

PUTTING THE 'ABILITY' BACK IN VULNERABILITY

**Food Security Early Warning Systems and
The Livelihoods Integration Unit in Ethiopia**

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Abstract

Vulnerability is a useful concept only if it is used to enable a dynamic analysis of the effects of change on populations. Change is part and parcel of rural and urban poverty. In the context of an ever-decreasing resource base, understanding how people will (or will not) be able to cope with both the expected changes, such as seasonal variability and the unexpected or unpredictable shocks, such as major policy changes, conflict, floods, and droughts, is absolutely essential to the task of early warning. Properly defining and placing 'vulnerability' within the analytical framework used to provide early warning is fundamental to this task.

The following paper argues that adequate early warning of food insecurity and livelihood crises requires the systematic use of the disasters' literature formulation of "vulnerability", and that the commonly used food security definition of 'vulnerability' will make a late response almost inevitable. The paper will explore what it means to apply and make operational the concept of 'vulnerability' in the context of an early warning system, and in such a way as to allow for and encourage a broad (and more importantly **early**) discussion about the range of potential responses to predicted outcomes, including both food and non-food emergency responses, as well as poverty alleviation and development programming. The Ethiopia Government's Livelihood Integration Unit, housed within the Early Warning Department of the Disaster Prevention and Preparedness Agency, which is primarily responsible for famine early warning and emergency needs assessment for the Ethiopian Government, will be used as a primary case study for illustrating these points.

The paper touches on a number of issues, including:

- The concept of vulnerability and its role in allowing for dynamic analyses of change
- Integrating hazard, vulnerability and risk analysis to provide effective early warning
- Using data about vulnerability to estimate effective demand
- Household vulnerability to market shocks, health shocks (such as HIV/AIDS), crop shocks, and livestock diseases
- The operational incorporation of coping strategies into an early warning system
- Survival and Livelihoods Protection Thresholds
- Emergency needs projections
- Non-food needs assessments
- Development planning and credit analysis

TABLE OF CONTENTS

Acknowledgments	ii
Abbreviations	iii
Glossary	iv
List of Figures	vi
Introduction	1
Background: Conceptual Issues	2
2.1 What's "vulnerability" got to do with it?	2
2.2 Moving from concepts to practice: implementing $R=f(V,H)$ in the food security world?	6
Putting Vulnerability to Work: The Livelihoods Integration Unit	8
3.1 Operationalizing Sen's Entitlements.....	8
3.2 Livelihood Baselines.....	9
What can the Baselines alone tell you about vulnerability?	12
<i>Market Analysis: household vulnerability to market and price shocks</i>	12
<i>Vulnerability to crop hazards</i>	14
<i>Vulnerability to Livestock Hazards</i>	14
<i>Estimating effective demand</i>	15
3.3 Seasonal Assessments	16
3.4 Outcome Analysis (Risk)	18
Incorporating Coping Strategies	20
Thresholds.....	21
3.5 The Livelihoods Impact Analysis Spreadsheets	23
3.6 Uses of Outcome Analysis	24
Emergency Needs Projections	25
Non-food responses	25
Development planning and beyond	26
Conclusion	27
Annex I. Livelihood Zones of Tigray, Somali, and SNNP Regions	29
References	32

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ABBREVIATIONS

DPPA	Disaster Prevention and Preparedness Agency
DPPB	Disaster Prevention and Preparedness Bureau
GFDRE	Government of the Federal Democratic Republic of Ethiopia
FAO	Food and Agricultural Organization of the United Nations
FEG	Food Economy Group
FEWS NET	United States Agency for International Development (USAID) Famine Early Warning System
GAM	Global Acute Malnutrition
HEA	Household Economy Approach
NGO	Non-Governmental Organisation
ODI	Overseas Development Institute
REST	Relief Society of Tigray
RRA	Rapid Rural Appraisal
SAM	Severe Acute Malnutrition
SC UK	Save the Children UK
SLF	Sustainable Livelihoods Framework
USAID	United States Agency for International Development
WFP	United Nations World Food Programme

GLOSSARY

Livelihood Impact Analysis Spreadsheet	A spreadsheet that integrates livelihood baseline and hazard information in order to carry out the outcome analysis .
Livelihood Baseline	The quantified analysis of sources of food and income and of expenditure for households in each wealth group over a defined reference period.
Baseline storage sheet	A spreadsheet that enables field teams to enter, check and analyse individual interview data in the field, and to analyse and summarise field data during the interim and final data analysis sessions.
Chronic food insecurity	A household is chronically food insecure when it consistently fails to meet its minimum energy requirements.
Coping capacity	The capacity of households to diversify and expand access to various sources of food and income, and thus to cope with a specified hazard.
Hazard	A shock such as drought, flood, conflict or market disruption which is likely to have an impact on people's livelihoods
Household	A group of people, each with different abilities and needs, who live together most of the time and contribute to a common economy, and share the food and other income from this.
Household economy	The sum of ways in which a household acquires its income, its savings and asset holdings, and by which it meets its food and non-food needs.
Livelihood protection threshold	The total income required to sustain local livelihoods. This means total expenditure to: <ul style="list-style-type: none"> (i) ensure basic survival (i.e. all items covered in the survival threshold) (ii) maintain access to basic services e.g. health and education (iii) sustain livelihoods in the medium to longer term e.g. purchase of seeds or veterinary drugs, and (iv) achieve a minimum locally acceptable standard of living e.g. purchase of basic clothing or coffee/tea.
Livelihood zones	Geographical areas within which people share broadly the same patterns of access to food and income, and have the same access to markets.
Outcome analysis	An analysis of how access to food and cash for each wealth group will be affected by a defined hazard, and of the extent to which other food or cash sources can be added or expanded, or non-essential expenditure reduced, to make up the initial shortages.

Problem specification	The translation of a hazard such as drought into economic consequences at household level.
Predicted outcome	A quantified estimate of access to food and cash, taking into account the shock and household responses to it, in relation to a survival and livelihoods protection threshold .
Reference period	A defined period (typically 12 months) to which the livelihood baseline information refers, needed in order to analyse how changes in the future (in production, for example) can be defined in relation to the baseline.
Risk	The likelihood of a particular outcome, such as unusual hunger or food insecurity
Scenario outcome	A quantified estimate of access to food and cash arising from an outcome analysis , taking into account the effects of the hazard and household responses to it, for each of the wealth groups .
Seasonal calendar	A graphical presentation of the months in which food and cash crop production and key food and income acquisition strategies take place, also showing key seasonal periods such as the rains, periods of peak illness and the hunger season.
Survival threshold	The total food and cash income required to cover the food and non-food items necessary for survival in the short term. It includes (i) 100% of minimum food energy needs; (ii) the costs associated with food preparation and consumption; and (iii) where applicable, the cost of water for human consumption.
Vulnerability	The 'internal' cause that creates a heightened risk when combined with a particular hazard. People are vulnerable to particular hazards if they are expected to be unable to cope with a defined hazard ; for example, they are vulnerable to crop failure if such a hazard is likely to reduce their access to food or cash below a defined threshold.
Wealth breakdown	The process by which people within a livelihood zone are grouped together using local definitions of wealth and the quantification of their assets. The level of division depends on how the community views its society, and the purpose of the analysis.
Wealth group	A group of households within the same community who share similar capacities to exploit the different food and income options within a particular livelihood zone .

LIST OF FIGURES

Figure 1. Making a Distinction Between Poverty and Vulnerability	5
Figure 2. The Basic Components of the LIU System.....	9
Figure 3. Components of the Livelihood Baselines	10
Figure 4. Vulnerability to Labour Market & Price Shocks and Health Hazards	12
Figure 5. Vulnerability to Crop Hazards	13
Figure 6. Cattle income vs. Shoat income in Tigray Region.....	15
Figure 7. Annual expenditure of all households on staple food by livelihood zone	16
Figure 8. Key parameters: customizing the monitoring system	17
Figure 9. The problem specification: defining the magnitude of the hazard.....	18
Figure 10: An Example of an Outcome Analysis for Poor Households from the Wolayita Maize and Root Crop Livelihood Zone in Southern Ethiopia.....	19
Figure 11: What it means if total income falls below one or other threshold.....	22
Figure 12. Emergency Needs Results.....	24
Figure 13. Annual and Seasonal Projections	25
Figure 14. Appropriate non-food responses to a survival deficit.....	26
Figure 15. Credit repayment scenarios using Livelihoods Baselines and Outcome Analysis ..	26

1 INTRODUCTION

It is no longer unusual to come across humanitarian practitioners who believe famine, as opposed to localized acute food insecurity, is a thing of the past. In many parts of the world, pockets of food shortage and acute hunger have become commonplace, part of a pattern of seasonal ebb and flow. A pre-harvest hunger season in agricultural areas and a dry season deficit for pastoralists are expected, built into the planning calendars of aid agencies and the market projections of economists. Localized crop failures and even large scale production losses are more often than not resolved, mostly through some sort of exchange mechanism: reciprocal, where households have the means to pay or borrow; non-reciprocal, where social networks are strong and gifts are an option.

However, there is at least one country in the world where famine still poses a serious threat: Ethiopia. A number of factors have contributed to the continued (and in some cases growing) impoverishment of rural households in Ethiopia: population growth; decreasing farm sizes; a still largely inadequate road and market infrastructure; development policies that focus almost exclusively on agricultural production in areas that have long since lost their capacity for self-sufficiency; and multiple knock-on effects of the conflict between Ethiopia and Eritrea.

With so many people so close to the edge, a famine early warning system in Ethiopia is essential. Because the margins between making it through the year and going hungry are so small, the system has to be especially sensitive, able to detect when even a small shock might result in catastrophe. This paper argues that vulnerability is the key to this discernment; and how vulnerability is defined and integrated into the early warning system is of the utmost importance.

2 BACKGROUND: CONCEPTUAL ISSUES

In science and social science-based disciplines, the definition of concepts, and the terminology that makes these concepts operational, forms the foundation on which scientists can describe a problem, identify what analytical components are needed to assess the problem, create a model or framework for analysis, and test hypotheses. Terminology must be able to accurately reflect systemic relationships within an internally coherent analytical and methodological framework. Not only is this necessary for the utility of the framework, it is necessary for its accuracy.

Indeed, on a more expansive level, terms provide a critical shorthand for effective communication; effective communication helps build consensus, trigger response, coordinate activities, and link a large set of diverse people together behind a common goal. It follows that a common understanding of terms is fundamental to appropriate actions and response.

2.1 What's "vulnerability" got to do with it?

The term 'vulnerability' has been set afloat in a discordant sea of views and terminological debate for the past twenty years¹. Whereas disaster management has used the term "vulnerability" to evaluate the susceptibility of a population to a specific exogenous event or shock which leads to an outcome (such as food insecurity), food security analysis began to define the term in relation to that outcome (e.g. food insecurity) – to use the term as an indicator of the extent to which a population had moved towards that state of being food insecure. What is at stake is far more than a debate about semantics. What is at stake in this debate over these definitions is far more than a debate about semantics. What is at stake is the ability to distinguish clearly between cause and effect, and to develop a framework that identifies the relationship between these two in such a way as to provide the conceptual tools for differentiating, categorizing, and prioritizing the causal factors, and to allow for a degree of confidence around predicted outcomes. This paper argues that while the disaster management definition of 'vulnerability' provides the foundation for a rigorous framework for analysis, the most widely-referenced definition for vulnerability in the food security world acts as an epistemological obstacle, one which precludes the formulation of a transparent link between early warning and early appropriate action. To the extent that it can be argued as self evident that early action can save lives and livelihoods, then what is at stake are these very lives and livelihoods.

The basic confusion about terms arose in the 1980s, when a new conception of 'vulnerability' emerged in the food security world, following an attempt to widen the traditional disasters definition of vulnerability to incorporate social and political factors (in addition to natural hazards) into the consideration of food insecurity. The traditional disasters definition of vulnerability was clear: it was based on agreements reached in a 1979 United Nations workshop in which three core concepts for disaster management and prevention were standardized. The most important outcome of this workshop was the conceptual distinction between cause and effect, and the application of the terms "hazards", "vulnerability" and "risk" within this conceptual

¹ For more on this debate, and the unfortunate evolution of the term 'vulnerability' in the food security world, see Maxx Dilley, Tanya Boudreau, "Coming to Terms with Vulnerability: A Critique of the Food Security Definition", *Food Policy* (Volume 26, Issue 3, June 2001, Pages 229 - 247)

framework². The *effect* to be measured was defined as the ‘risk’; and two *causes* were identified: an external cause, the ‘hazard’; and an internal cause, ‘vulnerability’. So, for example, it is the risk of a bridge collapsing; the risk of a beach eroding; the risk of a landslide occurring, etc. that is being measured; and this risk is determined by two concurrent factors. “Hazards” are the external “potentially damaging natural phenomenon” – a hurricane, for instance; “vulnerability” is the internal cause, or, the way the bridge is constructed. It is important to note that “vulnerability” in this formulation is **not an independent concept, but rather contingent on a hazard event.**

Relating the concepts of hazards, vulnerability, and risk in this way has subsequently informed a useful and progressive discussion on the causes of disasters, the information needed to assess disaster risks, and measures that can be taken to intervene between those causal factors and their negative outcomes. What ultimately emerged was a simple relationship, some variant of which is consistently encountered in scholarly works (Maskrey, 1989; Blaikie et al., 1994), training manuals (USAID/OFDA, 1997; Coburn et al., 1991a) and applications (Kreimer et al., 1999; UNDP, 2000), in which disaster risk is some function of hazard and vulnerability, or $r=f(h, v)$. Disaster prevention depends on this distinction, because: “For most of the risks associated with natural hazards, there is little or no opportunity to reduce the hazard. In these cases the focus of mitigation policies must be on reducing the vulnerability of the elements and activities at risk” (Coburn et al., 1991b: 26).³

The power of the term ‘vulnerability’ in the disasters literature is contained in its role as an **operative link between the external hazard world and the potential outcomes of those hazards**. All buildings in an earthquake are not equally at risk of collapse. The buildings that collapse during an earthquake might survive a flood. Vulnerability levels change from hazard to hazard and year to year. This is true in the disasters world, and it is true in the food security world as well.

A good illustration of this point can be made with the 2000 Mozambique floods. The flood was clearly the ‘hazard’, in this case. But households’ vulnerability to floods varied greatly depending on where they lived and what alternative income sources they depended on. Their risk of food insecurity depended on both the magnitude and extent of the hazard and the way their livelihoods were constructed. Better-off households had more land near the river, where rich alluvial soils provide higher yields; they also tended to have large amounts of remittance income from household members who worked in the South African mines. Poorer households on the other hand had much smaller areas of land along the river and cultivated in the sandier, less productive upland areas⁴. Vulnerability to flooding, therefore, was higher for richer households, but they were much less vulnerable to droughts. When the 2000 floods occurred, better off households lost far more immediate production than poorer households, who actually found ways to benefit from the extra moisture in the uplands. But richer households were able to recover in the subsequent months through maximizing their production from recession agriculture and through relying on their remittance income (as soon as markets re-opened) to purchase food. In 2001, when a localized drought occurred in the Basin, it was the poorer households’

² UNDRO (United Nations Disaster Relief Coordinator), 1979. Natural Disasters and Vulnerability Analysis. Report of Expert Group Meeting (9–12 July 1979). UNDRO, Geneva, p. 5

³ Dilley, Boudreau, p. 230

⁴ Drawn from FEWS NET HEA Baseline Reports from the Limpopo Basin, 2001, see www.fews.net/livelihoods

production that was hit hardest, partly due to the reasons listed above. Thus vulnerability levels for different households changed depending on the hazard, and their risk of food insecurity varied according to both the hazard and their vulnerability to it.

The critical point is that vulnerability needs to be factored into needs assessment equations as a dynamic variable rather than a static description or else it loses its fundamental role, meaning and value in an early warning system. Nevertheless, many attempts to measure and encapsulate 'vulnerability' in the food security world repeatedly define it in static terms, in relation to the outcome rather than the hazard.

In disaster management usages, the question, "vulnerable to what?" tends to be answered by specifying an external hazard or threat that, if it acts on a vulnerable entity, can lead to an undesirable outcome, that is, a disaster. In food-related contexts, the question, "vulnerable to what?" is nearly universally answered "famine", "food insecurity", or "hunger", the undesirable outcomes themselves that vulnerable populations face.⁵

This is due, in large part, to a continued adherence to the definition of vulnerability proposed by Chambers in his editorial introduction to an IDS bulletin entitled, "vulnerability, coping, and policy", which was as follows:

Vulnerability here refers to 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.⁶

This conception of vulnerability encompasses all causal factors leading to the outcome, (both the external hazard, and the internal make up of the system) but does not provide the conceptual tools for differentiating, categorizing and prioritizing them. In order to establish the causes, the analyst must work backwards, identifying **a priori** who and where the vulnerable are, then embarking on an exploration of the factors responsible for their vulnerability.

If one were to apply the Chambers definition to the example above, of the Mozambique floods, both the rich and the poor populations mentioned above would be "vulnerable" to food insecurity – which could theoretically be due not only to the floods, but also to conflict, drought, typhoons, and any other hazards that could potentially affect them. Here, the Lower Limpopo population rests in a static state of vulnerability, without distinction between sub-groups based on income source diversity or plot location. Given this inoperable definition of vulnerability – one which fails to identify *why* different groups of the population are vulnerable – and *to what* they are vulnerable – few prescriptive measures can be recommended that would efficiently and effectively target the population most at risk of incurring harm from the floods.

Whereas "vulnerability" in the disaster context is a dynamic, contingent concept reflecting a group's or other element's ability to withstand specific exogenous shocks or threats, the intrinsic aspect of vulnerability in Chambers' definition consists of a static state of categorical defenselessness.⁷

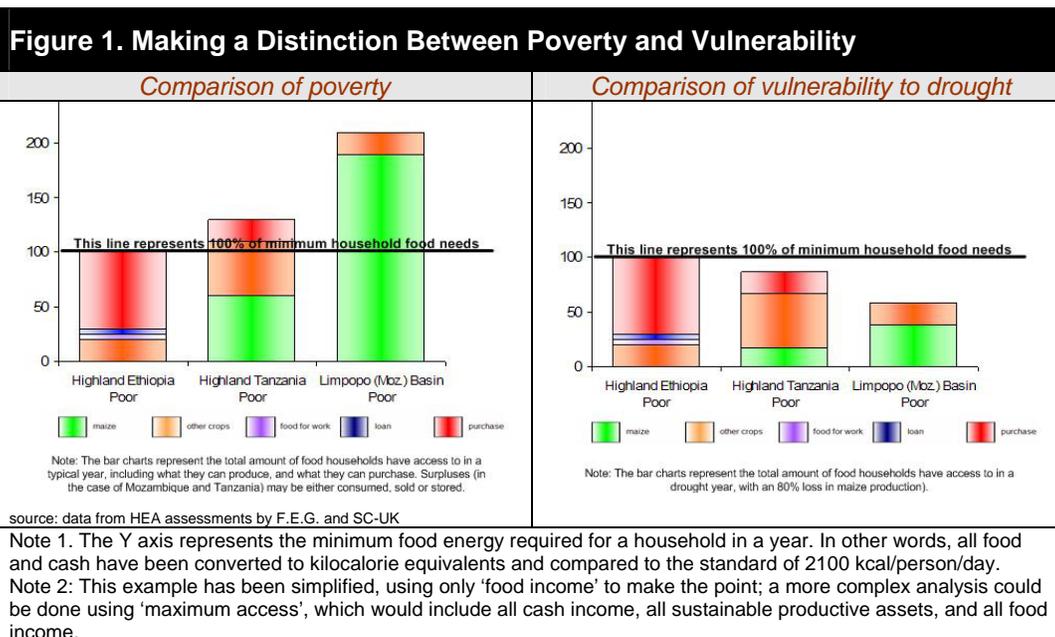
⁵ Dilley, Boudreau, p. 231

⁶ Robert Chambers, "Editorial Introduction: vulnerability, coping, and policy" *IDS Bulletin* (2) , 1989, p. 1

⁷ Dilley, Boudreau, p. 234

The Chambers definition of vulnerability has led to confusion about how to construct an analytical framework to encompass a dynamic analysis of change and its effects. One of the unintended results of this confusion is that causes and effects have been muddled into one. One example of this is with the terms ‘poverty’ and ‘vulnerability’, which have become almost interchangeable. Poor people are vulnerable and vulnerable people are poor. This is not only inappropriate for semantic reasons, but it can be dangerous from a practical point of view. In reality, while poverty is more a state of being, vulnerability can change in relation to the hazard, even as people’s poverty levels stay the same. Actions taken to reduce poverty can (and often do) increase vulnerability, at least in the short term. And actions taken to build resilience do not always increase wealth.

Take, for example, the cases illustrated in **Figure 1**. The graphs on the left provide a simple comparison of different levels of poverty among poor households in highland Ethiopia (part of Tigray Region), highland Tanzania (part of Arusha Region), and lowland Mozambique (part of the Limpopo Basin)⁸. In the baseline year, poor households in the Limpopo Basin are categorically richer than households in highland Ethiopia (see graph on left). However, in the face of a serious drought, with an 80% loss in maize production, it is these very same households who suffer the worst losses. The richest households in this example are most vulnerable to drought. One implication that can be drawn from this example, then, is that attempting to increase wealth for poor households in highland Ethiopia by, say, intensifying their crop production, (with all other things staying the same, i.e. no additional labour, land or capital resources), could actually increase their vulnerability to drought.



‘Vulnerability’ is a useful term because it allows us to see just what the relationship between poverty and hazards is. By conflating poverty with vulnerability, the

⁸ Poverty in this case is defined by comparing the amount of cash and food poor (vs middle and better off) households are able to generate in typical years using the land, labour, and social and physical capital at their disposal.

opportunity to reduce vulnerability to hazards, and to increase wealth sensibly (i.e. in a low-risk manner) is lost.

Aside from the confusion about which outcome is being measured, the most damaging result of the common food security conceptualization of 'vulnerability' is that it does not adequately distinguish between cause and effect. If it is not possible to analyze the link between cause and effect it is not possible to provide an early warning of a negative outcome or to prevent its worst effects. Rather the outcome must manifest before taking action. It is only when the relationship between a cause and its effect is defined that an early intervention can be mounted to either reduce the magnitude of the cause, or prevent the worst outcome(s).

2.2 Moving from concepts to practice: implementing $R=f(H,V)$ in the food security world?

In theory, a strong argument can be made for the logic of the disasters formulation of vulnerability in the food security world; but the transition from theory to practice is not always an easy one. All early warning systems have certain aspects in common, namely the aim of providing notice of a particular event, and communicating that information to relevant people. Specific elements of a food security early warning system are unique, however, because of the subject of enquiry and the outcome of concern. It is useful to review these elements as a preview to the next part of this paper, which is about aligning in practice the theory of food security early warning and the disasters equation referred to above.

The objective of a food security early warning system is to provide sufficient lead time to prevent people from going hungry. A good early warning system will, therefore, be able to not only monitor potential hazards or threats to food security, but identify who will be affected, where, when, to what degree. In order to link to appropriate preventive action and/or mitigating responses, the system should also be able to provide at least an initial view on the types of responses that might be most appropriate for different groups given the circumstances. And it should be able to provide enough lead time to prevent people from having to draw down on their productive assets in ways that will put their livelihoods at risk, leaving them less able to meet basic needs in the subsequent season.

Given these objectives, what are the specific methodological requirements of an early warning that is set up to analyze the risk of food insecurity? The current widely accepted definition of food security, 'ensured access'⁹ to sufficient food for all people at all time', contains four key elements that provide the starting point for defining these methodological "bottom lines".

- **Ensured access:** to understand **access** to food, we must understand the basic connections households have to the production system, markets, and social systems that encompass the set of options have for obtaining food. In other words, the basic *economic system* related to food. Increasingly in the world's poorest areas this involves a relatively stronger emphasis on labour and cash markets than crop production per se.

⁹ In this paper, 'access' is used in a wide sense to denote all the ways people obtain their food (i.e. not just the market). This definition includes the four standard options of: production (crops, fish, wild foods, milk/meat), purchase, reciprocal exchange (e.g. labour for food) and non-reciprocal exchange (e.g. gifts, relief).

- **Sufficient food:** The idea of sufficiency implies a threshold below which access would be insufficient. Obvious as this idea appears, the challenge of measurement in the real world is substantial. This challenge notwithstanding, it is absolutely essential to have a standard objective threshold against which access to food can be quantified and compared; it is, otherwise, not possible to adhere to the basic principles of international humanitarian law related to neutral and impartial prioritization of assistance based on relative need. While nutritional standards (GAM and SAM rates) provide one possible threshold, these are by definition not early warning thresholds, as signs of malnutrition emerge well after people's access to food has been compromised. The other practical standard is the international minimum food energy standard of 2100 kilocalories per person per day. While this standard does not necessarily encompass the wider diversity and nutrient requirements related to good nutrition, it does provide a useful absolute minimum threshold for determining (at least) the need to launch an emergency intervention aimed at preventing widespread acute hunger.
- **All people:** Contained within this element is the recognition that not all people share the same access to food. How people will be affected by changes is determined by how they usually obtain access to food, and what they tend to do to increase that access in the face of contractions in one or more options. An effective early warning system must, therefore, disaggregate its reference population into relevant units of analysis based on common access to food. Usually this means a geographic division (since where people live determines both what they can produce and where they can trade) and it means a social division (since how wealthy people are determines their means of production, their ability to buy food, and their means of coping given a contraction). An early warning system that fails to disaggregate adequately risks massive errors of inclusion and/or exclusion.
- **All times:** It is widely recognized that, because of the vagaries of the weather and other annual variables, people do not have the same access to food from year to year; however, it is often forgotten that in most rural areas variations in access occur within the year as well, from season to season and even month by month. These variations need to be understood and factored into an early warning system if it is to do two things: 1. determine when the effects of a hazard (and a subsequent food gap) will manifest; and 2. identify the period of time that the gap will last, i.e. when people's own livelihood strategies will adequately cover the deficit.

Early warning of food insecurity, then, is the ability to predict when a particular hazard (or external cause) will lead to an outcome in which all people no longer have ensured access to sufficient food. The system needs to be able to answer relevant questions that encourage appropriate prevention, mitigation and response, such as: Which people? Where? How much of a gap? When will it occur? For how long will it last?

Following from the above discussion of food security analysis and early warning systems in general, the following four methodological challenges should be essential components of a food security early warning system:

1. incorporate and effectively link together relevant information about the economic systems that ensure people's access to food;

2. disaggregate the population into relevant analysis units (in the case of food, this is usually determined by where people live and how wealthy they are);
3. predict both annual and seasonal access
4. measure against agreed-upon thresholds linked to well-defined and consensus-based response/intervention triggers

3 MAKING VULNERABILITY WORK: THE LIVELIHOODS INTEGRATION UNIT

The early warning system in Ethiopia is older than any other in Africa, born in the aftermath of the 1973 famine in Wollo. In the mid-1970s donors funded the establishment of an information and statistical unit (the Relief and Rehabilitation Commission) which became a fully-fledged Early Warning Service in the 1980s. Famine early warning systems in the 1970s typically tried to provide early warning of hazards but failed to provide early warning of outcomes. With the famine of 1984-85 renewed attention was given to the subject of early warning, along with new concerns about how to construct a system that would capture the complexity of the underlying economic and social causes of famine without overloading information collection and management capacities. A fundamental question began to emerge: why does famine sometimes fail to emerge in concurrence with large shocks, while small, nearly indiscernible triggers can cause acute food crises?

3.1 Operationalizing Sen's Entitlements

Around the same time, Amartya Sen's ground-breaking work on famine began to make clear the point that severe hunger crises are not the result of production failures alone, but of a combination of 'entitlement' failures. People's access to food is mediated by their reliance on different means of ownership, which, in turn, is based on the accepted entitlement relations in a country. In most parts of the world, there are four basic entitlement relations: production-based, trade-based, own-labour, and inheritance/transfer entitlements¹⁰. In essence this means that one has the right to own something if he/she:

- produces it with his/her own labour and capital (production-based);
- exchanges something he/she owns for it (trade-based);
- uses his/her own labour in exchange for it (own-labour); or
- receives it from a party who willingly gives it to him/her (inheritance/transfer).

Understanding who has access to food, and who will lose this access in the face of different threats, rests on a rigorous understanding of the network of pathways between households and these entitlements. Since the 1980s the study of food security, and the establishment of food security early warning systems, has included, in one way or another, some deference to this basic set of ideas.

The Livelihoods Integration Unit¹¹ was established within the Ethiopian government's Disaster Prevention and Preparedness Agency (DPPA) in 2006. It was designed with the express purpose of building the capacity within the government's early warning

¹⁰ Amartya Sen, "Poverty and Famines: an Essay on Entitlement and Deprivation". Clarendon Press, Oxford, 1981

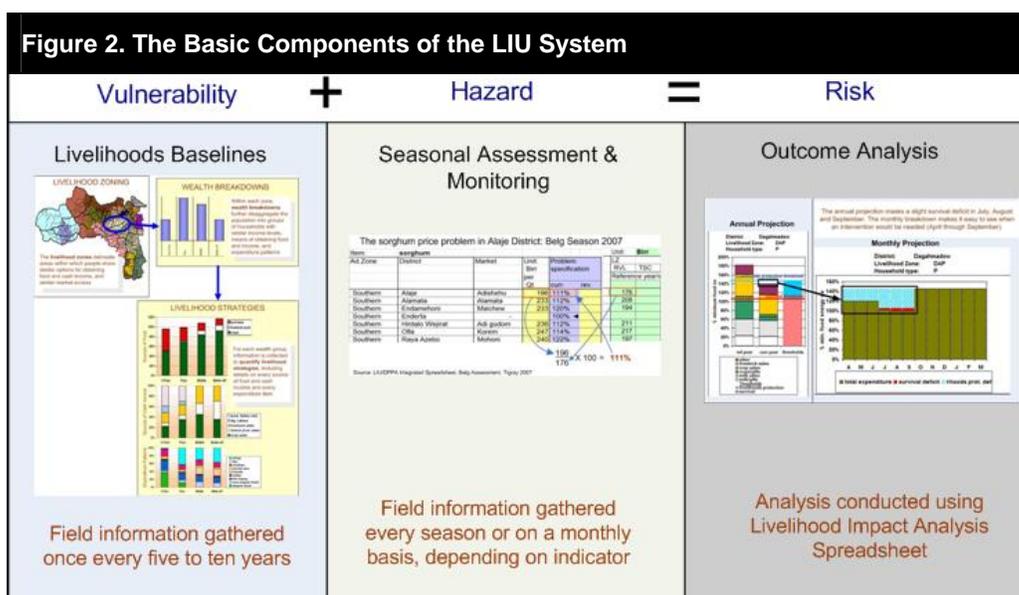
¹¹ The LIU is funded by USAID. The overall objective of the LIU is to build the capacity of the Early Warning Department to utilize a common livelihoods-based, quantitative framework for providing early warning of food crises, and for assessing and analysing emergency needs. Capacity building is at the core of the project. The idea is that after the project has completed its three year lifespan a system will be in place within the government to continue carrying out the functions of the unit.

system to take into consideration the types of entitlements identified by Sen, and at the same time to analyze how the relative reliance on one or another entitlement changes households' vulnerability to various natural and man-made hazards. In effect, the LIU is helping to transform the Ethiopian early warning system from an indicator-based to a systems-based approach¹².

The LIU's working methodology is based on the disasters management model referred to in Section 2.1 above $R=f(H,V)$, in which the *risk of food insecurity* = an analysis of the *hazard(s)*, which can be either natural phenomena or man-made (war, market disruptions, health, policy changes) combined with an understanding of *vulnerability* to these hazards¹³.

As illustrated in **Figure 2**, three basic components fit together in the LIU system to provide ongoing support to the DPPA:

- Livelihood Baselines;
- Seasonal Assessments; and
- Outcome Analyses.



Each of these components, and its relation to the $R=f(H,V)$ framework is discussed in greater detail below.

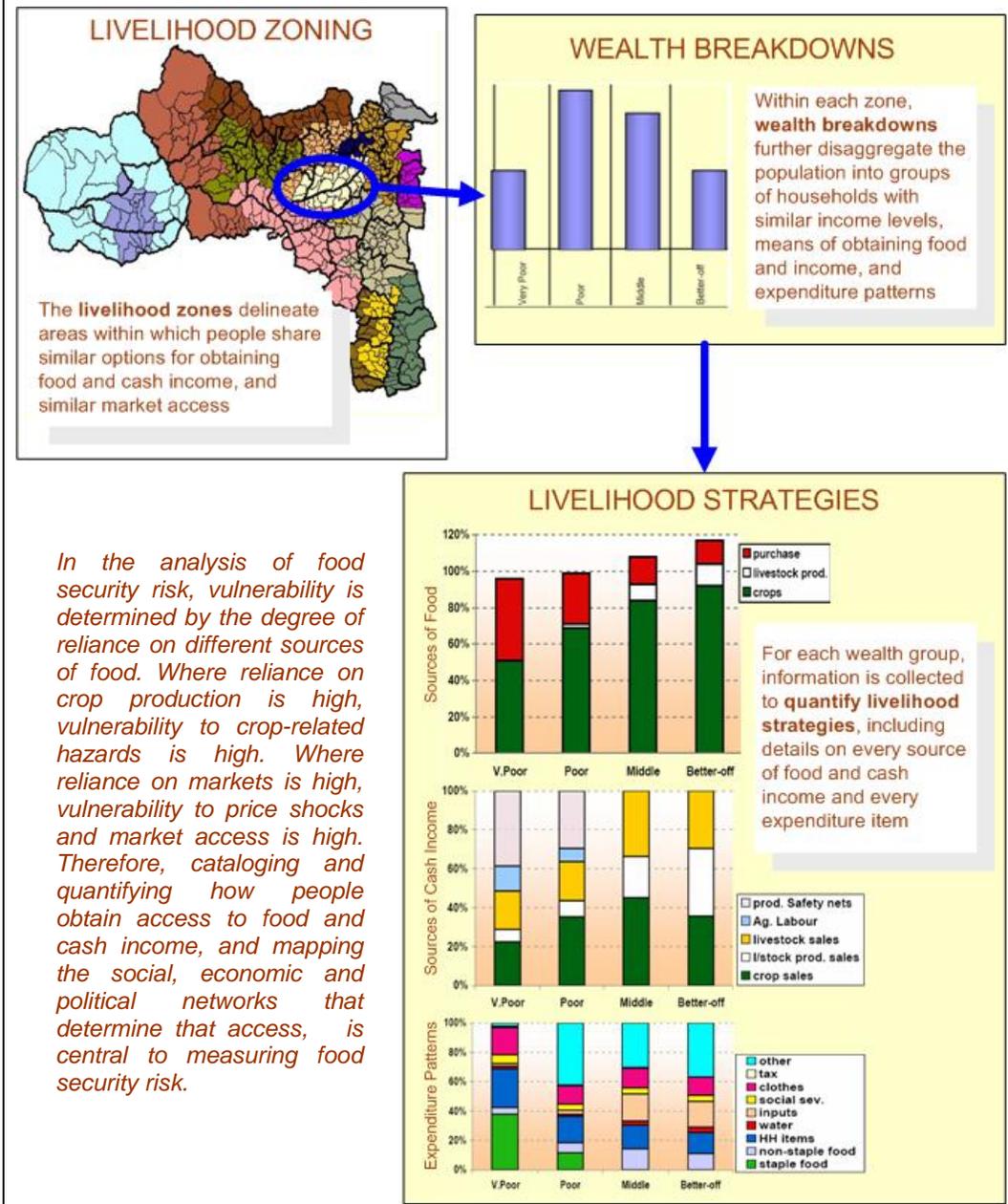
3.2 Livelihood Baselines

¹² A systems-approach to food security analysis aims to understand first the components that make up the local economy, so that the effects of a change in one part of the equation can be properly interpreted in another. Indicator approaches are based on more generalised assumptions about causal relationships (e.g. production drop = food insecurity).

¹³ The LIU uses the Household Economy Approach (HEA) as an organizing framework. HEA is an analytical framework that draws out the components of people's livelihoods, and allows analysts to systematically determine how people will be affected by a wide range of shocks, including those related to weather, markets, policies, and health. It provides a holistic picture of how people live, what puts them at risk of food or non-food shortages, and ultimately which types of responses (food, cash, or in kind non-food) are most appropriate. For more on HEA, contact F.E.G. at info@foodeconomy.com or see the upcoming release of The Practitioners Guide to HEA, F.E.G. and SC UK, 2007

Since the 1970s it has become widely accepted that an accurate prediction of food security outcomes can not be derived from hazard information alone. For instance, being able to predict that crop production will decline by 50% does not mean that people's access to food will decline by a similar percentage. Their access depends on 1. the degree to which they depend on crop production to meet their food needs; and 2. their complete package of livelihood capitals, which determines their capacity to turn to other means of generating access to food, such as the market, or alternative production options (e.g. fish or wild foods).

Figure 3. Components of the Livelihood Baselines



The premise for integrating livelihoods information into Ethiopia's food security early warning system is that a standardized, quantified and comparable set of information

about the way that people live provides a basis for understanding how various shocks will affect different sets of households, and for linking the hazard information to an estimation of risk. Therefore, a major thrust of the LIU's first two years has been to establish a complete set of livelihoods baseline data for the agricultural regions in Ethiopia, including: SNNP, Tigray, Amhara, Oromiya, Harari, Dire Dawa, Gambella and Benishangul Gumuz Regions. Livelihood Baselines in the pastoral regions, Somali and Afar, have been developed concurrently by Save the Children-UK and F.E.G.

A household's vulnerability to particular hazards is determined by its livelihood pattern, which includes how it obtains food, its means of generating cash income, and all the ways it secures access to the non-food services and provisions it needs. Thus, the Livelihoods Baselines are a detailed set of data about different sets of households on the following:

- sources of food
- sources of cash income
- expenditure patterns
- market networks and access
- productive assets
- savings

The Livelihood Baselines serve as the 'vulnerability' variable in the $R=f(V,H)$ equation

In essence they map how different sets of livelihood assets and capital determine access to the things people need to survive and prosper. With this set of data in place, it is possible to identify which aspects of households' livelihood systems will be affected by each hazard. The Livelihoods Baselines ultimately serve as the 'vulnerability' variable in the $R=f(V,H)$ equation.

The data sets are disaggregated by two main factors: geography and wealth. This is because people's physical market, production and social networks and their access to them varies depending on both geographic placement and wealth status. See **Figure 3**.

Information to construct the Livelihoods Baselines starts with a review of secondary sources (census, government ministry data sets, NGO and UN reports, various map layers, FEWS NET, etc.). However, most of the household-level data about food, income and expenditure can not be found in secondary sources; primary field work¹⁴ fills the gaps. The field work is conducted by federal, regional and *woreda* officials who have received extensive training through the LIU's capacity building program¹⁵. Data from the Livelihoods Baselines is stored in

The Livelihoods Baselines address the first two methodological requirements referred to in Section 2.2, above:

- 1. incorporate and effectively link together relevant information about the economic systems that ensure people's access to food; and**
- 2. disaggregate the population into relevant analysis units.**

¹⁴The field work is extensive and intensive. For example, in total, in the SNNPR field work, over 3,900 household members were interviewed, along with 2,800 community leaders. The interviews take, on average 2 hours each. For more on the specific methodology used, refer to The Practitioners' Guide to HEA, F.E.G. and SC UK, 2007.

¹⁵ Aside from government officials, other organizations who have participated in LIU supported training in the first year include: USAID, FEWSNET, UNOCHA, WFP, UNICEF, FAO, ACF, Bahir Dar University, Amhara BoARD, ORDA, SC-UK, GOAL, World Vision, PCDP, REST.

Livelihood Baseline Storage Sheets (LBSS), which act as both an archive of all the interviews conducted in the field, as well as an important quality control tool, with built-in analysis and cross-checking devices¹⁶. This data is also linked to the *Livelihood Impact Analysis Spreadsheets (LIAS)*, which facilitate the Hazard and Outcome Analysis (discussed further below).

What can the Livelihood Baselines tell you about vulnerability?

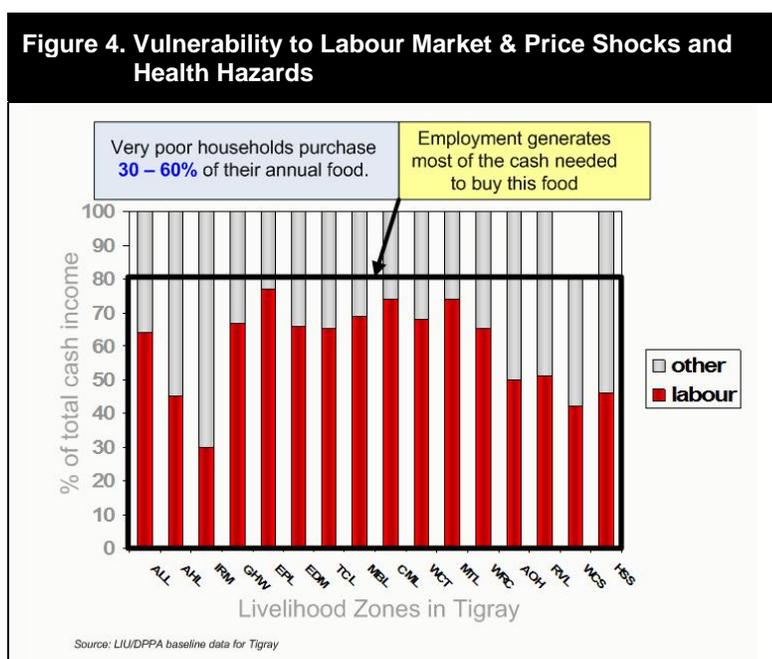
The unusual depth and breadth of the household-level data contained in the Livelihoods Baselines makes them a unique source to mine for insights into poverty analysis, development programming, and risk-reduction activities. Three examples of these applications are presented below, illustrating specific uses for market analysis, livestock programming, and targeting. The data for these examples comes from the *Livelihood Baseline Storage Sheets (LBSS)* from Tigray Region, which were completed in 2007. A map of the Livelihood Zones of Tigray can be found in **Annex I**.

Market Analysis: household vulnerability to market and price shocks

It is well understood these days that market ‘shocks’ are one of the most frequent and damaging hazards for poor households. As a general rule, and particularly in the Ethiopian Highlands, where two of the worst famines in the past 50 years occurred, the poorer the rural household, the more it depends on buying its food. By definition, being poor in Ethiopia (and in most rural

areas in the developing world) means having limited means of production and capital: less (if any) land and fewer livestock. Because labour is the one capital that poorer households can usually rely on, understanding labour markets and tracking staple grain prices must be at the heart of an early warning system aimed at measuring food security risks in Ethiopia. Despite this knowledge, requisite information about the specific link between households of different wealth groups and particular labour markets has been largely missing until now.

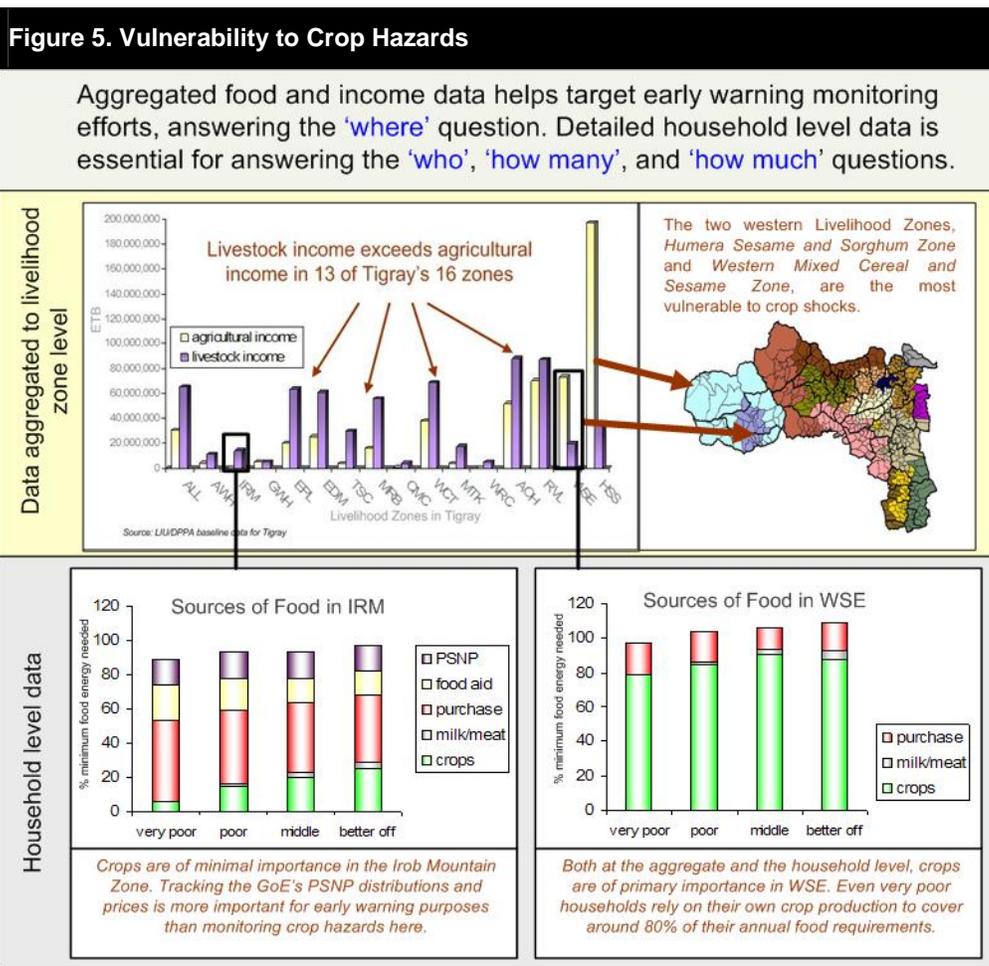
The Livelihoods Baselines are replete with information about people’s access to markets, offering clear evidence of the role markets play in allowing households to generate the income they need to survive as well as obtain the goods and services required for growth and wealth generation. Primary, secondary and tertiary markets



¹⁶ For more on the Baseline Storage Sheets see F.E.G.'s Guidance on the Baseline Storage Sheets, by Mark Lawrence

for every livelihood zone and every major commodity (crops, livestock, labour, staple grains, etc.) are documented in the *LBSS*, along with specific data on the amount of income each household group generates through each type of market. The strong focus on markets is not for its own sake, but because this information is essential in the vulnerability equation. **Figure 4** illustrates this point, highlighting the inordinate reliance on labour income for poor households in Tigray Region.

Labour’s primacy for poor households is relevant for an analysis of the impact of health hazards as well. For instance, we know that, on average, an HIV/AIDS afflicted adult suffers seventeen AIDS-related sick spells before dying. With each event, household productivity declines. Young productive men and women are the most common targets of HIV/AIDS and also the most likely household members to be generating employment-related cash income. Malaria, a common health hazard in the Humera Sesame Zone, where over 200,000 migrant workers flock each year to seek agricultural labour, is another major threat to household income. Knowing just how much this employment contributes to the household economy arms us with the information we need to determine the specific effects of losses to this component. It also provides an important advocacy tool for highlighting the importance of health-related interventions and services.



Vulnerability to crop hazards

Countless sources cite the agricultural potential of Ethiopia and almost all accounts of Ethiopia's economy start with reference to agriculture being its most important sector. The Ethiopian Government has made the development of agriculture central to its food security policies. The Livelihoods Baselines provide a useful reality check on these prioritizations. **Figure 5** illustrates the relative importance of crop and livestock income in Tigray Region, providing evidence that in all but two of the region's livelihood zones **livestock income far outweighs agricultural income**.

The LIU's Livelihood Baseline data challenges the conventional wisdom and the investment priorities of traditional agriculturally-focused development and economic growth initiatives, but in an objective way that can help reshape thinking about the importance of livestock to the local economy. At the same time the data also make clear that monitoring crop hazards in the two western livelihood zones is absolutely essential to regional early warning efforts, both because of the food security of the livelihood zones themselves, and because of the reliance of the wider region on labour income from these zones.

Vulnerability to Livestock Hazards

Until recently, information essential for livestock programming and early warning needs has been noticeably inadequate in pastoral areas. The Somali Region food emergency of 1999-2000, which found itself showcased in news headlines around the world, attests to this dangerous gap of knowledge for famine early warning purposes. Andrew Catley and Berhanu Admassu point out that the lack of information has also hindered appropriate targeting and prioritization of veterinary services.

In an era of declining public sector veterinary services in Africa, priority setting and rational allocation of resources is becoming increasingly important. Regarding livestock disease control, many countries lack the basic epidemiological and economic information that enables disease problems to be prioritised at local or national levels. Furthermore, information deficits are often most evident in those areas characterised by large livestock populations and high levels of poverty.¹⁷

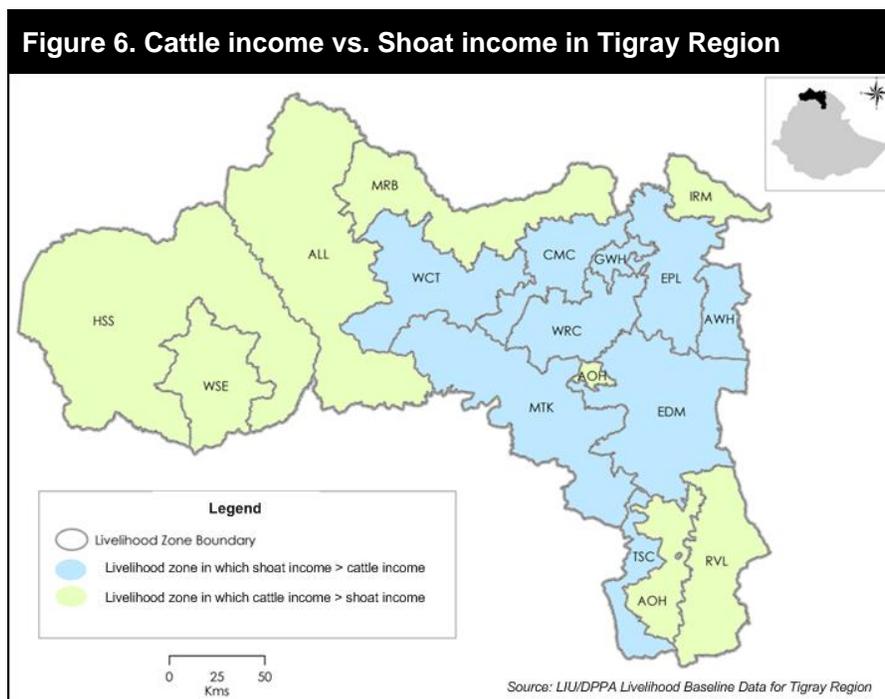
A UNDP emergency unit report further supports this point, arguing that one consequence of this lack of information is that livestock disease interventions in Ethiopia tend to occur after an outbreak, and after income and livelihood losses have already been suffered.

Although many of the diseases could be controlled by available vaccine technology, timely recognition of the disease followed by acquisition of the pharmaceuticals are lacking...Consequently, in Ethiopia the majority of disease intervention consists of mass inoculations following outbreaks rather than preventive measures.¹⁸

17 Andy Catley and Berhanu Admassu, "Using participatory epidemiology to assess the Impact of livestock diseases", *Community-based Animal Health and Participatory Epidemiology (CAPE) Unit*, Pan African Programme for the Control of Epizootics

18 Dr. Muktar Rashid, Dr. Robert Shank, "Technical Report : Rough Guide to Animal Diseases in Ethiopia", United Nations Development Programme, Emergencies Unit for Ethiopia, 1994

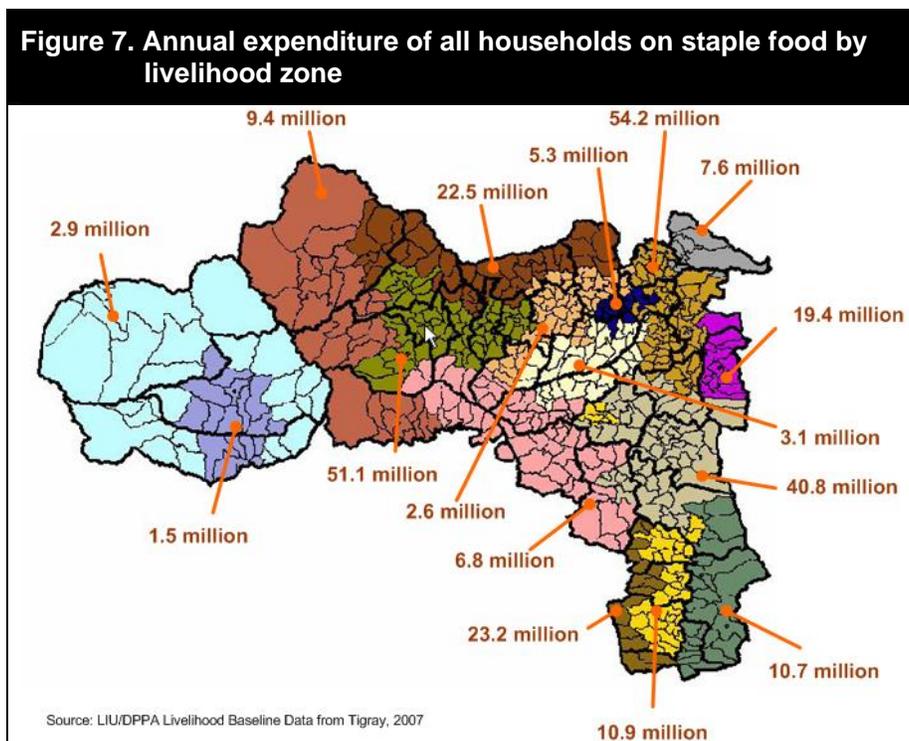
By knowing just how much each livelihood zone relies on different categories of livestock income, it is possible to prioritize and target preventive veterinarian care as well as to understand who will be most affected by specific livestock diseases.



The LIU Livelihood Baseline data helps in this regard, filling a critical information gap not just in pastoral areas, but also in agricultural areas, where, as illustrated in **Figure 5** above, livestock income is often hidden but essential. **Figure 6** maps the data on livestock income taken from the LIU baselines, aggregated up to livelihood zone level. It shows where income from cattle is more important than sheep/goat income (in green), and where the reverse is true (in blue). As a first cut, this can help focus the targeting of vaccines for bovine diseases and for shoat diseases; and since data exists for all livestock income categories (chickens, camels, cattle, goats, sheep, apiary, etc.) even for avian flu and Newcastle's disease, helping save time and increase efficiency. It can also be a good guide for early warning efforts, by assessing where the effects of particular livestock disease outbreaks will be most severely felt in terms of food and livelihood security.

Estimating effective demand

The LIU Livelihood Baselines are the only data source available in Ethiopia that contain highly detailed breakdowns of expenditure patterns and the amount paid for different cost categories by wealth group. Any of the expenditure items can be added up for each wealth group and summed for the livelihood zone or district as a whole providing a total amount spent per annum, or per season if necessary, for staple grains, agricultural labour, health services, water, agricultural inputs (seeds/fertilizers), etc. (See **Figure 7**). This information can contribute to an estimation of effective demand for any number of different services and commodities and can be a critical guide for agencies or offices aiming to link consumers to suppliers, and to develop market infrastructure in a sensible, demand-driven way.



3.3 Seasonal Assessments

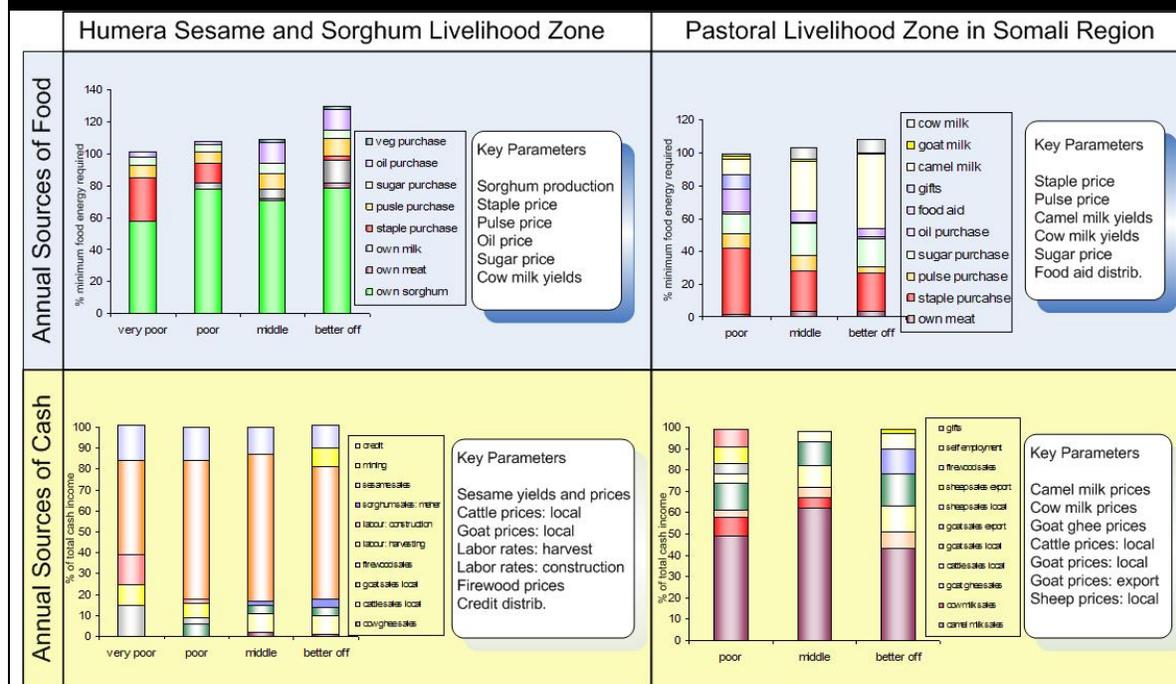
Monitoring constitutes the second component of the DPPA's livelihood-based early warning system. The Ethiopian EWS engages in a number of monitoring and assessment activities, including: regular monitoring of climatic data, crop production, markets and prices, etc.; disaster area assessments, mainly focusing on rapid-onset disasters and verification exercises; rapid health and nutrition assessments; intermittent nutritional surveillance; and annual multi-agency emergency need assessments (*meher/belg seasons*).

The objective of hazard monitoring is to define the magnitude and the geographic extent of the hazard, which in this case means any potential threats to food security. The advantage of having the Livelihood Baselines available is that it helps customize the indicators to monitor; the idea is to monitor only hazards relevant to the local livelihood system. This saves time, focuses energy, and makes the assessment process more efficient.

In the LIU these monitoring indicators are referred to as 'key parameters', that is, for each wealth group and livelihood zone, the sources of food or cash that contribute significantly to total food or cash income so that a reduction in access to that one source may have a significant effect on total access. In practice, a key parameter is a source that makes up at least 10% of food or cash income for one wealth group, or at least 5% of food or cash income for two wealth groups.

Figure 8 illustrates the dramatic difference in key parameters between an agricultural zone (Humera Sesame and Sorghum Livelihood Zone) and a pastoral zone (in Somali Region).

Figure 8. Key parameters: customizing the monitoring system



The argument for customizing monitoring systems by livelihood zone is clear from this example: to include sorghum yields in the Somali Region monitoring system would waste time and resources; just as monitoring cow milk prices in Humera would be of little value, and divert the focus from relevant enquiry. In Ethiopia, where personnel, vehicles, fuel and time tend to be extremely limited, it is especially important to maximize time spent in the field and to focus on only the relevant variables.

The next step, after identifying which “key parameters” to monitor, is to analyze the magnitude of the ‘problem’¹⁹ for each of these components of the livelihood system. This involves quantifying the change in relation to the reference year – in percentage terms – for each of the key parameters. The compilation of all of these quantified changes is called a ‘problem specification’. A problem specification allows analysts to mathematically link the hazard to the livelihood baseline in order to determine effects on access to food and income. Without this critical step of quantifying the hazard in relation to the baseline, estimating the risk of food insecurity is a subjective guessing game, open to bias and misappropriation, and readily subverted to political manipulation. **Figure 9** provides a real example of a price problem for sorghum in Alaje District in the Raya Valley Livelihood Zone in the 2007 *belg* season. As shown, the 2007 price, from monitoring data obtained at Adishehu market, is 196 birr, which is 111% of the

Seasonal Monitoring addresses part (but not all) of the third methodological requirement referred to in Section 2.2, above:

3. predict both annual and seasonal access

¹⁹ The system is also able to take into consideration gains, not just losses. So, if production increases for certain crops one year but declines for others, the effect of this on overall cash and food income can be seen.

reference year price of 176 birr. Whether or not this minimal shock leads to a food or cash income gap is analyzed in the next step: Outcome Analysis (below).

Figure 9. The problem specification: defining the magnitude of the hazard

The sorghum price problem in Alaje District: Belg Season 2007

Item: sorghum					Unit: Birr
Ad.Zone	District	Market	Unit: Birr per Qt	Problem specification	LZ
				curr. rev.	RVL TSC
					Reference year/s
Southern	Alaje	Adishehu	196	111%	176
Southern	Alamata	Alamata	233	112%	208
Southern	Endamehoni	Maichew	233	120%	194
Southern	Enderta	-		100%	
Southern	Hintalo Wejirat	Adi gudom	236	112%	211
Southern	Offa	Korem	247	114%	217
Southern	Raya Azebo	Mohoni	240	122%	197

$\frac{196}{176} \times 100 = 111\%$

Source: LIU/DPPA Integrated Spreadsheet, Belg Assessment, Tigray 2007

One important point is that monitoring data in the LIU system is gathered according to government protocols, at the relevant administrative levels. It is entered into spreadsheets that have been set up to cross-tabulate data between administrative level and livelihood zone. Results can be seen and analyzed at either level. This makes it easier to develop response plans in a timely way, and ensure that there is a seamless flow of information from one level to the next.

3.4 Outcome Analysis (Risk)

The essential task of early warning is to provide sufficient advance notice to governments and aid agencies to allow them to meet requirements before people go hungry or deplete productive assets essential to maintaining their livelihoods. An order for food aid placed today in Addis will typically arrive in Jijiga in no fewer than six months. Most ‘indicator’ based approaches tend to rely heavily on outcome indicators, such as malnutrition data to inform their classification of famine. Nutritional status is one of the latest indicators available and when GAM rates reach critical mass, people have likely stripped themselves of savings and stocks, sold both their non-productive and productive livestock, suffered hunger-related illnesses and possibly migrated. Re-constituting these lives and livelihoods is more expensive, by an order of magnitude, than a timely intervention would have been. In addition, because signs of malnutrition begin to emerge, in a measurable sense, only months after food access is seriously compromised, and because malnutrition is most prevalent in the period before the harvest, the harvest will usually be available by the time a response gets organized. Food aid flowing in at this time risks distorting markets and keeping local farmers from reaping the maximum cash benefits from their sales. The local farmers who sell their crops (and therefore most vulnerable to a drop in post-harvest prices) are also the ones who tend to hire the poorer household members; so food aid at harvest time can seriously undermine the entire local economy, with knock on effects well into the next year.

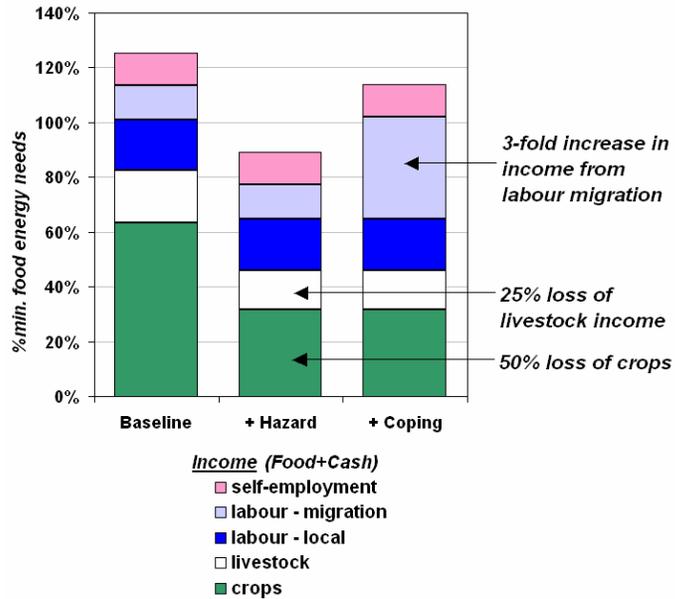
The LIU's Outcome Analysis provides six to nine months of lead time.

Figure 10: An Example of an Outcome Analysis for Poor Households from the Wolayita Maize and Root Crop Livelihood Zone in Southern Ethiopia

Three types of quantitative data are combined to predict outcome; data on baseline sources of food and cash, data on the hazard and data on coping strategies.

First of all, the effects of the hazard on baseline sources of food and cash income are calculated (middle bar in the chart). Then the effect of any coping strategies is added in (right-hand bar). The result is an estimate of maximum total food and cash income for the current year.

Note: In this graphic, food and cash income have been added together and, in this case, expressed in food terms. (The results could also be expressed in cash terms.)

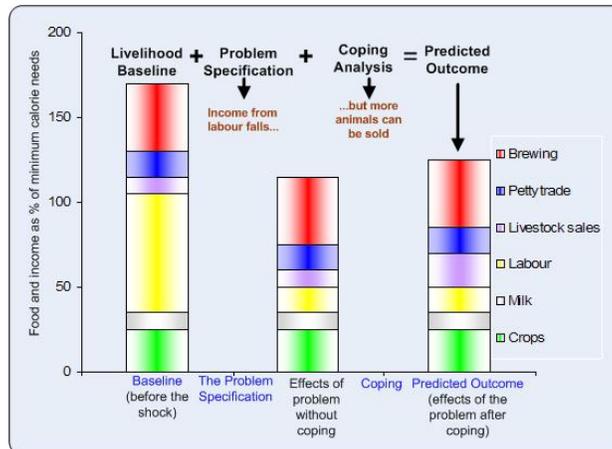


Source: Mark Lawrence, LIU, 2007

The point is: effective early warning is essential for minimizing costs for both the donors and poor households. In the LIU, the function of assessing the future risk of famine is provided by a process referred to as “Outcome Analysis”. Outcome Analysis adds together the Livelihood Baseline (Vulnerability) information and the problem specifications (Hazard) to project households’ ability to meet their basic survival and livelihood requirements (Risk). It provides between six and nine months of lead time. In theory the process is relatively simple, as reflected in the equation below:

$$\text{Livelihood Baseline} + \text{Problem Specification} + \text{Coping Analysis} = \text{Predicted Outcome}$$

In graphic form, the process translates into the following, using a hypothetical example:



Two aspects of the LIU's Outcome Analysis deserve further discussion. The first has to do with how coping capacity is incorporated into the analysis; the second is about the thresholds against which the outcome is measured.

Incorporating Coping Strategies

It is generally understood these days that people do not passively sit by in the face of a shock, but actively respond, attempting to protect their access to food and their livelihoods in a number of ways; these ways are commonly referred to in the food security literature as 'coping strategies'. With the exception of last-resort options, most 'coping strategies' are not unique alternatives turned to only in times of stress, but rather a temporary intensification of normal options for obtaining access to food and cash income. Data from HEA field work²⁰ conducted over the past 15 years by F.E.G. and SC UK, among others, shows that people's coping strategies can be grouped into three general categories:

1. increasing direct access to food (e.g. drawing down on stocks; increasing fishing or wild food collection activities)
2. increasing purchases by intensifying cash income generation (e.g. selling more livestock than normal, sending two rather than one household member to labour, selling more firewood, etc.)
3. Switching expenditure from non-survival to survival (e.g. foregoing expenditure on clothes and buying food instead)

In the LIU, each coping strategy is categorized by its level of cost. See **Box 1**. The truth is that every coping strategy has a cost to it: drawing down on stocks makes less available to sell in the coming year; selling more livestock reduces the safety margins of a household; spending more time gathering wild foods means less time spent in the fields or earning cash income, etc.

Outcome Analysis does not include high cost strategies in the calculations. The reason for this gets to the core of what the LIU's analysis aims to achieve:

Box 1. Types of coping strategy
<p>Low Cost (<i>included in outcome analysis</i>)</p> <ul style="list-style-type: none"> • Reduced expenditure on non-essential items (beer, cigarettes, ceremonies, festivals, expensive clothing, meat, sugar, more expensive staples, etc.) • Harvesting of reserve crops (e.g. cassava, enset) • Consumption rather than sale of any crop surplus
<p>Medium Cost (<i>included in outcome analysis</i>)</p> <ul style="list-style-type: none"> • Increased sale/slaughter of livestock (sustainable) • Intensification of local labour activities • Short-term/seasonal labour migration • Intensification of self-employment activities (firewood, charcoal, building poles, etc.) • Increased remittance income • Increased social support/gifts • Borrowing of food/cash • Sale of non-productive assets (jewelry, clothing, etc.) • Collection of wild foods
<p>High Cost (<i>excluded from outcome analysis</i>)</p> <ul style="list-style-type: none"> • Unsustainable sale/slaughter of livestock • Long-term/permanent migration (including distress migration of whole households) • Excessive sale of firewood/charcoal (e.g. because of its effect on the environment) • Sale/mortgaging of productive assets (land, tools, seeds, etc.) • Prostitution • Child labour • Reduced expenditure on productive inputs (fertilizer, livestock drugs etc.) • Reduced expenditure on health and education • Reduced expenditure on water • Decreased food intake <p><small>Source: HEA Practitioners' Guide, F.E.G./SC-UK, 2007</small></p>

²⁰ HEA has been conducted in the following countries/urban areas: Angola, Bangladesh, Burkina Faso, Burundi, Cambodia, Chad, Chechnya, Democratic Republic of Congo (DRC), Djibouti, Ethiopia, India, Indonesia, Ingushetia, Kenya, Kosovo, Lesotho, Liberia, Macedonia, Mali, Montenegro, Mozambique, Malawi, Myanmar, Niger, Pakistan, Palestine, Rwanda, Serbia, Sierra Leone, Somalia, Somaliland, Sri Lanka, Sudan (north and south), Swaziland, Tajikistan, Tanzania, Uganda, Zambia, Zimbabwe

Outcome Analysis **does not model behaviour**, but defines the point at which an intervention – either to save lives or to save livelihoods – is necessary. By leaving the high cost strategies out of the analysis, the predicted outcome provides guidance on when an intervention needs to occur in order to ensure that people will have the option not to turn to damaging and extreme options. This is not to say that people will not turn to high cost options anyway, but rather that they will retain sufficient resources to not to have to.

Information about households' coping strategies is collected during the Livelihood Baseline fieldwork and used during the Outcome Analysis to judge the extent to which people will – on their own – be able to reduce the food or cash income gap created by the hazard or set of shocks. In other words, the coping analysis step is a quantified assessment of households' ability to diversify and expand access to various sources of food and income, and thus to cope with (a) specified hazard(s).²¹

Thresholds

The discussion of coping strategies naturally leads to the question: how much coping is enough? In other words, what is the trigger point for an intervention?

A prerequisite for determining risk is defining a scale against which to measure it and thresholds that set the limit below which one is said to be 'food insecure' or 'livelihood insecure'. Because the LIU's primary role is to help improve the early warning of severe food insecurity, the scale in use is

based on 100% of food energy requirements. In other words, the 'y' axis is expressed in terms of percentage of minimum annual household calorie requirements²².

Two thresholds, which relate to this scale, are used by the LIU²³: the 'survival threshold', represents the line below which it is necessary to mount an emergency

Box 2. The Survival and Livelihoods Protection Thresholds

Projected total income (including income from low- and medium-cost coping strategies) is compared against two thresholds defined on the basis of local patterns of expenditure.

The Survival Threshold represents the total income required to cover:

- a) 100% of minimum food energy needs (2100 kcals per person), plus
- b) the costs associated with food preparation and consumption (i.e. salt, soap, kerosene and/or firewood for cooking and basic lighting), plus
- c) any expenditure on water for human consumption.

The Livelihoods Protection Threshold represents the total income required to sustain local livelihoods. This means total expenditure to:

- a) ensure basic survival (see above), plus
- b) maintain access to basic services (e.g. routine medical and schooling expenses), plus
- c) sustain livelihoods in the medium to longer term (e.g. regular purchases of seeds, fertilizer, veterinary drugs, etc.), plus
- d) achieve a minimum locally acceptable standard of living (e.g. purchase of basic clothing, coffee/tea, etc.)

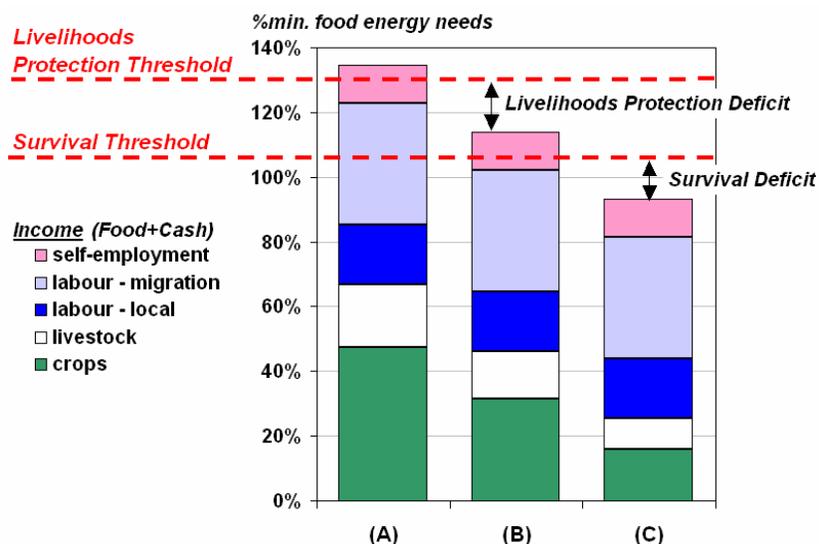
²¹ This approach differs fundamentally from other coping strategy analyses, which index and rank coping strategies along a scale that is meant to show a progression towards famine or livelihood breakdown, and compare field information to this scale. The goal of these approaches is to predict behavior based on an assessment of current indicators. See, for example, *Coping Strategies Index: A Tool For the Rapid Measurement of Household Food Security and the Impact of Food Aid Programs in Humanitarian Emergencies*, Dan Maxwell, Ben Watkins, Robin Wheeler, Greg Collins, CARE, WFP 2003

²² The internationally accepted standard mean of 2100 kilocalories per person per day is used as the basis for this calculation.

²³ The thresholds are gaining wide acceptance among NGOs and other implementing agencies; Oxfam and SC UK were primary contributors to the definition of these two thresholds, along with F.E.G.

intervention in order to save lives; the 'livelihoods protection threshold' is the line

Figure 11: What it means if total income falls below one or other threshold



If total income falls below one or the other threshold, an intervention of some kind is required. The figure compares three different situations, of progressively greater severity and urgency.

(A) – No deficit: In this situation, total income (including income from low and medium-cost coping strategies) is sufficient to ensure basic survival and to protect existing patterns of livelihood. There is no pressing need for an emergency intervention.

(B) – Livelihoods Protection Deficit: Total income is no longer sufficient to cover the cost of survival plus the expenditure required to protect local livelihoods, and an intervention of some kind is required to cover the deficit. At this level, local people can still cover expenditure on survival (including the consumption of 2100 kcals per person per day), provided they accord these needs a high enough priority. In other words, people should not have to go hungry at this level¹, although they will have to resort to other high-cost strategies including a reduction in expenditure on productive inputs, on health and on education. The primary objective of intervention at this level is to protect livelihoods, both in the current year and for the future.

(C) – Survival Deficit: At this level, total income is insufficient to cover the cost of survival, even if full use is made of all the available low- and medium-cost coping strategies, and all the money usually used to protect livelihoods is switched to the purchase of staple foods. It is very probable that people facing this type of deficit will go hungry, unless they resort to other undesirable high-cost coping strategies (see **Box 1** for a description of these). The primary objective of intervention at this level is to protect health and life in the short-term.

The difference between situations (B) and (C) is primarily one of the scale and urgency of the problem. There is no implication that different types of intervention should be used to address different types of deficit, e.g. that a survival deficit should be addressed through the distribution of food aid or that a non-food intervention is required to address a livelihoods protection deficit. The only point to bear in mind in relation to the type of deficit is that the intervention selected must be commensurate with the scale and urgency of the problem. There is little point, for example, in proposing a distribution of soap to fill a survival deficit. Something much larger in scale will generally be required, which will usually mean a distribution of food or cash, or a market intervention on a relatively large scale.

¹Although they may choose to do so, if, for example, not increasing livestock sales or not migrating for labour has a higher priority than maintaining food intake.

below which an emergency intervention is required to save livelihoods. **Box 2** details the elements that make up these thresholds. It is important to emphasize that these are emergency thresholds, rather than development targets. They are not intended to

circumscribe an acceptable or desirable standard of living, because emergency interventions are not mounted to meet those goals. In Ethiopia, a general consensus is developing around the idea of setting livelihood-zone specific livelihood protection thresholds, while maintaining a standard survival threshold across the country, but discussion on this subject is still ongoing. **Figure 11** provides more clarification on the thresholds and how they are applied.

3.5 The Livelihoods Impact Analysis Spreadsheets

The LIU uses a dedicated analysis tool called the *Livelihood Impact Analysis Spreadsheets*²⁴ (LIAS) to conduct the Outcome Analysis. The LIAS integrates baseline data, reference year hazard data, and current year hazard data to project annual and seasonal access for all wealth groups in all livelihood zones in the year to come.

The LIAS provides an essential link between the monitoring data, gathered by administrative unit, and the Livelihoods Baseline information, which is gathered for livelihood zones. This makes it possible for in-country analysts to use the livelihood baselines on a regular basis for scenario development and contingency planning, simply inputting the hazard data by *woreda*, and receiving the output by both *woreda* and livelihood zone.

Specifically, the LIAS facilitates the following:

- Sub-national or national level analysis can be undertaken within a single spreadsheet
- The LIAS accepts basic data on district level crop production and market prices and compares them to reference year data to calculate the 'problem'. This means the user does not have to calculate the problem specification before entering it into the spreadsheet.
- The integrated spreadsheet accepts data by district (or by market in the case of market prices), and generates output by district.
- The integrated spreadsheet generates estimates of the number of people facing a deficit, by district, and the overall assistance requirements, again by district. These are the primary outputs required by decision-makers.

Outcome Analysis addresses the third and fourth methodological requirements referred to in Section 2.2, above:

3. predict both annual and seasonal access
4. measure against agreed-upon thresholds linked to well-defined and consensus-based response/intervention triggers

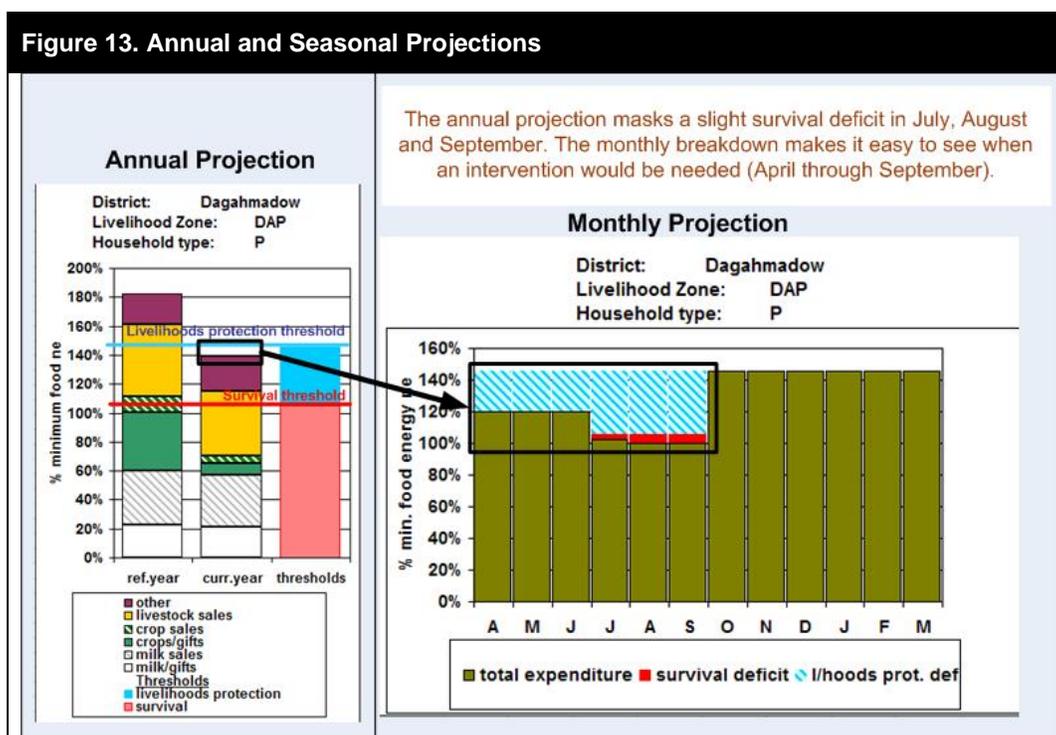
The basic **input** into the integrated spreadsheet consists of data that help define current access to food and non-food goods and services, such as data on crop production (entered by district) and prices of key commodities (entered by market). This is the type of data that the Ethiopian monitoring system already gathers; very little additional training is required to input this information into the LIAS.

²⁴ Previously known as the "Integrated Spreadsheet". The LIAS was developed by Mark Lawrence of F.E.G. For more information contact feq.us@foodeconomy.com

Emergency Needs Projections

The most obvious use of the Outcome Analysis is for projecting emergency needs. The LIAS provides numbers of people who fall below the survival and the livelihoods protection thresholds by *woreda* and livelihood zone, estimating metric tonnes of food required to cover the deficit as well as cash. An example is provided in **Figure 12**.

The results are also presented by livelihood zone and district in graphic form, both as an annual projection and as a monthly projection. The monthly projection is an important innovation because it highlights seasonal deficits that would otherwise be missed. It also guides the timing for interventions. See **Figure 13**.



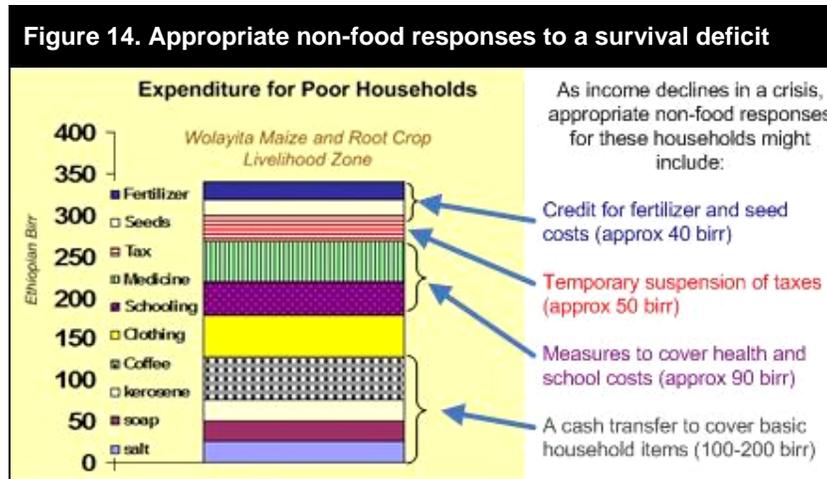
Non-food responses

This leaves open a number of options for response. A survival deficit does not necessarily imply an emergency food response. Just as a livelihoods protection deficit could arguably be addressed through food aid distributions. Having the livelihoods baselines on hand helps frame an educated and rational discussion about the most appropriate response given the local livelihood system, given households' reliance on labour markets, social networks and production options.

Conducting the Outcome Analysis shows how close to the edge different hazards push people; and it also provides specific quantitative guidance on just how much of any one direct transfer or substitution can fill the gap. By knowing how people live, we can find a response or combination of response that both fill an immediate emergency gap and build livelihoods resilience at the same time.

For instance, **Figure 14** offers a number of options for filling a survival gap, from cash transfers to cover basic household items to credit for agricultural inputs to

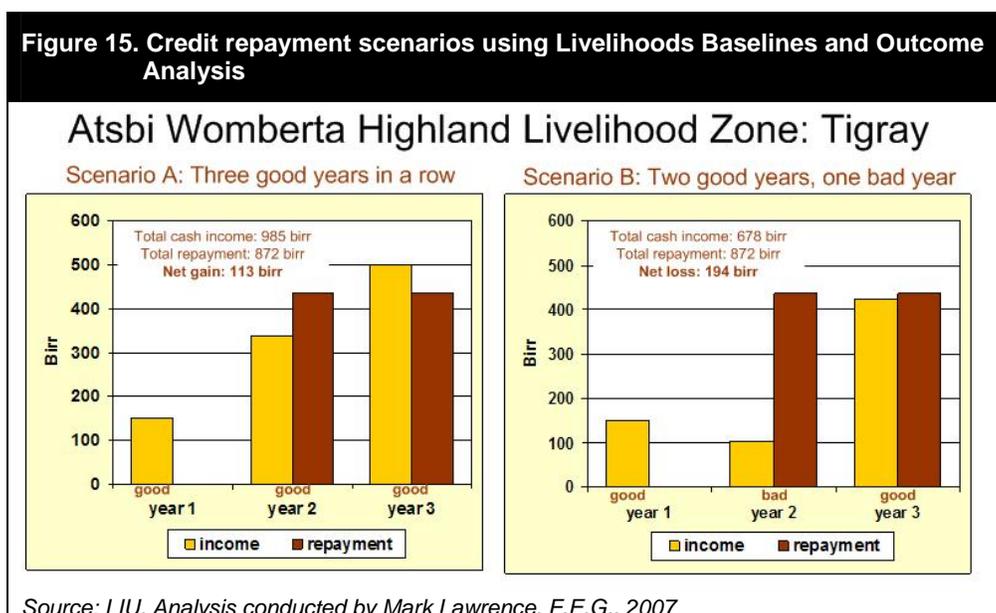
subsidised health and education costs. The advantage offered by the outcome analysis is that these measures can be quantified and targeted to households who are suffering the deficit.



Development planning and beyond

Furthermore, the Outcome Analysis can be used to help guide development planning, and monitoring and evaluation frameworks. One of the most difficult tasks of any monitoring and evaluation system is to develop a logical timeframe in which to accomplish stated objectives. It is difficult to do this both because it requires a lot of household-level information to make calculations on how an input might translate into increased overall income; but it is also difficult because households do not live in a vacuum, and external conditions will affect people's ability to translate an investment into a return.

One example of this application is with the credit program in Ethiopia, which has been implemented in Tigray as a component of the government's Productive Safety Nets Programme (PSNP). Outcome Analysis was used to help guide thinking on appropriate timeframes for repayment given different year-type scenarios. **Figure 15** illustrates the findings, which suggest that three years is only a sufficient time period if those years are all good ones. With one bad year, the household suffers a net loss.



Given the vagaries of the weather in Tigray, three good years in a row is not a safe assumption; the analysis showed that a five year time frame was a much better bet.

4 CONCLUSION

As the Livelihood Baselines become integrated into the Ethiopian early warning system, the goal is for monitoring exercises to be increasingly linked to the $R=f(H,V)$ framework and for outcome-related data to be interpreted in the context of households' particular vulnerability profiles. Already, nutritional data in SNNPR has been collected using the livelihood zone boundaries as a sampling frame, rather than traditional administrative boundaries; the result has been to clarify previously inconclusive results where important differences in nutritional outcome had been obscured by averaging across two very different livelihood zones.²⁶

In the first year and a half of the project, important lessons have been learned about the practical hurdles of implementing an early warning system that rests on a detailed knowledge of local livelihoods. While not the subject of this paper, a few of these are worth briefly mentioning, because it is only if such a system proves to be practical in implementation terms, as well as sound on a theoretical basis, that it will succeed over time. Clearly the information gathering and management demands are significant. Related to this, two challenges, in particular, deserve mention: 1. building national capacity to gather the baseline information and to run the system; and 2. developing the analytical tools to integrate baseline data with hazard monitoring data at various geographic levels.

Capacity building has been at the centre of this project, due to the recognition that a sustainable system relies on the transfer of knowledge and skills to government officials, rather than the continued funding of external consultants and advisors. While initial questions were raised about whether it was possible to train large numbers of people in gathering, analysing, and monitoring HEA information, the initial answer to this appears to be: yes. Through mid-November 2007, over 550 people have been trained, from all levels of government (federal, regional, *woreda*), the UN, NGOs, donors, private consultants, and other institutions (such as the University of Bahir Dar). A good number of team leaders and trainers of trainers have been certified, and most of the field teams are now led by Ethiopian team leaders, rather than external consultants.

A less obvious but important advantage to the integration of the system and the trainings that have occurred is that *woreda* officials, who are responsible for gathering monitoring data, and increasingly responsible for outcome analysis as part of the move towards decentralization, have become more motivated to do their job well. Because the link is clearer between the livelihood baseline, the indicators that get monitored, and the food security risk analysis, these officials report a stronger sense of purpose in their activities: they understand why they are gathering the information and take more care in doing so.²⁷

The other significant challenge has been in developing the tools for storing, analysing, and linking the baseline and monitoring information to the outcome analysis on a *woreda*, regional, and federal basis. The *LIAS* (or integrated spreadsheet) has been successfully used in SNNPR and Tigray, to estimate both

²⁶ For more details on these survey results, see www.dppc.com

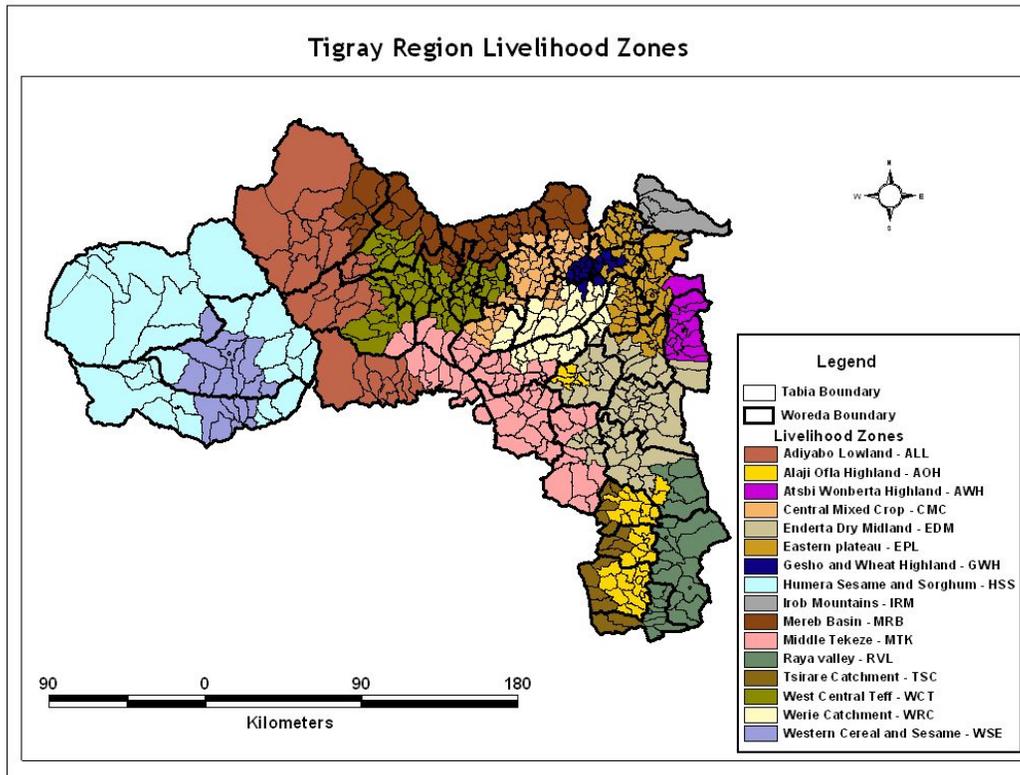
²⁷ Based on personal exchanges with officials from Tigray Region during a Using the Baselines Workshop in Addis Ababa, September 2007.

emergency and PSNP beneficiary numbers, both at the regional and *woreda* levels. Use at the federal level has not been tackled yet, in part because the push towards decentralized decision-making has limited this requirement, and in part because of the desire to keep the tools as transparent as possible. This tool continues to evolve in response to demand, as new requirements are voiced by different users – in relation to both the level of aggregation, and the uses of the analysis.

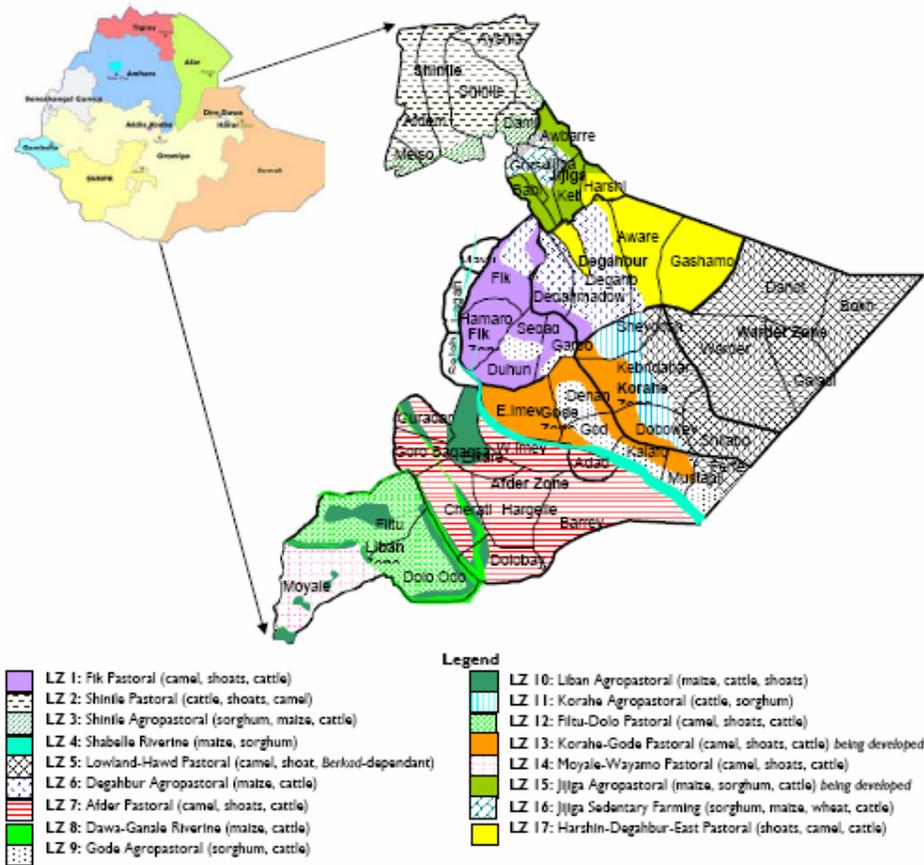
Time will tell whether a system of early warning, which integrates a complex set of vulnerability and hazard information in order to estimate the risk of both food insecurity and livelihood stress will survive. There are significant advantages to the effort, as argued in this paper. However, these gains do not come without considerable effort; and there are, sadly, few examples in the humanitarian world where a sustained, consistent effort towards a common goal survives personnel, funding and institutional changes. The lives of the people it aims to protect, however, promise to be more consistently understood and served in the period while it endures.

ANNEX I. LIVELIHOOD ZONES OF TIGRAY, SOMALI, AND SNNP REGIONS

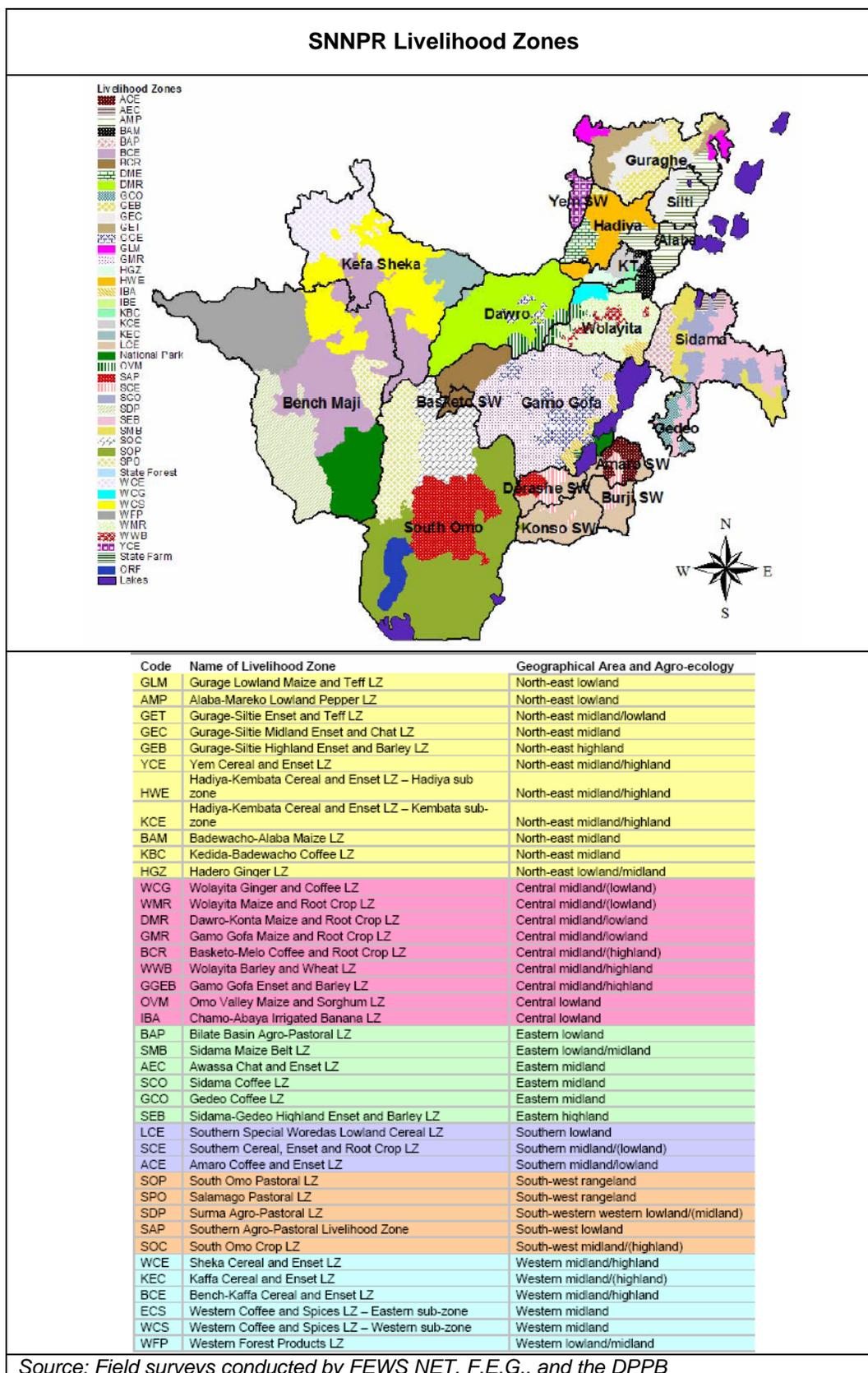
For a complete set of livelihoods baseline information and livelihood zone maps, please see: <http://www.dppc.gov.et/Livelihoods/livelihoodhome.htm>



Somali Region Livelihood Zones



Source: Field Surveys conducted by SC-UK and DPPB, revised 2004



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