



# **Impacts of Climate Change on Livelihoods: What are the Implications for Social Protection?**

Rachel Cipryk

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# **Impacts of climate change on livelihoods: What are the implications for social protection?**

**Rachel Cipryk<sup>1</sup>**

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**Summary:** The impacts of climate change will be felt in many ways, by many groups and people around the globe. But exactly how the climate will change in particular areas is not yet fully understood, nor, consequently, are the implications for people. This paper explores how rural agricultural livelihoods in Ethiopia may be impacted by the potential changes. It then considers the consequences and opportunities arising from this, focussing on how social protection may support the poorest and most vulnerable in adapting to the changing climate.

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## Acronyms, Abbreviations and Glossary

<i>belg</i>	the rainy season in May/June; the short rains
DFID	Department for International Development
<i>enset</i>	a drought resistant plant often held in reserve for drought
FSP	Food Security Programme
GNI	Gross National Income
GDP	Gross Domestic Product
HEA	Household Economy Analysis
IPCC	Intergovernmental Panel on Climate Change
<i>kirempt</i>	the long rains in July/August; known in some places as <i>meher</i>
LZ	Livelihood Zone
<i>meher</i>	the long rains in July/August; known in some places as <i>kirempt</i>
MOARD	Ministry of Agriculture and Rural Development
MEDaC	Ministry of Economic Development and Cooperation
PASDEP	Plan for Accelerated and Sustained Development to End Poverty
PRSP	Poverty Reduction Strategy Paper
PSNP	Productive Safety Net Programme
SRM	Social Risk Management
<i>teff</i>	a grain local to Ethiopia; <i>teff</i> is a staple in many regions
TSP	Transformative Social Protection
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
<i>woreda</i>	district; lowest level of government in Ethiopia

## 1. Introduction

Climate change is happening; and though debate continues regarding how much it will change, it is no longer an option to approach development planning without recognition of the challenges that lie ahead, and without a clear plan of how to incorporate the consequences of climate change.

Climate change, as defined by the Intergovernmental Panel on Climate Change (IPCC), is 'any change in climate over time, whether due to natural variability or as a result of human activity' (IPCC 2007: 21). To this, the United Nations Framework Convention on Climate Change (UNFCCC) identifies two broad responses: 'mitigation of climate change by reducing greenhouse-gas emissions and enhancing sinks, and adaptation to the impacts of climate change' (IPCC 2007: 748). *Mitigation* is defined as 'an anthropogenic intervention to reduce the source or enhance the sinks of greenhouse gases' (IPCC 2007: 750) and *adaptation* is given to mean 'adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (IPCC 2007: 750).

Predominantly - as is reflected in the terminology cited above - much of the thinking and research on climate change has focussed primarily on the climatic and physical aspects of the coming change such as predictions, modelling, physical disaster risk reduction strategies and infrastructural adaptation plans. Though increasingly a point of emphasis, the social and ecological impacts on people and how people will cope with a changing climate has received inadequate attention to date (Clark in McLaughlin and Dietz 2007). This paper seeks to bring some of these issues forward and explore the challenges, impacts and potential responses to a changing climate, especially for the livelihoods of the poorest and most vulnerable.

The concept of livelihoods has become increasingly popular in development study and practice in the recent past. Developing an understanding of what comprises a livelihood, what strategies are pursued in good and bad times, what resources are needed to make them viable, and how these resources are accessed has been the focus of much of this

work. Central to this thinking are the factors that make a livelihood sustainable – a key topic given the context of climate change.

Social protection is a central focus in development that undergoes ongoing debates in policy arenas of national governments, in donor offices and in the field concerning, amongst other things, definition, scope, premise, feasibility, and sustainability. But its importance in protecting and promoting sustainable livelihoods through times of shock is not in question. Given this broad mandate, the potential for social protection to help respond to the challenges climate change will bring is immense.

Through combining the potential consequences of climate change with an understanding of livelihoods, this paper explores how social protection can help respond to the challenges of the future. Ethiopia - one of the poorest countries in the world and highly vulnerable to the impacts of climate change - will be used as a case study to examine the potential for combining these three areas of thought and research, with a view to promoting a more human-focussed approach to climate change adaptation.

The paper is structured into six Chapters. Chapter 2 explores concepts and frameworks pertinent to the discussion and establishes the analytical framework and theory for the paper. Chapter 3 sets the scene, explaining methodology for the study and providing contextual background for the case studies. Chapter 4 examines two case studies in detail. Chapter 5 analyses the findings of the case studies and their implications for social protection policy in Ethiopia. Chapter 6 offers reflections on the framework and theory, and concluding remarks.

## **2. Conceptual frameworks**

This paper explores a range of themes associated with each of climate change, livelihoods and social protection in order to understand both the consequences and opportunities that the coming changes present. This section will outline some of the approaches used to frame the debates and thinking.

### **Climate change and vulnerability**

The IPCC adaptation definition (above) covers many of the issues that are contentious, including 'actual or expected climatic stimuli or their effects'. Though it seems to have been widely accepted that climate change is, in fact, happening, the future effects are highly debated and, as yet, quite uncertain. Research continues to attempt to determine how and to what extent climate change will affect different geographical regions and the people therein. Efforts to increase the focus of attention on the latter are extending, but the institutional and policy responses that can ensure comprehensive efforts are slow in coming. Though adaptation and response to changes is a combination of natural and social forces (Dore and Etkin 2003: 75) it is often the case that institutionally planned responses focus on physical - whilst ignoring social - dimensions. The purpose of this paper is to explore ways in which social forces can be considered in the climate change discussion, and how human systems can better respond.

The IPCC defines vulnerability as 'the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity' (IPCC 2007: 21). Though seemingly science focussed, this definition may offer more to the development debate than first glance would assume. Despite being expressed in technical terminology that refers to systems (rather than people), the principles are largely consistent with those that are also used in development and focussed on humans. As it is one of the main foci of development thinking and practice, and highly important in the climate change discussion, further exploration of this highly debated term is required.

One of the most quoted definitions of vulnerability in development comes from Robert Chambers, who interprets it as

[poor people's] exposure to contingencies and stress, and difficulty in coping with them. Vulnerability thus has two sides: an external side of risks, shocks and stress to which an individual or household is subject, and an internal side which is defencelessness, meaning a lack of means to cope without damaging loss.

(Chambers 1989: 1)

Whether talking about climate change or other types of shocks (e.g. health shocks or the loss of a family member), the focus on the internal and the external is foundational in explaining vulnerability. Described in the IPCC definition, in Chambers, and in work on emergency response (Boudreau 2007), understanding vulnerability is not only about understanding the risk or hazard, but also how one manages during a shock given the resources and capital to cope.

In the context of climate change, then, vulnerability will vary depending on (1) the combined effect of the system's (whether individual, household, community, region or nation) internal coping capacity, and (2) the nature and severity of the shock. It is also important to note that vulnerability can change over time depending on a number of factors, notably in the context of climate change, the magnitude of the shock and frequency as well as the degree to which adaptive capacity has been developed (Dore and Etkin 2003; Wisner *et al.* 2004).

Further exploring this idea of internal vulnerability, Adger (1996) emphasises the social determinants such as social capital, group membership and their secondary effects of physical location and access to resources that are fundamental to one's ability to cope with shocks. He states, 'social vulnerability to climate variability is the key dimension in the constitution of vulnerability, and that this parameter shifts emphasis onto the underlying rather than the proximate causes of vulnerability' (Adger 1996: abstract). The composite make-up of these underlying causes of vulnerability is complex<sup>2</sup>. One of the most broadly included, determined to be at the root of social vulnerability, is the effect of macro-level,

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<sup>2</sup> For an overview of various structural causes see McLaughlin and Dietz 2007.

political-economic structures (Brooks, Adger and Kelley 2005; McLaughlin and Dietz 2007; Devereux and Sabates-Wheeler 2004)<sup>3</sup>. These, in large part, determine the context and environment of the vulnerable and their access to resources to cope with external shocks. In light of this, the most vulnerable are clearly going to be most negatively impacted by the severe effects of climate change.

Highly influential in furthering the internal understanding of human vulnerability is the theory of entitlements (Sen 1981). Sen put forward the theory that famine is not caused by lack of food, but by lack of access to food. Through this, he proposed that there are four ways to gain access to food ((1) self production, (2) goods trade, (3) exchange for labour, (4) purchase or gift) and thus challenged the way that people had previously conceived of famine, and in doing so, vulnerability. It was clear that simply having sufficient food in the country was not enough to prevent a famine and that a plethora of underlying factors determine whether or not a person would have access to enough food to live. This principle translates to other contexts - it is the entitlement (i.e. access) to rather than the existence of resources - that determines one's vulnerability.

### **Livelihoods**

From this paradigm shift grew an abundance of new work using entitlements theory as its foundation. One such area is livelihoods, which are broadly defined as comprising 'people, their capabilities and means of living, including food, income and assets' (Chambers and Conway 1991: 1). Various livelihoods approaches have sought to explain more fully the complexities behind this definition by focussing on the different facets of entitlements and access to resources such as livelihoods strategies, capital holdings, actors and their wider structures, and institutional processes (Scoones 1998; DFID 1999). The Department for International Development (DFID) regards sustainable livelihoods approaches as particularly useful for improving the understanding of livelihoods by drawing links around the key relationships that influence the success and sustainability of them, whilst remaining people - rather than systems - focussed.

DFID's framework outlines the combination of the dimensions above as contributing to key livelihoods outcomes - two of which are particularly pertinent for this paper: (1) the

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<sup>3</sup> For an extended explanation of national structures and indices for vulnerability see Brooks, Adger and Kelly 2005.

reduction of vulnerability, and (2) the sustainability of livelihoods (DFID 1999: section 2.1 Figure 1). In the context of a changing climate and increased hazards, Wisner *et al.* argue that 'vulnerable groups are those who find it most difficult to reconstruct livelihoods following disaster, and this in turn makes them more vulnerable to the effects of subsequent hazard events' (2004: 12). Therefore, reducing vulnerability to shocks and increasing resilience is critical to ensuring sustainable livelihoods in a changing climate.

The sustainability of livelihoods is fundamental to one's understanding of adaptation. Increasing shocks may affect asset and capital bases, changing pressures may affect the attitudes and policies of actors and structures resulting in processes that may respond differently in the new context. Monitoring these changes, and thinking critically about how they may improve or impair livelihoods, is vital to ensuring that adaptation policies remain relevant to the needs of the poorest.

Household Economy Analysis (HEA) is an analytical framework founded on Sen's theory of entitlements (Holzmann *et al.* 2008), and largely focussed on the viability and sustainability of livelihoods. By establishing people's 'normal economy' (e.g. savings, sources of cash, assets, expenditure, etc.) (*ibid*: 3) HEA gets at the core of understanding how a household is impacted by changes and shocks, and why it may fail to access the resources it needs. Created as an alternative to early warning methodologies that used crop production yields, rainfall and price data alone, HEA provides the context of livelihoods information from the household level, thereby providing insight as to how the impacts of shocks (or changing macro-factors) would affect a household's access to food and other resources needed to live and maintain a livelihood.

HEA quantifies the problems in common currency (using minimum energy requirements for survival), allowing for, amongst others, concrete understandings of specific shock impacts, time-series comparisons, and comparability between livelihoods patterns, regions and countries. Further, the numbers generated show thresholds and gaps for the resources necessary to (1) help save lives; and (2) help protect livelihoods. Finally, HEA is predictive, allowing for the establishment of quantified gaps of necessary resources at the household level early enough that intervention can proactively address the problem.<sup>4</sup>

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<sup>4</sup> For further insight into how HEA does this, see the methodology section.

The use of HEA in the context of climate change is suggested to be useful in that it is able to show the current state of affairs at household level, and illustrate how a variation in circumstance (such as climate change) may impact households. The data generated offers concrete numbers (e.g. percentage of population affected, resources needed to save lives and livelihoods) and future understandings of the challenges that households may face. Finally, it offers the human perspective of climate change at the micro level that is so often absent in the discussions that dominate this debate.

### **Social Protection**

Among social protection frameworks it is safe to say that The World Bank's Social Risk Management (SRM) framework has been influential in moving the agenda of social protection in development forward. Born from the safety nets agenda that was put in place to protect people from destitution during the structural adjustments of the 1980s, SRM increased its social protection mandate to include measures that prevent people from falling back into poverty, and engages with some of the economic root causes of poverty traps in order to provide avenues out of chronic poverty (Holzmann and Jørgensen 2000). The primary argument of the SRM is that the risk-averse poor will not engage in higher-return activities without some kind of insurance mechanism in place to protect them if they fail. It is, therefore, the role of a social protection mechanism to both catch people when they fall and encourage them to engage in riskier, higher-return activities. This makes risk management in the economic realm the primary focus of SRM's efforts to lift people out of poverty.

Critics of SRM highlight the uni-dimensional focus on economics, observing little consideration for social dimensions that contribute heavily to the perpetuation of poverty and vulnerability (Guenther *et al.* 2007; Haddad 2007; Devereux and Sabates-Wheeler 2004). It can further be argued that, without substantial livelihoods support or alternative options, the avenues out of poverty are little more than safety nets themselves if they require the poor of few resources and capital (of every sort) to find these avenues themselves. Further, despite stating that 'avenues out' of poverty are a key part of the framework, SRM defines social protection as simply 'public interventions (i) to assist individuals, households, and communities better manage risk, and (ii) to provide support to the critically poor' (Holzmann and Jørgensen 2000: 9). In sum, despite responding to some major challenges by encouraging poor people towards more viable livelihoods

through supporting better risk management, SRM does not respond to some of the fundamental and complex obstacles, such as social status and vulnerability, that the poor face in trying to earn a livelihood.

The Transformative Social Protection (TSP) framework (Devereux and Sabates-Wheeler 2004) is a multi-faceted, multi-levelled approach to poverty alleviation that seeks to address the issues that SRM has failed to incorporate by including protective, preventive, promotive and transformative elements. The first three of this agenda are shared with SRM, though the descriptions of how they may be achieved differ. Where SRM focusses almost exclusively on economic avenues, TSP embraces a broader agenda including the enhancing of human capabilities. In addition, the TSP caps what the SRM offers by acknowledging that equity, rights, and the social dimensions of poverty and vulnerability are as - if not more - important as the economic challenges, because they affect one's access to economic engagement and opportunity. Through broadening the base of analysis and looking at the root causes of poverty - not simply the poverty itself, or its consequences - the transformative approach embraces the chronic poor who experience a multitude of challenges beyond the transitory nature of economic shocks.

On the topic of vulnerability, TSP argues,

structural factors cannot be disentangled from determinants of risk and vulnerability. Social, political, and economic structures are typically the defining characteristics of livelihood risk, with the possible exception of some natural disasters - though even in these cases, the contributions of socio-political factors and human agency have been persistently under-appreciated.

(Devereux and Sabates-Wheeler 2004: 7)

This highlights the dynamics between structural factors and people as being critical in determining one's vulnerability. And these factors (social, political, governance and economic structures) play a vital role in determining the access to capital one has, thereby affecting one's capacity to manage in the face of a shock.

Devereux and Sabates-Wheeler go further in the exploration of the relationship between structures and humans, turning it around to see how changes may impact structures. They

argue that, if there are fundamental changes in how the poor experience rights, it will catalyse response and change by governments seeking to respond to the demands of the public. Demands for accountability, social responsibility and a rising voice of the people could catalyse improvements in governance structures and generally how the government engages with its people, in turn, changing the outcomes of government efforts. A primary goal of the TSP framework is to explore how social protection can not only facilitate the delivery of three 'P's', but further impact and *transform* the structures of society that are at the root of chronic poverty and vulnerability.

Succinctly combining the views outlined above, TSP conceptually defines social protection as:

public and private initiatives that provide income or consumption transfers to the poor, protect the vulnerable against livelihood risks, and enhance the social status and rights of the marginalised; with the overall objective of reducing the economic and social vulnerability of poor, vulnerable and marginalised groups.

(Devereux and Sabates-Wheeler 2004: 9)

Fundamentally, addressing and understanding both the internal and external factors of vulnerability is the only thing that is going to ensure that climate change adaptation measures will both protect against the risks of climatic shocks and change, and increase internal resilience to be able to cope when they do hit.

This paper explores a combined Transformative Social Protection and Household Economy Approach as a framework for understanding and addressing the root causes and consequences of poverty and vulnerability, in the context of a changing climate. It will investigate case studies in Ethiopia to determine how social protection can contribute to adaptation plans - specifically for the poor and most vulnerable - in the context of a changing climate.

### 3. Context

#### Methodology

This paper will use the Household Economy Analysis analytical framework, in conjunction with anticipated climate change scenarios to project how livelihoods in selected *woredas* (districts) in Ethiopia may be impacted by future weather patterns. The case studies assume livelihoods as they are today and do not anticipate significant changes to the macro-economic or political environment<sup>5</sup>.

The HEA is an analytical framework designed to answer the necessary questions that will lead to an understanding of how households gain access to the resources that they need to survive and maintain viable livelihoods. This framework is broken down into methodological steps in order to generate a comparative analysis of predicted needs (Holzmann *et al.* 2008: 9).

The core of the HEA is the *baseline*, which describes how people earn a livelihood in an 'average' year (neither particularly good nor bad) and is used as a benchmark to which all other years can be compared. Three components make up the baseline: livelihood zoning, a wealth breakdown, and analysis of livelihoods strategies (*ibid.*). Livelihoods zoning identifies a geographic area in which livelihoods strategies are broadly similar and do not necessarily adhere to administrative boundaries. Wealth breakdowns are based on local definitions and show the population percentages in four different wealth groups. Livelihoods strategies include information on physical and financial asset holdings, access and management of resources, and 'normal' years' livelihoods maintenance strategies for each wealth group, as well as *coping strategies* employed in bad years.

The baseline is compared against a problem specification representing a shock or *hazard* in order to determine the vulnerability of different livelihoods and wealth groups to a particular shock. The information output is referred to as the *projected outcome* and illustrates where there may be gaps in necessary resources that require intervention. The formulaic representation for the analytic framework is:

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<sup>5</sup> For a full explanation of the assumptions used to define the problem specifications entered into HEA data sheets, see Annex I.

$$\text{Baseline} + \text{Hazard} + \text{Coping mechanisms} = \text{Projected outcome}$$

After the projected outcome is determined, HEA allows the comparison of this against (1) a survival threshold and (2) a livelihoods protection threshold. Survival thresholds indicate the minimum food and non-food items (e.g. salt, kerosene for cooking) required to stay healthy and to function. Livelihood thresholds quantify what is needed to maintain the livelihood at its pre-shock level (e.g. agricultural inputs, livestock drugs, school fees for children, health care costs). The amount required to sustain the latter changes for each wealth group, whereas the former are the same for all wealth groups. Additionally, these lines indicate at which point intervention is required to help households maintain these thresholds.

It must be understood that, in this paper, the terms 'shocks' or 'hazards' represent - in all case studies - what an 'average' year would look like under the given climate change scenarios. Shock simply expresses a change against the baseline year (established in the 2000s for all cases), whether positive or negative, large or small. Therefore, the formulaic representation for this paper is:

*baseline* (i.e. current livelihood strategies) + *hazard* [i.e. potential impacts of the changing climate on livelihoods (e.g. lower crop and animal product yields; less work for agricultural labourers)] + *coping* (those in the current baseline) = *projected outcome*, or a picture of what a 'normal' year may look like in the climate change scenario represented.

Using this framework, the 'projected outcomes' of these case studies will illustrate the possible implications of climate change on livelihoods, and reveal questions regarding what kinds of social protection strategies may be needed in these contexts.

HEA information is collected from a broad range of sources, using primarily participatory rapid appraisal methods, semi-structured interviews of focus groups and key informant interviews. Additional information is also gleaned from secondary data from household surveys, local historical documents and other relevant sources. Quantitative information about household income and expenditure is collected from households and is triangulated

in the field in order to ensure such information gleans accurate results. The methodology is flexible, allowing circumstances to indicate the best way to gain the necessary information (*ibid*: 5).

For the purpose of altering the problem specifications and comparing shock scenarios, the original baseline data has been made available to the author and was used in the case studies to show the impacts of possible changes, based on climate change predictions.

Locating climate change predictions with any degree of confidence is very difficult at this stage, and predictions that exist are often presented with the caveat of 'but we really don't know'. It is recognised that many predictions indicate increasing severity and frequency of climate shocks (IPCC 2007; UNEP *et al.*, n.d.; Conway *et al.* 2007), which will undoubtedly have severe repercussions on households' ability to maintain asset holdings and cope with future shocks. But for the purposes of this paper, simple predictions have been taken to illustrate the impacts of the overall changes that environments may undergo.

Taken from a paper on integrating climate change predictions and their relevance to development planning in Ethiopia (Conway *et al.* 2007), this paper uses predictions that are an amalgam of several models and scenarios and offer a range of projections for Ethiopia, disaggregated by region and organised under A2 and B1 IPCC scenarios<sup>6</sup> (pp. 21-24). The Conway *et al.* paper gives scenarios, for the following: A2, year 2020 wet, average and dry; A2, year 2050 wet, average and dry; B1, year 2020 wet, average and dry; B1, year 2050 wet, average and dry. One scenario has been chosen for each case study to explore the potential effects of some of the more extreme weather averages that may be a reality of the future. The range of scenarios chosen is also deliberate to reflect the fact that changes will likely vary in different areas of the country. All scenarios have been interpreted for this paper as possible 'normal' years in the future.

This paper uses the above climate change scenarios as the basis for estimating a shock in the HEA equation to infer how climate change may affect livelihoods in two HEA-defined livelihood zones. Problem specifications entered into HEA data sheets have not been calculated scientifically and do not compare rainfall data with water requirement

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<sup>6</sup> For an explanation of these scenarios see <http://www.grida.no/climate/ipcc/emission/094.htm> (accessed 31st January 2009).

satisfaction indices or historical yield analyses, or include the effects of evapotranspiration on water supply that a rise in temperature would bring. Estimates are crude and based almost entirely on rainfall change data (with some consideration to rise in temperature). Rather, assumptions and averages have been used to define problem specifications and so may not accurately reflect the impacts of a changing climate on the livelihoods examined in the case studies.

## **Ethiopia background**

### *General context*

Ethiopia has a population of 77 million with an annual growth rate of 2.6 per cent, a poverty head count of 44.2 per cent<sup>7</sup>, and an average GNI per capita of \$170 (World Bank n.d.). Nationally, rural livelihoods dominate with 85 per cent of the population still actively dependent on agriculture (MEDaC in Deressa 2007: 4) and small-scale farmers commanding the land, producing 90 per cent of the total agricultural output on 95 per cent of the land under cultivation (Deressa 2007: 5). Smallholder farmers continue to use traditional farming practices such as draught animals, considerable human labour and few agricultural inputs. It is estimated that 95 per cent of land cultivated is rainfall dependent (*ibid*: 5).

Ethiopia has struggled considerably with vulnerability. This has been attributed to a combination of factors including poor rural infrastructure, unfavourable land policies, population pressure and its consequences of increased demand on land, water and agriculture (Devereux 2000). The pressures of these demands, combined with eroded and poor quality soil in many regions, increasing demands to intensify production and not allow land to lie fallow, and challenging landscape have rendered much of Ethiopia food insecure for decades. Overall production trends in Ethiopia show a steady decline since the early 1980s, redefining its position as a net exporter of food and making it a net importer (MEDaC in Deressa 2007: 6). It is often suggested that weather hazards such as floods and droughts are the primary cause of distress to production and livelihoods. Though long-term weather trends are difficult to find, one study shows that the past decade has seen a continued decrease in rainfall during the months of May to September<sup>8</sup>

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<sup>7</sup> Based on the national poverty line in 2000.

<sup>8</sup> There are two rainy seasons in most of Ethiopia: the *belg* (March-May), or small rains, and the *kiremt* (June-September), or large rains. Both are vital for different crops in different regions.

(Funk *et al.* 2005). With very little rural and agricultural infrastructure (e.g. piped water and widespread irrigation or flood checks) in place, the effects of even moderate weather shocks can impact significantly on livelihoods fully dependent on the natural rainfall system.

#### *Poverty Reduction Strategy Plan*

Ethiopia's current poverty reduction strategy paper (PRSP), the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) is written with a five-year time frame and is Ethiopia's second PRSP. It focusses heavily on Ethiopia's natural resources and rural development as a means of lifting its population out of poverty, demonstrating the government's view that agriculture remains a sustainable livelihood. Its base case scenario anticipates the agricultural industry will contribute 43.9 per cent of the overall GDP, adding 6.2 per cent value to the overall annual GDP growth rate of 7.3 per cent (MoFED 2007). Dramatic increases in overall production are anticipated, with livestock and major crops expanding by more than a third and more than half respectively, which will aid in attaining targets of overall agricultural export increases of nearly three fold. This will be achieved through intensification of farming and widespread commercialisation of agriculture for which irrigation and water harvesting are essential.

Recognition of a changing climate and the resulting challenges for the future is evident throughout the document, with frequent mention of water, extreme weather events, and natural resource degradation as being critical factors to the sustainability of livelihoods. Some examples of plans to address this include reversing environmental degradation, improving waste management, relocating households to more fertile agricultural areas and increasing off-farm employment opportunities in areas that experience water-stress.

#### *Social protection*

National social protection in Ethiopia is embodied primarily in the national Food Security Programme (FSP). Overall, the aims of the FSP are protective, preventive and promotive, as it focusses on both providing food security and supporting sustainable agricultural livelihoods. The Programme comprises three components:

- 1) *Food security packages* provide livelihoods support to rural households through a credit package including inputs, training and on-going extension support. Various

packages are available to choose from, and the programme is targeted exclusively at beneficiaries of the Productive Safety Net Programme to enable them to graduate<sup>9</sup>. This component is paid for exclusively by the Government of Ethiopia.

2) The *Productive Safety Net Programme* (PSNP) is targeted at food insecure households and is designed to fill the food gap by offering a package of support - either in food or cash or both - in exchange for labour on public works programmes. The public works are designed to increase the assets and productivity of participating communities. It is delivered to 7.29 million people in six regions of the country primarily through government administration and is paid for by a group of multilateral and bilateral donors.

3) *Resettlement* aims to relocate people from unproductive to productive rural areas with a package of assistance to help them establish new, productive agricultural livelihoods. This is administered and paid for exclusively by the Government of Ethiopia. Targets for resettlement throughout the five-year PASDEP period are 1, 679, 725.

(Food Security Coordination Bureau 2006)

In addition to this, the government's national Ministry for Agriculture and Rural Development (MOARD) manages all disaster responses in conjunction with partner agencies<sup>10</sup>, and a number of international and national non-governmental organisations and civil society organisations run social protection programmes on a localised scale.

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<sup>9</sup> In Ethiopia, graduation broadly means to achieve food security based on a combination of assets and income holdings.

<sup>10</sup> In August 2008 a government reorganisation closed the Disaster Prevention and Preparedness Agency and emergency response activities were shifted to MOARD.

## 4. Case studies

This section will explore three contrasting case studies located in different areas of the country with different current climatic trends and predictions for change in the future. Further, it will discuss the challenges these livelihoods, as they are currently, would face. The first case focusses on a livelihood zone that is already highly vulnerable and classified as food insecure, and in which a large proportion of the population are currently beneficiaries of the existing social protection programme. The second case is of a reasonably food secure zone that does not receive predictable assistance and where the majority of the population are in sustainable livelihoods. The third case study is in a food secure zone that does not receive predictable assistance, and in which all wealth groups are able to meet their food needs as well as achieve sustainable livelihoods in the current climate.

The climate change scenarios for each case study were chosen to show the full range of possible future realities: case study one uses an A2 2020 dry scenario showing a reduction in average rainfall; case study two uses a B1 2020 wet scenario showing dramatic increase in average rainfall, causing flooding; and case study three looks further to the future using B1 2050 scenarios, and suggests that either the wet or dry would be reduced crop yields - producing flooding in the wet scenario or a sub-optimal water supply in the dry scenario.

All three cases will examine how current livelihoods strategies would be impacted by projected climatic changes. The first two explore this given the current baseline information. The third, alone, will explore these changes given a lower baseline, reflecting the impacts of increasing shock frequency and severity resulting in lower asset holdings and coping capacity.

### **Irob Mountain Livelihood Zone<sup>11</sup>**

The HEA livelihoods baseline locates Irob Mountain Livelihood zone in the North East corner of the country, bordering Eritrea, and shows that its people are primarily dependent on livestock production and limited crop cultivation. It was chosen as a case study

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<sup>11</sup> The baseline year for this livelihood zone is 2005/6. For a full description of this livelihood zone see [http://www.dppc.gov.et/Livelihoods/Tigray/Pages/IRM\\_LZ.htm](http://www.dppc.gov.et/Livelihoods/Tigray/Pages/IRM_LZ.htm) (accessed 31st January 2009).

because it is a food insecure area whose inhabitants are highly vulnerable and already suffer tangibly from the effects of poor soil quality, land degradation, small land-holdings, low and erratic rainfall patterns, and near-annual climatic shocks. Households in this livelihood zone also receive social protection support in the way of PSNP transfers and FSP livelihoods packages<sup>12</sup>. Key features of livelihoods in this zone include:

#### **Main sources of food and cash**

- *Meher teff*, sorghum and maize crops
- *Belg teff*
- Wild cacti, honey
- Cow's milk and butter, goats, sheep, chicken and eggs
- the Productive Safety Net Programme

#### **Main challenges in attaining livelihoods security**

- Highly rainfall dependent for the production of all resources (crops and livestock products)
- Drought-prone climate, and average annual rainfall of only 250-300 mm
- Severe shortage of cultivable land due to geographical features (steep cliffs, mountains), infertile land (sand and stone) and soil erosion
- No access to markets (closest is 40km)

#### **Main coping strategies employed in response to shocks**

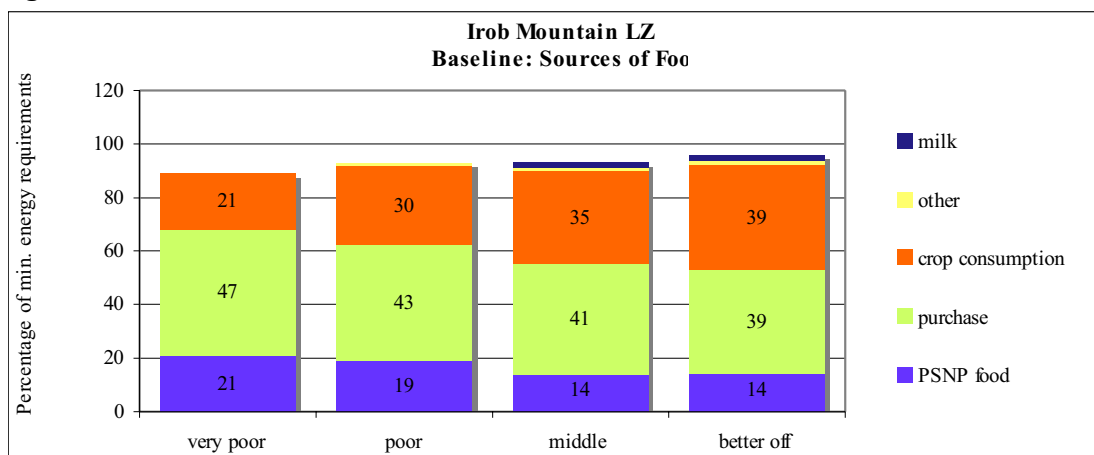
- Very poor and poor households exploit all the coping strategies they have in order to survive day-to-day and are very limited in accessing additional resources
- Foraging for wild foods such as cacti
- Some can gain remittances from family members that have moved to Arab countries
- The better off increase sale of livestock, with shoats being sold first and cattle last
- Increase in credit for all is a last resort

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<sup>12</sup> Across the country 292 *woredas* are of the same status; this was the target number for 2008.

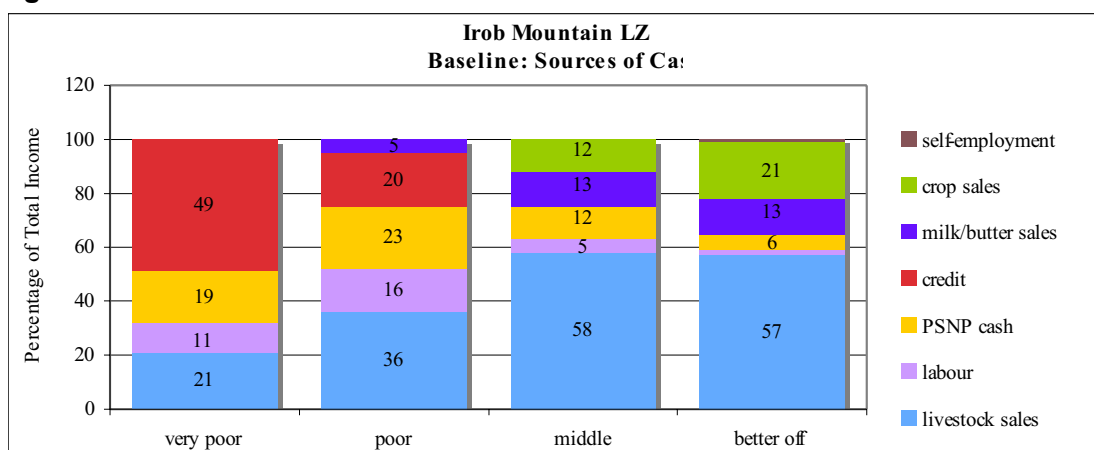
Figure 4.1 and Figure 4.2 show baseline year sources of food and income. Figure 4.1 shows results as a percentage of food minimum energy requirements and shows that none of the wealth groups is able to meet their food needs independently. Figure 4.2 shows total sources of cash - much of which is provided through the PSNP and credit. Together Figure 4.1 and Figure 4.2 show that the very poor and poor wealth groups are highly dependent on their crops and livestock holdings both for direct consumption and for the income they generate for purchasing cheaper staple food and other minimum non-food needs. Outside assistance in PSNP food and credit from money lenders are also key strategies for meeting minimum food needs.

**Figure 4.1**



Source: HEA baseline Irob Mountain Livelihood Zone data

**Figure 4.2**



Source: HEA baseline Irob Mountain Livelihood Zone data

The HEA baseline year data for all wealth groups indicates that the inhabitants of this zone are amongst the poorest and most vulnerable in the country, already dependent on the social protection systems in place to meet basic needs. Between 14 and 21 per cent of minimum food needs (Figure 4.1) are met with PSNP food transfers, and between 6 and 23 per cent of household incomes comes from the PSNP cash-transfers (Figure 4.2). Though predictable now, if the PSNP follows through with its plan to end the programme in the medium-term<sup>13</sup> it is possible that a large percentage of the population in this zone will not be able meet their minimum food needs, let alone protect the livelihoods that provide them with the remaining 80 per cent of income<sup>14</sup>. This is independent of any impacts climate change may have on the livelihoods in this zone.

### **A changing climate in Irob Mountain Livelihood Zone**

In both A2 and B1 scenarios population increases, applying increased pressure on the already constrained land and production capacity in Ethiopia. Though there may be increasing numbers of people moving to growing urban areas, it is likely that a significant number of rural households will continue to be dependent on small land holdings of less than 0.5 hectares to sustain households of seven people.

The middle-average scenarios for this area do not show a significant percentage change in the annual rainfall. In fact, many show average increases, which may positively impact livelihoods. However, if either the extreme wet or dry scenarios become a reality, more dramatic changes are forecast. The A2 2020 dry scenario shows a possible reduction in rainfall during the *belg* season, bringing rainfall totals for the seasons down to approximately 6mm from about 25mm. The *belg* rains are vital for the production of the *belg teff* crop, and milk and dairy products from cows, used both for consumption and sale. Such a drastic reduction in the level of rains will be likely to have an affect on the production levels of these two key resources.

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<sup>13</sup> The PSNP graduation strategy envisages all beneficiaries receiving food security packages to ensure households are able to survive independent of state support. However, severe financial constraints potentially hamper the achievement of this goal. For the purposes of this scenario, it is assumed that the Food Security Programme has not been able to graduate the majority of programme beneficiaries in this zone.

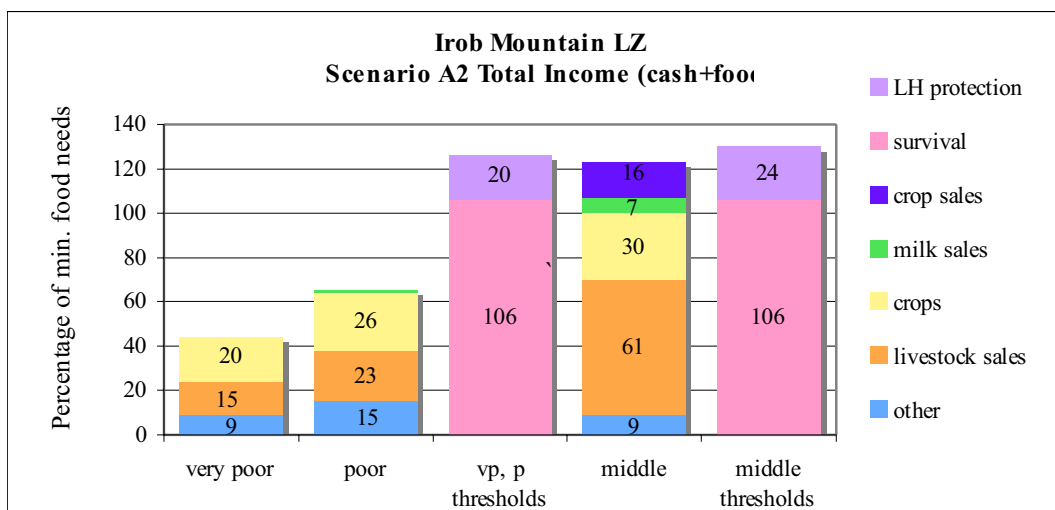
<sup>14</sup> This year many *woredas* have been affected by inflation, which minimises the purchasing power of the cash transfer.

This scenario also predicts *meher* rains will be reduced by 32 per cent. With *meher teff*, sorghum, maize and milk products dependent on these rains, one can expect a negative impact here, too. Further, given consistently low levels of rain, livestock holdings can be expected to decline somewhat, if not substantially. Using estimated figures<sup>15</sup> for an A2 2020 dry scenario to indicate production of livestock products and crop yields, Figure 4.3 shows what HEA data approximates as the impact on livelihoods and food security in this zone.

### Implications for households

The baseline year (shown in Figures 4.1 and 4.2) indicates the very poor and poor have virtually no coping capacity. With fewer livestock and livestock products to sell and

**Figure 4.3**



Source: originally based on Irob Mountain LZ data; revised for this paper to reflect scenario

fewer homegrown crops to eat in this scenario, they would be wholly dependent on credit, humanitarian aid or an increase in the PSNP transfer to cope with the losses they would sustain from a bad production year. Further, the labour that they usually sell to middle and better off households would be likely to diminish due to lower crop yields, and reduce that vital source of income further. Figure 4.3 shows that with the possible climatic changes indicated in dry scenario A2, it is possible that, even with continuing PSNP support, 51 per cent of the population (very poor and poor groups) would be chronically food insecure and

<sup>15</sup> See Annex I for exact estimates of changes to production.

trying to preserve unsustainable livelihoods. A further 36 per cent - though able to meet minimum food needs - would not be able to maintain a viable livelihood.

Ethiopia's current, social protection response to its chronic food insecurity problem is low-levels of short- to medium-term assistance designed to protect against food insecurity and prevent people from falling further into poverty<sup>16</sup>. But whether or not it will address long-term food insecurity - or the wider issue of chronic poverty and vulnerability - is debatable. And though the current food security strategy envisages all PSNP beneficiaries receiving livelihood support through the food security packages, financial constraints raise questions as to whether or not it will be possible to meet the target of 100 per cent coverage and graduation<sup>17</sup>.

If, for the sake of argument, one maintained that full coverage and graduation would be feasible, one has to remember that the programme is still focussed on keeping these households in rural areas and dependent on rain-fed agriculture to earn a livelihood. As the consequences of the A2 dry scenario highlight, it is questionable as to whether this strategy is practical given climate change may well bring about a wholly drier climate that is unable to support current production levels, let alone increased production.

### **Alaba-Mareko Lowland Pepper Livelihood Zone<sup>18</sup>**

This livelihood zone offers a contrast to the Irob Mountain picture. It is a food secure zone in which rainfall is presently regular and abundant - current average annual rainfall is more than three times that of the Irob Mountain Livelihood Zone. Despite already experiencing annual climatic shocks, households are reasonably resilient with 77 per cent of the population presently able to maintain a viable livelihood. Population density is sparse and its residents enjoy large land holdings in comparison to those found in other parts of the region and country. Mixed agriculture including cash crops, food crops and livestock holdings provide a diversity of food and income sources, spreading risk and supplying a larger range of coping strategies. Key features of livelihoods in this zone include:

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<sup>16</sup> Prevention would assume that people would have adequate assets to help them withstand a shock, or that more assistance was given so that households would not have to deplete assets in order to meet the increased food gap. However, this is not always the case.

<sup>17</sup> Recent figures show that 41 per cent of beneficiaries asked had received a livelihoods support package but 67 per cent are confident they will not graduate (IDS and Dadimos 2008).

<sup>18</sup> This livelihood zone's baseline year refers to 2003/4. For a full description of this livelihood zone profile see <http://www.fews.net/pages/countrylivelihood.aspx?gb=et> (accessed 31<sup>st</sup> January 2009).

### **Main sources of food and cash**

- Pepper sales as a cash crop
- Other crop sales
- Sales of livestock and their products
- Food aid (almost 20 per cent of minimum food needs for the poor)

### **Main challenges for meeting food needs and maintaining viable livelihoods**

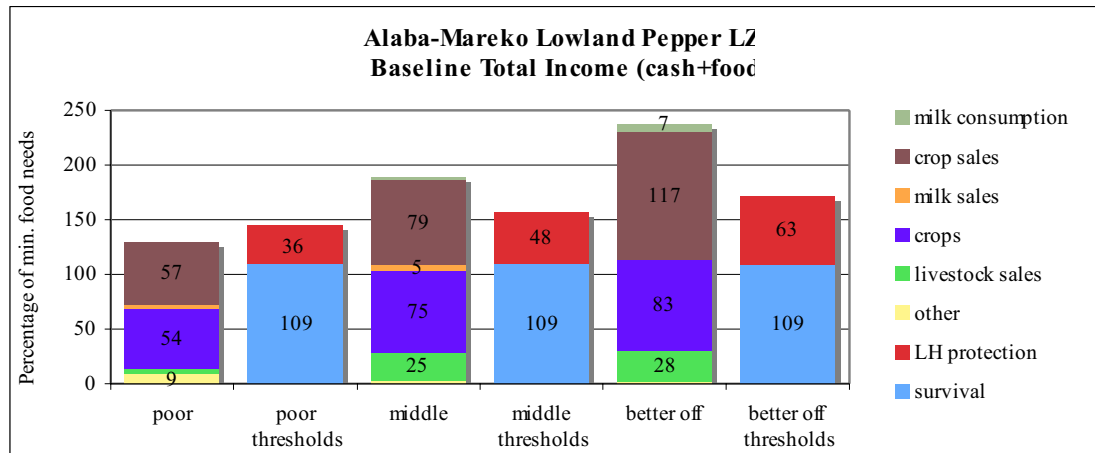
- Highly rainfall dependent for the production of all resources (crops and livestock products)
- Floods affect this area every year in June and July, which causes short-term migration away from the hazard, damage to crops, and always has costs of human and animal life
- Malaria, which is year-round here, affects labour availability and can cost in lives
- Food aid as a source of food income is not certain and not predictable

### **Main coping strategies employed in response to shocks**

- Reduction in expenditure and shift to purchase of cheaper staple foods
- Reduction in the number of meals eaten in a day
- The poor rent land to better off families, particularly in years of poor crop production
- Short-distance migration during June and July when the low flats flood
- Increased sale of livestock for the middle and better off households as a last resort

This livelihood zone has almost no one in the 'very poor' wealth group and, as Figure 4.4 shows, all of the groups in the livelihood zone are able to meet their minimum caloric needs. And though challenges present themselves yearly with annual flooding and other shocks, both the middle and better off are able to access sufficient income to maintain a livelihood. The baseline shows, however, that the poor regularly fall short of supporting a viable livelihood by approximately 16 per cent (of resources required to meet minimum food needs).

**Figure 4.4**



Source: HEA baseline Alaba-Mareko Lowland Pepper LZ data

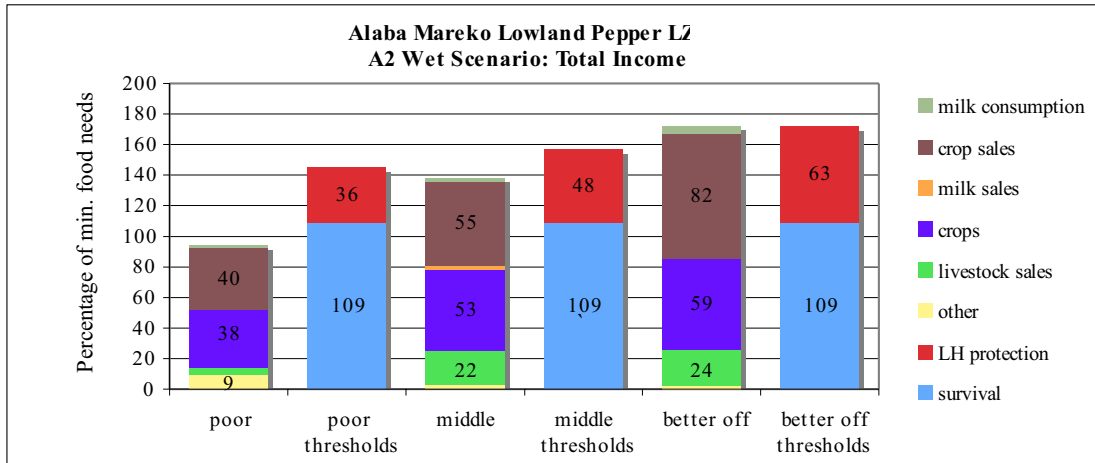
### A changing climate in Alaba-Mareko Lowland Pepper LZ

The B1 scenario for this region suggests that by as early as 2020, this region could see an average increase in annual rainfall of 96 per cent (average wet scenario). A large part of this rain will continue to fall during the *kirempt* rains of June and July, with increases during this time reaching as high as 126 per cent. As the current climate already means annual migration in these months to avoid the floods, it can be anticipated that the disruption to regular livelihoods and agricultural activities will be further exacerbated in the future.

In addition to the effects of increasing *kirempt* rains, it is expected that the greatest increase will be experienced in the September-November time frame, where projections show increases of up to 187 per cent. This season is particularly important, as the pepper crop from which all households gain between 70 and 80 per cent of their income is in the process of maturing. Such increases in rainfall levels will likely have an affect on this vital crop.

The following scenario assumes that floods caused by the dramatic increase in rains in two key growing seasons will (1) decrease crop production at a moderate level due to flooding damage and sub-optimal rain levels for crops; and (2) decrease livestock holdings at a low level due to loss during the floods and a possible increase in diseases during wetter weather. This scenario also assumes modest inflation rates to account for regular inflationary pressures.

**Figure 4.5**



Source: originally based on HEA baseline data; revised for this paper to reflect scenario

Figure 4.5 compares (1) B1 wet scenario total income sources and (2) resources needed to attain survival and livelihoods protection thresholds for all wealth groups. The HEA data for this scenario indicates that it will not take a large shock for the people of this food secure zone to feel the strong, negative effects of a changing climate. The poorest 33 per cent of the population will be unable to maintain food security. The middle wealth group, comprising 36 per cent of the population, is unable to maintain a viable livelihood as it has done in the past. And the remaining 31 per cent in the better off category are just managing to preserve their livelihoods. However, a severe shock may reduce their assets at any time, thus compromising their ability to do so in the future.

### Implications for households

The HEA baseline year data for all wealth groups indicates that between 43 and 48 per cent of overall expenditure was dedicated to livelihoods protection. This includes not only livestock drugs and agricultural inputs, but also health and education expenditure invested to ensure long-term sustainability and perhaps better prospects for the livelihoods of the household. By the time the year 2020 arrives with its increasingly difficult climate and associated negative impacts on production yields, it could be that these necessary livelihoods protection mechanisms are luxuries that an increasing percentage of the population cannot afford. The poor, struggling to meet minimum food requirements, will have already decreased the number of meals per day, potentially compromising the short- and long-term health of the household. The middle and better off may also have difficult

choices to make when choosing where to invest declining resources in order to protect a livelihood - is it in more agricultural inputs to answer short-term food needs or long-term focussed education fees for the children? Is it in health care for the family with its immediate pressures, or livestock drugs that ensure longer-term sustainability? The pressure caused by the conflict between immediate needs and long-term investments is great and can have long-lasting impacts for the household, and individuals within.

If there are few opportunities to diversify livelihoods strategies or increase asset levels to protect against either large shocks or a regular decline in production yields, increasing proportions of this population will be in need of regular social protection assistance in the medium- to long-term. Within the framework of the existing social protection system, none of these households would receive support other than food aid to help fill the food gap in a shock year with low crop yields. Further, unless *woredas* in this livelihood zone were reclassified as food insecure<sup>19</sup> they would not be able to enter the PSNP programme thereby also excluding its inhabitants from receiving food security packages.

### **Hadiya-Kembata Cereal and Enset Livelihood Zone<sup>20</sup>**

This livelihood zone was chosen for the positive contrast it offers to the two previous case studies. It is a food secure zone in which people earn their livelihoods through a diverse range of sources in mixed agriculture, growing a variety of crops and keeping small to medium sized livestock holdings. Despite regular climatic shocks, households are reasonably resilient and every wealth group is currently able to maintain a viable livelihood. As a cast into the future, this case study will illustrate how even some of the most resilient can be affected due to (1) increasing frequency of shocks over a period of time which can result in lower asset holdings, combined with (2) an extreme 'normal year' future scenario.

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<sup>19</sup> All PSNP *woredas* were classified as food insecure at the beginning of the programme based on a history of being in receipt of food aid. Though it would be technically possible to reclassify a *woreda* if it became food insecure, resources are limited and allocation of them is often politically contentious, making reclassification a potentially difficult task.

<sup>20</sup> This livelihood zone's baseline year refers to 2003/4. For a full description of this livelihood zone profile see <http://www.fews.net/pages/countrylivelihood.aspx?gb=et> (accessed 31<sup>st</sup> January 2009).

### **Main sources of food and cash**

- Consumption crop production providing between 63 per cent (very poor) and 95 per cent (better off) of minimum food needs
- Crop sales of wheat, barley, pulses, *enset* and Irish potatoes; particularly important for the poorer, who use this to purchase other, cheaper staple foods
- Local labour and labour migration, particularly for the poorer
- Livestock and products sales (primarily for the middle and better off)

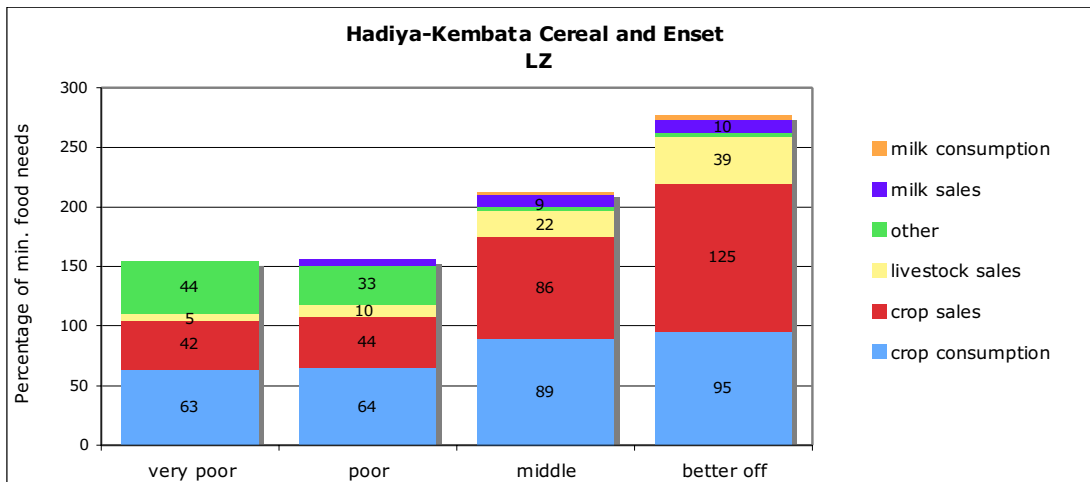
### **Main challenges for meeting food needs and maintaining viable livelihoods**

- Unpredictable rainfall is already showing to be a problem in pocket areas of this livelihood zone, sometimes resulting in crop damage and landslides
- Crop diseases are an on-going problem in this area affecting two key crops -potato and *enset* - a drought resistant plant
- Agricultural inputs are both expensive and often arrive late; it is vital to all crops to use fertilizer, and all four of the wealth groups spend between 58 (very poor) and 67 per cent (better off) of their overall expenditure on it.
- Increasing population

### **Main coping strategies employed in respond to shocks**

- Changing expenditure patterns - reduced expenditure on non-food items including, amongst many others, clothing, ceremonies, medicine and schooling for children - the saved money is then used to purchase more staple foods
- Increased consumption of the drought-resistant plant, *enset*, for all wealth groups in rain scarce years
- Increased out-migration of men from the very poor and poor households. In bad years more labourers leave, and they leave earlier
- Increased local casual labour by women from the very poor and poor households in preparing *enset* for consumption; this is more needed, and more available in bad years when more people eat this plant
- Increased sale of livestock amongst the middle and better off wealth groups, but only as far as herd size can be maintained at a viable level

**Figure 4.6**



Source: Based on the HEA baseline; revised for this paper

Figure 4.6 shows the great dependency this region has on rainfall, indicating that 100 per cent of minimum food needs for even the very poor can be met through a combination of self-sufficient farming and income generated from selling crops. In addition, the poor in this zone benefit from reasonable access to casual labour opportunities, either locally on middle and better off farms, or through migration to nearby state farms. The diversity of sources and amount of income gained in this zone means that, if a small to medium shock were to hit, the ability to maintain minimum food consumption may be possible through a shift in consumption patterns or reduction in excess expenditure without having to resort to outside support to survive.

In addition to being food secure, all wealth groups in this zone are able to gain enough income to support a viable livelihood. Even those in the very poor group earn enough in food and income to have, on average, 20 per cent (of the cost of minimum food needs) in addition to their livelihoods protection needs.

### **A changing climate in Hadiya-Kembata Cereal and Enset Zone**

The predicted effects of climate change for this zone vary drastically. As in Alaba-Mareko Lowland Pepper LZ above, it may experience an additional 96 per cent annual rainfall, with specific seasons getting 126 per cent more than they do now risking flood, crop damage and further landslides, as is already happening. As damaging, a dry scenario forecasts a

55 per cent decrease in annual rainfall, with dry spells peaking at -78 per cent of current rainfall in the key rainy seasons.

Combining a change scenario (i.e. A2 or B1, wet or dry) with the assumption that there will be an increase in frequency and severity of climatic shocks, the following scenario explores the possible future of a livelihood zone that is currently food secure and livelihoods secure. Assuming a number of shocks hit in the coming years, many household asset holdings will diminish. This scenario explores the affects of a 'normal' scenario - either wet or dry - that B1 2050 generates on top of a lower baseline - representing a decrease in protective assets and capacity to cope in the event of a shock.

In this scenario, the 2003/4 baseline has seen a 10 per cent decrease in normal year livestock and crop holdings<sup>21</sup>, with no change in the amount of labour one could access. The coping capacity has also been reduced by a corresponding 10 per cent to reflect the loss in assets that has occurred over the years that may have helped households cope during times of shock.

Given these changes, the new baseline picture does not look so different from what you see in Figure 4.6. All wealth groups are still able to meet survival needs as well as maintain a viable livelihood. But should either one of the extreme wet or dry scenarios become a reality, the story changes quickly.

Using this lower baseline, very modest shocks resulting in a <20 per cent decrease in crop production, a 10 per cent decrease in cattle holdings and cattle product yields for that year, and reasonable inflation rates indicate that almost no households in this zone would be able to maintain their livelihood.

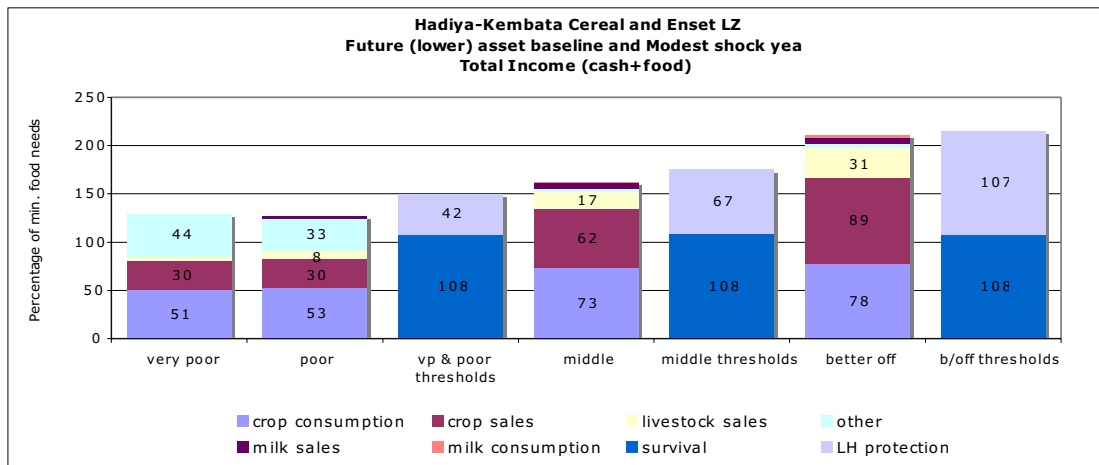
Figure 4.7 shows that own crop consumption is down by between 11 and 27 per cent - presumably in favour of purchasing cheaper food in the market. But income used to do so from crop sales is also down by between 12 and 36 per cent, as well as are livestock sales, (though marginally). Labour income for the bottom two wealth groups has not increased - thereby replacing this gap - as the need for labour on farms will not have

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<sup>21</sup> This assumption includes small crop production capacity has diminished as a result of the B1 scenario predictions of an ever-increasing population

increased when crop yields are low. This point is particularly pertinent for the poorest segments of society who are typically (1) more dependent on selling their labour as a source of income, and (2) without many assets or capitals that would enable them to improve their situation in general, and in a bad year in particular. It is also often the case

**Figure 4.7**



Source: originally based on HEA baseline; revised for this paper

that many of the poorer are those who have fallen out of agriculture as a means of making a vulnerable livelihood – but they remain stuck, with few alternative opportunities given the majority of labour opportunities are based on a narrow, agricultural labour market.

Though shocks may be modest on average, it is easy to see how a cumulative effect of larger hazards in bad years, combined with a general decline in production due to an overall change in climate, can lead to the deterioration of viable livelihoods strategies that sustain more than 85 per cent of the population of Ethiopia.

### Implications for households

As in the above scenarios, difficult decisions face the households in Hadiya-Kembata. Though still able to meet minimum food requirements, not one of the wealth groups in this zone is protected from the potential disintegration of livelihoods as they are now without employing adaptive measures in the near future. Diversification is a key strategy for households that rely primarily on agriculture and good weather. Though the households in this zone are diversified in the sources of income they access, they are all dependent on rain-fed agriculture. Maintaining attendance at school for children will ensure longer-term

prospects for diversification, but as seen in the Alaba-Mareko livelihood zone, choices regarding immediate or long-term protection are complex and are pervasive questions that every household will face in increasingly difficult climates. Social protection programmes with a longer-term vision focussed on support to diversified livelihoods through training, with access to a greater range of livelihoods strategies will be of the utmost importance as the climate changes the country over.

## **5. Implications of Case Study Findings**

### **Implications for current and future livelihoods**

Broadly, the HEA case studies show us a number of key factors about existing livelihoods, their strategies and their ability to cope with the consequences of shocks. The vast majority of livelihoods are based on smallholder agriculture that is dependent on good weather - either for own crop consumption or to sell crops in order to buy cheaper staples and non-food items. Existing opportunities for labour (either local or migratory) are still largely dependent on rain-fed agriculture, suggesting a narrow-base rural economy. Many coping strategies reserved for bad years are also agriculturally based and rely upon good weather. The current social protection system is strongly linked to current livelihoods and, at present, seems to be reasonably effective in protecting its beneficiaries from destitution and preventing a further fall into poverty.

The timeframe for these wet and dry scenarios extended as far as the 2050s. But it was also indicated that some of the more dramatic climatic changes could become a reality as early as the 2020s. Livelihoods are already sustaining shocks that are making promotion into more sustainable livelihoods difficult. Given this, and the looming difficulties in responding to increasing frequency and severity of climatic shocks, and the general challenges that Ethiopia faces in realising many of its development goals, it is entirely within the realm of possibility that livelihoods strategies in Ethiopia - as we understand them now - will not have changed significantly by the time these scenarios become 'normal year' realities. This potentially has significant negative implications for the sustainability of livelihoods, especially among the poorest.

These findings suggest that there may be increasing levels of physical and economic vulnerability due to changes in climate - both long-term trends and an increase in severity and frequency of climatic events. This could result in a depletion of the asset base, which is vital for coping in sub-optimal weather years. There may be rising numbers of food insecure households, and increasing numbers of families depending on unsustainable livelihoods. And though findings do not indicate where future possibilities may lie, results indicate increasing numbers of households dependent on unviable agricultural livelihoods,

which will lead to dramatic increases in households highly vulnerable to even small shocks.

The above combination of understanding of current livelihoods and the impact of climate change on current and future livelihoods suggests implications for the design of the current social protection system in Ethiopia, and the broader vision for development.

### **Implications for the current social protection framework**

Ethiopia's current social protection framework, embodied in the Food Security Programme, was designed with protection and promotion of sustainable livelihoods at its core. But the findings of the case studies show that the current programme may not be enough, and that changes may be necessary in order to ensure both reduced vulnerability and sustainable livelihoods through the coming climatic changes.

What the Productive Safety Net Programme currently offers is immediate and medium-term protection against food insecurity by predictably filling the food gap. It also contributes to the prevention of households falling further into poverty through asset generation and increases in income (IDS and Dadimos 2008). In the medium- to longer-term it is assumed that, if paired effectively with the livelihoods packages, PSNP households would experience promotional effects that support the advancement of agricultural livelihoods and a reduction in vulnerability and poverty (Food Security Coordination Bureau 2006). However, the PSNP is only delivered to food insecure *woredas*, in which - like Irob Mountain Livelihood Zone - livelihoods are already under threat in many ways (e.g. poor soil quality, difficult topography, naturally erratic rainfall patterns, dry climate) and feeling the effects of an increasing population. The impacts of dramatic changes in the climate are likely to exacerbate existing problems.

Given these findings, if the Food Security Programme were to continue as is, there may be implications for how the programmes are targeted, not only at the local level, but nationally, too. *Woreda* inclusion in the PSNP was established in the year of inception and based on historical food aid data. At present, the chronically food insecure in *woredas* deemed food secure do not receive the benefits of PSNP<sup>22</sup> and livelihoods packages.

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<sup>22</sup> One study suggests that the PSNP should conceivably support 30-35 million - the number of people under the national poverty line (Vaitla 2006)

Therefore, unless there is an increase in resources, rising numbers of chronically food insecure people - inside and outside PSNP *woredas* - will be forced to depend on unpredictable humanitarian assistance to fill the food gap in the hunger season.

Finally, as the case studies have shown, maintaining a large percentage of households dependent on small-plot, rain-fed rural livelihoods may not be a feasible plan in the future climatic context. To ensure that sustainable livelihoods remain the focus of Ethiopia's social protection programme, a shift in perspective may need to take place - away from agriculture to include other forms of livelihoods. Otherwise, the programme risks locking households in unviable livelihoods rather than promoting them to self-sufficiency. Given the over-dependence on agricultural livelihoods as the primary answer to food security and poverty, a review of the broader framework may need to be undertaken to ensure the social protection strategy is pursuing realistic, holistic and diversified responses to vulnerability in the future.

### **Implications for the Poverty Reduction Strategy Plan**

In the broader context, the Poverty Reduction Strategy Plans may need to be rethought in order to reflect a more realistic vision of the future. With a development plan that is highly dependent on increasing levels of agricultural output through intensification and commercialisation of smallholder farms, the coming climatic changes may mean that the goals for national development and poverty alleviation cannot be realised. The call to implement widespread irrigation and water harvesting across the country may not be rolled-out in time for the conceivable changes of 2020. Nor, in a wet scenario, would the latter be relevant. The plan to expand off-farm opportunities for water-stressed regions will have to be intensified in order to offer sufficient opportunities to the numbers of people in need of increased support in a drier climate. The PASDEP does not plan adequately for the coming changes and will need to be diversified in order to support the dynamic rural and urban communities that will be required to support changing livelihoods and vulnerabilities.

The current timeframe for the PRSP is five years. Though the need for short timeframes for planning is understood, longer-term visions must be paired with short-term plans in order to successfully set the stage for sustainability and long-term prosperity. If the presented scenarios become reality in the medium- to long-term, current plans need to

start taking account of that by proactively preparing the population for a smooth transition into a new environment. Unless this is changed, the political and economic structure of the development programme in Ethiopia will not be working towards poverty alleviation and accelerated growth. Instead, it will be maintaining - potentially even increasing - the percentage of the population living under the poverty line by offering families incentives to stay in unviable livelihoods.

### **An alternative vision for Ethiopia**

If Ethiopia decided to pursue an adaptation policy that supported diversification away from agriculture to more broad-based, diversified livelihoods strategies, the need for social protection would be immense. A change of demographics in growing urban and rural centres with the integration of people from all over the country will undoubtedly expose a wide range of vulnerability issues. In addition to the economic vulnerabilities that dominate the discourse today, there could potentially be more focus on the social dimensions of vulnerability, as different groups seek to build sustainable livelihoods and the consequences of urbanisation and increased population density become more apparent.

The scope for social protection to proactively improve the circumstances of the most poor and vulnerable through transformative measures is considerable. Some possibilities for a more diversified, holistic social protection programme that will enhance and support the overall adaptation strategy of the country could include:

#### **Protective and preventive measures**

*Robust disaster risk reduction* plans ensure that shocks that do hit are responded to rapidly, efficiently and effectively and provide the protective function that saves lives and livelihoods. The use of early warning and weather risk financing schemes are examples of such programmes that would help respond to shocks and save vulnerable agricultural livelihoods in a timely manner.

*Social insurance* provides a safety net for normally viable livelihoods that may have sustained a shock (weather related or not) and need protective assistance from becoming transitorily poor. Cooperative relationships between the public and private spheres can be powerful in ensuring this. The public can establish regulations to protect the interests of

the poor, while the private sector can respond to an increase in market demand as rural dwellers move and urban and rural centres grow. If the demand is slow in coming, the state can offer incentives for the private sector to engage, thereby encouraging the growth of this area.

*Appropriate transfers* protect the chronically poor from destitution and prevent them from falling further into poverty. Programmes could be regionally diversified to offer the best package for households based on local realities. Targeting could consider various ways of reaching the chronically poor and most vulnerable, such as age, gender or social group membership.

### **Promotive measures**

*Livelihood support packages* for both on- and off-farm opportunities ensure decreasing levels of vulnerability and increasing levels of resilience. For households that live in areas that may continue to be agriculturally viable in the future, packages can help build a broader asset base and offer technologies that will help weather the shocks. Off-farm opportunities such as small-business management training, micro-credit programmes, and technical training will help build broad-based, diversified livelihoods that will ensure fewer households' dependence on agriculture. Packages should be targeted to both men and women, offering different opportunities as appropriate.

*Support to education* through such programmes as school feeding can have multiple impacts that offer benefits from the short through to the long-term. Immediately, they can support household food security by offering additional calories to the family if children attend school. Studies show that such programmes result in increased school attendance rates and impact on the gender gap in school attendance (Bennett in Devereux and Sabates-Wheeler 2004: 19). Most significantly, the long-term benefits of education are well known, as are the high correlations between poverty and lack of education. Ensuring everyone has access to this foundational building block - particularly the poor and vulnerable - is key for ensuring a strong human capital base that will support the exit from poverty through access to diverse opportunities.

## **Transformative measures**

*Land ownership rights* will ensure that the poorest and most vulnerable are legally entitled to compensation for their land - often their most valuable asset - should they choose to move away from agriculture. This may be particularly important if there is a large shift towards overall diversification, combined with commercialisation of fewer, larger farms to ensure that the poorest are not moved off the land with no compensation.

*Public-private cooperation* will be vital as increasing numbers of off-farm workers seek jobs. Helping the private sector to respond to this demand for jobs by easing the constraints to enter the market and to set up businesses will be fundamental to the expansion of the non-agricultural sector. Further, the private sector can help fill the gap for insurance provision and safety nets to a growing wage-labour population as the Government works towards a situation in which it can offer more inclusive welfare programming.

*Regulatory policies* for wage labourers can help to ensure that the growing workforce is protected from exploitation and supported in claiming their rights as workers. Specific instruments that can be used to establish this are: (1) the institution of a reasonable and modest minimum wage, which can protect the vulnerable without encouraging widespread underemployment<sup>23</sup> and (2) support to trade unions that will not only reinforce and help monitor policies such as a minimum wage, but will also embolden workers to assert their own rights, thereby providing space for the socially vulnerable to establish themselves more fully in society.

*Proactively challenging discriminatory behaviour* that may arise as the human geography of the country changes from a primarily rural, agriculture-dependent society to more integrated, urban, wage-labour dependent society. Campaigns to help control the spread of HIV/AIDS or to fight against socially discriminatory behaviour can help address some of the structural causes of vulnerability with which social groups grapple.

*Improved public sector governance reform* will play a critical role in enhancing and deepening democratic institutions and governance structures, ensuring citizens have

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<sup>23</sup> For a more complete and nuanced discussion of this see Devereux and Sabates-Wheeler 2004 and Devereux 2005.

greater voice and engagement in state and local government processes. This will contribute to a greater understanding by the government of the needs of the poor and vulnerable. Many of these reform processes are already underway, and could be enhanced. Some of them include institutional capacity building, increased transparency of public accounts, judicial reform, and decentralisation.

Though not an exhaustive list of what a climate change adaptation strategy might comprise, the above highlights the areas in which a social protection strategy - rooted in an understanding of how livelihoods work and the various root causes, structures and processes that determine their vulnerability - can buttress the efforts to protect against the challenges a changing climate may bring.

## **6. Reflections and conclusion**

### **Reflections on the framework**

The Household Economy Analysis framework - designed to offer understanding on how different shocks may affect specific aspects of a household - has helped illustrate effectively how regions, livelihood zones, communities and households might experience increasing levels of vulnerability due to the impacts that a changing climate may bring about. The illustration of survival lines and livelihoods protection thresholds particularly have aided in explaining more fully the implications climate change may have on households, as well as the wider development plan for the country.

The scenarios and case studies shown above have not been rooted wholly in scientific data as there is yet much work to be done on integrating crop yield information with climate change predictions. But the broad principles are evident: with estimates HEA can provide a picture of how climate change may affect the vulnerability of households.

Though HEA does provide information on how a household may cope with a shock to its physical and financial assets, food security and livelihood, it offers limited insight into how one's social or political capital may protect against or exacerbate vulnerability in these contexts. Despite the fact that key information around social assets may be inferred through understanding livelihoods (e.g. wealth ranking, access to assets that are not owned, or coping strategies such as remittances from family or clan members), the complete picture is lacking, as HEA does not offer insight into the problems that different social groups face. Lack of information regarding the demographics and social group membership of who would typically be in the different wealth groups means that there is little opportunity to fully understand the internal dimensions of vulnerability that affect one's ability to cope with a shock.

In the same vein, understanding intra-household dynamics around how gender and age influence resource access and allocations, time expenditure, and how different household members may be impacted differently by a shock, are key to envisaging the future needs of households adapting to the changing climate. If a new social protection programme were to offer alternative livelihoods training and support, appreciating the different needs

and spaces that men and women occupy would be essential to designing a robust programme that would maximise the potential of the whole population.

Another challenge that the Household Economy Approach will encounter in the context of climate change is the speed at which livelihoods may change as a result of the increasing number of shocks or proactive adaptation. In the former instance, for example, if a livelihood zone had sustained a number of shocks in recent years, the baseline would not reflect the lower asset base that might then be a reality for many in that zone. The implications of this on estimates for assistance could be drastic, as analysis would compare the shock year inputs to a higher baseline than existed in reality. Alternatively, the population percentage in a given wealth group may change were many people to sustain asset losses (i.e. people moving down from the middle or poor wealth groups), resulting in a lower estimate of required resources. Another example is the changing risks to health. For example, it is predicted that the prevalence of malaria will increase as temperatures rise (IPCC 2007). Understanding how a household may respond to these changes, as well, will be critical both for comprehending the challenges individual households face, but how policies and plans around health care provision may have to respond to the coming changes.

The transformative social protection framework complements the constraints of HEA by focussing on how the needs of various vulnerable groups could be ignored in the race to address the needs of those who will be physically vulnerable to a change in climate. Further, it is not inconceivable to think that responses may focus exclusively on the economic and physical needs of the vast - and potentially increasing - poor population. TSP offers a framework that brings the structural determinants of vulnerability to the discussion table, mitigating the risks outlined above. Moreover, it aids in envisioning the many opportunities Ethiopia has in creating a robust social protection system for a potentially fast-changing and adapting population. With the provision of protective, preventive and promotive forms of social protection already valued by policy makers and programme developers, a stronger push to include transformative policies - some at minimal cost - need not be such a far cry from reality.

Despite this, TSP does raise complex political questions regarding the needs of the poorest in that it does not address the challenges related to the feasibility of understanding

and reaching the most vulnerable groups. Furthermore, TSP does not offer practical and accessible tools for analysis that can be applied across a range of social, political and cultural environments. A comprehensive and appropriate system similar to HEA that will bring these challenges out for discussion will be invaluable in complementing the framework that TSP provides.

## **Conclusions**

This paper has shown the potential impacts of climate change and how it may affect the lives of a vast majority of the population currently dependent on smallholder, rain-fed agriculture. The livelihoods framework, through the lens of a Household Economy Analysis, has brought the focus of usually high-level and broad discussions around climate change down to a human level, showing that many agricultural livelihoods may soon be unsustainable. Furthermore, vulnerable populations - in many senses including groups with little social capital, unviable livelihoods, the food insecure, and those in specific regions which are high risk due to changes in weather patterns - will become increasingly vulnerable if structures are not put in place to proactively address these challenges.

It has shown that HEA tells us some - but not all - of what we need to know about livelihoods and the needs of a social protection strategy. The use of the Transformative Social Protection framework complements this, by offering a holistic vision of the structural frameworks and processes that determine and influence sustainable livelihoods. It expands the vision of what social protection can do, highlighting particularly the need to address social vulnerabilities in addition to the physical and economic. Furthermore, it shows how, as policies, programmes and human behaviour adapt, there is scope for these structures and processes to proactively address the challenges that the socially vulnerable may face as livelihoods shift away from sustenance agriculture in rural areas.

Together, the two shape a powerful partnership that offers both the broad structural view of how vulnerability is broadly created and reinforced, and a micro-level understanding of livelihoods, access and vulnerability of the poorest. The combination of these two types of analysis show that implications of this are wide-reaching and that a change in perspective from the highest levels of government and donor organisations, down to the household level, will be vital for the country to adapt to the coming changes.

It is maintained that agriculture, in general, may suffer considerably in the coming years, and the poorest, in particular, will become increasingly poor and more vulnerable, leading to unsustainable livelihoods. This further draws out questions on the existing social protection policies, which are founded on the assumption that encouraging agricultural livelihoods will graduate people out of food insecurity and, eventually, poverty. Pursuing this strategy without change might only see increasing numbers of chronically poor, instead of a steady decrease, as envisaged.

It is argued that Ethiopian policy makers' broad vision of how development is pursued nationally may not reflect the reality faced by millions of poor people. This applies both to the timeframes under which planning is undertaken, and the policies that are pursued. A vision that extends beyond the Poverty Reduction Strategy Paper will be critical for rooting the five-year plan in long-term strategies that are sensitive to the coming changes in environment. This will, inevitably, draw out questions regarding whether or not the current PRSP - reliant on the success of the agricultural sector - is relevant to the needs of the population, and the poorest in particular.

There are innumerable challenges in trying to establish the impacts of climate change with any degree of confidence. The additional impacts of increasing temperature on crop water retention, the changing patterns including increases and decreases of rainfall and changes in timing resulting in changing seasonality, the increasingly erratic weather patterns and severity of shocks are just a few factors that may change the outcome of the case studies presented. The result is that the picture painted here may not be fully reflective of what the future will bring, and may have significantly under-estimated the challenges that lie ahead.

In the broader context, the implications of even these uncertain predictions are significant and include such challenges as gaining political and financial support to back proactive plans for an unknown future. However, without such endorsement, the potential for poor households to adapt on their own is limited and increasing numbers of vulnerable people will be the result.

Climate change is here to stay. These findings, though applicable particularly for Ethiopia - a country still very much in the process of envisioning a bright, new future through its

development programme - are such that could be applied to numerous other contexts. The benefits of bringing the livelihoods discussion of climate change to a household level concretises the potential impacts on people, communities and nations, illustrating the need for proactive policies to address future vulnerabilities. The social protection agenda helps guide changes for this future work, focussing on decreasing the vulnerability of many levels and forms in the context of a climate that - without proactive thinking and adaptation measures - may only contribute to increasing vulnerability. Regardless of the potential constraints of individual conceptual frameworks, when complementary approaches are brought together they provide a much stronger vision of the consequences and potential opportunities to mitigate the negative impacts of a changing climate.

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## **Annex I**

### **General Assumptions**

The following are the assumptions that were applied to each of the case studies.

- Livelihoods patterns have not changed significantly and from what the baseline reflects now
- The population percentage of the wealth groups has not changed
- Though the population will have increased overall, some have moved on to growing urban and rural centres which means that the land holdings and the population of the rural areas covered in this livelihood zone has remained consistent with baseline year numbers
- Land reform has not taken place, and the land holdings are the same as they were in the baseline year
- General weather patterns have been assumed as consistent with what we see now – e.g. flooding during what has always been the rainy season, drought during what has always been the dry season. It does not take into account the different effects of rain falling at irregular times.

## **Irob Mountain Livelihood Zone**

Specific assumptions for this A2 dry scenario case study are as follows:

<b>Key parameter</b>	<b>Percentage of the baseline</b>
<i>Meher</i> barley	75
<i>Meher</i> maize	65
<i>Meher</i> other pulses	75
<i>meher</i> wheat	75
cactus fruit	100
Honey	100
Other crops general	75
<i>Belg teff</i>	55
Cattle	65 for v. poor and poor; 70 for middle and better off
Shoats	65 for v. poor and poor 70 for middle and better off
July, August, Sept milk	Milking cow: 70 Milk production: 65
Chicken sales	80

It is assumed that the asset base is the same as the baseline.

Prices have not changed and do not take into account major changes in inflation as we have seen this year.

## **Alaba-Mareko Lowland Pepper Livelihood Zone**

The following assumptions were applied to this B1 wet scenario case study.

### *Crops*

All key parameter crops were reduced to 75 per cent of the baseline.

Exceptions to this are maize and sorghum, because they are more sensitive to drastic rainfall patterns; these were reduced to 70 per cent of the baseline.

Peppers were also reduced to 70 per cent of the baseline to account for the fact that their maturing season falls when this scenario predicts a drastic average increase in rainfall. Therefore, this assumption, predicts floods, a damaged crop, and reduced yield.

### *Livestock*

All livestock holdings were reduced to 90 per cent of the baseline assuming diseases that come with flooding will affect the herd marginally.

In line with this, milk yields and products were also reduced to 90 per cent to reflect a marginal effect.

### *Markets*

Inflation has been taken into account in this scenario. All products purchased were assumed to have seen general inflation of 120 per cent. Sale prices were assumed to have increased 112 per cent

## **Hadiya-Kembata Cereal and Enset Livelihood Zone**

In this case study it was assumed that the baseline had changed due to an increasing number of more severe shocks. So assumptions are for (1) the new baseline, and (2) the effects of the climate change scenario.

### **Assumed baseline changes**

The changes in the baseline are for all wealth groups in the livelihood zone.

All production income sources were lowered to 90 per cent of the original baseline

The coping capacity (expandability) of each livelihood for each lowered income source was also lowered a correlating 10 per cent, to 90 per cent of the original baseline.

Baselines for food and access to labour were not changed.

### **Moderate shock scenario**

In addition to the new baseline, as established using the assumption above, a modest shock representing an average year in the context of a changing climate was assumed.

The assumptions for this were as follows:

### *Crops*

All key parameter crops were reduced to 82 per cent.

### *Livestock*

All livestock holdings were put down to 90 per cent.

Milk production is assumed to be at 85 per cent of the new baseline.

### *Markets*

All purchasing prices (incl. staple food and inputs) were assumed at 120 per cent inflation.

All selling prices (incl. crops, livestock & labour) were assumed at 115 per cent.

Overall inflation was assumed at 120 per cent.

