there's pasture. So use of technology to improve communication.
	b §42-44	[...] We also learned... in Mendera what is happening is, because of this increase in droughts, families that have got their relatives outside their local communities there is more... sending back of money, remittances and so on [...] In Mendera what the communities told us is that that is being more, really, really helpful... It makes... those families survive... in increases their adaptive capacity. Are these remittances more from within Kenya, for example from people living in Nairobi, or also from abroad? I think it's across... They say it is people in Nairobi, major towns in Kenya and also from outside. Those families that are outside the country... realise more benefits more survival than even those families who have got their sons and daughters in the country. [...] In Mendera it came out more in the Somali community 'cause the Somali are more dispersed than in Turkana...
Q10	a §27-28	The droughts have been there before also, Kenya has always seen droughts... people must have old coping strategies to deal with these droughts, why are they not working anymore? Right... Like in pastoral areas a key coping strategy was mobility... and mobility is affected in many ways... livestock mobility has been affected by one, increased population... It has been affected by... the uncertainties and... Areas that used to receive rainfall are not receiving rainfall for the generation of fodder and water availability... so regions they would have used to go to in times of droughts are also failing... And from the study we did in Turkana and Mendera we see that... the... regeneration of vegetation is not happening... Some of

		<p>the conclusions in relation to drought was that... the natural seed bank in the soil is kind of interfered with. Because the seeds are not regenerating... the intensity of the droughts... the frequency of the grazing is not allowing natural... to recover... (..?) And the other thing is just the development approach... that people have adopted. I think for a long time... development was among pastoral areas was that "Settle, settle, settle..." And with that they came to think among some people... so some people took it up and had settled... other families are learning from them. So it is interfering with the traditional lifestyle and natural resource management systems...!</p>
	b §35-36	<p>And is migration (as a type of adaptation) also an issue... do people also decide to leave this kind of lifestyle behind and move to cities such as Nairobi or is that not such a big issue? What we've realised for example in Turkana. The illiteracy levels are very high, like in Turkana illiteracy levels... are up to 80%. And... that is also a hindrance... in terms of skills to survive in a different environment and to compete effectively. So I think something should be done to improve the education and skills of the people... to support this migration. I think it's a very good thing. Because population in the pastoral areas has grown [more] than is use to grow before... and the mobility... for livestock to use a range of resources across the land has been constrained by the increased population. So one intervention could be to encourage more of these pastoralists to move out of that area and find other opportunities. But that can only be achieved through improving education...</p>
Q11	a §25-26	<p>So what options do people have to address these issues, what adaptive capacities do they have to respond? I think one is... One of the things that we are recommending... how to harvest rainfall water... in terms of increasing its... infiltration into the soil to recharge... the fastly disappearing ground water. I think many people are not thinking around there... how to put strategies to recharge, to improve the rainwater recharge rate. The other is... preparing the people you know, preparing the people not just raising awareness... because I've seen for example the NCCRS, it says "Raise awareness!" But I think the issue is more than raising awareness... I should say... it's... working with these people... you know... to internalise the planning process in terms of... resource management, water management, fodder management and livestock management... you know... improving the planting cycles... and making sure that... these people are within it, learning from them... what facilitates community planning... I think is very important to increase capacity.</p>
	b §29-34	<p>So what options do pastoralists at the moment have when there is a drought, what can they do? Yea... we ask that question, it is just really a challenge! But I think they are trying to... survive... One is... most of the pastoralists are turning in to keeping small stock, goats particularly. They're also keeping... more herds of camels than [before]. So this transition towards keeping small stock and keeping... other forms of livestock like camels that can use various levels of vegetation resource. The other one that we have noticed in Uganda... is forcing peaceful coexistence with the neighbours. Strengthening... inter community networks for sharing of resources. For example the Turkana in Kenya are being facilitated even by government officials to move to Uganda, and the government officials [are] negotiating mobility... with the Ugandan counterparts... I think it is a trend that we feel... [...] I think it should be strengthened really! Those negotiations at high level, between the governments. Because you know these boundaries have been put there, these people have been divided, a brother has been divided from a cousin... and whenever there is scarcity there is hostility. And not just hostility between these communities, there is hostility between states! So the more the region realises that this is a problem and... they should... create awareness, plan negotiations... and create awareness among communities for sharing... for this tradition of practices to continue...</p> <p>So you would say that these traditions of practices in general are actually a sustainable way of living in the area? I think, at the moment... those... I think those should be reinforced! Other support ways can come in, of course like... even along the... mobile routes... the facilities should be provided. For example there should be some interventions, like water. Security should be provided for... enterprises for businesses to develop so that they can get supplies and so on. And then the other thing is improving communication. Improving communication is very important because what we learned in Mandera and Turkana is that even use of mobiles... informs pastoralists where... it rained, where there's pasture. So use of technology to improve communication.</p> <p>And this is already being done? It's being done. But I think there's more that needs to be done in terms of strengthening the networks. You know, providing the infrastructure for communication. There are some areas that don't have even mobile phone services.</p>
	c §49	<p>What other capabilities would people in rural areas need to be able to cope with the environmental changes that are happening? One is strengthening of the networks. Strengthening the social networks, between the community institutions but also between community institutions and other service providers, the government the external agencies like NGOs. That I think is very important... And communities and households that are able to link up with and enrich other agencies for support... the government agencies... they are acknowledging (...?) their services for... livestock protection against diseases. Services for... water... having equipment to pump water from the well at community or at household level, to pump water for irrigation. But also their abilities to diversify their sources of income...</p> <p>And how could that look like (in practice) on a local level? What we are seeing is... this is being driven at various levels. One, the community initiatives without external support. It's happening... that communities now are identifying these natural resources, like the... wild fruits... which were not being sold before they are now selling it... and using that to survive. So it becomes an alternative! Although it could have its negative effects but becomes an alternative source of income. So utilisation of the local resources. But also NGOs are making deliberate interventions. Like diversifying sources of income. For example... one NGO is promoting harvesting and extraction of Aloe. [...] It's not Aloe Vera but in that category. So they're supporting the communities to extract that and make it into various products. And various groups of women and men are now involved in that. They've lost their livestock to droughts. But aloe... is a drought tolerant crop... so they are now cultivating that they are managing it, that they reorganise it as a resource that they can use to earn some income.</p>
	d §59-60	<p>You mentioned that these participatory approaches have not really been implied... would you consider environmental governance relevant when you consider adaptation to climate change? It is a major issue... because you find that... the management structures at the district level and even the community level are not very inclusive, you know... so you find... because of exclusion of certain individuals or people... issues... are not come currently come out from across... and you find that the issues that are addressed tend to be narrow focused... they exclude some sections of the community. So when it comes to for example management of water... what we have seen is that the community says... we would want a borehole... because we are water stressed. And the government and the NGO goes in without discussing it with the herders for example and learning the impacts of that borehole on the local grazing area. So because of that the way decisions are made... are not very consolidative. And people are making some very serious mistakes... they destroy and exacerbate the impacts of climate change.</p>
	e §62-64	<p>[...] But what we found out they rely on the... on the... these people called 'Emrons'. Emron (?) is a Turkana word. That it's a... like... a fortune teller. He is a kind of an institution that is dependent upon, for various information, for conflict warnings, for early drought warnings and so on. So that's a key source! But the linkages between this person and the sources of scientific information is very poor! Of course there are challenges. What we've realised there are challenges... there is mistrust between the scientists... and these traditional people. But I think an effort should be made! Because this is a key link to the community! The efforts should be made to... enable this person access to scientific information in forms that they can interpret and pass it.</p> <p>So your suggestion would be to see who are the key figures in these communities, who are informing... Yes, yes! Because however accurate... however the science tries to improve the accuracy of the information, and that is not reaching the people. Or if people are getting distorted messages, I think we should identify the links... and be able to strengthen these links for... proper dissemination of this information.</p> <p>If you could advise the government about their next steps towards a better adaptation to climate change, what would your suggestions be? I think what... what we need to do... what the government should do at the moment is... there are several people who are working in the area of climate change and there is also global and international experience now quite rich in this area. And the... the issues of climate change are quite local, are very, very local. I think... we should do a thorough mapping of vulnerabilities. Across the many Kenyan counties now, 'cause we have the new constitution, we should do a thorough mapping and the... framework that we should develop is to strengthen each county to develop their own guidelines for dealing with climate change. [...] It would e very difficult to come up with a proper solution from Nairobi. [...]</p> <p>Is there any point you think we didn't talk about now which you think is important and you would like to address? I think you have asked very good questions! The other thing is the issue of institutions. Particularly those institutions that support... groups. To me I think forming an institution and saying "That institution will address issues of that particular community!" to me would be a wrong approach. Because what we have realised is... various groups within a community they have good institutions they relate to and they link up with quite well. I think it would be very useful to... go back to the communities and... find out which institutions serve women well, which institutions have various classes of people in them, you know the very poor... and develop... strengthen these institutions that are understanding the categories of their region...</p> <p>So you would say it is no useful to found a lot of new institutions but rather merge climate change adaptation into already existing institutions? ... yes... into already existing institutions that already reach people. And this could be in form of... For example what we found out was... [...] ... You know some of the very poor people and the women don't reach that particular institution. They don't see it! But they are, see for example a church... as being more effective and more supportive. So... instead of saying: "We channel resources through... the Ministry of Agriculture to serve a particular community" we should be asking how can the Ministry of Agriculture, who is an official institution utilising the government resources... work with this particular church, supporting this particular group of people, well? Otherwise some people will be left out! Maybe a church, a catholic church is more sympathetic with the agenda of women, the agenda of the poor... and they relate well, there's trust between the community and that particular institution...</p>

Q12	§17-18	And if you consider climate change, how important do you think is the impact of climate change in relation to other problems that Kenya is already facing? Ah... I think... that there are many problems of course... the overwriting problem, challenge that we have is poverty. Ah... and in the communities that we work with which... in pastoral areas especially... I will talk from that point of view, the pastoral areas have got the highest indexes of poverty. Ah... So one challenge that of course we have is you see is the poverty question... The... but you find that in... of let in the last... ten to fifteen years... you know... we would have tended to get more to the droughts. And it affects the country a lot you know! The crops... just it is... the economic cause is really affected. We lose a lot of... capital in terms of livestock, in terms of crops. And we import a lot and... and you find that we stagnate... to grow economically, because of these droughts. And... they're happening now more frequent... than before... this 2009/2010 drought was... not only just... declared a disaster... but see people lost their assets and that affected our economy. So we have had... droughts are been declared disasters for periods of time... so it is becoming a major issue...
Q13	§20-21	So generally how would you assess Kenya's preparedness to deal with these impacts? At the moment... I think the government is starting... to recognise there's a problem... and many people are now questioning... "Why can't we... make... plan around seasons... fractioning seasons in our budget and so on?" But that is yet to be realised. So as a country I should say... we are very far from being prepared to deal with the challenge of climate change. At first... the country just prepared the national response strategy to climate change... which a strategy came before the policy... so we find that within the strategy there... it is not well embedded... you know... for programmes to roll out... to deal with the issues at hand. So as a country I have to say we are not quite there... in terms of preparation. But... climate change... has on top of the political agenda, the prime minister's office, has taken it very seriously, has mobilised other ministries... And the level of awareness is now there. But... to me I feel... the approach... the national approach is tending to focus more on... let's plant more trees... you know... the Mau forest area, the ecosystem is affected so let us restore it. But that is drawing their attention more than... away from what are the real issues that we should be addressing... cause it is a bigger issue than just focusing on the forest, planting trees...
Q14	§55-58	And do you think Kenya... is able to deal with these impacts on its own or external help... is needed to help Kenya adapt? I feel that... there is need for support at various levels. One is just the capacity development aspect [...] In terms of... building the skills of the extensions... The government extensions have to identify opportunities... To be open to new innovations and... mainstream those innovations into their messages, into their advice for the farmers. So you find that most of the government extension people, who are working with these communities. They are still... guided by the tradition of training... all the knowledge they have... they are not open to these changes. Like for example Aloe Vera, they are not really mainstreaming quite fast. The other thing is... just the ability of the government people to... embrace these participatory approaches. You know participatory approaches have been around for some time since the 80s into but that has not really sunk into government training institutions. So you find that the government is missing an opportunity! The other capacity area is... improving the equipment we have. You find most of the... government offices working at community level they are not equipped. They don't have fast channels of accessing information... So improving communication... forwarding information into these agencies that are working at the community level would be very, very essential. [...]
Q15	a §21-22	[...] So as a country I have to say we are not quite there... in terms of preparation. But... climate change... has on top of the political agenda, the prime minister's office, has taken it very seriously, has mobilised other ministries... And the level of awareness is now there. But... to me I feel... the approach... the national approach is tending to focus more on... let's plant more trees... you know... the Mau forest area, the ecosystem is affected so let us restore it. But that is drawing their attention more than... away from what are the real issues that we should be addressing... cause it is a bigger issue than just focusing on the forest, planting trees...
	b §26-27	[...] The other is... preparing the people you know, preparing the people not just raising awareness... because I've seen for example the NCCRS, it says "Raise awareness!" But I think the issue is more than raising awareness... I should say... it's... working with these people... you know... to internalise the planning process in terms of... resource management, water management, fodder management and livestock management... you know... improving the planning cycles... and making sure that... these people are within it, learning from them... what facilitates community planning... I think is very important to increase capacity.
	c §61-63	I think communities are very aware that things have changed... that things are changing. They are not aware... of the many contributing factors to the change. They are not aware of the science behind. But they are aware... that the environment is changing... They are also not quite aware about... they have not internalised this thing of seasonal planning and planning best on scientific projections. For example... the Kenya Metrological Agency releases the quarterly information. That information doesn't reach the communities... [...] In the newspapers, in the radio, in the TV. And hardly it reaches the communities. And in those areas the government frontline, the government extension is very thin. So very remote communities... that are removed from the centre... don't have the access to that kind of information.
Q18	§53-54	And where do you see the role of the government, are they addressing the issue properly? I think the government... is lacking behind I should say. Government is lacking behind [...]. It is lacking behind these interventions. For example I should say... the aloe initiative is being tried. But it's ahead of policy... So people are making mistakes, but there's no... clear guideline on directing people to harvesting that resource. So I think government should be proactive and try to work with NGOs who are piloting these things, to mainstreaming properly guide communities on resource utilisation, building capacity... and invest more into developing the product.

Quotes from IP9

Q1	a §14-15	So regarding Kenya how would you estimate the impact of current climate change, what can be already assessed, which issues are already present? Ah... I think in general different sectors are most hit, like agriculture, livestock. Such sectors are at the most vulnerable to impacts of climate change. Then again I would say that... it depends with the region that the community or people are living in. For example in urban areas then for me the impact are not that hard felt because I think the people have an adaptive capacity, I mean if there is no water they will either buy water or something. But if you go to rural areas where maybe the only source of water is a certain stream and it dries and you have to walk 20km to get the next source of water. Then the impact is more adverse. And so for me I think it's real, I think the impact is high but mostly within the agricultural sector, within the poor rural communities. Because there is a lot of conflict issues over natural resources, water resources we are still fighting, issues of the Mau forest and all that, so that also in itself becomes an issue it may not be directly related to [climate change] but you can see the consequences of reduced rainfall and therefore conflicts with people wanting to acquire certain resources for their benefits.
	b §22-25	Concerning water where do you see the greatest impacts? ... I mean we are already experiencing the rivers that feed into the... the rivers, the water towers, Mau is one of the water towers, some are drying, some are becoming seasonal as opposed to permanent. And what we are seeing, the fighting wildlife population is also being affected, you know the wildlife have to move to a greater distance to look for water and therefore causes conflicts with the communities. I could come to the urban areas although this is not ecology but you find there are issues with the communities... you know there is scarcity of water there is water borne disease and all that. But mostly in terms of water in relation to resources I would say they are intertwined with... water resource being scarce affects wildlife and also affects people, 'cause you cannot look at an ecosystem without considering the people within the ecosystem. We talked about the impacts of climate change on different ecosystems... what implication does that have for Kenya as a country? For one, tourism will be affected and it's maybe being affected as of now. But from what I know... You expect to find this particular species of animal, let's say the elephants and you find none, not even one and you have to go kilometres and kilometres as you are tracing them. And that of course affects the economy of the country, I think it's the second largest sector other than agriculture... So that definitely will affect us as a country. In relation to water as well... with the decrease of water resources within Kenya... we are coming to a place where we are having water borne diseases. And things that we could have prevented and are not really necessarily being tackled. Our natural resources of course are going to be affected drastically, also talking of the costs... because that is something: once the impact starts its very hard to reverse it... [...] Try and have a mitigation measure now because you can't adapt to e.g. coral bleaching. You have to find ways to stop the impact. Mostly all natural resources in Kenya are linked to tourism, so in itself it affects the economy.
Q3	§23	[...] I could come to the urban areas although this is not ecology but you find there are issues with the communities... you know there is scarcity of water there is water borne disease and all that.
Q4	§25-26	For one, tourism will be affected and it's maybe being affected as of now. But from what I know... You expect to find this particular species of animal, let's say the elephants and you find none, not even one and you have to go kilometres and kilometres as you are tracing them. And that of course affects the economy of the country; I think it's the second largest sector other than agriculture... So that definitely will affect us as a country.
Q5	§23	[...] And what we are seeing, the fighting wildlife population is also being affected, you know the wildlife have to move to a greater distance to look for water and therefore causes conflicts with the communities. [...]
Q7	§25	[...] In relation to water as well... with the decrease of water resources within Kenya... we are coming to a place where we are having water borne diseases. [...]

Q11	§27	[...] I would say the humanitarian sector does not, in my opinion, respond well to issues of climate change, I mean for example in Turkana you get a drought and what people do is send maize. Dry maize. Dry beans. And the people are expected to cook the dry maize and dry beans with water and there is no water. So I think our response in the humanitarian is ineffective... Trying to save people's lives for them to die tomorrow? Instead of thinking long term. Maybe they need a borehole, maybe they need a permanent source of water. I am thinking if the money that we've poured out to the humanitarian sector could go into... help develop these areas and such then I think it would be a better approach to adapt... of for example the Kenya Agricultural Research Institute has done a lot of research on what we call orphan (?) fruits, the sorghum, the millet and so on. What they need to do... [...] is promote these fruits, telling people who are used to maize, that maize probably does well with such amounts of temperature and rainfall but then we are not having this contestant rainfall... So what can we do? Can we change the variety of maize, can we change to sorghum, millet? And try to introduce this type of foods gradually to the market and even to farmers. Then I think we'll be... better placed. I think the NGOs are doing a lot of advocacy work, awareness work, so the people realise climate change is real, it is going to impact in this and this way, but I feel we need to move other than just making noise... and blaming people and... putting fingers, we need to move! Either as us, as individuals, in the NGOs moving and saying ok... the more you create awareness people know. [...] I think we sometimes preach water and drink wine. Some people here say climate change is real and all that but you'll find NGOs are the ones who are flying all over without looking at their carbon footprint, they are the ones not taking initiative to plant trees or they come and plant 10,000 trees and then there is no follow-up process and how many trees have survived, who is taking care of the trees, who is nourishing them... I mean small and things they may look insignificant... saving power, using recyclables. So in as much as we are talking about adapting and all that we actually need to start with small simple things we can do and other than waiting for humanitarian help from abroad. [...]
Q12	§36-40	How relevant is climate change for Kenya as a country in relation to other problems such as HIV or poverty which we just talked about? Vis-à-vis other issues? ... On a scale of one to five I think it's at four [one being the highest]. And I think that is mainly because... The media does well, whenever we have issues of the Mau or Copenhagen and everything it highlights. But after the media highlights people tend to forget and people tend to net see it as a real impact... Because you are not really seeing the connection between I don't have water in my tap, to the trees being cut to the US and the UK and other developed countries polluting greenhouse emissions. And I think for now, most of this "Cut you carbon emissions!" its Greek to them... To us as Kenyans, the local people, we are not seeing a direct link to what the US people are doing or the other countries are doing in terms of green house gas emissions and how we are related to it. Maybe it's because we are not the ones who are polluting. But if you go to a farmer and you ask "What is your crop yield?" they say "Last year I did 100%, today it's 20%." Some will tell you the gods have not been good to me, some will say the weather has changed. But they will not really know... the long history of the GHG to actually linking it to rainfall and stuff that like that. They will not have a link like that. And if they don't have the link it won't be a priority to them, to the government. So in phases when natural disasters happen, El Niño and all that, it is highlighted and everyone says "Oh my goodness climate change!" then when things come down it's less of a concern, let's put it that way. How important should climate change be taken for Kenya? Again on my scale I think right now we should be at 2! Yea. Considering we are already seeing the reduced in rainfalls. And for us it's an alarm, it's something that has happened in the... current five years. Then it should... hit you to think "What about the next five years? Do we still get the same amount of rain in this specific period? What is happening?" For us I feel it should be a quite bigger priority, 2 or even 1 for that matter depending on the regions that are severely affected and the communities. And for that to happen like I said a strong link has to be there between... the ecosystem services, resource use to actually link it now directly to climate change. People think climate change is just basically drought and famine. But then it has to be elaborated more to just having less rainfall or having too much rainfall.
Q14	§41-42	Do you think Kenya as a country is able to deal with climate change as such on its own, or... does Kenya need external help? It's a tricky question because essentially I would say yes or I would say no. I would say yes we can be able to... deal with the adaptation programmes at the moment. With our own capacity if we integrate them into other sectors for example health, instead of dealing with the factors as an entity on its own, dealing with it under the health sector and all that. But then I would say the reason I am saying that because if... a lady in the village has a kid who falls sick. The lady will take the initiative to take the kid to a hospital or what we call 'harambee fundraising' and stuff like that. And so I am thinking in that own initiative, in that own capacity I feel maybe we could deal with it. But I am not sure to what extent. Maybe 100% or 80%. But I'm not of the opinion of we say "Look here you've been polluting give us money!" I don't buy to that kind of thought... where we really have to get aid from... the adaptation fund, financial donors and all that. I feel yes the aid comes fine, it will help us, but if it doesn't come let's take the initiative to look at the resources within ourselves! For us to make an impact. I think we have homongous recourses if we just decide maybe 10% of the tourism money would go into an adaptation fund in terms of... dealing with adaptation issues in relation to tourism. 10% of the business sector for going to building better water points or something. I think we'll go far other than just waiting for the government agencies or donors to help us in adaptation. But that is just my opinion, many people disagree.
Q15	a §27	[...] I think the NGOs are doing a lot of advocacy work, awareness work, so the people realise climate change is real, it is going to impact in this and this way, but I feel we need to move other than just making noise... and blaming people and... putting fingers, we need to move! Either as us, as individuals, in the NGOs moving and saying ok... the more you create awareness people know. [...] I think we sometimes preach water and drink wine. Some people here say climate change is real and all that but you'll find NGOs are the ones who are flying all over without looking at their carbon footprint, they are the ones not taking initiative to plant trees or they come and plant 10,000 trees and then there is no follow-up process and how many trees have survived, who is taking care of the trees, who is nourishing them... I mean small and things they may look insignificant... saving power, using recyclables. So in as much as we are talking about adapting and all that we actually need to start with small simple things we can do and other than waiting for humanitarian help from abroad.
	b §29	[...] I don't think they are aware... of the link or if they are aware they don't really know the strong connection between you opening your tap and not getting water and the Mau forest being destroyed. They don't get that strong link and to make it worse some members of parliament have down watered : "Why should we protect the forest?" and stuff like that. So I am not sure they get the direct link on ecosystem services with the ecosystem resources and the impacts of climate change. They would know climate change is real, they know the drastic impacts like sea lever rise... and drought and all that. But I don't think there is a strong link that has been put out. This is how you are going to be impacted, this is what it will mean for you as a community.
	c §36-40	How relevant is climate change for Kenya as a country in relation to other problems such as HIV or poverty which we just talked about? Vis-à-vis other issues? ... On a scale of one to five I think it's at four [one being the highest]. And I think that is mainly because... The media does well, whenever we have issues of the Mau or Copenhagen and everything it highlights. But after the media highlights people tend to forget and people tend to net see it as a real impact... Because you are not really seeing the connection between I don't have water in my tap, to the trees being cut to the US and the UK and other developed countries polluting greenhouse emissions. And I think for now, most of this "Cut you carbon emissions!" its Greek to them... To us as Kenyans, the local people, we are not seeing a direct link to what the US people are doing or the other countries are doing in terms of green house gas emissions and how we are related to it. Maybe it's because we are not the ones who are polluting. But if you go to a farmer and you ask "What is your crop yield?" they say "Last year I did 100%, today it's 20%." Some will tell you the gods have not been good to me, some will say the weather has changed. But they will not really know... the long history of the GHG to actually linking it to rainfall and stuff that like that. They will not have a link like that. And if they don't have the link it won't be a priority to them, to the government. So in phases when natural disasters happen, El Niño and all that, it is highlighted and everyone says "Oh my goodness climate change!" then when things come down it's less of a concern, let's put it that way. How important should climate change be taken for Kenya? Again on my scale I think right now we should be at 2! Yea. Considering we are already seeing the reduced in rainfalls. And for us it's an alarm, it's something that has happened in the... current five years. Then it should... hit you to think "What about the next five years? Do we still get the same amount of rain in this specific period? What is happening?" For us I feel it should be a quite bigger priority, 2 or even 1 for that matter depending on the regions that are severely affected and the communities. And for that to happen like I said a strong link has to be there between... the ecosystem services, resource use to actually link it now directly to climate change. People think climate change is just basically drought and famine. But then it has to be elaborated more to just having less rainfall or having too much rainfall.
Q18	a §27	[...] A positive thing is that the government has come up with this document, it's called the NCCRS. And it's a good thing because it sort of takes us into the strategy of how we should adapt to climate change. I am not sure how we are going to implement it, I am not sure we have the resources to implement it or at which state we are going to implement it. I know the government has put into programme... at the PM office there is a climate change coordination unit, there is also a unit at the department at the ministry of environment. But that is just a starting point! Which is a good thing! Then the other good thing that I know is that the government is trying to network with NGOs and CSOs and saying that "You are the actors on the ground, you're the people who are dealing directly with these people who are affected by climate change... So let's team together, show me what information you have, how we can fill the gaps." That in itself is a positive step. [...]
	b §32-33	So coming back to what is already being done, are there any programmes in place from the government, do you see any further issues from the government side to address? I see efforts, which is a positive sign. But I am not sure to what extent... the finance ministry, would give priority to addressing climate change issues. And therefore there maybe willpower from the ministry of environment in coming up with such strategies and implementing them and then... let's say the finance sector says "Let's deal with HIV it's greater or let's deal with malaria or certain issues." So I guess that in itself is a problem because then the policies I would say would be clashing. PS we don't have an environmental policy... [...] So I am

		seeing efforts [Talks about a newspaper add about climate change, quality is bad]. Maybe they need more willpower, I don't know from whom...
--	--	--

Quotes from IP10

Q5	a §18-19	So what are the impacts of climate change in communities that have been noticed in the past years, we've talked about drought, are there other aspects of their lives that are being affected? In fact there are several. [...] If you look at it... in term of livelihoods we have been affected in lots of ways. Looking for example it is the continuous droughts, the economic power of the community has really gone down. [...] People are now trying to diversify into... other practices. If lifestyle to some extent has really changed... cultural aspects of the community are changing. Because for example the Maasai communities perform only cultural practices meaning that you can say this is a rite of passage. You don't conduct these 'rite de passage' during dry spells. You only conduct them when you have green trees, green shrubs we use in this kind... It has even disorganised the kind of... communal arrangements that the community has in terms of how they deal with their... rite de passage and a few others. So if you look at the periods and you share with the communities... you will notice... is that to them drought... is becoming more severe. Then to some extent you even see the changes... in other things like pasture. Soil erosion becomes rampant, because of course when there is not enough vegetation livestock will still step and break the soil further. The quality of soil, the quality of vegetation all these things have changed to great extent. ... We've noticed some disappearance of even some species of grass... which have disappeared and which we have evidence about that. We have some species of birds and wildlife which have disappeared and we have evidence about that. Then we have some unique happenings... that never happened. Even in terms of rain! When we get rain we sometimes get some very abnormal rains. Like in 1997 we got the El Niño rains which was a new thing... it introduced new diseases, there was a new disease that killed a lot of sheep... in the community. So I mean we have some new things that are really coming over the years and that are becoming an evidence of climate change and the whole issues. To an extent the communities sometimes they say we are not understanding this. But we've also tended to foresee the... predictability of weather. We can say now the communities have their own ways of predicting weather. But this is really changing because it has really confused even the traditional rain-making, those who foresee things. Things have changed to quite a large extent.
	b §28-33	Coming back to climate change, which aspects of their everyday life are particularly susceptible to climate change? [...] If you have poor nutrition... if you don't have good food, good meat, milk, fat, gee... it even affects the nutrition that they have. You will find communities taking tea without milk, you will find them taking... food without fat, 'cause fat comes from animals. So it affects generally the nutrition of this family and the health in general, especially for people with HIV and AIDS. [...] It affects even the governance... the voting participation in the democratic processes in the county. But then if you look at education it's another sector that really gets affected by climate change. [...] It affects it in this way: First of all labour... drought brings labour... labour is required during drought for them to survive. This means boys will have to drop out of school until the next rainy season. They do not go to schools therefore fail to follow. In the pastoral areas schools will therefore follow the rainfall a calendar. People will go to school when there is rain and not when there is the normal school calendar. And it really affects education. In the last few days we had a lot of schools that were closed down... because of no people coming to school. Everybody moving. [...]
Q7	§59	[...] People used to die, in fact men, especially men... If you find your cows like 40 of them dead, we had several examples of people died. Which you could call the physiological aspects of the whole climate change issue. People die actually, in every drought we have people die from it... [...]
Q8	§29-32	If you look for example at women. Women I think have actually been affected... if you look at nutrition of the children it has been affected. It has been affected, because men will move for long distances, they don't want to feed the sick animals that they leave at home and all that. When livestock moves away... [...] Climate change and women is a big issue! In the Maasai community you don't have tapped water, you don't have boreholes we depend on water from the rivers. What this means is that most of the rivers in Maasai land are seasonal rivers. It means that the longer the drought, the longer the water problem in that area. One this [is often] unsafe water for drinking. The distance that these women walk to get this water sometimes is just unimaginable! Because they will walk for long distances... In the last drought for example we had two women who died or their way to look for water... in our area of cooperation. [...] 'Cause [with climate change] you see water is reducing, reducing, reducing. [...] Sometimes it's not guaranteed [that they will find water]. It reduces water in the borehole. In fact the yield the water you get from these boreholes is affected. Dams will dry up and all that. And it's women who are expected to look for water by all means to feed their people [...]
Q8	§15-17	[...] The Maasai people only have livestock. That is our main livelihood system, in fact this is... our sole livelihood system. If you look at the geographical setting of these communities, their land is... we live in the semi and arid areas where even crops and farming is something that is quite impossible... I mean it is not practical to do especially if you are depending on rain fed agriculture. So livestock... will remain the only liable kind of an adaptation mechanism for this community. And that is basically what we depend on. [...] Because even for us to get engaged in other governance issues, policy issues, quite effectively. These communities... even in... simple voting these communities have not have time to vote, these communities have not have time to be counted because they have always been on the move. And all their energies have always been geared towards survival. So it's an issue that has been in the community for so long, before climate change became the subject of the world. [...] It is hard to bring your issue to a legislation level, simply because of years of marginalisation and simply because a voice of the minority which is not often taken seriously by the government and legislators as they ought to have taken. So that... neglect of the voices of these people... has just lead to their continuous marginalisation. Well previously maybe to seek for... they were having these droughts here and all that. But when drought affects us as a community... they sometimes forget to take care of our livelihoods. Our livelihoods that are our animals and our animals are our lives and they are everything to us. That is my food and therefore if I don't have animals, therefore I don't have life. It is as simple as that! If you lose livestock then you don't have life. Because you won't get food, you won't get education, you won't get hospitalisation and you won't get anything else. You won't get good nutrition because that's where you get milk, that's where you get fat, that's where you get school fees by exchanging animals. So basically a cow to these people is everything! So for example when they design relief projects, the relief projects will concentrate on people saving the lives of the people. Forgetting that if you save the life of these people at this moment it is not sustainable, 'cause you've not saved the life of their livestock! Which will make... these programmes unsustainable. So then it's therefore at this level where we've been able to address issues at a global level. And I think that is one of the reasons why indigenous people are getting now some hearings and consideration out of the global processes, like the UNFCC and the CBD (?) it's basically because of this kind of evidence based kind of vulnerability that they have been undergoing... real people experiences over the years and therefore that is what is giving us time to be heard at the global front...
Q9	§40-44	What has happened from the emergence of this drought: There was a time that the community wanted to attach some value... some commercial value to this livestock. What this meant was that there was improvement of livestock. Livestock breeds. To big sahiwan (?) animals. Over the years what this has meant for us, they cannot adapt to the environment. In the harsh semiarid areas they cannot survive! Once that animals they grow faster and they die faster during drought. What slowly is happening... without anyone doing this is that traditional breeds of livestock... are now being reintroduced. [...] In fact right now most families have more sheep and goats than cows. The goats and the sheep are definitely more resilient to drought. The indigenous sheep definitely can survive those droughts.
Q10	a §46	They can shift to some extent. But not completely: There is no way Maasai can survive without cattle... Maasai without cattle will not be Maasai. For example and also in all these other communities... We have what we call a sentimental attachment to the cow. A cow has an economic value but has more social and cultural values to a Maasai than the economic value. I can refuse to sell my animals... because a Maasai loves their cow, that is what he used to braise (?) himself to see... that is what give out to deal dowry, that is the animal that... makes them kind of in their hamassle (?) of needs... get to the state of self actualisation. [...] And that person becomes even really, really respected. The more the good, well cared animals, the more you have those, the more self esteem you have and in fact you'll get yourself actualisation and eventually you will be respected. You get a lot of power when you have a lot of these animals that are good looking. So that's an interesting aspect that... is there. [...]
	b §21-23	[...] That the community is facing for example the change of the natural resource management. Land used to be owned communally. 'Cause for pastoralism to survive land must be available for spread of animals for space to graze. Cause pastoralists are not attired to land. Land tenure systems have changed in the country. The community has moved from what we call group ranches to now individual ranches. In that perspective you find that now the space to grazing these animals has reduced. Consumption of grass and forage and pasture is now quite high because you cannot really move. The whole issue of the cross border arrangements... the cross border policies where you cannot move from here to there is something else that as really... impacted quite negatively. But even the government policies... for example recently, NEMA which is the National Environmental Management Authority, said that there is to be no grazing in national parks and... government forest areas! This has been for years a fall back strategy for community. So when the fall back strategy is not available it seems that suffering and mobility is affected. So I can say mobility of livestock has lead to more vulnerability of these communities 'cause during drought periods this is when you'd move your animals... to a high potential area. But when it's not available, then it's quite difficult! The same way climate change is affecting pastoralists, it the same way it's affecting famer communities. [...]

		<p>So would you say that these mobility restrictions also increase the vulnerability of pastoralists to climate change?</p> <p>A big deal! The more mobility is restricted in fact the higher the vulnerability of these people. Even looking at practical issues of how... if you have for example 20 animals is 20 acres of land. Once that gets exhausted it will be very difficult to feed these animals. It just complicates the whole scenario. But if I am allowed to move them and they graze freely 'cause animals in Maasai land are not fed, they feed themselves through free launch grazing. So for example if you look at the southern rangelands of the Rift Valley, Kajiado, Transmara and all these there a lot of land subdivision has gone on, fencing is coming up and this is basically due to other issues that are contributing community and their vulnerability. The new practice is that there is a huge of land that is happening in the Maasai area. Change of use of land is really affecting pastoralism and is actually increasing vulnerability. Because you can see now flower farms being introduced to these old rangelands, in the plains because they say that flower farms do well in the plains. You see downstream the flow of water reducing due to cultivation in the highlands and this is the water that we depend on! [...] In the Magari (?) area, people are depending on the water that is coming down from the Mau forest... so the upstream- downstream relationship is really affecting the pastoralists (...) there is reduced water in our rivers and therefore the lack of water... worsens things for the pastoralists! Because if there is a drought then you have to walk for long distances that will further deteriorate the condition of the livestock, [...] and eventually they will die. When droughts become frequent the community loses that kind of... hope sometimes and they will get into other options like selling of land as I had mentioned. Most of them sell land and buy animals... you sell this portion and you buy animals to a reduced grazing space. By the next drought... they will sell off his land, therefore reducing this space for the animals to graze. It is quite an unfortunate happening. Then again it's introducing foreign lifestyle foreign practices. Because we don't have in this land a policy for the change of land, if you come as a solicitor and buy a piece of land you are free to put anything up whatever you want. There is also a willing seller, willing buyer policy so there is no control, there is no regulated piece of land in these regions. So I think those are some of the things that are really worsening the situation. But I am also a bit worried that the government and policymakers have refused either deliberately because of other issues to accept pastoralism and treat pastoralism as an economic lifestyle. Pastoralism contributes more than 15% of this country's GDP. In every household in Nairobi for example they consume milk or meat several times a week. Over the weekend you will see in Nairobi all of them driving all the way to Maasai land and other areas and enjoying peace of it, including the that people that I was talking about. I think pastoralism has not been taken seriously.</p>
	c §59	<p>They will need capital, they'll need seed money to initiate these farms. They will need maybe training, remember this is now a pastoralist community that have no idea of agriculture. They will need a lot of training on how to do it by themselves without having somebody from outside do it. They need to know the value addition and all that. And... mentioning value addition and the options available that is also one thing we've been trying to explore over the years. We need to make the cow have some value, when it's alive and when it's dead! A cow for example produced a lot of manure... that manure can be sold to farms as a fertiliser, the same manure you can invent that to light our homes because now we have this permanent residence, if we could have a few animals that remain there to produce that manure than we could things like biogas out of that. That needs capital. And then a value addition in terms of a cow when it is dead. We need to open up our markets, for example our hides do not find their way into the... common market. We have the commercial market. If we could get a way of getting our hides, the skins of animals... sold into the commercial market... I think that would really improve things. Because then even when an animal is dead due to drought. You can remove the skin... But you know what happens in most of the cases: Thousands of those animals will be lying on the roadside... If you could add value addition to the cow, that would be something to explore. That animal will die with its horns, with its skin with its bones attached to it. Bones have a lot of market value; horns have a lot of market value you can use it to make glue and other things. So if we could attach a value addition... and implement such a project... then definitely the vulnerability will reduce. Then when a cow dies... you just remove the skin nicely, you remove the bones and dry them somewhere and then you at least have something from that cow that will make you survive another day and another drought. To me that is another aspect that is quite important. And that needs training as well, because we are used to throwing them away. I am sure it will not be against the culture, I have seen a few Maasai doing that. [...] If we could build the capacity of these people, provide them with capital to initiate those alternative livelihood programmes... then trust me it will be far much better...</p>
Q11	a §48	<p>[...] Because land tenure, land management itself should be really looked at. We should stop selling land, we should stop subdividing land into small portions that are not valuable. And there should be policies against forest destruction in the upper areas so that way we can get the flow of water. And connected to water that is that they should improve water development policies. Water, water, water can really, reduce the vulnerability of the communities, a big deal. A big deal! Then also for these women, if we can have some water, if these women can diversify their livelihoods a little bit so that we don't entirely depend on livestock then it will become easy. Because right now in 90% of the Maasai still rely entirely on livestock and its products. Period. And maybe selling it to buy... flower to eat. So if we could diversify a little bit. And we look at the other alternatives. An alternative that should be compatible with one, the lifestyle of these people. Secondly that should be adjustable to the environment, 'cause the sights that we live in are arid and semiarid. So these alternatives should be alternatives but that are practical in our own setting, cause our context is unique, our context is diverse. So we should have something that is quite adaptive to our environment.</p>
	b §37-50	<p>[...] What would you say are community's needs be able to adapt to these changes, what capabilities do they lack?</p> <p>I think first of all... I will look at this from a policy... point of view. If people for example have a cross border policy that will allow our animals to move freely from one area to another, allow mobility. Then I think that would really... relax the impacts that climate change, especially drought, has on this community. If we could also have... a legislation to a... wildlife – community conservation... kind of agreement, again from a policy point of view. That yes we will allow livestock to graze in the national parks. You allow harmoniously wildlife to graze in our areas. In a coordinated manner, not haphazardly. Not haphazardly, so that we don't kick tourism... [...] Then I think we can cooperate quite nicely. Right now I can say that we've realised as a community that indigenous of livestock adapt better in fact... all the indigenous mechanism are good for the survival of the community. If we could continue having the indigenous sheep, the indigenous goat, the indigenous cattle... we feel that they are more resilient to drought. [...] For example you can improve on conservation. You can have small areas to have as conservancies, eco-tourism for example. It's going friendly to the environment, because it means conservation one, of the environment, it means conserving their land and the natural ecosystem. And the Maasai are perfect in that, I mean they have been living in this environment, the forest and all that. So they can just build up and perfect on things that they already had. And then again it's women could do... perfect their wonderful art. Maasai are wonderful in beadwork. If these women could find a market for cultural artefacts that are done by these people... they would definitely go along way. And then if water is sufficiently supplied... which is something that I believe is possible... then they can have small farms... I am not talking about large farms, I am talking about small farms for subsistence purposes. This would move out and improve their food security at home. So small farms and cultivation can mean an improvement of these people.</p>
Q12	§20-21	<p>And how important is the impact of climate change in relation to other issues (such as marginalisation, land issues, the economy around them) that affect pastoral communities?</p> <p>In fact it is a multiple of issues. That the community is facing for example the change of the natural resource management. Land used to be owned communally. 'Cause for pastoralism to survive land must be available for spread of animals for space to graze. Cause pastoralists are not attired to land. Land tenure systems have changed in the country. The community has moved from what we call group ranches to now individual ranches. In that perspective you find that now the space to grazing these animals has reduced. Consumption of grass and forage and pasture is now quite high because you cannot really move. The whole issue of the cross border arrangements... the cross border policies where you cannot move from here to there is something else that as really... impacted quite negatively. But even the government policies... for example recently, NEMA which is the National Environmental Management Authority, said that there is to be no grazing in national parks and... government forest areas! This has been for years a fall-back strategy for community. So when the fall back strategy is not available it seems that suffering and mobility is affected. So I can say mobility of livestock has lead to more vulnerability of these communities 'cause during drought periods this is when you'd move your animals... to a high potential area. But when it's not available, then it's quite difficult! The same way climate change is affecting pastoralists, it the same way it's affecting famer communities. So when the famer community becomes food insecure I think pastoralists become more insecure. [...] If you could place them on the vulnerability scale they are always more vulnerable than any other community. If food is reducing here it means that you don't have livestock and you don't have food so you need to buy from the famer community because they didn't have anything that they harvested. So it is more severe, kind of more... dangerous for the pastoralists.</p>
Q15	a §70-72	<p>That is very interesting actually. To be honest people are aware of the changes, they are conscious about the happenings here and there. What these people do not understand... for example if you to the community and discuss about RED, it is still something to them is strange...</p>
Q17	§33	<p>[...] An interesting aspect that this also brings is conflict. Conflict over natural resources really comes up during drought. In this way: After the drought your animals have died. You have to restock them. So you have to conduct what we call cattle rustling. Steal animals. It used to be a game. But now it is a practice that they conduct every other time to restock, if I may put that into quotes, "restock" their herds. So it brings a lot of killings. Because the competition fights. And it really affects peace in general! The more frequent these droughts come, the more frequent the conflicts in these areas, the more intense, the more sophisticated. Some now... they hire a truck and bring the animals from somewhere else. So it brings a lot of intercommunity conflict in these areas. Conflicts in ways that when you have scarce recourses, when you have limited water remain, when you have little grass remaining... the last drought people... To give my own example my animals had to move from... to come and stay close to the national parks, so that they can get the animals into the national park. And if they were found it was serious torture by the KWS, Kenya Wildlife Service rangers, serious torture [...] ... of the people who moved in. And the animals used to be chased. They used to drive lions closer to the animals so that the lions can feed on the livestock. They used to beat up... [...] herders. They even killed two herders in a range of two months. ... If you could see the portrait of pain that this community undergoes during drought it's just too heavy! [...] What we do is we have to force our animals into national park those are the only places</p>

		with remaining grass. And there is no fair play with this. The Maasai live harmoniously with the livestock we don't have a problem with wildlife in our areas. [...] We don't have a problem with them! Once they get into the boundaries of a national park or a reserve that is a total disaster. They will be beaten, the animals will be chased and all that... [...] So what happens now is that also we are becoming a little bit hostile to wildlife! Because they are coming to finish our grass! Because generally what this wildlife do is that they cross over [...] it's across Maasai land!
	b §73-74	There is a need to discuss... what is climate change, what is global warming, how we are contribution to global warming and all that... There is a lack of understanding in the community. But if you relate it to the impact, then they understand it quite perfect! If you relate it to the forest if you relate it to the ecosystem then they understand it. [...] In fact the interesting bit is that communities as I said are conscious they know for example that the drought that they got last year is worse than the drought that they had the other year.... They could tell you a long time back if you get old people to explain this. So... the awareness level then what this is... extremely low. Especially where lot's of these areas where the information has not reached. It is just too low.
Q18	§69	The government is not appreciating the techniques, the skills that are available in the civil society... especially to presentations of communities talking about issues of climate change they get quite envious about that and they want to be associated with us. But I would say that practically, practically the government has resources. They have resources if they want to help the people and reduce their vulnerability. But I must say that our relationship is remaining more at the national level. We are still at this level... I really wish that this relationship... created an impact on the ground. Because we are the governments people. This is our government we do not have another government. This is what we look upon for all things and we compliment. So I think we should not take this issue small. For example I think that if we want to adapt to water problems within Kenya we can do it within two years. We have a lot of machinery lying at the (...?) quarters... I understand. They have a lot of things to sink boreholes and all that. If they could move from county to county and seek who is the most vulnerable, let's sink borehole for them and get water! Because water right now is the biggest issue, the biggest priority in the communities. I am sure they can allocate these things if they want. I really wish we could now take our discussions with the government to practically help the people on the ground. Not just invite me for a meeting, not just taking me to a conference... but to practically address adaptation issues on the ground. Once we've done that then I think we are good to go with the government. We experience rains and all that, we have all these river and all that, if we can work on that and look that these rivers, get water for the communities. Its' not a lot of money to be very honest. It is just a little money and then we will be able to save the lives of the women and the children and the men of this county. So we need to stop doing a lot of talking and doing a lot of practical work [...] Can we get to work? That is really my preference... can we get to work and seek practical solutions to save people's lives?

Quotes from IP12

Q5	§21-32	Regarding Climate Change <ul style="list-style-type: none"> • 2009 the community had no electricity for several months [due to the severe droughts the hydropower stations didn't operate fully, my.com.] • shortages in water supply • the water bills have been rising, such as the electricity bills • both effects the local economy thoroughly • no communication comes down anymore • the health in the community is affected • in the mentioned case caused an increase in illnesses → during heavy rains • and in dry spells due do the lack of clean water • the community is indirectly affected by the change of the rainy cycles through the aforementioned issues + food shortages • but also directly → less rain → less clouds → more sun → rise in temperatures [especially in the poorly insulated metal shacks in the slums • climate change is a cross-cutting issue
Q7	§27-29	the health in the community is affected <ul style="list-style-type: none"> • in the mentioned case caused an increase in illnesses → during heavy rains • and in dry spells due do the lack of clean water
Q9	§38-46	What options do people in the community have to react to the climatic changes? <ul style="list-style-type: none"> • "We just have to accept it" • coping examples: • during the electricity failure students started working at night because that's when electricity was provided • collecting water in huge drums, so to store for drought periods • [...] electricity saving
Q10	a §33-37	Do they feel they are being informed sufficiently? <ul style="list-style-type: none"> • when they [the government + the city council, my.com.] started spreading the information it was too late • information is generally not well passed • there is no flow of information from the administrative [the group feels they are being avoided since their heavy protesting against a resettlement programme by the city council] • it is up to the NGOs and CBOs to inform themselves and spread the news in their community → completely left to them
	b §43-45	<ul style="list-style-type: none"> • there is only help when there is an acute health problem • e.g. during the cholera outbreak there was short term assistance by the government • there is no such thing as long-term capacity building efforts
Q11	§49-59	What would the community need to be able to better adapt? What would help them? <ul style="list-style-type: none"> • finances • knowledge transfer • e.g. through training • water harvesting • "we are trying to prepare ourselves in the best time" • so solutions are not forced to them but they can do it in their own way • 2009 "we were caught unaware" [because they were not informed beforehand, my.com] • the city council and local government should do more • e.g. open day were you listen to the views of the people • they should also approach the communities on their own, not only react on demand
Q16	§56-70	What are important stakeholders that would need to be included when seeking solutions for the communities in the face of climate change? <ul style="list-style-type: none"> • CBOs + grassroots • community networks • government • forest department → tell people what trees best to plant • science community → training and knowledge transfer

Quotes from IP13

Q1	§11	When we started in 2009 we decided to form ourselves... in what we call thematic groups. Climate change impacts on all sectors, at least in Kenya all sectors are affected by climate change! And we said for us to be effective, to be authoritative enough in issues of climate change, we need to be able to answer to the questions of climate change in every sector. Therefore we formed ourselves around nine thematic groups. We have a thematic group on energy, we have a thematic group on water, agriculture, livestock and fisheries combined,
----	-----	---

		conservation, pastoralism and conflict over natural resources combined, health, we have forestry, we have tourism and trade, we have education and finally we have infrastructure and housing.
Q4	§38-39	[...] Even the tourism – all sectors are affected. So in fact one of the sectors that is suffering so much is the tourism sector. Because with the recent temperatures our animal population our game parks and national parks are totally affected. That calls for a totally new way in order for them to be sustainable.
Q5	a §42	[...] So that's basically that and... so that affects even their education, they're not able to educate their children. And you find there is much more problem to that community even to this country. So climate change has really disorganised us. And we urgently need to think together, to act together to be able to be at peace ... to assure that we have this generation...(...) It is a serious matter to us that's why we call it a matter of life and death. If we don't confront the climate change quickly... the problems we already have will escalate and there will be more conflict in the families. In fact when we went to Kituju (?) we were told in a hearing there is more conflicts in the families than before. When you have no resources, when you can't provide food, the wife thinks the man is lazy and the man thinks another thing...and that has affected the family unit. And when you affect the family unit, they... affect the community, the society and the nation. To me it is much farer reaching than we could see.
	b §52-55	So the economic aspect of peoples live is very much affected by climate change, which other aspects of their everyday life are affected? ... we have no food. Let me go now to the Maasai land so that I exhibit what in the family they are facing. Initially we used to have the young people rear calves, rear animals. Now when all animals died... in Kajiado for example... the boys are idle. Today the boys are more idle and they have no money. [...] That idleness is leading to crime. They are actually able to attend schools, not educated and what the family is supposed to do is to try to find other means of livelihood sustain. So even you find even the Maasai today are trying to start farming. If their culture is based on animals their culture has been affected. [...] Even the kind of houses they used to build [...] today there are no trees, sticks that you can use. And the kind of houses we used to live in that has changed. Also culture has to do which what you eat. We used to eat a lot of meat, a lot of fruits from the bush. And if you'd eat a lot of fruits [...] you get sick less. You get sick less that is a fact! [...] You stop eating that you get sick every month. So today we have more diseases [...]. These plans don't grow anymore, some have been cut, others' only disappeared... [...]. So we are seeing we are getting more diseases in the family. And if you spend more money on the diseases today our people, if it was not for the free education system that was started, people would not go to school... So I am seeing a family which has become poor as a result of there being no livelihood sources the wives and the husband are not able to sustain it (...) that in lower eastern is a serious problem. When there is no food in the family... they have to deal with that perspective.
Q7	§55	[...] So we are seeing we are getting more diseases in the family. [...]
Q8	§57	Now, the people who are mostly affected. Look at water scarcity for example. Let's look at our family... that goes through the day... you need water for your animals, you need water for food and for washing all that. [...] Now today women are spending more time to look for water and the children are spending more time going to look for water for animals. So it is the women and children who are more affected by the changed and changing climate in this country. [...] with all this women are the sufferers of climate change. The men are still affected in that their families and problems... but they can stand shock more than women. So to me it's the women and the children that are seriously affected. That I know about lower eastern province, that I know about Maasai land...
Q9	§47-51	[...] There are a number of initiatives. One, there are some people who have started now growing sorghum. And one of... the members of KCCWVG called Rain Coat (?), Fertilisations of indigenous initiatives for community development, has started a project of planting cassava. We used to plant a lot of cassava ourselves. But somewhere in between people just stopped planting. [...] We used to grow sorghum. [...] So there have started an effort towards diversification of food crops and we are encouraging through projects and even people themselves to have cassava, to have sorghum, to have millet and start herding goats instead of cattle. Those goats are hardy animals and if you can improve their forage within a project or otherwise... the people will have milk, the people... don't need to have a lot of pasture... they have a source of income. The other thing they are doing is water harvesting. Then water harvesting is costly and that's something that you need to come together to be able to do for example to do a sandy dam. Because a sandy dam... should cost around one to five million, that can serve like 50 households with drinking water and around there they will be able to have a nursery of fruit-trees, they'll be able grow even small vegetables. If every village for example in the areas where we have sandy rivers, a lot of our country has sandy rivers, we have a sandy dam. Then People can have vegetables. And with vegetables people can't die of hunger. And that is what we are doing. In Maguoni (?) they have started growing mangoes [...] And we are seeing those mango trees you only need to water if for one year and it grows on its own and it can give you a lot of crop. So during the mango season they're selling the food... So what has been started already is mango growing... by many households but now... taking it through the food value chain is what a project is needed. We need to take them to understand that these mangoes can be packaged and they can be marketed, so that they bring income to the families for education and for other things for which they used to have maize too. So that is happening. In some areas where... they are establishing Aloe Vera. Aloe grows natural... in the bush. Aloe Vera is a component that is now going now to most of the soaps... body lotions, in the cosmetic industry. [...] So that is happening. We have an effort by one of our members supported by Trocaire in Muenji (?) of seeding sorghum. Early seeding which means before the rains come you establish sorghum in a seed bed. So that when it rains the sorghum in the seed bed will be like one month old. Now when it rains... you transplant it to the main field and it will take like another one month to be mature, or two months. So you'll need rain for about only three weeks. So you bridge the gap between the growing and the maturing. That is a very effective way that I know [...]. And there are also initiative to bring calla (?) goats that is with one of our members... Baraka College (?) have projects with several partners of Trocaire to improve the breeds of goats... So that they are able to grow faster and to have more milk. And that will make sure they will have an income. [...]
Q11	a §51	[...] In terms of water harvesting... I know that there are a few dams but that has not well done. But there is potential for sandy dams, hard dams, road catchments and for roof catchment. And that needs to be well done. [...] What is needed in these efforts is to take them to a more sustainable level. Because you can't just harvest water and that's it! You need to harvest water for a purpose. So helping them to plan a water harvesting structure where they find a specific need is what they lack. [...] So what we need to do in this efforts is to make sure where the efforts are, we go and meet that community and show them that this water will be able the community plant trees plant food crops. And even use those water merses (?) as education centres. Because the need the information. And training centres for families to be getting information and to enable them to implement in their shamba. So there are efforts but they need slightly to be taken to the next sustainable level.
	b §58-63	So what do communities need to better be able to cope with climate change, what are they lacking at the moment? It is one; they need a source of water. Water is... essentially... might actually be more significant than food. Because with water you get food. So we need to find ways to provide water... to the family. Do that we need to have a means and that has been put in the bill, of providing water harvesting. Because in a lot of areas in this country at one point it rains. All the rain water runs to the sea, carrying soil with it causing erosion. So we are saying if we harvest all the water that falls in Kenya in different parts. Wherever it is, you can distribute that water. In all parts [...] you are able to harvest water to remain for six months. So if we emphasise on harvesting water we can make it clean for family drinking and for animal use. So that is a basic, basic thing that needs to be done. The second thing is for people to be now trained to changes lifestyles. The kind of foods we believe we must eat. We have to believe that if it is starch, maize is starch, potatoes are starch, sorghum is starch still [...] So some things are never grown today and yet it's a crop that when you grow is able actually to provide women and husband with something to eat. People have closed their minds in terms of what you must eat to survive. So we need to... at the family level, if we are able to reach a household and make them begin growing all sorts of crops not only maize, pumpkins, melons, skumawiki (?) for the waste water, we have mango trees around there in the shamba. Then you can... if you dig trenches for water conservation you are able to conserve the little water that falls for growing fruits and other crops. So it's about enabling the family to have water in order to improve food sufficiently. [...] So we are saying they need to have water, diversity livelihood, we need to change our attitudes and... we need... [...] So... that must be done now. We need a lot of capacity building, really. And... you know for you to capacity build... any community towards improving livelihoods you need to be organised to groups. I'm looking at the ability of these people to understand how they able to grow these other crops so... they appreciate that have to rely not only on one source of livelihood, they see what else they need to rely on. And then enable them to know how to grow now. For example if its fruit trees how to tend the mango so that they sustain. Now capacity building towards water conservation: There are people who don't know how to conserve water and when it rains all the water goes. And yet on your own you can dig trenches which conserve water. Even establish a sandy dam at the family level if you are organised and there is a sandy river passing near you areas. They need to be motivated and shown sustainable solutions. That to me is capacity building! And we need to capacity build the groups in those areas in terms of being able to come up with development in the area for example of water harvesting, small scale agriculture, value addition and marketing. If you have a community group with is able to have a complete value chain of fruits for example. They will be able get the fruits from those who have fruit trees and add value like package the fruits and market them and improve income for the people and themselves.
Q12	§43-44	How relevant would you say climate change in relation to other problems? In terms of rating climate change might currently might have contributed to over 70% percent of the problem situation. Over 50%. You know why I say over 50? It's because our... our behaviour which needs to be changed! Our people [sound bad] you see they are all governance issues! [...] failing of people's and governance behaviours. Because to me if you even if I want to have a solution it will never go anywhere [sound bad] and Africa governance, honesty, I know people... our friends have been telling us that for a long time... and our friends in America, friends in UK. They tell us: If you want to [sound bad] or want to take an advantage over the situation and you want to be seen as the only people who can save the county. You can't safe a country try on your own. Look at the president! These are some of the issues our universities and all of us, the institutions have to recognise they have to go to democratic governance, people oriented governance to survive. [sound bad] We need to devote ourselves more fair and insist on it. [sound bad] That's why when the guys went to Uhuru park all

		of them, I think let them come with a solution! We can't afford dictatorship, we can't afford selfishness, we can't afford corruption, we are trying to survive and other people are eating and getting our resources. We can't [sound bad] that... So these are aspects of climate change... find themselves within a context, a matrix placed within social, economical, political problems and mine role as a citizen is to make sure that the way forward known and we know what we can't allow...
Q16	§15	[...] And it's the third draft which we now carry round the country to get more contributions from the people. And we want all the stakeholders, all the MPs to be able to actually go with it to their grassroots before we carry it to parliament. So the process is ongoing. And we did research on water, tourism, on infrastructure and housing, agriculture, livestock and fisheries, on a small part on one of our thematic areas on conflicts over natural resources... [...] Then we started now after that thematic research we started drafting our climate change bill and that process is still ongoing we now have a draft which we are now sharing with everyone. [...] Then we have come for the third objective... to sensitise communities... about the changing climate and discussing with them what needs to be done in their specific area. [...]
Q19	§28-34	And coming back to Kenya where do you see Kenya's core vulnerabilities concerning climate change? The biggest issue in this country is one: drought. Long ago... we used to have droughts which lead to famine... like after five years or ten years... actually normally ten years. These droughts have been now coming... in the beginning it was after seven years, then it came back every five years, then in the last 20 years a drought every four years, the last ten years a drought every three years, now every two years. Now it shows that it might be repeated every two years. And a serious drought, were animals die and you have to take relive food. So droughts have really caused serious damage to over 80% of Kenyans who rely on... rain fed agriculture... to sustain their livelihoods. In fact there used to be specific times when the rains came, that no longer holds, that's a fact... You'd know if the April rains is not enough you can be sure that the October rains will be enough. These days you don't know which is which. That is how Kenyans are so concerned about droughts. Then there are other areas which have become more prone to floods. When the rain comes and this is all over the nation... and this is a combination you can't say it's climate change alone. Look at Mau, it's not increasing temperatures that are causing it... they have destroyed the forest. So when it rains... where the water used to be held and sank it flows and too much water now goes like the... great Mara river is suffering a lot and we have floods like in Narok every year now. Because people have cut the trees... now when you add that the fact that the rains are flash floods... [...] So you have too much water... too little tree cover. So it's a combination. So we have droughts, floods. So 80% of Kenyans rely on rain fed agriculture and as a result when the crops that we used to grow... cannot grow anymore... [...] Now so what was I saying... [...] All over lower eastern province... in most parts... even high potential areas of the country, people used to wait for rain and there was no rain coming. What has happened in a lot of parts... In some parts the rains have increased, in a very few parts in the highlands, that's the truth! But in the most parts, 80% of this country rains have reduced and seasons have changed! And you realise that in lower eastern province maize is totally endangered as a food crop. Why? Every time you plant maize before it is able to produce the rain goes and it fails. Today... today as we talk! We planted the other day... and the maize's there are no crops... are all dried. Today as we talk! And that has been happening almost in... either on one or both planting seasons we got no produce at all. So you rely on the small food that grows in the upper regions of the country... [...] So we talked about issues of climate change in Kenya, and I started with the drought, I continued with floods and food security. And to me that is a fundamental problem because without food honestly we get disorganised. Whenever there is drought instead of doing development the government is now focusing on relieve. So that to me is a mayor, mayor challenge which in my opinion... when we are trying to adapt to climate change we need to look at! So and then the other challenge has been now organising ourselves to confront the situation. 'Cause when you have droughts, when you have floods when you have food shortages every Kenyan, even the government, everybody is affected. And in that case we must try to organise ourselves! The other problem has been now coordinating efforts towards climate change. 'Cause as much as we have all those situations among others... 'cause... all the mindset are affected... because the kind of education which (...?) our people. Because... the practices of agriculture... [...]

Quotes from IP14

Q5	a §48-51	What aspects of their livelihoods are affected? <ul style="list-style-type: none"> • climate change entrenches poverty • and productivity • it increases poverty levels
	b §35	increase of wildlife-human conflicts as they both struggle for water and pasture → also wild animals graze on people's fields
Q7	§29-30	warming in highlands <ul style="list-style-type: none"> • mosquitoes where formerly there were none → highland malaria
Q9	§37-42	How have agriculturalists responded to these changes? <ul style="list-style-type: none"> • planting of drought tolerant crops • shift from cattle to smaller livestock → sheep and goats • shift from rain fed agriculture → river line migration • which again causes environmental stress in these target areas → drying of riverbeds • boreholes have now to be dug much deeper: 200-250 meters
Q10	§85-85	I have seen that the Kenya Meteorological Department prints weather forecasts in the newspapers, does that information get through to the people? <ul style="list-style-type: none"> • no most farmers – if they can read do not read English newspapers
Q11	§63-69	What are the agriculturalists needs concerning a better adaptation, what is needed to be done to support them? <ol style="list-style-type: none"> 1. They need to understand the change, if they are not aware of the constant change that is going to happen they will not be able to make proper decisions and plan ahead 2. Solutions need to be developed to the acute problems present e.g. soils that are not that fertile anymore and dryer 3. a food support system needs to be implemented food security is at risk
Q12	§77-84	How relevant do you see climate change for farmers compared to other problems such as e.g. land tenure? <ul style="list-style-type: none"> • climate change is extremely relevant, • but until now has not been taken seriously enough • the impact and amount of damage that will be caused by climate change is not thoroughly understood by many people • it is very hard to reach people • there is a serious need for the simplification of the information provided to the farmers • they are not reached by radio • or newspapers
Q13	§55-62	How would you estimate the adaptive capacity of the agricultural producers to the changes? <ul style="list-style-type: none"> • naturally they have been doing trial and error • "It is a natural response not informed by science, that people just do" • generally the capacity to adapt is not there • poverty and powerlessness • they are poor they have less capacity to react • lack of financial resources leaves them with little options • at the same time climate change increases their poverty
Q15	§80-84	<ul style="list-style-type: none"> • the impact and amount of damage that will be caused by climate change is not thoroughly understood by many people • it is very hard to reach people • there is a serious need for the simplification of the information provided to the farmers • they are not reached by radio • or newspapers
Q17	§70-76	You mentioned an increase of human-wildlife conflicts, what can you say with regard to conflicts amongst farmers or farmers and pastoralists? <ul style="list-style-type: none"> • key aspect here is water • many formerly permanent rivers have become seasonal • many upstream-downstream conflicts

		<p>number of destructive conflicts have definitively increased</p> <p>Would you think that the resource scarcity has also led to more cooperation in some cases?</p> <ul style="list-style-type: none"> no, there are definitively more conflicts
--	--	--

Quotes from IP15

Q6	§22-23	<p>And where would you say are the key vulnerabilities in Kenya, where are the central issues that are problematic concerning climate change impacts?</p> <p>Food security! Because... just like in other countries in Africa, 80% of it is supported by... rain fed agriculture. So that's why if you read today's newspapers you realise that the food is skyrocketing, women blame that on global fuel prices but this actually is caused about by deflation. North eastern Province for instance which relies on livestock they have started dying. The Red Cross actually has called right now 8 million people are facing starvation. So basically... the biggest vulnerability for all of us is food.</p>
Q8	§35-36	<p>So would you say there are certain groups which are more affected, more vulnerable than other groups?</p> <p>Sure. It's the pastoralists, they're more vulnerable. Because... they rely on weather to survive. If it is dry then they have a problem... right now there is a lot [meaning too much floods] of rainfall, they have a problem. So those are I believe the most vulnerable. But the agriculturalists... farmers most of them are rain based and small scale. They are most vulnerable because of their way their mean to survive. So generally in the whole country is vulnerable but it depends on the sector.</p>
Q9	§40	<p>[...] And the other most creative one is the government has been trying to... when there is some eminence of drought for instance in those areas they buy the livestock and then they slaughter them... and when they slaughter them that food again goes to them. [...] It is done by the government. The strategy started with Red Cross and now the government is addressing it. And right now it's quite successful because now they don't lose their livestock they get money. So that now when things improve they go and buy more animals. Instead of letting them to die. And that's one of the coping mechanisms. Then most of them... when it becomes so difficult they migrate. And they go to look for jobs and then they make some remittances to... those who live home. But of course this has consequences because it those young and energetic who go. What about the women and children? So those are some of the questions to be answered. But that has been one of the best coping mechanisms. [...] It has an impact on the community.</p>
Q10	§27-28	<p>You mentioned one problem which hinders adaptation is this unclear governance based situation. Are there other issues that hinder adaptation?</p> <p>[...] You know we... require massive transfer of resources, which is not happening. So this increases the vulnerability because even if the government is willing, it doesn't have those kind of recourses. Whereas we know that this relies on the general state of governance and international community. So that is one. The other one is even for these communities themselves, they are poor. So poverty levels again... it's a problem! The other one is priority. The prioritisation of issues whereas they're issues which are more urgent to address at local level... although they are directly related to climate change it's difficult to link them that this is a climate change adaptation. So now... if we are able to link them that now the crisis of water... So why is it now to be addressed.... this is now how we are addressing climate change. Otherwise this has not come clear and that is what we are trying to do.</p>
Q11	§39-40	<p>So what would your suggestions be to help the people on the local level to better cope with the situation, e.g. droughts and reduced rainfall?</p> <p>You know we need serious diversification of their livelihoods. Like now pastoralists... having to rely entirely on livestock. I think there is need to diversity! Number two, [...] some companies even is trying to.... do some kind of insurance for livestock where they insure and if there is loss of livelihoods they are compensated. [...]</p>
Q12	§29-30	<p>Generally how important is climate change for Kenya in relation to other problems such as the IDPs or land issues?</p> <p>Climate change being an environmental issue you know is not... as let's say sensational. Like let's say political issues, the Hague... the international criminal court. So it... occurs and it is subdued it is taken to the back (...?). So that is the problem we are actually seeing. So we are trying to see how we can ensure that it gains such status as now the Hague issue. Because... when we came from Cancun the other day at national level we normally like to report back. Then we organised a press conference to tell people this is what happened in Cancun and our government should have done this. So that day is when Moreno Ocampo, the prosecutor if the international criminal court, released the names... so now what happened... the whole of media flooded so from page 1 to everywhere it was now focused on that. So do you know what happened? Not even a single mention of the press conference so that's what I am telling you, you can see now the priority.</p>
Q13	§24-25	<p>And how would you assess Kenya's preparedness to adapt to the changes?</p> <p>[...] Preparedness, politically. Were we have a very, very difficult scenario in terms of political structure. Were we have the pulling... the coalition government which does not agree generally on issues. So that becomes a problem. Even if we have a very good strategy on climate change but now it is in paper. To implement it has become a problem, because we have one part in the coalition saying this, the other saying this so they are lacks in coalition and coordination. Though... they are actually, to give credit where it is deserved, there is some effort now to try to see how this can be coordinated. We had a meeting recently where we agreed to establish a.... we need to have NCC, National Climate Change Activity Coordinating Committee, which is going to be coordinating overall all those issues. So we looked at all those problems in between. So there is... I think now because of... what the civil society has been pushing there is a lot of consensus(?) and the link between climate change and what is happening at national level which never used to be there. So everybody agrees that these are some of the impacts which we have been talking about on climate change.</p>
Q14	§41-42	<p>So do you think that Kenya would be able to deal with these impacts on its own or is external help needed?</p> <p>Help has always been called for. And that's why at international level we tell them that "Yes we would like to be part of the solution to climate change but you should to understand that our level of capacity is quite low." We require massive resources for this adaptation. So that's why we need to look at that and say "Yes we need to do that!"</p>
Q15	§31-34	<p>So would you say that generally the awareness is fairly high in Kenya?</p> <p>It's rising. It's rising. It's not very high, but is rising. And we are trying to intensify it as much as possible.</p> <p>And do you see a big difference of awareness between the awareness of people in Nairobi and the rural areas?</p> <p>That is picking up.</p>
Q17	§38	<p>Yes, there has been reported some conflicts over, for instance in some areas where pastoralist come and bring all their animals in the water points. And these are water points which are owned by farming communities. So there have been even conflicts were there has been loss of lives!</p>

Quotes from IP16

Q8	a §11	<p>[...] Now one of the things that we have seen in those two areas is this overreliance: They depend too much on cattle, the cattle is their main livestock. And when we do further analysis we have seen a situation where there are more losses on cattle than on other stocks, compared to camels, compared to sheep and goats. The losses are higher! And also given the... biological nature of cattle, they require a lot of pasture, they also require water more frequently and all that. That when we have a drought they are the first stock to be affected when others are still fine. Yet, that is where people have put their assets into, cattle is their main asset. [...]</p>
	b §20-21	<p>So you mentioned that they are especially vulnerable because they depend on their livestock and the livestock depends on pasture, what other factors make them vulnerable, more vulnerable than other areas?</p> <p>[...] compared to the rest of Kenya they have been least developed, they have been neglected by the central government for many years. Again... also because of security. The two areas, the strip around northern Kenya and north eastern Kenya is bordering Sudan, bordering Ethiopia and Uganda and Somalia. So insecurity has been a major, major issue in those two areas. And one has it has to do with the livestock raids, what we call cattle rustling, it's very common. [...] Conflict is a major thing that is pushing away any development, investment efforts in those areas. That is why that they don't get people to invest (...?) resources. They are very vast, huge, huge tracks of land, very big! That to move from one area to another you're to take more than 12 hours or so. And no roads, the roads are terrible! So I would say a system of marginalisation by the central government. The government has not put enough resources into developing those areas. So they are still poor because of that. That people only depend on livestock because other options are limited. Like they have Lake Turkana, a major lake, the second largest lake in Kenya with a lot of fish! But they can't do fishing, simply because the market infrastructure in terms of roads and all that is not there. So conflict is a major one, the issues of marginalisation by the central government and other major problems.</p>

Q9	§11	[...] diversify their productions systems. Because things have changed, the climate is changing so you can't maintain the same number of cattle that they used to keep many, many years back. At the same time try to check if they could start moving to the smaller stocks, like sheep and goats 'cause they are more drought resistant. Again try to assist them to adapt to climate change in very simple ways but which make a lot of economic sense. Because if you keep your cattle and there is a major drought you lose quite a lot. But if you can transform part of that into small stocks like sheep and goats than they are able to... at least survive through the drought period... Then there is the huge component of water, 'cause again when you talk... about droughts one of the best ways of mitigation the impacts of drought is to enhance water harvesting, surface runoff as well as try to tap ground water. So we have done a lot of work around water, because water is a major, major issue in these two regions. That people whenever there is drought it starts with a lack of water for people and also for livestock. So those are the things that we are dealing with mainly under climate change adaptation.
Q10	a §15	You can't [overthrow their whole culture], yea you can't! Today we have started a destocking process in form of slaughtering the livestock and you... distribute that as relive food, of course pay cash to the owners of the livestock. But again we have also commissioned a... research that will be looking to why pastoral communities are reluctant to do destocking. We want to understand, of course we know it is a lot of cultural issues, but we also want to engage in a deeper way. To understand why it is that when we talk about destocking they don't want to do that and they wait to when it's too late into the drought that they are taking very weak animals to the market and most of them they don't sell. In other cases we lose the livestock and the keeper. So we are trying to understand why is it that there is this resistance to destocking. If they know, and the information is there. [...]
	b §23	[...] But now in the recent past you see something like this. That the impact is not that high in terms of deaths of people, but they are too frequent that... they have eroded people's coping systems that they don't have enough time to recover. The recovery period is not there! So we have cases of droughts occurring back to back. That there is a drought, after one year another. So even by the time before you start your livelihood sources start recovering another one hits. So a number of them but with the accumulated impact that you don't have time to get your livestock to start going back to... a healthy status and start producing. So here it's a case of where the assets are facing shocks all through and this is a major, major cause of erosion of the coping systems.[...]
Q11	§27-31	We get them to discuss the different options that are available to them. So we get them to understand the situation and then discuss solutions that can be done to deal with this. And the most of them are mainly adaptation issues, what can you do? The frequency is there, the recovery period is not there. What can you do? What can you do to your livestock system to assure that you don't get hit every now and then? And then the other thing is try to diversify, it's a major one for us... that we are trying to get people to do small business, to check how they can commercialise their livestock production systems. Also to look for opportunities of (...) natural resources in the areas. To do small, small things that can be put in the market and get something. In some areas we try to get them to encourage them to do small scale farming, irrigation, if they're closer to rivers as a way of adapting to the changing climate. Near the lake we are advising them to some bit of fishing.[...] What would your suggestions be to improve the adaptive capacity of people if you look at the national level? I think at the national level we need to put in place policy frameworks. That I can get a partner to act under climate change, that they have concrete measures on climate change and that they can put in place concrete programmes on climate change adaptation, that they have to assist people to adapt. Because the problem is... climate change in happening in areas where people have the lowest adaptive capacity. So we have tried to get the policymakers to understand that. Even at the climate change hearings we do that in conjunction with government officials and other policymakers for them to appreciate, to know what is happening and also to assure that policies that we formulate take into consideration climate change issues. Of course now we are also focusing on those climate specific policies and legislations, again to get... the government to do their part in assisting people to adapt to climate change. But also... to get people to do their part! Because again we can't blame the government, people are also contributing to what is happening to the problems down there. Of course there is some global work, we are also working around major, major campaigns on climate change around UNFCCC. So try to get each actor to do their part, while at the same time try to address some of these other issues like infrastructure.
Q15	§16-19	How great would you assess is the awareness within these pastoral groups that you are working in concerning climate change? Very low! That is why we are conducting these climate change hearings. You know in the areas where we are doing programming now we make sure that we have a climate change hearing, that we pass that information to people. And again give them the information that things will not change in times soon. In some cases they are going to get worse! So the best thing you can do now is start tuning your production systems to the direction of the changing climate. Once you informed these groups through the climate hearings do you have the impression that people understand or does it take more...? No, I think for them to understand is very easy, because they have seen it happen. It's only that some can't tell why it is happening the way it is.
Q18	§33	[...] think the government has not done enough. Of course the whole discourse around climate change is a bit new. The government is very serious on climate change now. We have worked with them on a number of things, that's an indication that they are very serious on the whole thing. But these areas, northern and north eastern Kenya they are more... desert like environments, very arid so the context is very bad already. So the climate change comes in to make it even worse [...]

Quotes from IP17

Q8	§32-33	Going back to the local level, how do the changes in climate and the ecological systems impact the well-being of the people, how does that impact their everyday life? It's... our people are... poverty is pervasive! So already that's a serious underlying factor. Secondly, the livelihoods are dependent on rain fed agriculture. So if you have a change in that you are in serious trouble! And because... they don't have the capacity to do anything else, their basic source of livelihood is agriculture. If that's interfered with they can't be able to go to the markets to get the other basic commodities. So the poverty which is there is being aggravated now by climate change issues. And they may not know that it is climate change, but they really do feel it. People used to survive on almost wild fruits, a lot of vegetables, you'd just walk behind your house and get something. It's not happening anymore...
Q9	§36-39	And how do people cope with the impacts they are facing at the moment... what are coping strategies that people have developed? There is a lot of remittances... So you have a son working in Nairobi. He keeps on funding everything actually. So that's one way. The other way is to just... it's hard living. They still have one cow or two and still have vegetables here and there. Very basic kind of life. But a lot of remittances are coming in. So you would say that's a very central point? It's a very central point. And it's not just from abroad, but from urban areas. Cities, anybody who has a job has to support somebody else. So that's... probably the only coping strategy at the moment. [...]
Q10	a §28-31	People have been able to deal with droughts for a long time, they have had coping strategies to deal with these problems. Why is there need for further adaptation now, why do these traditional coping strategies to deal with extreme weather not work anymore? For several reasons. One, the traditional society was very structured, very dictatorial and you had to do things according to the norms. So people were supposed to do stuff, you were supposed to store food you were supposed to do all sorts of things. There was always a reserve. So the coping strategies in those days were strictly monitored by the community. Currently we have individualism. Everybody is an individual. And then the rights issue, you have a right to do whatever you wish to do. So there's no collective responsibility as far as food issues are concerned. So that's one issue. The other thing is the land tenure system. It was a communal thing. You would move from one area to the other without any problems, because the land was shared. Migration now is not an option. Because people have the title deeds, you can't move to another place. And then the intensity of the droughts is also kind of increasing. In the area we are working at we have sometimes five years of consecutive drought. Five years without rain, that would test anybody! And education has also changed, the way we perceive things, or what we eat... I think those are some of the issues that have been influencing this. The traditional ways are now being... The way we used to preserve meat for instance, we'd dry the meat in the sun or we'd smoke it. Now people buy meat and put in the fridge and that doesn't last too long. But dried meat would last a very long time. So you would say there is some kind of erosion of traditional systems? Seriously. They can't survive now because... the society is changing. You know, the African family was very structured. The father says this and everybody has to do it. And like if you had a polygamous group he has his own house and surrounded by all his wives, but he still controls everything. So there would be a granary, storage for the whole and each house would have their own storage and everybody eats in the same place. And then the conservation issues... how do you make sure that you still have water even if it's not raining. You can't cut trees indiscriminately there are all sanctions about everything and taboos. [...]
	b §49-50	What are people lacking to better adapt at the moment? What are people's needs to better come with the situation? The main problem is resources! The resources to adapt. Poverty has eroded people's capacity so much... so if you are to ask me... we have a lot of NGOs who are working in these communities. We have Kenya Red Cross for example, they are changing their focus from being humanitarian relief staff to now getting into development a little. We need to have that shift from food aid to development! And it

		<p>should be structures development, it should be development with the people. We have a lot of projects going into communities, to give, not to nurture. You need to strengthen their own systems! So participatory action research would be really ideal! But we need to go there not with our own ideas but use their ideas! This is very difficult. Because if I am writing a project proposal for funding, I don't have any money. So for me going into the community and start asking about what their problem is would not be possible. So I end up thinking of what their problem is and then doing a proposal. But I need to make it loose enough to be able to get some funding from them... But since they don't have resources and there're people who have resources, we have to link those two! And if we can do that and... the government of Kenya now has a lot devolution of finances, the CDF... Constituency Development fund, they have the local authorities funds, so those funds are now there. We need to empower the communities to be able to ask for these funds. Yes! And the biggest thing that we need to beat is corruption. That is what is messing everybody up. Because I'd go into the community, form groups but have my own interest. I would use the groups, ask for funding and disappear with the money! It doesn't help much! Corruption is a big problem for us!</p>
Q11	a §39-41	<p>[...] Because the problem is with colonialism we moved from our traditional crops to high breed kinds of crops, maize in particular. And maize... demands a lot of water. So that has really messed up a lot of families. And the pride in having maize, if you don't plant maize then you must be very poor or something. Everybody wants to plant maize! Very few people are looking at those drought resistant crops. The other issue is at the moment the market for those drought resistant crops is not there. You may get a lot of it then what do you do with it? It's too much for your own families and there's no market to sell it at. So... depending on those drought resistant crops is also not a very effective option. They are trying to bring them back. But some of the crops that we're bringing back, traditional indigenous crops that are coming back are also water demanding. So this Kenyan Agricultural Research Institute is doing a lot of work on drought resistant, drought escaping... But the problem is getting the seeds. And the awareness is not there. They don't know about these things and it's expensive to get the seeds. They still end up planning maize, maize, maize. Now there is also another bad problem: The land is overused. The productivity of the land has gone down. Since you don't have enough space you keep using the same land. [...]</p> <p>Would you say that if the image of these traditional crops was improved that would be a feasible adaptation strategy?</p> <p>I think what needs to be done is to demonstrate that the traditional crops is the way to go. So the improvement of the image. And then doing some pilot projects where you actually give the seed. Let them go ahead and plant their maize but in a portion of their land you plant the traditional crop. And then you improve the whole chain, marketing and all that. You get the produce, they can be able to sell it and then they see they can actually be able to survive on that. If you can show them that, they are fine. Currently they have resources for one crop. And that one crop is maize! And convincing this person not to plant maize and plant sorghum is very difficult. Kenyan breweries I think is doing a good thing. They're looking for sorghum... and they are creating the market for that. But there's still a lot of bureaucracy. And they buy in bulk. So you either have to organise the local farmers into a cooperative society to get enough to sell and to get that contract before they plant which is not very easy. And there is always the interests they want to support one part or something. But if you could have more players like that coming in to the market I think that would work. We had a programme in Makueni the dry land areas, when we went there in 2006 we got a bumper harvest, we got a lot of it! It was very, very good. They timed the planning and they got very, very good harvests. They started having a problem of storage. Then the ones who planted maize, we advised for a particular kind of maize, they got a lot of maize which was good and they also got a lot of sorghum and I think millet. And we had not planned for the market for that. So we had to quickly think of way of getting this out of the way so that it's not lost. So we were lucky when we went in the rains came, not too much but they came in time and it worked so the next season people followed our advice and even this last drought that area didn't have a problem because they already had quite a bit of storage. So it does work but it requires a lot of diversification and the markets. And controlling the markets or getting into the market is very difficult. [...]</p> <p>Often people mention that it is very important to shift from rain fed agriculture to irrigation agriculture and to improve water infrastructure, would you agree to that?</p> <p>Yes. I agree to that. But... you what kind of irrigation? What is the source of your water? That's another problem. Most places don't have rivers passing through. But we can do roof catchments, which we have not been doing. Water harvesting has not been emphasised enough in this place. [...] So roof catchment can be very useful! And that roof catchment can be linked to drip irrigation. Not the normal irrigation. And therefore you need to have high value crops coming out of it. Because you'll also be needing a little of fertiliser coming in with your drip irrigation. So it cannot be an extensive farm, for these smallholders. So that is one way to go. And we tried this with the dry land areas, we build sand dams. [...] So we build sand dams and around the sand dams we put pumps, so shallow wells. These pumps are connected to drip irrigation systems. And we are also looking at cattle. If you have one cow or whatever using their wastes and then just doing small vegetables, they are doing well. And then the sand dams are really helpful... [...] A sand dam is a very interesting structure. You kind of build a barrier on the path of a river. Not a huge thing, just a tiny little thing. So the river flows down, coming with sand... so long as it's not high enough the water will stay before the barrier and it keeps on piling the sand. So if it rains longer... you start having the river backing up from a long distance. [...] But as it is flowing over it's only the water that flows, the sand is... that sand will eventually move back. Now, when the river... even if it stopped raining and the river flow stops. The water will be inside the sand, so you reduce evaporation drastically! So it's withheld within the sand. Now the next thing that you do is at the other side of the valley you can put a pipe which now can be... you can have a pump which is withdrawing from the water which is held back. If it's very big it can stay one year or two years. [...] You just use concrete.</p>
	b §51-57	<p>Oh, this is... a very interesting project! That I am involved in and have been called names, "We are running away from research!" What we were doing in those projects was taking the final products. We have the Kenya MET, Peter Ambenje group coming out with their seasonal forecast. Then we get the traditional people telling us what they think is going to happen. So we'd have two forecasts, independently developed. Then we sit together and work on consensus. You can imagine people with M.Sc.s and PhDs sitting with guys who have never gone to class. But it is a facilitated consensus we are talking about. So if Peter says "It's going to rain in this part of the region from this part, in this time!" then he has to explain to us in very clear terms why he thinks that's the case. Then the old people, the traditional people would also say "No, it's not going to rain!" they say why they say it's not going to rain. So back and forth and argue and talk and then we agree that this is what is happening. So it's a meeting of minds, consensus development. But first of all we had to demystify both sides. The traditional, indigenous people didn't have faith in science. The science obviously don't have faith in these things, they say they are using voodooism to help these things. To bring them together to one table, we had to do a lot of talking and stuff. So we even went as far as validating the knowledge from the indigenous communities. "What plant are you using?" Then they get a botanist. The botanist looks at the physiology of that plant and links that to moisture in the atmosphere and the behaviour of that. So there is a scientific link between the indicator, which is a plant, and rainfall. They use winds, to get the meteorologists say "This is actually what we do!" If it is blowing from Lake Victoria it's carrying moisture, it's likely to rain. So a meeting of minds, so people started seeing that although these guys go to the forest to make it look... they are actually doing science. So that's what we did and that project got a lot of attention. [...] If not for the indigenous knowledge value, but for the connection to communities. Everybody now wants to be connected to the communities. So we could use their networks, the elder's networks to influence the communities. So long as it is working 'Cause like you said using newspapers and TV is really not reaching these guys. You need to find another way.</p>
Q12	§19-20	<p>With regard to Kenya in general how relevant would you say is climate change for the future development in comparison to other issues which need to be addressed such as land problems or the IDPs, how central is it really?</p> <p>In people minds... in the leader's minds it may not be central, it may not be important. But I think everything they do is impacted upon by climate. Climate change per se does not mean a lot to us. Because we may not even survive for one year, for a month. So looking 20 years into the future is not really what we are on about at the moment. So we are dealing more with variability of climate change, but... I also think that variability is a strong signal to climate change! So what we are seeing... the changes in variability, the extremes being more frequent, the intensity is getting worse and stuff... so that's a look into the future so to speak. So we need to be able to deal with this [variability] to be able to capture that [climate change]. The early warning system has those four components. The last component is that capacity to be able react. If we don't have the capacity deal with the floods today and we are saying that the floods are going to be worse in 20 years, then we are going to be in trouble! So for the Kenyan population the focus is on now, which is variability rather than climate change. But we link that by saying that the signals of variability are signals of climate change. Except when you have (...?) climate change, which is a different issue all together.</p>
Q13	§21-22	<p>And generally speaking how prepared is Kenya for the changing climate?</p> <p>Ah... not a lot. We seem to be having a lot of money, but it's not going to the right places. So the planning, contingency planning is not done very well. If we have droughts like we had... last year... every time we have a drought you hear of a national disaster they declare. So the preparedness is not there! We have very good warning facilities, but due to the uncertainty and the track record... not that we have been wrong... but people have been wrong. People want very specific forecasts so when the Kenya Met says a whole region is going to be dry and then in pockets of it there's rain then start getting these credibility issues coming in. So for the planners they get this information, but they don't want to act on it. Because there are other pressing issues, poverty is a bad, bad problem in this country. So if I can do something else now and hope that that forecast is wrong... I think we are not very well prepared. We are not a contingency planning country yet... [...]</p>
Q15	§23-25	<p>[...] awareness is there especially in the planning... in that level, they are very aware of climate change they're even trying to do policies and mainstream climate change. But the funding for these issues is still lacking, so the action... is still not really... driven by climate change issues. But we are more reactive than proactive. But awareness I think is there. We've had even workshops for members of parliament, ministers and they come and they participate very well. They know what is going on. And talking to the communities they may not know that it is called climate change but they are observing changes. They will talk to you and tell you that "We used to start planting... in the middle of February but now we are planting in the middle of March. Something is happening!" And the indigenous knowledge, people are observing trees and plants. Those trees are disappearing. So something they know is happening... they may not relate that to climate</p>

		change but they know there is something...
Q16	a §14	[...] Some of the methodologies are very unconventional, the people we deal with are people who are not academically gifted so to say. So it's a question of bringing society and science interests together.
	b §16	[...] So it's a question of... we pilot it somewhere if it works then we try to get policy issues out of it and try to involve the government. We have not worked too much with the... development NGOs, 'cause... it's easier to deal with the government for the time being. But eventually we have to link to development NGOs because adaptation is a development issue. If you don't have the funds, the resources, the capacity then you just vanish.
Q19	§60-62	[...] There is too much talk and very little action. And they are looking for money, there is so much money in cc. [...] We have a lot of project proposals being put there, probably being funded, but the link between that to communities, the vulnerable communities, is not here! So there are plans... the government is always doing this, you talk to them... you talk to the PS Minister of environment, Muhammad, he's a brilliant chap, he's very, very good. But I don't know whether those things are being transmitted. We had a problem of cc where does it sit: The Ministry of Environment or the Prime Minister's office... why should we have this problem? [...] Why do we have this problem? Cc is everywhere! Have a coordinating office that has budgets in all those ministries and then get this coordinating office that picks up the key issues and deals with them... But every Ministry should have a cc desk! [...] Yeah! But we're seeing much money there so if it is in your ministry, what does that make you? Does that make that ministry more powerful than other ministries? And that's what Ministers want! They want to be number one in the cabinet. But you don't do anything. And fighting over it here in Nairobi is not going to help somebody who in Turkana, so we need to have officers in Turkana not only here!

Quotes from IP18

Q5	§31	So all this has a social dimension, has an economic dimension, has a well-being dimension and it ultimately impacts. So very quickly, what was just delayed rains... yes... can very quickly turn into... school drop outs. [...] So what looks like just weather can very quickly become a social problem as you move down the line.
Q7	§12	If there are floods... yes? The... problems with... what do you call them... diseases and pests also increased. So we are seeing our development programming being impacted by this new reality. Our humanitarian work was also being impacted by this new reality. And increasingly we also realised that because climate change seemed to be impacting on our very development work and on our very humanitarian work.
Q8	a §11	[...] Farmers having challenges of having to replant, because you can't time the seasons well and even when you plant and the rains come they are too short... and the dry spells are too long. So ultimately you find for a farmer to secure even one harvest they probably have to do two or three plantings, because of the way the rains is behaving. So in many ways we realise that the world changes and the weather and the climate and the seasons that was impacting on the well-being of our communities. [...]
	b §26-31	Have you noticed that within the communities that you are working in different members are differently vulnerable? Yes! Women headed households clearly are affected. Both from an energy perspective but also from a livelihood perspective. Yes. It is more challenging... if weather vulnerability... impacts... requires her to make more investments in terms of agricultural inputs. If she has to buy seeds three times before she secures one yield... In the beginning she's already less well off, she doesn't have the capacity, she doesn't have the resources. Then you have to make her to do that three times. So what will happen is that instead of doing one acre, she will do half an acre the second time. If the rains don't come too well and that crop doesn't come up, in the next round she will do a quarter of an acre. So the less she has the more she then becomes dependant from other... [...] So all this has a social dimension, has an economic dimension, has a well-being dimension and it ultimately impacts. So very quickly, what was just delayed rains... yes... can very quickly turn into... school drop outs. And from school drop outs you'll probably next have kids with substance abuse. Because the young boys will start now looking for to support the mother. And very quickly delinquency kicks in. So what looks like just weather can very quickly become a social problem as you move down the line.
Q11	a §23-25	[...] Because... for you to address the issues you need to have a community wide approach. But the community is so fragmented into small subgroups and you need to provide a forum where they can come together. Building that forum is really the bigger challenge. Because for them to make any meaningful action... and for it to have an impact on the bigger picture... they need to be more than a group of 30 people. By doing a tree planning exercise with one women's group, in one small location that has absolutely no bearing on the vulnerability of the bigger group. So it doesn't make a difference. So if you want to do this you need to do it broader, wider and more inclusive. [...] But if you're really going to adapt and you're going to address the vulnerabilities and that you are going to really build resilience... it is very contextual. ... So our hope is that we will be able to inform that plan from that contextual perspective.
	b §39	For us... at least for us in the Kenya office our position has been climate change and governance are really two sides of the same coin. I believe that part if you're going to respond effectively to climate change then you need to get governance right. Because if you don't... if you don't... for instance a good example: Part of the reason why... Mt. Kenya and the Mau escarpment were affected were governance issues. Some... never related cutting down trees and exercising... forest land... to... major ecological... impacts on the well-being of this nation. Nobody... the body of politics never thought that far, it always saw that immediate need. There are some squatters that need to be resettled, there are some politicians that need to acquire tracks of land here, there is an opportunity to sell these trees. [...] But part of the problem is because for us actually and then that's what the youth have been doing, they've been pursuing saying if we are going to address the issues of environment and climate then the whole question of leadership needs to be addressed. So they actually put it this way... they said... [Long pause] they choose to go green. Where being green is not about trees, it's not just about trees. But it's about being not corrupt. It's about being just. It's about being... not wasting resources. It's about... being green is being cool and it's about all those things that are good. You get me? So being brown is something old, is something corrupt, it's something... wasteful, it's... the opposite of that that they want. So for them going green is actually going good, going just, going fair, going... those things. So that's actually what they are looking into.
Q12	a §11	[...] climate change is an injustice on the life of vulnerable communities, especially in the south and along the equator. They contribute the least... to its happening, yet they suffer the most. And over and above that they are expected to bear the burden of adapting with little or no inputs from whomever. [...] Of course the big climate debate was around emissions. But the villager in the areas that we work in... emission doesn't make sense! It doesn't connect, it doesn't... relate to what they're going through. So part of what we needed to do is to try to find out for them what does climate change mean? What has happened, are there any changes, really? Do they see them and if so what does it mean to their well-being? So it was in that kind of interaction that we realised that in a lot of the areas that we were working in... communities could bear witness... to changes that are taken place – even within their lifetime! Good example a place we were working in one of the areas in Kenya where... we had a climate hearing. And children five years old had never seen... a young boy of five years old had never seen rain! So you can imagine for five years... for a child to grow to five years and they've never seen rain. [...] Farmers having challenges of having to replant, because you can't time the seasons well and even when you plant and the rains come they are too short... and the dry spells are too long. So ultimately you find for a farmer to secure even one harvest they probably have to do two or three plantings, because of the way the rains is behaving. So in many ways we realise that the world changes and the weather and the climate and the seasons that was impacting on the well-being of our communities. [...] So we are seeing our development programming being impacted by this new reality. Our humanitarian work was also being impacted by this new reality. And increasingly we also realised that because climate change seemed to be impacting on our very development work and on our very humanitarian work. [...]
	b §38-39	There are so many issues out there which are on the agenda, which need to be addressed such as the question of IDPs or generally land rights... How relevant would you say is climate change generally for Kenya in relation to these other issues? For us... at least for us in the Kenya office our position has been climate change and governance are really two sides of the same coin. I believe that part if you're going to respond effectively to climate change then you need to get governance right. Because if you don't... if you don't... for instance a good example: Part of the reason why... Mt. Kenya and the Mau escarpment were affected were governance issues. Some... never related cutting down trees and exercising... forest land... to... major ecological... impacts on the well-being of this nation. Nobody... the body of politics never thought that far, it always saw that immediate need. There are some squatters that need to be resettled, there are some politicians that need to acquire tracks of land here, there is an opportunity to sell these trees. [...] But part of the problem is because for us actually and then that's what the youth have been doing, they've been pursuing saying if we are going to address the issues of environment and climate then the whole question of leadership needs to be addressed. So they actually put it this way... they said... [Long pause] they choose to go green. Where being green is not about trees, it's not just about trees. But it's about being not corrupt. It's about being just. It's about being... not wasting resources. It's about... being green is being cool and it's about all those things that are good. You get me? So being brown is something old, is something corrupt, it's something... wasteful, it's... the opposite of that that they want. So for them going green is actually going good, going just, going fair, going... those things. So that's actually what they are looking into.
Q13	§32-35	Generally speaking how well prepared are people to adapt to the changes, you mentioned earlier that there have been a lot of coping strategies people were using before during for example drought periods, how well are they prepared at the moment to deal with the impacts? Let me say one thing... [long pause] For communities that have generally as challenges... like pastoralist communities who know their extended dry periods, or their dry spells and that sometimes the weather does change and sometimes the rains don't come as frequently,

		<p>some of those people have been able to find ways. Because basically what they do is to extend the coping... and they understand first and foremost, they appreciate that we need to cope. [long pause] So for them... they has been some challenge they may have to change some styles , like for instance they need to introduce pasture management. So that they can have... the areas that are nearer to the homesteads are left ungrazed so they'll go further afield during... when the grass is good. But as pasture starts dwindling out there they start coming closer here. They put aside some boreholes , yes and allow them to be used. At least... it's more of a management issue for some of them. For those that have been affected by... this. But for communities where... [long pause] they probably don't even know... what is affecting them. They don't even know... why... their yield this year of tea is less than last year. In fact they don't know why their income from tea... this year is lower than last year. They don't know whether it's because the yields were lower, or whether the cost of production was higher... yes... or some other factor. And they don't know if they were lower, why were they lower? Was it because they... cut down on the fertiliser or is it because the rains were not as frequent? These are things that not all of them quite appreciate. So part of the problem is even to get them to appreciate that something has changed, to make them climate aware. That something is changing and some of these things you're seeing changing are not just by the way. There is something deeper and more systemic... yes... so you need to start thinking: Coping! ... And that for me is where the bigger challenge is.</p> <p>So you would say that pastoralist groups, although they live in more difficult areas, generally they are closer to stating to adapt because they are more aware of it?</p> <p>Yes... yes, yes, because coping has been part of their system. It's something they've been doing. But somebody... in a high potential agricultural area... they are not quite sure... what's changing... and whether that change is systemic. They just think the rains this year were bad. They don't realise that the rain has been bad for the last ten years. Do you get me? And it's increasingly worsening... that the variability, that your patterns have been changing so frequently... that you can no longer know... if you say the rains will start on May 15th. Chances are that they'll start on May 15th and instead of raining continuously for the next two weeks they'll start and after two days they'll disappear. Yes. You get me? They don't understand that. So that's part of it. How do you help them appreciate that there is something systemic that is changing so they can even start thinking about coping? That for me is actually the bigger challenge.</p>
Q14	§44	<p>External help will be critical. Yea. Because government hat too many competing priorities. So even if we were not corrupt. Even if we were focused, even if we had climate proofed our programming as a nation. I still think you can not secure this adaptation without significant inputs from outside. And I think it's a moral question. ... by helping... climate vulnerable communities to adapt... yes... and over and above that to take a low carbon development path is only but to our benefit. It buys us time as a globe. Yes. To correct... the many bad things that we are doing. So it's only right, it's only... rational to actually do it. To start negotiating and pretending like you want to go into the debate and discussion is to cheat yourself. Whether you like it or not things are changing [...]</p>
Q15	§36-38	<p>How aware would you say are people generally? I've been following newspapers and there is not a day without news related to climate change, but in the field, at the grassroots, in rural areas... how aware are people of the concept?</p> <p>I think it's not very... [Long pause] to be fair I think some good effort has been done to raise awareness of climate change. But I think... it's still a scratch on the surface. I think for you... to adapt to climate change you need to internalise it. And that takes time. That... that education is something you need to go through over time, before you really assimilate ... realise how significant and therefore what I need to do to adapt to this. And that is actually part of where the big investment needs to be made. Communities need to be taken through a process whereby they see historically this is what has been happening. These are the... the weather indicators in your village, this is what has changed, this is the situation, these are the trends. And we anticipate that in the next ten years this is how it will continue. So looking at... during this period what has changed in your life, how has that affected you... then now they start relating... what has been affecting them and what is the systemic factors that have contributed to that? ... And then from that then generate some options. Because otherwise they will do it just for the sake because the donors come in they have money and they are saying that there is this problem called climate change, but do they really know it's a problem? To what extent do they know it's a problem? That for me seems to be an area that we need to invest quite a lot in getting that work done. Government officials themselves are still sceptical about climate change. You talk to an agricultural officer, they don't understand what climate change is. No, no they will not understand how significant it is to the work that they are doing. They can see some things changing. But to what extent have they internalised this? And yet they are the frontline people to engage with farmers. So, what advice will they give? They will tell you ok, you plant drought resistant crops. Oh. Does that... maybe conservation tillage is more important, maybe that's what you need to advise them to do. So tell them how to plough their land... Why they don't invest their money in just conservation agriculture? Maybe it will be better. I don't know. That's the kind of thing. And it can only come from a climate aware personnel. Not many there...</p>
Q19	§46	<p>[...] As an organized group they'll figure out a response that's appropriate. But so long as that is not there... because remember something... part of what enabled the traditional communities to adapt was because they had this collective setting were they would reflect collectively and decide collectively. And there was some collective wisdom. Nowadays with increasing fragmentation of households, you don't have that collectivity... and no one is investing in the collectivity. People are actually investing in the fragmentation. So there is no sufficient social capital to allow for communities to think as an institution. They think as households... and they act as households. So at what point in time can you cope? Because the reality is that the future will be... affected by serious variability. The only way you can respond to that variability is if you can collectively monitor, engage and respond to that variability. So if the collectivity is not here, who will be doing that collectivity? Is it government?</p>
Q20	§11	<p>[...] So in many ways we realize that the world changes and the weather and the climate and the seasons that was impacting on the wellbeing of our communities. Areas where we'd been supporting drought response and recovery... the cycle has been there. We've always known there is this cycle. But then it started becoming a bit more severe. The droughts would extent for longer periods. It normally used to be a every 2-3 year cycle, it even became shorter. Or sometimes it would rain, heavy floods and then after that it changes. So we realized that our communities are now... challenged to even adapt to what is going on around us. So even in our disaster response... and our recovery activities it was very clear that... cc was impacting on the communities. So our humanitarian efforts were being challenged by this new dynamic, this new variability that was forcing us to think differently and respond differently. So both the humanitarian work and also our... development work was being affected by cc. Because if we are planning a food security program and what we are giving is... agricultural inputs... and then those agricultural inputs are now changing. We need to give them more... times than normal. It means our seed stock has... we have three or four distributions of the same seed. That affects something, tells you something. And then the farmer in terms of harvest, yes the yields are changing. Yes? If there are floods... yes? The... problems with... what do you call them... diseases and pests also increased. So we are seeing our development programming being impacted by this new reality. [...]</p>

Quotes from IP19

Q5	§21	<p>[...] At some point we might not... we had not classified it as climate change into but because that is an area that we are really going into as [name of organization, omitted in this public version] because of the impacts that we've seen from climate change and how it is hampering development work we easily classify that to fall under climate change and even to inform our future programmes and even the programmes that are implemented by the government we look into the best practises of some of the hardware work that we have done at the community... that can be seen... [...]</p>
Q8	a §23	<p>[...] because most of the areas that we work we find are semiarid but again we still have the smallholder farmers and there is the issue of... they mainly rely on rain fed agriculture and of course that with the productivity and the impacts of climate change you find... the yields that they get are smaller... so what the farmer gets is let me call it insignificant [...]</p>
	b §27	<p>As much as we know climate change really affects developing countries. Again if you go further down it affects men and women very differently. And we take women to be one of the groups of people who are mostly affected by climate change. One, you find that most of the women actually rely on... smallholder kind of farming to provide for their families for subsistence farming and maybe do some little bit of business from the farms. So I think... or rather what we see is the situation gets worse year in year out that is why some of the projects that we are doing targets the smallholder farmers and as we know the majority, or 80% of those smallholder farmers are women. So even when we are doing all these projects we have a special focus on working with women and of course... as a group... you find that most of the women for example they are really involved in what we can call the traditional chores. Like fetching water... maybe taking care of a sick person. You know the whole spectrum of... unpaid care work... you know the burden when it comes to traditional chores. And with the issue of climate change this has become harder because the quality of water of course has reduced. You may find a woman taking care of someone and of course they'll need things like... you know clean water when the person is sick. Then the woman has to go long distances to fetch... water. Or even when she's doing her farming she has to go an extra mile to ensure that she's able to get something for her farm. It becomes very difficult because the cycle of drought that we have been experiencing in our country. ... Some time back I think around... the 80s... that you know... we used to experience drought like every ten years. It has gone to 7, to 5, to 2. Now it's every year... there's a period of drought... and famine. Yea... And you see that kind of situation again... it is the woman who takes up most of the burden... you know to look for food, to look after the children... and even when they are moving into different parts because of famine again they are the ones who... are mostly affected. So in my view... when I look at women and climate change and the impact that is has... they bear the most burden. When we look at the situation of floods, because our main... characteristic for... climate change in Kenya is drought and floods. And</p>

		the fluctuation of that. And in areas like for instance like... Wodalangi (?) when... the river bursts its banks and all... you will see it's actually the woman who... who is more concerned about the health of the children, trying to get some food... you know from the camps and all that. So I will say it really... affects women more differently than the men [...] So... I think... they're very much vulnerable. Even when it comes to... planning for these projects that come to the communities. Because... in most of the cases we find that the women are not involved. Maybe they do not have the time because of the work they are supposed to be doing at home. So even when you go for the community meetings, what we call the community borasols (?) for them to plan for the particular area you find that the contribution from women is less. Of course their needs are not really met. And even forgetting the social, cultural context that we operate that even have the women in these kind of forums, for them to be able to articulate their issues and discuss... in a way that is... captured and recognised and accepted is a bit tricky. So the issue of involving women into planning of projects that are aimed to... you know... to have communities to adapt to climate changes... I think it makes them even more vulnerable. And it makes it difficult for us to come up with solutions that look at the different groups that are... in the society.
	c §57	[...] I think... already what I say when we are looking at climate change and its impacts and I was giving the example of sanitation of water... and the role the women play in the provision of water in their homes and going for distances of course it also... also affects their health. They deteriorate, physically. [...]
Q11	a §23-25	[...] they will not have anything to water their crops... So we to earth pans... sand dams and rock catchment that is now mainly trying to enforce... water storage, improving water storage as a way of adapting to climate change. [...] So that are examples of the hard core activities that we do. And then we have promotion of drought resistant crops were we work of course together with research institutions to come up with the drought resistant crops or... drought escaping you know kind of crops and we encourage the farmers to take them up because of the change of climate. And then agro forestry of course you know mixing... and all that. So for us that's some of the projects that we have done with the communities.
	b §50	[...] So yes, sustainable agriculture is actually for us... it's the way to go... if we... talk of the food crisis, the climate crisis and all that. Actually championing for non conventional methods of agriculture, putting more emphasis on using traditional crops... yea... and from the traditional crops trying to develop drought resistant crops instead of using the genetically modified kind...
Q12	§45-50	Generally how important do you think is climate change and the vulnerability of women in the country in comparison to other issues such as violence within their homes or the issue that women are not that likely to own their own land... how relevant is climate change for these women? Well I don't think climate change has really taken prominence... in our country as an issue at the moment. Ha. Kenya is very political right now we are talking of... the new constitution, the commissions that are being set up and... the ICC. So things like climate change are somewhat taking a back seat and they usually come into the limelight towards... maybe COP... or something major has happened maybe a major drought or floods. So it as subject it is not given so much weight. Yea. And further again... the gender issues within climate again is not being given... a lot of prominence. Yea. I would say... in terms of importance not so much... as I would want it to see... yea... not so much... So you would say it is more important than it is being looked at? Yea. But the good thing right now at least we have a national strategy on climate change mitigation and adaptation which was noted there in 2009 in by the government of course it still needs to be worked on especially on gender issues and informing the various projects that they are proposing. Yea. For them to be analysed from a gender perspective. But that's a step at least now we have that strategy and then there is... how do we call it... there is CAADEP (?), its Comprehensive Africa Cultural Development Programme, which I think for Kenya that's also a centre stage when it comes to tackling climate change. Because when we look at pillar one of CAADEP it looks at sustainable environment and here the talk of mobilising resources for... climate change adaption and having a framework in place. When we look at... the African Union and their idea of climate change adaption I can also link it to CAADEP. So I think for Kenya that is also an area that... is given prominence when it comes to agriculture and when it comes to climate change. Ensuring that there's a framework in place for the distribution of these resources. And when we are talking of sustainable agriculture for us we look at smallholder farmers as a way of providing solutions to... [...] Because we talk of a major challenge when it comes to climate change is the issue of resources. Where do we then the resources and then there is the issue of how are these resources... utilised how we are going to make sure the impact of resources... yea... so we will need to look into these strategies that we already have in place instead of reinventing new things... and find ways of strengthening them. [...]
Q15	§29-30	We see a difference between men and women. I would say there's one of the programmes that is being done... run by the Meteorological Department in terms of sending information to farmers so they can plan for their farming. And they usually have these meetings again... at the community. But we find that mainly we have representation of men, but not of women. But when you also talk to the women it's... it is... they're supposed to be doing something else... you know. Because such congregation is seen to be mainly for men... yea... so they get the information late. So there it's that access to information. And... not even looking at that in terms of information, look at it in terms of... when they are promoting new technologies for climate change adoptions. That information also only gets them... very late. So in my opinion or even from the work that we do we see we still need a lot of training, capacity building and awareness amongst the women in terms of climate change and... how they can upscale what they're doing... they're doing currently [...]

Thesis Declaration

I hereby declare, that I have completed this Master's Thesis, entitled 'Stakeholder Perspectives on Livelihood, Vulnerability and Adaptation to Climate Change in Kenya' independently, on my own, employing only the sources and aids specified and cited in the paper. I have identified and acknowledged all words and ideas taken from other work. The submitted electronic copy is identical in form and content to the written version of the thesis.

I further declare that I have not previously submitted this work or any version of it for academic credit, nor has it been published.

I hereby declare that I do not consent to this thesis, or any part of it, being published, reproduced or distributed, in printed copy or electronic form by the University of Hamburg or any other entity without my explicit written consent.

Place and Date

Name