CHANGING CLIMATES CHANGING LIVES

ADAPTATION STRATEGIES OF PASTORAL AND AGRO-PASTORAL COMMUNITIES IN ETHIOPIA AND MALI

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EXECUTIVE SUMMARY

More than 1 billion people are currently undernourished, mostly in the developing world (FAO, 2009a). In Africa, more than 218 million people, or around 30 per cent of the total population, are estimated to be suffering from chronic hunger and malnutrition (FAO, 2009b). Given current trends, governments are unlikely to halve the proportion of people who suffer from hunger in Africa by 2015 (MDG 1c). A large proportion of those suffering from hunger and malnutrition depend on agriculture and livestock production for their livelihoods, which makes them vulnerable to the impacts of climate change.

Agriculture and food security are back on the political agenda. Donors are recognising the links between agriculture, food security and climate change. Developing countries face the challenge of investing more in agriculture and ensuring food security for growing populations, securing additional funding to adapt, strengthening the resilience of their food production systems to climate variability and change, whilst also reducing emissions from agriculture. These tasks are particularly challenging in a dryland context such as the Sahel region of West Africa and in the Horn of Africa, where repeated droughts have already severely impacted people's livelihoods.

Pastoral and agro-pastoral people in these regions are considered particularly vulnerable to climate change since their livelihoods depend on resources that are highly sensitive to fluctuations in rainfall. These populations have shown considerable capacity to adapt to climate shifts in the past, but there are concerns whether they will be able to adapt to future changes, let alone continue to cope with already occurring variability and uncertainty. Their ability to adapt will depend on the severity of future climate shocks and stressors, as well as their access to the resources they need to live through lean seasons and 'bad' years.

This report explores the implications of climate change for pastoralists and agro-pastoralists in Ethiopia and Mali. The two case studies are based on fieldwork between May and October 2009 in the Borana zone of Ethiopia and in Gao and Mopti regions of Mali. Both areas have undergone considerable climatic shifts in the recent decades, and climate change projections suggest there will be further significant changes in the future. At the same time, there are multiple pressures that are undermining people's options and ability to respond to these changes in ways that strengthen their livelihoods and well-being.

The focus of the report is local perceptions of changes in climate shocks and stressors. It examines how people respond to these changes, and what constraints they face. Examining local perceptions and responses to change is important because these can help to identify more precisely what support people require to strengthen their climate resilience. It will also help identify specific constraints that different actors and groups face, and also uncover a more holistic understanding of adaptation in relation to particular socio-economic, political or historical contexts. Drawing on local perceptions, policy makers will be better informed of the impacts of climate change as they are felt on the ground, the challenges and opportunities that people face in adjusting their livelihoods, and what further assistance should be provided.

FINDINGS

The report addresses three key questions:

FIRST, WHAT ARE LOCAL PERCEPTIONS OF SHOCKS AND STRESSORS, NOT JUST CLIMATE VARIABILITY?

The perception of pastoralists and agro-pastoralists

in the case studies in Ethiopia and Mali tallies with similar studies of local perceptions carried out elsewhere, which have found that there is a trend of declining and more variable rainfall. Respondents in Ethiopia and Mali perceive a change in the type and severity of shocks and stressors and tell of the emergence of new risks, which are explained as having a negative impact on people's assets such as livestock and farmland. However, there is considerable social variation concerning the impacts of climate change, as well as people's ability to adjust their livelihoods. Climate stressors and shocks are nothing new in these contexts and pastoral and agro-pastoral systems exhibit important features that make them well suited to climate uncertainty and variability, including the qualities of being adaptable and flexible. The local perceptions expressed by pastoralists and agro-pastoralists suggest that people are becoming more vulnerable.

SECOND, TO WHAT EXTENT ARE PEOPLE ABLE TO RESPOND TO CHANGES AND WHAT IS THE IMPACT OF THEIR COPING AND ADAPTATION STRATEGIES?

Pastoralists and agro-pastoralists in Ethiopia and Mali cope in a variety of ways with a changing climate. Adjustments they make in their livelihoods include selling charcoal, migrating to find work, cultivating alternative crops, or saving up seeds and cereals as a buffer against future shocks. Some responses lock households into patterns of depleting assets and lead to greater pressure on natural resources, with knock-on effects on people's options to adapt over the long term. Still, other responses open up new opportunities, make households more resilient to shocks and stressors and may help empower marginalised groups.

In general, those poorest households in the case study villages are not only those most acutely affected by climate change and other shocks and stressors but also the ones with the fewest opportunities to strengthen their resilience and build their assets as a buffer against further climate changes. Pastoralists and agro-pastoralists in Ethiopia and Mali must manage multiple pressures. Whether they are able to respond well to climate change depends on a host of non-climatic factors such as conflicts, lack of access to markets, volatile food prices and restrictions on mobility and access to key resources. These pressures compromise responses to climate changes – both 'normal' variation and shocks as well as new variability and increased uncertainty. Although it may seem obvious, adjustments to climate change do not always happen in otherwise peaceful and stable settings. 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. Furthermore, not only will people's adaptive capacities need to be increased, but their ability to cope also needs strengthening as well – that is, their responsiveness in adjusting their livelihoods flexibly to sudden and unforeseen changes.

THIRD, WHAT SUPPORT – IN TERMS OF INSTITUTIONS AND SOCIAL TIES – CAN PEOPLE DRAW ON?

Local institutions play a key role in determining what options households have to cope and adapt. These institutions are changing and so is people's ability to access them to their advantage, in other words to make their livelihoods more climate resilient. The poorest people often do not benefit from support available through traditional structures, such as gifts of livestock and food. The support that is available is often meagre. A related point is that there are few vertical linkages, such as those that bind local elites with those who are less well-off – ties that can help to lift people out of a state of chronic vulnerability. In addition, many traditional institutions are biased against women. Institutional and cultural changes have, in some cases, given more opportunities to women, including local women's associations providing increased access to credit and markets. It is also the case that social and environmental changes mean that many young people no longer see a future in their home vil-

lages and decide to migrate seasonally or permanently in search of alternative livelihoods. The most vulnerable people – women, children and the elderly – are left behind. External aid and support given by the state has not been able to make up for the loss of support from informal social support networks.

RECOMMENDATIONS

This report identifies recommendations for different stakeholders and their efforts to promote food security and climate-resilient livelihoods. They are relevant for existing programmes, but also for programmes under new and additional funding that becomes available for the implementation of adaptation under a global post-2012 climate change agreement.

IN COLLABORATION WITH OTHER STAKEHOLDERS, NGOS SHOULD:

- **Ensure that people's local knowledge of climate change impacts and livelihood responses is connected to relevant decision-making processes,** so that policies and programmes are grounded in local realities and facilitate access to resources and households' ability to tackle climate variability.
- **Advocate for greater political commitments and financial support for adaptation from governments and donors,** while providing insights into the local politics and social changes that affect patterns of vulnerability seen on the ground.
- **Tailor programmes and support for basic services** to the diversity of needs that are created in the face of climate change and other shocks and stressors, based on assessments of changes in markets, government policies, support structures and the environment.
- **Document and communicate new and innovative livelihood response strategies to climate shocks and stressors.** Identify success stories and lessons learnt, and analyse how people take advantage of opportunities that arise from adjustments in production systems and economies, exploring the requirements for leveraging innovations.

NATIONAL GOVERNMENTS SHOULD:

- **Improve policy coherence, coordination, synergy and sectoral integration between national development goals, and diverse adaptation needs, incorporating climate risk across sectors. Ensure that food security is a high political priority with sufficient budget in the sectors relevant to climate change adaptation.**
  - Match the objectives and goals of development strategies and policies with what is required to strengthen adaptive capacities, access to resources and livelihood assets, resilience and flexibility of different social groups in adjusting to changes in seasonal patterns and long-term climatic changes.
  - Use tools to evaluate what 'climate resilience' means in practice to ensure food security, such as the framework by Twigg (2007, see Annex V).
- **Improve linkages and communication flows between early warning departments, food security agencies and safety net programmes** to ensure timely assistance, protection of assets and flexibility to adapt to future change to expand the size of transfers per capita if conditions deteriorate.
- **Strengthen existing local adaptive capacities and strategies through a range of social and political interventions, ensuring participation of communities in policy development and implementation.**
  - Extend social protection to vulnerable groups taking seasonality into account in planning and provide hunger safety nets at critical times of year (eg cash or food transfers).
  - Reform policies to safeguard and promote the rights and interests of marginalised populations such as pastoralists and agro-pastoralists, given that adaptation is, to a large extent, a political and social issue. Adaptive capacities relate to political and economic contexts as much as they do to changes in agricultural practices and resource management strategies. Factors such as wealth and gender are key to deciding who can access resources, such as land and water, and take advantage of new opportunities. Thus,

improved access to seeds and other new technologies may not improve resilience unless structural constraints such as labour shortages or gender-based hindrances are addressed at the same time.

DONORS SHOULD:

- **Support governments to base development planning and policies on climate risk information and analyses in order to:**
  - better understand socio-economic and political factors, local realities, access to institutions and why some people in a particular context are vulnerable, and less able to adjust their livelihoods, while other actors and groups are more resilient
  - identify other ways of strengthening people's climate resilience, such as through social protection measures and other forms of livelihood support and asset-building
  - build on communities' existing and innovative adaptation strategies and processes, rather than treat people as recipients of knowledge, technology and related support
- **Support governments with longer term, predictable funding arrangements** to ensure adaptation and food security, taking into account local dynamics as well as national-level and sector-level changes.
  - Fund NAPAs as a transition step towards the sustainable implementation and integration of adaptation activities into national development planning, sectoral policies and strategies.
  - Incorporate contingency plans and budgets into projects and support flexibility in aid responses to climate shocks. Contingency funds allow actors at sub-national levels to respond in more predictable ways to impending shocks and stressors.

ACADEMIA AND RESEARCHERS SHOULD:

- **Provide critical analysis of local perceptions** of climate variability and change by contextualising them in deeper historical and wider structural settings.
- **Work with communities and NGOs to develop more robust research methods** to explore local knowledge and perceptions and develop baselines to evaluate future shifts in them.
- **Use more rigorous methodological approaches, longitudinal research and systematic reviews** on local knowledge and perceptions to make the evidence base even more robust and relevant for policy actors to respond to.

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ACRONYMS AND ABBREVIATIONS

ACF	Action Contre la Faim International Network
DRR	Disaster risk reduction
FAO	United Nations Food and Agriculture Organisation
FEWSNET	Famine Early Warning System Network
FGD	Focus Group Discussion
FSL	Food security and livelihoods
IDS	Institute of Development Studies
IER	Institut d'Economie Rurale (Mali)
IPCC	Intergovernmental Panel on Climate Change
LIU	Livelihoods Integration Unit
MDG	Millennium Development Goals
MoARD	Ministry of Agriculture and Rural Development (MoARD)
NAPA	National Adaptation Programme of Action
NGO	Non-governmental organisation
ODES	Organisation de Développement pour l'Espérance
PRA	Participatory Rural Appraisal
SCN	United Nations Standing Committee on Nutrition
SL	Sustainable livelihoods
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNISDR	United Nations International Strategy for Disaster Reduction
WaSH	Water, sanitation and hygiene

1 BACKGROUND AND OVERVIEW

1.1 INTRODUCTION

More than 1 billion people are currently undernourished, mostly in the developing world (FAO, 2009a). In Africa, more than 218 million people, or around 30 per cent of the total population, are estimated to be suffering from chronic hunger and malnutrition (FAO, 2009b). Given current trends, governments are unlikely to halve the proportion of people who suffer from hunger in Africa by 2015 (MDG 1c). A large number of those suffering from hunger and malnutrition depend on agriculture and livestock production for their livelihoods, which makes them vulnerable to the impacts of climate change. Already, people are adjusting their livelihoods to manage better the increased uncertainties created by climate change. However, people's options and ability to make adjustments that increase their climate resilience are constrained by various social, economic, political and legal factors.

The linkages between climate change and people's livelihoods are numerous. Increased water stress and heightened disease prevalence due to climate change have a direct effect on household food security and nutritional status. Also, climate change has a direct impact on the multiple underlying causes of undernutrition (food security, health, care practices and water and sanitation) (SCN, 2009). It puts increasing pressure on households' asset base. Increasingly unpredictable harvests lead to longer hunger gaps.

This report is about perceptions of change, responses and constraints among pastoralists and agro-pastoralists in selected villages in Ethiopia and Mali. The report is intended to support the work of NGOs, policy makers and researchers to improve coherence in efforts linking climate change with disaster risk reduction (DRR) and food security and livelihoods (FSL).

Linkages between climate change, agriculture and food security are receiving increasing political attention, particularly since the global food crisis in 2008. A recent international call for action to eliminate chronic and transitory hunger was made at the World Food Summit in November 2009, where 180 countries affirmed their commitment to reach the first Millennium Development Goal (MDG 1) and agreed to support smallholders to be resilient and adapt to climate change; countries also committed to reducing emissions. They also agreed to coordinate their efforts through a Global Partnership for Agriculture, Food Security and Nutrition, and to reform the Committee on World Food Security (CF) to unite fragmented approaches and polices. The development of a Work Programme on Agriculture under the UN Framework Convention on Climate Change (UNFCCC) gives some hope for global plans to support small and marginal farmers, including in their adaptation to climate change.

At the national level, developing countries face the challenge of needing to invest more in agriculture and ensure food security for the population, as well as examining how various development interventions and support programmes can help build household-level resilience. Governments must also secure additional funding to adapt and strengthen the resilience to climate change of their food production systems and ecosystems. However, current climate financing for adaptation in developing countries is insufficient. There is a massive shortfall compared to the current estimates of need. Recent analysis highlights that developing countries have received less than ten per cent of the money promised by developed countries to help them adapt to climate change. While adaptation success does not depend on funding alone, the failure so far to secure additional funding

is creating deep mistrust between countries and is seriously undermining the current UNFCCC negotiations on a global climate deal.

Ethiopia and Mali were selected for several reasons. The countries are located in the Sahel and the Greater Horn of Africa, which – in view of past droughts and the uncertainties over rainfall records and their implications for future climate scenarios – are particularly interesting for research on adaptation in the context of drylands. Dryland populations are considered especially vulnerable to climate change due to high rainfall variability and limited natural, financial and institutional resources with which to support adaptation. Nonetheless, research during and after the droughts of the 1970s and 1980s demonstrated a high level of response capacity to climatic shifts, albeit with high individual and social costs. Rainfall records suggest that, after the dry decades of the 1970s and 1980s, parts of these regions have shown signs of a modest rainfall recovery and what is sometimes called a 'regreening' during the 1990s and 2000s (Giannini *et al*, 2008; Nicholson, 2005). The causes and effects of these trends are subject to debate, and trends at the local level may differ from macro-level trends (West *et al*, 2008).

1.2 STUDY FOCUS

This report's focus is on local-level perceptions of change in shocks and stressors, and responses to change.[1] There are huge uncertainties concerning scenarios of future climate change in Africa and problems of aggregation in using models of national and regional changes to predict local-level outcomes. Consequently, governments and NGOs cannot rely on climate science alone to guide their efforts to strengthen adaptation in particular sub-national agro-ecological settings. Local perceptions of change have an important role to play in this regard by filling in gaps in knowledge and evidence and enable the formulation of effective adaptation strategies – at the national, district and sub-district levels. Therefore, examining local perceptions provides important complementary knowledge to climate science. This report examines how people *perceive* changes in climate shocks and stressors, how they *act* to manage these, what the *effects* of their responses are, and what type of support they can draw on in terms of local institutions and social ties.

Focusing on local perceptions of climate change and people's responses in regions of Ethiopia and Mali, this report makes an important contribution to a growing body of work within the literature on climate change on the voices of vulnerable households and social groups. There are currently discussions around the ability of local people to respond effectively to global climate change, and the consequences of their adaptation efforts. Mortimore (2010) contests what he calls a view that poor farmers and pastoralists in drylands are 'too poor' or 'too incompetent' or have 'insufficient resources to adapt' to climate change. This report reinforces Mortimore's stance, demonstrating the range of adaptation strategies that people employ, while simultaneously recognising the role that social status and other factors play in limiting people's ability to adapt.

1.3 CLIMATE CONTEXT

The case study areas lie within the semi-arid areas of the Sahel and Greater Horn of Africa, where tackling rainfall variability is an integral part of people's lives. The areas are characterised by a highly variable climate and by large shifts in rainfall patterns over the last decades, with severe consequences for livelihoods. The droughts and famines during the 1970s and 80s were associated with some of the sharpest declines in rainfall in recorded history (Hulme, 2001).

While there are indications of a partial rainfall recovery over the Sahel and the Greater Horn of Africa in the 1990s and 2000s, there remains uncertainty about these trends and their implications for the future (Held *et al*, 2005). At a country level, Mali and Ethiopia appear to have experienced relatively stable rainfall or a small increase in mean rainfall at the

[1] *Shocks are sudden onset events occurring over a short time frame. Stressors occur over a longer time period, the effects of which may be more subtle. Full definition of terms can be found in Annex II.*

national level since the 1990s. A 'regreening' may also be caused by changes in land management and increased conservation of trees. A widely held view in the 1970s and 1980s was that droughts were caused by local people's mismanagement of resources, which led to land degradation. Research that followed the drought has shown, however, that the droughts were in fact caused by larger-scale atmospheric shifts, not local people. Indeed, Giannini *et al* (2008:125) takes the argument further, arguing that, while the drought was caused by external factors, the recent regreening may be due in part to local-level improvements:

> "*Not only was environmental mismanagement not the cause of drought, but also appropriate land management solutions such as soil water conservation techniques derived from local knowledge can be implemented to the benefit of rural communities even in times of drought.*"

It is still unclear whether the drought of the 1970s and '80s may be attributed in part or completely to global human-induced climate change. Also linked, though in more complex ways, is the future climate outlook. Climate projections for the Sahel and Greater Horn of Africa over the 21st century range from a significant overall decrease in rainfall over the region to a significant increase. A key uncertainty, especially for Ethiopian rainfall, is in the role of the Indian Ocean sea surface temperatures (SST) in driving rainfall patterns, which in turn relates to detection of a recovery (or not) in rainfall. The absence of a clear rainfall recovery would point to ocean warming being a dominant driver for rainfall, and so to a continued drying over the next decades, while evidence of a recovery of rainfall would point to a wetter future for the Sahel and the Greater Horn of Africa (Giannini *et al*, 2008).

2 FRAMEWORK AND METHODOLOGY

This report builds on fieldwork conducted between May and October 2009 in agro-pastoral and pastoral areas in Borana, southern Ethiopia, and in Gao and Mopti, Mali. It is based on several field visit reports, conducted by AZ Consult (Teshome and Abera, 2009), the Institute of Rural Economy (Cissé and Keita, 2009) and ODES, ACF and IDS researchers. It documents local (household- and community-level) perspectives to inform the policy and practice of governments and development agencies, among others. Perceptions of change in shocks and stressors over the past few years were examined, in addition to the actions, supporting structures and barriers experienced at the local level.

PERCEPTIONS AND ACTIONS

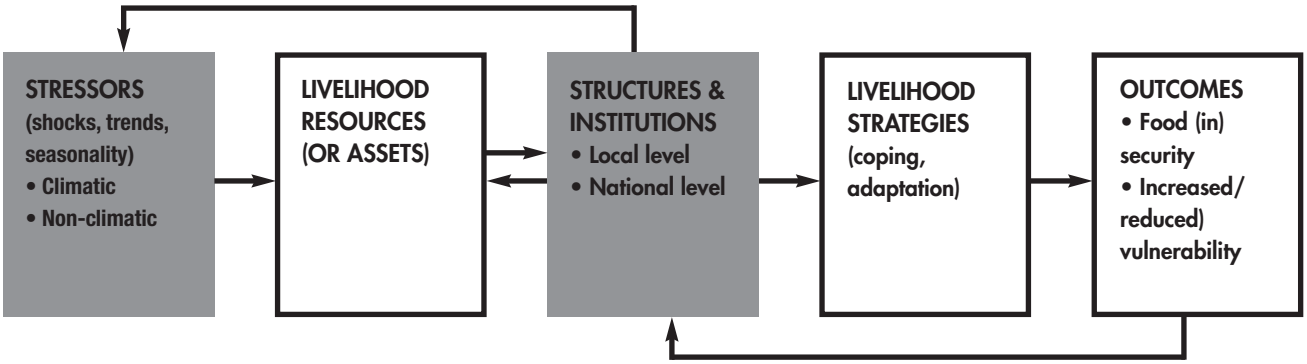
Perceptions of risks and changes in these perceptions were documented in order to say something about the change in relative importance of stressors, and about which changes are important, and why. Climate change poses new and highly uncertain risks, chiefly in terms of changing rainfall. Recent research suggests that rainfall changes at the national level may be perceived differently at local scales (West et al, 2008), either because of local variations or because rainfall records fail to capture key factors such as intensity or timing. Perceptions are affected by factors such as culture, knowledge and access to information. They were mapped using Participatory Rural Appraisal (PRA)-style group discussions and oral testimonies. Data collection exercises did not frame the discussions in terms of climate change and variability, in order to let this theme emerge where it was relevant. In fact, people may attach greater importance to climate if it is mentioned up front (Mertz et al, 2009). Some concessions were also made in the analysis to what Devereux (2006) calls the nostalgia effect'–the tendency for people to remember the past in a better light than the present.

ACTIONS AND EFFECTS

This part addresses how people have acted and continue to adjust their livelihoods in response to shocks and stressors, and why. The research aimed to document people's ingenuity in the face of change, based on past experience. Response actions may be intended or unintended, spontaneous or planned, anticipatory or reactive, technological, legislative, institutional or in most cases a combination of the above. They can be implemented at various levels, from the individual through the household and community to the national level. Some actions taken at different levels may be mutually supportive, whereas others may not. The research attempts to strengthen our understanding of the complex nature of people's responses. It is important to understand trends in vulnerabilities, as well as strategies used to face shocks and stressors. Vulnerabilities to climate and other shocks and stressors may be changing due to internal factors affecting the individual and community, or external factors such as the environment, government policy and economics. These dynamics are vital to understanding how adaptation might be supported through targeted or general efforts.

Climate is not the only driver of change; in many cases, it might not even be the most important one. In formulating their livelihood strategies, households draw on what knowledge and skills they have available on their own, as well as the resources they can access through their networks. This might mean migrating, borrowing food or money from neighbours, or increasing their use of forest resources. All these actions have implications – short- and long-term – for vulnerability to climate change. Do the actions lead them towards more robust livelihoods, or do they erode their assets and leave them more vulnerable to future shocks?

FIGURE 1: **CONCEPTUAL FRAMEWORK**



SUPPORT STRUCTURES

Finally, the research aims to document what kind of support structures – informal and formal – exist for agro-pastoralists and pastoralists at the local level, and, how these are changing. Livelihood strategies are affected by perceptions of shocks and stressors and assets available at the household level. They are also affected by access to community resources, and are therefore typically mediated by networks and institutions.[2]

APPROACH AND FRAMEWORK

A qualitative research approach was taken using semi-structured interviews, informal interviews, oral testimonies and a variety of PRA-based focus group discussions. The analytical framework *(Figure 1, above)* builds on the sustainable livelihoods (SL) framework, putting particular emphasis on access to resources, local strategies and institutions. Shocks and stressors are tackled differently depending on access to resources, which is differentiated socially and affected by internal and external institutions, policies and processes.

[2] *'Networks and institutions' refers to formal or informal structures which households or individuals draw upon when tackling risks or change.*

3 ETHIOPIA CASE STUDY

3.1 INTRODUCTION

Fieldwork was conducted in the Borana[3] zone, a semi-arid area of Oromia Regional State in southern Ethiopia. It is bordered on the south by Kenya, on the west by the Southern Nations, Nationalities and Peoples Regional State (SNNPR), on the north by the Guji zone and on the east by the Somali region. Research was conducted in the Dire and Dhas districts or woreda, which belong respectively to the Southern agro-pastoral livelihood zone and the Borana-Guji cattle pastoral livelihood zone (based on LIU, 2009); refer to Annex I.

The population of Borana zone is 966,467 (CSA, 2008). The four largest ethnic groups are the Oromo (77 per cent), the Gedeo (13 per cent), the Amhara (three per cent), and the Somali (three per cent). The other ethnic groups make up about four per cent of the population (based on Riché et al, 2009). The majority of people are pastoralists or agro-pastoralists, and livestock holdings mostly determine the level of household wealth. The main livestock kept in the area include cattle, sheep, goats and camels. The main agricultural crops are maize, teff, sorghum and haricot beans. It is estimated that more than 50 per cent of income in the zone is derived from the sale of livestock (Demeke, 2006, in Riché et al, 2009). Livestock exports from Borana contribute significantly to national foreign exchange earnings (based on Riché et al, 2009).

The climate in these areas is characterised by a bimodal rainfall pattern, with the main rainy season (long rains or Gana) between March and May, and the short rains (Hagayya) between September and December. Average annual rainfall is between 450mm and 700mm, with substantial variability in time and space between and within areas. Approximately 60 per cent of the rainfall is received during the long rains and 30 per cent during the short rains (Coppock, 1994). Temperatures peak in January, sometimes reaching more than 30 degrees.

Meteorological records suggest a reduction in rainfall since the early 1990s over southern parts of Ethiopia, unlike other areas of Ethiopia where a modest increase in rainfall has been observed (Funk et al, 2008). This could be linked to warming of Indian Ocean SST, which may also have been responsible for the 1984 drought (Funk et al, 2008). There are ongoing scientific debates over whether or not there are signs of a human influence in the observed changes (Hoerling et al, 2006), and also whether global climate models and crop models[4] may underestimate regional drought mechanisms.

3.2 FINDINGS

3.2.1 PERCEPTIONS OF SHOCKS AND STRESSORS

DROUGHTS AND CONFLICT OVER NATURAL RESOURCES

Of all the environmental and socio-economic shocks and stressors people are facing, drought was ranked the most common in agro-pastoral areas, whereas drought and conflict were ranked highest in pastoral areas, as indicated in Table 1, below. This is not surprising as these are age-old concerns that are part of daily life in Borana. People can easily make lists of major droughts over the past 30–40 years, with detailed accounts of the effects and implications. And there has been localised conflict between the Borana and neighbouring clans for decades, originally over grazing and water resources. The table also illustrates the difference between agro-pastoral and pastoral

[3] *Also called Borena.*
[4] *Called Global Circulation Models (GCM).*

TABLE 1. RANKING OF SHOCKS & STRESSORS: COMPARISON OF PASTORAL AND AGRO-PASTORAL AREAS, ETHIOPIA

PASTORAL (SHOCKS)	RANK	AGRO-PASTORAL (SHOCKS)
Conflict	1	Drought
Drought	2	Deforestation
Animal diseases	3	Land degradation
Human disease	4	Animal disease
Bush encroachment	5	Human disease
	6	Conflict
	7	Pest infestation

Source: Focus group discussions 2009, Dire Woreda and Dhas Woreda, Borana zone

areas. Conflict features much higher in the pastoral areas; in many villages, it was the dominant stressor (AZ Consult, 2009). Not surprisingly, many of the stressors for pastoralists relate to their mobility and the availability of pasture, while stressors identified in agro-pastoral areas relate predominantly to settled agriculture.

Some of the stressors are relatively new, such as bush encroachment and new types of pests and diseases (for livestock and flora). Bush encroachment is attributed mainly to a government ban on burning rangelands, and it causes concern among pastoralists about access to pasture.

In terms of trends, there is concern that more stressors now coincide, in comparison with the past. As one person in a Focus Group Discussion (FGD) in Dire Woreda said, *'The shocks [now] come in multiples.'*

The nature of stressors, notably conflicts and droughts, is also changing. Increasingly, conflicts over natural resources have evolved into complex disputes involving land ownership, administrative power and competing territorial claims. Pastoral communities noted that the nature of conflict is changing, with localised disputes occurring more frequently than before, and resulting in increasing loss of life. Struggles over access to water and pasture are central, as illustrated in the following quote:

> **"Previously, conflict was mainly about heroism and raiding of cattle. Now the conflict between Borana and neighbouring clans is about securing pasture and water and also for territorial integrity and power."**
>
> *(Obbo Arero Jateni, 80 years old, Dire Woreda, agro-pastoral area)*

The level of violence involved in these disputes has also reportedly increased over recent years. Despite the many causes of ethnic conflict, drought remains a significant driver, resulting in limited mobility and reduced access to pasture and water. Some people noted that the *Gada* system (traditional rules and norms governing use of natural resources) has been neglected, and that illegal claims are made to grazing areas and water points. They felt that the *Gada* alone was not able to deal with the escalating incidence of conflict.[5]

Rainfall patterns are perceived to have changed over the past decades (see Table 2), particularly in terms of timing and duration. The frequency of drought is viewed as increasing particularly over the past two decades. Some people argued that the changes have become more noticeable since the major famine in 1984; years of 'good rainfall' are seen as a distant memory. A typical response was that while in the past there used to be one drought per *Gada* (eight-year

[5] *The Gada system is explained in detail in Section 3.2.3*

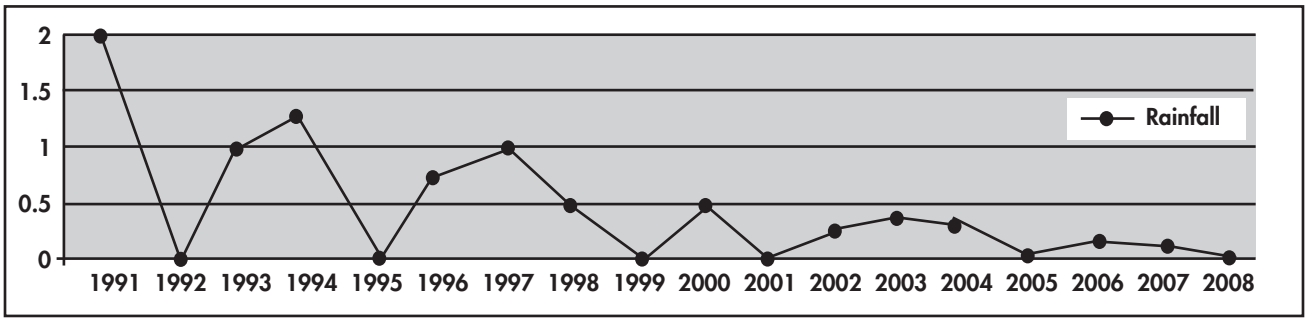
TABLE 2. CHANGES IN SHOCKS & STRESSORS, PASTORAL AND AGRO-PASTORAL AREAS OF ETHIOPIA

	PASTORAL		AGRO-PASTORAL	
	From (10 years ago)	To (today)	From (10 years ago)	To (today)
Climate	• Long rainfall duration (3 months in both Hagaya and Ganna) • High in amount of rainfall per rainfall event • Low temperature during rainy season	• Short rainfall duration (not more than a week) • Very low amount of rainfall per specific rainfall duration • Very high temperature during the rainy season	• Rainfall was high in amount, consistent and stayed for long duration (> 3 months)	• Rainfall is low in amount, variable and staying for short duration (one week)
Environment and agriculture	• Low level of bush encroachment • Forest fire the common practice to get new grass	• Bush encroachment has become very serious • Forest fire is forbidden due to government policy prohibition	• Households cultivate not more than 1ha but get high yields • Long-maturing maize, barley and wheat • Minimal soil moisture loss • Pest infestation did not lead to crop damage • Abundant pasture	• Households cultivate up to 10ha but get very low yields • Early-maturing maize, haricot bean, wheat and teff • Very high soil moisture loss due to temperature increase • Crop pests causing damage from year to year
Social and economic	• Conflict was rare • Milk production per cow was very high • Milking and slaughtering of cattle was more common than sale • The only practice of the household was livestock rearing	• Conflict has become frequent • Milk production per cow very low • Sale of animals more common than milking and slaughtering •They try to adapt crop production practices	• Price of grain, goods and commodities was affordable • Income was high for many households • Better market access	• Price of grain, goods and commodities double more than ten times • Big fluctuations and unpredictable grain market • Decreasing in income, increased poverty • Many have started selling firewood and charcoal • No good cattle market. Brokers have taken over and prices have increased
Organisation/ institutional	• Have no school • Have no vaccination for either humans or animals	• Have primary school • Have vaccination for a few animal and human diseases (especially for children and women)	• Little or no effort to train pastoralists on family health planning • Strong traditional support system	• NGOs (eg CARE) have given training on family health planning • People are not as friendly as before because they do not have any food to help each other

Source: A-Z Consult, 2009

FIGURE 2. TREND LINE FOR PERCEIVED RAINFALL

Note: Community gave scores to the year's rain (Ganna and Hagaya) 2=good; 1=normal/average; 0=poor and resulted in negligible crop production



Source: group discussion at Harallo Kebele (agro-pastoral zone), June 2009

period), droughts are now occurring in six out of every eight years. As indicated in Figure 2 above, people commented that the amount of rainfall has decreased most significantly since the drought of 2001.

Except in more dry years, changes in the seasonality, distribution and regularity of rainfall were more of a concern than the overall amount of rainfall. The main rainy season is also seen as becoming progressively shorter – it now starts later and finishes earlier than it used to – and the rains in general are becoming more unpredictable. Ten years ago, rains would normally start in the middle of September and continue until December. Now, it is more common for rains to start in October and continue for a maximum of one month, sometimes lasting for less than 20 days. As a result, farmers are increasingly unsure of receiving enough rain to justify planting staple food crops. As one person commented:

> **"Over the past Gada, we have lost two months of rain. Now the rain is not coming at the right time: it is starting later and finishing before long. We prepare the land for planting when the short rain starts but then it stops and no more rain comes so we have wasted our time."**
>
> *(FGD participant, Harallo, agro-pastoral area)*

Tome Dheeda, a mother of ten children with ages ranging from five to 25, expressed a similar concern over the change and uncertainty:

> **"During the last Gadas we had good rains. I don't know what tomorrow will bring but all I know is that the rains are changing – it is becoming less and it is falling at the wrong time. Jilo Aga[6] brought drought; at that time drought came once in eight years, it now comes almost every year now. My daughter is now five years old and she has not seen a good harvest yet."**
>
> *(Tome Dheeda, 45 years old, Harallo, agro-pastoral area)*

Another notable change often commented upon is a change in temperature. The following quote sums up a common sentiment: 'Now we have very bright sunshine. The sun seems hotter. We get heat instead of rain.' Changes in climate patterns in turn have clear implications for livelihoods through longer hunger gaps, increasing uncertainty in livelihood activities and the need for agro-pastoral and pastoral households to change their practices.

[6] *1983-1991*

3.2.2 LIVELIHOOD STRATEGIES AND CLIMATE RISKS

THE ROLE OF LIVESTOCK AND OTHER RESOURCES

By tradition, the Borana are pastoralists. The cultural importance of livestock – and cattle in particular – cannot be overstated. Keeping cattle is deeply linked to communities' social structures, values and beliefs, defining power and dependency relationships between cattle owners and non-cattle owners. Pastoralists commonly refer to themselves as 'pastoralists since time immemorial' (A-Z Consult, 2009). Aside from its cultural value, cattle are a main determinant of wealth and are a multiple livelihood asset, simultaneously providing capital (with reproductive potential), energy (traction), food and means of transport. Their economic importance is illustrated in table 3 below, where livestock production is ranked as either the first or second major economic activity of households.

The table illustrates that the majority of households depend on assets and resources that are climate-sensitive. Pastoralism depends on mobility to access pasture and water throughout the year. Agricultural production is predominantly rain-fed; if rain fails, households must find alternative income-generating strategies, and for most this is limited to the sale of natural resources (mainly firewood and charcoal). In years where rains are sufficient, households prioritise crop production and livestock production, but other assets and resources are becoming increasingly important.

Livestock ownership provides the key buffer against hardship. It has played – and continues to play – a major role in tackling climate variability. The table also illustrates the role of other income sources and the increasing diversity in livelihood strategies. Changes have been going on for many years and the reasons for changes are complex. Factors include government policies encouraging sedentary farming over pastoralism, restrictions on movement, as well as climatic factors and other local resource-use factors. Here, we will look in particular at the role of climate-related factors.

LIVELIHOOD TRENDS

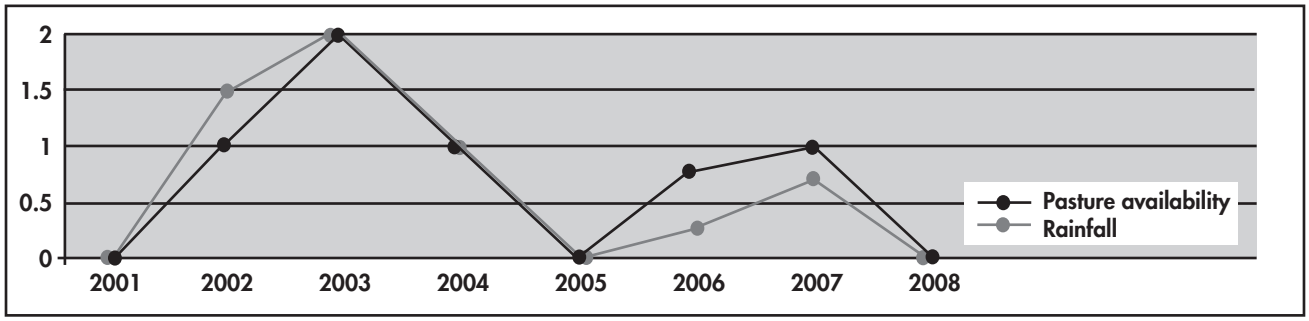
Crop production around homesteads has expanded in response to restrictions imposed on livestock movement. As indicated in Table 4 below, for agro-pastoral

TABLE 3 RANKING OF ECONOMIC ACTIVITIES, AGRO-PASTORAL AND PASTORAL ZONES

ZONE	AGRO-PASTORAL ZONE			PASTORAL ZONE				
Village	Hadha	Dolomekela	Tullowato	Buledi	Dhakawatta	Tesokomora	Tesodirbu	Dusii
Livestock production	1	1	2	2	1	1	1	1
Sale of natural resources*		3		4	2	2	3	
Crop production	2	2	1	1	3	3		2
Casual labour	5			3			2	3
Petty trade	4	4				4		
Mining	3							

** includes firewood, charcoal, incense, gum Arabic. Source: group discussions, June-July 2009*

FIGURE 3 TREND LINE FOR PERCEIVED PASTURE AVAILABILITY AND RAINFALL



Note: Y axis denotes relative pasture availability: 2 = good; 1 = normal: 0 = low.
Source: group discussion at Harallo Kebele (agro-pastoral zone), June 2009

households, the main crops grown include maize, teff, barley, wheat and beans. These will be grown both for consumption and sale, should harvests be sufficient.

Pasture availability and quality is perceived to have declined as a direct result of rainfall changes, as indicated in Figure 3 above.

Traditionally, herds were composed of cattle, but increasingly households are also keeping goats and camels. Households across wealth groups stressed that, as soon as circumstances allow, they prioritise livestock production. For many, the ultimate goal is to build up their herd to such an extent that it is no longer necessary to practise agricultural production. This is explained by a combination of an increasingly unpredictable climate, the labour-intensive nature of agricultural production and negligible returns made from agriculture in recent years. The desire to concentrate on livestock production can also be explained by the cultural importance attached to cattle. According to Borana tradition, livestock holdings are the only individually held property. All other assets are perceived as common property, belonging to the clan (see also Flintan et al, 2008). Livestock ownership is therefore the only way individual households are able to build up savings.

Off-farm activities have become increasingly important over recent years as households seek to diversify their livelihoods, given the increasing constraints on access to high-value fodder and water resources that are necessary for supporting mixed-species herds. Livestock-keeping alone rarely provides for the entirety of a household's food and livelihood needs. Localised clan conflicts have led to restrictions on movements and made access to high-quality local pasture more difficult. Combined with erratic rains which have rendered agricultural production risky, households have become increasingly reliant on the market to cover their food needs.

> **"Even if there is good pasture in one place, especially in places occupied by [people of] Gari ethinicity, movement of livestock to such places is impossible due to conflict. Conflict causes loss of human life and movement restriction for animals to graze in good pasture."**
>
> *(Adde Didi Wario Bojole, 97-year-old woman, Das woreda, Das Kebele, Tesodirbo village)*

Market reliance results in the need to generate cash income, which can only be done through additional activities which are not so vulnerable to climatic uncertainty. Labour sale and migration are important income-generating activities, particularly for poor households; people will sell their labour, either on a daily basis in local towns or on a more long-term basis by migrating to the regional centres of Yabello and

Moyale and further afield to Kenya. The sale of natural resources – predominantly charcoal and firewood, but also sand, stones and grass for cattle feed and incense and gum Arabic in pastoral areas – is another important livelihood activity, mainly for poorer households. Petty trade, incorporating the sale of salt, matches and sugar, is an activity requiring a certain level of capital prior to start-up, so it is mostly associated with middle-income groups. Diversification is a result of distress in customary livelihoods as well as new opportunities through the opening of markets and growth of small towns in arid and semi-arid areas. But households earn only meagre amounts of income from these new non-livestock-based tasks.

ASSETS AND SOCIO-ECONOMIC STATUS

A household's capacity to face shocks and stressors depends to a great extent on its asset base and on its ability to access this asset base at a given moment. Table 4 below outlines typical assets for four different wealth groups.

In pastoral areas, livestock is the chief determinant of wealth: poor and very poor categories are defined first and foremost by having little or no livestock of their own.

In pastoral and agro-pastoral areas, socio-economic status is determined by labour. Both tending cattle and agriculture production require a certain level of labour power which very poor households do not have. Labour-poor households will not be in a position to take up daily labour opportunities, or to migrate in search of work. Indeed, labour-poor households may have little alternative but to run down their assets in order to cover their basic needs. It is these households who have no option but to turn to unsustainable activities such as natural resource exploitation, in an attempt to cover their basic needs through increasingly long lean periods, which may compromise their ability to withstand future shocks.

The type of livelihood strategy used to respond to livelihood shocks and stressors will depend largely on

TABLE 4 COMMUNITY WEALTH BREAKDOWN

	VERY POOR		POOR		MIDDLE		BETTER OFF	
	Agro-pastoral	Pastoral	Agro-pastoral	Pastoral	Agro-pastoral	Pastoral	Agro-pastoral	Pastoral
Household size	7	4-5	7-8	8-10	7-9	8-10	9	10-15
Cultivated land (ha)	0-0.5	N/A	1-2	N/A	1-2	N/A	2-3	N/A
Main crops	Maize, barley, wheat, beans, teff		Maize, barley, wheat, beans, teff		Maize, barley, wheat, beans, teff		Maize, barley, wheat, beans, teff	
Livestock	0-2 cattle	0-2 cattle 1-2 shoats	0-5 cattle 3-5 chickens up to 5 goats	5-10 cattle 3-5 shoats	5-10 cattle 3-5 chickens 1 oxen 5-10 goats	10-50 cattle 10-25 shoats	10-20 cattle 2 oxen 15-20 goats	50+ cattle 20-40 shoats
Other assets			Hoe		Hoe	Camel donkey	Plough hoe	2+ camels donkey

Source: A-Z Consult, 2009

a household's socio-economic status. Poorer segments of rural society, whether in agro-pastoral or pastoral areas, will not have such a diverse range of options to choose from, whereas better-off households will have more opportunities available to them. Table 5 outlines some of the coping strategies identified by households in agro-pastoral areas in Borana zone in Ethiopia. We distinguish between 'positive' and 'negative' strategies – positive being those that help establish or add to household-level assets, and negative being those which lead to the depletion of household assets, reduced nutrition levels, or unsustainable land use practices.[7] Labour migration was discussed in detail. Some participants noted that labour migration is a positive strategy, with regular remittances covering essential household needs. However, on balance, people felt

TABLE 5 COPING STRATEGIES IDENTIFIED

TYPE	RESPONSE STRATEGY	WEALTH GROUP	EFFECT
'Negative' (depleting assets)	Increased labour migration	Poor middle	• Disruption in community dynamics • Reduction in household labour force, leading to a decline in ability to focus on household's own activities
	Increased sale of livestock	Poor Middle Better Off	• Reduction in household asset base from which to draw in the event of future shock • Less potential to exploit opportunities to sell livestock products such as milk, yoghurt, cheese. Inability to optimise profit • Forced to accept lower prices
	Increase livestock migration (travel longer distance for longer periods of time)	Poor Middle	• Disruption in community dynamics • Increased competition for limited grazing may result in heightened tension between clans/ethnic groups. Livestock become weak due to distances required to travel
	Increase sale of charcoal and firewood	Poor	• Environmental degradation • Increased erosion and run-off
	Change in food consumption patterns – reduction in frequency and quality of food intake	Poor	• Increase susceptibility to disease and potential malnutrition • Reduction in energy levels, resulting in lower productivity
'Positive' (establish or increase household assets)	Increase in kallo formation (preservation of pasture)	All	• Community cohesion strengthened through participation of all to form kallo • Enables regeneration of pasture • Pasture protected for future
	Harro (pond) creation/ water harvesting	All	• Households have access to water for specific activities (eg vegetable gardening)
	Planting short maturing crop varieties	All	• Increased potential to gain at least some harvest
	Increase in petty trade activities	Poor	• Increased income generated
	Increase in sales of gum Arabic and incense	Poor	• Increased income generated
	Vegetable farming		• Counter-seasonal source of food and income

Source: A-Z Consult, 2009

[7] *Interestingly, both positive strategies listed – preservation of pasture land and formation of ponds – were suggested during FGD with female-only participants.*

that ultimately labour migration is negative since remittances rarely reach intended beneficiaries when they are most needed. In addition, the absence of labour power at crucial times of year means that agricultural production is not maximised.

MOBILITY

Traditionally, households in Borana were pastoralists and cattle herders; agricultural production is a relatively new activity. Livestock-keeping was inherently suited to the ecological conditions of drylands, and mobility was an essential adaptive technique to use resources that were variable across time and space. Transhumance (migration of whole households with herds) was more common than now, with households travelling long distances with their herds in order to find sufficient pasture. Now the challenge is increasing constraints on mobility, leading to shortage of water and pasture. As pastoralists have become increasingly settled, livestock migration usually does not involve movement of the whole household or indeed the whole herd. In Borana, it is often the case that lactating cows and calves remain near the 'permanent' household, with the women and children, while the rest of the herd is taken in search of pasture by male members of the household. With the emergence of NGO activities in the area, middle-income households also reported an increase in destocking (sale and slaughter of livestock) as a coping strategy when facing recurrent drought.

REDUCTION OR CHANGE IN FOOD CONSUMPTION PATTERNS

Both in reaction to and anticipation of economic and environmental shocks and stressors, poor households reduce their food intake in order to make cereal stocks and cash last longer. It is common for adults to reduce the number of meals consumed per day. It is also common for children's food intake to be prioritised within the household, followed by working males, and finally women.

CHANGES IN HERD COMPOSITION

In pastoral areas particularly, wealth (and therefore coping capacity) is transient. Faced with repeated shocks, households must maintain a precarious balance between protecting their core herd and sustaining their food and income sources in order to survive. To this end, pastoral households in Ethiopia reported that one way in which they have 'adapted' to a rapidly changing situation is through changing the composition of the herd. With increasing bush encroachment and the transformation of grasslands into woodlands, households are more likely to incorporate browsers such as camels and goats into their herds.

LIVELIHOOD DIVERSIFICATION

Within and beyond agriculture, diversification is a widely recognised strategy for reducing risk and increasing well-being (Ellis, 2000; O'Laughlin, 2002; Ellis and Allison, 2004). It is an ongoing process

enabling households to build resilience by spreading risk. It is not easy to attribute a single cause to diversification, rather a combination of factors are driving change, factors which are economic (eg increased market integration), political (eg changes in land use policies) and environmental (increased climatic uncertainty).

Many traditionally pastoral households have diversified their livelihood base and started to engage in agricultural production around their homesteads. Production in the most part is for consumption. However, with increasing uncertainty over when the rains will come, and for how long, some pastoral households are questioning the relevance of cultivation. Agricultural production is costly, it is labour intensive and there is no guaranteed pay-off. In fact, some believe that precious labour resources may be put to more effective use elsewhere.

In the agro-pastoral areas visited, off-farm diversification includes exploitation of natural resources, increased involvement in petty trade and increased labour sale, including migration. Natural resource exploitation has increased in both agro-pastoral and pastoral areas. In agro-pastoral areas, poor households in particular have reportedly increased their involvement in the sale of firewood and charcoal as a direct consequence of recurrent drought, as indicated by one person in an agro-pastoral area:

> **"We have increased charcoal burning and firewood collection as we have had year after year of poor harvest."**

These households do not have livestock assets to speak of and, when rains are insufficient for crop production, they are left with little alternative but to turn to the sale of natural resources. Some commented that they started selling firewood and charcoal only as a last resort. Charcoal burning is hard work and not undertaken lightly. Many villagers were aware of the consequences of firewood collection, but felt that there was little else they could do, as the following quote from an oral testimony points out:

> **"The bare land that you see now was forest: we have destroyed that. Now we have lost the rain, we get heat only. I heard that trees bring rain. We cut down the trees so I know that we are making the rain go away. What can I do? I have no choice."**
>
> *(Tome Dheeda, 45, Harallo)*

Given that the poorest households have few options available to them, it is no surprise that environmental degradation has accelerated over recent years. Communities have sought to improve their management of increasingly scarce forest resources, but considerable support is still needed.

The upsurge in petty trade activities has been mainly attributed to women. Petty trade includes the sale of vegetables grown around the homestead, and the sale of essential items in villages, brought in from larger market centres. Commodities on sale include paraffin, matches, candles, tea, coffee, salt etc. Vegetable gardening has become an important income-generating activity for women's groups, with land and water sources set aside exclusively for vegetable production.

LABOUR MIGRATION

Labour migration is another major livelihood strategy which was initially employed in response to severe drought in the 1970s, but has now become part of everyday life for many rural households. In part, this is attributable to increasingly difficult agricultural conditions in combination with land shortages. Migration here refers mainly to labour migration, where working-age men seek employment outside their villages, in local towns and further afield. Recurrent droughts have made it increasingly hard for many to secure livelihoods from their own farms, leading to migration abroad. Short- and longer-term labour migration have become more common. The changes

are expressed below.

> **"In 1999, after the failure of crops, my husband migrated to Marsabet, Kenya, for labour work. The first year, he found work in the construction of new houses as a carpenter supporter. He was sending money for me to buy food for our children. For the last six months, he has had no job opportunity and he started charcoal production."**
>
> *(Adde Mesule Gegalo Bante, 45, a mother of six children, Dire woreda, Romsso Kebele, Tulluwato village)*

As indicated in Figure 4 below, the overall trend of labour migration in agro-pastoral areas in Ethiopia is perceived as an upwards one.

Peak labour migration years coincide with the years when rainfall was perceived to be poorest (eg 2006). It also follows that when rainfall and associated crop production peaked, migration rates were reduced (eg 2004). This is no surprise. Villagers commented that, particularly since 1997, migration has increased. Fit, healthy, working-age males go to Mega, Yabello and Moyale in search of work. Sometimes remittances are sent back, but mostly they are not.

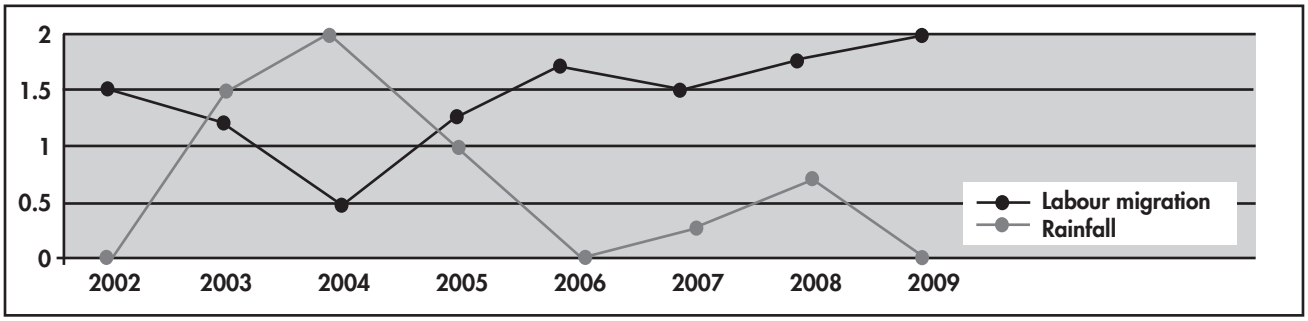
In summary, agro-pastoralists and pastoralists appear caught between a policy and socio-economic environment discouraging livestock on the one hand, and what is seen as an increasingly difficult situation for crop production on the other. Alternatives in off-farm incomes and migration for casual labour are available, but not to everyone; some remain restricted by gender roles and limited access to capital. The alternatives also bring with them increasing livelihood uncertainty. The next section explores the possibilities for accessing local informal and formal institutions.

3.2.3 SUPPORT STRUCTURES AND INSTITUTIONS

THE TRADITIONAL SYSTEM OF GOVERNANCE

This section explores the relative importance, function and interrelationships of local-level institutions. Major institutions include government agencies, NGO and civil society organisations, government rules and regulations for managing rangelands and forests, as well as traditional ruling systems. There is some variation in the institutions' relative importance. The overriding view, however, is that the traditional Borana system of governance – *the Gada* – remains extremely important. *The Gada* system is a generation grade system that organises Borana society: one generation rules for eight years before being replaced by another. At the head of the generation grade is the *Aba Gada* (father of the *Gada*) who performs rituals and rules in case of dispute. The *Aba Gada* and his council are considered to be the embodiment of the aada. The *aada* is a set of principles and customs which represent what is thought to be the correct

FIGURE 4 TREND LINES FOR PERCEIVED RAINFALL AND LABOUR MIGRATION, HARALLO, JUNE 2009



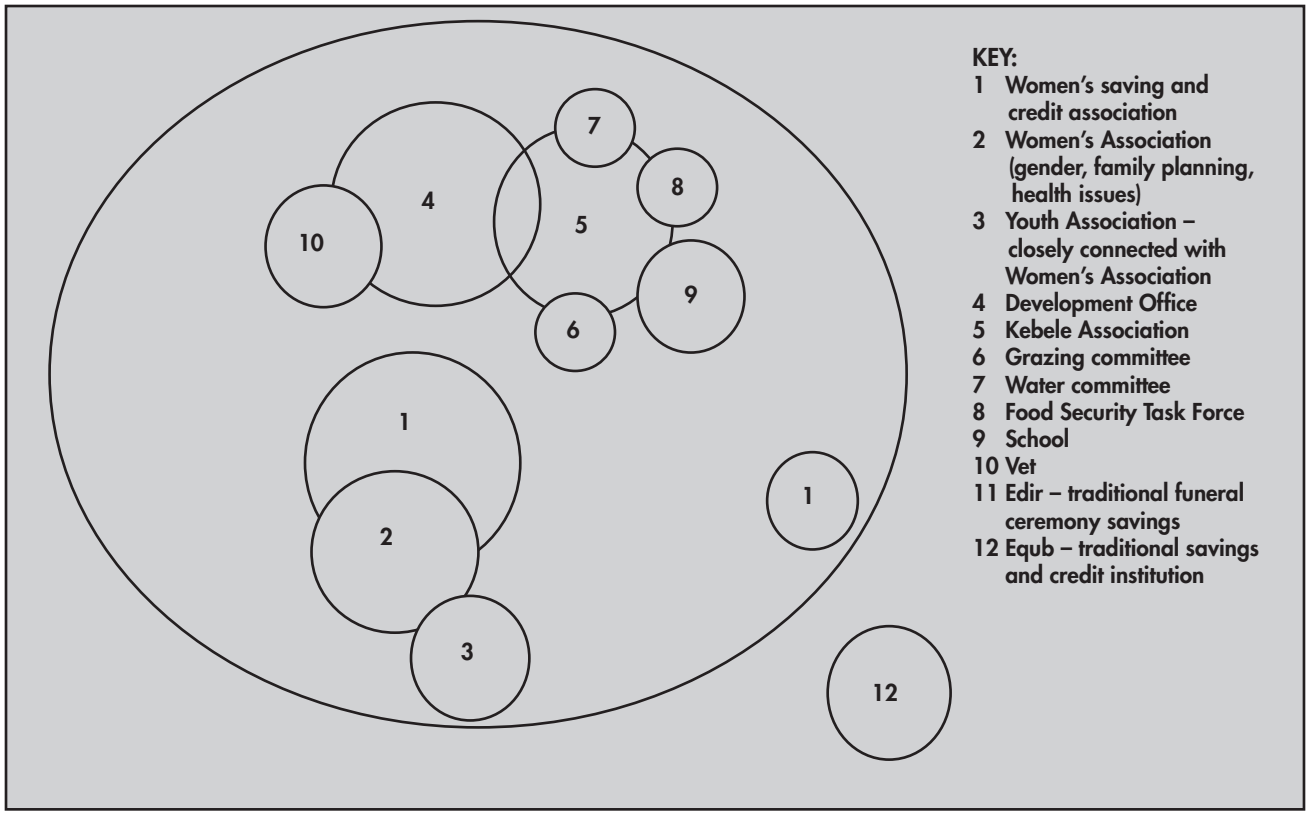
Source: group discussion at Harallo Kebele (agro-pastoral zone), June 2009

way for a Borana person to live. Helland (1997a) translates aada as 'the Borana way' (Watson, 2003). In some parts of Borana society, the *Gada* has lost its significance but here it appears that the traditional institution retains importance, especially in sorting out disputes over resources. Rules and regulations issued by the *Gada* are binding. The importance of the *Gada* system is illustrated well by the fact that many Borana, whether pastoralist or agro-pastoralist, refer to historical events in relation to the *Aba Gada* in power, instead of referring to the Ethiopian calendar. The following diagram (Figure 5) illustrates well how the *Gada* system is perceived to envelop all institutions within the community and is represented by the largest circle:

Participants attached greatest significance to the women's saving and credit association (WSCA) (1) and the Women's Association (2). The former provided access to start-up capital for small businesses, thereby enabling them to diversify their livelihood base. The Women's Association functions in close cooperation with the WSCA. The local government office is represented by circles 4 and 5, which is also deemed to play a significant role in the daily life of the community.

There are clear inter-linkages between formal governance structures and traditional institutions in Borana. The Kebele administration (lowest administrative unit) has a number of functions (including ensuring security, linking the community to the federal and central government, reporting drought), but importantly it depends on the traditional *Gada* system. The *Gada* system is perceived as particularly important when setting out rules relating to natural resource management. In particular, it is responsible for overseeing the pasture and water committees,

FIGURE 5 TYPICAL SOCIAL ORGANISATION, AGRO-PASTORAL AREAS, BORANA



even though these committees are attached to a local government institution. Committees are headed by elders and, if the case is beyond their capacity or if there is a dispute over resources, it is forwarded to the *Gada* leader. The *Gada* system continues to have considerable influence on both pastoral and agro-pastoral livelihoods in Borana; it is considered the primary supporting system. Its rules and regulations form a strong foundation for effective and equitable resource utilisation and management, which is key for adaptation. For example, the rules of the pasture committee govern access to pasture for the community. In particular, the committee is responsible for separating areas for access during *bonna* (dry) and *ganna* (rainy) seasons. They are also responsible for regulating access to areas set aside for calves, milking cows and weak cows *(kallo)*. *Kallo* are areas set aside for use when the pasture near to the settlement becomes scarce, usually in times of drought. Elders are responsible for deciding when the *kallo* should be used and, if people are found to have flouted the rules of access, they will be fined.

EXTERNAL INSTITUTIONS

To an extent, traditional mechanisms have been replaced by external support structures. With very few exceptions, the external interventions by various organisations, though they differ by coverage, duration and intensity, are perceived by communities to be supportive. Many people noted that external institutions were set up during the past ten years, becoming stronger in recent years, with the support of local government officers and improved community awareness and education. People also pointed out that climate-related stressors partly determine the level of community benefit:

> **"These organisations belong to us, and it is our responsibility to make them work... We are able to do so when the weather is not disturbing us."**
>
> *(FGD, agro-pastoral area, Borana)*

This exemplifies how recurrent drought was cited as the main reason for institutions' failure to function properly all the time:

> **"When there is drought, people must leave the area to find work so they are not really interested in the different organisations... If there is no drought, all works well."**
>
> *(FGD, agro-pastoral area, Borana)*

Some trends were noted in the type of support provided by external institutions. Past responses were predominantly emergency-oriented, designed to save lives. Now, there is a move away from emergency response to more development-focused interventions. In a context of shifting climate variability, long-term interventions are based upon enabling communities to live with these changes. The Government of Ethiopia's (GoE) Productive Safety Net Programme (PSNP) is a case in point. Here, the focus is on protecting livelihoods through predictable resource transfers in the form of safety nets and/or credit. This kind of external support has contributed significantly to protecting households from asset depletion.

> **"The recurrent drought of the past seven/eight years has negatively affected our livelihood. Even this year the intensity of the rain seems to be reduced (...) before the plants have matured. This in turn aggravates the communities' food security situation. That is the main reason for looking into external support, either in the form of Productive Safety Net Programme transfer or emergency food aid."**
>
> *(Habiba Godana, Dire Woreda)*

SOLIDARITY

Traditional mutual support between households (Busa Gonofa) has become weaker. Previously, the traditional 'kinship' system kicked in during times of

severe drought. Poorest households would be supported by those better off, through gifts of food and occasionally small livestock. However, as times have become tougher for all, poorer households are not able to access the same level of support. Middle-income and better-off households which would previously have been in a position to assist those with limited access to resources are no longer able to do so. Meeting even their own needs has become a challenge in itself.

That said, poor households are able to access livestock through informal arrangements. There is an informal system in place which enables poor households to access oxen: they will plough land for middle-income or better-off households, and payment will be in the form of the loan of the oxen. People reported that increasingly erratic and unpredictable rainfall patterns have meant that poor households have worked on better-off households' land but have not had the chance to plough their own land in time for planting. Middle-income households may own one ox and will join forces with another middle-income household in order to plough.

CREDIT

Only a minority of villagers have access to credit. However, the situation has improved over the last few years through local microcredit schemes and institutional support, in particular to women's and youth groups. This has boosted people's ability to take up loans, but also means that some become indebted, further reducing resilience to future shocks. The Government of Ethiopia (GoE) has assisted the community formation of women's groups within various villages. Women contribute 5 Birr per month in order to set up small businesses selling sugar, salt, tea and other commodities to the community.

Overall, the institutions at the local level were perceived to be beneficial. They help save the lives of humans and livestock, improve access to water, food and animal feed, enable access to medicines and encourage community development activity. There were no references to any institutions or organisations that directly undermined people's strategies. However, there are factors that may erode or undermine supporting institutions and organisations. In Borana, conflict has eroded traditional coping and adaptation mechanisms over the years. Furthermore, there is a clear perception that weakening of the authority of community leaders and the reduction of solidarity and help within the communities are partly linked with climate stressors. Reduced access to resources means that there is less surplus to share, which puts increasing strain on traditional systems of support and sharing.

3.3 DISCUSSION AND SUMMARY OF THE ETHIOPIA CASE STUDY

There is a widely held perception of changes in rainfall, including a perception of increasing unpredictability of rainfall patterns and a frequently shorter rainy season. Some bias towards what Devereux called 'the nostalgia effect' (Devereux, 2006) cannot be ruled out, and it is also possible that increased livelihood sensitivity to rainfall is behind some of these perceptions. At the same time, two additional points make it important to consider the perceptions. First, a recent study in Burkina Faso comparing local perceptions with meteorological data corroborate these findings also in areas where there is a conflict between what farmers say and what records show for macro level rainfall (West et al. 2008). Second, the findings show that views on rainfall change are one of the drivers for important decisions for livelihood strategies, partly because drought reduces access to pasture and water. Livelihoods are changing. Even though in many cases the reasons are a complex mix of politics, markets and institutions, climate factors play a part too as people rely on assets that are climate sensitive. Thus, a changing climate does pose distinct new challenges. For example, a change (for non-climatic reasons) towards seden-

tary agriculture can be seen to have made many households more vulnerable to climate change than they would otherwise have been as pastoralists as it is costly and labour intensive, without a guaranteed pay off. The traditional 'pastoral' livelihood relying mainly on livestock production is becoming less and less feasible, especially as localised conflicts are restricting movement of livestock.

The outcome is that households are diversifying their livelihood base, now incorporating elements of agricultural production, natural resource sale, petty trade and, importantly, labour sale. This means that households are increasingly reliant on the market. However, households are only in a position to diversify into sustainable activities, such as vegetable production or petty trade, if they have access to extra capital with which to start up. Increasing significance is attached to labour migration, which is now an integral part of life for many rural households. The findings also suggest that some livelihood strategies are driven by what they observe as permanent changes in climate risks (illustrated by quotes such as 'we have no other choice', and 'we can't trust the rainfall any longer')

Finally, the findings also show that the *Gada* system continues to exert considerable influence on both pastoral and agro-pastoral livelihoods in Borana; it is considered the primary supporting system in governing access to natural resources. However, there was a widespread feeling that the *Gada* system had lost its power to mediate access and use of water and pasture, resulting in increasing insecurity for livelihoods. In this era of growing climate uncertainty, there may be an opportunity for the *Gada* system to fulfil a greater role in natural resource management to prevent conflict. Traditional systems are now supported by external structures, although coordination between the two needs to be strengthened. Thus, institutional changes mean that households are increasingly 'on their own', with fewer support structures.

4 MALI CASE STUDY

4.1 INTRODUCTION

Fieldwork explored livelihood adaptation processes in agro-pastoral and pastoral communities in Gao and Mopti regions (refer to Annex I). In Gao, research sites included the pastoral communities of Imenas, Samit, Tamkoutate and Agdilinta in the north-eastern Haussa zone, and agro-pastoral communities in Boya, Kardjimé, Koissa and Gayna. In Mopti, research was undertaken in Sana, Kiri, Pènè and Sogou (all agro-pastoral). The latter are located in the surroundings of Koro, a small town bordering Burkina Faso.

Life in the nomadic, pastoral communities in the Haussa is centred around livestock breeding. Livelihood activities in the agro-pastoral research sites are by and large focused on transhumant pastoralism combined with agriculture. Millet is the main staple food farmed in Mopti. In the Niger valley around Gao, variable water levels have favoured the cultivation of rice and also permit sorghum and, to a certain extent, millet. Depending on the locally available resources, infrastructure and demand, the communities also engage in petty trade, vegetable gardening, blacksmithing, tailoring, timber trade and bricklaying.

Fishing is still considered a major activity in Gao (in agro-pastoral areas), although the quantity of fish in the river is perceived to have decreased dramatically. Apart from major geographical disparity between Gao and Mopti, the two regions also differ in terms of ethnic composition. In villages in Mopti, the Dogon dominate, whereas the Songhaï are the majority of inhabitants in Gao. The Fulani are a large and highly influential group in Gao, but a minority in Mopti. The nomadic pastoral zones of northern Gao are inhabited by the Tamasheq, a Touareg tribe.

Current climate models project temperature increases between 1.2°C and 3.6°C by 2050, and 1.8°C and 5.9°C by 2090. Rainfall trends are more difficult to establish. The current models project that by 2090, mean annual rainfall for Mali could be either 25 per cent higher or 22 per cent lower than the mean for 1970–1999 (McSweeney *et al*, 2008).

4.2 FINDINGS

4.2.1 PERCEPTIONS OF SHOCKS AND STRESSORS

Main livelihood activities depend heavily on the climate. Without rain falling in the right amounts and during certain months of the year, both the pasture for livestock and the harvest from agriculture are endangered. With the exception of a few privileged families with access to irrigation infrastructure such as motorised pumps, and the villages benefiting from the water carried by the Niger during some parts of the year, most households depend entirely on rains.

Whether a year has been good or bad is mostly determined by the harvest or condition of livestock, which in turn largely depends on a balanced frequency, duration and distribution of rainfall in the rainy season.

> **"When I was a girl, it rained a lot and we had everything. We had enough food, we were healthy; there were lots of celebrations and cultural events. There were lots of animals. Now it's all gone because of the drought; we are not as healthy as we used to be. The rains come late and the animals don't get enough to eat."**
>
> *(Aissatou Ganamé, 45, from Sana)*

Failed or excessive rains trigger a range of knock-on effects: most major problems reported by the communities in Gao and Mopti, from food insecurity to poor health and eroding social cohesion, are linked directly or indirectly to adverse climatic conditions, from insufficient or excessive rainfall to violent winds which cause health problems, accelerate desertification and bury fields and pasture under desert sand.

Table 6 below shows perceptions of the main stressors and their impacts on livelihood resources. Many of the highest-ranking stressors are not climate per se but are related to climate, such as drought, erratic rainfall and lack of water. In other agro-pastoral communities, where people were asked to describe the main stressors on their livelihoods in general, climate risks such as drought and climate-related risks such as food insecurity, lack of drinking water or lack of pasture also featured highly. In addition to this, they often complained of a lack of credit and of access to health and education facilities.

The main changes happened in large, decadal steps, around the Great Droughts, which led to widespread starvation and triggered fundamental changes in both the natural and social environment in which people's livelihoods are embedded. Elderly people talk of times when lions and game populated the backcoun-

TABLE 6 RANKING OF KEY SHOCKS AND STRESSORS IN GAO AND MOPTI

GAO	MOPTI
AGRICULTURE 1. Limited access to seeds and tools 2. Erratic rainfall 3. Birds/insects 4. River flow (lack of or flood) 5. Loss of land due to water level **FISHING** 1. Limited access to equipment such as canoes, cash 2. Lack of 'wet grasslands' (bourgoutière [7]) transformed into croplands (loss of reproductive area for fish and grazing area for livestock) 3. River silting: caused by wind and soil erosion and lack of rain **LIVESTOCK** 1. Cattle diseases 2. Grazing land: too far away from the river (up to 40km away) 3. Degradation of grazing areas 4. Water for livestock in the grazing areas	**AGRICULTURE AND FOOD INSECURITY** 1. Drought 2. Lack of improved seeds 3. Lack of fertiliser 4. Health problems (fatigue, malaria, diarrhoea) 5. Soil infertility ('soil does not rest', trying to save land for grazing and trees) **WATER CRISIS** 1. Drought (reason: lack of trees & loss of traditional culture; deforestation due to animals, drought and human activity; loss of traditional fetishism due to introduction of Islam) 2. Lack of financial means to build wells and dig ponds (deteriorating factors: drought, water level) 3. Lack of surface water (lack of means to dig ponds) 4. Poverty (drought) **FOREST DEGRADATION** 1. Drought: poor production makes poorest households exploit forest for survival 2. Population growth: increase of firewood and construction, of agricultural / inhabited land 3. No reforestation 4. Forest and wild animals 'disappearing' **LIVESTOCK** 1. Cattle diseases 2. Grazing land: too far away from the Koro's area (towards Burkina) 3. Degradation of local grazing areas 4. Drought (water for livestock in dry season)

Source: Fieldwork in Sana and Kiri (Mopti) and Boya and Kardjime (Gao), October 2009

[8] *The bourgoutière is a fish nursery. The reduction of its surface area is a real hindrance to fish reproduction.*

try, when the landscape was green and people celebrated their culture with pompous events. The Great Drought of 1973 is remembered in particular as a year when things changed:

> **"It began in 1973. That's when everything collapsed. Since then, we don't have enough food, we cannot feed our cattle, we don't have enough water and we don't have enough wood."**
>
> *(Talibo Abacar, 64, from Boya)*

People perceive the rainy seasons to have become shorter over the past 15 years, confirming the trend reported in rainfall records. Before the 1990s, the rains typically started falling 15 days after the storks' arrival in the village. According to villagers, it can now take 30 days before the rains start. Another traditional sign is that when frogs start croaking at night, the rain usually comes seven days later. However, today it may take between 12 and 13 days. In late-October, the departure of storks normally signals the end of the rainy season, though this is no longer applicable. It was also reported that winds are more violent and hotter than they used to be.

A shortening of the rainy season extends the hunger gap, leading to increasing risks for households. Table 7 below shows the five most severe and five most frequent climate-related risks, respectively, as listed and ranked by agro-pastoral and pastoral communities. They discussed the relative importance of frequency versus severity of climate risk. In most cases, it was found that the frequency with which a hazard occurs is more significant than the severity. This poses interesting questions in terms of policy response, given that responses tend to prioritise severity over frequency.

In some cases, the risks featured here are climate risks by definition, ie they are weather-related. Other risks are consequences of adverse climatic conditions.

Thus, for the past 15 years, people report an increasingly erratic duration, intensity and distribution of rainfall. Weather-related stressors have largely been

TABLE 7 RANKING OF THE MOST SEVERE AND FREQUENT CLIMATE RELATED RISKS

PASTORAL		
	SEVERITY	FREQUENCY
1	Human and livestock morbidity	Wind, food insecurity and diseases
2	Drought (multiple years)	Food insecurity
3	Food insecurity	Lack of pasture
4	Lack of pasture	Livestock mortality
5	Livestock mortality (dry spells)	Ineffective rains
AGRO-PASTORAL		
	SEVERITY	FREQUENCY
1	Sparse rainfall	Sparse rainfall, sand from dunes (equal)
2	Sand from dunes	
3	Saharan winds, unequal distribution of rains, hot temperatures after rains (equal)	Unequal distribution of rains
4		Delayed start of rainy season
5		Hot temperatures after rains

Source: Fieldwork in Koissa and Imanas (Gao), June 2009

perceived and responded to on a seasonal basis. As a consequence of both rapid and slow onset changes in the climate, hardship has become a daily reality for large parts of the population, hunger gaps have become more frequent and prolonged, health problems have become aggravated and the quest for drinking water for human beings and cattle has been getting ever more taxing. The capacity of even wealthier households to absorb economic and climate-related shocks has suffered. These new patterns severely threaten people's livelihoods, particularly where no safety nets are available.

"When I was young, the forest was so dense that nobody was brave enough to get in by night. The forest is clear now and a lot of species have disappeared. The tamarind and the shea tree are gone. It is why there is more and more dust because the soil is not protected any more by the vegetation and it becomes hotter than before."

(Hamidou Poudiougo, 75, male, Sana)

4.2.2 LIVELIHOOD STRATEGIES: OPTIONS AND TRADE-OFFS

Agro-pastoral and pastoral communities respond to climate-related and other shocks and stressors in a wide variety of ways. While households within a community have broadly similar degrees of exposure to climatic stressors, livelihood outcomes vary greatly – both within and between communities – due to different access to strategies. Table 8 opposite shows a summary of strategies people are reported to be taking in Gao. It illustrates how some responses are short-term, others are longer-term investments and permanent changes in livelihood strategies. Social differentiation in access to assets, as well as institutions, regulates who can use what type of strategies. As shown, many strategies are only available to the wealthier households, and some strategies (for example, acquisition and sale of livestock) are typically reserved for men.

There is little doubt that the range of possible responses increases with wealth. For the poorest people in particular, livelihood strategies tend to be defined not so much in response to a particular climatic stressor such as drought, but are more by socio-economic status, gender relations and the institutional support at hand. The poorest households tend to respond to a range of stressors with the same strategies. Labour migration is a typical example, increasingly used as the main way to tackle hunger gaps. But labour migration tends to be uncertain, and occupies labour that would be needed elsewhere – peak times for labour opportunities tend to be around the times when farmers need the labour on their own farms, for example. This may jeopardise farmers looking after their own farms.

By their very nature, livelihood strategies are dynamic and changeable over time, changing with new knowledge and information, and constrained by resource access. A clear evolution of strategies over the past 15 years could not be identified, but strategies seem instead to have evolved in decadal steps, in response to the Great Droughts of the past 40 years. With each drought crisis, the reestablishment of 'business as usual' became impossible and forged profound social changes such as (predominantly male) labour migration. It has also led to the emergence of women in previously male-dominated activities, changes in agricultural practice and the increased use of wild foods as food supplements.

Thus, responses imply trade-offs, particularly for the poorest groups. Outcomes depend on factors such as the main livelihood activities on which a household relies,the degree of livelihood diversification, wealth, access to local and external institutions and gender relations.

TABLE 8 LIVELIHOOD STRATEGIES AND IMPACTS, GAO

	IMPACTS OF STRATEGIES ON LIVELIHOODS AND ENVIRONMENT	
STRATEGIES	**POSITIVE IMPACTS**	**NEGATIVE IMPACTS**
Motor pump rental or purchase	• Improved rice irrigation → agricultural intensification • Improved on-farm employment opportunities (for poorest households) • Better control/use of Niger River water levels • Agriculture residues for livestock	
Small Irrigated Village Perimeters, since 1990s and construction of dykes for water management	• Improved rice yields • Improved on-farm employment opportunities (for poorest households) • Better control/use of Niger River water levels • Agriculture residues for livestock	Access to government support for irrigation is limited to wealthiest households; with the exception of public works programmes, governmental programmes reinforce inequality
Planting early maturing varieties	• Increased rice yields • Adaptation to shortened rainy seasons	Discriminatory distribution (access limited to wealthiest households)
Transformation of wet grasslands into rice croplands	• Increased rice production •Destruction of natural fish nurseries (wet grasslands)	• Reduction of grazing/pasture area (wet grasslands) for livestock • Conflict between livestock keepers and fishermen
Dune fixation	• Reduced speed of Niger river basin silting • Reduction of violent winds and temperature • Dune stabilisation prevents desertification	
Renting cropland to wealthier farmers		• Increased dependence on remittances and local food markets or on social mechanisms • Food insecurity and child malnutrition • Hard labour for women of Female headed households
Transhumance	Reduced cattle mortality	Progressive degradation of transhumancegrazing area
Livestock food purchase	Reduced cattle mortality	
Selling cattle: purchase of younger and more drought-resistant animals	• Income generation for all households in emergency • Renovation of livestock (young cattle) • Race diversification: drought resistance and improved millet productivity)	
Purchase of medicines and vaccines	• Enhance livestock health and resist ance/resilience to shocks and disease • Reduction in cattle morbidity and mortality • Reduction of epizooties	
Off-farm livelihood diversification eg vegetable gardening	• Improved household income • Reduced vulnerability to a variety of stressors, gradual transformation of gender relationships (improves women's livelihoods and status in villages)	
Consumption of wild foods during hunger gaps	Reduced hunger	Sometimes detrimental impact on health

COPING STRATEGIES LEADING TO DEGRADATION OF ASSETS

The poorest households within the communities are most vulnerable and most prone to employing adverse and unsustainable coping strategies. Unless they are supported by wealthier households or institutions, they lack alternatives. Even though the poorest households are often involved in activities not directly affected by the weather, such as bricklaying, their dependence on borrowing, gifts or employment from wealthier households can lead to a vertical trickle-down of knock-on effects in a bad season, which often has worse impacts on them than on those directly affected.

LIVELIHOOD DIVERSIFICATION

In communities highly dependent on increasingly erratic climatic conditions, livelihood diversification is a key adaptation strategy. Vegetable gardening, artisan activities and petty trade not only help households reduce their sensitivity to climatic impacts, but have visibly helped empower women and increase households' commitment to enrol their children in education. While migration, which implies that labour is sought elsewhere, can be seen as a form of livelihood diversification, and in many cases provides household with crucial income, the absence of migrants, as mentioned above, can have negative impacts as well. It is also important to consider the workload placed on women: as they take up new activities, they still have to fulfil their usual tasks of childcare, food preparation, collection of firewood and fetching water, which, given the progressive deforestation and difficulties in accessing drinking water, has become more time-consuming.

"After (the big droughts of 1973 and the following migration), we came back and started new activities such as agriculture, small businesses and artisan production, all that to get enough money to reconstitute our herd."

(Ismail, male farmer, Iminas, Mali)

"After the death of my wife, I understood that the small activities that she did (selling traditional soap and cotton thread) had an important place in the economy of my family. As soon as she left me, I noticed that the financial expenses of my family increased overnight. Finally, I took the decision to initiate another activity to support my family because agriculture only could not cover all our needs. Indeed, every year, I had to sell some animals to cover certain expenses of my family. So, in 2005, I was interested in small trade. I began with the products of basic necessity (sugar, soap, gauges magic, oils etc)."

(Boacar Togo, 56 years old, male, shopkeeper, Koro, Mopti region)

COOPERATIVES AND CREDIT

Cooperatives enable the collective accumulation of resources which buffer shocks and stressors in times of crisis. They save and share, for example, grains, money, tools or livestock feed. They allow people to plan ahead deliberately without failing to meet their basic needs and depleting their resource base. With credit, people invest in livestock or agricultural inputs to improve their outputs in the next season, hoping that their returns will enable them both to repay the loan and invest further. These mechanisms, however, are out of reach for many poorer households. This is due to membership contributions they cannot afford, credit conditions they cannot fulfil or even their social status and the fact that some local and external support mechanisms, either openly or inadvertently, limit access to those who possess large proportions of land and livestock or simply do not want new members. Cereal banks are particular assets to bridge seasonal hunger gaps. Again, however, access of those who are most in need of support during the hunger gap is often restricted.

CHANGES IN AGRICULTURAL PRACTICES

In response to reduced soil fertility and increasingly difficult weather conditions for farming, new agricultural practices have been sought over the past decades. They include the introduction and enhancement of vegetable farming, the use of fertilisers, the use of a different type of rice in the Niger valley to enable a second harvest, variable types of millet in the Koro area and, of late, the introduction of sesame in the same area. As the innovative agricultural inputs are mostly purchased in markets or donated by governmental agencies to wealthier households, access to these is largely limited to the latter. Poor households lack the means and often also the transport to access the seed markets. Instead, many of them have been resorting to wild foods.

"Fifteen to 30 years ago, we used to cultivate a species of millet which had long ears and produced a lot, although this species required four months to ripen and was demanding in water. Nowadays, we have replaced this with another species which grows in only three months and requires less water. However, it is less productive than the one we used to cultivate."

(Atème Djimdé, 73, male, Sana)

CHANGES IN LIVESTOCK-KEEPING PRACTICES

Scarcity of pasture and drinking water is a threat to the health and lives of livestock, particularly cattle which are the most desired but also most vulnerable of the animals kept by communities in Gao and Mopti. The starvation of large numbers of cattle not only harms their owners, but has severe implications for the herders they employ. In Gao, livestock has an immense cultural value besides its practical value as source of food and energy for traction, as well as investment of capital. So here livestock owners do everything they can to increase their herds to a maximum even when conditions are unfavourable.

"The herders renew frequently their old cows and bulls and replace them by young cattle [which are] more resistant to the lack of water and to the sicknesses. When families receive money for the purchase of food from their sons or brothers who have migrated, more than half of it is used for the acquisition of new livestock."

(Ibrahim Bellow, 38, male, Boya)

Their most desirable symbol of wealth is a very tall type of cow with large horns, which is the least drought-resistant type kept in the area. Of late, however, people have begun to purchase and breed a new type from the north, which needs much less drinking water while at the same time giving twice as much milk. Those who have enough cattle to spare in exchange for cash, or those who receive enough remittances from relatives, have begun to purchase livestock feed to ensure their animals do not starve when the pasture disappears. Another popular strategy is to sell old animals and buy younger, more resistant ones. Finally, the lack of pasture near the settlements has forced herders to travel further and further.

"Household expenses are very high and, as a married woman, it is necessary to do something that can bring you a little bit of money. Today, migration is not a strategy for us, so I buy the small rams around 25,000–30,000 CFA and I sell them during the festival of Tabaski between 45,000 and 75,000 CFA. It allows me to face my own small needs and the schoolchildren. My only threat in this job is the distance to get the hay. I have to go about 15 km to have green leaves. Those with more money can buy the hay but it is too expensive for poor women."

(Oumou Bamadjo, mother of ten children, 47 years old, Kiri, Mopti region)

NATURAL RESOURCE MANAGEMENT

As a consequence of increasing demographic pressure, food crises and the retreat of government, which used to monitor the use of water and forest resources at the local level, natural resources have been used unsustainably, both by local communities as well as those passing through with their herds.

> **"Since 1973, the pastures do not provide enough to feed our herds. We have to move our herds farther and for a longer period. Our quest for pastures often pushes us to go beyond the Mali borders to Burkina Faso and Nigeria."**
>
> *(Attaler Boncane, 70, male, agriculture and livestock, Boya, Gao)*

Competition for land to be used for either grazing or agriculture causes disputes among locals, and between locals and migrants. Of late, this has prompted a range of local attempts to govern resources. In the Niger valley, for example, fishing was prohibited during a whole fishing season to enable the stocks to recover, and local conventions were made to regulate the times and areas where herds would be allowed to pass through. In several communities, reforestation efforts, attempts to reintroduce plant species and agreements to restrict cutting down trees have begun, led by both the local chiefs and the initiative of NGOs. In the Koro area, the communities even introduced a forest patrol who monitor the trees and prosecute those who breach the regulations. Wherever communities have tried to make their own efforts to regulate natural resource use, they highlight a need for capacity-building as well as for government involvement: local conventions which are only respected by locals are inefficient in both regions as they are corridors for large numbers of migrants passing through them every year.

PHYSICAL STRUCTURES

Finally, a range of interventions are addressing directly the ecological and physical threats from weather-related impacts. While in the Mopti research sites, these are limited to the construction, deepening and technical improvement of wells for drinking water, the Niger valley has been populated with dune fixation sites to prevent river silting and stop desertification, motor pumps for irrigation, and dykes to regulate water levels in the river basin, mainly through large-scale governmental programmes. While the dune fixations benefit everyone, access to motor pumps is the privilege of a small elite.

As the list above shows, access to diversified and improved livelihood strategies at the household level is often a question of wealth and access to institutions. Viewed through the livelihood analysis lens, the strategic choices or constraints depend on access to the five types of livelihood assets (human, social, natural, physical and financial assets), which are in turn governed by social and institutional determinants. The most striking of these determinants are described in the following section.

4.2.3 SUPPORT STRUCTURES AND INSTITUTIONS

The findings from four of the agro-pastoral villages show how important social and institutional structures are for a household's capacity to adapt. In particular, they influence access to resources as well as access to decision-making power, two key factors that affect adaptive capacity. The following gives examples of social and institutional structures and how they affect adaptation, and for whom.

1. SOCIAL STRUCTURE

Social cohesion. The communities in Mopti, across all wealth groups, benefit from a tight social support network at village and sub-village level. In times of crisis, assets are shared, donated or borrowed. There is thus a high level of social assets for adaptive capacity inherent in these communities. This capacity, however, is to be seen as a potential which can only be effectively unleashed by wealthier households. Pronounced economic, natural resource and health constraints, which are mostly prevalent in the poorest households but which also affect middle-wealth households, increase their generic vulnerability – to food insecurity, water insecurity and diseases in particular – and limit the efficiency of these support structures. Repeated shocks and increasing drought and health stresses undermine their resource base and increase dependency on the practices of the wealthier groups which in turn have been adversely affected by these same shocks and stressors. In addition, average household sizes have increased over the last two decades. In other words, solidarity shrinks in proportion to the diminishing stocks of millet in the grain storages of the better-off on the one hand, and to the increasing number of mouths to feed across the entire community on the other.

> **"Before 1973, there was a strong solidarity between the different families and, if a family did not have food to eat, another would help and assets were shared. Nowadays, individualism is dominant in the families: it is every man for himself."**
>
> *(Mme Lalla, Arhabou, Koissa)*

Gender. Looking beyond the household level, gender role configurations, which also derive from ethnic tradition, represent another factor inhibiting or enabling strategic choices. Widows and women left behind by migrating men, along with their children and elderly relatives, are in a particularly vulnerable position. In the research sites, particularly in those in Gao, women are often illiterate and depend on others for the skills needed to engage in petty trade and other activities that require a certain level of education, such as microcredit. In Boya, women are largely removed from the public sphere and they lack the capacity and agency to access and make use of income-generating activities for themselves. They have little or no say in the allocation of household assets, which often means that they lack the means to keep themselves and their children healthy. Boya is a particularly striking example of how unequal gender relationships, in combination with unfavourable climatic conditions, accentuate and perpetuate poverty.

Other villages have witnessed what happens when women are empowered. Following their own or an external initiative, they have started up all sorts of income-generating activities, such as vegetable gardening, petty trade, pottery or in some cases even cattle trade. Revenues are invested in expanding those businesses and in education and health. While women's workload has increased, their empowerment has increased livelihood choices in favour of diversification and prevention, increasing their households' resilience and adaptive capacity. Kardjimé is an example of how the response to a shock can bring with it profound social transformation. In Kardjimé, gender relationships were profoundly shaken by the 1973 drought crisis and by external influences following the crises of the mid-80s and mid-90s, when hardship and an urgent need for labour in the fields no longer permitted women to stay inside. Until

today, the presence of women in the previously exclusively male domains has increased continually.

> **"Today, we do the work of men. We have become stronger than them. We bed out rice and collect wild herbs. In earlier days, women would not dare to go out in the fields. Without the women's associations, you would not have seen any women around."**
>
> *(Ishata, a 35-year-old widow from Kardjime, Gao)*

Also, proactive efforts have been made in Mopti and Gao, both locally and by external institutions, to increase girls' school attendance. As mothers in both regions proudly report, an educated girl is an asset to her family when it comes to business.

2. INSTITUTIONS

With the exception of national-level government, which since political transition in the early 1990s has become much less visible at the local level, external institutions have had a strong presence in and impact on the lives of the local populations over the last 15 years. The agro-pastoral communities identified a range of institutions at village, municipality and national level, as well as national and international NGOs.[9] Examples are shown in the table below. Except for organisations with continuous engagement in a community through a long-term commitment, many of them were identified in terms of programmes rather than organisations: communities attach importance to programmes' activities and benefits rather than to its institutional origin.

Many of these institutions have significantly improved communities' capacity to deal with major shocks and stressors, such as lack of drinking water, deforestation and drought at the community level. They have done so by providing options for livelihood diversification, improving infrastructure and building capacities. Some interventions address vulnerability to climate-related impacts, such as desertification and drought.

Table 10 opposite shows examples of external support that have contributed to reduced vulnerability.

Health problems, malnutrition and food insecurity, mainly due to difficulties in accessing drinking water and to drought, have nonetheless continued to increase. This undermines the communities' potential to operate effectively with advice and benefits provided by local and external institutional structures, and reinforces the application of adverse coping strategies such as reduced food intake and natural resource depletion. Women, for example, who have to feed their whole family when their husbands seek employment elsewhere for large parts of the year,

TABLE 9 EXAMPLES OF INSTITUTIONS ASSOCIATED WITH DIFFERENT LEVELS, AND THEIR SIGNIFICANCE

VILLAGE LEVEL • Village chief and village council: uncontested authority and fairness in collective decision-making, dispute settlement • Health centres: essential for infants and maternity care. Access is often a problem (cost) • Schools: apart from education, some provide school feeding. Access is often a problem (costs) • Cooperatives and cereal banks: risk-sharing, scale economies in agricultural, livestock and other activities. Access is often a problem (membership threshold, debt)
LOCAL GOVERNMENT • Local administration: mostly perceived as costly • Health centres: essential for infants and maternity care. Access is often a problem (distance and cost) • Schools: apart from education, some provide school feeding. Access is often a problem (distance and cost) • Local extension services for agriculture, livestock, water and forestry: technical advice, vaccinations and sometimes seed transfers; mostly perceived as costly and inefficient, the privilege of a few well-off households
NATIONAL GOVERNMENT • Governmental anti-desertification, irrigation and dyke construction programmes with public works components (only in Gao region)
NATIONAL AND INTERNATIONAL NGOS • Broad array of programmes, from emergency food transfers to long-term development, significant role in initiating cooperative initiatives and introducing options for livelihood diversification (eg vegetable farming) and building capacities of women in particular.

[9] *In some cases, this last category includes international governmental organisations such as the UN, eg the WFP. International bodies, both governmental and non-governmental, were perceived as part of the NGO sector, unless they were part of the Malian government. We therefore generally refer to them under the term 'NGO'.*

TABLE 10 EXAMPLES OF EXTERNAL INTERVENTIONS WITH ADAPTATION OUTCOMES

EXTERNAL INTERVENTIONS
• Livelihood diversification for men, women and youth (eg vegetable gardening) • School feeding • Micro-finance • Motor pumps (for irrigation) • Dykes (to regulate water levels) • Dune fixation (to hinder desertification) • Construction and technical improvement of wells • Reforestation and aforestation (protection from wind, heat and erosion, improved natural resource base) • Dyke construction and dune fixation combined with public works (to improve physical resilience while providing employment for poorest groups)

and at the same time spend more and more time fetching water and firewood for cooking, find little time to dedicate to other activities such as petty trade and vegetable gardening. Sending children to school seems like a luxury when any pair of hands is needed to carry water from a well or river. Also, repeated economic and weather-related shocks deplete many households' asset bases and make even the little contributions required for the participation in cooperative activities impossible. Time and resource constraints pose significant challenges for adaptation strategies.

As shown in Table 10 above, an array of interventions addressing vulnerability has already been implemented. Many of them have limited success in reducing overall vulnerability as they only benefit particular groups and do little to address the most vulnerable households. Also, comparisons between different wealth groups showed that the perception of institutions varies significantly between wealthier and poorer groups. In Boya, for example, the better-off described the institutional structure as a tight network of entrepreneurial opportunities with external interventions as their satellites. The poor, on the other hand, described the local institutions as a loose composition of actors from within and outside the community, failing to meet their basic needs.

Local traditional leadership. As a general tendency, local traditional leadership, consisting of a chief, his council and in some cases sub-council, is perceived as highly important. Most people unanimously placed them at the heart of the institutional landscape of their communities. The unconditional acknowledgement of the authority and fairness of a village chief and his council and their important roles in dispute settlement, resource distribution and any other major decision at village level have in some communities been beneficial in ensuring an equitable distribution of resources and for efforts to improve natural resource management. In cases of an emergency in the village, it has often been the village councils who came up with a response plan and were quick to deploy resources and people to help. In Kardjime, Sana and Kiri, a comparatively equitable access to institutions across wealth, gender and age groups is attributed to a large extent to the respective village chiefs leading a transparent and collective decision-making process. The case of Boya, however, shows that the distribution of asset transfers from external institutions, if handed over to locals, needs to be better monitored.

Health and education facilities. Despite equal access to health and education in theory, there are several constraints on poor households in particular, inhibiting their use of these facilities. Firstly, they often lack the means to incur the related costs, or the time and energy to walk all the way to the next village or city when there is no health centre available locally. Secondly, there are accounts of cases where health service staff overcharged their clients for services or took advantage of the illiteracy of many women to sell ineffective remedies for inflated prices. Where they are accessible and work efficiently, however, health centres can be vital partners for NGOS in monitoring and preventing malnutrition of mothers and children.

School enrolment involves similar challenges of time constraint, costs and long distances. Children often cannot attend school when their parents cannot spare the money or the labour. Students in the Niger valley lucky enough to be able to attend secondary school in a neighbouring village report increasing fatigue from the long distances they cover daily, in the midday heat. However, school feeding programmes, awareness-raising and an increased school enrolment of girls as a result, as well as the general transformation of gender roles, have been of real benefit. In the two villages in Mopti, sending girls to school is increasingly viewed as extremely useful, not only for the students' future opportunities in off-farm activities but also for their families' current efforts in livelihood diversification, eg microfinance and petty trade, where literacy and numeracy skills are needed.

Cooperatives and micro-finance. Whether initiated locally or by external institutions, cooperative activities are highly appreciated for their positive outcomes in terms of risk-sharing and as buffers for shocks. Many of them were created directly in response to one of the Great Droughts, particularly in the early 1990s. They aim to ease the effects of seasonal and inter-annual price fluctuations, the impacts of climate-related shocks and stressors, particularly drought, and resulting hardship – through collective savings, use of equipment, harvest and grain storage, and by enabling income-generating activities for young people and women. They have been instrumental in improving food availability and access. However, they can be socially transformative as they can perpetuate and amplify existing inequities. In some cases, poor households do not have the means to contribute for membership, are denied membership by existing members, are denied even the smallest credit, or are given loan conditions that increase their indebtedness. When the rains fail in two or more successive years, poor households often fail to repay loans that they took out to invest in cattle or seeds.

National government and extension services. Governmental institutions generally receive negative feedback. Generally, they tend to favour the wealthier owners of large herds of livestock or many fields, and largely neglect disadvantaged households who own nothing or only a few animals. In the Mopti region, the Water and Forestry Service is known for collecting high taxes, without delivering any support whatsoever in return. The only component of national programmes genuinely benefiting poor groups – public works programmes in dyke construction and dune fixation – provides employment opportunities but it does so in a way that does not reflect local realities at all. Providing additional employment precisely in those months of the year when there is a high demand for labour in agriculture can actually have a negative impact on the household.

Since the beginning of the Malian decentralisation process in the early 1990s, government has largely withdrawn from the local level and mostly works through contracting others for individual projects. Government has thus become largely invisible to the locals, who feel neglected. They particularly miss a firm regulation of natural resource use which, without governmental guidance, is difficult to negotiate between local communities, across regions and even across borders. Local natural resource management conventions are often undermined by migrants from other regions or countries.

NGOs. NGO interventions are, with a few exceptions, perceived as arbitrary, unpredictable and unsustainable, particularly in Boya. A closer look at these patterns in Kardjime, however, revealed that most interventions by international institutions were launched in the aftermaths of the grandes sécheresses of the 1970s, 1980s and 1990s, and that they have intensified over the last decade. NGOs are known for their pronounced efforts to support children and women. Their programmes were instrumental in empowering women through enrolling them in income-generating activities. However, people often

complained about the fact that far too little has been done for elderly people, who are extremely vulnerable to hunger and health problems and often feel like a burden on their families.

> **"Since the drought of 1973, farmers have tried to diversify their farming to fight hunger. The vegetable gardens have given a good yield and people have been helped by the government and an international NGO."**
>
> *(Mme Lalla, Arhabou, Koissa)*

4.3 DISCUSSION AND SUMMARY OF THE MALI CASE STUDY

The findings emphasise, in the localised context of climate variability and change, that drought, highly erratic weather and a range of closely related stressors have deteriorated the ecological environment and socio-economic conditions in which rural livelihoods are embedded. People stressed that the frequency, rather than the severity of hazards, was more significant. While all communities have similar degrees of exposure to similar climatic stressors, the impacts on livelihoods vary greatly between the different regions due to varying access to strategies.

A range of factors determines the impacts and livelihood strategies at the household level, such as the degree of livelihood diversification, wealth, access to local and external institutions and gender relations. The poorest households are most prone to using adverse and unsustainable coping strategies. Generally, communities are changing their agricultural and livestock-keeping practices and diversifying into areas such as vegetable gardening, artisan activities and petty trade. Local conventions have tried to manage natural resources to prevent disputes over land for grazing and farming, but the government needs to boost the local conventions with further regulations so that migrants passing through areas will abide by them.

Institutions influence access to resources and decision-making which affect adaptive capacity. Traditionally, a number of systems existed that provided buffers in times of crisis, but many of these were reported to be in decline, as is the case for community solidarity. External institutions have grown in their presence over the past 15 years, and communities identify their programmes rather than the organisations themselves. They have increased options to diversify livelihoods, improved infrastructure and built capacities. Some changes opened up opportunities for the increased participation of women (for example, women's cooperatives have empowered women, increased their livelihood choices and adaptive capacity), though these opportunities were not always reflected in formal institutions. NGOs have played a part in empowering women through income-generating activities, but on the whole households suggest that NGO interventions need to be more predictable and sustainable and provide extra support for the elderly. Commonly, access to benefits from supporting structures depends also on wealth and, in some cases, ethnicity. As illustrated above, richer households described networks in the village as opportunities for entrepreneurship, while poorer households perceived them as distant and loosely structured, providing little or no support. However, in some areas, village chiefs have ensured more equitable access to institutions across groups through a transparent and collective decision-making process. Government institutions should target vulnerable households, rather than wealthier owners of livestock and land eg by planning public works programmes that do not clash with planting and harvesting seasons, and ensure that departments such as the Water and Forestry Service deliver tangible support in return for taxes.

5 CONCLUSIONS

This report has addressed people's perceptions of changes, the kind of actions taken to tackle change and people's access to support from local institutions and social ties. It has highlighted people's knowledge and capacity while also assessing the constraints they face. Climate is only one of many stressors households must deal with on a regular basis. As such, it is essential to address climate-related risks together with other drivers of vulnerability. Households (particularly the poorest ones) are locked into certain types of response, often resulting in a downward spiral of asset depletion. Institutions and social structures fail to protect common interests which restrict households' options even further.

PERCEPTIONS OF CHANGES IN RAINFALL AND OTHER CLIMATE STRESSORS

Communities are no longer confident about rainfall patterns. People say that, particularly over the past ten years, the rain has become increasingly unpredictable and erratic; the seasonal rains have started later and finished earlier. In the Ethiopia case study, there was a strong perception that 'good rains' were a thing of the past and, in the case of Mali, there was a perception of a drying climate. These perceptions at the local level may also be influenced by other factors. A certain bias towards always perceiving the past to be better cannot be ruled out. Also, the fact that people's livelihoods are changing may play a role, for example in the case of traditional pastoralists now being more settled and dependent on rainfall in a certain location and at certain times.

Nevertheless, perceptions of rainfall change matter because they are also a reflection of changing vulnerabilities; they offer insights into what constraints people are facing, and what these in turn mean for livelihood strategies. Respondents in Ethiopia and Mali perceive a change in the type and severity of shocks and stressors and tell of the emergence of new stressors, which are explained as having a negative impact on people's assets, such as livestock and farmland. Recurrent drought was said to have significantly reduced harvests and extended hunger gaps. In the Mali case study, higher temperatures in recent years has resulted in new pest infestations affecting crops. There is less good-quality pasture, which means people have to travel further for longer periods to find pasture and water, and their cows yield insufficient milk. Conflict over shared grazing and water resources has increased between local people and those from different areas passing through.

PASTORALISM AND RAIN-FED AGRICULTURE ARE FACING STRESSORS FROM CLIMATIC AND OTHER FACTORS

Climate stressors and shocks are nothing new in these contexts and pastoral and agro-pastoral systems exhibit important features that make them well-suited to climate uncertainty and variability, including the qualities of being adaptable and flexible. In both areas, livestock is a key asset, with cultural and economic importance. It will remain central to any strategy tackling climate change and variability. Livestock ownership allows people to secure food and income, and acts as a buffer against shocks. But, due to increasing restrictions on mobility, it is increasingly hard to maintain traditional pastoral livelihood systems. In the Ethiopia case study, increasing conflict such as cattle theft and conflicts over access to water for livestock and pasture (which also occur in Mali) have also reduced households' options to tackle climate variability. Those without cattle are hit hardest by climate change. While government policies have encouraged sedentary farming, farming itself is coming under increasing stress from

what is observed as an increasingly unreliable rainfall pattern. This leads to increasingly complicated decision-making because people are vulnerable to climate change and other factors in both farming and pastoralism. Thus, even if climate change were not happening, or if climate change were to lead to improving conditions for livestock-keeping and rainfed cultivation, many people would still find it increasingly difficult to cope with 'normal' climate shocks and stressors.

THE CAPACITY TO WITHSTAND MULTIPLE SHOCKS IS BECOMING INCREASINGLY ERODED

Agro-pastoral and pastoral households are well-versed in dealing with shocks and stressors, whether they are environmental, socio-economic or climatic. Coping with a single shock is achievable for most households: the poorest are supported by the wider community, while middle-income groups are able to employ various strategies to survive. However, when one shock is compounded by another, repeatedly, over a number of years, households' ability to bounce back becomes compromised and resilience diminished. To exacerbate the situation, the type and severity of shocks are changing and new risks and vulnerabilities are emerging. Not only are people affected by climatic shocks, but there are also other social, economic and environmental factors, such as volatile food prices, institutions and policies which affect livelihoods.

Households in both case studies reported an increasing sense of insecurity, with extended hunger periods. In the Ethiopia case study, people report fatigue, weakness and increased susceptibility to disease, making it difficult to complete their daily work. Generally, mutual support between households has become weaker. Middle-income and better-off households are no longer in a position to assist those with limited access to resources because they need to meet their own needs.

MANY HOUSEHOLDS HAVE FEW ALTERNATIVES TO STRATEGIES THAT EXACERBATE VULNERABILITY

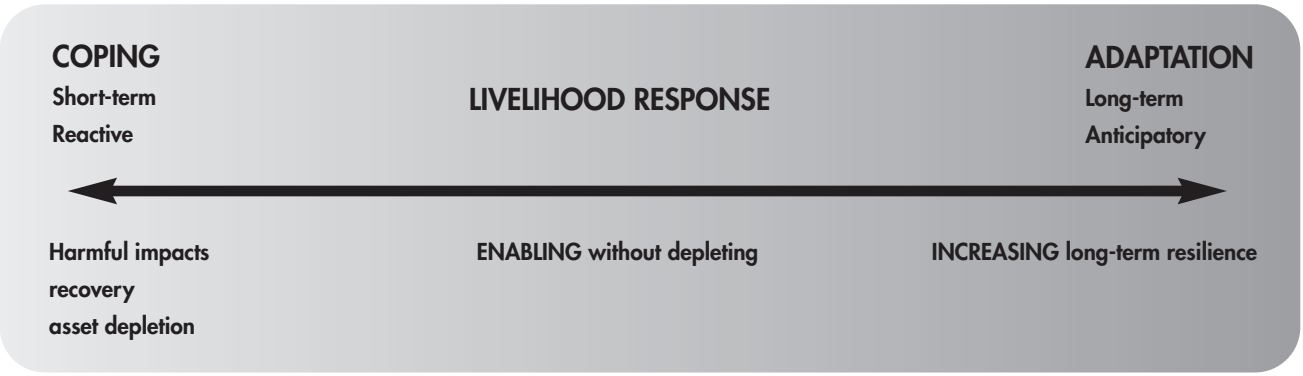
To cope with the changes, where possible, farmers are diversifying their livelihood base by, for example, increasing cropping, changing planting dates, engaging in petty trade and labour migration. These strategies may be seen as both spatial diversification (moving to new areas, using land differently) and temporal diversification (staggering planting dates or changing seasons to account for the availability of labour opportunities). While this may well be one pathway to successful adaptation, it is clear that, for many social groups, they are locked into certain strategies that are putting them in an increasingly difficult position. In many cases, households' response strategies are also depleting their asset base. Increased pressure on natural resources and the sale of livestock all contribute to negative cycles affecting food security and nutritional status. Labour migration poses risks and uncertainty for households' income, and may lead to labour shortages at home, particularly during difficult parts of the year. Labour migration and other strategies that were considered temporary activities now seem a more permanent feature of livelihoods in both case studies. Activities such as petty trade mean that households are increasingly reliant on the market.

ADAPTATION MEANS MULTIPLE STRATEGIES IN THE FACE OF UNCERTAINTY

The case studies distinguished between asset-depleting, unsustainable, short-term practices and longer-term strategies implying permanent changes in livelihoods in a way that increases robustness to future stressors. These two responses are commonly referred to as coping and adaptation. Research on adaptation has often tried to establish a clear demarcation between coping strategies and adaptation measures.[10] However, the findings illustrate that attempts to label an activity as 'coping' or 'adaptation' can sometimes prove fruitless and misleading. In fact, for many strategies identified, it is not possible or meaningful to distinguish between the two.

[10] *See Davies 1996, Thomas et al 2005, Osbahr et al 2007.*

FIGURE 6 **A COPING AND ADAPTATION CONTINUUM**



The strategies adopted by households are a response to a variety of triggers, based on evolving vulnerabilities. Outcomes can be both positive and negative over different lengths of time. Some responses lock households into patterns of depleting assets and lead to greater pressure on natural resources, with knock-on effects for peoples' options to adapt over the long term. Still, other responses open up new opportunities, make households more resilient to shocks and stressors, and may help empower marginalised groups. Many of them can be seen as both responses to rapid-onset shocks and an attempt to adapt to the anticipated repetition of future shocks. Some of them gradually evolve from a spontaneous reaction to an integral part of a livelihood system, while others remain short-term exceptions from business as usual. Households make their decisions as to what changes they are able to implement based on a thorough assessment of their current and potential resources at the time of the event. These decisions might well have been different with the benefit of hindsight.

Figure 6 illustrates that coping and adaptation may be seen as part of a continuum of complex livelihood responses to a range of stressors and with multiple sets of outcomes.

LOCAL INSTITUTIONS CAN SUPPORT ADAPTATION, BUT ACCESS IS SHAPED BY ASSETS, SOCIAL STATUS AND CULTURE

Institutions at the local level play a key role in determining what options households have to cope and adapt. The most common types of institution documented include government agencies, NGOs and civil society organisations, government rules and regulations for managing rangelands and forests, as well as traditional ruling systems. Their core function in terms of adaptation is determining access to key resources such as pasture, water resources and credit. The *Gada* system in Ethiopia, for example, exerts considerable influence on both pastoral and agro-pastoral livelihoods by regulating the use of resources. In an era of increasing climate uncertainty, there may be opportunities for local institutions such as the *Gada* to expand their role within natural resource management. Government institutions can boost regulations to resolve disputes between local people and migrants passing through. In Mali, farmers' and fisheries' organisations provide credit, which is empowering women, and access to markets. Perceptions of local institutions vary between and within communities. While most external support is perceived as effective in supporting livelihoods to face or recover from shocks, many interventions are short-term, *ad hoc* and not adapted to the seasonal cycles.

It is clear that household response to shocks is affected by access to institutions, which varies across

wealth, gender and age groups. Poor households are extremely resourceful when faced with shocks, but they have limited options to diversify. The poorest often do not benefit from support available through traditional structures, such as gifts of livestock and food. The support that is available is often meagre. A related point is that there are few vertical linkages, such as those that bind local elites with those who are less well-off – ties that can help to lift people out of a state of chronic vulnerability. In addition, activities such as petty trade require start-up capital and access to credit to which only the wealthier households have access. The poorest are excluded from credit systems because they are not literate or do not have the minimum level of inputs required. At the same time, findings also suggest that even rich farmers are feeling increasingly insecure, which has trickle-down effects on the poorer parts of the population. An exception to this is the example of village chiefs in the Mali case study, who have ensured more equitable access to institutions across wealth and gender groups through a transparent and collective decision-making process.

Local institutions are changing, and so are people's abilities to use them to their advantage. Changes to institutions are a result of many factors, including social and cultural changes, market changes and, importantly, an increasingly erratic climate that can undermine institutions' ability to foster mutual support. Historically, key climate shocks such as the droughts in the 1970s and 1980s led to major upheavals in local structures. Responses suggest that recent social and environmental changes mean that many young people no longer see a future in their home villages and decide to migrate seasonally or permanently in search of alternative livelihoods. The most vulnerable people – women, children and the elderly – are left behind. External aid and support given by the state have not been able to make up for the loss of support from informal social support networks. But there are also examples of increased opportunities following change, such as adjustments

in the *Gada* system in Ethiopia giving increased opportunities for women.

In all this is the expectation of increased funding for climate adaptation over the coming years. The NAPAs for Mali and Ethiopia (see Annex IV) have prioritised activities that are relevant to the agriculture sector to ensure food security, but in reality there may be competing demands such as infrastructure that may not target the most vulnerable. See Annex III for details on government policies relevant to food security and climate change.

It is clear that climate change is one among many stressors a household must deal with on a daily basis. The case studies suggest that the capacity of the most vulnerable groups to withstand multiple shocks is becoming increasingly eroded. The report has illustrated how many households have no alternative but to pursue strategies that exacerbate vulnerability. Social status and asset level play a significant role in determining how households are affected by climate change, and importantly, will determine their options for response. Findings illustrate that households employ a range of types of strategies in the face of adversity, which are partly dependent on the type of support available from local institutions. The final section outlines key recommendations for action.

6 RECOMMENDATIONS FOR POLICY, PRACTICE AND RESEARCH

The report identifies recommendations for different stakeholders and their efforts to promote food security and resilience in people's livelihoods in a changing climate. They are relevant for existing development strategies, but also for new and additional funding that will become available for adaptation under a global post-2012 climate change agreement.

IN COLLABORATION WITH OTHER STAKEHOLDERS, NGOS SHOULD:

- **Ensure that people's local knowledge of climate change impacts and livelihood responses is connected to relevant decision-making processes, so that policies and programmes are grounded in local realities.**

NGOs have an important role in making linkages between policy processes and the issues discussed in this report. Local perceptions of change could provide useful input into drought management policies; people's livelihood responses may offer important information about why people are less able than before to cope with 'normal' years. Changes in seasonal rainfall patterns, mentioned by a number of respondents in all case study areas, exemplify the particular challenges people are facing in coping with increased hunger gaps.

- **Advocate for greater political commitment and more financial support for adaptation from governments and donors, while providing insights into the local politics and social changes that affect patterns of vulnerability seen on the ground.**

NGOs should tailor programmes and support for basic services to the diversity of needs that are created in the face of changes to climate and other shocks and stressors, based on assessments of changes in markets, government policies, support structures and the environment.

As the report has shown, people's responses to climate stresses are compromised by various non-climate factors, such as limited access to informal or formal support networks by those with the fewest assets or lowest social status. Changes in markets, government policies and the environment have resulted in an increasing sense of insecurity among farmers and herders in the case study areas.

- **Document and communicate new and innovative livelihood response strategies to climate shocks and stressors.**

NGOs can provide valuable insights into how people are responding to change in new and innovative ways. The case studies documented a number of traditional and new strategies that contribute to asset-building and increased household assets. A useful next step would be to identify success stories and lessons learnt, and analyse how people take advantage of opportunities that arise from adjustments in production systems and economies, exploring the requirements for leveraging innovations.

NATIONAL GOVERNMENTS SHOULD:

- **Improve policy coherence, coordination, synergy and sectoral integration between national development goals and diverse adaptation needs, incorporating climate risk across sectors. Ensure that food security is a high political priority with sufficient budget in sectors relevant to climate change adaptation.**

  - Match the objectives and goals of development strategies and policies with what is required to strengthen adaptive capacities, access to resources and livelihood assets, resilience and flexibility of

different social groups in adjusting to changes in seasonal patterns and long-term climatic changes.

- Use tools to evaluate what 'climate resilience' means in practice to ensure food security, such as the framework by Twigg (2007, see Annex V).

- **Improve linkages and communication flows between early warning departments, food security agencies and safety net programmes** to ensure timely assistance, protection of assets and flexibility to adapt to future change to expand the size of transfers per capita if conditions deteriorate.
- **Strengthen existing local adaptive capacities and strategies through a range of social and political interventions, ensuring communities' participation in policy development and implementation.**

  - Extend social protection to vulnerable groups, taking seasonality into account in planning, and provide hunger safety nets at critical times of year (eg cash or food transfers).

  - Reform policies to safeguard and promote the rights and interests of marginalised populations such as pastoralists and agro-pastoralists, given that adaptation is to a large extent a political and social issue.

Adaptive capacities relate to political and economic contexts as much as they do to changes in agricultural practices and resource management strategies. Factors such as wealth and gender are key to deciding who can access resources, such as land and water, and take advantage of new opportunities. Thus, improved access to seeds and other new technologies may not improve resilience unless structural constraints such as labour shortages or gender-based hindrances are addressed at the same time.

DONORS SHOULD:

- **Support governments to base development planning and policies on climate risk information and analyses in order to:**

  - better understand socio-economic and political factors, local realities, access to institutions and why some people in a particular context are vulnerable, and less able to adjust their livelihoods, while other actors and groups are more resilient

  - identify other ways of strengthening people's climate resilience, such as through social protection measures and other forms of livelihood support and asset-building

  - build on communities' existing and innovative adaptation strategies and processes, rather than treat people as recipients of knowledge, technology and related support

- **Support governments with longer-term, predictable funding arrangements** to ensure adaptation and food security, taking into account local dynamics as well as national-level and sector-level changes.

  - Fund NAPAs as a transition step towards the sustainable implementation and integration of adaptation activities into national development planning, sectoral policies and strategies.

  - Incorporate contingency plans and budgets into projects and support flexibility in aid responses to climate shocks. Contingency funds allow actors at sub-national levels to respond in more predictable ways to impending shocks and stressors.

ACADEMIA AND RESEARCHERS SHOULD:

- **Provide critical analysis of local perceptions** of climate variability and change by contextualising them in deeper historical and wider structural settings.

Local perceptions can be interpreted in very different ways. As this study demonstrates, it is necessary to record local perceptions of change and to identify how people are responding – but it is not sufficient simply to leave it at that.

- **Work with communities and NGOs to develop more robust research methods** to explore local knowledge and perceptions and develop baselines to evaluate future shifts in them.
- **Use more rigorous methodological approaches, longitudinal research and systematic reviews** on local knowledge and perceptions to make the evidence base even more robust and relevant for policy actors to respond to.

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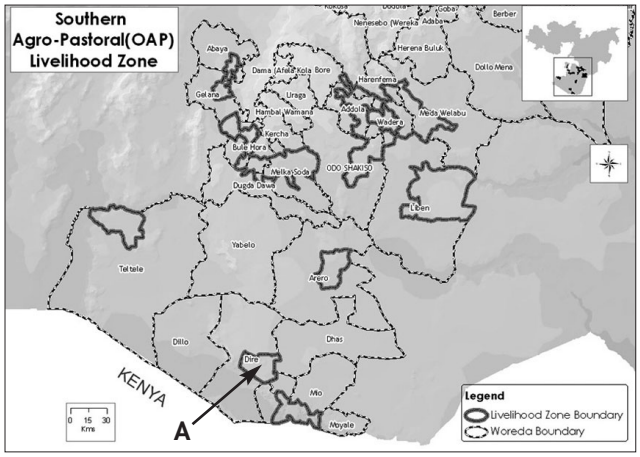
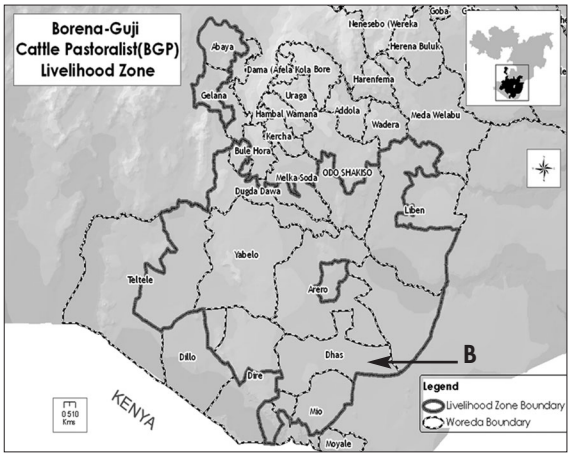
7 ANNEXES

7.1 ANNEX I – LOCATION OF RESEARCH SITES IN ETHIOPIA AND MALI

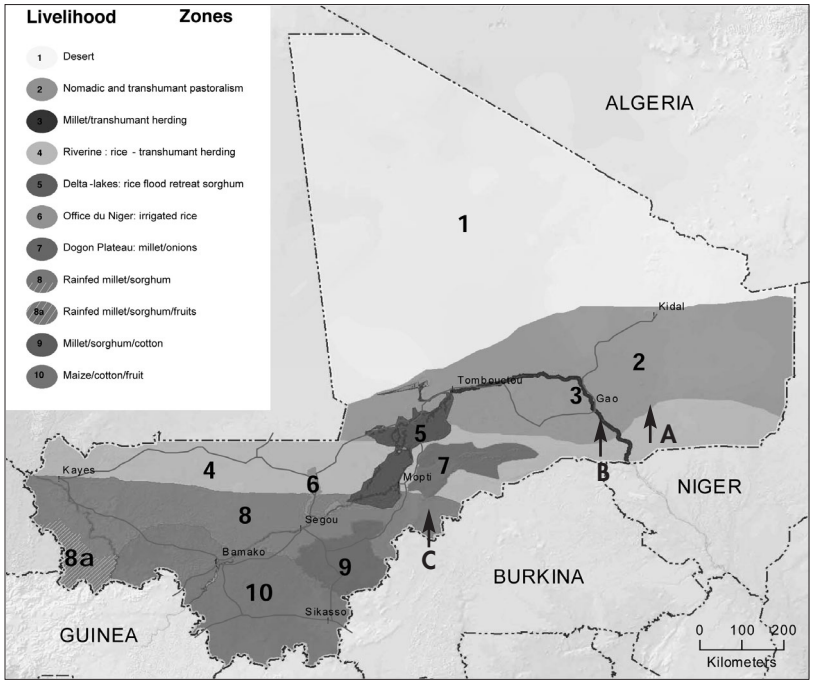
ETHIOPIA





LEGEND
A Borena agro-pastoral
B Borena pastoral

MALI



LEGEND
A Gao pastoral
B Gao agro-pastoral
C Mopti agro-pastoral

Source: FEWSNET, Livelihoods in Mali; available on: www.fews.net/pages/countrylivelihood.aspx?gb=ml&l=fr

7.2 ANNEX II – CONCEPTS AND DEFINITIONS

ADAPTATION

In referring to climate change adaptation (CCA), we use here the definition by IPCC (2007 AR4), considering adaptation as an 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities. By extension, adaptation refers to adjustments […] in response to climatic- and non-climatic stimuli or their effects.'

CLIMATE CHANGE AND VARIABILITY

We use the IPCC understanding of climate change: it refers to any change in climate over time, whether due to natural variability or as a result of human activity. Climate variability refers to fluctuations that occur from year to year, including extreme events.

DISASTER RISK REDUCTION

The concept and practice of reducing disaster risks through systematic efforts to analyse and manage the causal factors of disasters, including through reduced exposure to hazards, lessened vulnerability of people and property, wise management of land and the environment, and improved preparedness for adverse events (UNISDR, 2009).

FOOD SECURITY

Food security exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 2002).

LIVELIHOODS

A popular definition is that provided by Chambers and Conway (1992:7) wherein a livelihood 'comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living'. The important feature of this livelihood definition is to direct attention to the links between assets and the options people possess in practice to pursue alternative activities that can generate the income level required for survival. Followers of the Chambers and Conway line of thinking about livelihoods (eg Scoones, 1998) have tended to identify five main categories of assets: natural, physical, human, financial and social assets.

LIVELIHOOD STRATEGIES

Livelihood strategies are what people do to make a living in normal times to meet their needs, eg agriculture, livestock-keeping and wage labour. Livelihood response strategies are what people do in the face of shocks and stressors; they include coping strategies and adaptation strategies.

Coping strategies overlap with adaptation strategies in that they seek to reduce harm from stressors and their effects, but they do so in a more immediate, reactive and survival-oriented way, 'motivated by crisis' and 'prompted by a lack of alternatives' (Daze et al, 2009:7). As such, they are largely unsustainable in the long run and often entail harmful livelihood impacts, ie the depletion of livelihood assets, which can affect communities as a whole (eg through environmental degradation) and particular social groups, such as women and children (eg reduced food intake).

Adaptation strategies (originally referred to adaptive strategies in the livelihood literature) entail a long-term change in behaviour; they refer to efforts to improve livelihoods sustainably in response to such given or anticipated stimuli.

RESILIENCE

'System or community resilience can be understood as:

- capacity to absorb stress or destructive forces through resistance or adaptation
- capacity to manage or maintain certain basic functions and structures, during disastrous events
- capacity to recover or "bounce back"

after an event
"Resilience" is generally seen as a broader concept than "capacity" because it goes beyond the specific behaviour, measures and strategies that are normally understood as capacities.' (Twigg, 2007:6)

SEASONALITY
Seasonality refers as periodic fluctuations in the climate related to seasons of the year and to the changing availability of resources according to the different seasons. According to Mortimore (2009), each rainy season is "constructed as a composite of decadal, annual and daily variability, and (…) it constitutes a separate production opportunity and accounting unit."

SHOCKS AND STRESSORS
Punctuated and ongoing pressures that fundamentally affect people's livelihoods, over which they have limited or no control; stressors are cumulative and comprise of critical trends as well as shocks and seasonality.

VULNERABILITY
Vulnerability to climate variability and change is 'the degree to which a system is susceptible to, or 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 variation to which a system is exposed, its sensitivity and its adaptive capacity' (IPCC AR4: 883). This report refers to 'system' as a household or a rural community.

Exposure - 'The nature and degree to which a system is exposed to significant climatic variations' (IPCC TAR, 2001). As a factor shaping vulnerability to climate variability and change, exposure to climatic variations is not isolated from other risks: 'Exposure to one type of risk can increase vulnerability to other risk factors.' (CCD, 2009:14)

Sensitivity - 'The degree to which a system is affected, either adversely or beneficially, by climate-related stimuli' (IPCC TAR, 2001).

Capacities; adaptive capacity - 'Adaptive capacity refers to the potential to adapt to the challenges posed by climate change, describing the ability to be actively involved in processes of change. It encompasses the ability of actors within a particular human and environmental system to respond to changes, shape changes and create changes in that system' (Ensor and Berger, 2009:17).

By extension, vulnerability refers as well to the degree to which a system is susceptible to, or unable to cope with, adverse effects of climatic- and non-climatic stressors.

7.3 ANNEX III NATIONAL CLIMATE CHANGE AND FOOD SECURITY CONTEXT

7.3.1 ETHIOPIA

Agriculture constitutes about 56 per cent of the Ethiopian GDP, and 85 per cent of the population's livelihoods are based on agriculture. The government signed up to the UNFCCC and the Kyoto Protocol in 1999.

The Environment Protection Authority (EPA) has recently been given full authorisation to coordinate climate change-related issues in the country. The Ethiopian government has prepared the NAPA document with a list of prioritised activities to address the issue of food insecurity, in due course also implementing adaptation and environment rehabilitation interventions.[11] Recognising the cross-cutting nature of climate change, the NAPA suggests that climate change and adaptation interventions are incorporated into the ongoing national programmes such as poverty reduction as a sub-component. It particularly highlights the national programmes on food security and disaster prevention and management, which should be considered when planning interventions that

[11] *See Annex IV for further details.*

address climate change and adaptation. Barriers for adaptation gains from ongoing national initiatives are also listed.[12]

The IPCC is preparing a National Appropriate Mitigation Action (NAMA) under the EPA. A national climate change forum has been established, chaired by MoARD, with Oxfam America as secretary. In January 2010, a third conference was held on disaster risk management, with the theme 'Enhancing disaster risk management for reducing the impact of climate change'. One local NGO, Forum for Environment, has established a civil society forum for climate change, which has been organising different workshops and discussions through the media after the climate change negotiations at Copenhagen, which the Prime Minister attended in 2009. Generally, the negotiations created awareness amongst all communities, including farmers and pastoralists, that climate change is already happening and signalled the need to act soon to save future generations. However, the lack of a global agreement on climate change will mean a shortage of adaptation funds and a delay in the preparation of new policies and their implementation.

The government has moved forward in implementing the Hyogo Framework for Action 2005–15 priorities through developing a Disaster Risk Reduction Strategy. The government claims that it has transformed its disaster management system from a traditionally reactive and relief-oriented system to a proactive, people-centred disaster risk reduction and management-focused system that mitigates potential disasters by strengthening capacity (including in preparedness and emergency response) for disaster risk management.[13] The UN agencies also play a significant role in emergency response planning and funding. A new policy on disaster management and food security is going through parliament for endorsement. Civil society organisations, through the Poverty Action Network Ethiopia (PANE), are involved in the review of the annual reports of the Plan for Accelerated Sustainable Development to End Poverty (PASDEP). PANE has completed a study on how PASDEP can take account of climate change impacts.

The Ministry of Agriculture and Rural Development (MoARD) is officially responsible for responding to food insecurity. Some see the agricultural policy as based on a set of packages for crops that has the use of chemical fertilisers as its core strategy, which is problematic because chemical fertilisers are very expensive. Similarly, access to improved seeds is limited. Under MoARD, the Disaster Risk Management and Food Security Sector (DRMFSS) incorporates two directorates: Food security and Early Warning and Response (EWR). The Food Security Directorate coordinates national food security programmes, the Productive Safety Net Programme (PSNP) and asset-building programmes in chronically food-insecure districts. This could be improved with a clear strategy on how to move people out of the safety net system, to avoid creating a group of dependent farmers. The EWR directorate collects early warning information to activate an early response. The National Meteorological Agency (NMA) provides meteorological information to pertinent organisations and the public.

7.3.2 MALI

Agriculture represents 50 per cent of GNP and the Malian economy is strongly dependent on the performance of the agricultural sector, which is the sector most vulnerable to climate change. Eighty per cent of the population is dependent on agriculture for their livelihood.

The government is a signatory of the UNFCCC (UN Framework Convention on Climate Change) and the Kyoto Protocol. Mali is also a signatory of, and has also established a National Platform to implement, the Hyogo Framework for Action 2005–2015. A decree is in the process of being approved which would create a National Committee on Climate Change. The national policy for the Protection of the Environment, which was signed in 1998, has as one of its aims improving food security.

[12] *Ibid*
[13] *http://www.preventionweb.net/files/10076_TheOfficialstatmentofEthiopianDeleg.doc*

The government responds to food insecurity and floods by eg distributing some its national food stock for free or at a subsidised price, lifting the tax on cereal imports and seeking international aid. More recently, other solutions were initiated eg: using drought-tolerant seeds; training rural farmers in using meteorological information and planning activities according to the seasons; and community participation in developing solutions, based on vulnerability analysis and sectors in the national poverty reduction strategy.

The aim of the Directorate-General of Civil Protection is to manage and prevent disasters and coordinate civil protection actions carried out by various national departments, partners and regional branches. One natural disaster management capacity building project aimed to draw up a national plan, legal and institutional frameworks, inter-sectoral regional risk reduction plans, information exchange, and training in risks and disasters, and is being assisted by NGOs, local government authorities, state institutions and grassroots communities. However, the department does not seem to be sufficiently equipped in human or operational capacity for preventing and managing risks and disasters.

Other relevant government institutions include the Ministry of Environment, the Ministry of Water and Sanitation, and the National Management of Water and Forests. The Permanent Technical Secretariat for the Management of Environmental Issues coordinates all national-level agreements on the environment.

The government department for meteorology is the focal point for climate change, which is increasingly being taken into account in policies, plans, programmes and strategies of socio-economic development. The government has held a number of seminars to provide training, information and awareness-raising of climate change. For example, a recent workshop focused on the resilience of agricultural production to climate change in view of food security in rural areas.

Civil society can be involved in consultations and the elaboration of the text of policies. However, there seems to be a limited local of awareness of the national policies and laws eg on food security at the community level, partly due to illiteracy, difficultly in accessing information and lack of training of locally elected people in municipalities. The 'invisibility' of government at local level is also attributed to the decentralisation process which began in Mali in 2000 and has since resulted in a withdrawal of national institutions from the local level. Local NGOs also report a lack of implementation of and budget for policies on the environment and disaster management.

The Mali NAPA identifies 19 priority projects.[14] They are yet to be funded completely and Mali still waits for concrete results from the negotiations on climate change under UNFCCC.

7.4 ANNEX IV – ETHIOPIA AND MALI NAPA

The government of Ethiopia , through the NAPA, prioritised 11 projects out of the adaptation needs:

- Promoting drought/crop insurance programme
- Strengthening/enhancing drought and flood early warning systems
- Development of small-scale irrigation and water harvesting schemes in arid, semi-arid, and dry sub-humid areas
- Improving/enhancing rangeland resource management practices in the pastoral areas
- Community based sustainable utilisation and management of wet lands in selected areas
- Capacity building programme for climate change adaptation
- Realising food security through multi-purpose large-scale water development project in Genale– Dawa Basin
- Community-based carbon sequestration project in the Rift Valley System of Ethiopia
- Establishment of national research and development (R&D) centre for climate change

[14] *See Annex IV.*

- Strengthening malaria containment programme (MCP) in selected areas of Ethiopia
- Promotion of on farm and homestead forestry and agro-forestry practices in arid, semi-arid and dry-sub humid areas

Barriers for adaptation gains from ongoing national initiatives listed in the NAPA include:

- Lack of strong coordination mechanism, both at the federal and regional levels
- Inadequacy of cross-sectoral links of ministries and line departments
- Lack of linking elements such as cross-sectoral federal committees
- Lack of elaborated links of federal and regional sector offices involved in environment and development
- Lack of capacity, ie absence of a centre or an institution for research and development on climate change adaptation
- Lack of efficient outreach mechanism on environment to local communities
- Oversight of long-term environmental impacts of short-term economic benefits
- Economic challenge, ie limited finance for environment
- Low level of awareness for environment
- Low level of public literacy
- High level of poverty
- Inadequate capacity to exchange information among NMSA and NAPA project and or action plans implementers

Priority projects identified in Mali's NAPA:

- Promoting improved varieties of seed for the main food crops (millet, sorghum, maize and rice), adapted to the climatic conditions
- Promoting those animal and vegetable species best adapted to the climatic conditions
- Promoting income-generating activities and setting up of cooperatives
- Setting up fish farming operations
- Promoting cereal banks
- Making use of meteorological information to improve agricultural production and contribute to food security
- Development of low-lying land
- Sinking wells, equipped with solar- or wind-pumps
- Making use of the energy potential of a certain bulrush plant
- Promotion of solar energy
- Harnessing run-off water and refurbishing water sources (backwaters, ponds and lakes)
- Raising awareness of, and organising, the population to conserve natural resources (drawing up local conventions for reforestation and agro-forestry)
- Managing bush fires
- Developing erosion control actions and composting
- Development of forage crops
- Developing a technical 'package' for training the populations in simple climate change adaptation practices
- Promoting food banks for livestock
- Promotion of jatropha oil
- Setting up an information system about health risks associated with climatic changes

7.5 ANNEX V – CHARACTERISTICS OF A DISASTER-RESILIENT COMMUNITY – FROM A FOOD SECURITY PERSPECTIVE

THEMATIC AREA 1: GOVERNANCE	REFERENCE TO FULL LIST
• Committed, effective and accountable leadership of DRR planning and implementation • Community aware of its rights and the legal obligations of government and other stakeholders to provide protection • Inclusion/representation of vulnerable groups in community decision-making and management of DRR	1.5 2.2 7.6
THEMATIC AREA 2: RISK ASSESSMENT	
• Community-level hazard, vulnerability and capacity assessments carried out, to provide a comprehensive picture of all HVCs • HVC assessment (above), carried out as a participatory process, involving representatives of all sectors of community, including all vulnerable groups • Use of indigenous knowledge and local perceptions of risk, as well as other scientific knowledge, data and assessment methods	1.1, 2.1 1.2, 2.2 3.2
THEMATIC AREA 3: KNOWLEDGE AND EDUCATION	
• Local schools provide education in DRR for children through the curriculum and, where appropriate, extra-curricular activities. • Community members skilled or trained in appropriate agricultural, land-use, water management and environmental management practices.	3.1 3.5
THEMATIC AREA 4: RISK MANAGEMENT AND VULNERABILITY REDUCTION	
• Adoption of sustainable environmental management practices that reduce hazard risk • Food supply and nutritional status secure (eg through reserve stocks of grain and other staple foods managed by the community, with an equitable distribution system during food crisis) • Access to sufficient quantity and quality of water for domestic needs for 12 months of year • Livelihood diversification (household and community level) including on-farm and off-farm activities in rural areas • Adoption of hazard resistant agricultural practices (eg soil and water conservation methods, cropping patterns geared to low or variable rainfall, hazard tolerant crops) for food security • Mutual assistance systems, social networks and support mechanisms that support risk reduction directly through targeted DRR activities, indirectly through other socio-economic development activities that reduce vulnerability, or by being capable of extending their activities to manage emergencies when these occur • Existence of community/group savings and credit schemes, and/or access to micro-credit facilities • Structural mitigation measures in place – eg for water harvesting, field bunding or irrigation dams and channels – built using local labour, skills, materials and appropriate technology as far as possible	1.2 2.3 2.4 3.3 3.5 4.1 5.3 6.4
THEMATIC AREA 5: DISASTER PREPAREDNESS AND RESPONSE	
• Local organisational structures for disaster preparedness or emergency response in place (eg disaster preparedness committee) • Community-based and people-centred Early Warning System in place, which generates timely, trustworthy and understandable warnings of hazards to reach all members of community • Community and household contingency plans in place for drought, including preservation of key assets (eg fodder, water and health of livestock) • Emergency supplies (buffer stocks) in place, managed by community, alone or in partnership with other local organisations (including grain/seed banks)	1.2 2.1, 2.2, 2.3, 2.7 3.1 & 3.9 4.7

Note: The five thematic categories are those used by John Twigg in Characteristics of a disaster-resilient community; similarly, the numbers in the right-hand column refer to a particular characteristic within that category in the original publication. Characteristics have been selected according to measurability and relevance to slow-onset disasters, choosing at least two per category and minimising overlap between them. They may not necessarily be the most important characteristics.

Action Against Hunger - UK
www.actionagainsthunger.org.uk

Action contre la Faim - France
www.actioncontrelafaim.org

Acción contra el Hambre - Spain
www.accioncontraelhambre.org

Action contre la Faim - Canada
www.actioncontrelafaim.ca

Action Against Hunger - USA
www.actionagainsthunger.org

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