

**VULNERABILITY AND FOOD INSECURITY IN ETHIOPIA:
FORGING THE LINKS BETWEEN GLOBAL POLICIES,
NATIONAL STRATEGIES AND LOCAL SOCIO-SPATIAL
ANALYSES**

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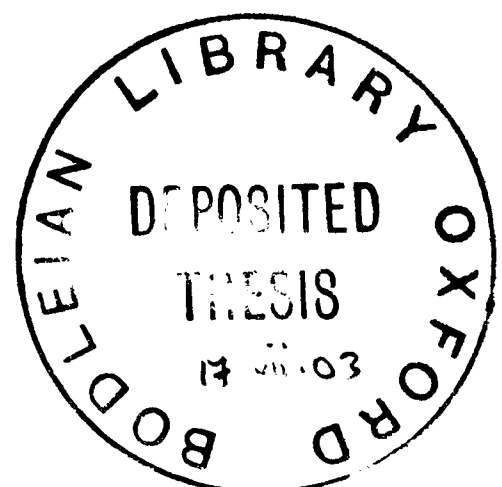
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ABSTRACT

Vulnerability and Food Insecurity in Ethiopia: forging the links between global policies, national strategies and local socio-spatial analyses

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Ethiopia is a food insecure country in the Horn of Africa. A wide body of literature in the 1980s and early 1990s justifiably associated food insecurity and famine in Africa and Ethiopia with centralised governance and weaknesses in national early warning systems, which were argued to have had an enduring influence on the outcomes of early warning and famine/food security interventions. Among this wide body of research, however, little attention has been devoted to the socio-spatial dimensions of the problem and the resulting effect on interventions aimed at addressing vulnerability to food insecurity at the household level. In this thesis it is argued that social processes, inherent in the structure of societies and institutions, combine globally, nationally and locally to undermine the treatment of vulnerability to food insecurity as a variable, place-based phenomenon. The arguments are developed with reference to food policy and vulnerability assessments in Ethiopia during the 1990s. Specific references are made to the findings from interviews with national early warning system staffs carried out in 1997 and 1998 and to food security surveys in Delanta Dawint, Ethiopia carried out in 1998.

The research and discussion concentrates on events in Ethiopia during the 1990s, with reflections on important antecedents dating from 1972. The 1970s to 1990s saw dramatic political transitions: from an imperial government to a centralized command

economy based on the socialist model, to a decentralized democratically orientated government and sub-national regional restructuring. Struggles for political independence and human rights also distinguish these decades. One of the aims of rebel movements in the 1970s, for example, was to remove power from the ruling monarchy, and from the Amhara ethnic group who were perceived to have benefited from sharing the same ethnicity as the monarchy. Land tenure arrangements under the monarchy followed traditional rules. However, under the subsequent socialist system customary rights were dissolved and land was appropriated for government purposes. In the 1990s, under the new Democratic Republic of Ethiopia a new form of land allocation emerged as geographical regions were established according to ethnic composition. Despite the differences in the aims of each government administration, aspects of policies under each regime have augmented the divide between national and local and have increased the sense of insecurity amongst rural people. This has contributed to their vulnerability.

In addition to government, institutions and individual decision makers are implicated in the power dynamics that hinder progress towards appropriate strategies and interventions at the proper scale. Since the early 1970s there have been several critical droughts and rain failure, some of which led to famine throughout Ethiopia. The northern regions, which include the case study area, have been frequently affected. International aid organizations have played a critical role in relief and development and have been instrumental in determining the course of vulnerability assessments and analyses (VA). In theory, VA is a systematic method for identifying regions and people threatened by food insecurity. VA is meant to provide a social, historical and geographic picture within which monitoring of current and chronic seasonal conditions can be performed, with the ultimate objective of carrying out a livelihoods analysis.

This derives from knowledge now prevalent in the development field. Yet until recently, a proper livelihoods analysis at the household level has not occurred in Ethiopia both because of resource limitations and because of the socio-political factors structured in early warning systems.

Other factors that determine the quality of interventions are the agreements and mandates decided among international institutions and nations in global fora. The transfer in knowledge, skills and economic resources has a pervasive influence on national strategies for vulnerability and food insecurity alleviation.

Few studies have brought all of these elements together into a comprehensive appraisal of food security and vulnerability strategies. This thesis considers the socio-political origins and implications of current food security and vulnerability concepts and the social shaping of VA methods for collecting data. Theories are drawn from Foucauldian approaches, discourse analysis and the sociology of scientific knowledge. The thesis also adapts a scientific approach to discuss these issues. It contains an appraisal of the nature of food insecurity and vulnerability. Data collection methods and analyses are presented. Institutional capacities and influences are assessed and the implications for farmers are discussed.

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When one finally arrives at the end of a lengthy project there are many persons and institutions that should be acknowledged for their contributions towards sustaining and finalizing the work. If some are excluded from the following acknowledgements, it is not intentional, merely the fault of memory at the time of writing.

*

Like so many other people around the world I was touched by the images of famine devastating Ethiopia in the 1980s. This led me to volunteer in non-governmental organizations working on hunger alleviation projects around the United States and the world. My main task back then was to fold letters and stuff envelopes. The famines inspired me to read Amartya Sen's *Poverty and Famines* some years later, which got me for the *n*th time thinking of ways to apply my current skills and education to relief and development work. That book was the catalyst to writing the proposal with which I applied to do a Doctorate. And so I thank the international media for opening my eyes and Sen for helping me to think critically about society, my place in it and how I might contribute to making things different.

*

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CHAPTER ONE

Introduction to the thesis

1. Introduction

Almost one half of Ethiopia's population (total 61 million) in the mid 1990s was classified as undernourished. This alone was roughly as much as the entire population of Canada (total 29.4 million), a country among those the UNDP has no statistics depicting food insecurity at all (reference to UNDP, 1998, 2001). The world estimate of undernourishment is 815 million people: 777 million in developing countries, 27 million in countries transitioning to market economies and 11 million in industrialized countries (FAO, 2001). The total in developing countries is only a few million more than the eastern and western European populations together. These food security facts hint at varying levels of vulnerability and socio-economic inequalities common and specific to countries geographically located in the northern and southern hemispheres. Yet, one is more likely to find only the comparative statistics than to see a deeper level of analysis which explains local variability. The major donor and government institutions that disseminate this knowledge hold to practices that generalize the issues along spatial, politico-economic and temporal lines, with a concentration of resources and attention given to national and regional issues. The central argument of this dissertation is that social processes, inherent in the structure of societies and played out in institutions, combine globally, nationally and locally to undermine the treatment of vulnerability to food insecurity as a variable, place-based phenomenon having both fixed and mutable facets. This is reflected in the fact that most national approaches aim to treat vulnerability to food insecurity as generic across space and time. This dissertation explores the separation of the 'global' and the 'local' in vulnerability and food security theory and practice. It discusses the inconsistencies between concepts and theories that support place-specific analyses of vulnerability to food insecurity and

humanitarian interventions which effectively homogenize individual households and socio-economic groups into aggregated regional pictures of vulnerability. Concepts, policy discourses, early warning practices and socio-spatial measurements, which frame vulnerability and food security plans, are examined.

The dualities of vulnerability and food insecurity

Vulnerability to food insecurity is a complex, socio-natural issue that is both highly variable and contains detectable patterns. Tackling the problem requires multiple approaches and analyses at different geographic and administrative levels that are targeted at addressing poverty and comprehend the diversity in experiences and livelihood strategies of vulnerable people. An increasing body of research in environmental and social studies conclude that it is especially important that methods are designed to investigate both the social and ecological dimensions in spatially variable environments and for issues where physical and socio-political changes demonstrate a high temporal variability (Lam and Quattrochi, 1992; Thomas and Sporton, 1997; Fotheringham, 1997; Marchione, 1999; Marston, 2000; Stephen and Downing, 2001; Noordin et al, 2001). Some of the literature builds on Smith's analysis showing geographic scale as a function in uneven economic development (1984) and LeFebvre's arguments that our concepts of space are socially produced (1991). Further reference is made to the work of Foucault (1969) and Latour (1991) whose interests were in the social production of knowledge and associated power dynamics.

Recognizing and responding to the dualities in vulnerability to food insecurity is critical for further research and to the success of any vulnerability/food security project. Vulnerability and food insecurity, whether studied separately or together, both exhibit

distinct qualities while also being fluid and dynamic. There are similarities in the people who are vulnerable and food insecure across the world, but vulnerability to food insecurity is also spatially, economically, politically and socially differentiated from one world region to the next and within countries. The impact of food insecurity, famine and most environmental disasters are determined by people's vulnerability to social, political, economical and environmental factors, and this is true both in the North and the South. In a typical county in the central Appalachian mountains of the United States, where the history of poverty is well documented, demographics show that people earn only about ½ of the national median income. Appalachian people are also less educated than the national average. Only 46% of the population over the age of 25 finished secondary school, compared to 84% for the country as a whole¹ (US Census Bureau, 2000). When the United States has experienced economic recession, the socio-economic conditions in Appalachian communities have made them among the worst affected. The sociologic and economic sides to vulnerability are also distinct in Japan. Studies of earthquake disasters in Japan's mega-cities showed that the populations worst affected have been the homeless and the elderly (Wisner, 1998; Uitto, 1998). In Appalachia and Japan's urban areas, vulnerable people live on the social and geographic periphery of their societies and this makes them particularly at risk to economic failures and environmental hazards. A similar disparity in social, economic and spatial conditions exists between urban and rural populations in Ethiopia. Northern highland farmers of Ethiopia are geographically, socially and economically distanced from the comparatively food secure, elite urban populations in central Ethiopia. The population of the North are mostly illiterate crop and/or livestock subsistence farmers and experience chronic drought and rain failure. They live in remote rural communities. In contrast, urban populations contain a large corps of

¹ This data is for Bell County, Kentucky which some sources consider a proxy for Central Appalachia.

government ministers, civil servants, businesses and the largest concentration of European and American expatriates in the country, among whom are famine early warning strategists and food aid distributors. In Webb's (et al, 1994) chronology of Ethiopian famines and food shortages since the beginning of the 20th century, the capital, Addis Ababa, was only severely affected once, compared to seven or more times for rural communities in the North. Rural poverty levels are not necessarily greater than urban levels (as indicated in Dercon and Taddesse, 1997), but on the whole, urban areas are at a comparative economic advantage compared to rural ones in terms of transport infrastructures, social services and income generating activity. These basic features of vulnerability suggest that urban areas will be less vulnerable to food insecurity.

Vulnerability to food insecurity is further complicated by global environmental change and the state of the institutional infrastructures in place. Climate studies in recent years point to El Niño - Southern Oscillation (ENSO) events as the cause for annual variability in rainfall and adverse weather patterns leading to forest fires, hurricanes and floods. The research on ENSO effects on the Horn of Africa has so far not been as extensive as elsewhere, but a few studies have attempted to correlate ENSO events with climate patterns in Ethiopia (Fekadu Bekele, 1997; Menghestab Haile and Watkins, 1998). Sea Surface Temperature anomalies occurring during El Niño-Southern Oscillation events are said to trigger fluctuations in the global atmospheric circulation, and these fluctuations have been shown to be the principal cause of drought; ENSO was shown to increase the uncertainty of crop production by altering the start and end dates and duration of seasons; and a chronology of ENSO and drought/famine in Ethiopia links ENSO years to some of the worst famines in the country's history. These studies have associated both drought and periods of intense rainfall (leading to flood

disasters) to El Niño-Southern Oscillation anomalies. The larger body of work on Southern Africa suggests that food systems throughout the continent are increasingly vulnerable as a result of climate change (Dilley, 2000; Betsill et al, 1997).

The institutions in place for assessing the cumulative factors of food insecurity in developing countries appear to hold a shared understanding of the conceptual and theoretical bases to the food insecurity of various types of populations, but the capability to mitigate the effects of an environmental disaster, to respond effectively and on-time, is less reliable. Effective action requires a strong commitment on the part of states, donors and decision makers in institutions to grasp its complexity, and to move beyond the concepts to actions that reflect the various components of vulnerability to food insecurity. Researchers and practitioners require a comprehension of variations in scale, economics, politics and institutions in the global versus local sense, and also within communities, among households and within households.

2. Aims and methods of the dissertation

Maxwell (2001) writes that we are in the 5th phase of the evolution in food security thinking. The central challenge in this phase is whether we should constructively apply concepts and methods that reflect our former interests in food security as a problem of supply and production or continue in the current vein of analysing food security from the perspective of people's entitlements. This challenge sums up one of the central concerns of this thesis; that a concentration on national and regional vulnerability analyses occur at the expense of appropriate interventions at the community and household levels. Of special interest throughout the thesis, are the implications for a proper assessment of the long-term developmental needs of vulnerable people.

However, the discussion often also refers to short-term assessment scenarios, as many of the conflicts and competing agendas, which give rise to a practice focused on national and regional vulnerability, occurs when actors and stakeholders make decisions about emergency relief operations. Indeed, in this dissertation, the analyses of interactions in a relief context shows that a national focus emphasises aggregate quantities, cereal production, food supply and generalises the conditions at smaller geographic scales. The dualities of vulnerability to food insecurity—its distinct patterns alongside its variability—are lost in macro analyses.

The thesis aims to understand the following:

1. What concepts are historically fundamental to vulnerability and food security?
What issues and socio-political factors frame current vulnerability and food security theories, methods and practice?
2. What are the methods for evaluating household vulnerability and food insecurity?
3. How does vulnerability to food insecurity vary among individuals and households?
4. What are the origins of some of the key food security and vulnerability concepts?
How are these concepts carried forward in current practices, particularly the idea of addressing household level food insecurity, in early warning systems?
5. Do the vulnerability and food security approaches in Ethiopia produce information that is reliable and of use to all of the stakeholders? To whom and where are they most useful?
6. How do current concepts and methodological instruments articulate and measure the multi-scalar dimension, particularly local differentiation?
7. What are the implications when policy and analyses are predominantly regionally and nationally based?

These questions emerge from a postmodernist view, in which the central occupation is to explore the fundamentals of our conceptual knowledge and truth claims. Adapting some of Michel Foucault’s ideas and structure of analysis (as in the *Archaeology of Knowledge*, 1969) for understanding human discourses and social relations and my own attempts to re-construct a scientific mode of enquiry, the objectives and methods for exploring the questions in this thesis are presented in the following table.

Table 1 *Research questions, chapter objectives and methods*

Chapter	Research Questions	Objectives	Methods
Two	What concepts are fundamental to vulnerability and food security? What issues and socio-political factors currently frame vulnerability and food security theories, methods and practice?	To place vulnerability to food insecurity within the political context of global change.	A review of food security and vulnerability concepts and social constructivist theories that are relevant for framing and examining vulnerability to food insecurity; employs the structure of a scientific approach. Specific emphasis is given to discourse analysis, sociology of scientific knowledge, and social theories on spatial scale.
Three	What are the methods for evaluating household vulnerability and food insecurity?	To describe the assumptions and methods used to collect vulnerability and food security data, with direct reference to an Ethiopian food security study.	An explanation of sampling criteria, qualitative and quantitative survey aims and methods, including a method for developing vulnerability profiles; with comparisons to vulnerability assessment methods currently used in aid organisations.
Four	How does vulnerability to food insecurity vary among individuals and households?	To illustrate the nature of vulnerability, its complexity and variability; to carry out an exegesis of livelihoods, what it means to be vulnerable to food insecurity in a rural agricultural household in Ethiopia.	Household and community survey data from a food security study in Ethiopia are analysed and used to build an understanding of socio-economic and political components of vulnerability.

Chapter	Research Questions	Objectives	Methods
Five	What are the origins of some of the key food security and vulnerability concepts? How are these concepts carried forward in early warning practices, particularly the idea of addressing food security at the household level?	To highlight the significant historical elements of global discourses that exist in the socio-political context of famine early warning practice within Ethiopia.	The elements of a discourse analysis are employed to discuss global and national policy formations and the perpetuation of two vulnerability myths. The following are highlighted: Global discourses, National policies affecting vulnerability and food security, socio and ideological exclusions which carry forth in practice.
Six	What issues emerged as early warning systems evolved and how do these issues affect vulnerability and food security practices?	To highlight the historical significance of governance, interagency coordination and vulnerability assessments in early warning systems.	A background discussion of key debates and issues affecting early warning systems and vulnerability assessments.
Seven	Do the vulnerability and food security approaches in Ethiopia produce information that is reliable and of use to all of the stakeholders? To whom and where are they most useful?	To come to an understanding of the culture of the early warning system and of how global discourses are used or combine with national and sub-national socio-political themes.	This is a systems analysis (using Soft Systems Methodology) of the Ethiopian national early warning system, and a reconstruction of the socio-political processes which shape vulnerability assessments and analyses. Impressions of social structures in early warning come from interviews with early warning personnel in 1998.
Eight	How do current concepts and methodological instruments articulate and measure the multi-scalar dimension, particularly local differentiation?	To show the importance of scale, as a discursive formation, as socially produced and as a critical indicator in the detection and measurement of vulnerability to food insecurity at household levels.	The first sections of the chapter review key concepts, theories and arguments related to 'scale'. The final sections explore the feasibility of three current technological instruments, in terms of how they spatially specify vulnerability to food insecurity and in relation to the constraints and challenges for early warning practitioners.

Chapter	Research Questions	Objectives	Methods
Nine	What are the implications when policy and analyses are predominantly regionally and nationally based?	To demonstrate that current food aid and policy discourses in Ethiopia imply treating vulnerable places rather than vulnerable people. This is part of a problem of global change planning and alleviation strategies in general; disaggregated social impacts are often not well elaborated.	An integration of the key arguments and theories presented in previous chapters

3. Background and Significance of Case Study

The arguments in this dissertation are developed with reference to food policy and vulnerability assessments in the Ethiopian national early warning system (NEWS) during the 1990s. Specific emphasis will be given to the findings from interviews with NEWS staff and member institutions and a food security household study in Delanta Dawint, Ethiopia carried out in 1997 and 1998 (please refer to maps at the end of the chapter).

National versus local hierarchies and differences in Ethiopia

Smith (1984) drew from comparisons between geographic locations to support his theories of uneven development. Differences in social, political and economic activities and opportunities are more evident when spatial scales are compared. In Ethiopia, the current government’s program has played on the socio-economic variability and inequalities of the country. Like most countries in Africa, Ethiopia has different layers of diversity, particularly in its ethnic composition, economic and class differences, topography, and history. While a good deal of this diversity may be

assessed countrywide, it may also be stratified nationally, regionally and sub-regionally.

National and Urban

At the national level, the People's Democratic Republic of Ethiopia may be described as a land-locked country of 1,104,000 square kilometres. There are an estimated 61 million people ², who contribute to a GDP per capita estimated at 154 US dollars in 1995. In the same year, the external debt was 5.2 billion US dollars, 100 per cent of the GNP. Ethiopia also received 849 million US dollars net overseas development assistance in 1995 (UNDP-HDR, 1998 and 2001). In 1995, 1996, and 1997 relief food aid needs were estimated at 427,000 tons, 347,379 tons and 291,000 tons for each respective year. Between 75 per cent and 100 per cent of this aid was distributed (FAO/WFP, 1998). In 2002 90 to 100% of crops failed as a result of drought in some areas. Food aid requirements were 84,000 tonnes for 5.6 million people in November, and 67,000 tonnes for 4.5 million people in December. It has been estimated that between 10 and 14 million people could need humanitarian assistance in 2003 (UN Emergencies Unit for Ethiopia, 2002). The assistance requirements in 2003 will be more than three times the average required between 1995 and 1997. Eighty-six percent of the country's labour force is employed in the agricultural sector. This makes the problem of recurring drought a fundamental issue in vulnerability to food insecurity. Agriculture makes up around 57 per cent of the GDP. Sixty-five per cent of the people are illiterate and the life expectancy is 51 years (UNDP, 1998 and 2001; African Development Bank, 2001).

² Estimated from the 2000 Census.

Apart from these types of generalities the country varies in ways that are important for understanding vulnerability. The Ethiopian climate varies from hot, barren desert in the north to lush forest in south western and central regions. The official language is Amharic, yet there are four main language groups and more than 80 different dialects. The ethnic composition consists of 40 per cent Oromo, 32 per cent Amhara and Tigrean, 9 per cent Sidamo, 6 per cent Shankella, 6 per cent Somali, 4 per cent Afar, 2 per cent Gurage and 1 per cent other. They live mainly within ethnically contained regional divisions throughout the country.

Between 15 and 20 per cent of Ethiopia's 61 million people live in urban areas, the greatest concentration being in Addis Ababa and its central highlands environs. The bulk of the industrial, service and private business activities are concentrated in urban areas. The wealth generated by industry lies in contrast to the extreme poverty existing in Ethiopia's cities. In every town beggars, among them street children, disabled ex-soldiers and the elderly, are a constant reminder of the inequalities throughout the country.

The government coordinates the activities of regional and zonal satellite offices from the capital. All statistics on crop production and other agricultural activities are collated and analysed centrally. Government offices in the capital bear the signs of resource poverty, except for information technology. In the Early Warning Department of the Disaster Prevention and Preparedness Commission, there has been a substantial increase in information technology during the 1990s used for the purposes of basic word processing and for more advanced statistical analysis and mapping.

Defining the regions and zones

The data collection for this research focused on vulnerability and food insecurity and vulnerability assessments for the Wello zone of Ethiopia. Wello zone is located in the Amhara region, one of three regions in northern Ethiopia (refer to region and zone maps, Figures 1 and 2, in the annex). Food shortage regularly occurs in the northern and western parts of Wello and these areas are frequently targeted for international and local relief aid. According to Webb and von Braun (1994), most famine events since 253-242 BC were geographically concentrated in two broad zones of the country: the central and north-eastern highlands, which includes Wello, and the agro-pastoral Afar and Somali regions. A significant proportion of the people who suffered famine in the 1980s were in Wello, where one the largest concentrations of Amhara people live.

Poor rainfall in Wello zone was a concern during the first year of field research for this thesis. On a road trip in March 1997, I observed migrants from the neighboring Afar zone, who regularly migrate to Wello in search of water and grazing land for cattle. One could readily find health facilities, hotels, bars and restaurants in Dessi, the capital of Wello, and in all of Wello's towns along the country's only direct North/South road that passes through them. Compared to the desserts of Afar, Wello seemed a green haven. There were the first signs of Belg season³ growth in some places. But there were problems. The Wello cattle appeared emaciated. The few households observed were in a state of emergency: selling clothing, people migrating, poor rainfall. Farmers in the farthest highland territories had received adequate rainfall, but they had the additional fear of frost and hail. The government's Disaster Prevention and Preparedness bureau (DPPB) located in Woldya was poorly resourced to cope effectively with the problem

³ Ethiopia has a bi-modal type of rainfall and consequently two growing season. The traditional name for the short growing season occurring early in the year is Belg. A longer season of intense, heavy rainfall occurs from June through August. This is called Meher.

in a timely manner. Telecommunications were rudimentary. Telephones were not functioning. The possibility of email did not exist, as there were no computers and only basic electronic infrastructure. There was one bare hanging bulb in each of the offices. The field conditions for farm surveyors were inadequate: they had no first aid supplies or bathing facilities. There were few, if any, official transport vehicles to use in traveling from one site to the next. A worker could walk for up to four hours to reach some communities. This meant that there were serious hindrances to regular food security monitoring.

Defining the local

The experiences of the DPPC field surveyor are the daily reality for the inhabitants of Wello's weredas⁴ and villages. They lie within a rural mountainous terrain with no asphalted roads, few social service facilities, and a few hours of electricity in some satellite towns, no running water or sewage systems. Case material was gathered in Delanta Dawint, a wereda in the north Wello highlands. There, food insecurity is complex and heterogeneous between climatic/altitudinal zones and small administrative units. The people earn a subsistence income from crop and livestock farming. Land and resources are so scarce that they hand-plough even the steep slopes of the mountainside. This may be contrasted with the common regional view found in public documents from 1997 to 1999, which generalizes the diverse conditions of vulnerability found in communities and villages. Generalizations partly result from the fact that field based staffs are not well equipped to carry out the level of data gathering required. Governmental and non-governmental organization field staffs are housed in similar fashion to the people inhabiting the villages they monitor: they occupy simple, one room, wood and straw structures, with no running water and one shared pit latrine.

Their offices and equipment are even more rudimentary than what one finds at the zonal and regional bureaus. There is only one vehicle serving several offices and institutions. The alternative to vehicles is to travel by foot, donkey or mule.

Drought, famine and the emergence of vulnerability assessments

The research in this thesis concentrates on vulnerability to food insecurity and vulnerability assessments of drought events in the 1990s, but there were important antecedents dating from the early 1970s. Since the early 1970s there have been several critical droughts and rain failure, some of which led to famine throughout Ethiopia. Table 2 lists periods of drought, regions affected, and attributed environmental causes. The northern regions, which include the case study area, have been frequently affected. Some of the worst periods documented in this table overlap with the difficult years farmers in the case study reported.

Table 2 *Drought, food insecurity and famine since 1969*

Date	Region Affected	Attributed environmental causes and severity
1969	Eritrea	1.7 million people suffered food shortage
1971	Ethiopia	Sequence of rain failures, ¼ million (est.) people died, 50% loss of livestock in Tigray and Wello
1978	Southern Ethiopia	Failure of early (belg) rains
1982	Northern Ethiopia	Failure of late (meher) rains
1983	Ethiopia	Rain failure, 8 million affected, 1 million (est.) dead, livestock loss
1987	Ethiopia	Severe drought in peripheral regions
1990	Northern, Eastern and Southwestern Ethiopia	Rain failure, regional conflicts, 4 million (est.) suffered food shortage
1993	Tigray, Wello and Addis	4 million required food aid, new droughts

Adapted from: Webb and von Braun (1994)

⁴ The wereda is one of the smallest administrative sub-districts in Ethiopia. It is followed in order of reducing size by the peasant association (PA), village and household.

Since the first droughts in this time period, humanitarian aid organizations have carried out relief and development operations whilst facing a complex and changing Ethiopia. During the past 10 years, the practice known as Vulnerability Assessment/Analysis⁵ (VA) emerged. VA systematically identifies regions and people threatened by food insecurity. In Ethiopia, the current VA methods evolved out of governmental and traditional food monitoring systems and the combined strategies of foreign aid institutions. VA is meant to provide a social, historical and geographic picture within which monitoring of current and chronic seasonal conditions can be performed. The objective of most VAs is to carry out a livelihoods analysis. This derives from knowledge now prevalent in the development field. One of the most recent challenges has been to develop a reasonably robust analysis of livelihoods and food insecurity using current technology. The presence of information technology used for food monitoring in Ethiopia is representative of global processes whereby the reliance on information technologies has rapidly increased along with the formulation of new national policies. The interactions between international and national processes are manifest within Ethiopia's early warning system, where member institutions act as conduits for information transfers from developed to developing countries. This information is embedded in practice but also in the technological applications used by these institutions for vulnerability assessment and famine early warning. In this dissertation, specific reference will be made to practices in Save the Children Fund, UK (SCF-UK), the Food and Agriculture Organisation (FAO), the United States Agency for International Development (USAID), the World Food Program (WFP) and the government's Disaster Prevention and Preparedness Commission (DPPC). These organisations have been leading VAs in Ethiopia.

⁵ Practitioners refer to the process of data collection and analysis as both vulnerability assessment and vulnerability analysis, depending on their mandates and purposes. In this thesis, I will use the two terms

The influence of political transitions on farmer vulnerability

In Ethiopia, the period from the 1970s to 1990s were marked by dramatic political transitions which have affected farmer vulnerability. The country moved from an imperial government to a centralized command economy based on the socialist model, to a decentralized democratically orientated government whose defining aims were economic growth and sub-national, regional restructuring. Struggles for political independence and human rights, waged by groups such as the Eritrea Peoples' Liberation Front, also distinguish the period. One of the aims of the civil strife of the 1970s was to remove power from the ruling monarchy. This power struggle was also targeted to the Amhara ethnic group who shared the same ethnicity as the monarchy and therefore was perceived to have benefited from that association. According to the Ethiopian central statistics authority, the entire population of the study area in this research was Amhara. With the success of each administrative coup, most farmers in the northern highlands faced new restrictions on land, new taxation, constraints to income and ultimately, a disruption of livelihoods, regardless of ethnicity. Moreover, in practice, the concentration of resources and analyses remained largely national and regional.

Legacy of the Derg: The emergence of control tactics

In 1974, the Derg government ⁶ seized power from Emperor Haile Selassie and launched a military socialist revolution, which had a fundamental effect on peasant life.

interchangeably, but will note differences as needed to distinguish different institutional strategies or policies.

⁶ Derg was the name for the committee that coordinated the Ethiopian armed forces, police and territorial army. The committee took power in 1974. A new revolutionary military regime was installed with the stated aim of following a socialist model. Under the leadership of Mengistu Haile-Miriam, the Derg carried out an authoritarian, centralized and violent rule for close to 15 years.

Under the Derg government, land within peasant communities was redistributed several times starting from the 1975 policy. Land was declared as public property and customary and traditional land rights were annulled. According to Dessalegn Rahmato (1991), under the authority of these laws, the government expropriated land for many of its initiatives. The policy had a pervasive effect in the north, where the populations were largely Tigrean and Amhara. There was some resistance from wealthier northern highland farmers, but on the whole new leaders were keen to establish more cooperative farming arrangements. Each peasant community settlement, known as peasant associations (PA), could occasionally reallocate land, a system that still exists today. Hoben's (1995) analysis shows that the enforcement of reallocation rules did not solve the problem of acute land shortage, however, and land-holding sizes decreased as the rate of new families increased. Land reallocation also increased tenure insecurity and this was a disincentive to good farm investment. Throughout the period, an average of 15 per cent of the government's budget was allocated to agriculture (Hoben, 1995, p1012).

During the early to mid 1980s, another Derg strategy that created uncertainty among farmers was *Villagisation*. Families in areas characterised as food deficit, such as in the north, were forced to resettle in food surplus areas in the centre and south. Villagisation disrupted land rights, and some experts suggest that it was the cause of environmental degradation and loss of livestock through reduced pasture and disease (see Hoben, 1995).

The Derg was overthrown in the late 1980s by a transitional government committed to democratic forms of governance. The leaders of the transitional government were formally elected to govern Ethiopia in the early 1990s. This new system resulted in a few positive changes, such as the recognition that agriculture contributed a significant proportion to the gross domestic product (GDP), and thus there was a significant increase in expenditures targeted to the agricultural sector. However, like the policies under the Derg regime, the new government's policies also had the effect of manoeuvring the individual towards the achievement of national aims. Under the new republic, some policies countered the collective focus of Derg socialism by re-emphasising the individual, but did not do so in a manner that fully liberalised the individual rights and empowerment of the poor. The following commentary on selected policies flags areas of disjuncture. Some of the policy issues discussed here will be taken up again in subsequent chapters. The policies have been listed chronologically to show the progression in policy formulation under the transitional and elected governments, which was firstly a reaction against the policies of previous regimes, and then later a more informed people centred effort to address some of the fundamental causes of vulnerability and food insecurity.

a. Population control, spatial reorganisation and household vulnerability

The major goal of the *National Population Policy of Ethiopia*, published in 1993, was 'the *harmonization* of the rate of population growth and to increase the capacity of the country for the development and rational utilization of natural resources to the end that the level of welfare of the population was maximized over time' (article 4). In reality it was a population control policy, disguised as an equity and growth strategy, designed to

complement the spatial reorganisation plan. Its tenets bear similarity to the goals of the 'regionalisation' project that spatially restructured the geographical administration of the country according to ethnic groupings. In personal conversations with Ethiopians, this researcher found a general concern that regionalisation effectively intensified the 'us' against 'them' reality that had formed the basis for previous civil conflict. It was fundamental to the overthrow of the monarchy by a communist military regime in 1974, the subsequent civil war between the military and ethnically based rebel movements, and the final overthrow of the communist government at the end of the 1980s. Likewise, some international non-governmental organisations (NGOs) and traditional community based groups have argued that the population policy has had the potential to bring social *disharmony* and to disrupt traditional practices and privacies. The spatial reorganisation focus of the regionalisation program reflects the population policy's subordination of household rights and vulnerabilities to national aims.

Lefebvre (1991) showed space as a social product, not simply an external fact, and the consequences of spatial restructuring as the outcome of macro-level social structures and everyday events. The components of a basic socio-spatial theory includes the state, capital and non-state level political actors, and interactions between these groups (see discussion in Marston, 2000). When viewed alongside 'regionalisation', Ethiopia's *Population Policy* may be viewed as a strategy by which the Ethiopian state concretized control by manipulating the rights and privileges and geographic space of the people.

Much of the general focus of the policy was driven by a Malthusian concern that the cause for low economic and environmental sustainability was an increasing population.

This is reflected in statements regarding food security, crop production and land degradation, such as the following.

‘achieving such important national goals as food self sufficiency, universal primary education, improving the accessibility of health services to the largest possible number in the shortest possible time, increasing employment opportunities, reducing underemployment in the labour force and improving housing conditions, among others, are proving to be exceedingly difficult under a scenario of continuing high fertility’(article 2. Environment).

‘Declining productivity is a function of the increasing man/land ratio occasioned by rapid population growth’ (article 2. Declining Productivity in Crop Producing Areas).

‘Ensuring a spatially balanced population distribution patterns with a view to maintaining environmental security and extending the scope of development activities’ (article 4. Specific Objectives, f).

Some elements of the population policy have been highlighted as measures in the country’s Food Security Strategy (see comments in WFP, 1998; Flynn, Markunas, Gold, and Rennison, 1992). I argue that this linking of the population to national food security effectively cast individuals against the larger aims of the entire country, suggesting a sentiment of the communist ideologies of the Derg regime.

b. Vulnerability and economic development

Several sectoral and cross-Sectoral policies instated in 1993 had had an impact on economic vulnerability and development.⁷ Like the population policy, most of these policies do not refer directly to vulnerability and food insecurity but contained references that have had very important implications in any effort to combat desertification and mitigate the effect of drought. Examples are the rural land use and

⁷ The Sectoral and cross-Sectoral policies which are officially approved and operational are the disaster prevention and management policy, the energy policy, the national agricultural research policy and strategy, the social policy, women’s policy, the bio-diversity policy, education and training policy, science and technology policy.

administration policy, forestry policy, wildlife policy, and the soil and water conservation policy. But the major policies among these, which are fundamental to the country's *Food Security Strategy* (Government of Ethiopia, 1996), are policies to improve economic growth and development.

The two main principles of the food security strategy are to create a comparative economic advantage in international trade and crop production, and to enable a transition to self-reliance (p.11). The economic reform program that began in 1992 was cited as one of three components integral to the success of the strategy. The goal of economic reform is to reduce poverty through broad-based economic growth in a stable macro-economic environment, and to increase employment opportunities (p. 14). The means for realising this are through strengthening the service and industrial sectors and by increasing agricultural output. Household vulnerability to food security is thus conceptually and strategically tied to national economic growth.

c. Vulnerability alleviation as general goal

The *National Policy on Disaster Prevention and Management* (NPDPM), 1993, defines disaster as "an event in which society or a community undergoes acute deprivation of food and other basic necessities due to natural and man-made calamities to such an extent that the normal functioning of the society or the community is disrupted and that it cannot subsist without outside intervention" (Transitional Government of Ethiopia, 1993). Relief is said to include measures that reduce vulnerability to disaster through programs that generate employment, environmental rehabilitation and other drought proofing activities. Prevention pertains to measures designed to eliminate the root causes of vulnerability to disaster. At first glance, one may consider this policy limited to prevention and management while its objectives imply that it carries the broader aim

of promoting sustainable development based on the best use of natural resources in affected areas. When considered from the point of view of combating desertification and mitigating the effects of drought, this policy is most relevant to food security, particularly in relation to those desertification issues which are of a cross-sector nature (e.g. poverty alleviation and eradication, alternative livelihoods).

Some of the relevant objectives of this policy were to ensure that relief efforts reinforced the capabilities of the affected areas and populations, promoted self-reliance and contributed to sustainable economic growth and development. It specifies that relief programs should be geared to eliminating the root causes of vulnerability to disaster and promotes efficient use of natural resource endowments in affected areas. Further, it is the objective of the policy to ensure that all spheres of development give due emphasis to disaster prevention programs. The major policy direction in this area is to ensure that communities play a leading role in planning, programming, implementing and evaluating relief programs and related measures.

In effect, however, the NPDPM removed authority over food aid from the hands of the poor, despite the proclaimed community-led prevention and development focus. For example, the policy contains a basic principle to reduce the free distribution of aid to able-bodied people who are affected by food insecurity. The NPDPM was founded on the concept of linking relief efforts to longer term development planning, and the implementation of this concept through employment generation schemes (EGS) functioned as a targeting mechanism. It was expected to discourage the less needy from seeking aid and to reduce errors of inclusion. However, Sharp (1998) has shown that a complication in the implementation of EGS and food aid has been disruptions in the flow of information. When decisions were not very transparent or information on

food aid allocations was not freely available to communities, targeting was considerably less effective. The NPDPM upheld the right of vulnerable people to participate in alleviating vulnerability but actually expected government to assume that responsibility.

d. Five-year plan

Elements of the population, regionalisation and economic development strategies appear again in the DPPC *Five-Year Plan (1998)*. The plan acknowledges that the functions of the NEWS are decentralised in principle, as to be consistent with regionalisation policy and bottom-up approaches (p. 6). The intention was to link relief and development measures based on participatory planning processes that included national and international organisations in all regions and at all geographic levels of administration. The basis for the bottom-up approach logically arose from the linking of household food vulnerability and crop failure to famine disasters. The important vulnerability factors noted in the plan are environmental degradation, dependency on rain fed agriculture and a lack of off-farm employment, land scarcity and population pressure, a lack of infrastructure and improved agricultural inputs. Thus, the main activities proposed by the plan focus on pre and post harvest assessments, early warning and emergency reports and enhanced methodologies that aim to refine indicators of agro-meteorological, crop, livestock and market activities. In practice the methods for assessing vulnerability are better suited to analysing short-term impacts and emergencies.

e. Vulnerability profiles

A *National Guideline for Vulnerability Profile Development* was prepared in August 1999 and is currently being used by the SERA (USAID funded project) for preparing

vulnerability profiles for 16 selected weredas in the four major regions of the country (Tigray, Amhara, Oromiya and SNNPR). The drafts for selected weredas were recently circulated for feedback. On targeting, the *National Food Aid Targeting Guideline* was launched in November 2000 (for household targeting only). The guideline assumes that area targeting would be done through the regular NEWS and Annual Crop and Food Aid Needs Assessment processes. A draft handbook for use by practitioners in the field was the basis for discussion at a multi-agency Food Aid Targeting Steering Committee meeting in September 2001. The idea was to pilot the guideline (through the handbook) in one selected wereda for targeting 2002-relief food aid and, based on the feedback thus obtained revise the handbook and expand the coverage gradually to 158 weredas over a three-year period. These guidelines were designed to support the following activities: data collection, data analysis, and vulnerability profile development at all administrative levels (SERA, PPPD, and DPPC, 1999:6). At the national level, the DPPC was designated to serve as the executing agency, to design policy and to plan programs. Under the facilitation of the DPPC, vulnerability information management units and working groups were established to carry out the technical and practical aspects of the work. Members of the VA Group (a consortium of international and national institutions) facilitated coordination efforts and provided technical assistance in developing the aims and outputs of vulnerability profile development activities (SERA, PPPD of the DPPC, 1999:7). Some international institutions that sit on the VA Group have been most influential, dictating an analysis of vulnerability drawn more from quantitative and large-scale analyses than qualitative locally specific data.

These policies reflect inconsistencies between stated and actual intentions, which I will argue in subsequent chapters is connected to the institutional arrangements and

administrative structures in Ethiopia. Despite elaborate efforts to rename departments and reorient staffs through decentralisation, in practice, the institutional arrangements for policy implementation under the new government favoured a centralised process. This has resulted in a hub of activity and authority centred in Addis Ababa and poorly resourced countrywide satellite offices with weak capacities to carry out independent analyses or to implement projects without intervention from national staffs and international experts. This applies also to early warning activities involving the collection of crop production data and vulnerability analyses. The recent plan to appraise livelihoods and vulnerability through profiling throughout the country will be rendered less effective should the administrative infrastructure maintain the centrally focused hierarchy by which data and information has always been controlled.

The Derg and the democratic republic have had different aims, yet aspects of both of their policies have increased the sense of insecurity amongst rural people and this contributes to their vulnerability.

4. The influence of donor policies and the decline of global food aid on national vulnerability and food security policies.

In Ethiopia, both the government's ideologies and international agreements played significant roles in setting national priorities for famine early warning and vulnerability assessments. Chapter Five of the thesis discusses how the political channels of international assistance (in the form of food aid, expertise or technology) deliver global agendas, such as those in the World Food Summit 1996, and the possibility for entry into global markets, to national policies and early warning systems. These processes have had an effect on vulnerability and food security policies and practices within Ethiopia.

The Ethiopian government's program for responding to chronic food insecurity in the 1990s came as a result of decreases in overseas development assistance and restructuring under a new administration. Within a couple years after the civil war, in late 1991, the Ethiopian government initiated a major reform moving from a command to a market economy. Their program has since been supported by the International Monetary Fund (IMF) and the World Bank. Ethiopia's reform program also received strong endorsement from donors at three consultative group meetings in November 1992, March 1994 and December 1996. Early in 1997, Paris Club creditors granted Ethiopia debt relief based on Naples Terms.⁸ In Autumn 1997, Russia reached an agreement with the Paris Club creditors on more favourable treatment of ruble-denominated debt to countries like Ethiopia that had formerly been supported by the Soviet Union⁹ (IMF/World Bank, 1998:1).

The Government's Policy Framework Paper (PFP) for 1998 to 2001 articulated their strategy:

'The overriding objective of the government is to attain and more equitable economic growth with macroeconomic stability. A rapid increase in agricultural output sparked by productivity gains and rural development programs to upgrade infrastructure and social services is expected to be the cornerstone of economic growth and poverty alleviation...agricultural development would provide the springboard for higher export earnings of farm commodities and agro-industrial goods.' (Government of Ethiopia et al, 1998: III).

⁸ "Naples terms" are agreements among creditors associated with the Paris Club to implement a new treatment on the debt of the poorest countries. They were agreed in 1994. Under these terms two substantial enhancements are granted to developing countries on a case by case basis, on the level of reduction and the conditions of treatment of the debt. For the poorest and most indebted countries, the level of cancellation is at least 50% and can be raised to 67% of eligible non-ODA credits. Creditors agreed in September 1999 that all Naples terms treatments would carry a 67% debt reduction

⁹ The terms of the accord between the Paris Club and Russia call for an up front discount of 80 percent on the stock of debt owed and the application of Naples terms to the remaining 20 percent, i.e. this part is subject to a 67 percent reduction in net present value terms. (IMF/World Bank Special Program of Assistance Status Report for Ethiopia, 1998)

In addition to aid, foreign direct investment played an increasingly critical role in Ethiopia's development, both in terms of financial resources and technological and managerial know-how. The strategy involved creating a favourable and credible environment for investment while opening up foreign investment to most sectors. In that regard, the government has already permitted foreign entry into previously restricted areas, such as in telecommunications and power generation (Government of Ethiopia et al, 1998: III). Food aid was a way of accumulating development assistance and strengthening the country's agricultural base, and this was planned to lead to economic growth.

Nevertheless, structural reform and democratic forms of governance were not in themselves a sufficient guarantee of food security in Ethiopia during the 1990s because they were instated to satisfy external mandates; those external sources did not necessarily feel accountable to developing countries; and Ethiopian national aims continued to be given the highest priority over localised issues. During the governmental transition from 1980s to 1990s, various forms of nationalistic behaviour were employed to build solidarity and support. Having vulnerability profiling as an aim was therefore needed both for understanding vulnerability and also lent government credibility amongst the people. It also complied with the role and responsibilities donor countries carved for government and nationally based international institutions. The vulnerability concepts present in Ethiopian early warning policies like the *Food Security Strategy* or the *National Policy on Disaster Prevention and Management* reflected the new government's initial reshaping of their ideologies and economy to show consistency with global concepts and a commitment to Ethiopian people. These policies held the stated aim of naming target groups, and to identify and articulate who vulnerable people were. Consequently, the naming and identification

of vulnerable target groups was set within a framework where separate and unequal responsibilities between international and national bodies had already polarised the issue as one of North against South, rich versus poor, those who were vulnerable and those who were not. This translated sub-nationally into scaled divisions in analysis, national versus regional versus local.

In line with its global role, the Ethiopian government and early warning institutions based at the national level placed greater emphasis on measuring vulnerability in aggregate. They calculated vulnerable people in mass to produce the need estimates donors and early warning institutions frequently debated. Regional and local interactions between early warning personnel and local people were largely non-participatory exercises used to elicit and extract information, not to engage people. This form of information gathering is better suited to emergency situations not to assessments of vulnerability over the long term. This type of 'extractive' vulnerability assessment in Ethiopia followed a historical precedent in which the importance of short-term relief measures out-shadowed long-term development ones.

5. Organisation and content of dissertation

Each chapter of the dissertation was written as an autonomous piece, each with full reference lists and appendices at the end. As a result, there is a certain degree of replication in argument, concepts and cited publications. Nonetheless, these chapters are important links in the wider discussion and problem, which by its nature is rather complex, dynamic and sometimes seemingly disparate. Where possible, in each chapter I highlight relevant issues and interconnections explored in other chapters.

The dissertation is organised to start with the historical setting for the issues discussed later on. This begins here in the introduction, which includes a background discussion of Ethiopia's geo-demographics and institutional capacities at various administrative levels, political movements, policy formation and impacts on vulnerability and food security analyses.

In Chapter Two, social constructivist theories are used to appraise vulnerability to food insecurity concepts and practices, with emphasis on the last decade. This is placed within an analytical framework that adapts the sequence of enquiry in scientific processes. Along the lines of a scientific mode of enquiry, the discussion proceeds from defining the nature of vulnerability to food security; to an exposition of the theories which inform vulnerability and food security concepts; then to the proposition of social constructivist theories that explain both the fundamental vulnerability and food security concepts and the accompanying socio-political issues; and finally an appraisal of current methods that carry out livelihoods analyses. The central questions are to do with conceptualising the fundamental vulnerability and food security issues as they evolved over time, alongside the socio-political factors that currently frame vulnerability and food security theories, methods and practice. A central question is explored: what theories both explain the emergence of vulnerability and food security concepts, and also the geographical and social polarization and inequality which accompanies vulnerability? The chapter reviews the concepts developed within international institutions and reinforced by practitioners; how this might in practice produce interventions designed to address a state's strategic aims rather than the nature of vulnerability and food insecurity in its truest sense. Another key question explored in the chapter is: how can practice be made more reflexive and transfer power to the

individual in finding solutions, given the complex socio-political environment in which methods emerge and given the complexity of the problems themselves?

In Chapter Three, it is argued that an appraisal of rural food systems requires a rigorous examination of vulnerability at the lowest levels of aggregation and therefore survey methods should be designed to investigate vulnerability to food insecurity at the community and household levels. The chapter presents two data collection methods used to collect food security data in Delanta Dawint, Ethiopia in 1998 and briefly compares that approach to those established in humanitarian aid agencies and food and agricultural institutions. In the Delanta survey, the methods and aims of a quantitative household survey and a participatory rural appraisal (PRA) were combined to evaluate what families did in times of need, which could assist the preparation of a profile of the household food systems during periods when people were food secure and when they were not. Food availability, access, utilisation, household assets and perceptions were assessed. The surveys also evaluated the extent to which existing governmental and non-governmental programs were followed and accepted by the communities. An antecedent to this approach to assessing food security was Sen's (1981) treatment of famine and food insecurity as a socio-political, resource and access problem rather than purely an environmental one.

Chapter Four presents the findings from the Delanta survey. The aim of the chapter is to explore the various aspects of vulnerability to food insecurity for individuals and households. It is argued that there are important differences in people's personal assets and access to food, which makes vulnerability quite variable across spatial scales and between households. These differences have not been easily discernible from the Ethiopian government's early warning and food outlook reports until recently.

Methodologies used by governmental and some non-governmental organizations, built an aggregate picture of vulnerability that can be useful at regional and national scales, but oversimplify the heterogeneity, scale, dimensions and degrees of vulnerability at more local scales. The case study illustrates the fundamental indicators of food insecurity that would be critical for food aid targeting and accurate early warning information systems. The chapter also contrasts the published generalizations about vulnerability to food insecurity with the rich variability of food insecurity within a small local area.

Chapter Five follows with an examination of the origins and forms of those generalizations. I argue that vulnerability is a matter of human construction; it reflects past and current political decisions about food aid and ongoing political processes which we find in all areas of early warning practice. Household vulnerability is a mirror to our system of values, of political, social and economic processes to which we all contribute. The globally accepted vulnerability concepts, food insecurity explanations, methods for analysis and intervention, mythologize the causes and solutions to famine. Elements in a discourse analysis, such as framing and narratives, are the basis for a deconstruction of global and national policies and specific early warning activities. The World Food Summit, the decline in food aid, and national economic restructuring were some of the impetus behind Ethiopian national policy on vulnerability and food security and were important in the promotion of myths regarding responsibility for assuring a right to food and addressing vulnerability and food security at the household level. The issues about institutional and governmental accountability are introduced here, but are developed further in subsequent chapters. Thus the national constitution, policies, measurements of vulnerability and specific positions of various institutions in the early warning system are discussed. All of these events combined to

promote two myths of vulnerability around which the discourses in Ethiopian policy and practice were formed. Secondary source data, Ethiopian government and humanitarian aid documents, and interviews with humanitarian and government personnel in 1997 and 1998 are used to build the arguments in the chapter.

Chapter Six briefly highlights the importance of early warning systems for famine prediction and vulnerability assessments. Emphasis is given to three critical issues which have an impact on the quality and timing of food insecurity interventions: governance, interagency coordination and the vulnerability assessment. It is not the intention to give sole responsibility for assessment outcomes to national governments, but to illustrate, using early warning literature, that they play a critical role. They are ultimately accountable for implementing appropriate interventions at the proper scale. In Ethiopia, governance has also been critical to the success of collaborative efforts between institutions which carry both short and long term implications.

The focus of Chapter Seven is the national early warning system (NEWS). The discussion centres on the interactions between institutions and individuals that define the organisational culture of the early warning system and contribute to the promotion of methods that fail to accurately target people who are vulnerable to food insecurity. Reference is made to interviews and observations of managers and technicians in early warning institutions in 1997 and 1998. The main questions explored in the chapter are: do vulnerability and food security approaches in Ethiopia produce information that is reliable and of use to all of the stakeholders; and to whom and where are they most useful? Much of the activities of members of the NEWS have centred on the collection and interpretation of information. This created a political tension and competition among institutions for resources and legitimacy. By adapting the Soft Systems

Methodology, I am able to explore the discourses and images of food security and vulnerability that are critical to the public perceptions of early warning practice but are not necessarily representative of the activities actually taking place. This also reveals the power struggles amongst institutions in the formation and control of knowledge, and the alienation of the poor, which are endemic in Ethiopian policy and society. Governance and accountability emerge as important features in early warning practices.

In Chapter Eight, the objective is to understand the extent to which concepts and methodological instruments articulate and measure the multi-scalar dimensions of food insecurity and vulnerability, particularly its differentiation at the local level. I argue that practical challenges and conceptual frameworks carry equal weight in the delivery of effective famine early warning and interventions. Among the impediments to good practice, the most detrimental is the politics of negotiation amongst institutions, and its effects on decision-making, choice of methods and effective targeting. One of the issues resulting from the power dynamics in organisations engaged in early warning is that decision makers generalise about the spatial dimensions of vulnerability and thereby minimise its complexity and variability. A brief conceptual analysis at the outset of the chapter is used to frame later discussions on the measurement, targeting and scale of vulnerability.

The capabilities of the Save the Children Fund's Household Food Economy Approach (HFE) and RiskMap program, and the Classification and Regression Tree analysis are evaluated alongside analytical output from a Neural Network. HFE-Risk Map and CART were designed to perform more localised analyses and all of these approaches are ultimately used for food aid targeting. I argue that the theories driving their development are the guide explaining their utility.

All of the arguments are brought together in Chapter Nine, the thesis conclusions. This final chapter highlights the regional and national biases in vulnerability analyses, which work against a proper understanding of the variability in poor peoples' vulnerability.

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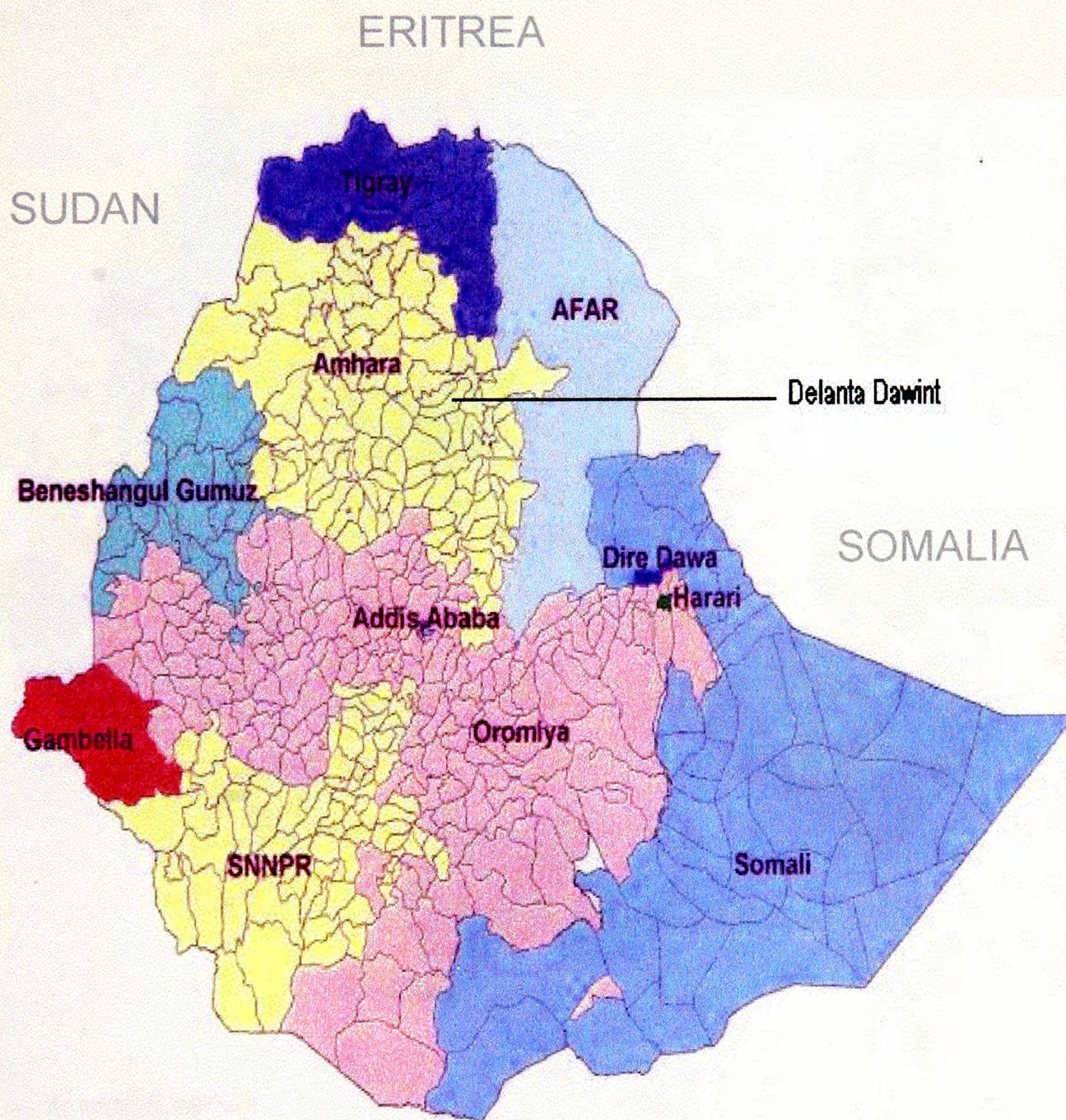
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Figure 1: Ethiopia Regions

The Federal Government of Ethiopia
Disaster Prevention and Preparedness Commission
Early Warning Department



~ Wereda Boundary

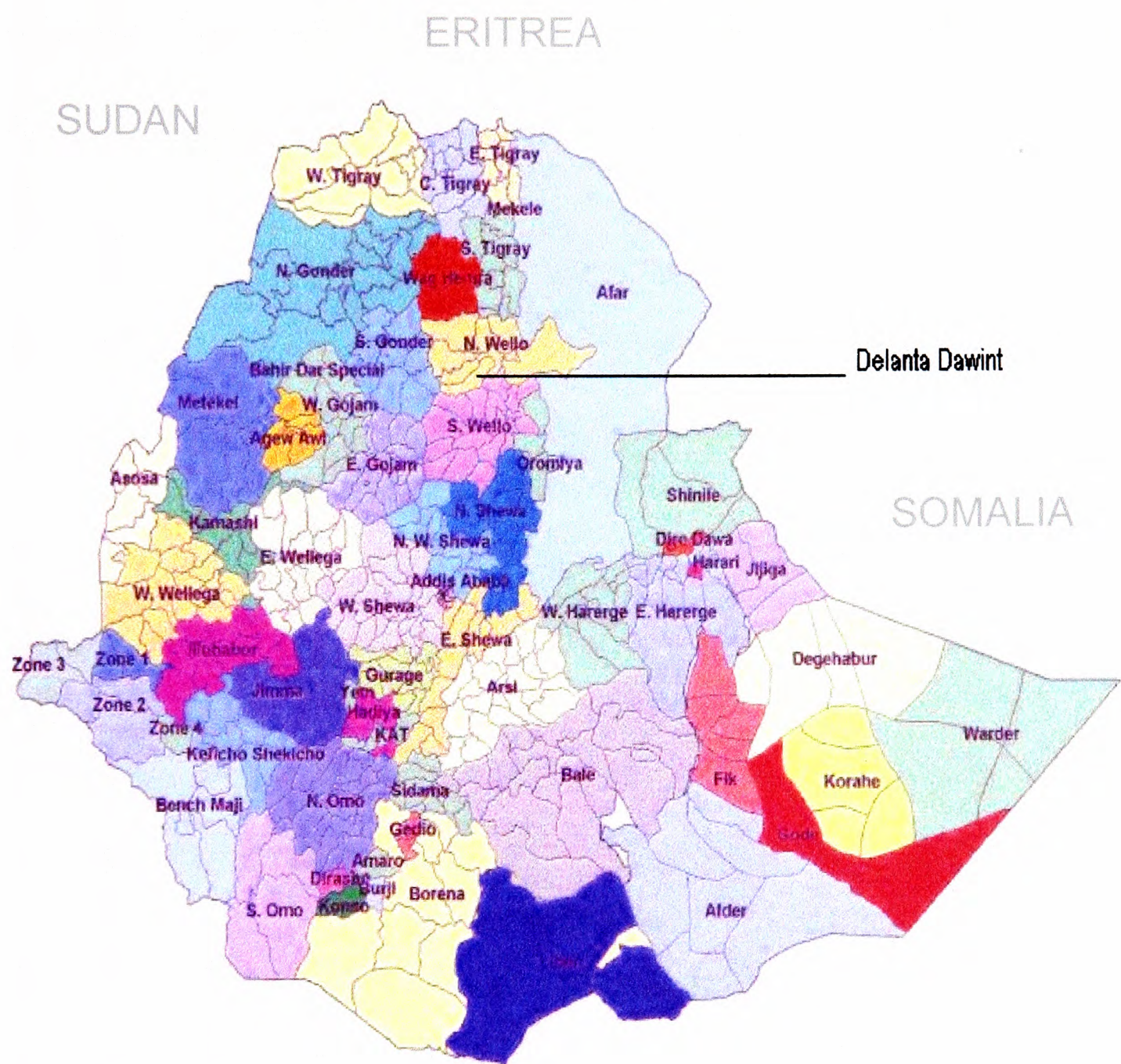
Scale: 1:10,000,000

Source: World Food Program (WFP)
Digitized from Central Statistics Authority
(CSA) 1:50,000 & 1:1,000,000 1994-1997
Wereda maps

Date: Dec. 28, 1997, Addis Ababa

Figure 2: Ethiopia Zones

Federal Government of Ethiopia
Disaster Prevention and Preparedness Commission
Early Warning Department



Wereda Boundary

Scale: 1:10,000,000

Source: World Food Program (WFP)
Digitized from Central Statistics Authority
(CSA) 1:50,000 & 1:1,000,000 1994-1997
Wereda maps

Date: Dec. 28, 1997, Addis Ababa

CHAPTER TWO

A scientific process approach to vulnerability and food insecurity

1. Introduction

A challenge for social scientists concerned with theoretical applications is the development of conceptual frameworks that also engage real problems. This particularly pertains to theory applied to most socio-natural phenomenon of a complex nature, which are defined by a combination of social, economic, political and environmental variables. Current debates among social theorists regarding development and environmental change have so far developed within Marxist, structuralist or post-structuralist camps. They contribute to a post-modernist social critique. Among the critiques, an important line of argument in the analysis of global change (i.e developmental, environmental, economical, social) are social-constructivists theories concerned with the appropriation of knowledge, power dynamics and the enduring influence of unevaluated forms of 'hard science' in development and environment studies. A few have applied theory(ies) which incorporate both natural and social sciences in a critical and comprehensive understanding of the socio-political and environmental factors contributing to change (Hajer, 1993; Fischer and Hajer, 1999; Wynne, 1987). They have appraised specific globally recognized cases of environmental disaster, like Chernobyl, and the acid rain controversies. They have used theory as an explanatory device for policy processes surrounding these issues and the implications for society at large. They have drawn from Latour (1979, 1991), Foucault (1969), Mannheim (1936) and Ravitz (1971 and 1990), who were concerned with developing social theory; the social production of knowledge, particularly claims to 'truth', and the discursive processes by and through which knowledge emerges. A more local focus comes out of studies by practitioners and institutions committed to a cross-disciplinary approach (Geist and Lambin, 2001; IFRCRC, 1999; USAID-FEWS,

1999). But these studies have had a somewhat less elaborated theoretical treatment, as they have given more attention to the conditions of vulnerable people and to designing interventions. They are allied to socio-anthropological vulnerability concepts and those developed within the disaster studies literature (Chambers, 1988 and 1989; Blaikie and Brookfield, 1987; Blaikie et al, 1994). All of these perspectives have contributed to our knowledge of the underlying causes driving vulnerability to a variety of social and environmental problems affecting vulnerable people everywhere. Their theoretical frames have helped to bring understanding of the global issues and to highlight the limitations for current vulnerability assessment.

In the introductory chapter, I drew evidence from statistics, historical events and current knowledge of global climate change to suggest that vulnerability to food insecurity is dynamic and fluid at different geographic scales yet contains clear patterns that connect various levels of analysis. This chapter is concerned with applying the social constructivist theories used in environmental studies for an appraisal of various concepts and practices which have shaped this knowledge of vulnerability to food insecurity in the last decade. I propose an analytical framework that adapts the sequence of enquiry in a scientific process. It is not my intention to view vulnerability to food insecurity as a scientific project. My aim is to articulate an approach by which processes of analysis can be critically appraised by academics and practitioners themselves. This follows on the observations of current writers on food security, that analysts need to critique received concepts and knowledge on vulnerability and food insecurity to understand where they originate, whose interests they serve, and what the implications are for vulnerable and food insecure people (Devereux and Maxwell, 2001).

Habermas (1974) described three principle kinds of science: one that aims to interpret meaning by a historically based examination of thoughts, actions and world experience; one that aims to uncover the real explanations upon which society is governed and to support social change; and one which is to predict the empirical world using scientific, positivist methods. My aim is to combine elements of all three, with more emphasis on concrete explanations and interpretations of actions in society. First, I will reflect on the nature of vulnerability to food insecurity and famine. Secondly, I will attempt to frame the important conceptual elements of vulnerability to food insecurity within a post-modern theoretical schema. Third, I will review and discuss methodologies by which relevant case material could be collected. Finally, I conclude with a summary of the discussion. My methods of analysis are predicated on the belief that an approach to vulnerability must be flexible but also rigorous in bringing theory and practice together.

2. The nature of food insecurity and vulnerability: a review of concepts and terms

The nature of an object or phenomenon is not only its ontology but also what is brought to it by social conditions and agents. Thus the nature of food insecurity and vulnerability consists of endogenous states of being and exogenous processes of causation.

Examples of Food Insecurity

a. During the Tajikistan Food Crisis in 2001, the Karohonov Davlat family of 8 people produced some 300 kg of wheat, but no vegetables. The trees in the garden, apricots and nuts all dried up. A ten-year old boy named Bunyod is one of many children in Tajikistan that did not go to school during the winter because there was no money in

the household for "luxuries" such as clothes and shoes. His parents were to sell whatever they had to buy food. Some children, like Safarali Kaibud and Saidato Saifulozoda, were sent by their parents to search for wheat in rat holes in the fields. In Northern Tajikistan, Otaena Homide explained that the crop yield was so poor it was harvested by hand to use as fodder for the animals (IFRCRC 'Photo Gallery').

b. In India, residents of Rajasthan worked to counter the effects of drought. Some delivered water by camel cart. Villagers in a government relief site in Kutch, Western Gujarat, were employed as daily labourers constructing water catchments, which are a series of interconnecting grids. They capture rainwater preventing the run off of the monsoon rains. This was part of a cash for work programme (IFRCRC 'Photo Gallery').

c. Commenting on the Ethiopian drought in 2000, a Guardian newspaper reporter described the situation from the eyes of a hungry boy: [He] emerged from the crowds of people sheltering from the fierce sun under torn umbrellas and old blankets. His name was Asalafew and he began pleading in English. "I am miserable. I am hungry. I have had to stop school because of the drought. I want to go back to school. I have worn out my clothes." (Gillan, 2000). In Ethiopia, food security is a problem, with the average caloric intake per person standing at 45% of the world's average (IFRCRC 'Photo Gallery').

d. While the capital city got a facelift, North Korea ran out of food. Millions of North Koreans were reduced to eating seaweed, cabbage stalks and grass. With no prospect of real food for two months before some new-season crops would start yielding food, hundreds of thousands of desperate refugees fled across the border into China. The

WFP confirmed that those two months would be critical as the old harvest was exhausted and the people hung on until some vegetables and potatoes could become available (Gittings, 1999).

e. In the Caribbean, many felt helpless, as they understood they could do little to influence the regulations governing trade. A banana grower remarked, “If the banana industry goes down, St. Lucia goes down with it. The situation is really bad now. I feel like abandoning the fields. Unemployment is very high. Bananas were the only things that we could depend on.” Throughout the Windward Islands of St. Lucia, St. Vincent, Grenada, and Dominica, there were thousands of small farmers who felt that their livelihoods had been snatched away because of a ruling by the World Trade Organisation. “We want to be traders, not beggars.” Why can’t the distant regulators of global trade understand that as farmers lose the market for their crops, the islands’ economies are collapsing (Oxfam, 1998)?

This selection of examples depicts a cause for peoples’ levels of vulnerability to food insecurity that is poverty, limited economic and political entitlements, adverse agro-climatological conditions, drought and fragile food systems. Environmental factors alone do not fully explain the chronic conditions of food insecurity or famine. Political, economic and social components are equally important. Food insecure people live in conditions where drought, flooding or pests affect healthy growing patterns among sedentary crop producing farmers and the water resources of livestock herding pastoralists. The food insecure also occupy the most impoverished sectors of urban spaces. In Latin America, Africa and Asia, the food insecure tend to be already poor and or destitute, largely illiterate and generally marginalized. One of the most interesting writers on African famine in the last 20 years observed that:

‘Socio-economic processes are central to an understanding of famine, and in the extreme, they can cause famine. Starvation, if it occurs, is the outcome of long processes of marginalisation and impoverishment’ (De Waal, 1991).

For many potential famine victims, food insecurity is their chronic state. The underlying socio-economic processes existing when a person is food insecure can lead directly to famine. These processes are historically and contextually specific.

The social and political components present a sociological twist to what had long previously been dealt with in purely economic or scientific terms. From the 1970s and 1980s, sociological and political analyses have been the subject for most writers on famine. Amartya Sen’s (1981) essay popularised the understanding of famine as entitlement failure, i.e. a failure in the socio-economic conditions determining access to food. De Waal (1989) has discussed the various interpretations of hunger and famine in Sudan, illustrating that attention to local knowledge and cultural dynamics might lead to different interventions. De Waal (1991; 1997) and Keen (1991) have shown the various interests at stake in some of the better-known famines, particularly when there have been conditions of war. The primary interest has been to illustrate how the socio-economic distinctions between the food secure and the insecure are embedded within societies. These authors have contributed to a sociological and political perspective on why people are food insecure.

To gain an understanding of how the ‘nature’ of food security has evolved however it is necessary to place it within an historical conceptual and theoretical perspective. The most focussed discussions of this type have come from Maxwell (1994-6, 2001) who elaborated the evolution in food security thinking. Maxwell’s theses generally

emphasize institutional limitations, while he describes the movement from thinking about food security in terms of national food balance sheets to the capacities of household economies. He points to successive definitions of the term since the 1970s: from the global and the national to the household and individual; from a food for emergencies perspective to a livelihoods perspective; and from objective indicators to subjective perception (1994-6). For Maxwell, the real utility of these concepts depends heavily on institutional approach—whether the organisational culture is suited to the task at hand and allows for better long and short-term planning, implementation and evaluation.

Although Maxwell did not place the entire evolution of ideas nor his discussion of institutional limitations within a Marxist or a post-modern frame, his emphasis on institutions illustrates that ultimately people within key global institutions have determined the ‘nature’ of food insecurity. Institutional structures and the interactions amongst its members (nationally and internationally) often reflect the interactions amongst classes and groups within society. This has resonance within Marxist and post-modern/ post-structuralist schools. However, Maxwell did relate post-modernist analysis specifically to the last 15 years of the conceptual movement, as we have become more interested in understanding the particulars (who is food insecure?), the multiplicities (what socio-natural factors contribute to food insecurity?) and poly-semantics (what are the ways in which people cope with food insecurity, which interventions are most effective, how does organisational culture shape food policy and planning?).

In his most recent writing on this topic (2001) three paradigm shifts since the 1970s are discussed and it is possible to align each of them with the international institutions that

disseminated them. Hence, we learned from the UN reports on the outcomes of the World Food Conference in 1974 that we should worry about the availability of world food supplies (UN, 1975); In the 1980s the emphasis on 'access' to food, which defined the movement in that period, is oft referenced as the World Bank definition¹; and in the 1990s the larger multi-lateral and bilateral organisations (like the WFP-VAM) took the lead in establishing methods for measuring vulnerability at sub-regional levels. Maxwell (2001: 26) describes the last few years of the current movement, since the middle of the 1990s, as a period in which '*the future of food security is very much in play*'. He suggests that decision makers are confronting the prospect of shifting back towards the production focus of the 1970s or continuing with the policy emphasis on more detailed analyses of vulnerable households.

A broader more detailed criticism of the historical movements in food security is presented in Kracht and Schulz's *Food security and nutrition: the global challenge*, (1999). The combined thesis among the authors in this book is firstly a humanitarian stance against the levels of hunger and malnutrition worldwide. They critically review nutrition and food security in light of the development theories starting from the 1950s onward. They argue that Modernisation theory was used to transform developing economies into capitalist ones, technologically advanced systems following the Second World War. In the late sixties, Dependency theorists, rejecting modernisation thinking, saw the causes for under-development as external to the cultures of developing countries. Much of dependency theory took a radical, Marxist position. In the late 70s and 80s, attention was drawn to basic needs. This was a welfare approach, which

¹ In 1986 the World Bank published a document on poverty and hunger in which the concept of food security was defined. The basic wording was: access by all people at all times to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The phrase has been modified and used widely among non-governmental organisations, bilateral and multilateral institutions and academics to define food security.

advocated economic redistribution along with economic growth. In the middle and late 80s, structural adjustment dominated the agenda. This was considered a means for controlling the mounting debt crisis facing most countries within the developing world. The 1980s also saw the birth of 'sustainable development' concepts, which is development that meets present needs without compromising the future. Globalisation and post-modernism have framed the policy debate in the 1990s. The similarity between Kracht and Schulz's chronology and Maxwell's is that certain global institutions, most notably the United Nations and the World Bank, have played a large role in defining the paradigms and the debates. Amongst these approaches and world views one readily finds descriptions and analyses of socio-natural phenomenon but from whose perspective—the vulnerable farmer or the international institution? It could be argued that the nature of food security is understood through the institution's eyes despite the movement towards a greater comprehension of food security from the perspective of the vulnerable household.

Examples from different periods

These theoretical developments appeared widely in the literature within each period. In the 1970s for example, the reports published by the Food and Agricultural Organisation (FAO) and the World Food Conference (1974) demonstrated the prevailing interest in making national crop production a global concern. The central question (then and now) was whether the world could produce enough to feed itself. In the 1980s however, research looked more at the socio-economic components determining 'access' to food. An article written in the early 80s for the FAO review on agriculture and development pointed to 14 fallacies about famine. The first of these was that an absolute [global] shortage of food necessarily means famine (Curry, 1981). In analysing the remaining

fallacies Curry emphasized the importance of institutional, political and technical issues, in addition to the problem of food supply. In the same decade, Downing's (1988) research on food security and climate variability within five districts in rural Kenya followed up on the technical aspects required for improved forecasting and early warning. He detailed the functions of household agricultural production, socio-economic and political environments, and the sensitivity of household food security to climate change, which were developed within the framework of a typology of vulnerability to hunger. The 1980s was also the period in which the FAO's Global Information and Early Warning System (GIEWS) began looking at methods for matching aggregated global production data to nationally based socio-economic issues to inform our knowledge of food insecurity. The 1990s saw the increase in approaches to analysing sub-national vulnerability within multilateral organisations. The World Food Program established a vulnerability analysis and mapping unit, while the US agency for international development's famine early warning system produced a guideline for collecting current data on vulnerability within communities. Nutritionists talked about a 'new way of looking at nutrition in famine', taking as given that individual and community access to food was the main underlying cause of starvation and famine (Young and Jaspars, 1995:27). The institutional handbooks and working papers produced during this period also reproduce the progression in food security thinking from the 1970s to the 1990s, as is found in Mulat Demeke et al (1995) or Frankenberger and McCaston (1998). Much of the 1970s retrospective that Maxwell describes in this latter period, can be found amongst government institutions that show an inconsistency between policies spouting the rhetoric of global conventions on famine while also administering programs that are more taken up with other domestic commitments, agreements and alliances (these issues are taken up in Chapters Five and Six).

Vulnerability

A different story emerges when evaluating the nature of vulnerability. Here vulnerability has been worked out amongst practitioners and academics but has not had the same international profile among key institutions as food security concepts.

The early literature on vulnerability evolved among disaster mitigators, who were primarily interested in environmental hazards from a scientific perspective. For example, Gabor and Griffith (1980) saw vulnerability as the threat of exposure to hazardous materials. UNDRO (1982) described vulnerability as the degree of loss to a given element(s) at risk resulting from natural phenomenon. Soon following this, social and economic components were introduced (as in Hewitt, 1983; Susman et al, 1984; and Kates, 1985). Liverman (1990) distinguished between vulnerability as a biophysical condition, requiring an identification of geographic location; and as a condition resulting from ones social, economic and political position in society, requiring an identification of who vulnerable people are. Downing (1991 and 1996) and Cutter (1993) further developed the juxtaposition of vulnerability to environmental hazard and the socio-economic vulnerability of individuals and groups. Downing saw different connotations: an adverse consequence (e.g. famine) rather than a cause (e.g. drought), and as a relative term that differentiates among socio-economic groups or regions. Cutter said that vulnerability is the likelihood that an individual or group will be exposed to a hazard and that the degree of vulnerability will depend on the geographic location and the social profile of that individual or group. Blaikie et al (1994) elaborated a framework in which vulnerability involved a combination of factors that determine the degree to which life or livelihood is put at risk by events in nature or society. Practitioners in the late 1990s provided more concrete case examples

of the social profile of vulnerable people in diverse situations (Uitto, 1998; Wisner, 1998; Morrow, 1999). From this we know that the most vulnerable are also often the most socially and politically marginalized. Yet, it was not until the end of the 1990s that institutions with a more global profile (such as the Intergovernmental Panel on Climate Change [IPCC]) began formalising methods for vulnerability analysis based on current knowledge. The definition appearing commonly among them was vulnerability in terms of both exposures to risk factors and also the underlying socio-economic processes which reduce the capacity of people's ability to cope (WFP, 1999; IFRCRC, 1999).

Food Security and Vulnerability

Based on the literature since the 1970s, there is a complementarity between the underlying causes of food security and vulnerability and hence the nature of vulnerability to food insecurity will contain elements of risk of exposure to environmental hazard as a result of geographic location and position within society. The personal and external resources and strategies available to a person or group will also determine it. Global institutions and practitioners mainly in institutions in the wealthier countries, will continue to play a critical role in the dissemination of knowledge on vulnerability to food security as it develops over time. Theoreticians will also play a role in shaping our conceptual understanding.

3. Theoretical frameworks

Theory and Metaphor

Barnes and Duncan (1992) suggest that metaphor provides a bridge for understanding theory. Theory is metaphorical. Big metaphors lie behind general research theories and methods, while small metaphors pepper individual writing. The ones to watch are most prevalent amongst practitioners; they emerge within a broader dynamic social context. It would follow from this that the paradigms, concepts and definitions of food insecurity and vulnerability taken up by an influential institution may also be metaphors reflecting the intention to promote one kind of knowledge over others. The vulnerability and food security metaphors and myths accompanying paradigms therefore tell us something about the paradigm and about real social relations.

If we extract from Kracht and Schulz's and Maxwell's accounts of the theoretical developments under which food security policy and practice were formed, the vulnerability and food security metaphors within Maxwell's last two periods of evolution in thinking existed within Marxist, Capitalist, Post-Modernist paradigms. The respective metaphors made food security analogous to basic needs and human rights, economic growth through structural adjustment, liberalisation and reform, sustainable development and globalisation respectively. Under the Marxist paradigm, development and social theorists like Neil Smith (1984) and David Harvey (1982) were concerned about how the geography of capitalism produced specific spatial and social processes resulting in inequalities between people within urban, regional and global spaces. Smith's processes of 'uneven economic development' created by capitalism would by extension encompass uneven levels of vulnerability amongst people across the world or

within urban settlements. This type of argument laid the ground for later critiques of the structural adjustment program promoted within various disciplines and by the World Bank. In contrast, the economic writing that centred on growth models rather than economic growth filled out the paradigms framing structural adjustment policies (Avramovic, 1972; Noorbakhsh and Paloni, 1998).

The tensions between Marxist development theorists and those who based development on capitalist principles played out in several arenas on the subject of famine. In Ethiopia during the famine of the mid-1980s this appeared in conflicts between a government dedicated to an aggressive and coercive socialism on one hand, and food aid donors from institutions in developed capital-based economies who contested the government's needs estimates on the other. Serious arguments resulted over the amount of aid to be distributed and who would be responsible for it. The suspicions between foreign institutions and the Ethiopian government carried through to the sustainable development and globalisation phases in the late 80s and early 90s.² During that time, most of the countries that had operated under command economies made the transition to market economies. Ethiopia was among them. The reconstruction of global political alliances during their transition had a profound effect on policies across all sectors. Policies were linked to rapid economic growth, which was expected to propel food self-sufficiency in a time when foreign aid, including food aid, was declining and create a favourable environment for foreign investment. It was a strategy prompted by the processes of capitalist restructuring taking place during globalisation (Castells, 1996).

² The enduring effects of conflicts between institutions on the current interactions in the national early warning system are discussed in Chapters one and six.

Harvey (1995:2 and 6) has argued that, *‘globalisation has been integral to capitalist development since its very inception. Capitalism creates a geographical landscape (of space relations, of territorial organisation and of systems of places linked in a “global” division of labour and of functions) appropriate to its own dynamic of accumulation at a particular moment of its history’*. Technological innovation, reorganisation of state powers to regulate money, law, and politics and to monopolise the means of violent coercion are distinct features of globalisation processes. Globalisation theories frame an ongoing process of capitalist development, a period of rapid expansion and reorganisation, which plays out in international relations and national policies. At the same time, however, globalisation necessarily embraces all of the ‘counter’ movements and impulses (including anti-capitalism) propelled by different ethnic and religious groups, political interests, stakeholders; because globalisation inherently refers to the integrating processes of capital accumulation across geographic boundaries, not to an assimilation of all the worlds peoples and places. This flip side of globalisation encompasses the socio-political and geographic differences that shape vulnerability. In my view the duality in globalisation processes is well reflected in the fixed and mutable nature of vulnerability to food insecurity and the inconsistencies between food security policies and practices, such as the current ‘shall we turn back to 1970s or move forward’ conundrum Maxwell describes.

Sovereignty and Nationalism (as underlying metaphors)

Under the governance of the Democratic Republic of Ethiopia in the 1990s, there has been a complicit adoption of international concepts within Ethiopian national policy, accompanied by a commitment at some level to the neo-capitalist ideologies that

supported them.³ Yet there were also separate ideologies held by the Ethiopian government that contributed to policy formation and more importantly to food security and vulnerability practices in Ethiopia. This was found in a sense of nationalism promoted during the transition years (1989-91) to unite the country in a new direction after the collapse of the previous regime. It has been said that nationalism supports and sustains features of its host ideology (Freedon, 1998). In Ethiopia nationalism supported a confused ideology that appeared in somewhat the Marxist sense, as a stance against the socio-economic status quo among an elite, while also rejecting the social and economic structures and concepts of nationhood enforced under the previous socialist system. An indication of this confusion was the policy designed under the transitional government that restructured the geographical territory of Ethiopia along ethnic lines. This policy upheld the diversity of the people, an ideal suppressed under the previous regime. At the same time it only reinforced socio-economic and ethnic divisions, as some regions clearly held an economic advantage over others. Particular forms of ethnic relations involving the assertion or suppression of identities are symptomatic of state-social relations in Africa (Osaghae, 1994).

Another aspect of governance that influenced the adoption of ideologies that supported the status quo and concepts of nationhood was the sovereignty of the Ethiopian state. There are three versions of sovereignty that I believe operate simultaneously in Ethiopia. Sovereignty is an institution, which necessarily arranges and emphasizes some identities at the expense of others. As such it is capable of denying and depriving the 'other', those who do not conform to the national program (Jackson, 1999). Another view on sovereignty which can be applied to Ethiopia is presented by those who have

³ The introductory chapter briefly outlines differences in policy under the Derg government in the 1970s and 1980s and the Democratic Republic, which formally took over in the early 1990s. Refer to Chapter Five for a discussion of global discourses and national constitutional structures and policies.

argued that international conventions designed to uphold a Westphalian notion of sovereignty have often been appropriated by new and transitional governments in developing countries to enhance their domestic control (Clapham, 1999). Thus it may serve the private ends of ruling elites. Sovereignty in Ethiopia may also be understood in a third sense, as a Machiavellian concept supporting the principles of monarchic rule. Such patterns of governance in the present arrangement are the legacy of 17 centuries of monarchic rule⁴, which ended only 15 years before the transition to democracy in 1989.

Scale: the State, knowledge, power and socio-economic differences

In addition to the expansion of capitalist modes of operation and particular forms of governance, the theoretical output and practice in the area of food security and vulnerability assessments during the globalisation period has also been informed by politics of scale. Social spatial issues are evident in the fact that the conventional, received knowledge of food security and vulnerability amongst practitioners in Ethiopia had been that disseminated by the leading funding institutions in the Northern hemisphere. National governments and international institutions based in the South have adapted this information towards national policy aims. Hendrie (1997) provides a useful discussion of how famine concepts emerge in a context that is geographically, culturally and intellectually distanced from the people and practitioners who encounter it. She argued that the idea of famine as a disaster event—concerning only the fact of an occurrence, rather than a process in which a phenomenon progresses in a specific context—is characteristic of the official discourse that predominates among major humanitarian aid institutions. This enables famine to be detached from its roots within

⁴ Ullendorff (1973) dates the earliest empire, the Abyssinian kingdom, to the third and fourth centuries

a set of historically specific and locally based economic and political processes. In addition, I argue that the detachment of the problem (famine, food insecurity, vulnerability) from history and context is an important aspect of the politics of scale where socio-economic and natural resource differences are manipulated to serve specific political aims. The ownership of the means for promoting information and knowledge is controlled by states through networks of institutions across spatial scales.

Borrowing from Swyngedouw's (1997) writing on spatial scale, I argue that when states re-define space and scale (in terms of the location of business activity, political offices or food aid activities) this represents a moment where socio-spatial power relations may be compromised, negotiated and regulated. Similar to the political and economic activities of a society, vulnerability analysis and food security interventions are politically constructed across geographical areas and the activities therein do not appear 'naturally' but are produced. The central actor in these power relations is the state.

State restructuring of its own administration as well as the political economic geography of its territory has emerged as a salient feature in the globalisation period. Jessop (1997) has argued that globalisation led to a continuing movement of state power across all geographic lines. It has also been accompanied by a paradoxical concern with the political economy of place. Among the countries that shifted from command to market economies, the transition period and its aftermath were the moment when states decentralised and were reconfigured in new ways along local, regional and international lines. Rescaling state functions allowed states to establish informal cross-regional partnerships which some suggest led to more effective

governance (Stone, 1989). Thus the state formed part of a network of policymaking and activity that integrated policy communities and issues across scales with the function of supporting state projects. A complex ensemble of institutions and organisations operating at a distance from the state apparatus were used to mediate political, moral and intellectual leadership (Jessop, 1997). Adapting Macleod and Goodwin's (1999:517) ideas, I argue that in the context of Ethiopia this reformation of the state and its informal organs has been the outcome of past struggles, interactions between past patterns of strategic selectivity and strategies adopted for the current transformation. State power is reproduced through the interplay between states, institutions and the changing nature of political forces. (Macleod and Goodwin, 1999). The policies and plans of the transitional and elected governments of Ethiopia in the late 1980s and early 1990s, were seen in hegemonic projects designed to forge a new identity in a new Ethiopia yet also maintained the essence of its political history.

Two important views on the geography of associations that make up policy networks and the social construction of space are found in Latour's actor-network theories (1994) and Harvey's geography of difference (1996). Actor-network theory helps illustrate that interactions are both local and global using non-human entities (such as institutions) and these permit certain actor-networks to carry out their objectives while even at a geographic distance from the activities they control. Patterns of centrality and marginality thus emerge as power is demarcated geographically. In contrast, Harvey is concerned with human modifications of the material world. He sees social forces acting upon the material world but places little emphasis on the power of the material world in itself. A recent alternative seeks to eliminate the dualism (micro-macro, global local, material and immaterial) in socio-spatial analyses by arguing for geography of

association that traces how actions are embedded in materials and then extended through time and space (Murdoch, 1997).

All of these points are of relevance here, particularly that ‘agents’ or ‘actors’ are central to the formation of socio-spatial relations, and that therefore the manipulation of knowledge emerges within the minds of individuals or individual groups operating within a particular socio-political structure at a particular moment in time. The manipulation of political and economic activities across scales is really an attempt to control socio-economic differences, because space is always heterogeneous, conflictual and contested (Swyngedouw, 1997). Such differences often lead to local power struggles, the kind that led to the overthrow of the Ethiopian monarchy in 1974 and later to the fall of the Ethiopian socialist system in 1989. No other issue in Ethiopia highlights the contrast between rich and poor (geographically, socially and economically) more than vulnerability to food insecurity, and this has provided impetus for wanting to control any information concerning it.

Discourses: as a framework for analysis

At the beginning of the theory section in this chapter I said that vulnerability and food security theory was metaphorical because it generally represents the knowledge base of an elite, powerful sector, rather than the ‘truth’. I turned to Harvey’s ideas on the social construction of space and time and Latour’s actor-network theories for the rudiments of an analysis of the processes by which power dynamics among States and institutions lead to the promotion of certain types of knowledge. Latour’s arguments rest on the concept of ‘agency’ assigned to both humans and material objects (i.e. institutions, technologies) in the production of knowledge and the enforcement of power in specific

geographic places. In this section I turn to Foucault's work on epistemes, discourses and power, which underlie those theories of socio-spatial scale that are most relevant to this thesis and in which it is noted that the concept of 'agency' is absent and or contested. My interest here is to explore the extent to which Foucault's discourse theories may complement Latour's ideas and enhance our understanding of why and how the dominant food policy and development institutions and state structures determine our food security and vulnerability concepts.

There are notable themes to Foucault's work that are also the basic elements of his discourse theory. In *The Archaeology of Knowledge* (1969) discursive formations systematically organise knowledge and experience and repress alternatives through dominance. In all of his work there is a rejection of the agency of individuals and the idea of 'self' as subject. It is important to study the ideas, principles and the changing, contingent processes through which social relations and institutions are maintained and transformed. The emphasis is on the ways in which individuals are constructed and normalised by the power regimes under which they are formed. Foucault is interested in the historical processes by which configurations of power have brought the world (our society) into being (Bevir, 1997).

In addition, whereas Latour ascribes agency to institutions which furthers the argument that the material world is brought into human processes of interaction, Foucault suggested that institutions exist as a consequence of being constantly recreated through a series of activities and processes, and through devices and policies that give effect to a regime of power and which are themselves always changing. The structure of institutions are therefore formed by the discourse. Discourses are subject to external controls that may exclude or include elements as necessary to sustain particular

worldviews. Thus institutions may exist in certain forms or not exist at all, which would certainly limit their agency. Latour's position on the significance of immateriality should not be rejected out right. It is possible to accept that immaterial objects are prominent in power networks, but they are not necessarily 'participants' in processes of human interaction. Furthermore, Foucault's analysis has greater explanatory strength particularly as regards the actions and power of the state in the Ethiopian case.

According to Foucault (refer to McNay, 1994; Burchell et al, 1991), power exists through society in large and small situations and on a range of issues. The state incorporates the rudiments of power through: a Machiavellian expression of sovereignty; the enforcement of discipline not only in a physical sense but through rules and the exercise of control over the political economy; and by enacting pastoral forms of governance. This view of the state characterises some of the duality in roles evident in Ethiopia during and after the transition from a command to market economy. Ethiopian state policies and interventions, particularly relating to vulnerability and food insecurity have demonstrated benevolent interest in social welfare (through increased resources allocated to health, education and agricultural sectors) while at the same time intensifying regulation and control (i.e. the population policies—which regulate family planning, and the regionalisation policies—that restructures geographic territory along ethnic lines).

Latour and Foucault were joined in the importance given to human practices. However, for Foucault, discourse is found in practices. It is not exterior to material objects, but neither can material objects stand-alone. Hence, both the institution and the state contain the capacity to eschew a particular type of knowledge because they embody the

dimensions of power that are critical to the development of epistemes and exist within a discursive framework of statements, alliances, rules, negotiations and practices that define them and define knowledge in itself. The knowledge base of the people, who are subjects of debate and interventions, is rarely or only superficially brought into evaluations because of the different interests at stake. Local knowledge is more often negotiated than incorporated.

Sociology of scientific knowledge

It is important to have a means for critically reflecting on the quality of 'expert' opinions and consultant's studies in vulnerability assessment reports, to understand what world views are being perpetuated through the language of negotiations, the text of reports, and the instruments employed to measure vulnerability to food insecurity. Some of the current work that applies discourse theories to an analysis of environmental and developmental issues were developed under the rubric of sociology of knowledge and the sociology of scientific knowledge (SSK). It is useful here to explore some of this thinking, especially relating to environmental policy.

Since the 1960s a core element of the critique of environmental policy has been the influence of paradigms of which science has been central. Policy has tended to be designed around scientific analyses upheld as truth. The field has also sought the advice of scientists in physics, biology, and chemistry. This has not been accompanied by a critical evaluation among practitioners as to the extent that hard facts are partly subjective claims to truth. This has implications for the general knowledge eschewed and for strategies employed to mitigate the negative effects of human practices that contribute to global environmental change.

A fundamental problem has been the 'production' of knowledge. The thesis of some of the earliest and most cited work on the sociology of knowledge is that thought categories, knowledge claims, and social reality are connected and that everything regarded as knowledge in society is open to sociological investigation (Scheler, 1926; Mannheim, 1929). Some of the underlying reasoning here was also found in the work of Durkheim (1912) who saw categories as the ordering of perceptions and experience. The classification of things reproduces the classification of people. Other ideas were borrowed from Marx. For instance the extension of the notion of substructure, factors which are believed to condition thought in different historical periods and in various social and cultural systems in specific ways. These factors have sometimes been regarded as institutionalised forces that occur instinctively and ahistorically, and this differs from a Marxist perspective (Scheler, 1926). There was also a distancing from Marx's critique of ideology that sees ideology as a disguise for the interests of powerful groups.

Mannheim argued that the sociology of knowledge was central to any strategy for creating a link between science and reason, yet some have felt the sociology of knowledge 'strong program' (more detail on this later) was rather weak on elaborating how the 'hardest' of sciences, like physics and mathematics could be subject to sociological analysis (Bloor, 1973). Hence, the later writing that developed into the sociology of science and sociology of scientific knowledge (SSK) has looked to Wittgenstein (1956) and others (Kuhn, (various); Ravitz, 1971; Mulkay, 1976; and Wynne, 1982) for inspiration. The sociology of science explores the social character of science, especially the social production of scientific knowledge (Mulkay, 1993). Wittgenstein proposed an account of mathematical knowledge that is 'created'. He

argued that even the arithmetical processes for using a formula could be embedded in standardized 'social' practices. Many writers refer to Kuhn although he did not write specifically on the subject of sociology of science. Nevertheless, Kuhn's *The Structure of Scientific Revolutions* (1962) fuelled an examination of science 'practices'. This has been a concern to Ravitz, particularly the ways in which science and its practices are organised to suit commercial and military industrial needs. He was also interested in the importance of 'truth' to scientific endeavours as they were used in environmental practice. This has also been a theme in Brian Wynne's work. In a 1996 collaboration, he argues that scientific claims are often taken as truth claims in environmental policy and public understanding (Lash, Szerszynski and Wynne, 1996; Irwin and Wynne, 1996).

How can SSK assist our understanding of the nature of food security and the practice of vulnerability assessments? The sociology of knowledge 'strong program', which is the basic structure by which the sociology of scientific knowledge operates, is a useful starting point. Firstly, from inception it was proposed that knowledge is socially embedded (Mannheim, 1929). This could readily apply to knowledge surrounding vulnerability and food security concepts, assessments and analyses. Secondly, knowledge gained by the hard sciences are amenable to sociological understanding (see Wittgenstein, 1956; Latour and Woolgar, 1979). The science behind climatologic and remote sensing technologies, for example, are fundamental to today's vulnerability assessments. Third, the strong program aims to locate the causes and laws that structure our beliefs. The investigator or practitioner implicated in the processes must relate beliefs to their determinants. A degree of impartiality must be employed; there are no exemptions for even the investigator's beliefs. This introduces reflexivity not only on the emergence of beliefs but also the emergence of the process of investigation

in itself. Finally, true and false beliefs must be explained and the same sort of causes must generate both classes of belief. This is referred to as symmetry. The work of environmental theorists (like Fisher and Hajer, 1999; Leach and Mearns, 1996) have indirectly complemented the SSK strong program with elements of discourse analysis; especially, the analysis of political and historical frameworks, positioning, communication, literal and metaphorical texts.

4. Current and alternative methodologies for addressing vulnerability and food security

A discussion of methodology in the context of the arguments in this chapter places one in a strange sort of circle. I have already said that our knowledge of food security is that upheld by major international aid and development institutions; that this knowledge emerges through discursive processes and operates within specific global theoretical frameworks; that the features of these frameworks explain how the information is taken up by states who exercise their own notions of sovereignty and, in the case of Ethiopia, use scale politics to control power to suit their own strategic aims. This places food security theory and practice, and my own investigation of it, in the context of post-modern modes of analysis, globalisation theories, and social spatial analyses of difference. So the question now asked is what limitations does this circularity place on current methods, and how can the methodology be both reflexive and effective?

To step out of the conceptual loop presented by this subject, I have decided to acknowledge my own role in the production of theoretical knowledge, which comes from my own understanding and interpretation of vulnerability and food security. It is based on my interpretations of the theories I feel are relevant and are available to me. I set that as given and instead focus on two things in this section. First, to further the

application of discourse and SSK theories, I propose methodology that focuses on the systems which give rise to a social production of knowledge and the power that uses this knowledge to control socio-economic differences. At the same time, I argue that methods ought to provide the means for evaluating the conditions faced by food insecure and vulnerable people. Methodology needs to be 'extractive' and 'informative' in a reciprocal, and where possible, participatory manner. Both the investigator and the subject(s) being investigated should be the focus of attention. Both should be able to 'extract' information on the processes and environment in which methods are produced and on the subject of the enquiry while also being able to 'inform' the designers, end users and the subjects of investigation, the last through appropriate interventions.

The 'livelihoods approach', which identifies the main components of food insecurity at the household level, is now the basis of major data collection efforts and is a common theme in vulnerability and food security work (i.e. Ethiopia's vulnerability profile development; the USAID-FEWS Current Vulnerability Assessments). In the spirit of the SSK strong program and my objectives here to find a reflexive methodology, I would like to reflect on how livelihoods approaches are being adopted and whether they can be really effective.

Current methods and issues

In much of food policy planning and vulnerability analysis, theories are understood to reflect real famine conditions while the basis for methods are debated: some are refuted vociferously, while others are accepted with little contestation. But why are the 'frameworks' considered more or less sound representations of reality, while the articulation of those frames the subject of debate? The answer lies in the organisational

structures and cultural practices by which food policy and interventions are formed. Ann Game (1991) interpreted the accepted duality between facts and theory in sociological practice as the consequence of the prevailing models in the discipline, which preclude the possibility that theory might consist of subjective themes and personal desires. Such desires refute the idea that theory might be fictitious representations of fact. Game argues for a deconstruction of sociology, to which she applies the rules of textual analyses, along the lines of Latour and Derrida. Sociological texts are conceived as embodied practice. Thus sociological concepts and language are not regarded as impartial transfers of what is real or true. She also draws from Hegel's conceptions of power and desire in knowledge. For Game, it is more important to ask 'why' we want to know about a situation, rather than 'what' do we want to know about it. Our enquiries arise from our own interpretations, desires or experiences, which also need to be assessed in order to decipher what is really true. Philosophies and theories are not simply commentaries or mirrors on the real world. They constitute it. She reasserts Foucault's argument that knowledge is discursive practice, and that all practices are produced through networks of power and knowledge. I find in her thesis resonance with food security practice and also the beginnings of an explanation for food security's theoretical Holy Grails versus the contested territory that is methodology. If famine theory is really the outcome of social texts, and the scroll upon which it is scripted is practice, then practice—which is where methodologies are born—must also be an area of conflict as individuals and groups confront each other in the social shaping of theories.

Social scientists have applied various techniques of observation (as in Latour and Woolgar, 1979) or of the deconstruction of practices embedded in social and technical 'texts' for appraisals of processes in the social construction of knowledge (as in the

works of Derrida or Foucault). The emphasis is on examining practices. In Akrich's (1992) de-scripting of technological texts, she asserts that both the technical application and the study of it produces a vague picture of reality. *'There is always a hazy context or background with fuzzy boundaries'* (p.1), which comes about as the result of a set of diverse forces (i.e. the various interpretations and negotiated understandings of what the technical is or should be). Social practices determine the knowledge database and technological instruments that are necessary to certain methods. Akrich also proceeds along the lines of Latour, as she argues that technical objects participate in building heterogeneous networks that bring together different types of human and non-human agents. Akrich proposes that we can study the conditions and mechanisms under which the relations between society and knowledge are constructed by constantly shifting between the technical and the social. By doing so, one can start to see how technology constrains agents and their abilities to relate both to the technology and to each other. When new technologies are introduced we are able to observe new arrangements of people and objects and often the standardization of concepts, work structures and hierarchies. In terms of my desire to explore a methodology that can accommodate both a self-critique (of the livelihoods approach) while also addressing the issues at hand (an analysis of food security and vulnerability), I lean towards Akrich's suggestion that we find potential circumstances in which the method and or the technology fails. There is where we will find the disagreements and collaborations that make up the technology and represent the social environment of the text. This method of deconstruction is widely used in sociological studies of technology and may be used here to decipher the formation of 'livelihoods approaches' as the current dominant methodology.

Methods for analysing institutional structures and discursive practices

The different operational arrangements in institutional systems contribute as much to the choice, measurements and outcomes of analysis as does the livelihoods approach itself. Therefore, useful methods are those which enable both an appraisal of institutional structures and methodologies. During the 1990s, famine early warning and other institutional evaluation systems have added vulnerability analysis to their programs as a method for analysing household livelihood strategies of food insecure and vulnerable people. Livelihoods analyses are employed to understand the causes of poverty, the processes of increased well-being, household responses and opportunities (as in Rakodi, 1999; Ellis, 2000). Vulnerability analysis departments and programs are organised around varying levels of sophistication. In the World Food Program's vulnerability analysis and mapping units (WFP-VAM), for example, remotely sensed data are important to the structure of analysis. In contrast, the Save the Children Fund's food economy approach and RiskMap computer program were developed on the principle of finding patterns of household vulnerability using local experts---generally traders, community leaders or government officials who live or work in the area of analysis.

In Ethiopia, SCF's approach to livelihoods analysis, the Household Food Economy approach, was introduced several years before the WFP VAM unit was officially established yet the WFP effort was taken aboard as a legitimate method more quickly than SCF's. Why was that? In Chapters Five and Six of this thesis I argue that some of the reasons were the imbalance in power relations between WFP (an organ of the United Nations) and the SCF (an international Non-governmental Organisation of good reputation), the institutional and cultural arrangements that fostered their methods, and

what each of them represented to end users. The interactions between actors in the Ethiopian national early warning system has historically had an effect on the analytical methods introduced and the ability to assess livelihoods. There are several methodological issues associated with livelihood approaches. First, as discussed previously, the dynamics of method formation within the systems where livelihoods approaches are undertaken suggest that approaches will often be adapted to suit the needs of designers and not to the needs of vulnerable people. Few systems contain a participatory process wherein the people who are the subjects of project planning are genuinely engaged and empowered to effect change. This type of change would entail a reordering of the larger socio-economic structures that sustain current societal arrangements. Secondly, the data from which knowledge of livelihood systems and strategies are built are generally of low quality or too expensive for most national early warning systems to gather on a regular basis. Third, the unit of measurement that is at the centre of livelihoods analyses, the household, can be difficult to define depending on where the method is applied (Russell, 1993). The application of a livelihoods approach must therefore be flexible in different contexts. In Chapters Five, Six and Seven, additional evaluations of SCF's RiskMap model in relation to the practical challenges of early warning systems, supports the argument that livelihood assessment methods will be limited by the social relations involved and the resources allocated to their methodological development.

Given the competitive environment in which vulnerability and food security methods and analytical techniques emerge, a method which allows the user to appraise the methodology, key issues and institutional structures would be needed. The soft systems methodology (SSM) may offer the framework to do this.

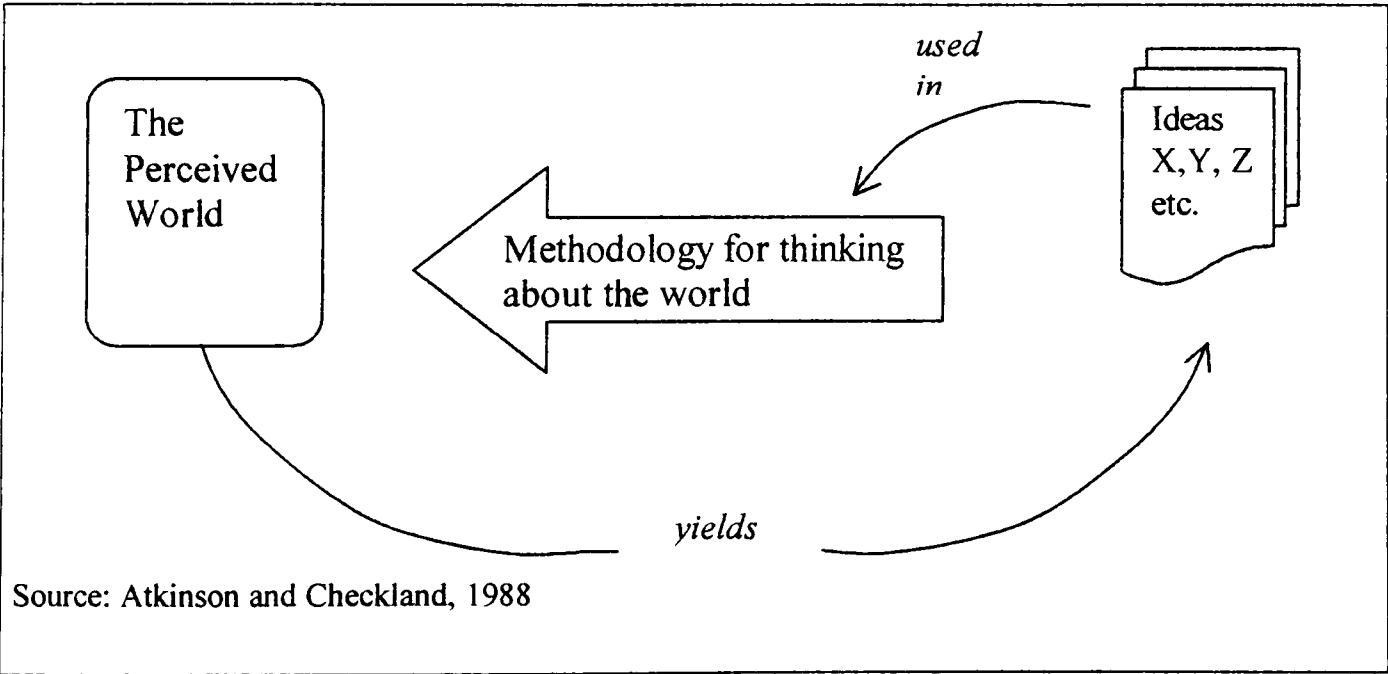
Soft Systems Methodology

SSM is a methodology for operationalising the cycle from experience to action. It was designed on the premise that human beings attribute meaning to their experienced world; they then decide to take action in response to their experiences. It was developed to assess information processes in real systems where peoples' perceptions and interpretations are negotiated (i.e. deciding how an organisation should make use of information technology). The components of SSM draw from themes in organisation theory (Handy, 1985; Morgan, 1986). At time of writing, very few formal vulnerability or food security studies have referred to or applied the methodology. Many elements of the SSM can be found in Buchanan-Smith's appraisal of famine early warning systems in Africa (1995). The work makes no formal acknowledgement of the approach, but nevertheless, the principle components of the methodology, such as the evaluation of the effects of organisational culture, a review of policies, expenditures and interventions, all contribute to the coherence and strength of her arguments. In related work, SSM was used to look at the system processes in developing a master plan for the livestock sector in Nepal (Macadam et al, 1995). It also was used to frame an analysis of the sociology in cross-disciplinary research, with reference to farming systems research (Wall, 1998). The greatest volume of published work on SSM indicates that it has been useful in the healthcare sector to identify the underlying values that produce and effect the information within health care systems (Macias-Chapula, 1995). Other healthcare studies employed SSM to evaluate health service management, impacts, and information systems (Connell, et al, 1998; Hindle, et al, 1998; Midgley, 1996). Judging from the use and outcome of these studies it is clear that SSM is better used for internal self-evaluation among people involved in the system, or at the outset of establishing a system involving information and exchange of some

product between designers and end-users. The value of the SSM approach in relation for assessing complex socio-natural issues is discussed in Chapter Seven. What follows is an introduction to SSM, to be applied and discussed further in the following chapters.

In a reflexive fashion, SSM articulates the learning cycle, from meanings to intentions to purposeful action. It enacts a system learning process. A system is defined as having emergent properties, communications and control. This enables the system to adapt in response to shocks and changes in its internal and external environment. SSM structures the debate around models of system activities. The system is conceived as an adaptive whole (Atkinson and Checkland, 1988). We perceive the world through the filter of our own ideas. The authors argue that this is the basis of systems thinking. A soft systems learning cycle is presented in the following diagram.

Figure 1 *The soft systems learning cycle*



The methods that emerge within systems are used to find out about, or gain insight to, or to engineer some world outside the method designers themselves. SSM assumes that methodology as a process of enquiry can itself be created as a system. And thus

processes of enquiry can be articulated in order to understand and intervene usefully in the flux of everyday situations. Daily activities within a system are connected in such a way as to create the whole system. Activities are constructed to meet the requirements of the image that is at the core of the system. Given the human ability to interpret the world in different ways, there will never be just one relevant system of activities operating. And thus an aim of SSM is to create several models of human activity systems and to debate and learn of their relevance to real life.

SSM is intended to be a process of finding out about a problem, exploring the activities by which the problem is interpreted, and producing models of human activity systems that may then be used referentially for the purpose of comparison and improvement of the existing system. The processes are expressed in terms of the worldviews, meanings, methods, and action, design of data and information systems, and interventions. The SSM concept of worldview is the notion of a theory of worldviews, 'Weltanschauung', that has underpinned the sociology of knowledge since its inception. The aim is not to improve the models of activities produced, but to find an accommodation between different interests and worldviews in a given situation (p36).

The major components of the SSM express the logical and cultural streams of analysis in systems. Logical streams of analysis involve conceptualising activities based on how people describe, define and name their actions and comparing these to observed activities. Cultural analysis involves an analysis of interventions, social interaction and political negotiation. This is an exploration of the roles, values and norms by which humans attribute myths and meanings in their professional and personal interactions; and the power dynamics inherent in the management of different interests (p27). For every activity, there will be a number of different interpretations and transfers of

meaning by which it can be expressed. Actors and actions interact in the process in the following way:

Table 1 *Actors and roles*

C	Clients or Customers	The victims or beneficiaries of the transformation
A	Actors	Those who would carry out the transformation
T	Transformation Process	The conversion of inputs (activities and data) to output (information) processes
W	Worldview	The worldview which makes the transformation meaningful
O	Owners	Those who could stop the transformation
E	Environmental Constraints	Elements outside of the system, constraints, that are taken as given

The data that are produced from our activities and methodologies in the system are attributed meaning, and this consists of both data manipulation (through man or machine) or the transformation of data into information. Data will have different meanings for designers, users and the subjects of analysis. Of relevance here is Akrich’s (1992) point that the designers and builders of technologies use them to obtain access to certain actors, whom they push into specific roles. Persuasion is sometimes necessary to interest the actors to play out their roles and technical objects define actors and the relationships between them by channelling and stabilizing them.

5. Conclusions

Vulnerability and food insecurity are interdependent subjects, containing multiple social and environmental dimensions that are both dynamic and structured, yet these aspects have seldom been jointly analysed under a rigorous framework that brings concepts and practice together. A critical issue is that policy makers collapse the

diverse spatial, politico-economic and temporal issues into national and global analyses. In the introductory chapter I have suggested that analyses need to explain variability and areas of commonality. This chapter has aimed to do that from a theoretical and methodological standpoint. The main question underlying the approach I have proposed in this chapter is whether the concepts that we are given by institutions and reinforced by practitioners reflect the true nature of vulnerability and food insecurity and if not, how might we make the practice more reflexive and give more power to the individual in working with received knowledge and finding solutions that truly address vulnerability? I have aimed here to outline a structure by which an academic or practitioner may appraise the nature of the problem(s) s/he is confronting (I am referring also to the institutional and political arrangements) and may be aware of the origins of underlying concepts and methods for addressing vulnerability as a complex, socio-natural problem. Towards this end, I have tried to show that the format presented in discourse theory and sociology of scientific knowledge theories expresses the multiplicity of voices and interpretations of the social world and therefore offer a framework for understanding the dynamics in social situations surrounding vulnerability and food security assessments. I have also tried to show that methods and techniques must be taken up in a reflexive approach to problem solving, which offers a flexible means of understanding complex issues and developing strategies.

The whole of my arguments have suggested that given the social construction of theories, methods and the nature of vulnerability to food security itself, we may never aspire to some kind of 'truth'. Therefore, following the logic of a scientific approach can not be expected to resolve all of the issues that arise in the everyday reality of political and institutional arrangements, which are constantly 'producing and reinforcing' our knowledge. Nonetheless, a critique of our theoretical constructs in light

of the multi-faceted natures of vulnerability and food insecurity will be necessary to develop reflexive and informative methods. The approach here helps bring consistency between the theoretical constructs we uphold and the interventions we carry out.

The chapter provided a historical review of the theoretical and methodological development of food security and vulnerability concepts, and this has shown that social processes, which structure societies and institutions, hold a pervasive influence over policy and analyses. Furthermore, they act to inform the use and outcomes of locally based, livelihoods approaches. As a consequence, it has been a challenge for vulnerability and food security program managers to respond to the dualities in vulnerability and food insecurity.

The following chapters adapt elements of discourse analysis, the sociology of scientific knowledge and soft systems methodology to deconstruct the multiple factors which contribute to the current understanding and practices surrounding vulnerability and food security analyses in Ethiopia.

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CHAPTER THREE

Case Study Concepts and Methods

1. Introduction

Rural food systems are best examined at the lowest levels of aggregation where the dynamic patterns of food insecurity are most evident (Hoddinott, 1999; USAID-FEWS, 1999). In the methods section of Chapter Two, the study of household level vulnerability and food insecurity was described as the livelihoods approach. Sen (1981) provided an antecedent to this approach to assessing food security in his treatment of famine and food insecurity as a socio-political, resource and access problem rather than purely an environmental one. Further research on food security and rural systems (Jaspars and Young, 1995; Bevan and Pankhurst, 1996) appraise 'livelihoods' as a way of addressing household food insecurity; and livelihoods are described in terms of assets and access as well as income generating employment. In line with these views, food security surveys in Delanta Dawint, Ethiopia (1998) were designed to investigate vulnerability to food insecurity at the community and household level. Delanta is a rural agricultural sub-division (known as a wereda) in the northern Ethiopian highlands (refer to maps in Chapter One). It is less than one per cent the size, in population and square kilometres, of Ethiopia. Yet its socio-economic indicators (i.e. literacy and income per capita) compare more favourably with national statistics than one might expect given that the main livelihood activity is subsistence agriculture and it has a history of famine and food insecurity (comparative statistics in Table 1). The wereda came to attention in the 1980s when most of northern Ethiopia experienced a failure of the late (meher) rains, and that, combined with inadequate government and donor responses, resulted in a famine. In the early to middle of the 1980s, emergency feeding

programs started in Delanta. They operated primarily through the government’s ministries and the non-governmental organization Oxfam.¹

In this chapter, various methods for studying rural household level food security (and livelihoods) are mentioned, with particular focus on the methods used in the case study of this thesis, Delanta Dawint. The following section provides a brief review of current vulnerability assessment methods used by institutions participating in the Ethiopian early warning system. The next sections explain the underlying assumptions, survey criteria, and methods for deriving vulnerability profiles in the Delanta case study. The chapter concludes in section 8.

Table 1 *Comparative statistics for Ethiopia and Delanta*

	Ethiopia	Delanta
Adult Literacy (can read and write)	20%	25%
School Age Children Attending	63%	28%
GNP	US\$110 ²	US\$206
Area (km ²)	1,176,429	1,553
Population	48,816,189	158,301
Population Density	41.5	94.83

Sources: UNDP, 1998 and Oxfam Delanta food security study, 1998.

2. Vulnerability assessment methods

During the 1990s, many of the foreign institutions engaged in food policy and assistance in Ethiopia grappled with methods for analysing vulnerability to food insecurity at sub-national scales. For some, the efforts resulted in guidance manuals describing methods for measurement and assessment. These activities developed along with the government’s policy to decentralise early warning functions and the growing

¹ Background material on Delanta are mentioned in the introductory chapter (the section entitled: National versus local hierarchies and differences in Ethiopia) and in greater detail developed in Chapter Four.

acceptance of the definition of food security as access to food by all people (World Bank, 1986). Institutions varied in the ability to apply these methods, which was a consequence of the different mandates and resources they held and the socio-political relations among groups in the early warning system. In general, however, the efforts that would be most useful to farmers in the long run, were those which showed consistency between concepts and definitions focussed on the household level and methods which aimed at establishing some type of profile of vulnerable people.

The elements of an assessment methodology which targets communities and households

Vulnerability, food security and famine concepts support a common understanding among practitioners, but nevertheless these concepts are often not fully realized in the actual strategies for vulnerability analyses (VA) and measurements. The purpose of the VA is to identify the likelihood of individuals or larger populations to suffer food insecurity—which means limited access to food. Or to identify susceptibility to famine—which is food shortage leading to death by starvation, resulting from a combination of environmental and non-environmental (social, economic and political) disruptions. VAs involve two components: (1) to identify who is at risk to climatic and environmental perturbations; and (2) to prioritise need as influenced by the population's economic, social and/or political situation. The specific aims of food security assessments, are to evaluate peoples' overall livelihoods comprising their assets, consumption, access to and availability of food. Food security assessments evolved mainly after the experience of failed famine relief interventions and after Sen's (1981) convincing arguments that famine was the product of broader interactions in society and that peoples' social, political and economic entitlements would be the

² Source: African Development Report, 1998

basis for understanding who would be vulnerable to famine. The most recent food policy and development literature also emphasises the importance of making time-sensitive assessments of livelihood and income strategies of the poor, given the variance in individual strategies and the exogenous circumstances that influence them (Devereux and Maxwell, 2001; D. Maxwell et al, 1999; Ellis, 2000). Thus, identifying vulnerable people requires a coherent system for understanding the dimensions of the problem in given contexts and a measurement of the severity of the problem on different regions and people over time.

Food insecurity is the culmination of a mix of environmental and social factors, and therefore the aim of a vulnerability assessment is also to capture both the natural and socio-economic processes. As a result of the difficulties entailed, food security cannot be measured by single, discrete variables (Yisehac Yohannes and Webb, 1999). Like food security, famine is brought on by a range of components that include resource constraints, production, prices, consumption, assets and coping mechanisms (Downing, 1991; Webb et al, 1992). Effective measurements are those that are able to account for the livelihood conditions of target groups (i.e. the rural and urban poor, female-headed households, pastoralists and the unemployed). Therefore, a selected group of indicators is needed.

The importance of indicators

What could be the indicators of vulnerability to food insecurity? Food production at scales larger than the community show little correlation to production and food security of households, therefore indicators capturing information below the community level must be utilised (IFAD, 1997; Chung et al, 1997). In general, good community and household level indicators will measure processes of food security and access in terms

of productivity and outcomes, such as consumption, at local scale (Maxwell and Frankenberger, 1992). To develop and use indicators of household food security, Hoddinott (1999) recommends a review of secondary literature, participatory rural appraisal techniques (PRA), and interviews with key community based persons who are knowledgeable about food insecurity in the study area, and a household questionnaire. The data collected from these efforts helps in the 'characterization of the locality in terms of the nature of the food security problem, the identity of the food insecure, and the severity of food insecurity' (p.7-23). All of these are important elements in profiling.

The research has pointed to the 'coping mechanisms' of farmers (Corbett, 1988; Swift, 1989; Downing, 1991) suggesting that an explicit focus on socio-economic groups facilitates interpretation of famine indicators and provides a link to appropriate famine interventions. D'Souza (1989) used case studies from Mali, Ethiopia and Mozambique to highlight the merits of different indicators. He argued that 'stress indicators' reflected economic and social behaviour, which was the best way of getting an early identification of famine and building on local knowledge. These positions reflect a paradigm shift away from the macroeconomic production focus, which dominated the discussion prior to the late 1980s. Some current data collection efforts duly emphasize the processes through which people become vulnerable. The key questions for the selection of indicators and analyses of vulnerability processes include: what are the components of rural livelihoods in terms of material and social assets; where do families find off-farm income; which crops do they depend on? What is their political context; are they victims of war? What are the agricultural and labour market conditions? What behaviours, like migration, signal a crisis? These factors add to an socio-economic and political profile of the vulnerable.

Chronic and current indicators

Indicators may be used for early warning, requiring regular monitoring of select food security variables over time, or for targeting of food assistance once an event has occurred. They can therefore either support studies and interventions for chronic or current food insecurity. As Kelly (1992) argues in a critical assessment of anthropometric indicators for populations prone to famine, indicators must capture the complexity of the interactions that lead to famine in different places over time. No matter the use (chronic or current assessment), the value of an indicator is its predictive capacity, tested on a range of places. In the past, the difficulty of data collection on famine and food insecurity (staff and financial limitations) prohibited the testing of the full range of food security variables. This necessitated a cautious approach, mainly using indicators for signalling whether famine was likely to occur, but not definitively for estimating if, when, where or which groups of people would likely be affected. Greater improvement has been made in checking the validity of indicators, and this has come about in conjunction with the move towards vulnerability profiling.

The use of chronic and current indicators for targeting in Ethiopia

Among early warning institutions in Ethiopia, the understanding was that some of the most likely community level food security indicators useful for targeting purposes would be agricultural production, market access, market price data, non-agricultural income, assets, anthropometric measures, rainfall. There has been debate among early warning practitioners over the value of each as key indicators, which led to the initiation of several collaborative exercises to rank indicators at wereda level. A joint assessment of the Wolayta wereda in Ethiopia carried out a vulnerability ranking of

relief food aid need estimates.³ Twenty-seven indicators were used in the analysis. They were first assigned to two categories: chronic or current. Chronic indicators were those which reflected long-term development issues, mainly poverty. Current indicators reflected changes detectable over the short term, such as rainfall measurements or the mean weight for length measurements in children under five years old. A system for ranking and weighting indicators was applied, each indicator was then scored and the sum of scores in each category (i.e. the chronic vulnerability score and the current vulnerability score) represented a final score. Sensitivity tests showed that the final score was fairly stable regardless of the value of the weight. This exercise was used as a basis for validating food aid targeting methods, as the weredas with the highest current vulnerability rank could be identified as most in need of assistance in a given period. Resource requirements would also be calculated based on target groups, those populations particularly pre-disposed to food insecurity (such as the elderly or children under five).

Exercises such as these were the antecedents to the recent national vulnerability profiling and targeting effort in Ethiopia.⁴ In the intervening years, however, each agency continued to carry out separate assessment operations. For example, the World Food Program (WFP) concentrated on developing a database of indicators for Ethiopia, which was primarily used to support vulnerability mapping analysis using geographic information systems. The analysis focused on national and regional scale, which I argue in Chapter Seven, limited the effectiveness of their approaches in the 1990s.

³ The Wolayta assessment was conducted in 1997. One of the primary purposes of the ranking was to create a *common understanding* of the magnitude of food insecurity in Wolayta. The following institutions were involved: the UN World Food Program, US Agency for International Development, Disaster Prevention and Preparedness Commission (Early Warning Department), INTERAID France, CONCERN, SOS-Sahel, SCF-UK, World Vision. Of the group, WFP and USAID were the most active (WFP-VAM, 1997).

However, aggregated analyses were consistent with the vulnerability analysis and mapping unit's aim to provide information that would guide more detailed analysis and programming decisions to be carried out by other institutions and WFP departments (WFP-VAM, 1996). Today the organisation uses a 'hybrid' approach—an adaptation of various methods.

An alternative method for current vulnerability assessment, which has been used for local level assessment and targeting throughout Africa, is the USAID current vulnerability assessment. The program for current vulnerability assessments of the USAID is more in line with the common understanding of food insecurity. Through a process of data gathering and analysis such as that described by Hoddinott (1999), an analyst in the USAID Famine Early Warning System program could begin the process of developing socio-economic groupings of vulnerable people in various locations throughout a country within a given time period. The analysis and data obtained as a result of this current assessment could then be used to evaluate the potential for a population to be food insecure in the future. There is little published on the use of this method for Ethiopia, however the documentation of the approach used in Malawi (USAID-FEWS, 1998) and its use in conjunction with WFPs analysis and mapping in Kenya (Haan, et al, 2001) demonstrates its utility for accurate identification of potentially vulnerable groups. In this D.Phil research, the method was adapted for the development of vulnerability profiles of households in Delanta, Ethiopia. A more detailed discussion of the method and its applications to Delanta are discussed later in the Chapter (see section seven).

⁴ National vulnerability and targeting programs were established in 1999 and 2000. A brief introduction to the policies supporting these programs is presented in the introductory chapter.

Another method of community level assessment is Save the Children Fund UKs (SCF-UK) household food economy approach and RiskMap software program. As discussed in Chapters Two and Five, SCF-UK approaches were not widely accepted within early warning circles until recently, although they were one of the earliest comprehensive and dynamic methods for profiling vulnerability within Ethiopia and Africa. The method has limitations, which are discussed elsewhere, but an advantage is that it effectively aims to detect both the changes in vulnerability to food insecurity and the fundamental socio-economic structure of the problem across communities.

The greatest limitation to the success of each method for carrying out vulnerability and food security assessments at community level is the early warning context in Ethiopia. The early warning history in Ethiopia has shown that social relations between individuals and institutions play a large role in determining which methods are adopted and how they are used. This has had an enduring effect on household vulnerability and food security analyses.

3. Underlying assumptions of the Delanta food security study and methods

Much of the literature since the 1980s supports an assessment of food security using both qualitative and quantitative methods and considering four components: availability, access, utilization and assets. The Delanta study was carried out through a quantitative household survey and a participatory rural appraisal (PRA), which were both structured by these five food security components. Structuring the surveys this way helped later in the identification of chronic indicators of vulnerability to food insecurity at the community and household level. It also provided enough detail for constructing vulnerability profiles. There were two overall goals to the study. One was

to evaluate what families did in times of need, to create a profile of household food systems during periods when people were food secure and when they were not. Another goal was to evaluate the extent to which existing governmental and non-governmental programs were followed and accepted by the communities. Table two outlines each food security component and the associated assumptions in the Delanta food security study.

Table 2 *Food security components and assumptions*

Components of Food Security	Assumptions
Food availability and Access/Entitlements	A household's ability to acquire food in Delanta would depend on the availability of food produced; food production depends on rainfall, soil conditions and the agro-ecological zone; availability and access are also dependent upon market activity (production, financial and other constraints in any given year); socio-economic rights and entitlements to services and land are important (includes access to information about food aid interventions). The information collected under these categories included: <i>Income, labour, economic activities, market activities, aid agency interventions.</i>
Utilization	Utilization provides insight to household food sources, diet and consumption patterns. The strongest indicators of community and household level food consumption measure dietary diversity and caloric intake (Hoddinott, 1999).
Assets	An understanding of what people own informs a forecast of how people survive during difficult years. It also provides information about whether they are selling to cope with current crises.
Household Perspectives on Food Insecurity	A deeper analysis of a household's food security comes from understanding local peoples' perceptions, particularly the battery of coping strategies. Under this category, it was possible to note whether there had been some change to food security as a result of aid agency interventions.

4. Survey teams and general sample selection criteria

Oxfam GB employed the survey teams to carry out a food security study for the purposes of impact assessment. This researcher (I) was contracted to design and manage the household survey and to observe, participate in and write the PRA report. The household survey team consisted of two team leaders, including this researcher, and 18 enumerators. In the PRA survey, I acted as an observer along with nine interviewers and one trainer. The survey teams met for one week to undergo training and to discuss general criteria for selecting households for both surveys. These criteria were based on staff knowledge about food insecurity in the area and were used as a benchmark for classifications. The surveys were not explicitly designed to test the correlation between each criterion and food insecurity, although some of the results indicate differences based on them. The following is the rationale behind each criterion.

Agro-ecological zone

Communities (or peasant associations) and households were drawn from the three agro-ecological zones known locally as Kolla, Weina Dega, and Dega. Kolla areas are lowlands, Weina Dega is the midlands and Dega is the highlands.⁵ Depending on temperature, soil quality and rainfall in each zone, the demonstrated effect on agriculture is that crop failure is likely to be higher in the lowlands than in the highlands for the types of crops grown in this area (see Getachew, 1993).

Road Access

Another consideration was whether the peasant association (PA) was accessible to a road or another common pathway. The existence and quality of infrastructure is considered a good indicator of vulnerability in terms of access to socio-economic services and for the political legitimacy and entitlement it implies. During food aid distributions the presence and quality of roads are critical for food reaching people and for people reaching feeding centres. If people are too weak to get to where food is distributed, then it is imperative for deliveries to get as close to them as possible. The problem is compounded when rain makes dirt roads impassable. For many families in Southeast Ethiopia during the food crisis of 2000, there was the dual problem of access to food due to their location in relation to the nearest road and to muddy conditions (Guardian/Observer, April 2000). The existence and location of road networks are often the consequence of decisions made outside of the communities that rely on them. Ethnicity and political affiliation share close links. It is possible to find some ethnic groups living in and around areas where the government has made a notable investment in service development (Sainath, 1996).

Non-governmental organisation (NGO) services

A third criterion was whether the Oxfam NGO carried out projects in the area. Here again the underlying issue was access and entitlements. An important question for Oxfam and the development debate is whether international interventions are making the intended impacts and who benefits from these interventions.

⁵ In Delanta, the agro-ecological zone Kolla is approximately 1700 meters above sea level, Weina Dega is 2800 and the highest Dega areas are measured at 3300.

Religion

The population in Delanta is predominantly Christian, with a minority of Moslems. The Oxfam staff believed that this might be a factor in social and economic inequalities and might determine levels of access to services.

5. The Household Survey aims and methods

Aims

In addition to the broad assumptions described before, that availability, access, utilization and assets can explain food insecurity, the household questionnaire was designed with three specific objectives. The first objective was to quantify dimensions of vulnerability to food insecurity. Second, to establish indicators of food insecurity in Delanta. The third objective was to establish whether the recipients of food, and other types of aid, benefited from them. It was important to learn how foreign and local agencies' interventions affected people. The indicators were expressed by the components of household food security (availability, access, utilization and assets) and the data associated with them (i.e. market, community and household characteristics, consumption, and land holdings). The household survey questionnaire is presented in the Annex.

Survey design

Our survey procedures were constrained by time and resources (financial and human). Moreover, no previous studies were available to estimate a coefficient of variation and sample size. Therefore, the sample size was based on the following approximations.

There were 44 Peasant Associations in the Delanta Dawint wereda and three agro-ecological zones: Kolla, Weina Dega, and Dega. The proportion of PAs belonging to these zones were approximately in the ratio of 2:2:3, respectively. The three zones were used as a first level stratification, then a total of seven PAs were chosen as representative of the 44 PAs in the Wereda. We based representation on criteria such as access to roads, and whether they were within Oxfam's project area. The seven PAs were then allocated to the three agro-ecological zones based on proportion to size, so that Kolla, Weina Dega and Dega received 2, 2 and 3 PAs respectively. A map of the peasant associations in Delanta is presented on page 23.

Between two and three per cent of the households in each of the seven PAs in the sample were selected, which came to total 189 households. The number of respondent households per PA is shown in Table 3. Ranges of two to six villages were selected from each PA, which was decided based on the size of the PA (see Table 5). Systematic sampling was used to identify households for interview within villages. Every 30-40 households in each village were interviewed. The intervals varied depending on the size (number of households) in each PA. There was not enough man-power or time to sample at small intervals in the largest PAs. The percentage of households and sample intervals are shown in Table 4.

The survey team leaders contracted eighteen enumerators to carry out the survey over a ten-day period. To qualify, enumerators needed to have achieved a secondary school education or beyond. All of the enumerators were from Delanta Dawint. Classes were held with the enumerators for three days, during which time the questionnaire was translated from English to Amharic, the purposes and responses expected for each

question were explained and role plays with volunteer heads of households were enacted. Enumerators worked in pairs, each pair covering 2-3 households per day.

To ensure the accuracy of the enumeration, the team leaders met with designated enumerators at the end of each day to review the responses. We were interested in the quality of the interview (i.e. the relationship between the interviewer and the interviewee) as well as whether questions were asked correctly. In cases where questions were incorrectly asked or the question itself provoked an illogical response, the interviewer was shown how to rephrase the question in the next day's interviews. This was an effective strategy, because it allowed us to note and offset weaknesses in the questionnaire and identified weak interviewers. The contact enumerators were also responsible for informing others in their survey area about the outcomes of our discussions.

Statistical analyses of the household survey data

After the interviews were completed, a clerk was supervised in entering the data into a D-base data management computer program, carrying out basic statistical tests of heterogeneity using SPSS, and generating a short preliminary report. These activities took ten to fifteen days. At a later stage, this researcher conducted further analyses in SPSS using chi-square, ANOVA, correlation and principal component analyses, and this formed the basis for the final Oxfam report and the case study material in this dissertation.

Table 3 *Number of Households surveyed in each Peasant Association*

Peasant Associations							
Number of households	3	4	11	13	29	32	39
	27	32	23	22	31	30	24
							Total
							189

Table 4 *Percentage of households sampled in each village and sampling interval*

Agro-Ecological Zones	Peasant Associations	Total PA Population	Number of households sampled	Percentage of households sampled	Sample interval
Kolla	PA 29	1186	31	3%	38
	PA 11	852	23	3%	37
Weina Dega	PA 4	1334	32	2%	42
	PA 3	1126	27	2%	42
	PA 13	867	22	3%	39
Dega	PA 32	900	30	3%	30
	PA 39	701	24	3%	29
Total			189		

Table 5 *Names of villages listed by Agro-ecological Zone and by the PAs in the sample*

Agro-Ecological Zones	Peasant Associations	Villages					Total PA Population
Kolla	PA 29	Adisu Amba	Chaka mender	Deldalit	Kess Mender	Kiltu Kulkual	1186
	PA 11	Adgimit	Donzie	Gorgie	Shembeko	Tegiena	852
	PA 4	Alabaegir	Tesenko				1334
Weina Dega	PA 3	Ferja Mareja	Mariam Got	Zelam Kab			1126
	PA 13	Fenseha	Shegela	Matebi			867
Dega	PA 32	Asa Bahir	Asagit	Aytached	Bet Anese	Debir	900
	PA 39	Marko Keba	Motegrie			Gala Maderia	701

In the analyses presented in the case study, the mean values are accompanied by their respective standard errors (SE) or Standard Deviations (SD). The magnitude of SE shows the level of precision of the estimates. A large SE indicates a less precise mean and a small SE indicates a more precise mean. Calculations of SE are based on the extent of variability in the response. Parametric and Non-Parametric tests, ANOVA and chi-square analyses, were used to test whether there were differences between the two sex groups, agro-climatic zones, educational levels, religious groups and their combinations. Differences among PAs for continuous variables were tested by means of one-way ANOVAs ⁶. Differences in frequency counts among PAs were tested by means of chi-square (χ^2) analysis ⁷. A probability level of <0.05 was used for all tests.

Non-response was defined as no response to a question to which there was a definite answer. In this survey, the rate of non-response was estimated to be around five per cent, which did not have an enduring influence on the conclusions drawn from the study. The statistical tests used account for sample size differences that occurred as a result of non-response. Prior to doing the parametric tests, some of the data were transformed to log, square root, and arcsine-square root values, as necessary to meet the assumptions of normality.

⁶ Norusis, M.J. (1993) SPSS Base System User Guide. New York: McGraw-Hill.

⁷ Siegel, S. and N.J. Castellan (1988) Non-Parametric Statistics for the Behavioral Sciences. New York: McGraw-Hill

6. Participatory Rural Appraisal survey

Participatory Rural Appraisal (PRA) was chosen for several reasons. First, it is a rapid form of information gathering⁸. Secondly, it has become a widely used method of obtaining qualitative information about communities that might otherwise be missed using traditional forms of data gathering. For example, using PRA tools and methods, it is possible to learn about income through diagrams showing income and expenditure represented by the proportions allocated to the most important household items. In this survey people were asked to describe or draw diagrams of the items that contribute most to household earnings and to prioritise each item. The actual amounts were never asked. The responses were summarised in a pie chart showing the proportional value of those items known to bring the most income to the household.

During the PRA survey people were interviewed about their perceptions of being food insecure and the changes in their lives that have some bearing on food security. For example, through a series of exercises, surveyors explored the perceptions about wealth in each village. Using a PRA tool called wealth ranking, selected individuals were asked to describe the assets and characteristics of rich and poor families. The results were tabulated, ranked and separated into four categories: rich, upper middle, lower middle and poor. Farmers were also allowed to interpret their own conditions and to provide reasons and solutions. In addition to wealth ranking, the following interactive PRA tools were employed during the survey.

⁸ For a thorough discussion of rural appraisal methods, particularly comparisons to household survey questionnaires, see G. Bergeron, 1999. PRA survey techniques were preceded by rapid rural appraisal (RRA), a qualitative method introduced primarily for emergency assessments. Examples of the application of RRA may be found in R. Chambers, 1980; and R. Chambers, 1992.

Table 6 *Participatory Rural Appraisal tools*

Tool	Description
Village Maps	Farmers were asked to re-construct their villages using sticks, stones and other objects to designate buildings, rivers and other physical features.
Venn Diagrams	Hierarchical diagrams of the institutional structure of villages were drawn.
Matrix Ranking	A ranking based on locally derived criteria. For example, trees were ranked and classified by use value.
Problem Trees	Farmers were asked to brainstorm major and secondary issues to form a flow diagram of problems with related causes.
Timelines	Farmers recounted historical events. This was used to assess Trends.
Proportional Diagrams	An example: the number of stones placed next to different tasks measured time consumption per task.

Group meetings were used to conduct the survey. The meetings were announced through community based local institutions and through representatives from the local ministry of agriculture. All members of the household attended except for those who were ill or otherwise felt they were too busy to attend. Men and women were interviewed in separate groups.

Peasant Associations and villages in the PRA survey

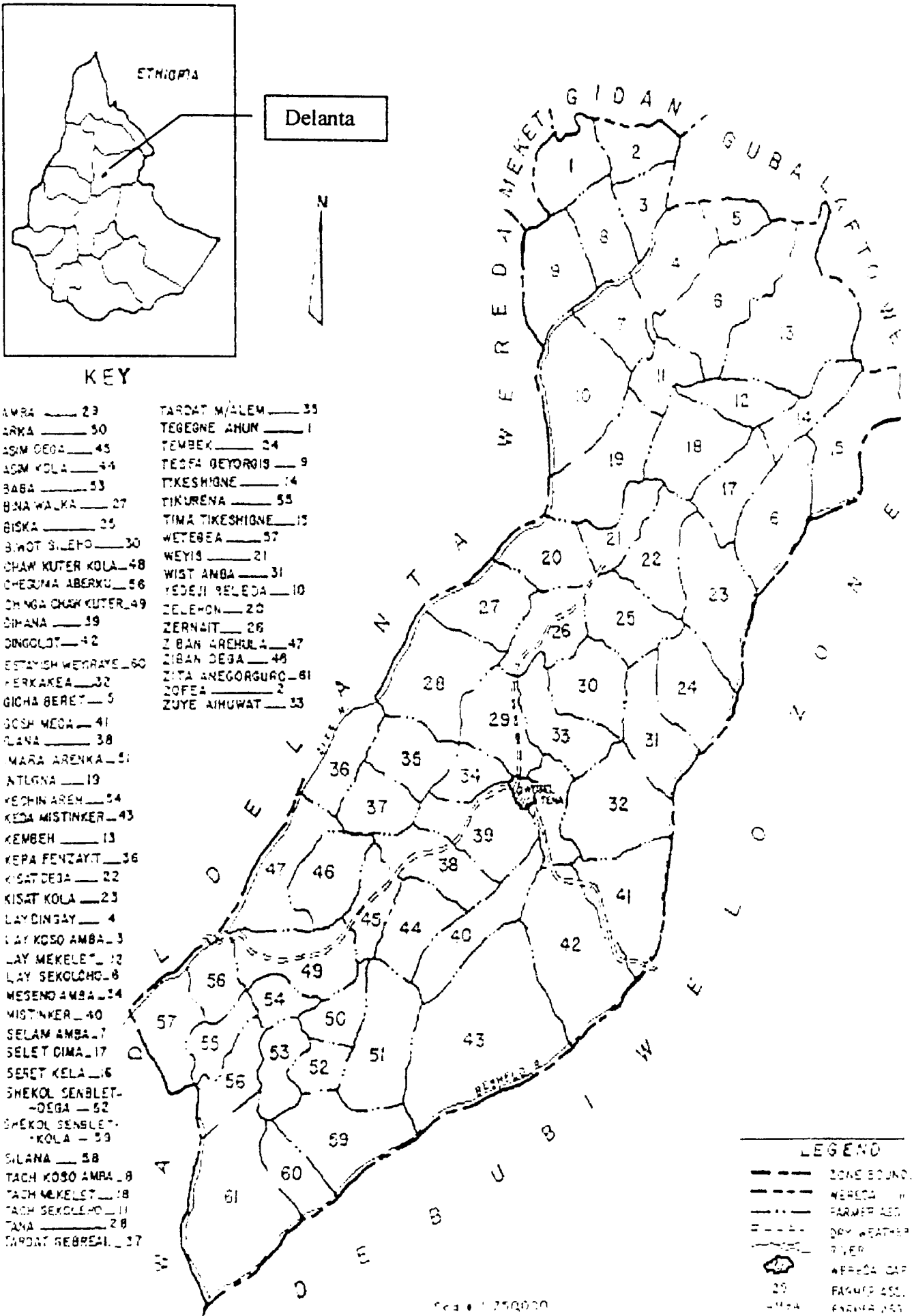
PRA meetings were held at all three altitudes. There were three PAs and six villages selected. As shown in Table 7, PAs were selected based on criteria similar to that in the household survey, which staff believed represented the Wereda. For reference, a map of PAs in Delanta is shown on page 18. The map was drawn before Dawint wereda was annexed in 1997, and therefore some of the PA numbers will be different from the present numbering system.

Table 7 *Criteria for selecting Peasant Associations and villages*

Peasant Association (PAs)	Village	Agro-ecological zone	Number of households	Road Access	Included in Oxfam's project area	Religion
03	Zelam Kab	Midlands (Weina Dega)	80	Yes	Yes	Christian
029	Firja Mareja	Midlands (Weina Dega)	95	Yes	Yes (recent)	Christian
	Kess Mender/ Wohaw Mender	Lowlands (Kolla)	116	45 minutes from main road	Yes	Kess Mender is Christian, Wohaw Mender is Moslem
	Kiltu Mender	Lowlands (Kolla)	88	Yes	Yes	Christian and Moslem
032	Tina Mender	Highlands (Dega)	125	Yes	No	Christian
	Millawa	Highlands (Dega)	45	Trail access	No	Christian

A limitation of using PRA methods is that the group dynamics of the interviewing process may bias the results towards the goals of stronger group members. It is therefore weaker at detecting individual anomalies than a standard household questionnaire. Nevertheless, an advantage of using both the PRA survey and a household questionnaire together is that the findings from PRA surveys, such as the likelihood of food insecurity based on a group assessment of individual household assets, may be cross-checked against statistical tests (such as the ANOVA or chi-square tests) of household questionnaire data, which can show correlations between key indicators and specific household characteristics.

MAP OF DELANTA WEREDA (Pre- 1997)



7. Methods for deriving vulnerability groups

For the purposes of this dissertation, the data collected in the Delanta study were used to develop profiles of vulnerability to food insecurity. Vulnerability profiles were developed from a cluster analysis of the household questionnaire data. The purpose of the profiles was to get a sense of who vulnerable people were from a socio-economic standpoint, what assets they held and where they were located in terms of altitude. The literature and experience suggests that profiling satisfies the basic requirements for appraising livelihoods and understanding the variability of vulnerability at local scale.

The USAID current vulnerability assessment process was used to articulate whom people were, what resources they held and where they were located in the wereda. The USAID Famine Early Warning System Current Vulnerability Assessment adapted for Delanta is presented in the Annex.

To understand *whom* vulnerable people were, each group was labeled with a socio-economic category: Crop Farmers, Dairy Farmers, Mixed Crop and Dairy Farmers, and Other. Most families engage in mixed economic activities, with the largest proportion involved in crop production. Households for which crop income constituted more than 50% of total income were labeled as Crop Farmers. The same rule was applied in labeling Dairy Farmers. Those who engaged in mixed or none of either activity were labeled as Mixed and Other. As agricultural activities were highly mixed among groups the final groupings were as follows: Group 1- Crop Farmers, Group 2- Mixed Crop and Dairy Farmers, Group 3- Crop Farmers and Other, Group 4- Crop Farmers, Group 5- Dairy and Crop Farmers, Other.

To make an assessment of *what* people had—their capacities to support themselves—and to rank the groups, I followed a modified version of the USAID Current Vulnerability Assessment (CVA) process (1999). The first step was to identify socio-economic categories as described previously. The second was to determine whether the aggregate food available was sufficient for the overall population. The third step was to determine whether people had sufficient access to food judging from their livelihood strategies (e.g. means of earning income, ‘coping mechanisms’, and assets). Steps four through seven involved: determining whether the population faced important challenges to using food in a healthy and nutritious manner, determining if access and utilization permitted the population to meet consumption requirements, an assessment of whether the population could protect its asset base and assigning the population to food security categories.

I ranked and coded the groups into the following food security categories: 0 = extremely food insecure, 0.5 = highly food insecure, .75 = moderately food insecure and 1.0 = food secure. Table 5 explains each ranking in greater detail. Following the logic of the modified CVA, it was clear that none of the families or groups would qualify as food secure (1.0). This became apparent at the second step when it was determined that food was not sufficient for all of the population in the study area during the period of the survey as a result of poor growing conditions in the previous year. This information came out of food status reports from Ethiopia’s Ministry of Agriculture (Wereda and Regional levels), WFP and USAID national vulnerability assessment and mapping and Ethiopia’s Disaster Prevention and Preparedness Commission crop assessments.⁹ In addition, there was little variance between groups in the coping mechanisms used.

Therefore, entering into step three, everyone was ranked as extremely food insecure. At stage three there were differences noted between the groups. Notably, farmers in group 2 had average and above average numbers of male labourers, income, food aid, and managed to get the best prices for their goods during periods of food shortage. Their expenses were around the average to below and they had well above the average number of livestock. Group 2 had mixed farming activities. They were placed in the category moderately food insecure (0.75) because they had sufficient access to food through competitive income, prices and the food they produced for their own consumption. At step 4, I classified Groups 1, 4 and 5 in the highly food insecure (0.50) category because they had limited access and utilisation of food. For example, Group 1 earned a very low income, particularly from their main activity, which was growing crops. Group 5's expenses were very high and they earned little from trade. Of the three, Group 4 was a borderline classification because they had similar levels of assets as group 2, however they earned and consumed well below the average from livestock and had the second highest cattle holdings. At the same time they did not have much grazing land. The relatively high expense of keeping livestock in comparison to their poor productivity, placed this group in the highly food insecure category. Step 5 was an assessment of household nutrition, food intake and caloric consumption. Such data is only available for a very large sample frame, and I could not be sure of its reliability. Therefore step 5 was skipped. At step 6, it was possible to classify the extremely food insecure category (0) who were entirely represented by group 3. These were mainly crop farmers who also engaged in other activities, because crop production in itself did not sustain them. They had less male labour available, the lowest incomes; they received the least food aid (only 25% compared to 84% in Group 2), and received the least amount of money for the items they traded. They owned a

⁹ Footnote references to the sources of these reports are cited in the Annex.

very small amount of livestock (on average 2 per household). Of all the groups, they expressed the greatest interest (56-69%) in receiving agricultural training or training of any kind. In Step 7 all of the families in each food security category were assigned a code. The rationale for each code is described in Table 8.

Table 8 *Food Security Categories*

Category	Description	Code
Extremely food insecure	Households had insufficient local food available, insufficient access, insufficient utilization, out-migrated.	0
Highly food insecure	Households had insufficient local food available, limited food access, insufficient utilization, disposed of productive assets.	0.5
Moderately food insecure	Households had insufficient local food available, sufficient food access, sufficient utilization, recourse to adaptive coping strategies	0.75
Food secure	Households had sufficient local food available, sufficient food access, sufficient utilization, normal income generating patterns	1.0

After assigning food security categories, the next phase was to observe *where* people lived. The greatest proportion lived in the mid-altitudes (2800 masl). Seventy-five percent of the moderately food insecure lived in the mid-altitudes. The highly food insecure lived at all altitudes, but the greatest proportion were also in the mid-altitude range. Sixty-six percent of the extremely food insecure lived mainly at high altitudes (3300 masl), and the remaining were in the mid-altitudes.

8. Conclusions

The basic principles of the vulnerability and food security assessment methods discussed in this chapter were applied for an appraisal of livelihoods and survival strategies of households in Delanta. The raw data obtained were evaluated to determine

characteristics of the most vulnerable groups, which agro-ecological regions of the wereda they occupied and what assets and coping strategies were available to them. These are fundamental elements in understanding rural livelihoods and household food security systems.

Both the PRA and the household questionnaire were standard formats adapted to local conditions and needs. They were designed to inform Oxfam project planning decisions, and as such reflect the staffs' requirements to have as wide an understanding of the factors contributing to food insecurity as possible. The findings presented in subsequent chapters will also be coloured both by the survey designer's position as a western educated outsider, by the purposes and arguments of this dissertation, and by the reality of survey work. Both the household and PRA surveys are likely to have contained biases that affected the output. For example, in the PRA sessions, we attempted to fully engage all participants, but there were inevitably one or two more outspoken members in some groups from whom others took subtle cues. In addition, in carrying out the household surveys our enumerators faced extremely rugged field conditions: they sometimes walked for several hours away from their home villages and were therefore obliged to spend the night in the villages, or sometimes the households, where they had interviewed. Much also depended on the amenability and sex of the respondent. In one case, an enumerator reported having to follow behind a busy farmer as he ploughed his field. On other farms, adult females were interviewed alone because adult males were already at work away from the homestead. Ultimately, the results will present a certain picture of vulnerability in Delanta Dawint. This will be the combined outcome of our own needs as researchers to gather information that makes sense given our concepts of famine and the farmers' desires to receive our assistance.

In the following chapter, the discussion and presentation of findings from the surveys aim to highlight the subtle variations and generalizations that exist regarding food insecurity and vulnerability in Delanta.

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Annex 1: USAID Famine Early Warning System Current Vulnerability Assessment Adapted for Delanta

Steps in the CVA Process	CVA applied to Delanta, Ethiopia	Rationale	Description	Description	ANN Code ¹⁰
1. Define Socio-economic groups	Socio-economic groups:	Adapted Kenya CVA, as could not find documentation of an Ethiopian CVA			
	Farmer 1		Cereal and vegetable crop farmers		F1
	Farmer 2		Mixed Vegetable and Dairy farmer		F2
	Farmer 3		Dairy Farmer		F3
	Non-farmer Urban Non-farmer		Laborer in town Non-farm laborers and other		NFU NF
2. Determine sufficiency of Food Availability	Delanta Woreda not food sufficient in 1 st quarter 1998. Food aid contribution not calculated	Collected data from wereda and regional ministries of agriculture, WFP national vulnerability assessment and mapping, USAID and DPPC harvest reports ¹¹			

¹⁰ The socio-economic groups were given codes that were used in an artificial neural network (ANN) analysis of variability between households in Delanta. That analysis is discussed in Chapter Eight.

¹¹ **USAID Famine Early Warning Systems-FEWS** Bulletins 1997, 1998.
 For example, see <http://www.fews.org/fewspub.html#1998>: shows that growing conditions in Belg were good for farmers in highland areas- crop growth normal in first quarter of 1998. Also <http://www.fews.org/fb971128/ea971128.html#ET>: crop damage in northern highlands resulting from unusually heavy rainfall, causing frost and flooding- Poor harvest end 1997, means insufficient availability in 1st quarter 1998. <http://www.fews.org/fb971229/ea971229.html#ET>: shows the FAO - WFP Joint Harvest and Food Supply Assessment, Ethiopia's 1997/98 main-season harvest will be approximately 8.8 million MT -- 25 percent below last year's main-season harvest. Poor crop establishment due to irregular rainfall early in the season and damage caused by excessively heavy and untimely rains at the end of the season are largely responsible for this reduction in production. The most seriously affected areas are South and East Tigray, North Wello, Oromiya, and East and West Hararghe Zones.

DPPC, Initial Analysis of 1998 Belg season
http://www.wfp.it/vam_documents/africa/ethiopia/va98/html/belg_season/sld003.htm. : In some major Belg producing areas, crop production accounts for 60 percent of food.

Steps in the CVA Process	CVA applied to Delanta, Ethiopia	Rationale	Description	Description	ANN Code 12
3. Determine whether population has sufficient access to food	XX% of households have direct and indirect access	Access in terms of: 1.income strategies 2.coping strategies 3.assets	Stocks, own food production, cash cropping, artisan and petty trading, livestock production	Loans, productive and liquid assets	
4. Determine whether population faces important challenges to using food healthfully	XX% of households face challenges to healthy diet	Woreda is chronically food insecure			
	Not determined	No full nutritional survey data for Delanta	We assumed that consumption needs could only be partially met if HH had insufficient food availability, access, and utilization		
5. Determine if access and utilization permit population to meet consumption requirements					
6. Assess whether population can protect its asset base	XX% of population were not able to protect their asset base	Assets include: Land, crops, oxen, other livestock, labor	Crops, oxen, livestock and labor are all vulnerable to a drought and food shortage.	Land portions are assigned at the discretion of local administrations	

http://www.wfp.it/vam_documents/africa/ethiopia/va98/html/belg_season/sld010.htm: 1998 cereal price increases ranged from 15-30% in North Wollo- insufficient availability due to adverse market conditions.
http://www.wfp.it/vam_documents/africa/ethiopia/va98/html/belg_season/sld011.htm: reports of crop wilting in North Wollo. Dry spell in March and early April adversely affected Belg crops.

World Food Program, 'Amhara Region Populations in need of assistance in 1998'
http://www.wfp.it/vam_documents/africa/ethiopia/va98/images/r3_az4.gif: population of Woreda estimated to be in need of assistance for 4 months in 1998. Based on 1997 crop assessment.

Steps in the CVA Process	CVA applied to Delanta, Ethiopia	Rationale	Description	Description	ANN Code
7. Assign population to food security category	XX% of HH extremely food insecure	Households had insufficient local food available, insufficient food access, insufficient utilization, out-migrated			0
	XX% of HH highly food insecure	Households had insufficient local food available, insufficient food access, insufficient utilization, disposed of productive assets			0.5
	XX% of HH moderately food insecure	Households had sufficient local food available, sufficient food access, sufficient utilization, recourse to adaptive coping strategies			0.75
	XX% of Household food secure	Households had sufficient local food available, sufficient food access, sufficient utilization, normal income generating patterns			1.0

**Annex 2 - Rural Household Survey, Delanta Dawint Woreda, Amhara Region
2 -12 March 1998**

Section 1.0 Household Identification

PA Number	Name of Household Head
Village Name	Agro-ecological zone
Household ID	
Notes: Agro-ecological zones Kolla=K, Weina Dega=w/d, Dega=D	

1.1 Household Structure

Member	Age	Sex	Occupation	Marital Status	Household Head	No. of Years Lived in Village	Birth Place
1					Yes		
2					No		
3					No		
4					No		
5					No		
6					No		

1.1 Household Structure

Member	Active	Education	Relation to H.H
1			
2			
3			
4			
5			
6			

1.2 Religion and Ethnic Identification

- 1.2.1 What is your religion?
1.2.2 What is your ethnic group?
1.2.3 How many religious holidays do you celebrate in one year?
1.2.4 How many do you observe in one month?
1.2.4 What type of work do you do on these days?

Section 2.0 Food Availability

2.1.1 Markets(purchases)

Please list the Food Items Available in the market?	Please list the Price?	Are you able to purchase?	How often?	Month Available	Name of Market

2.1.2 Markets (sales)

Please list the items you are able to sell in the Market.	Please list the amount you get for this item in a good year?	Please list the amount you get in a bad year?	Please tell me the selling price this year.	In what month are you able to sell?	In which Market do you sell?

2.1.3 Are there cereals available in local markets throughout the year ?

2.1.4 If No, where do you get grains?

2.1.5 If yes, of the grains you've listed, which two are the most profitable?

2.1.6 Livestock

Product Sales

Product	Unit	Price	Rank
Butter			
Egg			
Meat			
Milk			

2.1.7 Petty Commodity Production and Sales

Did any member of your household produce any non-crop or non-livestock goods?			NO (go to next questions) YES (continue)
Name of Product	Price sold for	Year	To whom sold? If in the market, which one?

2.2 Income and Expenditure

Source of Income	Total Birr
On farm food crop sales (including fruits and horticultural crops)	
Income from hides , sale of chickens and eggs	
Income from livestock sales	
Petty commodity production	
Petty trading, trading of goods (buying and selling - do not include sales of on farm products)	
Waged farm labour	
Waged non farm labour	
Income from renting out oxen or pack animals	
Remittances from migrant workers and cash donations from relatives	
Cash loan for consumption	
Other sources of cash income (specify which....)	
Credit	
TOTAL	

2.2.1 Which of these items contributed most to the household?

2.2.2 Why do you say that?

2.2.3 Five years ago, which items would you have chosen? Why is that?

- 2.2.4 If you had income from credit, can you name the source?
- 2.2.5 *Expenditures*: Can you name the things that cost you and your family the most? Which would you say is most costly? Which is the least costly?

2.3 *Livelihoods, Change and Food Acquirement*

- 2.3.1 In good years, how do you acquire income?
 checklist: subsistence farming, herding, livestock or fishing, casual or waged labour, sharecropping, trading or artisanal production or natural resources (e.g.), rent, remittances, gifts or loans, theft.
- 2.3.2 Can you tell me which activity brings you the most food? Which brings you some food? And which brings you the least food?
- 2.3.4 During the food shortage years you mentioned before, which activities did you engage in? (see check-list)
- 2.3.5 Which of these items brought you the most food? Some food? The least food?
- 2.3.6 Who in your household was engaged in these activities during good years? During difficult years?

2.4 *Crop Performance*

- What are the major crops grows?
 In what season are they grown?
 What is the cost?

Name of Crop	Season (Belg/Meher)	Rank (from 1 to 5)

Section 3.0 Access/Entitlements

3.1 *Impact of Food Aid and Other Interventions*

- 3.1.1. During the worst years, did you receive any help from anyone? Who?
- 3.1.2. Who would you say helped the most with your food shortage? Why do you say that?
- 3.1.3. If the help you received came from non-government agencies or institutions, in what ways did they help?
- 3.1.4. Were you a participant in any activities carried out by non-government agencies?
- 3.1.5. Have you noticed any changes at all since these activities have been in place?
- 3.1.6. Please tell me about those changes.
- 3.1.7. How did you learn about the new wells and water points in your PA?
- 3.1.8. Did you start using the wells right away?
- 3.1.9. If yes or no, why was that so?
- 3.1.10. Can you tell me what you like best about the water projects?
- 3.1.11. Can you tell me what you like least?
- 3.1.12. Can you know who is responsible for the bringing new wells?
- 3.1.13. How do you know this information?
- 3.1.14. Do you have discussions with them before the wells were installed?
- 3.1.15. Do you have discussions with them now?

3.6. *Major Constraints to Agricultural Production*

In your opinion, what are the major constraints to increase agricultural production in the area? Indicate at least three choices.

- A. Lack of draft oxen
- B. Shortage of input supply

- C. Drought.
- D. Degradation of the land
- E. Labour shortage
- F. Lack of Knowledge of new Technologies
- G. Livestock and crop diseases
- H. Crop storage problems
- I. Weeds
- J. Other _____

1st Choice	
2nd Choice	
3rd Choice	

Section 3.0 Utilization

3.1 Severity of Food Shortage

- 3.1.1 Has this household ever experienced food shortage?
- 3.1.2. If yes, can you tell me when you experienced a food shortage?
- 3.1.3. Can tell me which was the worst year(s)?
- 3.1.4. Can you describe the conditions your family faced at that time?
- 3.1.5. At that time, can you tell me how many meals you had in one day?
- 3.1.6 Can you name the foods you ate at that time? How did you acquire these foods?
- 3.1.7. Are these foods different from what you would eat in a year where there was no food shortage?
- 3.1.8. Can you please describe what you did to earn income during that time

3.2 Household Consumption

- 3.2.1. During the worst years, do people from other households eat with you? How often?
- 3.2.2. During the worst years do you or members of your household eat with others? How often?
- 3.2.3. If others eat with you, can you tell me how many were women, men and children?
- 3.2.4. In the food shortage years you mentioned, can you tell me how food is distributed in your family?
- 3.2.5. In good years do all members of the family eat all meals together?
- 3.2.6. If not, why is that so?

Section 4.0 Assets

4.1 Land Allocation

- 4.1.1 How long have you lived in this area?
- 4.1.2 How long have you lived on this land?
- 4.1.3 Did your grandfathers also farm this land?
- 4.1.4 What is the size of the land you own?
- 4.1.5 Have you had an increase in land? If so, when?
- 4.1.6 Have you lost some land? If so, how much? When?
- 4.1.7 Can you please tell me what type of soil you have?
- 4.1.8. Indicating with a diagram (pie chart), can you tell me how much of each type of soil you have?
- 4.1.9 Can you tell me how you use your land?

Type of Land	Size used (in Timad)
Grazing	
Cultivation	
Homestead	
Other	

4.2. Livestock
4.2.1 Inventory

Code		Cattle/Animal	Number			Please Rank (1 to 5)
0	1	Draught/Oxen				
0	2	Cows				
0	3	Heifers				
0	4	Bulls				
0	5	Calves				
0	6	Sheep				
0	7	Goats				
1	0	Camels				
1	1	Donkeys				
1	2	Horses				
1	3	Mules				
1	4	Chicken				
1	5	Beehives				

Section 5.0 Household Perspectives about Food Insecurity

- 5.1 Food Security
 - 5.1.1 What is food security?
 - 5.1.2 In your opinion what are the reasons for the food shortage you mentioned?
- 5.2 Understanding Constraints to Livelihoods and F/S
 - 5.2.1 What are the worst problems your household faces?
 - 5.2.2 Why do you say that?

CHAPTER FOUR

The Complexity of Vulnerability

This chapter has been published in two reports:

1. 'Livelihoods and Food Security in Delanta: Report on Participatory Rural Appraisal of 3 Peasant Associations in Delanta, Ethiopia'. Oxfam GB, Oxford, 1998.
2. 'Vulnerability and Food Insecurity in Delanta', Oxfam GB, Addis Ababa, May 2000.

‘We used to be happy with our lives, satisfied with what we had, food and drinks in excess. All of a sudden we were caught by drought, unable to acquire little food even for a taste.’

-A villager in Firja Mareja Village,
Delanta Dawint, Ethiopia 1998

1. Introduction

In the 1990s, the guiding principles for understanding vulnerability to famine and food insecurity shifted from the global towards the locally specific. Practitioners at all levels of decision making refocused attention from national food stocks to individual household reserves. Alongside national GDP, we now take an interest in the household food economy (as described in Seaman, 2000; Boudreau, 1998). This focus on local vulnerability has been ascribed both to post-modernism (Maxwell, 1994) and experience-based common sense. Nevertheless, as much as we now recognise the need to understand local coping capacities and markets, this information is seldom used in a manner that reflects the complexity of vulnerability to food insecurity. Methodologies used by governmental and some non-governmental organisations, build an aggregate picture of vulnerability that can be useful at regional and national scales. Such approaches oversimplify the heterogeneity, scale, dimensions and degrees of vulnerability. Furthermore, they fail to understand peasantries as ‘historical outcomes of agrarian labour processes that are constantly changing and adjusting to surrounding conditions: climate and market fluctuations, state exactions, political regimes, as well as technological innovations, demographic trends, and environmental changes (Bryceson et al, 2000:3). This chapter illustrates the fundamental elements of food insecurity, which are needed for food aid targeting at various scales, for more accurate early warning information and an improved understanding of rural livelihoods.

A case study of Delanta Dawint, a subdivision in the rural northern highlands of Ethiopia, is presented (for reference see maps in Chapter One, figures 1 and 2). The case material shows food insecurity as complex and heterogeneous between climatic/altitudinal zones and small administrative units. It supports recent arguments that peasants do not constitute a homogeneous social grouping. They are highly differentiated by class, gender, age and locality (Bryceson et al, 2000: 299). To explore the range of food security issues specific to Delanta, I present baseline information from the participatory rural appraisal (PRA) and household (HH) surveys (1998) described in Chapter Three, and highlight the key indicators which characterise vulnerability and food insecurity.

The first section of this chapter introduces the common public perceptions of vulnerability in Ethiopia and provides background information on Delanta from three perspectives: socio-political, environmental and economic. Section two explores who is vulnerable by looking more closely at the socio-demographic characteristics of the people, social organisations and community resources. In section three, the objective is to examine assets, what people had to support their livelihoods during food shortage and non-food shortage periods. The aim of section four is to determine where vulnerable people live; to explore the spatial scale and geographic dimensions of vulnerability. Section five presents vulnerability profiles of farm groups in Delanta, which is a summary analysis of differences in vulnerability to food insecurity for each groups. Conclusions are made in section six.

Public perceptions of vulnerability

One often hears of Delanta in the context of regional analyses, which is insufficient for understanding the range of vulnerabilities evident there. It is not unusual to read the north central highlands, where Delanta is located, characterised as chronically food insecure or of the central parts of Ethiopia as food sufficient (DPPC, 1997/1998). Such generalisations are founded mainly on historical trends and are not wholly inaccurate. Recent famine has plagued northern areas both in the drought of 1974 and in 1982-84, and the people do share similar constraints to levels of income and economic growth. Yet there is much to be known about specific areas that are not captured in aggregated analyses.

There are known complications in collecting data in Ethiopia due to limited financial and staff resources; vastly different climatic zones and poor road infrastructure contribute to its inaccessibility (DPPC-5 year plan, 1998:21). Despite this, the government's Disaster Prevention and Preparedness Commission manages to detect the major food problems throughout the country. An issue for targeting however is the amount of local variability that is lost among the broad descriptions. The DPPC- 5 year plan of Ethiopia describes food shortage and famine areas this way:

The most drought-prone areas of the country are its northern, eastern and southern parts. [These] areas are characterized by high rates of land degradation, low agricultural input, poor agricultural technology, etc. which all have contributed to increasing the vulnerability of the rural population to food shortages. (DPPC, 5- year plan, 1998:3)

It is true that land degradation has an overall negative impact on agricultural production. But people are affected differently depending on which socio-economic

groups they belong to, what their economic and other resources are or even the altitude at which they live. Alone, the climatic zones within a wereda can produce highly diverse circumstances. In addition, the ranges in area and demographics subscribed to weredas are dramatic. There are more than 100 (roughly 116) weredas in the Amhara region. The smallest wereda is 6 square kilometres and the largest is 8181. The population of the smallest are around 25,000 and the largest, 228,772 (CSA, 1994). Detailed knowledge of variations and patterns for and across specific places and individual livelihoods are important for constructing intervening strategies and food needs assessments.

Vulnerability in Delanta

This study concentrated on the local socio-economy and food vulnerability of Delanta Dawint, a wereda¹ in the north central highlands of Ethiopia. During the period of this case study, 1997-1999, Delanta had suffered the effects of unseasonably late and heavy rains in 1997, and poor rains in 1998. Drought and harvest failures had an impact largely because the main livelihood is agriculture, which employed 94 per cent of the 189 households in the survey. A projection from the 1990 census showed the population of Delanta was 158,301 at the time of the survey (CSA, 1994).

The wereda is 1,533.25 square kilometres, spreading from lowland to highland, much of it in the mid-altitude range covering the plateau of a mountain. The Ethiopian central statistics authority classifies 97 per cent of the territory as rural. We conducted

¹ There are three administrative boundaries within Ethiopia above the village level. The largest are the regions, divided into 15 sections on the basis of ethnicity. The boundaries within each region are known as Zones and the next sub-level boundaries are known as Weredas. Delanta Dawint is a Wereda of region 1, North Wollo zone. Region 1 and North Wollo zone cover the north Central Highlands of Ethiopia, which has had a history of drought and famine.

surveys in a maximum of seven different peasant associations (PA)² which were drawn from the three traditional agro-ecological zones: Kolla (lowlands), Weina Dega (midlands) and Dega (highlands). These range in altitude from 1700 to 2800 to 3300 meters above sea level respectively.

Processes of Vulnerability in Delanta

To describe food insecurity and vulnerability in Ethiopia and Delanta one needs to consider several processes of events. The socio-political, environmental and economic trends in the northeast highlands, and throughout Ethiopia, are good indicators of these processes³ (and Holt and Lawrence, 1993). Farmers drew time-lines during the PRA survey which suggested that famine and vulnerability to food insecurity are closely correlated to the economic and social policies of the three significant governing regimes since the 1970s, and by environmental perturbations. The composite time-line in Figure 1 gives insight to local and national trends, like the famines of 1973 and 1982–1984. It shows that the most important events were those that affected their main livelihood, agriculture.

Socio-political factors:

Harmful government policies and a civil war formed the background to Ethiopia's famines and food crises over the last 20 years. Soon after the military-socialist government took over in the middle of the 1970s, adult males in Delanta were conscripted into the army to fight rebel movements and to defend the socialist state. Those who remained on farms found that a new land reformation policy reduced land sizes. Farmers in North Wollo zone typically hold less than an hectare (ha) of land. In

² The boundaries below the Wereda level are known as Peasant Associations. Peasant Associations group villages and households together. There are 44 Peasant associations in the Delanta Dawint Wereda.

³ see discussions in the SOS Sahel survey of the neighbouring wereda, Meket

Delanta Dawint 24 percent of farmers owned less than 0.5 ha, and 68 per cent owned between 0.5 and 1.5 ha⁴. Others were forced to resettle outside of their traditional regions, as part of the governments policy to create equity between those who were in surplus producing areas and those in deficit. It was a policy which failed to achieve its aims, partly because the disruption made people even less productive than they were on their original farms. When the drought in 1982-1984 came, this compounded problems of production cause by displacement.

Environmental factors:

Delanta's climate makes it particularly susceptible to drought. It has a moderate sub-humid to semi-arid climate, with average temperatures ranging between 15° and 20° centigrade. The average annual rainfall in Delanta is in the very low to moderate range (DPPC/IGAD maps, 1998). In the years preceding this study, rainfall had been erratic. Reports from the National Meteorological Services Agency (1997) show that the average annual rainfall in Delanta wereda was 844mm in 1997. This was only 7 mm more than the long-term average for the entire Wollo zone between 1961 and 1987 (Webb, von Braun and Yohannes, 1992). However, rainfall in different parts of Delanta varied in relation to the wereda and zone average. The average annual rainfall in the midland areas of Delanta in 1997 was recorded at 668.4 mm, which was below the wereda average, but close to the 4-year average for the midlands (560mm). In the lowlands, the measurement was 953.7mm, which is also consistent with the four-year mean for lowlands (948.35), and higher than the wereda average (Figures 2 and 3). There is a bi-modal ⁵ type of rainfall. Farmers plant during both the early (Belg) and

⁴ Source: Asfaw Tilaye: Assessment of Agricultural Resource in Delanta Dawint, October 1998, Oxfam.

⁵ In the Kola (lowlands) region the Belg occurs between February and May, and the Meher occurs from June through August. The Belg and Meher occur in slightly different months in the mid-lands and highlands.

late (Meher) rainy periods. These rains occur in different months depending on altitude.

Famine has occurred when there has been a drought in either period.

Economic factors:

The fundamental poverty of the region, and of Ethiopia, intensifies socio-political and environmental factors of vulnerability in Delanta. The 1998 UNDP Human Development Report classified Ethiopia as a 'least developed' country, with a ranking that placed it among the bottom five percent of all countries. The Food and Agricultural Organisation estimates that even in exceptionally good agricultural seasons, relief food is required for at least 3.3 million persons. In Delanta Dawint, between 30 and 50 percent of the population required food aid between 1998 and 2000.⁶ Clearly, the livelihoods of a significant proportion of people in Delanta are fragile. It is almost impossible to meet their food needs when there is a serious drought. This study showed the average earnings per year in Delanta at 1717 Birr, the equivalent of 206 US dollars (less than US\$1.00 per day).⁷ Income came mainly from agricultural activities.

These descriptions suggest what makes Delanta a vulnerable area. To shift the focus to the vulnerability of people in Delanta a question was posed: what specifically contributes to making people in Delanta vulnerable? This led to the development of vulnerability profiles.

⁶ The sources of these figures were: DPPC Food Supply prospects for 1998 and Oxfam's *The Impact of Drought on Highland Wollo*, Ethiopia, 2000.

⁷ 1 Birr = .08 pounds sterling and .12 US dollars in year 2001.

Figure 1 *Time-line of Economic, Socio-political and Environmental Events (a composite of several villages)*

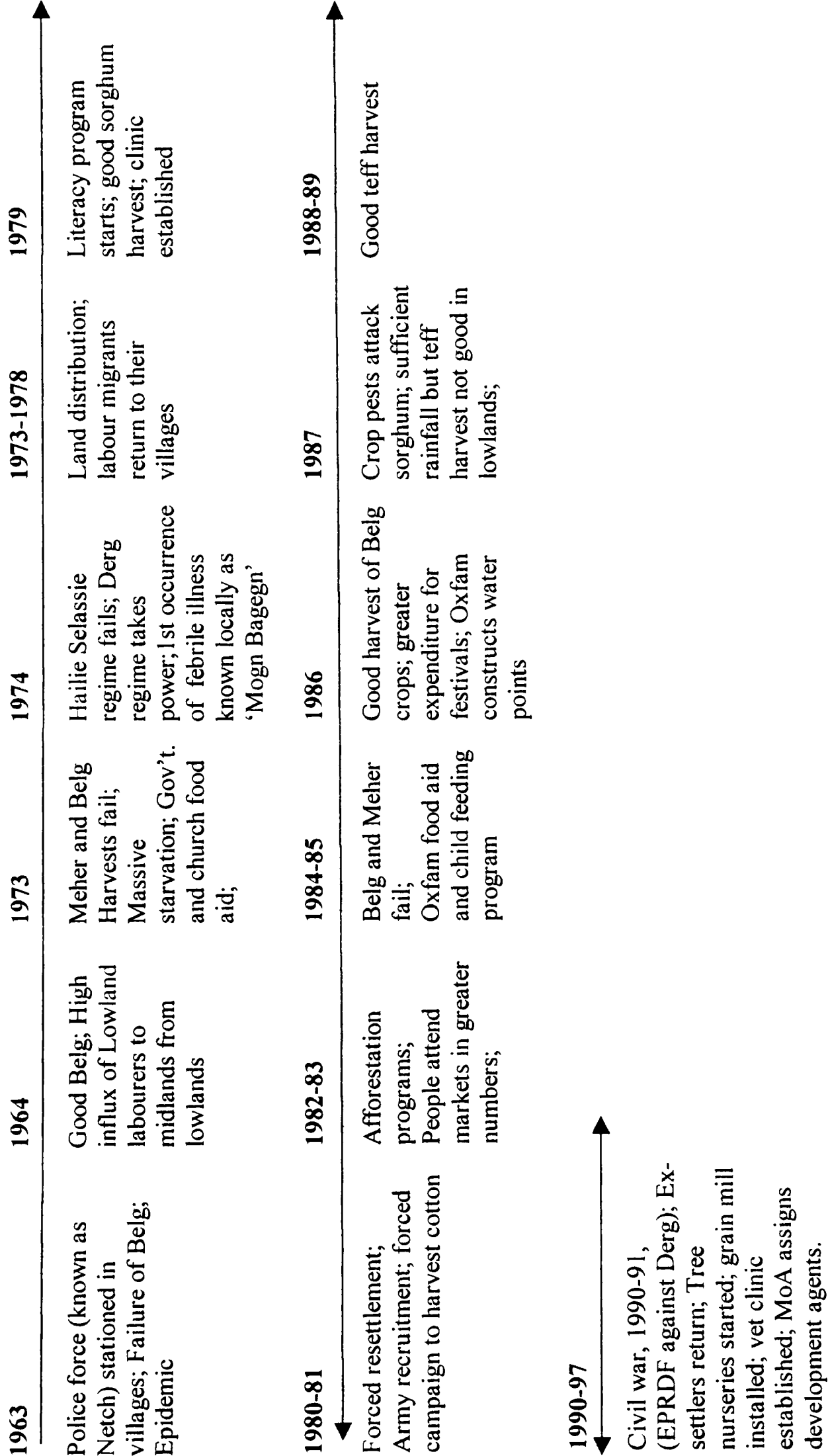


Figure 2 1997 Monthly Rainfall, Delanta-Lowlands

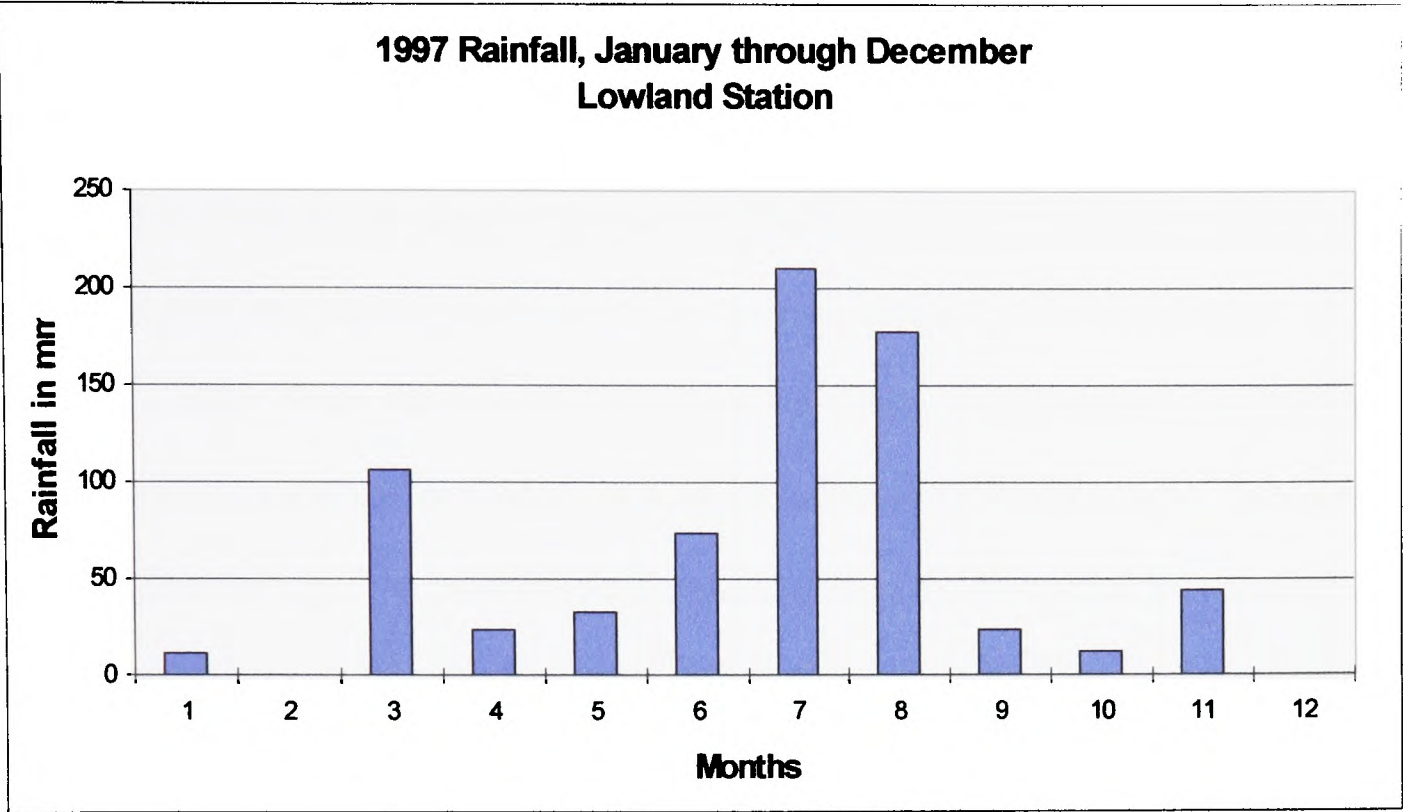
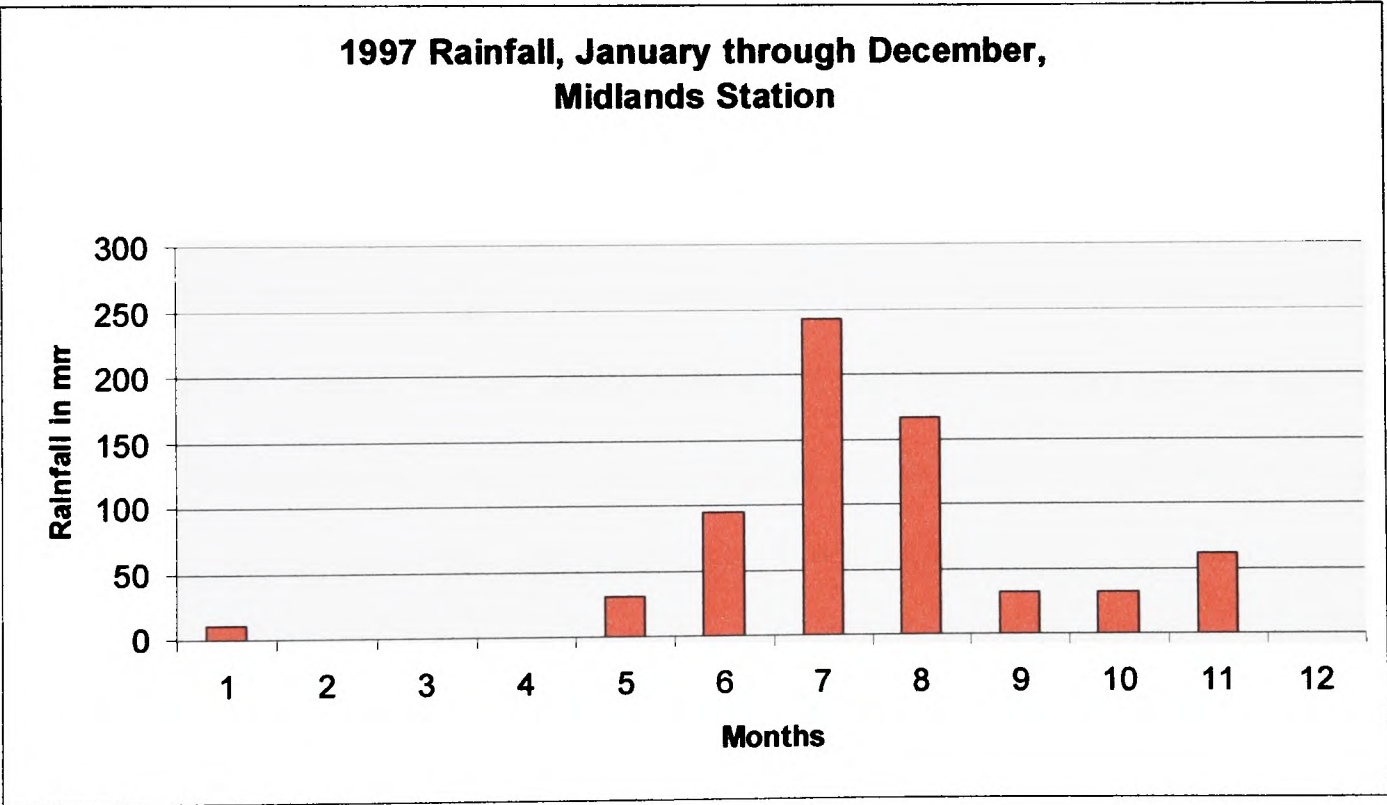


Figure 3 1997 Monthly Rainfall, Delanta-Midlands



2. Who are the vulnerable? People living in ‘an economy of affection’

In the government's food supply prospects report for 1998, households in low productivity areas [Tigray, Amhara, eastern parts of Oromiya and SNNPR] were described as living on the edge of *destitution* (DPPC, 1997:6). Destitute means ‘to be extremely poor and lacking the means to provide for oneself’, also ‘not having’. This suggests a rather linear and biased view of rural societies, which reflects the Smithian (supply side economics) and Malthusian approaches found frequently in Ethiopian policy. Often the aim is to modernize peasant economies and to control the activities of rural populations. A post-modern view would direct the policy maker or analyst to understanding the range of coping strategies and external changes which shape rural life. Certainly the people in Delanta are poor, all of the economic statistics tell us that. But whether they are truly lacking and unable to fend for themselves as the word destitution entails is another matter. Some of the literature on vulnerability to food insecurity in Ethiopian agrarian systems indicates that an important element in rural survival is the *economy of affection*, a complex mix of production activities and social exchange (CARE, 1996:12; Bevan and Pankhurst, 1996). This literature did not use the term in its original sense, which carried negative connotations, suggesting peasant backwardness and a retreat from modernisation.⁸ Following the more positive CARE and Bevan and Pankhurst usage of the term, it is argued here that an economy of affection emphasises the importance of social structures and community institutions in household access to social services and other resources. Therefore, whether rural

⁸ Hyden's (1980) use of Marxist political economy terminology carried a negative tenor in the peasant debate. Whereas marxist analysts had emphasized peasant self-sufficiency, Hyden saw peasant autonomy as a resistance to modernizing the African state. He argued that peasants encased themselves in an Economy of Affection. The term was used to describe a retreat from market forces and economic modernisation. (see discussion in Bryceson et al, 2000:18-19).

people are truly on the edge of destitution as the Ethiopian government suggests, is questionable in the presence of social networks.

To begin exploring who was vulnerable: what were the overall social characteristics of Delanta, and to learn the extent to which an economy of affection mitigated destitution and vulnerability, I used peoples' responses during the PRA survey to describe their traditions and common resources. Data from the household questionnaire and other regional studies were used for comparative analyses.

The importance of village structures, religious and traditional institutions

Villages were observed both in clusters and dispersed widely. The houses were thatched; some in the highlands had stone walls, but most were built from mud and wood. Nuclear and extended families shaped the villages that made up Delanta. They provided a support network in times of need and during celebrations, like weddings and religious feast days. All of the families in the survey belonged to the Amhara ethnic group and spoke Amharic. Amharic is the most common of over eighty languages in Ethiopia. Christian Orthodoxy (40 per cent) and Islam (40 per cent) are the two most widely practised religions in Ethiopia (Oneworld, 1996). In Delanta, 89 per cent of the families were Christian Orthodox and 11 per cent of the families were Muslim (CSA, 1994). Our sample contained 93 per cent Christian families and 7 per cent Muslim, (N=189, Table 23). No other religions were represented and there was no significant variation among PAs (*chi-square test*, $\chi^2=0.000$, $df=6$, $P > 0.05$, see Table 9). The villages were either Christian or Muslim and seldom a mix of the two.

This religious stratification by village, and even within villages, had importance as the survey suggested that peoples' social lives, perceptions and obligations were shaped by the common religion they observed. The social maps they drew showed religious institutions at the centre of life, while most other institutions held equal importance to one to the other. In Christian villages, peoples' working lives were dominated by farm activities and their social lives were occupied by religious observances. People reported around ten religious days per month in the villages we covered, and people did not farm on these days. In Muslim areas, there were four recognised days, two of which were observed on Wednesday and Friday of every week. For Muslims there was also Mewled, celebrated once a year, and Zawaya once a week. Some farmers felt restricted by such holidays, because they felt it distracted them from work from which they earned income. Yet the social obligation was strong enough to keep them participating despite personal objections.

The importance of institutions could be measured by the associated services people described.⁹ The map on page 138, which villagers drew during the PRA survey, is a blueprint of a typical village and illustrates village institutions. Two institutions that were second in importance to religious institutions were the traditional and social organizations known respectively as Sembeté and Kiré. Sembeté is an institution closely related to the church. The root word for Sembeté is Sembet, which means Sabbath. Kiré is seen as a symbol of social integrity.

Today Sembeté is commonly understood as an organisation based on Christian religious beliefs and one that facilitates worship. It is used as a forum for resolving

⁹ Villagers drew their maps and diagrams in the soil, using sticks, leaves, branches and stones of varying size as symbols. Members of the survey team later drew the images on Paper.

conflict and strengthens attachment to the church. Another notable social organisation, Kiré resolves conflicts and enforces conformity to traditional rules through rewards and sanctions. If there is an accusation of adultery or theft, for example, the Kiré committee investigates the case and a likely punishment could include disclosing the culprit's identity to the community. Kiré also organises burial services and mourning practices. They sometimes assist in organising weddings, and will gather members of Kiré and relatives for such occasions.

These institutions helped create solidarity for communities. In some villages, families and persons who did not affiliate with Kiré or Sembeté lost their status and were not allowed to participate in social affairs. People spent between 5 and 15 per cent of their income to support Kiré, Sembeté and the church.¹⁰ In most villages everyone shared equally in the village's institutions. An exception was Kess and Wohaw Mender villages, where Christians and Muslims lived together but used separate Kiré organizations for each religion. This was because Kess, which is Christian and Wohaw, which is Muslim, operate as separate settlements within one village. Apart from Kiré, however, each village shared and interacted equally with the other institutions associate with both settlements.

Other institutions people reported included the PA administration, which established afforestation activities, resolved legal and other conflicts, carried out livestock vaccinations and supervised some Ministry of Agriculture (MoA)¹¹ activities. Mengistawi Buden (MB), a sub-unit of the PA administration and the smallest government administered unit. MB is organised at the village level to facilitate meetings, the MoAs mass mobilisation work (i.e. terracing), Womens', Fathers' and

¹⁰ See Oxfam PRA Survey, Delanta 1998

¹¹ The PA administration also actively engages with other government and non-government offices such as the Ministry of Agriculture, the Ministry of Education and the Ministry of Health and Oxfam.

Youth associations, Clinics, Non-governmental organisations and service co-operatives.

All institutions were mentioned for their importance in supporting social life and livelihood.

The Household

Bevan and Pankhurst (1996) observed that the northern Ethiopian household was more of an economic unit, rather than one based solely on kinship, common property or resources. The people living within the walls of a housing compound may include hired labour and servants, who are not always considered real family members. The interest in household constructs has had meaning for evaluating assets, consumption, caloric intake and nutrition (as in Fafchamps and Quisumbing, 2000; Dercon and Krishnan, 1997). It is evident that food will be consumed and shared differently depending on the role of the household member. However, there was not much evidence of inter-household diversity in Delanta. The average household consisted of five people who were both blood relations and people who were not related by blood or marriage, but the relationships were largely familial. Only four per cent of households contained employees, while 96 per cent consisted of different generations of the same family (N=189).

Map of Tina Village

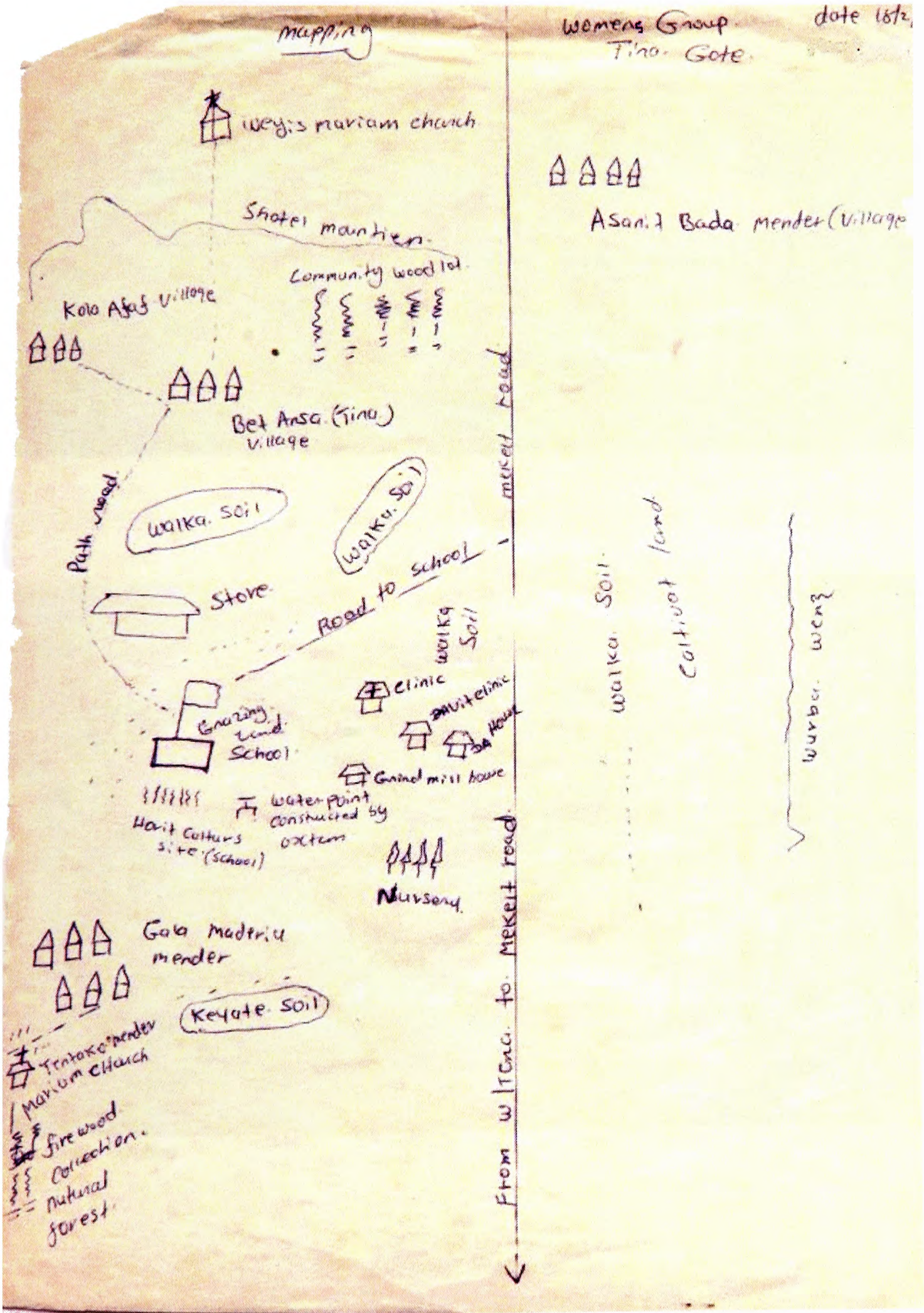




Photo: Linda Stephen

*Lowland villages
Delanta, Ethiopia*

Differences between households

There were notable differences in household size, particularly related to religious composition, but this was not a strong factor in food security. Muslim households were larger than the mean for all households. Muslim households contained an average of six persons. The average Christian household size was the same as the mean, but the largest households (containing nine or more people) were predominantly Christian. Tests of differences between household size and frequency of meals indicated no great variance between households. Nor did religion matter in the number of meals taken during periods of food shortage and household size. Muslim and Christian households averaged the same amount of meals. This initially suggested little variability in how much people consumed in difficult periods. However, further tests of household size in relation to income showed a significant statistical difference between the two variables, particularly between those household sizes that were above the mean and those that were below the mean. The analysis suggests that the larger households had more income (Spearman's $r_s = 0.278$, $N=188$), but also more expenditures (Spearman's $r_s = 0.253$, $N=189$). Sixty-seven households that were below the mean size (five persons) had a lower than average income ($N=189$, Table 1)

Table 1 *Household size and income*

	Household size (number of households)	Income (number of households)
Above Average	122	64
Below Average	67	124
Total	189	188

The general conclusion to be made about the Delanta household based on this study is that it provides a network of support, solidarity and access to resources for all connected to it regardless of blood relationship or family size.

Social services and natural resources

Social and traditional structures in Delanta explain the level of social resources available at all times, and especially when there is a food shortage. Survival in Delanta also depends on access to social services, such as education and health facilities, and natural resources, such as water.

Education

In Delanta, adult level secondary and elementary school programs are available, yet the average person in Delanta is illiterate. Seventy-five percent reported having no formal education (sample size, N=189, details in Section 4, Table 19), and only twenty-eight percent of elementary school age children attended school in 1996 (Ministry of Education, 1997). There was no significant difference in education levels between PAs.

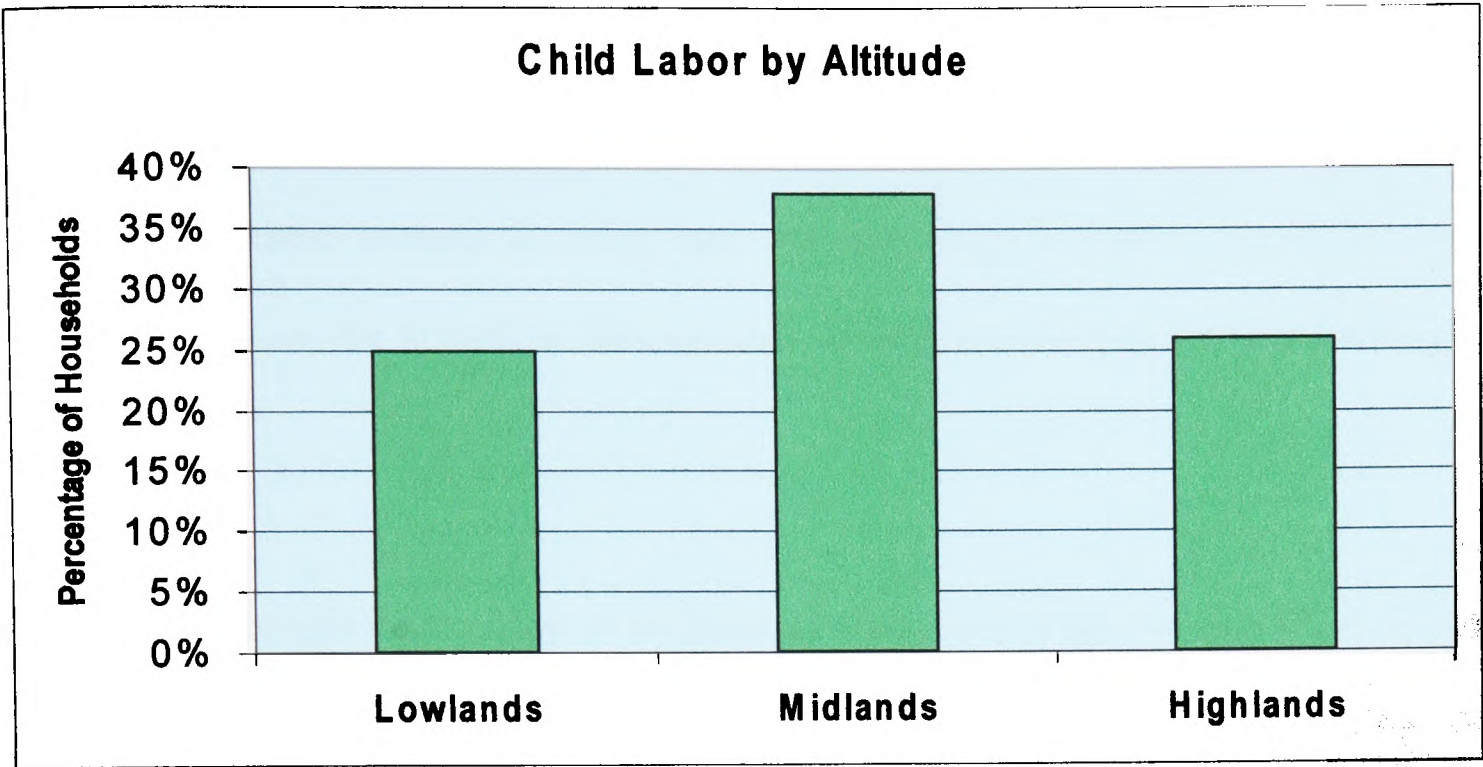
¹² As indicated in education studies in developing countries, formal education is often hindered by many factors. Only 20 per cent of adults throughout Ethiopia can read and write (Oneworld, 1996). Bevan and Pankhurst (1996) observed that some of the constraints on education throughout Ethiopia included a high demand for child and adult labour, distance from schools and costs.

¹² Statistically significant differences in education levels between PAs ($F_{6, 182} = 1.733, P=0.116$).

For people in Delanta education was important. On the time-line exercises conducted for the PRA survey, they thought it necessary to identify the start of literacy programs, and in some villages they noted that they had their own delegates representing them at school management committee meetings. The frequency of attendance varied depending on location. For example, in the highlands one in every six children attended, and in the lowlands, four out of ten households sent their children to school (PRA, 1998). However, the PRA survey showed that the desire to educate children conflicted with the need for child labour on farms. As indicated in Figure 4, the average number of households in each altitude that employed children ranged between 25 per cent and 38 per cent, and 88 per cent of all families employed children. If children did not work during peak work periods, it was almost impossible for households to make ends meet. Some children attended school three months after it officially started in September, because from September to November is the harvest period. Children were needed to protect crops from birds and other animals. In some places, the school closed during peak labour periods. In this way, the community supported child labour.

Gender biases in school attendance have been noted. Some studies suggest that there is a pattern of women marrying younger in the north of Ethiopia than elsewhere (Bevan and Pankhurst, 1996), and this may be linked to a preference for sending boys rather than girls to school. The tradition in Delanta is for girls above the age of ten to marry.

Figure 4 *Child labour by altitude*



Additional constraints to school attendance included long distances to schools, (up to one and one-half hours by foot in one direction), the high financial costs and outbreaks of serious diseases. In one highland PA, enrolled students drop out each year because of the long walking distance. People in the highland village, Millawa, said that the walk between school and village was unbearable during their cold season (September to December). In PA 29, the distance to Wogel Tena¹³ Junior School is three hours, which means that students must seek accommodation in the town. This is not always possible or affordable. The only adult education centre in the wereda is also located in Wogel Tena. For others the cost of educational materials is too high. Schools cannot always afford to supply materials and it is impossible for families to purchase them.

¹³ Wogel Tena is the only town in the Wereda, and serves as the centre for government administration and local commerce.

The threat and rapid spread of diseases in school environments was also mentioned as a deterrent to adult attendance. Women headed households and women with small children in particular were fearful that their children would contract diseases in school. It is customary for these women to bring their children along to adult education classes because there is no one to care for them at home. Health scares prevent them attending at all.

A final but important disincentive to educational attainment is that there are few choices for educated people other than farming because the overall economy is poor (Bevan and Pankhurst, 1993; SCF, 1993).

Health

The correlation between general health and vulnerability to food insecurity has been demonstrated in studies of famine (see Young and Jaspars, 1995). Poor nutritional status is generally the greatest determinant of death during food shortage, and depending on the cause of malnutrition it can serve as a proxy for either wider public health conditions, or food insecurity. A farmer who is sick or undernourished is unlikely to apply all of his energies to his or her livelihood, which reduces productivity and income. This study showed that, in the case of dairy production, the use of any type of health facility was positively correlated to both production and sales (see Table 2).

Table 2 *Correlation between dairy production and health facilities*

	Percentage using health facilities	Aggregate income from Dairy as a percentage of total income per annum (In Birr)	Spearman's Correlation coefficients (Total sample in brackets)
Dairy sellers	56%	11%	.227(188)
Dairy producers ¹⁴	60%	-	.257(188)

Traditional and non-traditional health provision

As in many parts of Ethiopia, most people in Delanta placed a high value on traditional forms of health care (Bevan and Pankhurst, 1996). The primary reason was access. In the early 1990's it was estimated that half the Ethiopian population had no access to health care, and there was an estimated 1 doctor per 33,330 people (Oneworld, 1996). At the time of this survey, Delanta had one health centre that employed doctors and nurse practitioners, eight clinics staffed by nurses and health assistants, and four newly established health posts. In villages where people were asked about health clinics, they said that traditional forms of health care were more important than government-run health clinics. Christian communities preferred the church above medical institutions. People generally approached priests for holy water and prayer for healing first, then traditional healers, and finally health clinics.

In two mid-altitude peasant associations (PAs 03 and 04), which were the only ones in the household survey where people said they preferred traditional healers, the main reasons were cost and accessibility. Women in the Zalam Kab village in PA 03

¹⁴ There was trading between dairy producers and dairy sellers, which accounts for differences in the figures. Not all dairy sellers produce or own livestock. They buy for their own consumption and for selling. And some producers do not sell everything. They also retain for their own consumption.

complained that clinics were for the rich only. They said that if you could afford it, medical treatment and medicines were immediately available. However, for poorer people, there was a lengthy, bureaucratic process for obtaining free medical vouchers. The process involved first going to the wereda administration office in primary town Wogel Tena to get a letter of approval. When they did receive treatment, they claimed that the medicines did not cure them. Clinics and health centres were located between forty-five minutes and one and one quarter (1 1/4) hours walking distance from homes. Even in the lowland villages of PA 29, people reported between thirty minutes to three hours walking distance. Since traditional birth attendants and herbalists were available in the villages, they could continue to receive treatments they had faith in and close to their homes.

Despite these accounts, a large proportion of people made use of non-traditional systems (Figure 5). In 1997, 23,311 (15-16 per cent) received treatment at health centres throughout the wereda (Delanta Ministry of Health, 1998). People specified which non-traditional forms of health services they appreciated, such as the mother and child immunisation program; and assistance during outbreaks, epidemics and other emergencies. They also noted the health education and family planning services. Consequently, although there is a preference for traditional cures, their responses show that non-traditional medicine is also valued.

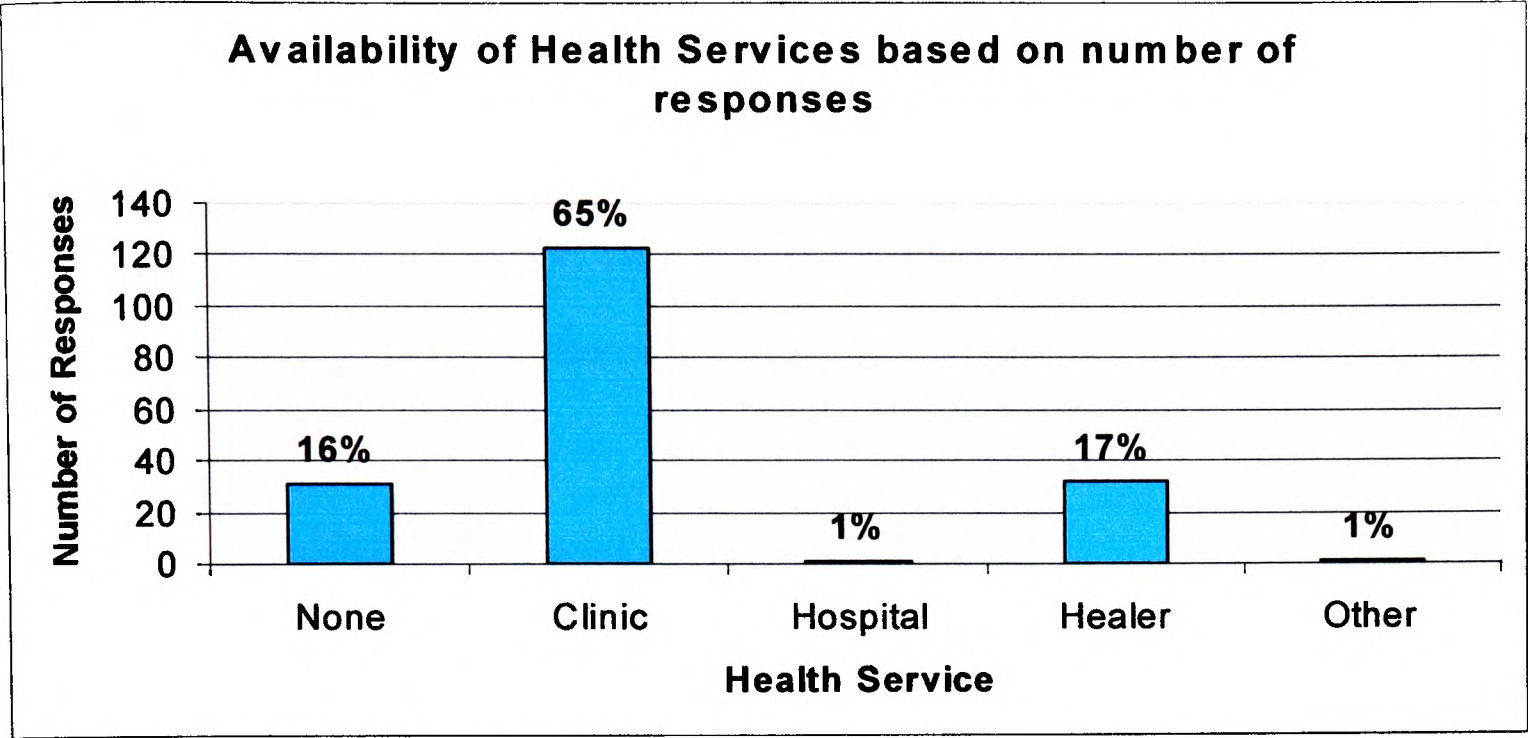


Figure 5 *Health services available*

Diseases and ailments

The illnesses people encountered most frequently can be generally associated with poor access to food and water resources. The diseases and ailments mentioned during the PRA surveys were itching, ‘paralysis’ or ‘limpness’, malaria, typhoid and whooping cough. The itching is associated with scabies or eczema, which are among the top five ailments for which people sought treatment in 1997 (Ministry of Health, 1998). Paralysis and the disease known locally as ‘Mogn Bagegn’¹⁵ have appeared only in the past 10-15 years. The paralysis is known to be associated with eating vetch, a ‘famine food’ crop usually eaten when other crops have failed. Famine foods will be discussed in the following section on assets. Mogn Bagegn is a febrile illness, likely symptomatic of cold or flu. In figure 6, respondents in the household survey ranked the common cold, typhus and scabies amongst the most common diseases and ailments.

¹⁵ Mogn Bagegn has been described as general feeling of weakness and pain throughout the body.

As shown in Table 3, people sought both traditional and non-traditional care to treat illnesses that were perceived to be serious. Sixty percent of the people who were affected by scabies, which has a very visible severity, used traditional treatments. The 71 per cent, who suffered from diarrhoea, used a clinic or hospital. But the greatest proportions of respondents were treated at a clinic or hospital for each illness except headaches.

Figure 6 *Common diseases and ailments*

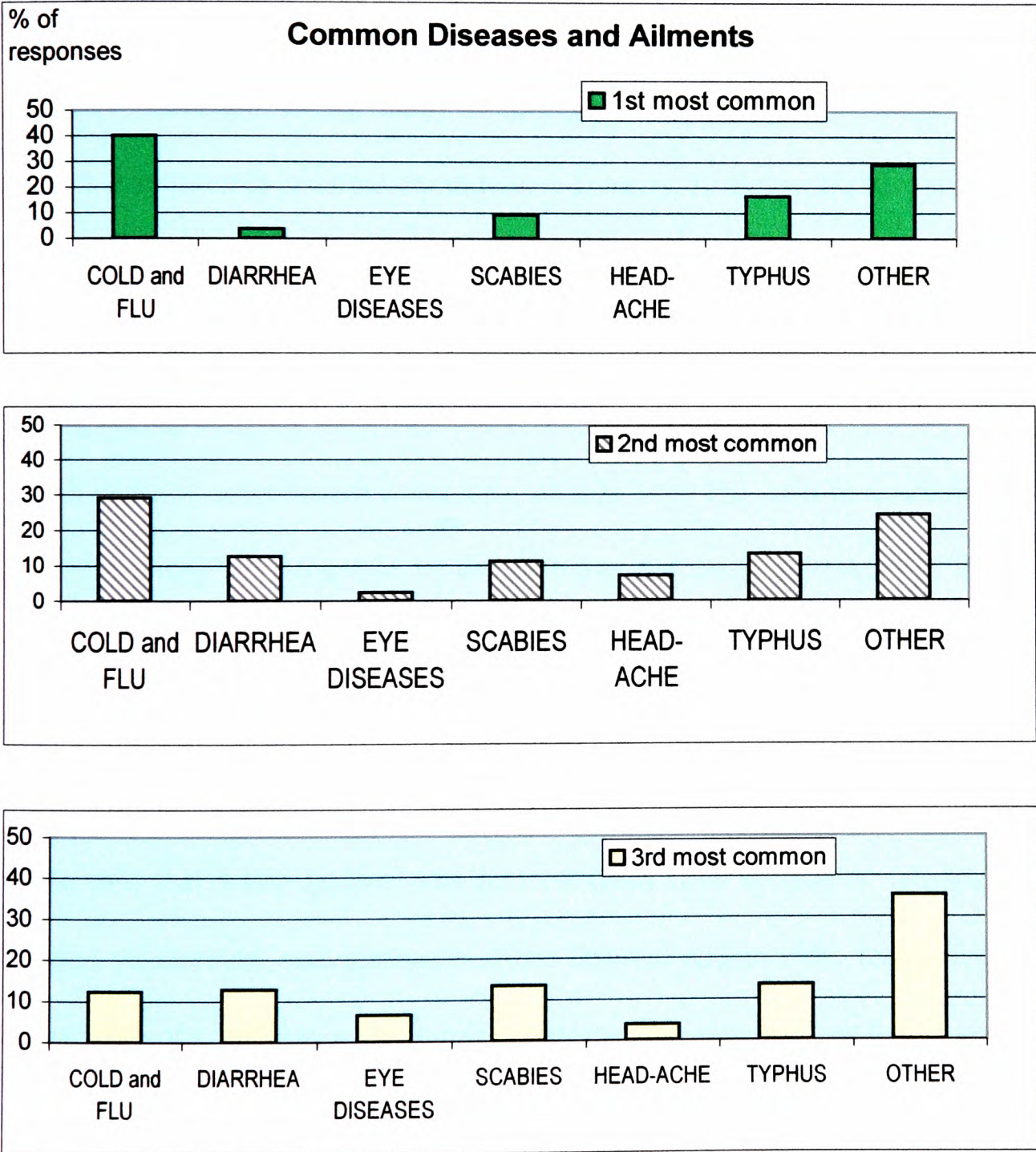


Table 3 *Ailments and access to health facilities (% of respondents per illness)*

1 st most common Diseases or Ailments	No facility	Non-traditional (clinic, hospital)	Traditional (healer, church, other)
Cold and Flu	28	57	15
Diarrhoea	29	71	0
Scabies	6	35	60
Head-ache	50	50	0
Typhus	0	73	27
Other	13	81	4

Water Resources

A crucial challenge facing many communities in Ethiopia is water scarcity. Water supports ecosystems, livelihoods and food security. In the northern highlands of Ethiopia, many communities suffer water stress on a seasonal and annual basis, mainly a lack of availability and access (Calow et al, 2000). Villagers in Delanta collected most of their water from springs and used the water for household and agricultural purposes. Social conflict did not accompany water use, as has been the case in countries of the Middle East. This could be attributed to the fact that the water resources in Delanta are inter-communal rather than inter-national. Rather, the major constraints identified in Delanta were water quality and distance.

People said that water quality was poorest from June to August (during the main rainy period), when rivers and springs became flooded and muddy. Ironically, this is also the period when the volume of water is greatest. The distance needed to get to the nearest spring presented another limitation. Women and children were responsible for carrying water, which was reported to be one of the more time consuming and labour intensive

tasks. At the time of this study, the international non-governmental organisation, Oxfam, had developed 45 water points, which opened access for 13,300 people (Oxfam GB, 1997). The water installations included pipelines and wells, which were constructed to protect the springs. All of the PAs in the PRA survey had access to water points restructured by Oxfam. Still, there was an interest and a genuine need to expand the same development to other areas (Oxfam GB, 1998). A villager has been appointed to supervise these points, mainly to ensure that systems are maintained, but also to manage their use.

An issue that still needs exploring is ‘water marketing’. In a few places, it has been observed that people sold their labour to collect water on behalf of others. The extent of this practice is yet unknown, but evidently water has an economic price related to the prevailing wage labour rates.

Conclusions

The people of Delanta are culturally rich and steeped in tradition. Often, their cultural activities and traditional institutions mitigate absolute destitution. Social structures and institutions provide access to food, resources and services. The non-governmental organisation (NGO) CARE has labelled traditional social systems in Ethiopia as economies of affection (1996). This ‘denotes a network of support, communications and interactions among structurally defined groups that are connected by blood, kin and community or other affinities’.

Reliance on social networks may be fostered by the fact that all of the people in Delanta belong to the Amhara ethnic group. They therefore share similar traditional institutions and practices, although they are both Christian and Muslim. Muslim household sizes were larger than the mean for Delanta, containing an average of six persons but showed no differences in income or consumption habits during food shortage from Christian households. The average household consisted of five people who were both blood relations and people who were not related by blood or marriage, but the relationships were largely familial. There was a significant statistical difference between household size and income, particularly between those household sizes that were above the mean and those that were below the mean, but this did not depend on religion.

The people in Delanta are largely illiterate, but educational achievement was constrained by logistic, economic and health factors. Access to school in Delanta is not limited entirely by a lack of peoples' will to attend. The main problems are that there are too few schools and not enough government resources to invest in it. A poor national economy and insufficient diversity in income generating activities are the most critical determinants of their vulnerability. The lack of services and distance to existing facilities were also important in relation to health care. Distance was mentioned several times as a constraint affecting most people. SCF (1993) did a regional study showing distances of up to three hours for access to health facilities in Delanta. Many of the better health facilities are located in the central town, which means that people living within the town or in neighbouring peasant associations had better access than those in remote areas. But

families were able to rely on traditional health provision, fostered by cultural and religious attitudes endemic to Delanta and Ethiopia. The people of Delanta placed a high value on traditional forms of health care, primarily because non-traditional care was less physically accessible. Traditional attitudes also fostered family support, particularly among women, in carrying and accessing water.

3. What People Owned: Differences in Assets, Access and Availability

1998- 'the belg season was not as favourable as was hoped, and subsequent assessments revealed that an additional 17,000 MT of relief food would be required to cover the extra need which emanated from the poor Belg harvest in Tigray, Amhara and Oromiya regions'. (speech of the DPPC Commissioner, 1999)

1998- There was an early withdrawal of the rains in pockets when the crops were at the flowering and fruit setting stages. Significant pest infestation on sorghum and pulses was reported. These problems caused substantial yield reductions in Gubalafto, Delanta, Gidan, Bugna and Habru in North Wello.

(DPPC, 1999:18)

Government reports covering the period of the field study predicted that the failure of the Belg rains would cause distress for farmers throughout the Amhara Region. Again, generalisations were made about specific regions, this time substantiated by meteorological data. These statements were also said to be supported by discussions with farm representatives at wereda level during crop assessments. In this section of the chapter, survey responses are used to further describe peoples' livelihoods and support mechanisms given the government's regional outlook. An analysis of people's responses helped to identify the differences in household 'wealth' which would determine the assets farmers had available; access to food through livelihood strategies; and the availability of foods through weekly trading markets and systems. Two of the most important assets families in Delanta had were land and labour. An analysis of the distribution and quality of land, labour and livelihood activities is presented. This is followed by a discussion of trading arrangements and consumption patterns, with special reference to changes signalling a constraint in access to food during the period of the field study. A final section reviews asset holdings and differences between families as defined by 'wealth' groups and sources of income. A family's wealth and income sources are important for the mitigation of food insecurity.

Land

The Wereda is characterised by rugged topography and mountain features dominated by highly eroded and fragmented agricultural rock. From the farmer's point of view, land and poverty were woven together in the understanding of production methods. This was demonstrated in a statistical correlation analysis which showed a positive relationship between land and food security.

A significant impact on food security was soil fertility. In the PRA survey people said that there had been important environmental degradation affecting the quality and productive capacity of soils. There were gullies and other signs of damage from run-off. The area was sparsely covered with trees especially on mountain slopes. Much of the tree cover was described as being recent plantation. Farmers in PA29 (lowlands) reported significant tree loss starting during and continuing after the famine years from 1984-85. This is when people started cutting and selling trees for firewood as a coping mechanism.

Land allocation and land size

This analysis of land focussed on the extent to which land size and quality were production constraints for families in the study area, and how these constraints differed from one family or region to the next.

Among farmers there seemed to be a sense that apart from tax increases conditions regarding land tenure had improved since the previous regime. Systems of land tenure changed several times during the previous 20 years, due to changing policies from three administratively distinct national governments. Overall, however, farmers said there had been an increasing shortage of land. Some villagers reported that in 1993 the

transitional government redistributed land equally to the farmers. Under that reallocation plan, families that had returned after forced resettlement in the 1980s and ex-soldiers were included. The local government administered land based on family size and soil type. An example of the allocation system is presented in Annex 1. Land size per PA in the sampled area averaged 4.7 timads¹ (N=186 farms sampled) and this differed significantly between PAs. Spearman's Correlation tests indicate that land size had a positive effect on income; as income increased, land size increased ($r_s=0.153$, $n=185$). There was an even stronger correlation between land size and income from crop production ($r_s= 0.319$, $n=166$). This suggests that the size of land allocated indirectly had an effect on production and income.

Soil Quality and Type

In addition to land size as a factor affecting productivity, the type of soil also determined productive output. The variety and types of crops grown depended on the type and quality of soils. Soil type was a criterion upon which land was distributed in the Wereda which suggests differences in soil qualities depending on type. The soils were locally described as 'red', 'brown', 'grey', and 'black'. Black soil was the most abundant in the plateau areas of the Wereda². Figure 7 shows that most people held a mixed soil (45 per cent of farms, N=185 farms), and few farms (9 per cent) contained 'red' soils, which was said to contain many nutrients and are common throughout Wollo. Soil quality was perceived to have fallen dramatically in living memory, however there were no extensive analyses specifically on Delanta soils to confirm whether this was true or not. Drawing from studies of soil quality conducted throughout Africa and Ethiopia, comparisons were made between the properties of known soils in

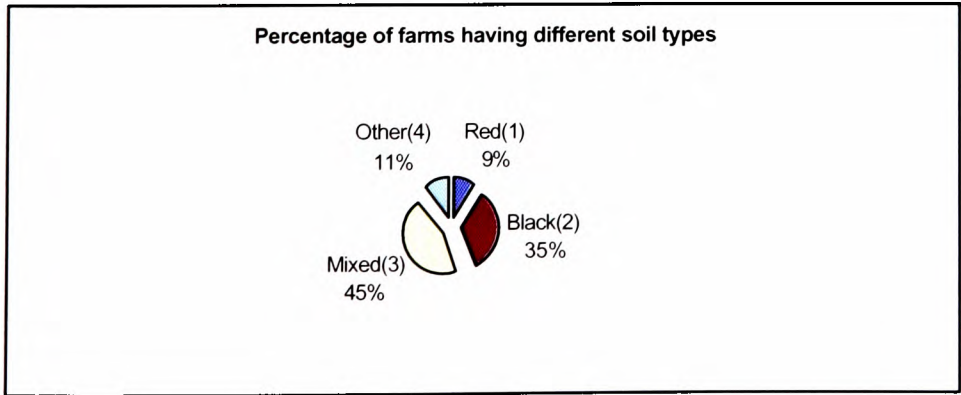
¹ A timad is a local measurement. 1 timad $\approx$ between 1000 and 1250 square meters. The differences in land size were statistically tested (ANOVA, $F_{6,182}=10.291$, $P=0.0001$).

² Mezmur, Kassaye (1997) 'Current Forest Resource Management Practices, Problems and Future Opportunities in Delanta Dawunt'. Oxfam UK/I, Addis Ababa, Ethiopia.

the North Wollo region and the rough descriptions farmers gave (see Annex for comparisons). Thus, some preliminary conclusions about the potential and availability of high quality soils in the study area could be drawn

Judging from the descriptions, the red soils may be ferric and chromic Cambisols or ferric Luvisols. Thirty-five percent of the soils in the Wollo zone of Ethiopia are Cambisols and 4 percent are Luvisols. Chromic Cambisols have a characteristically red hue. The black soils can be classified as nitosols and Vertisols. Nitosols make up only four per cent of the total soil coverage in Wollo, while Vertisols account for 10 per cent and are the second greatest proportion, next to Cambisols. Vertisols are considered a high quality soil for agricultural production (Virmani, 1988). Both nitosols and Vertisols have a significant clay content. Fluvisols best describe the sandy soils generally deposited when there are floods. Flooding occurs every year during the deluge of the Kremp¹ season. In that season the primary bridge in Delanta and the main rivers are made impassable. Given the chronic flooding in the area, it is not difficult to reason that there is a significant proportion of Fluvisols. Indeed, Fluvisols make up seven per cent of all soils in Wollo. Scientific and local definitions of soils and there percentages in the Wollo zone are presented in the Annex.

Figure 7 *Percentage of farms having different types of soils*



¹ Kremp¹ is another name for the heavy Meher rains that occur from June to August.

Vertisols

Much has been written about the potential of Vertisols for agricultural production in Africa and Ethiopia which is relevant to understanding the vulnerability of farmers and land in Delanta. Vertisols are heavy soils with more than 35 percent clay, are generally deep, dark in colour and can hold considerable amounts of water (200-300 mm) in the soil profile. They are geographically widespread, but only received scientific attention since the 1960s. It is estimated that there are at least 280 million ha of these clays in the world. Finck and Venkateswarlu (1982) write that Vertisols have an enormous yield potential and represent a vast crop production resource. Vertisols and vertic soils are potentially a highly productive group of African soils, if properly managed and depending on many other factors including agro-climatology and the individual properties of the soil.

It is estimated that out of a total of 43 million hectares of tropical Vertisols and associated soils in Africa, some 34 million hectares are located in the dry and dry/wet semi-arid climates. In agro-climatological terms, the climate in Delanta is a cross between the dry and dry/wet semi-arid. Vertisols occupy more than 10 percent of the soils in all administrative zones of Ethiopia. Vertisols in Ethiopia generally contain more than 40 per cent clay in the surface horizons and close to 75 percent in the middle part of the profiles. The sand fraction is low, often less than 20 per cent, and is found in the bottom and the surface (plough layer) horizons. Average yields on these soils are: 500-800 kg ha for cereals, 500-700 kg ha for highland pulses and 300 kg ha for oil crops (Asnakew Woldeab, 1988). If the average family size is five persons and the nationally estimated cereal requirement per person/per month is 15 kg, then the average family in Delanta would require a minimum of 75 kg per month. Therefore, assuming

that the average yield in Black soil is 600 kg/ per hectare, then average family in Delanta with the average allotment of 1 hectare would be able to meet their monthly cereal needs if as little as 15 per cent of their land is used to cultivate cereal in black soil.

The main reasons for low agricultural production on Vertisols, however, are variability of rainfall, poor management of on-farm water resources, inadequate conservation of soil-water in the rainy season and the adoption of low-input, low-risk technologies (Wagnew Ayalneh, Haile Regassa, A.K.S. Huda and S.M. Virmani, 1988). The physical characteristics of Vertisols, coupled with the limited resources of small farmers, limit crop production on these soils. Deep and wide cracking in dry Vertisols reduces moisture at the beginning of the growing period, and provides too much at later stages. In addition, the unique mineralogy of Vertisols makes these soils very susceptible to erosion (E. de Pauw, 1988; H. Eswaran and T. Cook, 1988).

Nevertheless, the high water-storage capacity of Vertisols is important in regions with uncertain rainfall. Improved Vertisols management systems have been adapted to the Ethiopian highlands (Jutzi and Mesfin Abebe, 1986). The growing season on deep Vertisols is usually longer than on other soils. On the highland Vertisols of Ethiopia, wheat, lentil, chickpea and vetch grow to maturity entirely on residual soil moisture after establishment at the end of the rainy season. Farmers practice late-season planting to avoid the serious drainage problems characteristic of these soils during the rainy season.

Given the potential and constraints associated with Vertisols several recommendations have been considered by the ministry of agriculture: identify and characterise Vertisols;

analyse tillage and land configuration, specifically surface drainage and seedbed preparation; manage water resources and use through studying rainfall patterns, probability studies and water harvesting from catchments; and design and develop soil conservation structures and practices.

Soil preferences

An indication of the farmers’ preferences for different soils is the relationship between soil type and the profitability of certain crops (Table 4). This relationship may be connected both to the potential of different soils to produce better crops and to the farmer’s desire to plant his best selling crops in his best soil. The red and black soils seem to be preferred. Four out of the seven (60 percent) crops planted in Keyate soil were also considered the most profitable, three out of the six (50 percent) of those planted in Walka and Setae were most profitable. These soils were also used to plant most, in some cases all, of the crops, while the other remaining soils, asherhonaie and necha, were only used for planting a maximum of one or two crops.

Table 4 *Soil type, crops planted, and profitability*

SOIL TYPE	CROPS PLANTED	TOP PRICES and MOST PROFITABLE ⁴
Keyate (red)	Field pea, wheat, flax, barley, lentils, sorghum, ‘nacho’ teff	Wheat Barley Lentils Teff
Walka (black)	Faba bean, wheat, barley, fenugreek, grass pea, teff	Wheat Barley Teff
Setae (also red)	Wheat, fenugreek, lentils, grass pea, teff, chickpea	Wheat Lentils Teff
Necha	‘Burka’ teff	Teff
Asherhonaie	‘Burka’ teff, lentils	Teff Lentils

⁴ Profitability was determined by the question, ‘which crops do you think are most profitable’? See the sample questionnaire in the Annex of Chapter 3.

Link between Soil Type and Income (chi-square test)

A chi-square test showed a significant relationship between soil-type and income, confirming the farmer’s preference for black soils. Forty-nine percent of the people who had an above average income were using the black soils, while only 27 per cent of those with below average incomes were using them (Table 5).

Table 5 *Income and soil type*

Income	Soil Type								Total
	1(red)		2(black)		3(mixed)		4(other)		
	count	(%)	count	(%)	count	(%)	count	(%)	
below avg.	14	12%	33	27%	60	50%	14	12%	121
above avg.	3	5%	31	49%	23	37%	6	10%	63
Total count	17		64		83		20		184
Total %	9.20%		34.80%		45.10%		10.90%		100.00%

Labour

A key asset for subsistence farmers is labour. The average number of adult males actively labouring on farms in Delanta was four per household (N=178), and this differed significantly across PAs (Table 6). Female labour averaged five persons per household (N=186), and also varied significantly across PAs.⁵ The importance of male labour was supported by correlation analyses which showed that income and expenditures were both positively correlated to male labour (Spearman’s r_s =0.354, N=188 and r_s =0.202, N=189), while there was no correlation between income or expenditures and female labour.

⁵ Statistically significant differences in adult male labour by PA ($F_{6,171}$ = 7.579, P =0.0001) and female labour ($F_{6,179}$ =2.160, P =0.049). Figures in Table 18, next section.

Table 6 *Labour by altitude and PA (in Birr)*
 Notation: average ± standard error (sample size)

VARIABLE	PA11	PA29	PA 3	PA4	PA 13	PA32	PA39
	Lowlands	Lowlands	Mid-lands	Mid-lands	Mid-lands	High-lands	High-lands
Labour (male adult)	7.4±1.19 (21)	4.0±.27 (31)	2.9±.39 (23)	3.6±.28 (32)	3.6±.50 (22)	3.7±.49 (30)	3.2±.20 (23)
Labour (female adult)	5.4±.58 (22)	5.4±.43 (30)	4.4±.31 (27)	4.8±.23 (32)	4.8±.49 (22)	4.1±.35 (30)	4.0±.24 (23)
Labour (child)	4.7±3.6 (19)	3.0±.44 (29)	9.0±2.6 (27)	1.8±.19 (25)	4.8±.55 (19)	4.3± .5 (24)	3.6±.33 (24)

Gender differences in labour activities

The PRA survey showed the following differences between male, female and children's activities. Children generally tended livestock and protected crops from birds and *zinjero* (baboons). They also participated in ‘adult’ labour activities as needed, with boys being with fathers in the field and girls fetching water and collecting firewood with their mothers. Women’s work tended to be more diversified and involved two strenuous activities: fetching water and grinding. The women in Kiltu said that they slept only 6 hours per night, worked the remaining 18 hours, with the most labour-intensive part of the day being early mornings and evenings. This was when they were engaged in activities at home. Men in all the PAs reported about 10 hours in the field daily (Ploughing, tending livestock, etc.). During peak periods (June, July and September), when there is ploughing and general land preparation, this could be as much as 15 hours per day. The most labour-intensive months were June through September.

The following figures show the gender division and intensity of labour. The women appeared to shoulder a greater responsibility for the overall administration of the farm



Photo: Linda Stephen, 1998

*Children tending sheep in eroded fields
Delanta Highlands, Ethiopia*



Photo: Linda Stephen, 1998

*Grinding teff: A young mother at work
Delanta, Ethiopia*

Livelihood activities

Recent literature on peasant economies shows that diversification of investment and income earning activities is a strategy used by all classes of peasantry to enhance livelihood activities. Increasingly, transport and trade investments are favoured over production (Bryceson, et al 2000: 64-79). Accelerated growth in the non-farm portions of peasant incomes occurred during the height of the structural adjustment period in the 1980s. This was a form of risk management. By engaging in a range of farm and non-farm economic activities, rural households increased their earning capacities and provided an economic safety net (p54). Thus indirectly, structural adjustment contributed to processes of rural income diversification and rural economic differentiation. Income and investment diversification are now a salient feature of rural peasant life. Delanta is no exception.

As presented in Table 7, there were a number of different sources of income for families in Delanta. External income sources of income, such as credit and loan schemes, brought the highest revenues. These programs were mainly managed by international NGOs. External assistance, including food aid, was also an important income source in terms of monetary value and served as a coping strategy. Among internal sources of income, the largest gains were made from traditional farm activities (livestock and crop production) and trade.

Table 7 Sources of income

Source	Income generated (average in Birr) ⁶
Crop sales	140.60
Livestock products	106.11
Livestock	315.14
Petty production	93.03
Trade	177.77
Waged farm labour	119.23
Waged non-farm labour	154.92
Renting oxen & pack animals	56.46
Remittances & cash donations	208.29
Cash loan	246.53
Credit	232.54
Other	460.79
Total	3576

Crop farming

Crop production was the major economic activity in the study area. Eighty-six percent of the population were engaged in it and it contributed to 74 per cent of total income (N=169). As indicated in Table 8, the cereals and vegetables that commanded the highest prices were lentils, teff (a type of millet), oats, wheat and onions. Respondents considered the most profitable to be wheat, barley, teff and lentils. Profitability was judged more in terms of how much the local diet depended on these items, rather than their actual value.

In Delanta, cultivation occurs around the two rainy seasons, Belg and Meher. Different crops are grown within each season and this varies depending on altitude. Farmers in highland villages, for example, use the shorter rainy period of the Belg to plant barley, wheat and oats. During the Meher, only beans are sown. The women of this region reported that if rain started early in January, they began to sow lentils, which is normally a Meher crop. If rain started late in March, which is the normal seasonal time in the highlands, then they were likely to reap a harvest in July. Women living in the

⁶ Figures represent average annual income for year of survey.

highland village of Tina Mender created a typical cropping schedule that is shown in Table 9a. The planting schedule developed by lowland farmers in Kiltu village followed the two rainy seasons, as it did in the highlands. The differences were that lowland farmers started their calendar from the beginning of the Belg in March rather than the beginning of the harvest in September (in Table 9b).

Livestock farming

Next to crop production, livestock farming is the second most important activity and source of income in the Wereda. At the time of this study, 62 per cent of the people reared them (N=179). Most of these people also were involved in crop production. Apart from selling animals, butter, eggs, meat, milk, wool and hide were normally produced and traded. During the period of the survey, there were some price fluctuations indicated by the prices of meat, milk and hide, which were commanding a much higher price than optimum. In contrast, butter, eggs and wool were traded for less than expected in a good year (in Table 10).

Table 8 *Comparison of yields of major crops (responses from HH survey)*

Crop Type	4 Most profitable (% of responses)	Growing Season (1=Belg)	Growing Season (2=Meher)	Price at which sold (Birr average)	% share of total	Number of Markets where traded
Wheat	15%	1	2	311	6%	7
Barley	17%	1	2	230	5%	7
Teff	31%	1		327	7%	5
Maize				197	4%	2
Sorghum		1	2	250	5%	5
Lentils	26%	1	2	397	8%	10
Beans		1	2	275	6%	5
Chick peas		1	2	284	6%	4
Field Peas		1	2	293	6%	5
Oats		1	2	325	7%	7
Vetch		1		214	4%	6
Potato				150	3%	1
Tomatoes				300	6%	1
Onions		1	2	303	6%	2
Banana				15	0%	1
Green Pepper		1		175	4%	2

Table 9a *Crop calendar, Tina Mender village*

	MEHER		BELG		
	Bean	Lentil	Oat	Wheat	Barley
September	Growing	Ploughing	Ploughing	Ploughing	Ploughing
October	Grain Filling				
November	Maturation	Threshing	Threshing	Threshing	Threshing
December	Harvesting/Threshing				
January					
February					
March		Ploughing/Sowing	Ploughing/Sowing	Ploughing/Sowing	Ploughing/Sowing
April		Germination	Germination	Germination	Germination
May		Growing	Growing	Growing	Growing
June		Grain Filling	Grain Filling	Grain Filling	Grain Filling
July	Ploughing/Sowing	Harvesting	Harvesting	Harvesting	Harvesting
August	Germination				

Table 9b *Crop calendar, Kiltu village*

	MEHER				BELG	
	BARLEY	CHICK PEAS	PEAS	BEANS	SORGHUM	TEFF
March					Sowing	Ploughing
April					Cultivation	Ploughing
May					Cultivation	
June					Growing	
July	Sowing		Sowing	Sowing	Growing	Sowing/Ploughing
August	Growing		Growing	Weeding	Weeding	Weeding
September	Growing	Sowing	Growing	Growing	Grain Filling	Weeding
October	Maturity	Growing	Maturity	Harvesting		Growing
November	Harvesting	Growing	Threshing	Threshing	Harvesting	Harvesting
December	Threshing	Growing			Harvesting	Transported
January		Harvesting			Threshing	Threshing
February						

Table 10 *Livestock products and prices*

Product	Price (Per 1 local unit of measure)	% Difference from prices in a 'good year'
Butter	16.50	-15%
Eggs	0.23	-19%
Meat	19.52	+73%
Milk	1.25	+8%
Wool	2.75	-10%
Hide	19.72	+58%
Total	59.98	

Although agriculture was the main productive activity, crop sales and livestock/livestock production were only three sources among twelve income sources that people listed. The average sale from livestock products, such as butter or milk, earned a family 106.11 Birr (N=102). Income from selling livestock averaged 315.14 Birr (N=81). Earnings from livestock were significantly higher in PA 39, which is in the highlands and where livestock farming is the main livelihood.



Photo: Linda Stephen, 1998

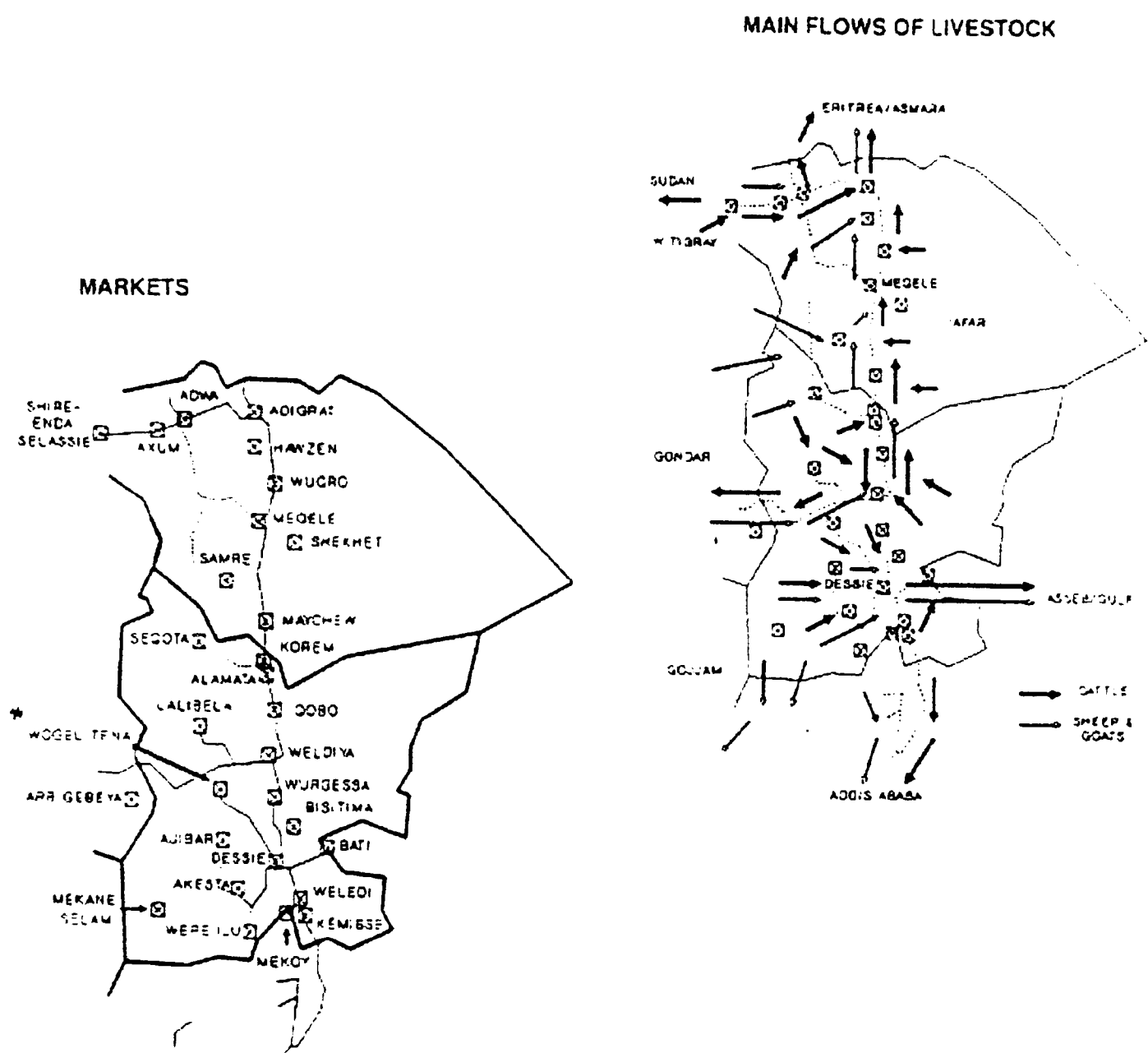
Going to Market, North Woll,o Ethiopia

Access to weekly trade and local market places

An ingredient for the success of productive activities was access to local market places where rural people held weekly commodity exchanges. These markets facilitated cereal, pulse and livestock movements, and income through crop and livestock sales. What role did markets play in Delanta?

Each community in the study prioritised markets according to use. The most common markets are presented in Table 11. Judging from villagers' comments and from observation, the longest walking distances to major markets could range from 1 to 4 hours. Yet, distance did not appear to be a factor for preference; rather, people considered prices and items available to be the most important criteria. Most market transactions in Wollo region have been described as intense rural-to-rural transactions stretching far beyond the locality of the given market (SCF, 1993). In Delanta, most trading was conducted within the wereda, but occasionally a more distant market, like Zeha in South Wollo, was mentioned. The most frequented market was Teritera located in the centre of the main wereda town, Wogel Tina. It served 41 per cent of the respondents. The seeming 'sufficiency' of Delanta markets may be explained by the fact that the Teritera market and the entire wereda sit at the centre of several regional grain and livestock trading routes. The SCF (1993) study demonstrated that Teretera hosted traders from Gondar (west), Dessie and Gojjam (south), and Weldya (north). Livestock routes were shown to originate as far north as Mekele in the Tigray region and from Eritrea. (Maps on following pages)

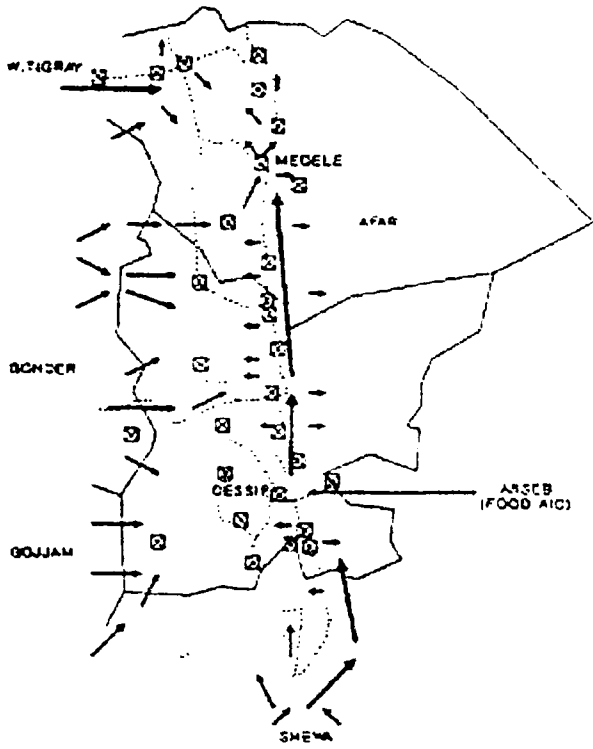
Regional Markets and Trade Routes (Amhara and Tigray regions)



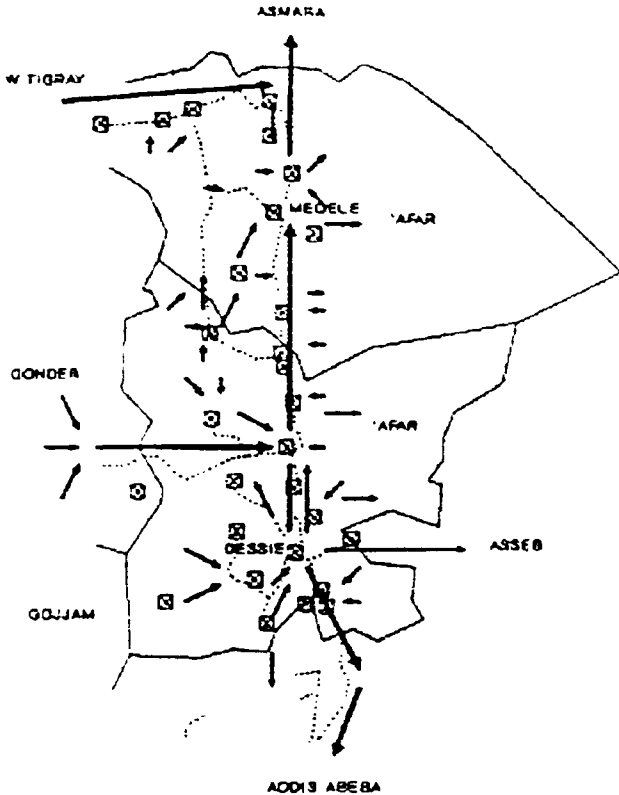
Source: Holt and Lawrence (1993)

* Wogel Tena is the central town in Delanta

GRAIN FLOWS INTO AREA



GRAIN FLOWS THROUGH & OUT OF AREA



Source: Holt and Lawrence (1993)

Table 11 *Common markets, location and utility*

Market	Location	Use and Value
Teritera	Located in Wogel Tena, the central town of Delanta - 3 to 4 hours distance for some,	• First preference for all types of products and trade.
Terefe	Located in the highlands	• Petty trading • Livestock trade • Highland farmers said it was a good market for sheep, oxen, onions and butter
Janos	Located in the highlands - frequented by people in the highlands	• Closest market for highland dwellers
Hamusit ⁷	Mid-Highlands	• Second preference to the Wogel Tena market (Teritera) for people living in the middle and highlands.
Zeha,	Located in Ambasel Wereda, South Wollo	• Prices for mules, donkeys, hide and skins are better than in the Teritera market.

Gender differences in trading

There were gender differences in trading patterns. It was the women’s responsibility to buy and sell household items, poultry and livestock products. The items women sold are shown in Table 12a. The men attended the more distant markets, while women mainly traded in markets close to the village. People in the lowland villages said that women, who use a barter system, did most of the trading. The men in all the surveyed areas suggested that women barter because of need rather than for profit. This comment explained the things women generally traded, which were mainly household items.

⁷ Two separate markets carry the name Hamusit. They are in the highlands and the midlands.

Table 12a *Household items and farm products traded by women*

Item	Sale Price (average)
Fire wood	49.36
Cow dung	14.25
Pottery	3.70
Weaving	0
Beverage	3.53
Hand-crafts	25.33
Carpet weaving	54.63
Other	27.69
TOTAL	178.49
Livestock products	23.83

Table 12b *Trading done by men*

Item	Sale Price (average)
Crops	486.6
Livestock	315.14
Other	177.77
TOTAL	541.57

The effect of food shortages on Delanta trade activities

The price fluctuations during the period of this study revealed a pattern of yearly food insecurity. In early 1997, there was little evidence of an impending food problem. Between 1996 and 1997 local market prices for grain and produce did not differ much. In contrast, there was a noticeable drop in oxen and cow prices, which suggests there was a degree of distress selling in response to poor crop performance later in 1997. By the time of this study in March 1998, farmers certainly reported higher grain prices (Figures 9),

which was further evidence of a problem. Given the poor harvest of 1997, the higher prices could be explained as an indication of greater demand. Additionally, these prices reflect the fact that March is the beginning of the 'hungry' period for some farmers—the time when Belg crops are planted—and families must live off of their reserves. It is also a period when people migrate to other villages, towns or regions to seek employment.

For comparison, December 1997 grain prices recorded by the Wereda office of Agriculture were used to get a sense of the value of each of the top grains Delanta farmers reported and to measure the effect of food shortages on current prices. As indicated in Figures 10, at the time of the survey both sources reported that lentils commanded a comparatively higher price than wheat, barley or teff (31 per cent, sample size N=189). An SCF study also supported the Delanta study's finding that barley was consistently a lower cost product than the others (SCF, 1993). SCF reports (NSP reports 1998) showed the grain prices had decreased from previous years during the first quarter of 1998, which was a result of the poor Meher harvest of 1997/98. People were dependent on livestock sales in order to buy grain, which may explain the lower livestock and higher cereal prices people were reporting.



Photo: Linda Stephen, 1998

*Highland fields freshly ploughed
Delanta, Ethiopia*

Figures 9a,b,c Grain and produce price trends, 1996, 1997, and 1998

Figure 9a Grain and produce prices, 1996, 1997

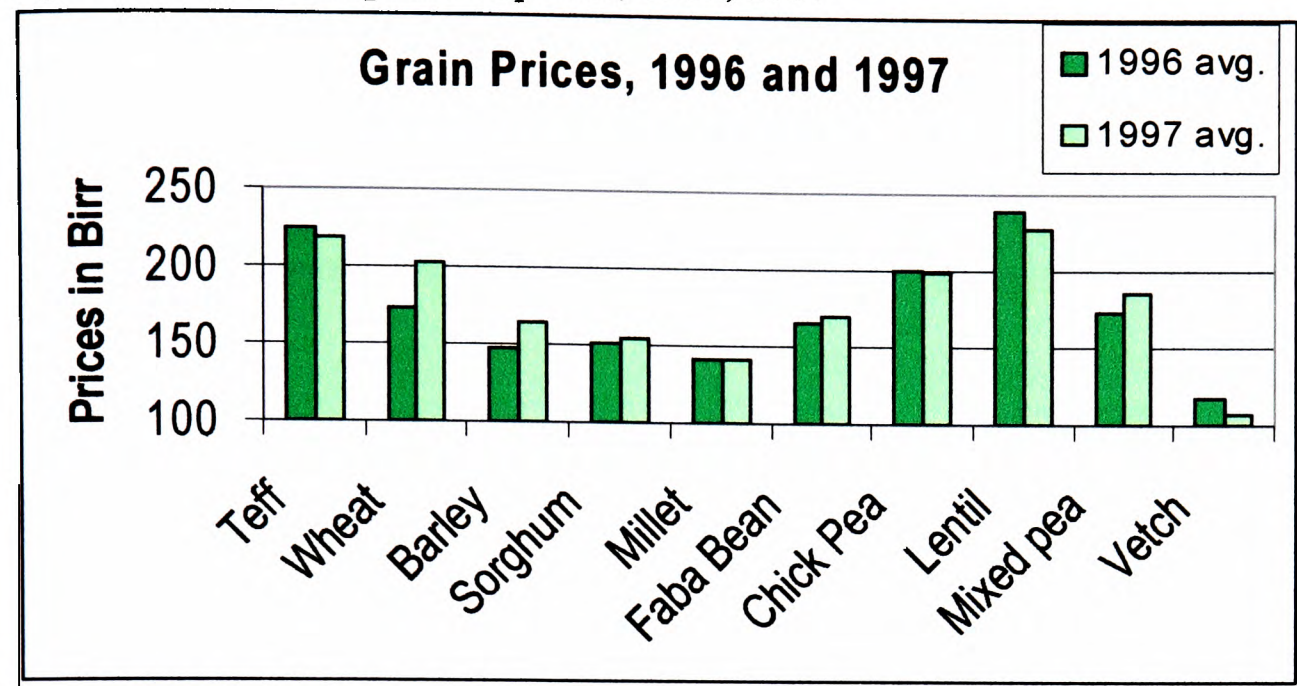


Figure 9b Oxen and Cow prices, 1996,1997

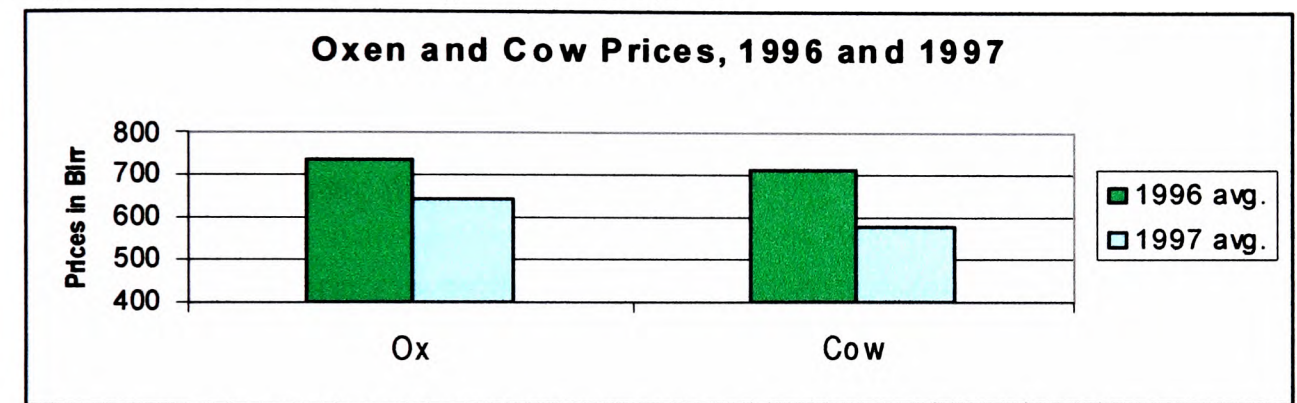
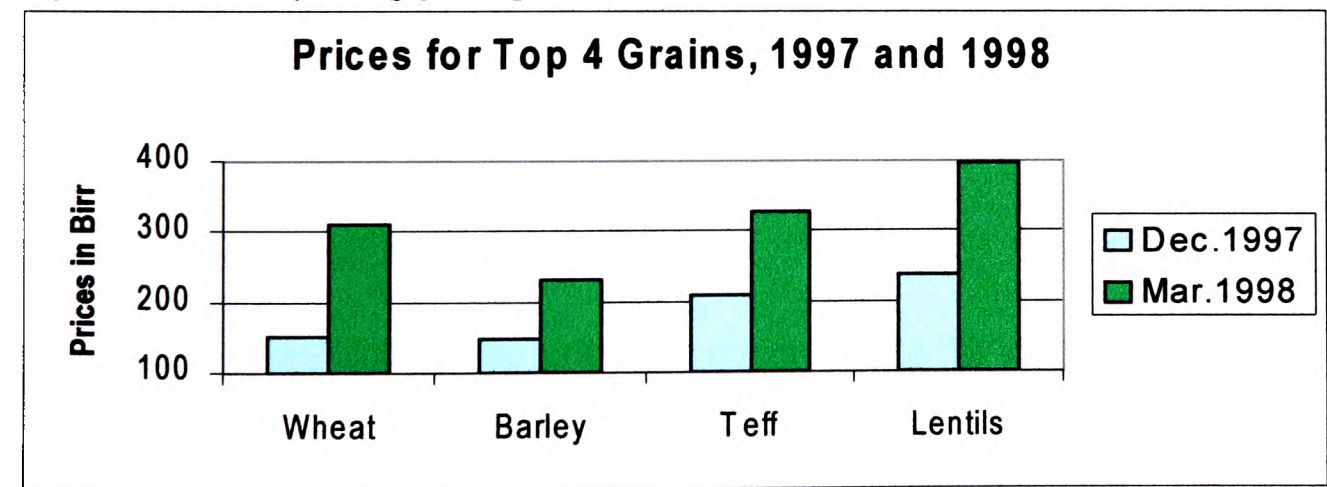


Figure 9c Prices for top four grains,1997,1998



(source of 1996, 1997 prices: *Wereda Office of Agriculture and Natural Resources*)

Figures 10a, 10b *Farmers' prices for top grains compared to Woreda Agricultural Office Reports*

Figure 10a *Farmers' grain prices*

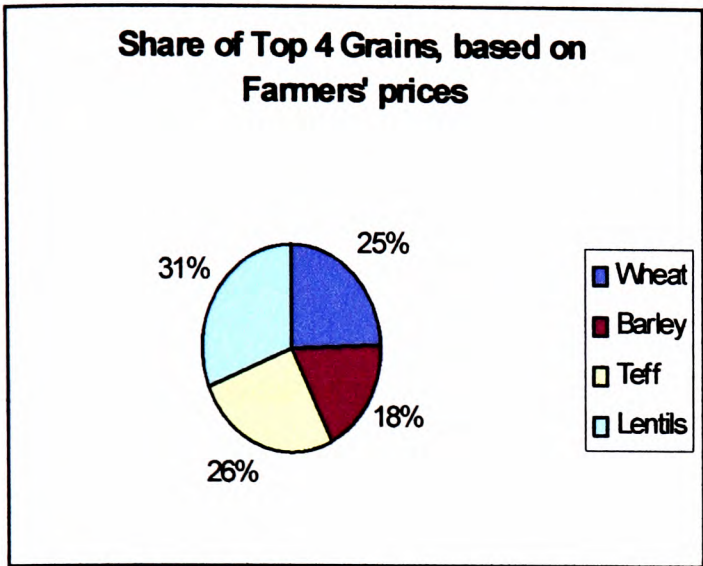
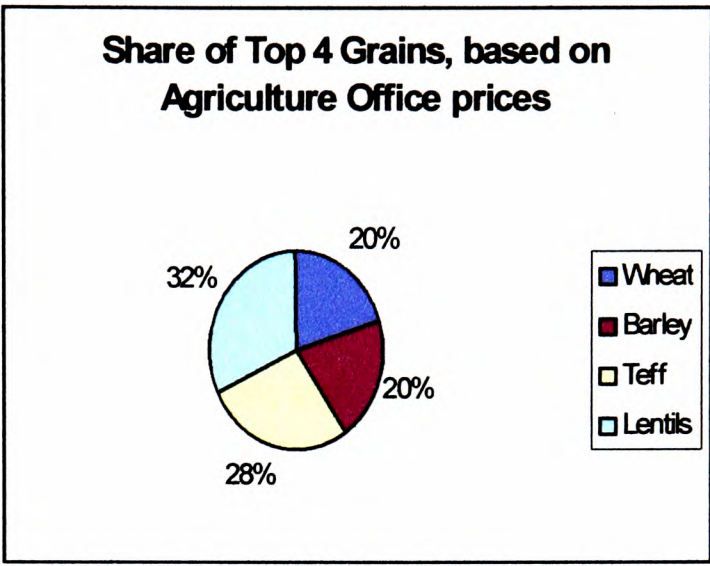


Figure 10b *Prices listed in Woreda agricultural office*



Changes in consumption

Changes in consumption patterns may alert constraints to food availability and access as a result of production failure, higher prices or disruptions in normal trade. Impending food crises are often signalled by the consumption of certain types of foods, which are eaten as a coping strategy, and changes in food sources and diet.

'Famine Foods' and diet

Changes in diet are considered to be one indication of the severity of food insecurity (SCF, 1993). It is common throughout Ethiopia for people to value certain food items, which have become a type of 'famine food' (SOS Sahel, 1993; Getachew Diriba, 1995). Unlike other parts of Africa, Ethiopian famine foods were not introduced by colonial authorities (Kuczynski, 1948-53). They were a response to changes and dynamics in the

environmental and sometimes political climate. Some foods also held traditional and cultural value. Ethiopian families rely on famine foods during a food shortage, and some of these foods are also staple food items. If they suddenly disappear from the diet, or are the only foods people consume, this usually signals a general constraint in access to food. In Delanta, famine foods are mainly composed of three grains (barley, wheat, teff) and the plant, Vetch (*Vicia sativa*). The grains are used to make kollo, injera and keita.

Of the 39 per cent of people on the household survey who ate kollo, injera or keita during food shortages, 90 per cent of them ate kollo and not the other two foods (N=189). The importance of kollo has become incorporated into historic folklore. There is an Ethiopian legend which says that King Menelik conquered the invading Italian armies during the battle of Adwa in 1896, because his soldiers survived on kollo while the Italians ran short of food.⁸ During lean periods, farmers may miss meals in order to work in the fields or simply because there is not enough food. Kollo has been eaten to sustain them throughout the day. Kollo is made from roasted barley, one of the most widely used of all grains.

In the midlands farmers ranked barley highest among all crops using their own rating system. Barley scored high in terms of productivity: it was an active ingredient in the local beer, 'tela', in the national bread, 'injera', and a local bread called 'dabo'; as a popular snack and food substitute during shortage. For mid-land farmers, wheat and wheat products were valued second to barley, because wheat had many uses. The highest

⁸ This story came from conversations with Ethiopian aid workers, 1998.

commercial values were given to lentils and fenugreek (see Figures 9, 10 and Table 7). In the highlands some people shared these preferences.

In the lowlands, barley ranked high because they said that the straw remains could be used as fodder. Teff was ranked higher than barley because it was primarily used to make injera. Injera is a flat pancake-shaped bread which is baked on a large earthenware or iron pan over an open fire. It is the base for a variety of sauces and stews and is eaten at nearly every meal. A similar bread made from teff is keita. Keita is a crude form of injera. The difference is that keita can be made within a few minutes since the ground teff is not fermented as is done for injera. During food shortages only four per cent of the surveyed population in Delanta had access to the grain to make injera or keita.

In addition to teff being the primary grain in 'injera', its residue is used as livestock feed. It also has a high commercial value and commands a large proportion of the household diet. It is also a crop which farmers said matures early. Sorghum ranked second overall as a household food source, and lentils again ranked high for its commercial value.

Of the four famine foods mentioned at the outset, vetch is the only one that can be harmful and at the same time is a strong indicator of famine conditions. It is a vegetable in the legume family. Farmers described two forms of vetch. There is *Vicia ervilia*, commonly known as bitter vetch. It is not normally eaten because of the sharp taste, but instead has other uses for farmers (as a manure crop in California⁹, for example). There is

⁹ "Vetch," Microsoft® Encarta® Online Encyclopedia 2001
<http://encarta.msn.com> © 1997-2001 Microsoft Corporation

also *Vicia sativa*, or common vetch, which grows in some of the worst drought conditions. Some studies say that common vetch contains a neurolathyrigen that may be partly responsible for neurolathyrism, which usually occurs in humans. It is suspected to be the source of a mild paralysis of the limbs, which local people describe as 'limpness'. Neurolathyrism affects mainly the rural poor during drought and famine, with cases reported in Ethiopia, India, Bangladesh, Nepal and Pakistan.¹⁰ In Delanta, there has been a notable increase in the quantities of vetch grown since the famine in Ethiopia during 1982-1984.

Dairy Consumption

Dairy was present in the diets of 54 per cent of the families who were consuming more than one item of dairy in a day (N=189). However, the consumption of dairy products was not as consistent between families as expected, given how widespread and important livestock was. On the household survey, people were asked how many litres of milk and pounds of butter and cheese they consumed per day. A wide variation in the volume consumed was noted.

¹⁰ Historic outbreaks of this disease have also been documented for Spain, Algeria, Ukraine, Russia, Germany, Italy, France, Syria and more recently from 1972-74 in China. The cause of neurolathyrism is the continued consumption of *L. sativus* seed as a staple food. The hardy *L. sativus* may provide most of the food for survival during drought in areas where neurolathyrism is prevalent. Other *Lathyrus* species used as food have also occasionally been linked with neurolathyrism, e.g. *L. cicera*, *L. ochrus* and *L. clymenum*. These species all contain beta-ODAP in their seeds. The occurrence of neurolathyrism is intricately linked to drought caused famine, poverty and malnutrition. (Cheeke, P. R., Shull, L. R. 1985; and Cooper, M. R., Johnson, A. W., 1984)

Changes in household food sources over time

People were asked to compare food sources in different years to gather an impression of changes in household consumption over time and to understand which crops had been failing. Between 1982 and 1997 there was a reduction in the consumption of most crops and a transfer from some crops to others. In most cases, the main sources of food, like barley, were either reduced or replaced altogether as a percentage of total intake. This was partly a result of households relying more on the Meher crops when the Belg failed. It was also common to plant new crops and varieties that were resistant to pests and infestation.

The consumption of foods made from teff seemed to increase in several places. Vetch was grown in larger quantities than before. In rare cases, such as Tina and Kiltu villages, women reported little or no change in the proportions although the variety of crops decreased in 1997. In these two villages, Meher crops failed in both of the years compared. An example of changes to household food sources is shown in Figures 11a and 11b.

Nutritional status and household food sources

As a result of the poor 1997/98 harvest the nutritional status of families had declined during the previous 6 months. Weight-for-Length measurements were just above the cut-off point for requiring emergency assistance. The closest estimates of nutritional status in the wereda at the time of the study were from samples in the SCF nutritional surveillance program. That program reported weight for length at 91.6 (SCF-NSP, 1998:2). Weight

for length measurements between 90 per cent and 94.9 per cent are considered satisfactory, while measurements below 90 per cent are the basis for emergency assistance (as defined by the government’s guidelines).

Figure 11a Household food sources in Kiltu village, 1986 ¹

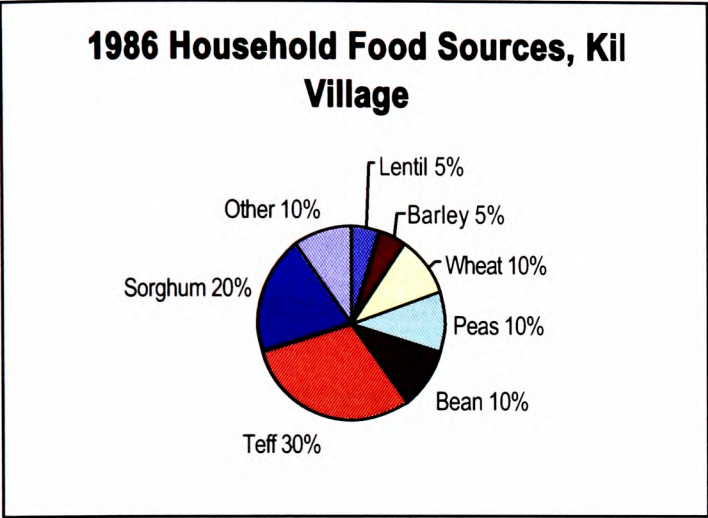
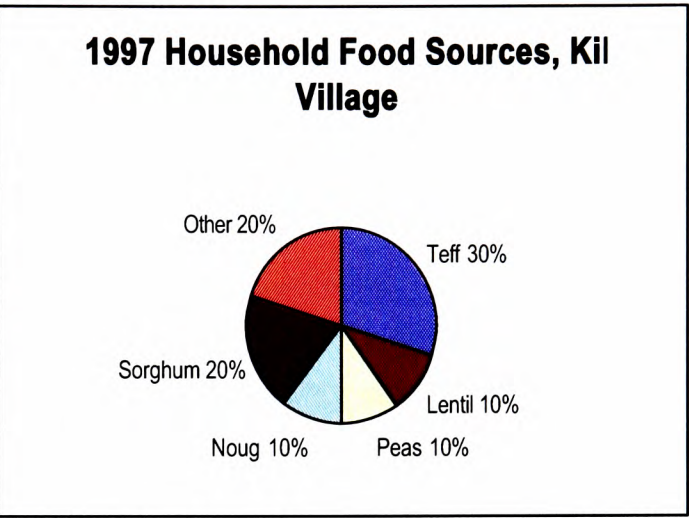


Figure 11b Household food sources in Kiltu village, 1997



Wealth , vulnerability and food security

Wealth ranking is a tool used in participatory rural appraisals (PRA) to understand differences in economic and social status within communities. Some of the literature questions the accuracy of qualitative ranking exercises for measuring household food insecurity. As Young (1990) showed, wealth ranking selected those households who were locally perceived to be poorer – the economically vulnerable, [and] this did not correspond to the physiological vulnerable – the malnourished. Despite its limitations, in this study wealth-ranking categories were consistent with the food security categories developed separately using a quantitative household survey. Those comparisons are discussed in section 5 (vulnerability profiles). Most significantly, wealth groupings are a

¹ Total production was only 20% in 1986 and 5% in 1997.

determinant in the abilities of families to cope when there is a crisis affecting income and access to food.

Differences in wealth

Using wealth ranking, key informants in villages categorised families into four groups. Table 13 presents the group criteria villagers defined.

Table 13 *Delanta Farmers’ wealth ranking categories*

Category One: Most wealth
Those who owned one or two oxen, two or more cows, 10-30 sheep and goats, one or more donkeys, one mule, own land, have labour and farm inputs (seed, ploughs, fertiliser). They could afford to lend money, or were sometimes involved in trade, handicraft or petty commodity sales and could feed their families for one year or more during good periods and 9 months during bad periods (for lowlands), 5 months (for highlands).
Category two
Those who owned one ox, two or more cows, up to 10 sheep and goats, one donkey, own land, could feed their families for up to one year during good periods and 6 months during bad periods in the lowlands, two months only in the highlands.
Category three
Those who owned two to five sheep and goats and possibly an ox or cow. The persons falling under this category were diverse, but were generally: people who owned land but were unable to plough it. This could include female-headed households, disabled persons and the elderly. It could also include ex-settlers, persons newly married and living with Parents. These persons could be expected to feed their families for 7- 9 months during good periods and only 3-6 months when there was a food shortage.
Category four: least wealth
Those who owned little or no livestock, owned little or no land, had nothing to trade or sold vegetable products by trading in different markets. They included, ex-settlers, the newly married who lived with Parents; disabled; female-headed households; elderly. These persons could support themselves or families for 4-5 months in good years and only 3 months during bad years.

Wealth ranking and coping mechanisms

Families in different wealth ranked categories differed in the coping mechanisms used. Families ranked 3 and 4 (see Table 13) tended to sell firewood and/or trade items to support themselves. Some also offered their land to those who had farm inputs, like oxen. The produce from these 'shared' arrangements were divided between the two parties during harvest. Land and Oxen were scarce, but there was still an average of one ox per family (sample size, N=119). This varied significantly by PA and altitude¹². Those in the highland owned slightly more than the average two oxen, while the midland farms owned the least. On average there were nine heads of livestock per family (N=189), and the differences were statistically significant amongst PAs.¹³ Details are presented in (Section 4, Table 15).

Farmers described persons in wealth ranking categories three and four as reliant on external assistance, particularly food aid. Based on their analysis of wealth, the provision of food assistance, food for work, credit, oxen, tools and seeds should bring persons in poorer categories at least one category higher.

Conclusions

Among the issues affecting the ability of families in Delanta to cope with the food shortages described in regional forecasts, wealth, as composed of a household's basket of assets, activities, strategies and consumption patterns, would be the strongest factor. Inter-farm differences were noted in terms of land holdings and soil quality, sources of income and livelihood strategies, local trade and prices, and consumption. These

¹² The mean number of Oxen owned varied significantly between PAs and Altitude (Duncan's Multiple Range Test: $P < 0.05$, $F_{6,112} = 8.883$, $P = 0.000$).

¹³ There was a statistical difference in the total livestock owned $F_{6,182} = 4.424$, $P = 0.000$

differences are a part of the endogenous processes that influence the capacity of communities and households to respond to the same sets of exogenous processes (i.e. poor rainfall, structural adjustment policies, civil war, price adjustments, etc.). Thus, the impact of a food shortage on different wealth groups can only be understood by analyses in specific local places. It would be difficult to understand the types and numbers of people affected using the governments traditional methods which calculate need based mainly on aggregate crop production.

4. Where do they live? The spatial scale and geographic dimensions of vulnerability

The populations most in need of relief assistance are mainly concentrated in the middle and lowland areas of Tigray, Amhara and eastern parts of Oromiya and SNNPR. These areas are mostly in the 'belt' of highly vulnerable and chronically food insecure areas where relief assistance has been frequently distributed in the last 10 years (DPPC, 1997:6).

Geographical location accounted for a number of differences between households and was an important factor in their income, asset holdings and access to food. The government's Disaster Prevention and Preparedness Commission declared the most vulnerable populations in the Amhara region were in the *middle* and *lowland* areas, as these are mostly in the 'belt' of historic food insecurity and where relief assistance has been frequently distributed. Contrary to this, analysis of the field study data showed that the midlands and lowlands in Delanta had some advantages over farmers in highland areas. These differences in relation to food security were investigated using data from both the household questionnaire and the participatory rural appraisal (PRA) survey. By analysing selected assets and variables presented in the previous sections, this section of the chapter explores the spatial inequalities in access and resources among farmers.

Key Variables

ANOVA tests were used to identify differences in assets and resources across the seven peasant associations and three agro-ecological zones based on 96 variables from the household questionnaire. These tests showed there were significant differences between peasant associations. This was further explored by submitting the data to correlation and principle component analyses with the aim of identifying the key factors (variables) influencing vulnerability and food security across several scales. Out of the original 96 variables extracted from the data, 70 variables had correlates. After further analyses the number was down to 20 variables, which were then used in principle component analyses. Finally, scale (by altitude) and income (income from different sources, expenditures and sales) proved to be the strongest factors. On the basis of these findings the relationship between altitude, income and vulnerability to food insecurity at the peasant association and village levels were explored.

The strongest indicator of vulnerability to food insecurity was income. When the relationship between income and wealth, land, soil-type and health were examined across geographic areas, the results indicated that income and wealth were strongly correlated and there were notable differences across the three different altitudes.

Income and wealth

Income and wealth ranking were strongly correlated and differed significantly amongst PAs¹⁴, with 69 percent of it concentrated in the lowlands and midlands. Most people lived in the midlands, regardless of wealth ranking or income. The least numbers of

¹⁴ Income was significantly different amongst PAs ($F_{6, 181} = 28.216$, $P = 0.000$).

people were living in the lowlands where some of the highest incomes were recorded. Overall, the average income was 1716.00 Birr (N=188 farms)¹⁵. Although the sample size was small, there were notable differences in earnings and sources among PAs.¹⁶ Farms in the low to mid lands earned the most, while mid to highland farms earned the least.¹⁷ A comparison of vulnerable and food secure groups from the wealth ranking and the vulnerability profile showed that income was connected to the type of farming activity. The farmers who earned most of their income from livestock lived in the highlands and also had access to the most grazing land. People in the lowlands had the highest incomes, earned mostly from crop production. These lowland farmers also cultivated the most hectares of land.

Figure 12 and Table 14 give the distribution of income and related assets across peasant associations and altitudes. Income was significantly different amongst PAs.¹⁸

¹⁵ 1 Birr = 0.08 pounds sterling and 0.12 US dollars in the last quarter of year 2001.

¹⁶ Statistical significance of income from livestock products (Duncan's Multiple Range Test, $P < 0.05$, $F_{6, 96} = 3.569$, $P = 0.013$), and livestock sales ($F_{6, 74} = 2.631$, $P = 0.005$).

¹⁷ Income showed statistical difference by PA and altitude (Duncan's Multiple Range Test, $P < 0.05$, $F_{6, 162} = 47.702$, $P = 0.000$).

¹⁸ Income was significantly different amongst PAs ($F_{6, 181} = 28.216$, $P = 0.000$).

Figure 12 *Income in each PA as a percentage of total income*

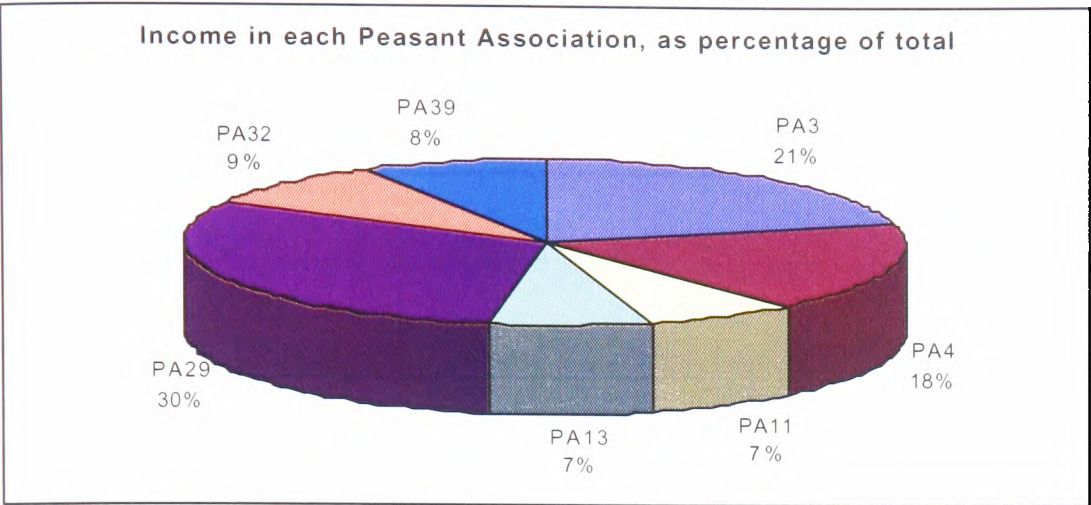


Table 14 *Income and related variables by altitude and PA (in Birr)*
Notation: average ± standard error (sample size)

VARIABLE	PA11	PA29	PA 3	PA4	PA 13	PA32	PA39
	Lowlands	Lowlands	Mid-Lands	mid-lands	mid-lands	hi-lands	hi-lands
Avg. Income	4282.30± 342.1(23)	940.00± 129.4(31)	836.60± 78.3(26)	727.60± 69.8(32)	1825.30± 263.1(22)	940.00± 129.4(30)	1126.40± 163.4(24)
Income (crop sales)	397.41± 323.8(23)	272.50± 28.7(31)	453.5± 47.2(26)	272.5± 28.7(32)	453.5± 47.2(22)	524.7± 73.6 (29)	155± 34.4(6)
Income (livestock products)	115.1± 32.2(7)	138.2± 46.1(14)	62.9± 20.5(14)	62.6± 9.3(24)	77.4± 23.1(16)	54.2± 13.6 (9)	220.6± 95.5 (18)
Income (livestock sales)	319.7± 116.2(7)	167.4± 25.7(6)	317.3± 85.9(13)	167.4± 25.7(19)	317.3± 85.9(11)	227.5± 55.4 (6)	579.3± 127.1(19)
Land-size	4.8±0(23)	6.2±0(31)	3.9±0(27)	3.3±0(32)	3.5±0(22)	3.7±.1 (30)	7.2±.1(24)
Land allocation							
Land increase	11(22)	15(31)	11(27)	16(31)	7(22)	14(28)	11(23)
No	1(22)	2(31)	3(27)	1(31)	5(22)	2(28)	2(23)
Yes							
Land reduction	6(22)	11(31)	11(27)	16(31)	7(22)	15(28)	3(24)
No	6(22)	6(31)	3(27)	1(31)	5(22)	1(28)	10(24)
Yes							
Amount of Land reduced	.48±.14 (22)	.74±.23 (31)	.34±.2(27)	0±0(31)	.55±.18 (27)	.0±.0(28)	2.5±.45 (24)

Livestock ownership as an indicator of wealth

In section three of this chapter, wealth was defined in terms of household assets — mostly livestock holdings— and food supply. Thus, the variability of wealth by village and peasant association could also be observed by the amount of livestock people owned. However, the statistical analyses showed that livestock holdings did not always equate with wealth, suggesting that livestock production is only one among several sources of income for people in Delanta. This partly explains the small proportion that livestock contributes to total income (11 per cent). The vulnerability profile in section 5 shows that people who had a combination of both crop and livestock producing activities were better off.

The lowlands showed some advantage in the number of oxen owned. Among the farm animals, oxen are invaluable for subsistence farms as they are needed for ploughing. Yet the size of the holdings did not correlate to the amount of income earned from selling livestock or from the sale of livestock products as expected. The lowlands in fact earned the least from livestock sales. Similarly, the largest number of livestock overall were owned by farmers in the midlands, yet they earned the least from livestock products. Livestock holdings and income from livestock for each area are shown in Table 14. The following figure and table show oxen ownership by altitude and livestock resources by village.

Figure 13 *Percentage of oxen by altitude*

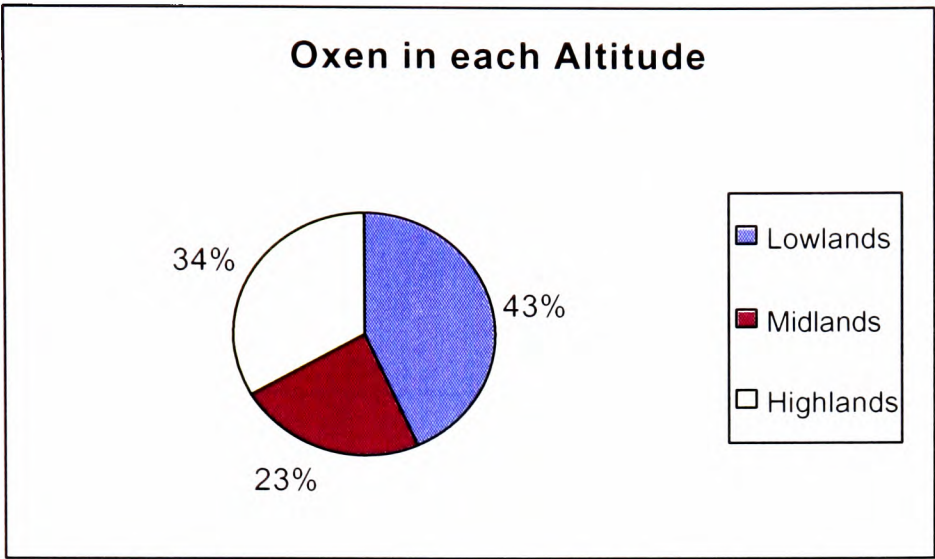


Table 15 *Livestock resources*¹

Villages	Administrative Unit	Cattle	Sheep	Goats	Equine	Poultry	Other (Bee-keeping)
PA-3							
FERJA MAREJA		39	50	3	9	20	1
MARIAM GOT		1			1	4	6
ZELAN KAB		29	41	6	8	28	
PA-39							
MERKO KEB A		41	38	5	12	34	130
MOTEGRIE		50	92	10	14	52	1
PA-13							
FENSEH		1			1	2	1
SHEGLA		20	48		14	61	143
SHEMA MATEBIA		5	4		4	13	26
PA-11							
AGDIMIT		9	3	2	2	5	2
GORGIE		22	5	12	6	4	
SHENBEKO		23	4	6	5	4	42
TEGIEMA		4	2	4	1	3	1
PA-32							
ASA BAHIR		4	3		1		8
ASAGIT BADO		3	5		2	2	12
AYTACHED		2					2
BET ANESE		2			1	8	11
DABIR		28	13		5	3	39
GALA MADERIA						2	2

¹ Villages reporting no livestock were not included

GEDEMEKEMECHA	5	8		4	4	21
GELA MADERIA	3	10		2	3	18
LECHEKIE	1					1
MESEL	2					2
SETA LBU	3	2		1	2	7
TINA	3	5		1	3	12
TENTAKUA	5	7	4	3	5	24
	PA-29					
ADISU AMBA	4		6	1		3
CHKAW MENDER	1					
DELDALIT	4				1	
KES MENDER	43	2	13	6	8	2
KILTU	11	2	8	5	4	11
KULKUAL AMBA	5	2	1		6	3
SHEKUR DENG	2	4	3		6	2
WUHAW MENDER	59	12	35	15	28	3
YEBARA MENDER	11	1	5		5	22
	PA-4					
ALBAGIR	25	18		10	30	1
TESENKO	44	45		18	31	1
Total	514 (24%)	426 (20%)	123 (6%)	152 (7%)	381 (18%)	560 (26%)

Land and income

The link between land use and income

Land size was positively correlated with total income (Spearman’s $r_s=0.153$, $N=185$). Those who owned more land also earned more of an income. However, the relationships between land size, income and food security are not as straightforward as the correlation suggests. Note the differences in income and land-size by PA (in Table 13). PA 39 in the highlands and PA 29 in the lowlands had the largest plots of land, but their total income was low in comparison to others with less land. Using data from the vulnerability profile (discussed in Section 5), it was noted that the type of productive activity in which farmers engaged was the determining factor.

The vulnerability profiles showed that crop farmers in the lowlands own more land and earn the most income from crop production. PA 29 in the lowlands showed relatively low income compared to the mean, but those families also had the largest amount of cultivated land, and also earned the most from crop production. Indeed, there was an even stronger correlation between the size of land and income from crop sales ($r_s=0.319$, $N=166$). In contrast, PA 39 in the highlands had the largest amount of grazing land and earned the highest incomes from livestock production (see vulnerability profile, Table 20).

Land restrictions and income

Since the mid-1970s, the Amhara region was subjected to three land policies that resulted in land re-allocations (see Annex 1 for allocation system). The statistics showed that land reallocation policies had an impact on income, although not as one might expect. Income was positively correlated to both land reductions and increases (Table 14). There were relatively few people who had lost land (27 per cent) and this was true also of those whose land had increased (17 per cent). Eighty-three percent saw no increases in land since the last policy in the early 1990s ($N=184$), while 31 per cent of the families reported land reductions over the past 20 years ($N=185$). PAs that share a common border in the midlands and highlands had the least number of households reporting a reduction in land. The average amount of land reduced was .63 timads ($N=181$) (Table 14). The average amount of grazing land was .5 timads ($N=124$), land used for homestead and other construction averaged .4 timads ($N=175$). Most of the farm land was used for cultivation. Table 16 shows that the amount of cultivated land on each farm

PAs in the highlands had the least increases in land and they were also the least food secure. When the experience of land increase was examined by food security groups in the vulnerability profile, however, this showed the moderately food secure having the largest increases (21 per cent) in land, while those in the extremely food category had the least increases (6 per cent).

Table 16 *Land use and size in each PA*
 Notation: average ± standard error (sample size)

Land	PA11	PA29	PA 3	PA 4	PA 13	PA 32	PA 39
	Lowland	Lowland	Midland	Midland	Midland	Highland	Highland
Grazing	.35±.18(4)	1.1±.36 (29)	.45±0(5)	.54±0(14)	.14±0(26)	.56±0(24)	.56±.17 (22)
Natural vegetation	1.4±1.0(4)	6.7±0(1)	0±0(6)	.27±0(18)	.12±0(4)	5.2±.25(2)	0±0(3)
Cultivation	4.3±.19 (21)	5.3±.36 (30)	3.6±.13 (27)	2.2±.17 (32)	3.4±.21 (22)	2.6±.22 (25)	3.6±.34 (24)
Homestead	.51±0(22)	.48±0(31)	.10±0(26)	.5±.16(30)	.14±0(22)	.6±0(24)	.32±0(20)
Irrigated Land	0± 0(1)	1±0(1)	0± 0(2)	.13± .13(4)	0± 0(0)	0± 0(0)	1± 0(1)
Total Land	109.00	193.50	107.55	104.00	77.69	105.50	173.20
Soil Type (%)							
Red	0(22)	5(31)	0(27)	1(32)	0(22)	3(27)	1(24)
Black	8(22)	1(31)	5(27)	11(32)	9(22)	2(22)	0(24)
Mixed	4(22)	9(31)	10(27)	6(32)	3(22)	10(22)	4(24)

Health, Income and Altitude

Type of health facility and income

The type of health facility was one of the key correlates in a principle components analysis, and also was negatively correlated to income. Thus, having access to no facility at all was related to having a low income (Spearman's $r_s = -0.433$, $N=187$). Tables 18 and 19 show the numbers and percentages of families that chose healers compared to clinics. Interestingly however, a common assumption in Delanta, that attending a non-traditional facility is associated with high incomes (i.e. only people who have money can be treated at clinics and hospitals) was tested and disproved. ANOVA tests showed significant differences in income by type of health facility, and a notable difference in income between people who went to a healer and those who attended a health clinic²¹. Forty-percent of the people attending a clinic or other non-traditional form of care fell below the average income, while 22 per cent were above the average income. This suggests a slight preference among lower income groups for non-traditional medicine. Such preferences might also be determined by other factors, like distances to clinics.

For most people, the Cold or Flu and Typhus ranked the highest among ailments, but there was considerable variation in the percentage of people identifying different ailments across altitudes (Table 17). Not only did people place different emphases on the types of illnesses affecting them, their access to health care differed as well. The variability of health facilities of different standards by the type of diseases reported may show an

²¹ Differences in income by type of health facility, and between people who went to a healer and those who attended a health clinic ($df=4$, $N=156$, $P=0.000$).

important link to be explored in future studies. Certainly, accessibility varied among PAs ($\chi^2 = 0.000$, $df=12$, $P=0.000$, $N=186$).²²

Table 17 *List of most common illnesses by Altitude*

1 st most common Diseases or Ailments	Altitude		
	Highlands	Midlands	Lowlands
Cold and Flu	23%	59%	18%
Diarrhoea	14%	57%	29%
Scabies	17%	65%	18%
Head-ache	50%	50%	0%
Typhus	65%	29%	6%
Other	22%	20%	58%

Table 18 *Percentage of persons using clinics and healers in each Altitude and PA. % (total)*

	Health Service Used % (total respondents)	
	Clinic	Healer
Lowland		
PA11	1(22)	0(22)
PA29	16(30)	0(30)
Midland		
PA 3	8(27)	1(27)
PA 4	0(31)	17(31)
PA 13	12(22)	0(22)
Highland		
PA 32	16(30)	0(30)
PA 39	13(24)	0(24)
TOTAL	66 (186)	18(186)

²² Access to health facilities differed significantly by PA ($\chi^2 = 0.000$, $df=12$, $P=0.000$, $N=186$).

Table 19 *Health and other social indicators by PA and Altitude*
Notation: response ± standard error (sample size)

VARIABLE	PA11	PA29	PA 3	PA 4	PA 13	PA 32	PA 39
	Lowland	Lowland	Midland	Midland	Midland	Highland	Highland
Health Facilities (%)	1(22) 0(22)	16(30) 0(30)	8(27) 1(27)	0(31) 17(31)	12(22) 0(22)	16(30) 0(30)	13(24) 0(24)
Clinic Healer							
Education level (1=illiterate)	1±0(31)	1±0(32)	1±0(23)	1±0(22)	1±0(27)	1±.12(30)	1±0(24)
Household size (average)	6±.45(31)	5±.30(32)	5±.44(23)	4±.27(22)	5±.39(27)	5±.36(30)	6±.41(24)
Religion in %							
Christian	12(23) 0(23)	10(23) 1(23)	14(27) 0(27)	17(32) 0(32)	12(22) 0(22)	16(30) 0(30)	13(24) 0(24)
Muslim							

Differences in natural vegetation and soils by altitude

Natural vegetation

Land covered by natural vegetation (non-cultivated) was four per cent and averaged 0.7 timads and there was a significant difference amongst respondents.²³ Although the sample size was small (N= 38), it is possible to make some conclusions about land use that are support field observations and qualitative interviews with farmers. The reason for the small number of respondents to this question was that most farms have no vegetation apart from crops. Most of the available land is under cultivation. In living memory, marginal lands, such as on hillsides, have been brought into production and have eroded rapidly. One observes that the area is sparsely covered, especially on mountain slopes. Much of the tree cover was recent plantation associated with NGO and government reforestation schemes. A total of 60 per cent of the natural vegetation were

²³ Land covered by natural vegetation (non-cultivated) varied from one PA to the next ($F_{6,31} = 24.136$, $P=0.000$).

for the small number of respondents to this question was that most farms have no vegetation apart from crops. Most of the available land is under cultivation. In living memory, marginal lands, such as on hillsides, have been brought into production and have eroded rapidly. One observes that the area is sparsely covered, especially on mountain slopes. Much of the tree cover was recent plantation associated with NGO and government reforestation schemes. A total of 60 per cent of the natural vegetation were in bordering middle and highland PAs. See Figure 14 and Table 20 for differences in vegetation across PAs.

Figure 14 *Natural vegetation (non-cultivated) in each PA*

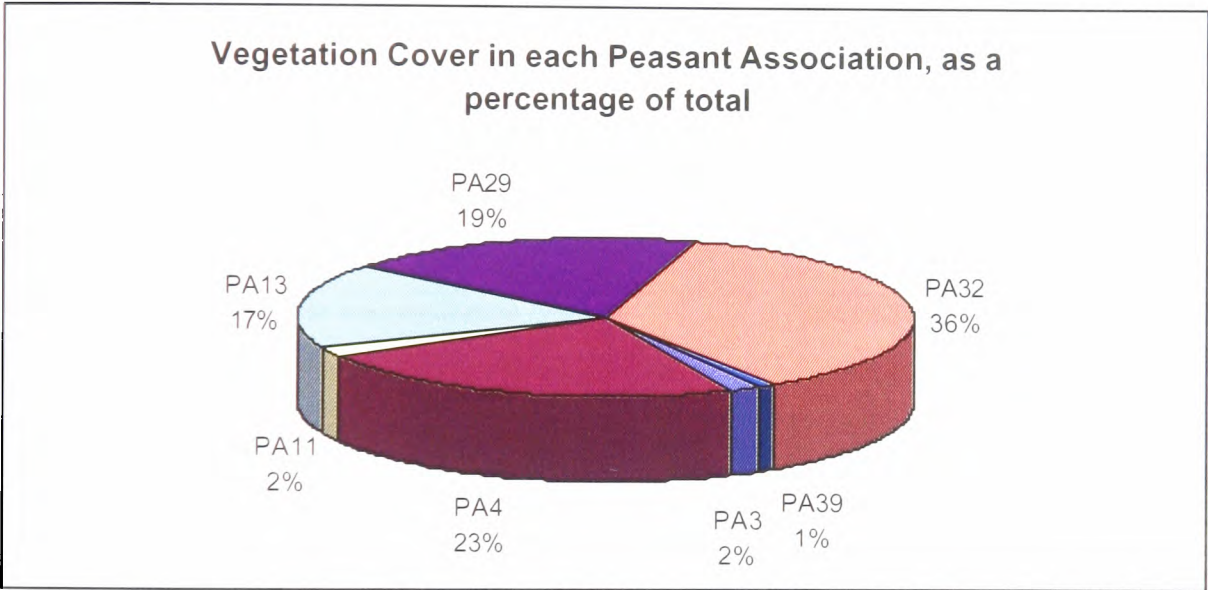
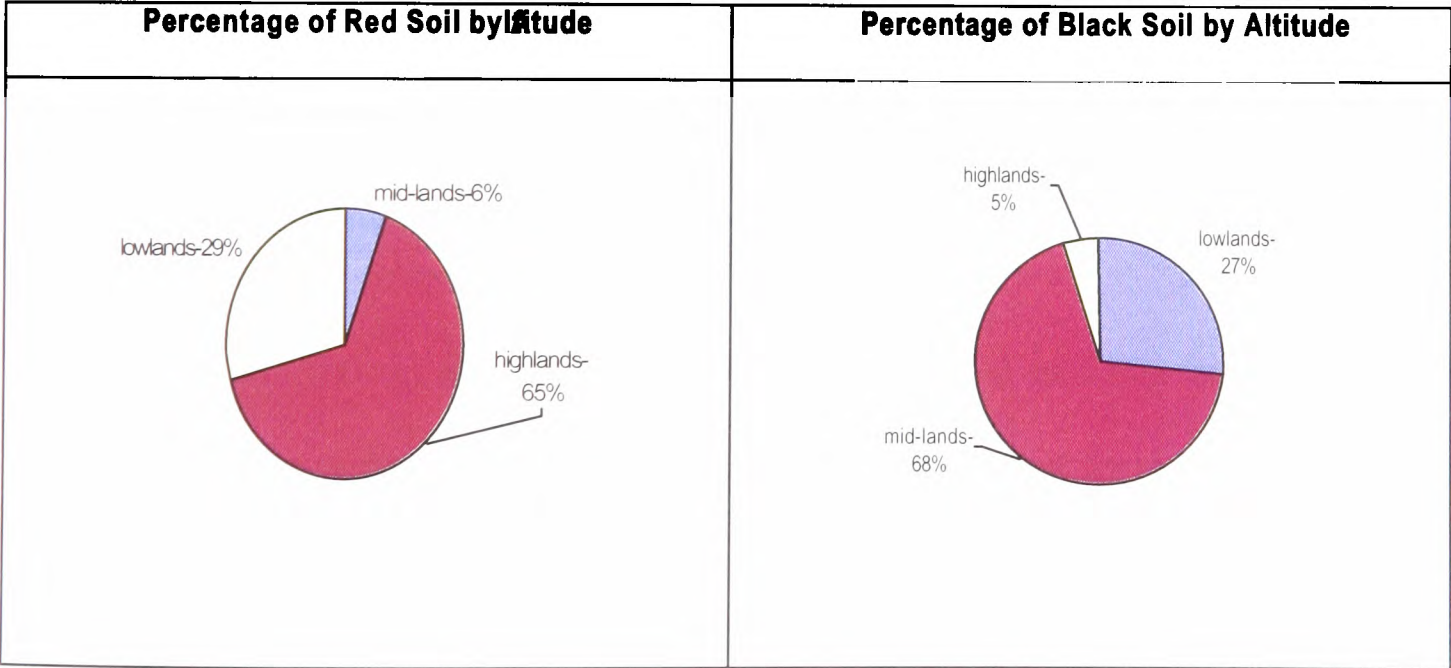


Table 20 *Environmental indicators of vulnerability in each Peasant Association (sample size in parentheses)*

VARIABLE	PA 11	PA 29	PA 3	PA 4	PA 13	PA 32	PA 39
	Lowland	Lowland	midland	midland	midland	highland	highland
Natural Vegetation in %	19(1)	23(18)	2(4)	17(4)	2(6)	36(2)	1(3)
Black Soil (%)							
Black	9(22)	1(31)	5(27)	11(32)	8(22)	2(22)	0(24)
Mixed	3(22)	9(31)	10(27)	6(32)	4(22)	10(22)	4(24)
Rainfall in mm	668.4	953.7	668.4	668.4	953.7		

cent of the farms, but was found in the greatest proportions in the midlands and secondly in the lowlands (Figures 15). The dominant soil in the midlands was black; on average, farmers received 40m to 50m x 75m of red and 50m to 80m x 75-80m black.²⁵ In the lowlands, the average farmer possessed 25m x 50m of farmland, which is part red and mixed soil. Female heads of household in the lowlands received 50m x 75m total of both types. The lowlands were particular, with 53 percent of the red soil concentrated in one lowland PA, the clay content of Walka was said to be low and Necha was found mainly in the lowest altitudes of the lowlands. Very little black soil was available in the highlands (5 per cent), but that was made up by red soils (65 per cent). In the highlands, the distribution was 90m x 60m on average, of both types, while female-headed households receive 45m by 30m of both.

Figures 15 *Percentage of red and black soils in each altitude*



²⁵ Allocations are explained in Annex 1

Conclusions

This section illustrated the high diversity between households depending on their location geographic location. The relationship between income and different key indicators was emphasized as the statistics showed income to have the strongest correlation to the vulnerability and food security variables selected for analyses. The data presented here underscores the argument that relief and development initiatives should increasingly aim to target localities, where the patterns of vulnerability are more evident and diverse, rather than larger, higher administrative zones and regions.

5. Vulnerability profiles and analyses of vulnerability to food insecurity

This evaluation of food insecurity and vulnerability in Delanta has shown important divergences in individual and community *access* to resources, like income, land and labour. The *assets* families held also differed as was the way in which households *utilised* food during periods of shortage. This appraisal also revealed broad demographic similarities and likenesses in respect to the *availability* and level of water resources, market transactions and the services provided through traditional and non-traditional institutions and through community and family networks. The data used in the preceding discussion were brought together into the following summary profiles.

Table 21 shows the profiles of five vulnerable groups in Delanta Dawint. The profile consists of a summary of *who* the vulnerable people were, *what* assets they had to support

themselves, *where* they lived in terms of scale and altitude and a ranking placing each group into a food security category. These profiles were developed following the USAID current vulnerability assessment approach described in Chapter Three.

The vulnerability profile describes a subsistence agricultural farming community. Most people in Delanta gain a livelihood from crop production, while significant portions live off of livestock and livestock products. Dairy production contributes both to household consumption and income. One out of five of the socio-economic groups in the profiles were extremely food insecure, three groups were highly food insecure, and one group, the mixed crop and dairy farmers, were classified as moderately food secure.

Correlations between food security groups and social characteristics, availability and access to resources and assets

In addition to different livelihood strategies (i.e. crop and dairy farming), some social characteristics, such as family size or the availability and access to resources and social services were important indicators of the food security category households fell under. For example, the extremely food insecure group in the vulnerability profile had a noticeably low number of household members compared to other groups and compared to the overall mean. This suggests a correlation between household size and food security.

Additional correlations are presented in the following discussions.

Another indication of food insecurity amongst groups was the use of wage labour. The most food insecure relied on off-farm wage labour, although overall it was not an important alternative. Only around three per cent of all families had members (of both

sexes) regularly engaged in it. Of these, 83 per cent belonged to the highly food insecure category. However, during food shortage periods the percentage of families who engaged in waged labour was dramatically higher (54%)(N=183). More than one half of these families are dependent on it as an alternative income source during difficult times.

Table 21 *Summary of Vulnerability Profiles*
(Source: Delanta Dawint, Ethiopia Household Survey, 1998)

	Vulnerability Groups	1	2	3	4	5
Who						
Socio-economic group		Crop Farmers	Mixed Crop and Dairy	Crop Farmers and Other	Crop Farmers	Dairy/ Crop Farmers ²⁶
HH Size		5	6	4	6	4
What						
Road Access		76%	96%	100%	42%	100%
Food Aid		54%	84%	25%	52%	52%
Avg. No. of Male laborers		5	4	1	6	3
Total Inc. per year (in Ethiopian Birr)		956.1	1133.2	375	3561.8	804.2
Total Exp. per year		999.1	1638.6	605.9	2221.3	5444.4
Avg. selling price for crops in bad year		300	400	200	400	400
Oxen		1.2	1.4	0.8	1.4	2.0
Total Livestock holdings		7	13	2	10	10
Different types of dairy produced		3	7	0.5	3	8
Land size for cattle grazing (in timads)		0.4	0.7	0.4	0.1	0.5
Land size for growing crops (timads)		3.46	2.78	2.61	4.21	2.5
Where						
Low Altitude		21%	4%	0%	67%	0%
Mid Altitude		52%	75%	33%	33%	50%
High Altitude		27%	21%	67%	0%	50%
Food Security Category		0.5	0.75	0	0.5	0.5

²⁶ 50% of the households in this group were involved in dairy farming and the other 50% produced crops.

Food insecurity and land holdings

Income was positively correlated to both land reductions and increases. However, when the experience of land increases was matched to the different food security groups, this showed the moderately food secure having the largest increases (21 per cent) in land, while those in the extremely food insecure category had the least increases (6 per cent).

Food insecure groups and wealth ranking

The characteristics of each of the wealth ranking categories were similar to food security categories in the vulnerability profile. Figures 16a and 16b compare oxen and livestock holdings for different groups of people as defined by wealth ranking and the vulnerability profile. The figures show that livestock ownership for each of the wealth ranked groups was within the same ranges as corresponding food security categories. For example, the persons considered least wealthy and those who fell under food security category 0, both owned between 0 and 5 animals and had enough food for three to five months. People who were rank 2 were expected to have food for six months. This corresponded to people classified as moderately food secure who had a household income deficit that was 45% of total income and could expect to have enough food for six to seven months. The range of months of food availability were the same for rank 4 and the extremely food insecure. There were larger variations in months of food availability for rank 3/highly food insecure, which can be explained by the fact the figures used in the calculation are the combined figures of three separate socio-economic groups of highly food insecure families. In fact the combined deficit of the highly food insecure (70 per cent of total income) was greater than that of the extremely food insecure (62 per cent), who were

only made up of one socio-economic group. There were no families in the ‘food secure’ category, therefore the following figures show no data for that category.

Figure 16a Comparison of wealth ranking and food security for livestock holdings

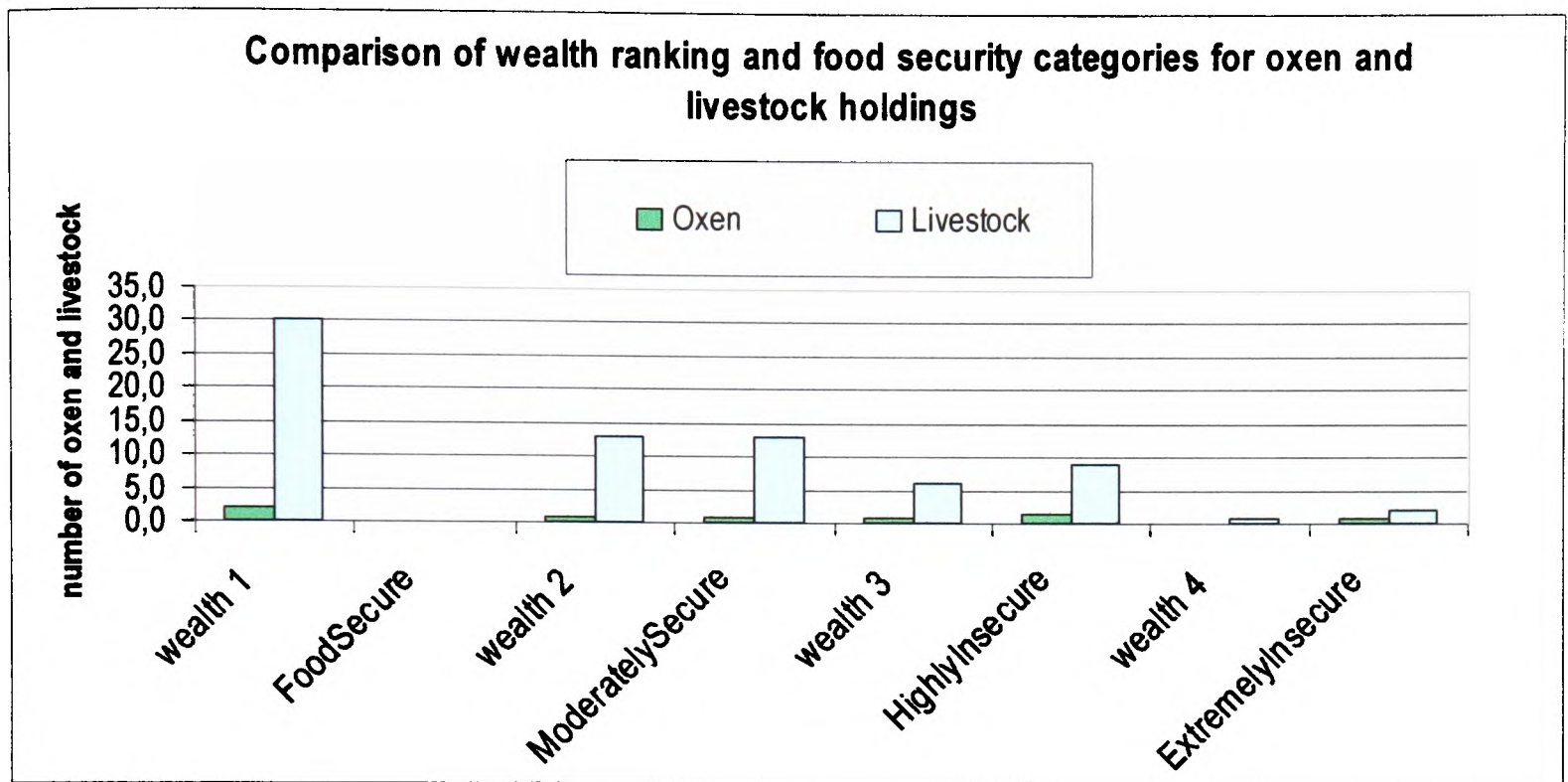
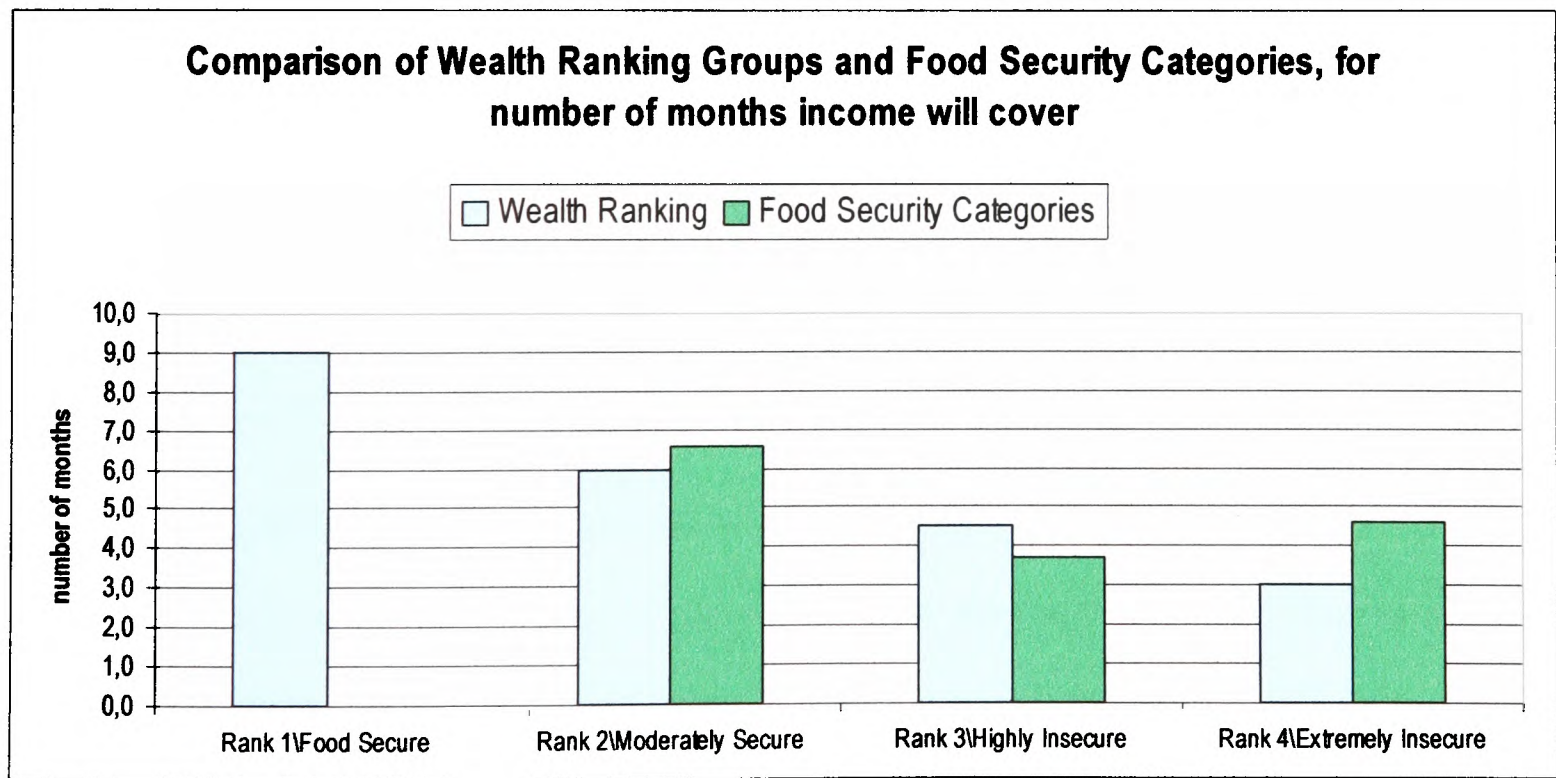


Figure 16b Comparison of wealth ranking and food security categories



Food secure groups, income, wealth and farm location

The greatest proportion of people fell into the middle categories of wealth and this corresponded to the food security categories in the vulnerability profile. Those ranked least wealthy and least food secure were in the highlands. Members of group four (crop farmers), of whom 67 per cent lived in the lowlands also showed the highest incomes. The greater income of lowland households, as reflected by group four, was confirmed by the wealth ranking. The ranking showed that people put the greatest proportion of ‘wealthy’ people in the lowland villages, Kess/Wohaw and Kiltu. The least ‘wealthy’ were in highland villages, Tina and Millawa. Table 22 gives the percentage of persons in each ranked category by villages (selected during the PRA survey) and altitude.

Table 22 *Wealth by villages*

Village	Cat. One	Cat. Two	Cat. Three	Cat. Four	Cross- Categories	TOTAL
Highland: Tina	7.8%	31.9%	36.1%	11.3%	13%	100
Millawa	5%	35%	45%	15%		100
Midland: Firja	13%	31.2%	36%	18.4%	1.4%	100
Mareja						
Lowland: Kess/Wohaw	22%	27.8%	27.8%	20.8%	1.6%	100
Kiltu	20.4%	24.4%	43.8%	10%	1.8%	100

Food insecurity and receipt of external assistance

Seventy-five percent of the families in the survey said they ate only one meal in a day during hard periods. This was true for 73 per cent of those classified as extremely food secure and 64 per cent of the moderately food secure in the vulnerability profile (N=158).

A Save the Children Fund (UK) approach used to determine whether food aid had been successfully targeted to the neediest people in Wollo (SCF, 1993) was replicated with the Delanta data. The approach was slightly adapted to compare the amount of food aid received in households (rather than villages) to the reported quality of the harvest and the percentage of villagers owning either no animals or no oxen. The same analysis was used to compare other types of external assistance, like food-for-work programs and credit schemes. As one can see from Table 23, the figures give a strong indication that targeting is generalised and widespread but not always equitable. One hundred per cent of the families who had reported higher production levels were also receiving assistance of some kind. And, 98 per cent of people who were producing less were also receiving assistance. There were only modest differences in the delivery of food aid between the low and high producers. This was also true for food for work programs.

Table 23 *Percentage of households receiving assistance*

	Percentage of Households Receiving Assistance				
	General Aid	Food Aid	Food-for-Work	Food Aid and Food-for-Work	Credit
Quality of Harvest					
Less Production	98%	59%	20%	17%	11%
More Production	100%	44%	22%	33%	6%

There appeared to be a fairer distribution in the percentage of people receiving food aid. A greater proportion of the people who had produced less than previous years were receiving food aid than those who had produced more. Yet, when this was cross-referenced with the vulnerability profile, it was clear that the least food secure people were least targeted for food aid. One explanation for the mismatch between need and relief assistance is that people who had participated in NGO and governmental relief programs tended to be the

likely candidates for food aid. To assess this, two peasant associations were compared. PA32, which is a remote, highland PA and not within the Oxfam programme for Delanta, had 37 per cent of its households receiving food aid. PA3 is in the midlands, is centrally located in terms of services, wereda administration and Oxfam offices, is within the Oxfam programme and had 74 per cent of its households in receipt of food aid (Table 24). This comparison between peasant associations confirmed findings in a previous study, that showed that a strong criteria for area targeting in Ethiopia was whether the area had a relatively long history of food shortage *and* external assistance (discussed in Clay, et al, 1998).

Table 24 *Comparison of households receiving food aid and NGO assistance*

	Number of Households	Number Receiving Food Aid	% Receiving Food Aid	% Oxfam Coverage
PA3	27	20	74	100
PA32	30	11	37	0

Road Access

In previous studies, road access in Wollo zone was correlated to active relief programs present in the area and prices. This influenced whether people joined food-for-work programs which generally involve road construction and repair, and there was an indirect link to lower livestock prices (SCF, 1993). Those studies concluded that the strong association between roads and the delivery of services was not likely to change. In Delanta, access to a central road or path showed a modest statistical significance among the socio-economic groups in the vulnerability profile. Most people had access regardless of their group. Yet amongst those who did not have access, the greatest proportion were in the highly food insecure category (in Table 25). This led to the

question: in what ways having access to a road made people more or less vulnerable. How did it affect livelihoods?

Table 25 *Road Access by socio-economic group*

	Vulnerability	Groups			
	1	2	3	4	5
	highly food insecure	moderately food secure	extremely food insecure	highly food insecure	highly food insecure
Road Access					
No	24%	4%	0%	58%	29%
Yes	76%	96%	100%	42%	71%
Total	67	24	15	48	156

Livelihoods and road access

The value of roads to rural livelihoods is suggested in Spearman’s correlation analyses. There was a negative correlation between road access and many assets like total income, income from crop sales, livestock holdings, land size, total sales of any kind and the average crop condition. Conversely, there was a positive correlation to altitude and expenditures. Thus, it appears there was some advantage to having a road than not having one, and that the roads were more accessible in the higher altitudes than in the lower ones.

Being near a road also had an advantage in relation to food aid. Eighty-five percent of the people, who were in receipt of food aid, also had access to a road. Ninety-five percent of the moderately food secure were near a road and 83 per cent of them were also receiving food aid (N=155).

Conclusions

Vulnerability profiles, such as the modest one described here, are useful for clearer targeting of assistance and the understanding of food insecurity in small subsets of populations. The profiles developed for Delanta informed the analysis of variations in local capacities to respond to emergency and long term food access problems. It was also important for clarifying the different livelihood strategies employed and existing access to services and external assistance. Such information adds value to ongoing rural development planning and relief assistance programs.

6. Chapter Conclusions

Some social theorists warn that over-emphasising differences could be counter-effective in terms of social justice (Merrifield and Swyngedouw, 1996). It could undermine activist movements aimed at effecting change and uniting people on the larger social issues facing society as a whole. However, I argue at various points throughout this dissertation that under recent food policy arrangements, such as Ethiopia has had in the 1990s, real action has been aborted because of an attempt to control, modify and even downplay differences. In addressing the implications, the point is not to abruptly skew attention towards individual experiences but to follow Giddens (1984) suggestion that we study social practices ordered across space and time. There are important differences in household assets and access to food, which have made vulnerability quite variable across spatial scales and between households. These differences have not been easily discerned from the Ethiopian government's early warning and food outlook reports. Until recently, resource limitations have been one reason preventing the government from preparing

vulnerability profiles at local scale, and thus they have shown an inconsistency between their stated objective of addressing food insecurity at the household level and practice. This chapter has shown the variability of vulnerability to food insecurity across altitudes and peasant associations within a relatively small geographic area. It has also supported the arguments in some of the literature on rural peasantry, that the lives of rural peasants are not always bounded and constant. They are shaded and textured (p.3). Their livelihoods involve adapting survival strategies and labour to changing agrarian, environmental and political processes. Their 'geographical dispersion imparts a highly localised character to each peasantry, thus making it difficult to discern long-term trends and broad spatial patterns' (Bryceson, et al, 2000: 3-4).

The vulnerability profiles developed for Delanta effectively compiled the data into vulnerability and food security categories, at a disaggregated and detailed level, which provided information based on which decision makers could more accurately target food assistance. The effort to provide analyses at very local scale supports the current national early warning system objectives, to develop more detailed and accurate descriptions of vulnerable people.

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Annex 1 : Example of land allocation system in Delanta

In **Kess Mender (lowlands)** farmers explained land distribution this way:

Homestead Land = 25m, Walka soil

Farm Land = 25m x 50m, Keyata soil and Nechata soil

Grazing Land = None. Farmers collect small amounts of grass around the edge of their farmland, which they feed to draught animals. The main source of animal feed comes from crop residue (of barley, wheat, maize, sorghum and straw).

Forest Land = Not more than 20ha. Communally owned and managed by the Fathers' Association, except for a small amount of trees fencing homesteads.

In **Zelam Kab (midlands)**:

A husband and wife get land from the two major soil types, i.e. 'Walka' and 'Keyate'. They receive .75 of land:

-Walka = 50m x 75m

-Keyate = 50m x 75m

With two children, a couple will receive an additional

-Walka = 50m x 75m

-Keyate = 50m x 75m

-from both soil types = 6.25m x 75m

-A total of .796ha would be allocated for this family

A couple with more than 6 children:

-Walka = 50m x 75m

-Keyate = 50m x 75m

-Both 50m x 75m

-Approximately 1.125ha would be allocated for this family

Female headed household:

-50m 75m from both soil types

-This is approximately .375ha

Ex-settlers and soldiers:

At a minimum, 12.5m x 75m, approximately .0937ha in total

The maximum amount is nearly that of a couple with no children

Grazing Land = 75m x 10m

There is no communal grazing land because of the high volume of cattle per land. Cattle feed mainly on weeds removed from wheat crops, hay and from grazing.

In Firja Mareja (midlands):

Walka Soil = 80m x 80m
Setae Soil - 40m x 80m
Keyate = 80m x 160m

Families with two children, will get an additional 15m x 80m of each type

Grazing Land = Distribution per household unknown. Whether they own livestock or not, all households get equal share of land. Households with no cattle sell their grass at food prices or make arrangements with farmers who have oxen to plough their agricultural land.

Annex 2a. Scientific and local definitions of soil type and percentages in Wollo zone

Soil Type (farmer's description)	Scientific Name ^{27a,b}	Scientific Properties ^{8c}	Proporti on in Wollo ²⁸
Keyate (red, brown)	Ferric and Chromic Cambisols	Other soils having a cambic B horizon or an umbric A horizon which is more than 25 cm thick, with ferralic properties. Chromic Cambisols have a strong brown to red B horizon (rubbed soil has a hue of 7.5YR)	35%
	Ferric Luvisols	Other soils having an argillic B horizon, showing ferric properties	4%
Walka (grey, black, clay)	Nitosols	Having an argillic B horizon with a clay distribution where the percentage of clay does not decrease from its maximum amount by as much as 20 percent within 150 cm of the surface; lacking plinthite within 125 cm of the surface; lacking vertic	4%

²⁷ a. Virmani, S.M. (1988) Agroclimatology of Vertisols and Vertic Soil Areas in Africa. In Management of Vertisols in sub-Saharan Africa, proceedings of a conference held at ILCA, Addis Abeba, Ethiopia, 31 August-4 September 1987.

b. R. Sant'Anna (1993) Major Soils for Food Production in Africa. In Soil tillage in Africa: needs and challenges, FAO Soils Bulletin 69. FAO, Rome.

c. FAO/UNESCO (1974) Legend of the Soil Map of the World, extract from Soil Map of the World, UNESCO, Paris.

²⁸ Bull, T.A. (1988) Agroecological assessment of Ethiopian Vertisols. in Management of Vertisols in sub-Saharan Africa, proceedings of a conference held at ILCA, Addis Abeba, Ethiopia, 31 August-4 September 1987.

and ferric properties			
Soil Type (farmer's description)	Scientific Name	Scientific Properties	Proportion in Wollo
Walka (grey, black, clay)	Vertisols	Soils which, after the upper 20 cm are mixed, have 30 percent or more clay in all horizons to at least 50 cm from the surface; at some period in most years have cracks at least 1 cm wide at a depth of 50 cm, unless irrigated, and have one or more of the following characteristics: gilgai micro relief, intersecting slicken sides or wedge-shaped or parallelepiped structural aggregates at some depth between 25 and 100 cm from the surface	10%
Setae (red)	Ferric and Chromic Cambisols	See description of Keyate	35%
Necha (sandy)	Ferric Luvisols	See description of Keyate	4%
	Fluvisols	Developed from recent alluvial deposits.	7%
Asherhonaie	Other, could be Lithosols or Andosols	Lithosols are limited in depth by continuous coherent and hard rock within 10 cm of the surface. Andosols are other soils having to a depth of 35 cm or more one or both of: (a) a bulk density (at 1/3-bar water retention) of the fine earth (less than 2 mm) fraction of the soil of less than 0.85 g/cm ³ and the exchange complex dominated by amorphous material; (b) 60 percent or more vitric volcanic ash, cinders, or other vitric pyroclastic material in the silt, sand and gravel fractions	4%

Annex 2b Physical properties of Ethiopian Vertisols

(Source: Asnakew Woldeab, 1988)

Texture

Vertisols in Ethiopia generally contain more than 40% clay in the surface horizons and close to 75% in the middle part of the profiles. The sand fraction is low, often less than 20%, and is found in the bottom and the surface (plough layer) horizons. In the highland Vertisols where soil burning (guie) is practiced, the sand fraction is normally high in the surface horizon because the clay bakes into sand-size particles (Table 2, Berhanu Debele, 1985).

Clay mineralogy

In Ethiopian Vertisols the dominant clay minerals belong to the smectite group. Since both the free and total iron contents of Vertisols are high, it is believed that Nontronite is the most prevalent smectite. Berhanu Debele (1985) indicated that illitic minerals also constitute a significant proportion.

Bulk density

Because few data on bulk density of Ethiopian Vertisols are available, it is not possible to characterise bulk densities of very widely distributed Vertisols. Reports from elsewhere show that Vertisol bulk density is usually high, 1.5-1.8 g cm⁻³, and may reach 2.05-2.1 g cm⁻³ (Murthy et al, 1982). Swelling and shrinking with changes in soil moisture content cause these variations in bulk density. The soils have high bulk density when dry and low density when wet (Virmani et al, 1982).

Consistency

When dry, Vertisols are hard and impossible to plough with oxen-drawn implements and may even be difficult to cultivate with heavy machinery. Seedbed preparation is therefore difficult; the seedbed is generally rough even after repeated cultivation. When wet these soils become plastic and sticky. Tillage and seedbed preparation are only possible within a narrow soil-moisture range.

Structure

In the dry season, surface horizons are characterised by huge, strongly developed prismatic primary structures separated from each other by deep vertical cracks, of various sizes, at intervals of 20-30 cm. These prisms break into strongly developed, often coarse, and angular to sub-angular, secondary aggregates. In the wet season, both primary and secondary structures are almost completely destroyed, reducing the surface horizon to a massive block. At this time only shiny pressure faces and/or well-developed slickensides are visible (Berhanu Debele, 1985). Pores, except for the cracks developed during the dry season and occasional root channels, are limited. The plant roots are confined to cracks and slickenside faces.

Available water

Vertisols have a relatively high water storage capacity in the root zone because of their depth and high clay content. The available water range has been reported as 110-250 mm for the top 1 m of the soil profile (Virmani et al, 1982). Virgo and Munro, as quoted by Virmani et al (1982), observed that the moisture content in deeper layers of the soil profile is lower, apparently due to compression effects on metric potential.

The high water-storage capacity of Vertisols is important in regions with uncertain rainfall. The growing season on deep Vertisols is usually longer than on other soils; on the highland Vertisols, wheat, lentil, chickpea and vetch grow to maturity entirely on residual soil moisture after establishment at the end of the rainy season. Farmers practice late-season planting to avoid the serious drainage problems characteristic of these soils during the rainy season.

Annex 2c Problems associated with Vertisols
(Source: Asnakew Woldeab, 1988)

Cultivation and seedbed preparation
Ethiopian Vertisols have a high content of clay, particularly expanding lattice clays. High clay content, type of clay mineral, unfavourable consistency and absence of pores make them difficult to work in both dry and wet conditions. A substantial amount of rainfall is needed to wet a dry Vertisol. The rain tends to move into cracks rapidly and wets the deeper layers of the soil profile, leaving the surface relatively dry. Achieving optimum moisture conditions for cultivation is difficult under present management practices. Once the rainy season starts and the surface is wet, cultivation is virtually impossible.
To overcome cultivation difficulties, seedbed preparation for all crops in the Ethiopian highlands starts with two ploughings during the short rainy season (March/April), when workability is relatively good. Up to six passes are made to prepare a seedbed for teff and durum wheat. It is not always possible to prepare a fine seedbed. Even after repeated cultivations the seedbed is rough. For the other crops, two or three passes are considered sufficient.
Drainage
The highland Vertisol areas are generally characterised by smallholder mixed cereal-livestock farming systems with a marked subsistence orientation. Land cultivation is almost exclusively done using oxen-drawn implements. The area is characterised by high rainfall (>900 mm year ⁻¹) and low evaporative demand due to moderate temperatures, which vary widely with altitude, but might average 15°C annually. As a result, most vertic soils are severely waterlogged (estimated at 2.5 million ha, especially vertic Cambisols and vertic Luvisols) (Jutzi and Mesfin Abebe, 1986).
As the result of poor drainage, crops sown in early June suffer from prolonged waterlogging they are stunted and show signs of poor aeration and nutrient deficiency. Grain yields are low.
Erosion
Vertisols in Ethiopia are located on either relatively flat or slightly sloping land. Erosion is a serious problem under present management, especially on fallow cultivated during the rainy season and on some sloping land in the highlands.

CHAPTER FIVE

Food Aid Discourses: examining vulnerability myths

1. Introduction

An important underlying theme in previous chapters, was that generalizations about vulnerability to food insecurity, primarily that promoted by Ethiopian government and institutions in the early warning system, treat food insecurity as a regional or national problem and therefore often miss the rich heterogeneity of vulnerability at the household level. In this chapter, I examine the origin and structure of those generalizations by applying different forms of discourse analysis. This follows the tradition of Foucault (1968, 1977) and Latour and Woolgar (1979) as discussed in Chapter Two. All development and environment questions contain contradictory tendencies and rivalries (Nygren, 1998), and ‘environmental politics brings together a great deal of actors who not only all have their own legitimate orientations, but have their own modes of tackling it too’ (Hajer, 1993:46). Similarly, the policies and practices addressing vulnerability to famine and food insecurity are imbedded with cross-purposes, unfulfilled expectations, agendas, and competition. Despite this, the food policy and vulnerability analysis/assessment (VA) record is not entirely bleak; there are localized success stories and progress towards collaborative analyses of vulnerability in food insecure environments (as in Ecuador, see LAWG-FIVIMS, 1999; or Southern Africa, see SADC FANR Unit publications¹). When famine and food insecurity interventions fail despite advances in understanding what causes vulnerability to food insecurity, this flags problems of institutional capacity, as Maxwell (1997) suggested, and the difficulty of working on complex issues involving many institutions. I argue that it also points to a disjuncture between theory and practice, between policy and implementation. The globally accepted vulnerability

¹ The Southern African Development Community (SADC) is a development effort managed by neighboring countries within the southern African region. A description of collaborative famine early warning activities of the

concepts, food insecurity explanations, methods for analysis and intervention, mythologize the causes and solutions to food insecurity and vulnerability. It effectively widens the gap between decision makers and vulnerable people. The two myths discussed in this chapter highlight the disparity between concepts eschewed in global fora and what occurs within countries in practice. I am specifically referring to the: 1) the responsibility for ensuring the human right to food would be a shared responsibility between donor and aid receiving countries; and 2) the belief that vulnerability to food insecurity would be addressed at the household level.

In this chapter I discuss global food policies, select statements in the Ethiopian national constitution, the policies of foreign aid giving institutions, events and discussions in the national early warning system, which effect the formulation of vulnerability and food insecurity alleviation strategies. The remainder of this introduction highlights the basic elements of a discourse analysis that will be used throughout the chapter to trace the origins and perpetuation of vulnerability myths. Section two explores the ‘framing’ of global concepts, such as food for all, rights to food and the concept of household vulnerability to food insecurity. In section three, the aims are to specify the content and structure of Ethiopian policies and vulnerability measurements. Section four considers the style of behaviour and argumentation in the Ethiopian early warning system that portray wider messages about vulnerability and institutional power dynamics. The content of this discussion comes from secondary source data, Ethiopian government and humanitarian aid documents, and interviews with humanitarian and government personnel in 1997 and 1998. Much of the discussion refers to the 1990s, particularly the period from 1996-1999.

Elements in a discourse analysis: frame, specification and style

Discourse has many meanings. It may be an intellectual framework for concepts and ideas; it may refer to linguistics, debate or practice (Hajer, 1993; Bullock and Stallybrass, 1977, Honderich, 1995, White, 1994; Watts, 1995). Barnes and Duncan (1992) show that discourse analysis has two foci: the broad context and the details of that context. The dual emphasis underscores recent discourse-based development analyses that aim to disentangle development frameworks from development activities. Development analysts argue that discourse analysis separates actual events from the policies, theories or models that they have been shown to fit (Apthorpe, 1996). Likewise, I am interested in discourse as the intellectual framework for vulnerability analysis to food insecurity. Additionally, I am interested in the dominant debates within that framework and the myths. Myths are one means of framing and perpetuating ideas, and therefore they are also both the context and the content of a discourse. They are fundamentally systemic or societal.

Specification is one analytical method of identifying, articulating and deconstructing a myth. Through specification one defines the very content of the discourse, what claims it makes. A complimentary method is to evaluate the style of a discourse or myth. Style illustrates the quality of the processes by which the myth is disseminated, what ideas perpetuate it and why. Style might be the language used; a policy position, propaganda or the media, any means whereby the myth can be validated.

Gasper (1996) explains that certain literary devices characteristic of style, are consciously or unconsciously employed in text and concept. Exclusion and narration are examples. The modes of excluding concepts, policy positions, methodological

approaches, or interventions are ways of framing the authority of different positions. Select activities are the substance of the main position policy makers and practitioners aim to advance. Narratives are stories that also promote certain aims. The synthesis of judgments and experiences is characteristic of political narratives. They convey the need for selecting and constructing explanations from information available, and the explanations are joined together into an overall account of behavior. Exclusion and storytelling are done purposefully to weave together and apply the phases relevant to the position(s) upheld.

2. Framing: Food for all, rights to food and the concept of household vulnerability to food insecurity

Following the failure of previous world food conferences to achieve their commitments, the World Food Summit (WFS) in 1996 attempted to re-frame food politics in humanitarian terms. More emphasis was placed on the right to food and vulnerability to food insecurity at the household level. These famine and food security frameworks have now become the basis for national policy and humanitarian practice. Much of the interest in food security as a human right belonging to every household was popularised at the World Food Summit. Hajer's (1993) work demonstrated that such meetings among decision makers play a large role in the process of policy formulation and persuasion. However, the introduction of global human rights concepts and the interest in household vulnerability to food insecurity signified the polarisation of concept and responsibility for eradicating hunger. The global debates about famine that emerged in this setting also gave an enormous scope to a complex issue, and this reflected the different interests at stake, the many constraints to achieving food security and the uncertainty of eliminating hunger. The concept of

household vulnerability provided a metaphor for globally, publicly stated aims, around which different political and economic interests could converge.

Matters of Scope: global food aid and resources vs. household vulnerability

There were 186 nations gathered at the World Food Summit (WFS) to articulate a coalition of ideas pervading policy at all levels of decision-making. Its tenets---the Rome Declaration on World Food Security and the World Food Summit plan of action---echoed similar promises heard at the World Food Conference of 1974, and the commitments of most of the major developed countries since the Second World War. It was partly an attempt to move beyond rhetoric and to challenge policy makers to explore whether the ‘right to food’ and ‘freedom from hunger’ were achievable. Indeed the Summit proposed self-regulatory mile-markers: notably, the Plan of Action, a reduction of malnutrition to 1/2 by 2015,² the Food and Agriculture Organisation’s (FAOs) monthly Committee on World Food Security (who monitor progress in implementing the World Food Summit plan of action) and a Technical Consultation on Food Insecurity and Vulnerability Information and Mapping Systems (FIVIMS). The target of halving social problems, like poverty, by the year 2015 had been agreed at the World Summit for Social Development in Copenhagen (1995) and later became entrenched in UN declarations and the Development Assistance Committee of the OECD. Thus various global vulnerability narratives coalesced in the WFS meeting.

Alongside the emphasis on global aims, however, the 1996 summit was distinguished from previous global food policy meetings by a shift in perception about food security,

² Several International Development Targets (IDTs) were established at the World Summit for Social Development in Copenhagen (1995). In addition to the reduction in malnutrition, they include gender equity in education,

as primarily a consequence of national production failures and rather as a socio-economic problem determining and affecting the vulnerability of individual households. This was particularly present in NGO participation. Through a series of consultations prior to the summit and in an NGO forum that ran alongside the Summit sessions, NGOs showed a determination to bring the global debate down to the local. There were representatives from some 1200 organisations and 80 countries. They frequently narrowed the focus on the vulnerability of family farms, and referred to them in each clause of a collaborative *Civil Society Proposal* for achieving food security (NGLS, 1997).

The range in perceptions about the problem was indicative of the ever-broadening definitions of famine, food security and food aid concepts that began developing in the 1980s. It fell in line with a post-modern and Foucauldian framework, one that specified the argument from different viewpoints: the donor, the farmer, the multilateral institution and the NGO. It indicated a political tension between the discursive positions of developed countries and developing countries. This broadened scope would complicate strategies for alleviating hunger by making it more difficult to identify the responsible parties.

Alternative viewpoints on the constraints to achieving food security

The moral tone of the summit suggested individual motives promoting the *right to food*. Dr. Jacques Diouf, Director-General of FAO, first proposed the idea for the Summit. Mr Diouf was born in Senegal; a country periodically affected by Sahelian

poverty reduction, improvements in maternal and child health. In 1996 the World Food Summit upheld the goal of halving the cases of malnutrition by 2015.

drought and most recently faced famine in the middle 1980s and early 1990s. In his final address at the Summit he argued against poverty, cynicism and egoism, while upholding human values in relations among states and within countries and communities. Pope John Paul II, who referred to the intolerable contrast between rich and poor, endorsed these sentiments. The church's stance on contraception and abortion were evident as he often forcefully dismissed population control as a means of creating food security (Reuter, 1996). The Pope placed the causes of food insecurity on political instability, war, international debt and trade embargoes.

The focus of the WFS technical background documents showed similar constraints to achieving food security: sustainable development, income generation, socio-political factors, population growth, malnutrition among mothers and children, degraded natural resources, research, institutional capacity, technology, trade and food aid (FAO, 1996). Among these issues, trade policies evoked controversy particularly around export subsidies as the basis for improving food security in developing countries. Representatives from developing countries and commodity traders were reportedly among those sceptical about the success of the free trade initiatives. African governments sided with the Pope in saying that open markets were unfair to them and free market rules only work if everyone could compete on equal terms. Some developed countries held a double standard by asking developing countries to reduce agriculture subsidies while they continued to do so. Commodity traders opposed political intervention into markets citing the failure of previous world conferences to eliminate hunger. The United States (US) urged developing nations to free their markets. They declared that free and fair trade promoted global prosperity and plenty. The chairman of the US Federal Reserve, Alan Greenspan, took this up a few years later in response to anti-globalisation activities at World Trade meetings in Seattle,

Washington. He said, *"It is essential to note that probably the best single action that the industrial countries could actually take to alleviate the terrible problem of poverty in many developing countries would be to open, unilaterally, markets to imports from these countries. These countries need more globalisation, not less"* (MSNBC News, 2001). Export subsidies were portrayed by the US as the great evil constraining world market capitalism. It was a criticism leveraged at both developed and developing countries. The European Union, for example had recently reinstated export subsidy programmes. Canada and other countries joined in this portrayal. It was implied that trade reforms would be a condition for further US aid to developing countries (Reuter, 1996). It has been said that donor countries tend to value food aid in terms of the costs to themselves (Shaw and Singer, 1996:454). This appears to have been the case with the US. Their position on trade represented a framework in which domestic considerations were at stake. The US foreign assistance budget had been reduced in recent years and the leading US agencies responsible for foreign assistance—Department of State and the US Department of Agriculture—concentrated on the interests of US agriculture and their economy (USAID, 1995).

In a six-point proposal NGOs presented an alternative development model in which they also upheld the rights to food, spoke against the terms of free trade that harm family farms and pushed for continued food aid without international sanctions or conditions.

As White (1994) has argued, conflicting points such as these occur less for negotiating purposes and more as a consequence of framing individual policy issues. In addition to trade, a defining aspect of this framework was food aid.

The decline in responsibility for food aid

A distinct message coming across during the 1990s was that the largest responsibility for food aid was on national governments. Assistance from the global international community would supplement local efforts as necessary. Drèze and Sen (1989) for instance implicated states for failing to enable access to food and to protect livelihoods. In 1995 the World Summit on Social Development acknowledged that it was the primary responsibility of states to attain social goals. In 1996, the WFS again emphasized that national governments have the ultimate responsibility of ensuring that all their citizens are food secure and this was repeated in the WFS Plan of Action (see action plan objectives 1, 3 and 12). It is notable, however, that the World Food Summit placed a disproportionately greater responsibility on governments when the most cited advocates of public action in famine policy, Drèze and Sen (1989), did not. They gave national governments a major role, but they did not intend for states to be the primary agents in eradicating hunger.

Repeatedly, the WFS placed the onus on national governments in relation to trade and food assistance. The message at the Summit was that international trade policies would work only if *domestic* policies protected the poor (WFS, 1996:40-44). Three goals for achieving food security were articulated of which two were wholly within the realm of national responsibility. These were to provide timely, adequate and appropriate relief interventions and to make assistance a tool for development. A third goal was to provide assistance to those who would not otherwise have access. The role of international donors in providing assistance became evident as the reduction in global food assistance came along with more aid conditions. Most, like the British government, wanted to see financial, social and governmental reforms (Speech by

Chalker and Hurd, 1990). Many donors held the view that past inefficient and wasteful food assistance programs justified a reduction in overseas development assistance.

The decline in overseas development assistance

The WFS was scheduled in the wake of decreases in all forms of foreign aid during the late 1980s and the 1990s. Foreign aid is a multi-billion dollar business supporting the livelihoods of people in the North and the South. Food aid had been the main form of non-financial economic aid to developing countries, drawn from surplus agricultural production in aid-giving countries. The total food aid worldwide was US\$800 million in 1996, representing 1.5 percent of all overseas development assistance (ODA) (Lancaster, 1999:37).

Along with a general decline in ODA in the 1990s, there has also been a decline in food aid available ³ since 1992/93, when it reached a record level of 17 million tonnes (FAO, 1996). It has declined from relatively high levels in the middle of the 1980s to now being a marginal and increasingly uncertain component of global aid to poorer countries. In the 1990s, food aid comprised between 3 and 4 percent of official ODA compared with more than 20 per cent in 1965 and 11 per cent in 1985 (ODI, 1998). Overall food aid shipments declined from just over 10 million tonnes between 1995 and 1997. Much of this decline has been in bilateral ⁴ food aid. Multilateral commodity assistance, the majority of which is provided through the World Food Programme (WFP), has shown a much lower rate of decline and consequently by 1997 this form of

³ This refers to the early 1990s. In 1998, FAO predicted an increase in food aid contributions from all donors, forecasting based on the slight increases in 1997/98.

⁴ Bilateral aid transfers directly from governments in aid-giving countries to governments in developing countries.

corporations, which, as Hart (1997) explains, are quite specific in the way they enter and transform local politico-economic networks and follow hybrid and multiple paths of capitalist development. This is true for the allocation of general ODA as well as food aid, the latter inextricably linked to debates on agriculture and food policy.

Changes in global agriculture and national and international food policy reflect larger issues to do with capitalist dynamics, innovation, and institutional change. Lancaster (1999) relates the drop in the donor contributions to overseas development to their own domestic agendas that developed while communist states underwent a transition to capitalist economies. At the same time, the previously capitalist countries were transforming in ways suited to a new global political and economic environment. Castells (1996:20) describes this as capitalist restructuring. He observes that the process of (capitalist) restructuring had very different manifestations in societies around the world:

‘...It was diverted from its fundamental logic by the military Keynesianism of the Reagan Administration, which created difficulties for the American economy... it was limited in Western Europe because of society’s resistance to the dismantling of the welfare state and to one-sided labour market flexibility, with the result of raising unemployment in the EU; it was absorbed in Japan without dramatic changes; and it plunged the economies of Africa (except South Africa and Botswana) and Latin America (except Chile and Columbia) into a major recession in the 1980s, when IMF polices cut money supply, reduced wages and imports, to homogenise conditions of global capital accumulation around the world.’

Goodman and Watts (1997:4) provide a useful divergence from Castells’ idea, theorising that a characteristic of capitalist restructuring has involved a global regionalism of competing continental trade blocs, which they call ‘triadisation’. Triadisation is premised on centrifugal forces that exacerbate fragmentation and exclusion leading to the progressive de-linking of the triad from the rest of the world – a form of ‘truncated globalisation’. I would add that what Goodman and Watts refer to

as triadisation and truncated globalisation is not much different from the forms of capitalist accumulation exercised by multinational corporations in the post World War II era. It helped secure the competitive advantage exclusive first to North America and Europe and later to East Asia.

The globalisation of capital and power has exacerbated the divisions between North and South, and supported a competitive atmosphere between the 'haves' and the 'have nots'. Once developing countries decided to make the transition to 'democracies', they became participants in a new global order, and that usually entailed a restructuring of their economies.

Ethiopian ODA: contradictions and conditions of aid giving

Despite the general reduction in aid, which I argue suggests a decline in donor responsibility for promoting a right to food, Ethiopia's ODA actually increased between 1980 and 1996 (World Bank, 1999). In 1990 and 1995 Ethiopia was among the top five African countries receiving overseas assistance from different donors (Lancaster, 1999:49). This is explained by the famines in 1974, 1982/84 and severe drought years 1994/95 and 1997/98, when *emergency* food assistance was granted. Sub-Saharan Africa garners one half of the global emergency food aid (Shaw and Singer, 1996). Ethiopia's willingness to impose structural reform policies in the 1990s contributed to continued favourable aid contributions.

The foreign aid relationship with European donors that began in the early decades of the 20th century continued in full force with the United States during the post-war (World War II) era. This subsided considerably while the country was governed by Mengistu's interpretation of communism during the late 1970's and 1980's. In the wake of Ethiopia's drought in 1984 and the worldwide focus on the worsening economic crisis in the region, aid again rose sharply reaching its peak in 1990. When

the Mengistu government fell, a courtship with western aid was renewed and new efforts were made to transform the country to a democracy. Structural reforms were the conditions for receiving World Bank and International Monetary Fund supported Sector-wide Development Programs ⁵ and an Enhanced Structural Adjustment Program in Ethiopia, worth US\$42 million for the 1998/1999 period. The data on Ethiopian ODA and food production are presented in the Annex.

The rate of adoption of Structural Adjustment in transitional and low income economies has been high, despite the evidence that Structural Adjustment has little ability to reduce poverty by accelerating growth (Killick, 1999). Although it is difficult to generalise about the effects of Structural Adjustment across countries, it has also been indicated that they are only a small part in the attack on poverty. Demery and Addison (1987) discussed the negative effect IMF/World Bank conditionality had on agricultural production in sub-Saharan Africa during the 1970s and 1980s. Furthermore, they argued that the effects on food consumption among vulnerable groups would depend on how poor peoples' incomes were affected by Structural Adjustment policies. That poor countries commit to such policies can only be explained within a complex global power structure in which there are real and perceived advantages for both parties. Shaw and Singer (1996) observed that the conditions imposed by Structural Adjustment programs are high, and those programs usually contain an element of food assistance. Where the possibility of food assistance or ODA of any kind exists, governments are more likely to instate policies that facilitate acquisition of aid. The adoption of policies based on economic, social and

⁵ Sector-wide Development Programs are used by the Government to ensure that donor contributions meet the Government's priorities and also as a means for donor co-ordination. Presently there are three SDPs (also known as Sector Investment Programs, SIPs) in Ethiopia- Transport, Education and Health (IMF Special Program of Assistance Status Report for Ethiopia, 1998, section I, no.7).

political conditions reinforced certain myths about addressing food security and vulnerability.

A global framework which promoted access to food as a human right was ripe with contradictions which had the effect of placing the responsibility for eradicating hunger on everyone and no one. Vulnerability to food insecurity framed within the concept of global rights to food presented a myth of vulnerability as a globally shared challenge and that conditions for individual households could improve through institutional collaboration. In reality, the operational rules of this rights-based framework, in which there was a hierarchical division between global and national responsibilities for assistance and conditional international economic arrangements, suggested that household level vulnerability to food insecurity would be alleviated primarily by the efforts of national governments. Moreover, the financial arrangement for the receipt of aid to countries like Ethiopia or Zimbabwe, whose recent human rights records have been poor, were not indicators of increased international responsibility. Rather it demonstrates that the continued, and sometimes increasing, supply of assistance was allocated on conditions and less favourable to receiving countries. For most developing countries this meant that there would be a greater responsibility of meeting the needs of hungry people, as they confronted the administrative task of juggling food security programs with competing poverty issues, national economic considerations and conditional foreign assistance.

3. Specifying content and structure of Ethiopian policies and vulnerability measurements

The constitutional principles and policies among agencies in the Ethiopian national early warning system during the 1990s were framed by the global concepts of a *right to*

food expressed in the World Food Summit and reflected the polarisation of concepts and responsibility in the North versus the South and the global versus the national/local. They illustrated the politics of food aid and of political transitions. Within this framework, the rules dictated that ODA, food aid and economic assistance of any kind would be conditioned on the adoption of terms favourable to donors and on global humanitarian concepts. They were predicated on the adoption of democratic forms of governance and national accountability.

In assessing the content and structure of Ethiopian policies related to vulnerability and food insecurity and vulnerability measurements, it is important to clarify what the policies imply, whether they reinforce the concept of *rights to food* and how they define vulnerability. This will help identify how vulnerability myths take form and the discursive rules that keep them in place. Gasper has followed Scriven's (1976 in Gasper, 1996) view that the content of arguments should be found in definitions, conclusions, structure and unstated assumptions. In doing so he describes a procedure for articulating the concepts in policy. According to Gasper, the researcher then searches for an understanding of the implications and assumptions, those statements that make the policy argument complete or consistent. How are ideas connected, inferred or concluded? Who are policies targeted to and why? This approaches policy as both written and socio-political text. Barnes and Duncan's (1992) description of text as metaphor for cultural and socio-political practices may apply to our understanding of policy. Thus policy as a text may develop within a specific framework, it depends on a range of interpretations and generally has a meaning beyond the initial context in which it was composed. Policy in this sense is a discursive strategy.

Policy as a discursive strategy

The historical relations between the Ethiopian government and humanitarian aid institutions play out in current food and vulnerability politics. A WFS objective was that governments and partners should engage in humanitarian programmes, which identified who and where were the vulnerable and food insecure people (WFS, 1996:45). The policies of humanitarian institutions engaged in providing food assistance and development in Ethiopia showed a political allegiance to upholding these international agreements and concepts. As early as the famines in the 1980s, the agreement to identify vulnerable people was a fundamental element in negotiations between foreign institutions and the Ethiopian government regarding food aid distributions. From the early 1990s onward, the concept of household vulnerability became a common feature in government policy; it appeared to readdress the historical arguments between government and international institutions over appropriate allocations of food aid, it brought attention to individual problems and left the impression of a desire to disengage from the inequalities present in the food assistance policies of the previous regime. National policies also represented the change from a centralised, military system founded on communist ideologies to a democratic, capital driven one.

Ethiopian constitutional rights and rights to food

A good example of the policy shift is the Ethiopian constitution of 1994. This constitution should be acknowledged for advancing human and democratic rights, particularly in relation to women. Several of its articles are fundamental to supporting the right to food, although none specifically uphold this right. For example, the clauses in article 40 allow and protect peasants' rights to land for cultivation and cattle

grazing. The nearest to upholding individual rights to food, however, can be assumed from the economic, social and cultural rights in article 41, which says that every Ethiopian has a right to engage in economic activities and should have access to social services specifically public education and health (article 41.1-3). Farmers and pastoralists also have the right to fair trade and an equitable share of national wealth (article 41.8). State responsibility for economic, social and cultural affairs falls in line with Dreze and Sen's (1989) notions of the state as enabler. The state therefore has the obligation to adequately resource social services, expand job opportunities for the unemployed and the poor and undertake such programs and public works towards creating employment (article 41.4-7). These rights and state responsibility for assuring them are duly subjugated to the larger powers of state control over land and resources and the economy described in article 51. However, the powers to enact specific laws relating to these rights are afforded to the peoples' representatives in parliament (article 55). It is also the representative who signs onto international agreements and approves social and economic policy. The Prime Minister and the Council of Ministries are responsible to the House of Representatives, and must enforce laws, directives, and policies decided therein. Thus the constitution provides for a system of checks whereby international and state mandates may be balanced against peoples' needs, including access to safe and nutritious food.

Government policies

Articles 85 to 93 of the Ethiopian constitution outline national policy principles and objectives. These articles assign all arms of government the duty of formulating participatory policies that ensure favourable economic conditions, protect people from and provide early warning for disasters, promote health and welfare, and provide access to food security. In August 1995 a proclamation was made to establish the Disaster

Prevention and Preparedness Commission (DPPC) thereby formalising the power and duty for studying vulnerability to all disasters, early warning, and strategic planning to this institution. Under previous regimes, the DPPC had been named the relief and rehabilitation commission (RRC). The change from RRC to DPPC was consistent with a broadening of focus and an emphasis on linking relief and development approaches. The RRC was an emergency relief operation, while the DPPC attempts to engage in long-term development. The extent that constitutional statutes and institutional arrangements relating to national policy were adhered to was largely determined by how policy was formulated. As discussed in the introductory chapter (Chapter One), Ethiopian food security policies in the 1990s reflect the global shift in emphasis from production and supply to household food security and vulnerability, which was consistent with a change in government. In 1991, the country officially transformed from a command, centrally managed economy to a democratic, market oriented system. Nevertheless, some policies in the 1990s exhibited conceptual irregularities that told of competing perceptions of vulnerability, food insecurity, famine and democracy.

Donor, UN and NGO policies

Government policies had the largest influence on early warning and relief activities, but their policies and activities were connected to the interpretation of food security, rights to food and household vulnerability of other institutions active in the early warning system. During the 1990s, the US Agency for International Development, WFP and Save the Children, UKs (SCF-UK) policies had a particular effect on how vulnerability assessments (VAs) were carried out.

The United States instated laws to provide assistance to poor countries starting after World War II, and in significant amounts to Africa since the 1960s. Section 402(s) of U.S Public Law 480 defines food security according to the World Bank (1986) definition as ‘access by all people at all times to sufficient food and nutrition for a healthy and productive life.’ At an elementary level, access to food and a right to food may be considered along the same sociological lines. The framing of international food policy according to US agendas on trade and international relations, places conditions on food access and therefore may also be considered a constraint on the right to food. Farmer vulnerability is given a tertiary consideration next to US domestic agriculture and US foreign policy.

Public Law 480 set the legal framework for condition-based aid programming. Title I of that law deals with Program Food Aid, that is aid transferred bilaterally from government to government. Under Title I, export credit programs develop foreign markets for US farm products and assistance is provided on a concessional loan basis (USAID, 1995). Under Title II, food aid is granted for emergency and development purposes and is mainly managed by US private voluntary organisations and the WFP. Title III provides aid as long as the recipient government has introduced policy reform.

As the institutional vehicle for U.S donations, the USAID also made nations accountable for their own food security. Trade issues were critical to their policy framework. They supported expanded global trade markets, reduced subsidies, and democratic and sound domestic policies. In a statement at a food aid and food security workshop held in Addis Ababa, USAID placed long-term food security under the remit of national governments (USAID, 1995:14). Food aid could only fill a short-term gap as long-term aid might conflict with US economic interests. Food aid could only

supplement other development programs. Furthermore, from their point of view, there was no conflict between an adherence to the World Bank definition of food security and the position that food aid was temporary and sometimes not necessary to the pursuit of achieving food security. Implicit in this stance was the belief that some countries would never realise food security or development (USAID memo, 1995: 4-5). The underlying pessimism about aid in general was linked to the perception that the root causes of vulnerability and food insecurity originate from a range of local not global problems. The root problems were defined as poverty, population pressure, national economic policy and natural resource constraints (p.3). The chief cause of food insecurity was acknowledged to be chronic poverty and the persistent lack of economic opportunity (USAID-paper, 1995:10). Thus the USAID role was to assure that food aid supplemented national efforts not to supplant them. Like Ethiopia's National Policy on Disaster Prevention and Management, a firm interest was to allocate food aid when needed to the people likely to require it the most. The USAID-famine early warning system's vulnerability assessment was designed to immediately identify regions and groups most likely to experience 'episodic food shortages and problems of inadequate food access in order to prevent severe malnutrition and starvation' (USAID-FEWS, 1996). This was a practical assignment that would help capture the basic dynamics of food economy regions and groups and would link to an elaborate system for compiling vulnerability indicators. It was built to help create access to food. Yet it fostered a developmental scepticism about the feasibility of sustaining poor countries and therefore served to protect donor financial interests in the long term.

Another institution whose policies are largely donor orientated is the World Food Programme (WFP). Like the USAID, it operates under a 'food-access' definition of food security but this is a corollary to other objectives that do not necessarily foster

access to or rights to food at household level. For instance, a major part of their program in Ethiopia is dedicated to emergency assistance. From 1965 to 1996 the WFPs assistance to Ethiopia averaged around 34 million dollars a year: nine million dollars for refugee feeding, 14 million dollars for emergency operations and the balance, 11 million dollars, for development. Only recently has emphasis shifted somewhat towards facilitating development in recognition that development strategies further the aims of helping food insecure people in the long-term. In a 1998 report, the WFPs goals for the Ethiopia country program were 'to improve in a sustainable manner, the level of food security of approximately 895,200 beneficiaries a year through the creation and rehabilitation of assets and support to the development of human resources; and enhance emergency preparedness and response by targeting food aid to chronic food-deficit areas, and strengthening the capacity for planning projects suitable to [the government's food and employment access schemes]' (WFP Ethiopia country program report (1998-2003), sections 21-22).

Despite the turn towards development, A WFP strategic aim that is not necessarily conducive to meeting the needs of vulnerable households in the long term is collaboration with national governments on a data focussed VA. WFP's program activities have been adjusted over time to match the decline in food aid available and the Ethiopian government's program. There is interest within WFP to align its program work with other Government development plans, such as the Sectoral Investment Programs (SIPs), and they have been impressed by the support this program has received from the World Bank, the African Development Bank and the UN. Ties to the government are also evident in their VA and mapping. The WFP must work closely with Ethiopian government on VA primarily because it is there that they have obtained the bulk of raw data. VAM staff sits on the government's early warning

committee and on the VA sub-committee known as the VA group. WFP-VAM analysis is done by systematic data collection and the organisation and integration of that data to national scale (WFP memo, 1996). The affiliation with government is limited to national activities and strategies, which means that their vulnerability analysis seldom captures patterns in individual household food economies and access to food.

While donor and UN agencies have fixed programmes at the country level, historically the international responsibility for farmers and households has been within the NGO remit. Save the Children Fund, UK (SCF-UK), for instance, has provided aid to Ethiopia since 1932. Its operations were largely emergency relief in the central highlands during the famine of 1973-74. Beginning in the 1980s they have engaged in famine preparedness. Their current aims are to offer relief, rehabilitation and development and to build the capacity of communities and governments to secure benefits for children (SCF, 1994, Country Report). They are committed to protecting the rights of children through a range of projects including food security. A nutritional surveillance programme and support government agriculture and food assistance initiatives are regionally and community based. Nutritional survey activities provide information by which long-term development may be achieved. These activities operate alongside the development of the Risk Mapping program in the 1990s whose purpose was to identify vulnerable food economy areas. RiskMap is fed data collected using SCF's nutritional surveillance program, secondary sources and the Household Food Economy Approach. The food economy approach surveys a sample of households from which a profile of households in vulnerable areas and zones is made. The fundamental principle behind the approach was Sen's concept of entitlement to food, with an emphasis on production and markets. SCF's activities and RiskMap

therefore reflect in principle and programme, a commitment to addressing the right to food as well as household level vulnerability.

Vulnerability measurements

To carry out its policies the Ethiopian government referred to a type of economic rationalism, in which vulnerable people were quantified, calculated and measured. In economic arguments the social becomes measurable in scientific terms (Apthorpe, 1996). Indicators are pursued to vindicate positions not merely to describe them. This method of analysing vulnerable people introduces vagueness to complex problems symbolic of the myth that the variability and heterogeneity of addressing household level food insecurity would be achieved. It shows the target group to be VA decision makers not vulnerable people. In Ethiopia, these methods have further masked the uncertainty of the problem and its solution in an atmosphere of reduced ODA. Apthorpe (1996) describes four types of measurements of this nature. *Absolute measurements*-- characterised by datum lines; *headcounts*; *Relative measurements*—bottom deciles compared to top deciles; and *participant—self-rating* systems. Policy dictates methodology and methodology explains the policy framework. Policy that promises to eradicate poverty is generally drawn to absolute measurements. Ethiopian policies were aimed at poverty alleviation while their planning documents indicated other motives and methods. They concentrated on the headcount method and the participant method in analysing vulnerability and in targeting.

Headcounts served the purpose of supporting emergency relief policies and informing decision makers in government agencies, NGOs and other aid agencies (DPPC, 1997). The result was to separate affected populations into vulnerable and non-vulnerable groups with little further distinctions among the poor or within regions. From the point

of view of vulnerable people, this approach is best suited to emergency situations than to long-term development programming. Headcounts may provide evidence for the need of food assistance, while they can also be manipulated and negotiated to achieve greater gains. For several decades the practice of tallying the numbers of needy people in Ethiopia has been the main output of crop assessments and is the basis for relief appeals.

Participant food aid self-targeting fits within the policy framework of the National Policy on Disaster Prevention and Management (1993), of distributing free food to those who were most in need and assigning able-bodied people to assistance programs (for instance through food-for-work programs). This would facilitate the policy to develop VA profiles within communities and to acquire a deeper knowledge of coping mechanisms and other vulnerability factors. Yet so far, there are no well-elaborated methods with the capability to carry this out.

An occupation of some international NGOs, UN and multilateral institutions in Ethiopia is the data collection, computer modelling and mapping. This has been driven by the need to produce comparative vulnerability figures against which government figures could be tested and donors could be convinced. The target audience for most VA activities were the donors, the institutions that conducted VA, and government (USAID-FEWS, 1996:1-2; DPPC, 1995; WFP-VAM, 1995). By the 1990s it had become conventional knowledge that a single indicator could not measure vulnerability. This informed much of their data analysis, because it was important to know which indicators pointed to food insecurity and vulnerability, and who would require food aid and who would not. Selecting, indexing, cataloguing and weighting indicators were instrumental to both the WFP and the USAID-FEWS vulnerability

analyses. Indicators served to prove the institutional policy position on the causes and solutions to food insecurity. The USAID-FEWS VA, for example, would not include assessments of food needs, but would be an important source of information and analysis in support of needs assessment (USAID-FEWS, 1996:3). The data from which WFP and USAID derived indicators came mostly from different quantitative sources including satellite images. While indicators could be stratified according to socio-economic and demographic categories, little of the analysis described in manuals would actually constitute an analysis by which one would understand the socio-political context by which vulnerable individuals could be differentiated. WFP's Vulnerability Analysis and Mapping (VAM) unit analysed data and patterns on food insecurity to determine levels and geographic locations of vulnerability. This information was mapped and further analysed using geographic information systems. VAM informed WFP program developers as well as the Ethiopian government. Mapping procedures that show heterogeneity are useful for developing a richer understanding of socio-natural phenomenon at a disaggregated level. However, the WFP maps consistently present an aggregated picture amongst which the details of vulnerability may be lost. The data output from WFP and USAID normally builds an argument in favour of individual institutional positions but does not always identify who vulnerable people really are.

Until recently, methods of measuring vulnerability that could satisfy global and national policies aimed at understanding the 'who, where and what' about vulnerable people at the household level, were not fully implemented. Such a measurement would need to be socially driven, founded on the WFS principle of food security as a human right. It would be aimed at addressing society at large, but not merely in terms of comparing top deciles to bottom deciles or of weighting and organising indicators.

Summary of policy and measurements

Three messages should be noted from these policies and methods for measurement. The first is that democratic forms of governance are not in themselves a sufficient guarantee of food security when they are instated to satisfy external mandates, when those external sources do not feel accountable to developing countries and when national aims continue to be given the highest priority. The second is that space and scale matter in terms of conceptualisation, methods, interventions and inequality. And the third is that a clearly articulated long-term view of development impacts is needed to understand vulnerability and to plan vulnerability interventions and methods.

The vulnerability concepts presented in the preceding policies reflect the new government's initial reshaping of their ideologies and economy and their declarations to name target groups, and to identify and articulate who vulnerable people were. During the governmental transition from the 1980s to 1990s, various forms of nationalistic behaviour were employed to build solidarity and support. Amidst this, having vulnerability profiling as an aim was needed for understanding vulnerability, but it also complied with the role carved for government and nationally based

international institutions by donors and international fora. The naming and identification of vulnerable target groups was set within a framework where the concepts of separate and unequal responsibilities between international and national bodies polarised the issue as one of North against South, rich versus poor, those who were vulnerable and those who were not. This translated sub-nationally into scaled divisions in analysis, national versus local. Vulnerability analysis in Ethiopia also followed a historical precedent in which short-term relief measures were the focal point rather than long-term development ones, and vulnerable people were analysed and calculated in mass.

4. Styles

The style in which a given situation is portrayed carries wider messages about conceptual frameworks, social commitments between institutions and individual aspirations. Stories (or narratives) and exclusion are stylistic techniques present in text, argument and social interaction and are used for conveying and constructing a certain message. Stories are used in policy for positioning from which people may launch verbal and non-verbal opposition or support (Hajer, 1993). Exclusion is a style of framing. It may rely on precedents, likeliness or obviousness to be persuasive (Gasper, 1996). Stories and exclusionary devices may occur both strategically and unintentionally and can serve to support a myth.

Four stories about vulnerability

The individuals active in early warning in Ethiopia during the mid to late 1990s were positioned in discursive exchanges. Each had a role in sustaining certain storylines because they saw it as an opportunity in their overall strategy to represent themselves

and their institutions. My interviews with humanitarian personnel in 1997 and 1998 suggested that the story of vulnerability told from the government, multilateral, bilateral and NGO points of view was related to the coping abilities and economic means of farmers. It was commonly held that it should be tackled at the household level. Yet each institution told the story with a slightly different spin indicative of what Scriven (1976) would refer to as a layering of positions and crossed transactions ⁶. Actors accepted or rejected stories as part of a strategy for positioning.

The Government

The demands made by the donors and international banks that funded the government provided the stimulus by which the government's response was to make commitments to combat poverty and eradicate hunger. Little in their own history had previously provided such an impetus or commitment to the poor. Mesfin Wolde-Mariam (1986) demonstrated that famine affected people were peripheral objects to be manipulated towards military or diplomatic ends. Vulnerability assessments were not a new policy focus,⁷ but there was no organised or concrete step towards an extensive assessment of all areas of the country until the 1990s.

The UN

WFPs aim was to build collaboration with national governments in addressing vulnerability. Their stimulus was an organisational mandate operational in all countries where they were present but in Ethiopia it was also the poor perception and mistrust of

⁶ Complementary transactions entail an exchange in which the responses to a stimulus follow a logical pattern: I agree, I disagree, reasons for disagreeing. In crossed transaction the responses carry underlying messages which are not obviously suggested by the stimulus: My reasons are justified on x, y, z grounds, I deny your implication, or I reject your accusation (see Gasper, 1996).

⁷ VA was mentioned in the Relief and Rehabilitation Commissions paper on disaster preparedness and planning in 1976. Little was done in the first years although flood risk vulnerability maps were published for some areas in

the government, which arose during previous famines, as well as their arrangements with donors. Their response to the Ethiopian government was aimed at proving they understood the problem and would contribute a complimentary methodology. Since needs estimates were a source of contention in the past and the collection of crop production data as a means of developing estimates was the primary methodology of the government, need calculations and mapping became a focal point in their VA. Much of this analysis initially concentrated on national or regional vulnerability as this was within the donor purview.

The Donor

In line with US policy, the USAID adopted a development framework and not a human rights framework. Their strategic priorities were to support economic growth, health, population, the environment and democracy. The approach to tackling household vulnerability to food insecurity was aimed at addressing its two-part nature as both immediate and chronic. Transitional emergency related food insecurity related to risk while chronic food insecurity related to poverty. Giving both aspects due attention would bring about the relief to development continuum. Sen and Drèze (1989) proposed a strategy of protecting and promoting entitlements, which was the basis for USAID supporting research on nutrition at the household level and improving national agricultural productivity. Nutrition and agriculture were believed to hold the greatest potential for improving food security and sustaining livelihoods. In addition, effort would go towards identifying precisely who the vulnerable people were. They would work with local NGOs and other agencies to conduct community level VAs, to collect data and to build profiles of socio-economic groups. The agency would also strive to

the 1978, disaster assessments were made for Wollo, Tigray and Gonder in the 1980s, and later a data centred vulnerability profile on Hararghe was made. This is discussed in a DPPC discussion paper entitled VAs (1997).

take an active role in donor coordination in country and drew on the US role as a major provider of humanitarian aid and a strong field based presence to support their position (USAID paper, 1995:28). In 1998, the USAID had not fully formulated a VA effort in Ethiopia as they had in other parts of Africa. They were nevertheless allied to UN vulnerability assessment activities, particularly those of the WFP. However, in my interviews, USAID staffs expressed the desire to use their methods to deal with food insecurity as a way of legitimising their approaches.⁸

The Non-Governmental Organisation (NGO)

In the 1990s, the NGO Save the Children Fund, UK (SCF-UK) introduced a computerised method for VA called the RiskMap program. This contained both quantitative and qualitative methods, but was decidedly more advanced in the process than other approaches at that time. SCF drew from years of data and experience in Ethiopia and was also much more households based than any of the other methodologies. A difficulty with RiskMap, however, was its unclear parameters which made its findings less amenable to testing or validation. Nonetheless, it was far more capable than other methods at that time at providing a definite means of identifying precisely who was vulnerable.

These storylines validated historical institutional arrangements within the early warning system; they supported the policy aim of understanding vulnerability as a household level issue, while some simultaneously validated methods which effectively distanced vulnerable people from national goals and the institutional requirements of international parties.

⁸ Interview format and persons interviewed are presented in the Annex.

Exclusion and black boxes: The RiskMap controversy

In the methods section of Chapter Two the argument was that the success of methodological approaches for assessing household vulnerability to food insecurity were subject to the politico-social relations among institutions in early warning systems. An example was the introduction of the RiskMap software in the Ethiopian early warning system. Among the government ministries and the leading institutions in the national early warning system, the SCF RiskMap was scrutinised, while the methods and knowledge base driving vulnerability assessments in other agencies, such as the WFP-VAM GIS models, were reviewed with less rigour. When the RiskMap program was first introduced to governmental and non-governmental institutions in early warning, it was privately dismissed for having a 'black box' approach and for not being widely tested. But was the black box the RiskMap model or the designation of RiskMap as a black box? Often relevant knowledge is held apart from the discussion because it threatens other approaches. Hajer explains how environmental model makers in the Netherlands were not allowed to use their model in policy settings to suggest possible effects of certain changes in emissions (1993). When looking at the early warning practice in Ethiopia during the late 1990s, it is notable that RiskMap was not the only model or approach vying for legitimacy. It competed with the WFP's vulnerability analysis and mapping approach, which relied on GIS and satellite images. USAID was also attempting to start VAs in Ethiopia based on the identification of socio-economic groupings of vulnerable people. The government's Disaster Prevention and Preparedness Commission (DPPC) had seconded a development economist from the UNDP to conduct an extensive baseline survey of food security and to develop an econometric model. He worked alongside an SCF-UK secondment, whose role was to

promote RiskMap and the food economy approach to the Ethiopian government by setting up the social infrastructure within the DPPC. This would make RiskMap accessible to staff in even the remotest parts of Ethiopia.⁹ The story emerging from this was that there were competing reasons for excluding or advocating the RiskMap program.

The storylines like those against RiskMap almost always lead to black boxing because they work to preserve the status quo.¹⁰ I argue that RiskMap threatened authority by proposing an alternative model that determined who vulnerable people were; by providing food need estimates against which government and UN agencies' figures could be contested; and there were personal antipathies between its authors and some early warning members which extended to their appraisals of the software program. For some, it was an attempt to advance the personal ambitions of a few at the cost of poor governments. According to its opponents, RiskMap represented an ambiguous, technological fix. Its authors on the other hand often presented it as a superior method of providing easy identification of food insecure people and calculations of food deficit and numbers of persons in need. There were sensitivities related to the fact that a reduction in funding could prevent further development of the program and therefore the authors appeared more at ease discussing the program's assets than its algorithms and analytical processes. This introduced a covert atmosphere around the subject, which fuelled suspicion and competition.

⁹ This information was gathered through formal interviews and informal conversations with staff in USAID, WFP, DPPC and SCF in 1997 and 1998. There is also evidence of some government engagement with SCF regarding risk map in a DPPC VA discussion paper produced in 1997.

¹⁰ This view of black boxing is explored in Hajer (1993).

In addition, the SCF methods and technology had a more explicit emphasis on vulnerable households, and therefore entered an area of knowledge that was predominantly the terrain of government ministries and local administrations. In contrast, the WFP method operated on a much larger scale, with a more complicit agreement with the government's approach. As discussed in Akrich's (1992:221) appraisal of technology, once technical objects are stabilized within a system they become instruments for knowledge. If this is true, then SCF in one way represented a threat; that their method of reaching vulnerable people would supplant and precede the governments own programs within the national early warning system, and would therefore compete for resources and legitimacy. This line of argument follows from Foucault's (1977) descriptions of the links between the technology of the penitentiary, power relations and new forms of knowledge.

The RiskMap storylines represented what social-interaction theorists refer to as subject-positions. People are constituted by discursive practices and human interaction is therefore an exchange of arguments aimed at making sense of their world (Billig, 1987; Harré, 1993; Hajer, 1993). That world was built within a global framework containing various ideological and policy positions to which actors responded. A consequence of these interactions was that the institutions in Ethiopian early warning were engaged in operationalising vulnerability myths.

5. Conclusions

The World Food Summit aims, the decline in food aid, and economic restructuring were some of the impetus behind Ethiopian national policy on vulnerability and food

security. All of these events combined to promote two myths of vulnerability around which the discourses in Ethiopian policy and practice were formed.

One part of the vulnerability myth was the aim of addressing household level vulnerability and food security. Judging from the applied methodologies and practices, it is doubtful this could ever be fully realised. In seeking aggregated national measurements of localized problems, and in hindering the acceptance of competing household assessment models, early warning decision makers distanced themselves from seeing the problem and its solutions clearly.

As the Ethiopian example shows, vulnerability is a matter of human construction that has been brought into political and social processes. This idea of the social reconstruction of the reality of vulnerability is necessarily political because vulnerability and assessments have always been a political contest between international parties, national governments, humanitarian institutions and farmers. It involved international agreements, state control, institutional policy and farmer productivity. An added dimension to current vulnerability assessment practices in Ethiopia was that political decisions about food aid made in the past were thrown into the ongoing political processes of practice. Ideological disputes between government and humanitarian institutions affected the amount and kind of assistance provided during the 1980s and this continues to form the backdrop to relations between institutions and their policies.

Household vulnerability has been a mirror to a system of values, of political, social and economic processes to which societies contribute. Some environmentalists would refer the linking of political, social and economic factors to the cultural processes through which nature and society are transformed and understood (Redclift, 1995; Hajer and

Fischer, 1999). Nygren (2000) brought socio-political, economic and cultural factors together to show the dynamic struggle over the utilization of natural resources in a mountain community in Costa Rica. This was an effective method for illustrating the relationship between local resource management practices and global processes. Similarly, my examination of government and humanitarian aid policies in Ethiopia illustrates how vulnerability policies, interventions and scale can be socially constructed out of global concepts and individual intentions. The policies attempted to extend the paradigm of global sympathy and local responsibility. However, a vulnerability policy that was truly sensitive would have placed vulnerability within its proper political context, combining current and historical political factors with social and economic systems, and offering realistic measurements of the long-term development impacts.

The other part of the myth was that there would be globally shared responsibility for eradicating hunger. A shared action plan, in an institutional structure involving agencies at all levels, such as the WTO, IMF, World Bank, FAO, WFP, bilateral organisations and national governments was needed to accompany the moral ideology proposed at the summit. A 1992 study (Mellor Associates) promotes a world food aid regime in which donors, other humanitarian aid agencies and national governments work together. In such a framework, food aid should serve both the recipient and the donor; it should contribute both to emergency and development programmes.

Foucault (1977) has shown that institutional arrangements legitimate the truths a discourse produces, and the power of discourses derive from their material basis in institutions and practices. The existing international institutional frameworks set up to moderate the achievement of WFS goals require consideration as they continue to

support and validate the myth that alleviating vulnerability to food security is a shared responsibility. So far, the economic costs of meeting the global aim of *rights to food* has outstripped food assistance resources, international commitment and institutional arrangements. Maxwell (1997) shows that certain kinds of institutional frameworks would be required to carry forth the WFS plan of action, and thus rightly placed the emphasis on institutions and organizational culture. To arrive at appropriate institutional arrangements the global discussion would have to be grounded in a critical discussion of the socio-cultural values and institutional patterns of modern societies (Sachs, 1992).

I turn to the subject of institutions again in Chapter Seven, where I analyze the institutional arrangements in the Ethiopian famine early warning system. I focus on the political processes whereby early warning activities at times express a different concept of vulnerability and food insecurity than the general view stated in policy documents.

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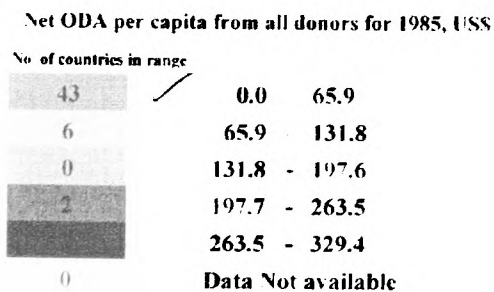
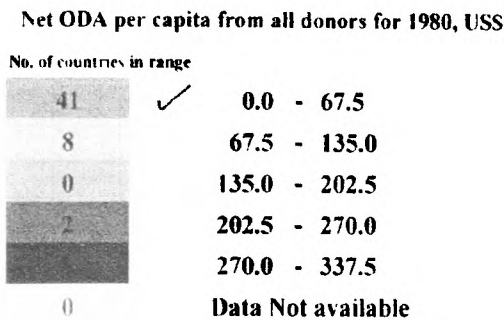
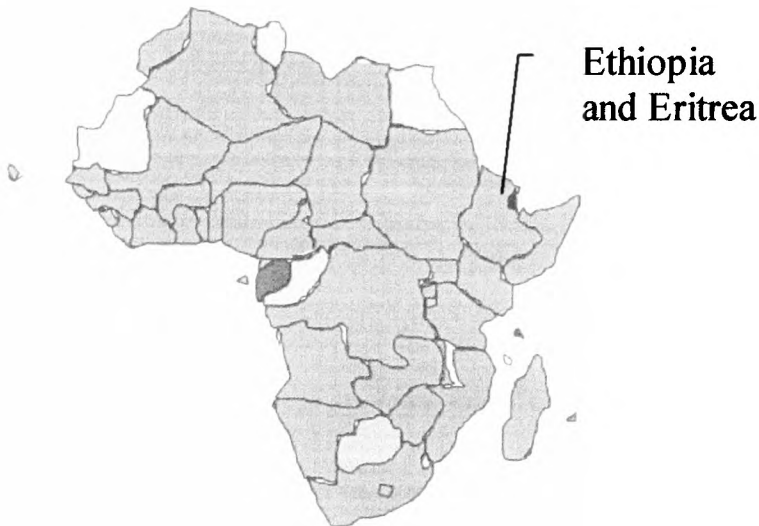
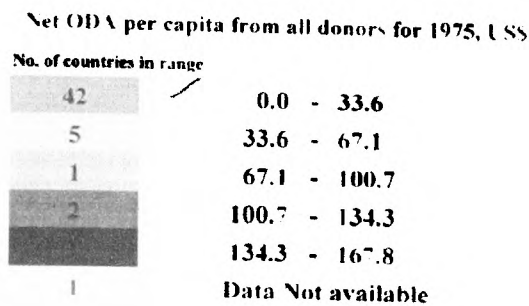
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Annex 1- Overseas Development Assistance to Africa, 1975-1985



Annex 2 - Overseas Development Assistance to Africa, 1990-1995

Net ODA per capita from all donors for 1990, US\$

No. of countries in range

39	0.0 - 102.7
9	102.7 - 205.4
0	205.4 - 308.1
2	308.1 - 410.8
0	410.8 - 513.5
0	Data Not available



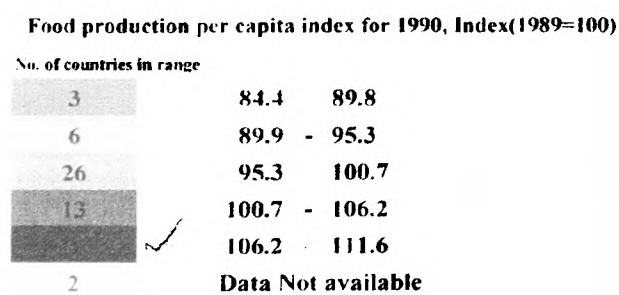
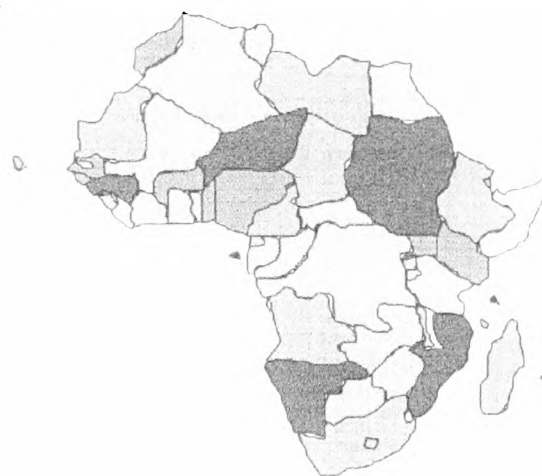
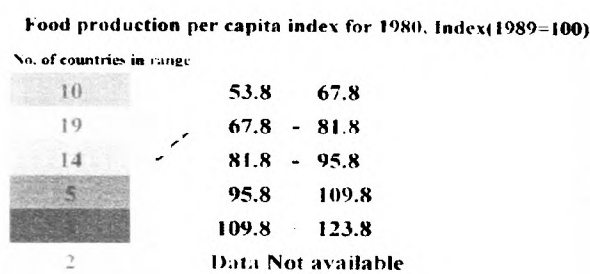
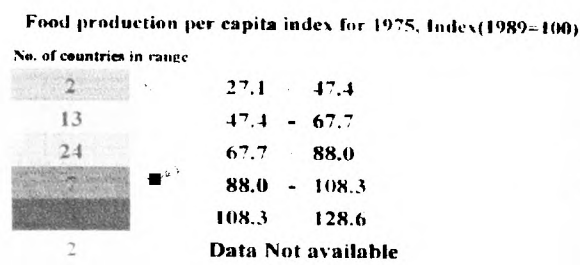
Net ODA per capita from all donors for 1995, US\$

No. of countries in range

46	✓ 1.7 - 129.0
4	129.0 - 256.3
1	256.3 - 383.6
0	383.6 - 510.9
0	510.9 - 638.2
0	Data Not available



Annex 3 - Food Production in Africa, 1975-1990



CHAPTER SIX

Governance, the coordination of efforts and the role of vulnerability assessments in Early Warning Systems

1. Introduction

As suggested in the previous chapter, the early warning system setting is critical in the dissemination of international vulnerability and food security myths. Within such systems, government, international and local aid institutions play central roles in implementing globally recognized strategies for targeting household food insecurity and vulnerability and for promoting individual and institutional interests in a broader, generalised understanding of the problem. Throughout early warning history, governance and inter-agency coordination have emerged as salient issues for vulnerability analyses which target vulnerable regions rather than vulnerable people in the short and long terms. This chapter briefly presents the key debates and issues affecting early warning systems and vulnerability assessments.

2. Governance

In the 1980s, the criticism of early warning systems (EWS) was mainly directed towards the people responsible for managing them: governments and humanitarian aid staff. Sen (1981) was foremost in linking government to famine, and analysts like Drèze and Sen (1989) and De Waal (1989) followed this. They saw the role of government as instrumental in famine alleviation. Drèze (1988) and de Waal (1997) argued that famine relief would be impossible without any political commitment. They also argued that while governments and States played a critical role they were not the primary parties in eradicating hunger (Drèze and Sen, 1989; Kracht and Huq, 1996). Other institutions also influence the information and outcomes of famine early warning systems.

When the debate reached its peak, urging more effective early warning, Peter Walker (1989) saw a dual role for famine early warning systems: to warn of famine, and to provide ongoing information even after an event. Despite the varied positions on the subject, this view was widely shared (UNDRO, 1977-1986). Buchanan-Smith and others described famine early warning as:

A system of data collection designed to monitor a population's access to food in order to provide timely notice when crisis threatens and thus to elicit a response (1991: 2).

Thus, by the 1990s, the prevailing knowledge was that early warning must be systematic, it must contain good information, and this information must be timely. The early critics (see Buchanan-Smith et al, 1991) suggested that famine early warning's previously poor record had to do with the 'system' itself. But this was still *related to the way the system was governed*. Decision-making was too centralised; it was too far removed from the problem. Some argued that centralisation reflected a lack of commitment to addressing the underlying cause of famine, which is poverty (Longhurst et al, 1986; Anderson, 1989). Others added that as early warning originated as famine relief, it remained too focused on emergency situations, and foreign and local decision makers were unwilling and unable to take a long-term, developmental view (Maxwell et al, 1990). By implication, the critics presented this as another reason why the information collected and eschewed was lacking; because communities were not adequately consulted and greater collaboration between local, national and international systems were needed (Swift, 1979; Torry, 1984; De Waal, 1989). This pointed to a conceptual problem where early warning decision makers reduced the problem of famine to only death by starvation and thus the only response would have to be immediate and not necessarily long-term (Buchanan-Smith, 1995:6). Others still, believed the 'information' problem to be a technical and resource one. The information

was inaccurate, because geographically extensive surveys were few or too expensive for governments to conduct. Where such information did exist, it was done by UN organisations, for example through satellite images, but this was on too large a scale to be consistently accurate and for anyone to understand the socio-economic variants to the problem. It did not include the socio-economic data that are important for a better knowledge of vulnerability to famine (FAO, 1985 & 1989; Chambers, 1985; Corbett, 1988; Borton and Shoham, 1991; Dessalegn Rahmato, 1988).

For economic and political reasons, many international and national early warning systems have now devolved responsibility downward, to varying extents. In Ethiopia, the relief organisation of Tigray, known as REST, is a reliable source of regional famine relief and development interventions. In addition, in the 1990s a new democracy orientated Ethiopia established sub-regional capacity across all government ministries, although the real decision making in early warning still remained regional and national (discussed briefly in the thesis Introduction and in Chapter Seven). As for early warning information, timeliness remains an issue as much as quality in terms of a response to food needs. It is now a common feature in early warning systems to include socio-economic data and this has been integrated into most systems, from the Food and Agricultural Organisation's (FAOs), Global Information and Early Warning System (GIEWS) to REST. However, a persistent problem with socio-economic information, which correlates in some ways to response, is disaggregated local coverage. As Walker noted (1989), socio-economic responses to stress are extremely complex, localised and often produce contradictory signals. This makes the focus on local information gathering and analysis imperative to good early warning. The prioritisation of local information requires financial and staff resources, both of which increased during and following the African famines in the 1970s and 1980s. However,

this has diminished in the 1990s. The continuing scarcity of international monetary assistance raises the stakes for everyone involved—from the international community to the farmer. The prioritisation of local information also requires a commitment to the farmer that does not compete with other political aims of governments and other decision makers.

3. The problem of institutional coordination in national famine early warning systems

Redclift (1995:111) has argued that political relations between institutions produce competing definitions of environmental problems, and thus human activities shape our concepts of the environment. Similarly, EWSs generally consist of many distinct institutions working towards similar goals, and in so doing, the EWS becomes an arena for conflicting agendas for famine alleviation. In Ethiopia, government and aid agencies have long been unable to fully agree on how to establish a multi-agency vulnerability assessment (VA) process, and to select useful, context sensitive monitoring indicators. The issue of coordination of approaches has been present at each point in Ethiopia's famine and food crises over the last 20 years. In 1997 the Ethiopian government estimated 68,670 persons would require assistance for the next year, while the World Food Program (WFP) estimated between 4,000 and 5,000¹. According to the FAO - WFP Joint Harvest and Food Supply Assessment, Ethiopia's 1997/98 main-season harvest was 8.8 million metric tons (MT) and estimated that 300,000 to 400,000 MT of food assistance would be needed in 1998. Conversely, Ethiopia's Disaster Prevention and Preparedness Commission estimated in its annual appeal that 573,000 MT of food aid was needed.² These divergent figures illustrate a

¹ DPPC food supply prospect, 1998 and WFP 'Amhara Region Populations in Need of Assistance in 1998' (http://www.wfp.it/vam_documents/africa/ethiopia/va98/images/r3_az4.gif, accessed: June 2000)

² See also USAID 'bulletin'

(<http://www.usaid.gov/FEWS/fb971229/ea971229.html#ET> Accessed: June 2000)

lack of consensus on what are appropriate criteria to define food insecurity and vulnerability, and how best to measure these conditions.

There has been an informal consensus among some experts (MSF, 1997) that the theoretical and conceptual basis to vulnerability analysis coincides across agencies but that there is a divergence in methodologies that are related to the different mandates institutions hold. I argue that an early warning system that has a variety of approaches to vulnerability assessments has an overall benefit if and when the results are the same. When they are different, however, this can result in time wasted contesting the differences. For some, multiple approaches can be advantageous (see discussion in Buchanan-Smith et al, 1991: 82). They can provide a stronger empirical argument, one that it is harder for governments to ignore. On the contrary, there are those who believe that this is duplicative and does not optimise scarce resources. I argue that it also reflects the presence of different institutional objectives and the absence of shared views and methods that are important for standardisation and consistency in early warning.

In Chapter Five a central argument is that global forums, such as the World Food Summit (WFS) in 1996, have had a pervasive influence on institutional strategies and interactions. The WFS established the Interagency Working Group (IAWG) and Food Insecurity, Vulnerability Information and Mapping Systems (FIVIMS) to increase attention on food security issues (FAO/CFS, 1998). One of the enduring problems facing the establishment of FIVIMS and also national early warning systems has been the co-ordination of various institutional perspectives around agreed methodology (Eilerts, 1999). The original FIVIMS guidelines prescribed the importance of developing inter-institutional co-operation in food security and vulnerability

assessment system building, and an early identification of key actors. However, there is no guidance available on what assessment methodology to adopt. The option for the IAWG to identify and endorse a single assessment method is difficult, because there is a distinct political dimension to the choice of method. So far, there are no empirical evaluations of the performance and utility of any recommended method in various national settings, on which to base this choice. Consequently, a challenge for effective early warning is establishing a conceptual and methodological basis for joint vulnerability assessments within the political constraints of the system. This requires consensus and standardization, which are made difficult because of various institutional agendas.

4. The role of vulnerability assessments in effective early warning

For institutions in early warning today, a prevailing practical challenge—following resource constraints, governance and institutional co-ordination—is the vulnerability assessment. It presents the greatest managerial challenge, to grasp and translate the mix of factors contributing to food insecurity into a cohesive plan of action, which has the greatest likelihood of convincing governments to act, and has the largest impact on affected populations. What measures are suitable to the political infrastructure imposed on and within early warning systems, and which measures are also responsive to the needs of vulnerable people? Which are the most useful and cost-effective? Which reflect the right combination of scientific and socio-economic dynamics at the right time and for the right population?

Despite the call for a stronger commitment to long-term development and poverty reduction, through analyses of socio-economic and political causes of famine, many

alleviation strategies still fall short of targeting the most needy and appropriately addressing vulnerability. Some of the failure is due to the nature of food insecurity. Clay et al (1999:407) concluded that 'food insecurity in Ethiopia was something deeply rooted in inequality, reinforced by poverty and structural in nature' (Clay et al, 1999:407). They showed government and the EWS as fundamentally and structurally inflexible in handling these basic elements of food insecurity and thus their vulnerability assessment strategies were sometimes inadequate. I add that an inability to properly assess vulnerability is systemic and co-linked to early warning management and tensions between institutional staff.

The purpose of the vulnerability assessment is to: (1) identify who is at risk to climatic and environmental perturbations; and (2) to prioritise need as influenced by the population's economic, social and/or political situation. Vulnerability to food insecurity refers to the susceptibility of individuals or larger populations to hunger and/or starvation resulting from a combination of environmental and social, economic and political uncertainty. An identification of vulnerable people requires a coherent system for understanding the dimensions of the problem in given contexts and a measurement of the severity of the problem on different regions and people.

Until the 20th century, however, publicly operated famine relief systems in many countries only made two broad statistical and socio-economic distinctions about the affected populations: Rich vs. Poor. On one side, there was always a monarchy or governing body, and on the other, the masses and the peasant farmer. Governing administrations made little effort to further classify people by levels of need although urban dwellers were less affected than rural ones. Examples from the Indian famines at the end of the 19th century point to failures in British Colonial political instruments and

in their early warning systems (Davis, 2000). In addition, the political measures enacted during and after the Irish potato famine reflected a general disinterest in famine victims and in refining categories of vulnerability or targeting. They included, importing American maize, which was sold to the destitute, and relief schemes such as canal building and road building to provide employment for victims.³ Marjie Bloy (2001) summarised the policy decisions and their ramifications in the following way:

In 1846 the conservative British administration, which were dedicated to a laissez-faire policy, rejected the policy of direct state intervention or aid. In 1847, the administration modified its non-interventionist policy and made money available on *loan to poor people for relief*, and soup kitchens were established. By then, hundreds of thousands of starving people had started pouring into the towns and cities for relief, where epidemics of typhoid fever, cholera and dysentery broke out, and claimed more lives than starvation itself. The 1841 census recorded an Irish population of 8.2 million. By 1851 this figure had been reduced to 6.5 million.

However, post-hoc analyses demonstrated that food was not needed as much as income (see discussions in Kee, 1995; Walker, 1989; Woodham-Smith, 1962). There was a weak political resolution to develop a system for appraising vulnerability and to impose strategies targeted at the poor; for example, by making use of the available community records which clearly showed the dimensions of the problem. Many of the famine early warning systems in developing countries today have been designed based on this type of model, first through the influence of colonial administrations and later through international aid institutions, in combination with local government's famine alleviation strategies. Both international and local institutions are complicit in

³ Bloy, M. 'The Peel Web. The Irish Famine: 1845-9' (<http://www.dialspace.dial.pipex.com/town/terrace/adw03/peel/peelhom.htm>, accessed: January 2001)

establishing early warning systems that sometimes fail to target, and which frequently are accompanied by a slow, inappropriate response (Buchanan-Smith, 1995).

Moreover, these examples illustrate the failure of putting 'vulnerability' first. As Walker (1989:52) notes, vulnerability assessments allow early warning systems to address the precursors of famine, which are location and class specific. He warned that:

Famine warnings should not be about predicting mass starvation. It must be geared to warning of the erosion of the subsistence base of the victim's society.

In an assessment of socio-economic vulnerability, Downing (1991) explained that the patterns of vulnerability are best distinguished by the stratification of socio-economic groups. He proposed a framework for assessing the causal structure of hunger, by identifying socio-economic vulnerability to famine, and for monitoring indicators of famine. Vulnerability is multi-dimensional. Its patterns may be seen as material, socio-psychological and organisational (as in Anderson, 1985). Or they may be physiological, political, economic and social (in Jaspars and Young, 1995; and Jaspars, 2000). Consequently, a national or even the regional reading of the problem will only provide a partial picture. Dessalegn Rahmato (1987) found that Ethiopia's national warning system was originally modelled on the farmers' system and that the local and traditional warning systems were as good at predicting food crises in Ethiopia as the governmental ones. Nevertheless, the detailed analysis of vulnerable people present in local models has not been well adapted in the national system. If vulnerability to famine is to be tackled, then all facets of the phenomenon including locally generated analyses must be incorporated into early warning.

5. Conclusions

Decentralised, responsive governance and firm coordination of efforts among agencies in early warning systems are needed to appropriately address the multidimensionality of food security and vulnerability. The following chapter gives a more in-depth appraisal of the politics of social interactions, information and methods which shape early warning practices. The system is likened to classical definitions of political systems. Political dynamics and discourses are emphasized.

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CHAPTER SEVEN

Famine Early Warning Systems as Political Systems

1. Introduction

Research done in the mid to late 1990s has demonstrated that the Ethiopian famine early warning system failed to accurately target people who were vulnerable to food insecurity (Clay et al, 1999; Sharp, 1998, Buchanan-Smith and Davies, 1995). Chapter Four of this thesis also contains examples illustrating the inconsistencies between aid deliveries and food production, suggesting discrepancies in the Ethiopian system for targeting food aid. Where has it gone wrong? To begin to explain why targeting interventions fail I explored the discourses amongst institutions that have an effect on food policy and practices in Chapter Five. In this chapter I carry out a closer examination of the political processes and constituent socio-political practices of members of famine early warning systems. Targeting food aid is a strategy nascent in a system in which individuals and institutions are implicated in the power dynamics surrounding food policy and food aid. Borrowing from Fischer and Hajer (1999:17; and Harvey, 1999), I argue that food aid and food security debates are much like environmental arguments; they are arguments about society in general. They represent global and nationally derived world views about vulnerability and food insecurity. These world views, combined with the socio-political interactions in the national early warning system (NEWS), produce a discourse that presents methodological challenges for analysing vulnerability at the household level. An appraisal of vulnerability at the household level would employ methods for determining the asset base and livelihood strategies of poor households over time, which would inform macro-level strategies and policies that effect poor people (Ellis, 2000).

To examine this more closely, in this chapter I reflect on the discourses that politicised practice in the early warning system during the 1997/1998 agricultural season, how these influenced vulnerability analysis methods (such as the World Food Program's use of Geographic Information Systems), targeting interventions and how the roles of institutions, individuals and farmers formed or were formed by it. Along these lines, the work of Redclift (1995), Gaspers and Apthorpe (1996), and Fischer and Hajer (1999) are fitting as they show that political processes emphasize environmental and development discourses. Building on earlier approaches to assessing early warning and interventions in Ethiopia (especially Buchanan-Smith and Davies', 1995; and Sharp's, 1998), the approach I adopt is to focus on the *political processes* whereby early warning activities at times express a different concept of vulnerability and food insecurity than the general view stated in policy documents. This is neither to make a strong argument against current interventions nor to highlight the missing links between prediction and response (as is found in Sharp's assessment of Ethiopia's employment generation schemes and Buchanan-Smith and Davies' appraisal of famine early warning and response). My aims are different: 1) to form a view of political processes (the policies and socio-political interactions) that comprise the discourse of early warning; 2) to note the external discourses which influence internal political processes; and 3) investigate how the prevailing vulnerability and food security discourses influence activities, outcomes and ultimately a limited accountability to poor farmers.

The chapter has four sections in addition to the introduction. The following section, section two, considers the prerequisites for the Ethiopian early warning system to have an impact given the key issues in its history of early warning. The third section initiates a systems analysis. It explores the nature of political systems and situates

famine early warning systems within political theories of the State and spatially differentiated policy making. Section four aims to establish a methodology for systems analysis. Fifth, the Soft Systems Methodology is employed to document the political processes within the NEWS and to 'deconstruct' practice, concepts and activities. Section six concludes with a discussion on the implications of existing early warning practice and structure using a few examples from the Delanta case study.

2. Prerequisites for good famine early warning systems in Ethiopia

Early warning systems (EWS) illustrate a set of "processes of interaction" between political and non-political subsystems, which makes them characteristic of political systems. Devereux (in Devereux and Maxwell, 2001) tells us that some of the key factors preventing an adequate response to food crises relates to a lack of information, weak institutions and problematic politics. Extending this to Ethiopia I suggest that these qualities of EWS contributed to some failings in Ethiopia.

Efficient and effective early warning and response systems are those that have three capabilities:

1. They warn of large-scale famine and are sensitive to localised, periodic food insecurity.
2. They respond early enough, before people become destitute.
3. They are both relief and development orientated.¹

In each of Ethiopia's famines and food crises over the last 20 years, these issues have been critical. In 1984-85, the underlying factors were political, institutional and

¹ These criteria for early warning systems were presented in Buchanan-Smith and Davies (1995). Chapter nine of her book draws from these criteria to support an argument for forging the link between early warning and response.

informational and this manifested in a slow warning, relief-biased system that was insensitive to localised destitution. Most donors and international non-governmental organisations (NGOs) did not trust the government on ideological grounds—because there was an atmosphere of civil war, government oppression, manipulation and misleading information. The government estimated that the famine population and the food supply need were higher than the UN's (on whom donors relied)². Donors and NGOs believed the government diverted food aid for its own purposes. In addition, the system relied on information from aid agencies' nutrition monitoring programs, which at the time was described as cumbersome and slow (Vaux, 2001). No matter the underlying issues, the result was an ineffective early warning and response, one that did not respond early enough and, because of political constraints, could only be aimed at saving lives, not livelihoods. Similar failures were evident in the food emergencies of 1990-91. Buchanan-Smith and Davies (1995:66) analysed the 'story of early warning' during the 1990/91 food shortage, and concluded that although relief was provided, it was too late and too little. This was linked to having a centralised government, highly aggregated data, an evolving food policy that centred on providing relief (not development), a resistance to co-ordinated efforts and assessment methods. These were the central issues explaining why despite the lessons learned about famine, the response to it failed. What is more, the connection between poverty and vulnerability to famine had been poorly elaborated and both government and international relief organisations did not incorporate a localised understanding of it.

Many of these issues appeared less relevant by the late 1990s as a result of important policy and administrative changes. The Ethiopian government decentralised their operations across all ministries, including the Disaster Prevention and Preparedness

² Part of the problem with cross-estimates was the UN method for calculation. Vaux (2001) observes that the UN's World Food Program calculated commercial imports, food for specific projects and food for emergencies all together, which brought their supply *need* lower than the governments.

Commission (DPPC), who were directly responsible for early warning activities. Their food policies reflected other forms of aid beyond just relief, thus the aim shifted to linking relief and development. The UN and other institutions have led the effort towards creating a multi-agency vulnerability assessment, in which there has been greater collaboration amongst participants. The assessment of vulnerability at more local scales was taken on board.

Nevertheless, the interviews and public documents used in this thesis have suggested that some of the historical problems persisted into the middle to late 1990s. The issues were primarily related to the political and administrative framework within and among institutions and this limited the quality and use of information collected.

3. Systems analysis and famine early warning systems

Systems analysis can be useful for exploring the factors contributing to Ethiopia's early warning dynamics and the methodological challenges that contribute to its food distributions and targeting record. It allows the exploration of political, institutional and informational issues which existed in 1984 and 1991, and the weak points where accountability and responsibility break down. Any system involving human interactions will have a political dimension whereby personal motives or institutional structures determine the outcome of activities. By employing a systems analysis governmental policies and relationships among early warning institutions may be investigated in relation to the targeting, vulnerability analyses and practices they engage in. When food aid targeting interventions and other early warning activities, like the vulnerability assessment, fail to produce the outcome of reaching the food insecure, Buchanan-Smith and Davies (1995) suggests that this implies a structural problem related to the kinds of information the system uses and how it is used. The

information contained in vulnerability assessments is a central political issue in early warning systems. It provokes questions about the kinds of information used in vulnerability analysis, how and why is it used and by whom. The answers require a review of systems processes.

I am assuming a system to be a complex whole that may have properties, which refer to the whole, but are meaningless in terms of the parts that make up the whole (Checkland and Scholes, 1990:18). When I describe the NEWS as political or refer to the politicisation of the NEWS, I am using the Oxford English dictionary definition as follows:

‘Of or taking part in politics; of state or its government; relating to a person’s or an organisation’s status; to give political character to [something-in this case the early warning system].’

Systems theory and its applications (in works like T. Parson's, *The Social System*, 1951) have broadened the understanding of government by highlighting the interactions between it and the larger society. Today, classifications of government are clearly linked to 'political systems' (Heywood, 1994:34). In *Politics*, Aristotle defined politics as the processes by which order is maintained in a city-state, and consists of an aggregate of members who have different interests. Accommodating those interests is the business of politics. A political system can thus be seen as a means by which those varied interests might be accommodated. Among the definitions of a political system, a very simple and relevant one is the following:

‘A set of "processes of interaction" or as a subsystem of the social system interacting with other non-political subsystems, such as the economic system. This points to the importance of informal socio-political processes. Instability in the system is generally explained in three ways. It can result from a situation

where the distribution of wealth fails to correspond with the distribution of political power. A Marxist view holds that it can be the result of changes in the mode of production. Finally, the alienation of the governing elite from the mass has been said to be the prime cause of revolutions and other forms of violent political change.³

When I applied this definition of political systems to Ethiopian famine early warning and other early warning systems described in the literature (see Buchanan-Smith et al, 1991), I found the definition was apt, and that state sovereignty was central to it. This challenges arguments that use recent events in Ethiopia as examples of the decoupling of sovereignty from concepts like self-determination, authority, power, security, and identity (Denham and Lombardi, 1996). Early warning systems exhibit processes of interaction, between political and non-political institutions, where stakeholders bring their own agendas to the table, and where the state maintains a key role. Instability and inefficiencies in the system generally result from an imbalance between the broad, diverse geographic and social location of the food insecure and the comparatively smaller world of decision makers. Furthermore, I found that more than 60 per cent of the 20 famine early warning systems Buchanan-Smith et al (1991) reviewed bore these characteristics.

Famine early warning systems may also be placed within the political framework of policy networks. This is an approach that links the state to sub-national urban and regional political analysis. The policy network itself refers to meso-level political structures and activities that filter change (Rhodes and Marsh, 1992). Several types of policy networks have been described in the literature: 1) integrated policy communities characterised by stable relationships; 2) those with restrictive membership; 3) those that are vertically interdependent and relatively insular; and 4) integrated issue networks

³ From Encyclopedia Britannica

wherein there exist a large number of participants with limited degrees of interdependence (Rhodes, 1990—reference in MacLeod and Goodwin). MacLeod and Goodwin (1999) caution the use of policy networks for explaining sub-national developments as a consequence of de-Statization. Policy networks do not result from the state breaking down, they argue, but rather exist to support certain state projects. They also argue that policy network theories provide a limited understanding of the collective political representations and discursive struggles that underpin the substantive and scalar constitution of networks and communities. The causal pathways that one can establish to explain the many variables involved are limited using policy network analysis (Evans, 2001). Nevertheless, its use value here is for enabling us to see that policy making takes place within multi-layered, self-organising networks (Evans, 2001). It is useful for describing the early warning system as a political subsystem or as political machinery, operating at central-regional-local spatial scales under the guidance of the state (MacLeod and Goodwin, 1999). Policy network analysts also regard the state government as a differentiated whole in which individual departments pursue their own autonomy within overall governmental constraints. Government departments and international and local institutions are integrated on issues with limited degrees of interdependence, as each institution is committed to its own agenda as well as to maintaining political alliances in the network (or early warning system).

Given some of the weaknesses of policy networks mentioned before, a supplementary approach found in political theory would be needed to articulate the power dynamics among early warning members and to understand the structures, mechanisms and events that constitute socio-political processes in specific places and at given times. MacLeod and Goodwin (1999) discuss the utility of Neo-Gramscian state theory for situating processes of capital accumulation in relation to specific hegemonic political or

state projects, and this might also apply to early warning political processes. Neo-Gramscian state theory offers useful approaches to interpret the politically constructed informal networks of association and governance situated at various spatial scales. In this way institutions and governance at various scales may be positioned within a wider set of social and political forces and can be understood as part of the state's attempt to forge and sustain a successful political project. This line of reasoning builds on Jessop's (1990- in MacLeod and Goodwin) interpretation of Foucault's analysis of social relations. The state is perceived as a site that generates and produces strategies. The emphasis is on politics and political strategy. The state's strategic political objectives are to privilege some strategies and activities over others. The success of achieving this objective is contingent on the actions and strategic endeavours of all of the other agents and institutions within the system. Thus the state engages in 'hegemonic projects': the mobilisation of support behind a concrete program of action that asserts a contingent general interest in pursuing objectives which advance the long-term interests of the hegemonic class (Jessop, 1997).

4. Methods for exploring information and system processes

Several approaches have been used, with varying degrees of success, to analyse complex, interacting socio-physical processes. Among these are causal analyses, integrated assessment models, institutional analyses and systems analyses. Causal analyses involve the assessment of cause and effect; what actions lead to certain conclusions. This suggests a certain linearity of processes that does not always apply to the real world. Likewise, the integrated assessment models (IAMs) applied to environmental policies and systems so far are mainly based on econometrics and use linear representations of each sub-system being modelled. This limits their ability to

achieve the level of integration and policy analysis required. A more socially responsive method is the US Agency for International Development's (USAID's) logical framework, which has become a common method of assessing the consistency and assumptions of development projects and potentially broader development impacts. However, Gaspers (1996:42-45) has shown that a weakness of the logical framework is that it is less effective for probing the antecedents to institutional goals and policy. For my purposes here, the approach is not sufficient because it is suited to analysing the goals and activities of one institution rather than several in one system. An analysis of systems of institutions is required. As an alternative, the contributions of Morgan (1986), Moore et al (1994), and Roche (1998), are more significant. At a minimum, they offer the means for analysing humanitarian orientated institutions based on the assumption that they are sets of interactions among actors, as something produced by society as well as reproducing in society, and as dynamic and changing. Some analyses of institutional structures use discourse analysis to explore the ensemble of ideas, concepts and categories that are produced, reproduced and transformed in particular sets of practices (Hajer, 1993). Discourse analysis is a way of looking at institutions, how they function, how power is structured. Along these conceptual lines, an alternative suited to evaluating a system of institutions and actors is the agent based simulation model (ABSM) being used in climate policy research. The ABSM provides a framework within which to collect observations of social and physical systems and to identify relationships and processes that must be understood to shed insight into policies (Downing et al, 2000). From IAMs, institutional analyses and ABSMs we can learn about finding the right methodology for assessing famine early warning systems: we need an integrated approach that allows us to represent the processes that cause change or effect outcomes. Agent based integrated assessments also go the distance of offering the prospect for model validation; they are capable of assessing their own accuracy at

specifying and representing social entities, they involve the actual stakeholders in the simulation and they model processes at different spatial resolutions. These are superior methods of analysis and represent the way forward.

Drawing from these traditions, Checkland's soft systems methodology (SSM) is a way to explore the information processes within systems (described in Chapter Two). An advantage of using SSM is that it allows systems to be understood holistically, but it is flexible enough to appraise cultural and logical fragments of the whole system. In this chapter the major elements of SSM have been extracted to evaluate two aspects of system processes: the socio-political transformation of policy and information into distinct activities and outcomes. Observing policy transformations is not simply an analysis of cause and effect. It involves an appraisal of how actions transform, or transform to, other actions. It differs from looking at how actions lead to other actions, as one would with traditional causal analysis (Checkland and Scholes, 1990:39). A political analysis that employs soft systems methodology emphasizes an assessment of how power is expressed, by whom and through which commodities or mechanisms. An analysis of information is also central to this. SSM has also been applied to assessing information issues across systems of different kinds. A study of information access and use in health care illustrated that the barriers to information access and use were most frequently lack of communication, bureaucracy, a lack of information sources and a lack of skills in using the information (Macias-Chapula, 1995). The respondents in a separate SSM study on information in the banking sector identified timeliness and accessible information as the most important aspects in strategic management processes (Hayward and Broady, 1995).

The principle behind SSM is that people's perceptions of the real world yield ideas and concepts within a system; these in turn create new perceptions of the world. The processes wherein real world perceptions are transformed to system activities are observed by comparing real human activities to those conceptualised by institutions, individuals and the public. These processes of change could be classified within some branches of policy network analysis as the conventionally accepted and supported view of the system. Systemic goals, structures, rules and external linkages may be examined.⁴ SSM offers a method for doing this. SSM is a way of articulating practice, ideas and actions, interests and power. This is critical to analysing human social interactions (on the analysis of human social interactions see Hajer, 1993; Foucault, 1977; Harvey, 1996-reference in Murdoch's paper on scale, 1997) and may provide useful indicators for assessing similar systems.

5. Applying soft systems methodology to the Ethiopian early warning system

To apply SSM, I interviewed staff in four institutions that were active in the Ethiopian early warning system in 1997 and 1998. I also consulted government and international policy documents, plans and reports from the 1990s. The early warning system consisted of more than 20 international and local institutions, NGOs and government ministries (see the Annex for interview formats and persons interviewed). All of the persons interviewed belonged to member institutions of the NEWS and the early warning system's vulnerability assessment group. There were 13 interviews in total, with persons from the DPPC early warning department and working group, two of the key international donor-affiliated organisations, the U.S. Agency for International

⁴ Evans (2001:546) defines policy network morphology as the officially enforced and conventionally accepted view of the organization. He distinguishes four areas for analysis: network goals, network structures, network rules and network linkages to the external environment.

Development's Famine Early Warning System (USAID-FEWS) and the World Food Program's Vulnerability Analysis and Mapping unit (WFP-VAM), and with one international non-governmental organisation, Save the Children Fund, U. K. (SCF-UK). At that time, all were integral to discussions about appropriate methodology for vulnerability assessment. Members of the planning departments of the DPPC and the line ministries may have given a different insight but could not be contacted for interview. Six of the persons interviewed (46 per cent) had more than five years experience working on food security or vulnerability. Few had more than ten years experience on the subject.

The application of SSMs culture based processes of inquiry

The following concepts of organisational cultures are fundamental to SSMs culture-based processes of enquiry. Institutional weaknesses have been associated with poor implementation of food policy and organisational structures (Maxwell, 1997; Devereux, 2001). Individuals in institutions and their practices determine which world views and activities will take precedence in the early warning system. We have learned from studies of organisation culture in humanitarian aid that relations between the organisation and the external environment are complicated by politics, donor fatigue, confrontations (Bratton, 1989; Smillie, 1995), and that their limitations are caused by institutional dynamics characteristic of aid organisations (Walkup, 1996). The researcher's job is to uncover the structures of meaning in use in the organisational setting and to synthesize an image of that group's reality (Smircich, 1983). Handy (1985) described four organisational cultures; one characteristically shaped by power struggles, another controlled by a hierarchy of roles and regulations, a third that is task orientated—focussed on forming and reforming specific tasks, and the fourth is

dominated by individual aspirations and priorities. Organisational cultures are formed by history and experience and often conform to the type of work being done (Maxwell, 1997). The concept of organisations as dynamic and varied entities is fundamental in the literature and this quality of organisations lends them to analysis in system process models.

A related concept is that every system has myths and meanings which constitute its culture and that it is important to look at the roles, norms and values within that culture to really understand the nature of the system. Vaux (2001) observed that during the 1984-85 Ethiopian famine, the interventions NGOs and UN organisations selected were often the initiative of one individual and their power to persuade others to adopt the same line. Although the Ethiopian government spoke with one voice, there were profound differences among the individuals themselves (2001:66). SSMs culture-based inquiry helped reveal the discursive storylines and positioning of the owners in the process. It helped identify those organisations that shaped the transformation of policy and information into practice.

Buchanan-Smith and Davies (1995:9) described government, donors and NGOs as the principle players in early warning and relief operations. Using SSM, an early warning system's activities and interventions can be deconstructed by classifying these three actors according to different roles. First, who are the clients—the people for whom interventions are designed? Second, who are the problem solvers—those who wish to do something about the situation in question? The intervention is best defined from their perceptions, knowledge and readiness to make resources available. Third, the problem owners—people who are in a position to do something, to effect policy or change. The problem solver decides who the problem owners will be. This analysis of

stakeholders, motivations and incentives has been previously applied to uncovering the factors encouraging staff to work and to make organisations perform (Roche, 1998 and Moore, 1994) and this is fundamental to explaining the processes within any organisation or system. The aid personnel interviewed for this thesis mainly made up two strata: fifty percent were managers and forty-six percent were technicians. The remaining were independent consultants. These roles are explored further in the following discussion.

The power structure and its influence on practice and methodology

During multi-agency vulnerability assessments, politics, and information issues shaped the roles of those individuals and agencies that collaborated on methods for food security data collection and analysis. An important finding in Hajer's (1993) work on environmental politics was the role that meetings and excursions played in persuasion. In Ethiopia, meetings like the Needs Assessment Steering Committee (NASC)⁵ and vulnerability assessment missions were critical for persuading participants of the authority of specific policies and methods. The scenario in Box 1 is a snapshot of the circumstances under which collaboration and data discussions shaped the activities in the early warning system, defined the roles of different institutions and framed adopted methods. Advanced information and mapping technologies were used to validate an ongoing program geared towards donor and government information needs during vulnerability assessments in Borena and Wolayta.

⁵ The Needs Assessment Steering Committee (NASC) was established as a sub-committee of the Early Warning Working Group. This information was taken from NASC meeting minutes, 1996.

Box 1 Scenario - Multi-agency vulnerability assessments of Borena and Wolayta¹

In march 1997, vulnerability assessment teams from the U.S. Agency for International development, the World Food Program, the Disaster Prevention and Preparedness Commission (DPPC) and a few international NGOs drove more than six hours from the capital to southern Ethiopia. This decision was based on early DDPC reports of food insecurity, low rainfall measurements and a computer generated map on which Borena, a region in Southern Ethiopia near the Kenyan border, appeared in red. A similar assessment in Wolayta (central-southwest) in the same year was used as a case study for establishing methods for vulnerability ranking and relief food aid need estimates. They used an indicators based approach that classified indicators according to either current or chronic vulnerability. This provided a context for better estimates of relief food aid needs.

Sources: 1) WFP-VAM (1997) Southern Rangelands; rainfall analysis. World Food Programme internal email
2) WFP-VAM (1997) Vulnerability Ranking and Relief Food Aid Need Estimates, Wolayta: a case study

The government's role(s), spatial disparities, methodological direction

The daily interactions of government ministries across different geographical levels showed diversity in procedure and practice. As discussed in Chapter One, the government designed cross-sector policies based on concepts of protecting and promoting entitlements. Yet, early warning governmental administrations and activities in local areas have been passive and disconnected from the national guidelines they were expected to follow. They have had a limited capacity and authority to fully realise the other part of the equation, which is promoting entitlements. They have conducted analyses of vulnerability in line with donor activities rather than from a perspective of supporting farmers' livelihoods.

The government has held the traditional state role, presenting a united front that hid a number of inconsistencies. One area of inconsistency was in the implementation of the decentralisation plan. Since the transition from a communist regime to a more democratic one, the government in Ethiopia has operated at different spatial scales as

part of a decentralisation project. Each segment contributes to the functioning of the early warning system but in different ways, sometimes with different interpretations, and often bureaus at different strata communicate poorly one with the other. Figures 1 and 2 (on pages 308 and 317) show that at the time of the interviews for this thesis (1997 and 1998), information on farmers' crop production and general food security were collected by locally based committees and government agents. The local government, along with communities, also had the authority to decide on food aid targets once the analysis of total national need was made in Addis Ababa. They officially hosted the vulnerability assessments missions conducted in Borena and Wolayta (refer to Box 1). Contrary to their aim of decentralisation, however, the local government has not been fully resourced to respond to crises immediately. Weak local capacity has impeded appropriate and timely responses throughout Africa (Buchanan-Smith and Davies, 1995), but where local capacity was strong, it was because of decentralisation policies *and* external international assistance. International sources have been instrumental in shaping the outcomes of early warning systems.

There were also contradictory elements within the government's ideological approach that appeared during the transition period. In 1991 they launched a democratic and capitalistic process. The hallmarks were free elections, decentralisation and economic reform. Meanwhile, as Buchanan-Smith and Davies put it, the old system had to be safeguarded until new systems could be implemented (1995:61). The desire to maximise aid and economic growth while protecting sovereignty has been a key issue in government's relationship with donors (Buchanan-Smith and Davies, 1995:23). These contradictions have shaped the direction of assessments like those in Borena and Wolayta. In those assessments, this appeared as tacit support for the methods employed by foreign institutions, even when those may have been contrary to Drèze

and Sen's (1989) concept of fully promoting entitlements, a commitment expressed in policy.

Similarly, there was some discontinuity between their stated and practical aims. Their policies indicated a commitment to the World Bank definition of food security, as access to enough food for an active and healthy life. They made statements compatible with protecting and promoting entitlements, creating employment opportunities by building the general economy. Indeed employment generation programs and food-for-work schemes which support such aims are in place. Concurrently, they have been fundamentally interested in producing large-scale need estimates by which populations could be targeted for assistance and funding requests could be made (DPPC, 1997, 1998 and DPPC 5-Year Plan, 1998-2002). Vulnerability to food security has been a function of production, asset base and exchange factors, and therefore the indicators of the success of different production systems in Ethiopia were more important for an analysis of food need than differentiating one vulnerable group from another. To this end, their activities have traditionally focused on tallies of production shortfall, trade, and calculating relief needs (DPPC, 1995). A focus on production may be critical in emergencies, but it is incomplete information for developing long-term development assistance.

A critical problem with these analyses is that they render Drèze and Sen's (1989) concept of promoting entitlements, which is enabling vulnerable local people, less effective. These analyses are designed for emergencies; they tend to focus on the highest levels of aggregation. Without considerable data disaggregation it is uncertain how vulnerability differs within local geographic areas. Such information could enhance national alleviation strategies by providing information about local livelihood

strategies, how people utilise their assets over time and how they adapt. Yet local administrations are given national guidelines not local ones. Community self-targeting of food distributions is the end phase in a process of information gathering, analysis and response, yet it is disconnected from the government's crop assessment missions and other data gathering activities which occur in the initial phases of the process. The assessment methods applied to the Borena assessment presented in the previous scenario (Box 1), outlined a comprehensive approach involving local elders. Nonetheless, the mission teams met predominantly with local government ministry (Multi-Agency Assessments, 1997). This focus on regional and national level vulnerability is in the process of changing, but it is too early to assess whether this new approach will meet the needs of vulnerable people.

Given the historical relations between the Ethiopian government and donors and the endorsement of State sovereignty among Ethiopian policy makers that endured during the transition from one regime to another, the government's role in the Borena and Wolayta assessments was not unusual. They maintained a pivotal position in decision-making and information; they decided when emergency assessments should be made, how much food aid would be needed and how much should be asked of international organisations. They assigned Non-Governmental Organisations (NGOs) to specific emergency and long-term tasks, like 'water trucking' or 'irrigation projects' (Multi-Agency Assessments, 1997). In the Needs Assessment Steering Committee (NASC) meetings, the government remained allied with international agencies in the desire to improve data quality and analytical methods, despite being critical of other factors, like the timing of WFP/FAO assessments. This is because better data analysis supported their need for having convincing evidence before declaring a disaster (Transitional Government of Ethiopia, NPDPM 1993:6).

Donors, international organisations and technological mechanisms

At the inception of formal multi-agency vulnerability assessment in Ethiopia, Donors, institutions and multi-lateral organisations carved an integral role in controlling information. The first meetings of the NASC raised issues related to collaboration among international organisations, including non-governmental organisations and government, and improving food security data. The World Food Program's (WFP) vulnerability analysis and mapping unit (VAM) and USAID's famine early warning system (FEWS) representatives led those meetings, in which the primary aim was to establish a database of indicators. Representatives from the EU and other members of the NASC followed the WFP initiative to set up a Vulnerability Assessment sub-committee. The NASC itself was created to replicate WFP and USAID experiences collaborating with various institutions on vulnerability assessment in other parts of Africa (Larsen, 1994; WFP and USAID-FEWS, 1994). In 1996, for example, the key elements of the WFP VAM unit in Zambia were described as collaboration with government, donors and NGOs; district level analysis; the division of vulnerability data indicators into two principal factors, risk and coping (WFP-Zambia, 1996). These elements came to form the basis of WFP vulnerability assessment and mapping practices throughout Africa.

The methodology used by international organisations was an important feature in joint vulnerability assessments, as the choice of method reflected a mix of global discourse on vulnerability and food security, organisational agendas, personal choice, political decisions between organisations and control over information. In both the Borena and Wolayta assessments (Box 1), the WFP VAM drew from previous famine studies on each area, from which the representative defined famine in terms of a localised event,

affecting whole populations, denying them access to food and leading to mortality. The factors contributing to food insecurity were known to be complex and multi-dimensional, not easily captured or described by static models. The organisation defined food security as 'access to enough food', a World Bank definition, and made this an objective in their country programme (WFP, 1999⁶). The WFP and USAID also associated vulnerability with poverty. USAID defined vulnerability in terms of socio-economic groups within targeted areas (WFP, 1994) as an approach to VA. The WFP vulnerability analysis and mapping unit adopted a hybrid approach, relying on a convergence of indicators method used by CARE, and international organisations (WFP-VAM, 1995). However, satellite images were an important means of comparing current rainy seasons to the average in Borena. In other words, the instruments and analyses employed dealt with the broad scale of vulnerability, not with localised problems that might explain more about household level vulnerability. In Wolayta, a great deal of effort went towards understanding local variability of vulnerability at wereda level, yet their methods quantitatively compiled, weighted and calculated indicators of food insecurity in such a manner that converted socio political issues into statistical ones.

Credibility was another issue determining this choice of method. Technological and quantitative methods carried more weight with donors than national government methods because they originated in donor-affiliated institutions. They were therefore more likely to elicit a response from donors. For some international institutions, data base development was a greater priority than methodological development (Riely, 1996). A solid database provided one way of crosschecking government figures (Riley, 1996). Data and technology provided 'hard' evidence that donors were

⁶ WFP report 'Ethiopia: Objectives of WFP Assistance', 1999

comfortable with. Since the donor purview has been more global, the products they relied on and indirectly supported carried forward a more global analysis.

During the Borena assessment, the reliance on technological innovations to aid quantitative data analysis of food security indicators reinforced the legitimacy of donors, international institutions and the dominant data-centric methodology. In the Wolayta case, WFP and USAID were foremost in deciding methodology and data processing.⁷ Among the organisations on the Borena assessment mission, WFP was the only one with an explicit mandate to ‘map’ vulnerability, an activity involving almost entirely computer analysis. During the early stages of the WFP VAM unit’s development in Ethiopia, they consistently defined their role in relation to the DPPC as collaborators, relying on the government’s raw data sets, and as developers of VA methods and databases. The end product of VA was to develop a vulnerability map (WFP-VAM, 1995). USAID supported these efforts to control outcomes by controlling information with the aid of technological instruments.

The control of information through technology included people who held the technological equipment, the skill, or both and this highlighted the power distinction between those in the know and those who were not. Eight of the thirteen staff persons interviewed for this thesis concentrated on the technical analysis of rainfall and crop growth with one half of them using GIS. As one can see from Figure 2, all of the technological analyses were activities at national level only.

⁷ This is a reference to the introductory paragraph of Vulnerability Ranking and Relief Food Aid Need Estimates, Wolayta: a case study (WFP, 1997)

The technological costs were small compared to the general budget, but primarily donors, through their mission offices and UN organisations, funded technology. In the 1998-2002 period the government allocated 3% of their disaster prevention and preparedness budget to information and other computer technologies. Seventy percent of that was foreign funded.⁸ More than 30% of the budget was allocated to capacity building, collaboration and public relations; donors and government funded more than 80% of that (DPPC 5-year plan, 1998-2002). Donors and the DPPC were also the primary financiers of vulnerability profiling and assessment.

Non-governmental organisations; exclusion or containment

There is an historical correlation between Non-governmental organisations (NGOs) and political change in developing countries (Clarke, 1998; Fowler, 1993). Often they only serve to preserve the status quo. This was the case in Ethiopian early warning. NGOs in Ethiopia participated in field based vulnerability assessments, like that in Borena and Wolayta (discussed in Box 1). They made a contribution to identifying indicators of food insecurity and some were responsible for promoting the validity of qualitative approaches for ranking vulnerable groups. To be participants, NGOs have had to walk the balance between their own mandates and initiatives and a courtship with the government, and on the whole their activities have been controlled, monitored and contained.

NGOs serve a specific purpose to the Ethiopian government. They provide information. They help maintain continuity with local people. In the past, they have been able to facilitate arbitration between donors and government. Some of the literature presents NGOs as instrumental in determining whether, when and how many resources are

⁸ Figures found in DPPC 5-year plan, 1998-2002

allocated once an early warning system has signalled the threat of famine (Buchanan-Smith and Davies, 1995: 9). When there has been the tendency for donor scepticism in relation to government operations, a solution was to use more high profile, first generation international NGOs, who have experience implementing programs and may play an ambivalent role (Clarke, 1998). Despite this utility, at times some NGO personnel have felt their organisation lacked a role in the ideological struggles between states or have felt forced to take sides. Vaux (2001) described how Oxfam in Mozambique was conflicted over supporting the government, who advanced their own fleet for logistics, and supporting the private sector, whom American donors felt would improve investment, efficiency and economic development. In Ethiopia, NGOs, particularly international ones, have been caught in the politics of early warning; at times finding themselves committed to donors and at other times to government. This ambivalence is representative of the dualism NGOs have evolved towards: that of strengthening civil society by articulating and representing non-state interests, or of institutionalising existing patterns of political contestation between civil society and the state or within civil society itself (Clarke, 1998).

The NGOs interviewed for this dissertation said that their main concerns were political, institutional and informational:

1. A lack of collaboration
2. Difficulty expressing individual views without repercussions
3. At headquarters: poor information, information not timely
4. At household level: poor transport, time, language/communication difficulties, unreliable information and poor relations with government
5. Political competition among institutions

One respondent said it was not possible to work effectively in Ethiopia without working with the government. The government required NGOs to be registered. They were made to commit to an NGO code of conduct. Their role was to contribute to national efforts, to aid in fundraising, transporting, distributing and otherwise implementing relief (Transitional Government of Ethiopia, 1993; Robinson, 1994; DPPC, 1995⁹). As in Wolayta, they were invited to participate in one-off assessments (Flynn, et al, 1992). This was one way in which they supported the status quo.

The sometimes conflicting relationship between NGOs and other institutions in society were evident in Ethiopia. Some NGOs may be viewed as a threat to other institutions (see examples in Brosch, 1990). For example, the WFP and USAID discussed collaboration with NGOs, like SCF-UK, particularly for their local knowledge-based approach and the RiskMap program, which was designed to profile vulnerable people according to household food economy zones (Szynalski, 1994¹⁰; Robinson, 1994; WFP-VAM, 1995). Yet, I observed in a meeting on methodology for vulnerability assessment in Rome, 1996 ¹¹ and in conversations with individuals in the early warning system, that there were methodological disputes between SCF, international donor agencies and the DPPC that limited the use of their approaches considerably. The central issues were their reliance on qualitative methods as a basis for developing a computer analysis, which itself was not transparent and was difficult to validate. This dispute was characteristic of the politics of containment to which NGOs were subjected

⁹ DPPC EWS Guidelines, 1995,

¹⁰ WFP Internal Memo, 1994

and the efforts of individual institutions to promote their own view of the problem and its solution. Ultimately, the State determined individual NGO roles in Ethiopia, but endorsement by an international donor affiliated institution certainly furthered their chances of inclusion. To maintain a voice in decision making, NGOs have had to make the choice between exclusion and containment.

Summary of organisational culture: Problem solvers, problem owners and clients

The early warning system was a vertically linked, spatially differentiated, local-region-centre machinery in which centre maintained control of local activities. Individual ministries and organisations pursued autonomous interests within overall government constraints. This structure is characteristic of a 'policy network'.¹² Within the Ethiopian early warning policy network the institution that led much of the methodological development of vulnerability assessment was the WFP, particularly the VAM unit. According to SSM, this made them the problem solvers. Early in discussions to establish vulnerability analysis, which took place within early warning committees, they used their expertise in technology and resources to steer the outcomes of vulnerability assessments. A dialogue between WFP and the government, in which there was a mutual exchange of data for funding and skills, was fundamental to the government's role as problem owners. The government shaped the early warning and vulnerability assessment agendas through policy, and decided the roles of the other institutions in early warning. They subordinated NGOs to further national food

¹¹ The FAO hosted the 'Second Informal Meeting on Methodology for Vulnerability Assessment', December 9-10, 1996. Approximately 50 multilateral institutions, NGOs, universities and independent consultants were represented.

¹² The concept of policy networks within political theory, links State to sub national urban and regional political analysis. A discussion relating policy network concepts to analysis of State territorial structuring and control is found in MacLeod and Goodwin (1999).

security strategies. Farmers were the intended beneficiaries, but in practice they were not the real clients of early warning activities.

From government's perspective, the comparatively greater wealth of donor organisations was an asset to early warning. International organisations introduced the latest computer technologies to analyse crop data, while remotely sensed data and geographic information systems provided a national and regional view of farmers' problems. The way in which sophisticated information technologies were introduced made it a commodity. The people who owned the most technology and expertise generally were forceful in decision making. It was no coincidence that they were also donors and affiliated organisations. The DPPC, donors and international organisations would be the key users of early warning information and vulnerability profile data as they funded the greatest proportion of relief efforts (DPPC, 1995:9; SERA, PPPD, and DPPC, 1999).

International multi-lateral organisations have made their commitment to building partnerships with national governments. Yet, such commitments contradict and devalue their own ongoing projects that can support the livelihoods of poor people, such as food-for-work programs, community based targeting and vulnerability profile development. Specific outcomes occurred under the umbrella of organisations but were not necessarily determined at the organisational level. They often came about because individuals pursued and influenced the course of meetings, negotiations, and methods. Thus, the socio-political interaction among people within early warning was as important in shaping practice as the organisational policy stance.

SSMs logic based processes of analysis

In addition to an identification of roles, SSM outlines a logic-based process of analysis useful for exploring system activities. Emphasis is placed on how people formulate *primary* or *issue driven* activities. Primary activities are generally mappings of real world activities. They are equated to the public perception of the role of the system. Checkland and Scholes (1990:31-32) provide an example.

‘The charity Oxfam can be thought of as a relief organisation, and their primary activity would be the provision of relief. It could also be perceived as an organisation tackling poverty, in which case its primary activities could involve advocacy for impoverished people. In contrast, issue driven activities are not embodied in formalised real world arrangements. Their boundaries do not map on to real world boundaries. Thus, although Oxfam might be perceived as a relief organisation, their activities might not involve relief provision at all. Instead, they could be involved in public campaigns on issues related to people requiring relief, or in educating women about better marketing of their informal business activities—whatever the agents decide to be the relevant system activities.’

To derive the primary activities and to initially see the content of issue driven activities, the names given to the systems are important. The names of systems indicate the root definitions present in the system and these root definitions express its core purpose. In the case of Ethiopia, two names were dominant: Famine Early Warning System and the Disaster Prevention and Preparedness Commission (DPPC). The DPPC is the government ministry responsible for managing the activities of the early warning system.

The DPPC guidelines for famine early warning (1995:7) offers the following root definition of a famine early warning system: ‘*A programme for monitoring and*

warning of threat to disasters ahead of time; geared principally to warn of drought-related famine and to assess the impact of sudden onset emergencies. It involves monitoring at household, community, sub-national and national levels'. International organisations like WFP and USAID defined early warning in terms of global concepts: *disaster mitigation and crisis recovery and the World Food Summit goal of reducing malnutrition by ½ by 2015* (WFP, 1999¹³). Consequently, based on these definitions both primary activities and the core purpose of the Ethiopian early warning system related to:

1. Famine alleviation (emergency relief)
2. Disaster preparedness (early warning)

There was no indication from these definitions that the early warning system dealt with vulnerability or that it sustained long-term development.

In contrast, issue driven activities reflect other (most likely internal) perceptions of the system, which might be quite different from the public's'. The people interviewed in Ethiopia described an early warning administrative structure that did not always accurately reflect the actual processes and activities of early warning. This was quite evident when the issues they mentioned (in Table 1) were compared to their organisational diagrams (shown in Figure1). Politics, information, and system constraints were often mentioned, while information (quality, timeliness, use, interpretation, etc) was the most frequently mentioned. A review of the antecedents to the problems associated with information, drawn from the issues people raised, showed that information was strongly influenced by politics (including policies, decision making, intra-institutional competition) and the power struggles within the system.

¹³ WFP report 'Enabling Development', 1999

Table 1 *Issues and constraints to early warning and response*

Number of times mentioned	Issues
07	Government: restrictive, poorly organised, poorly resourced, poor decision making
19	Information: source, quality, timeliness, transfer processes, use and interpretation, non-standardisation
09	Poor communications/collaboration: interpersonal, intra-institutional
18	Systemic: poor skills, finance, equipment, organisation
18	Political: competition among institutions, interpretation of data, different perceptions, motivations, decision making
02	Methodological

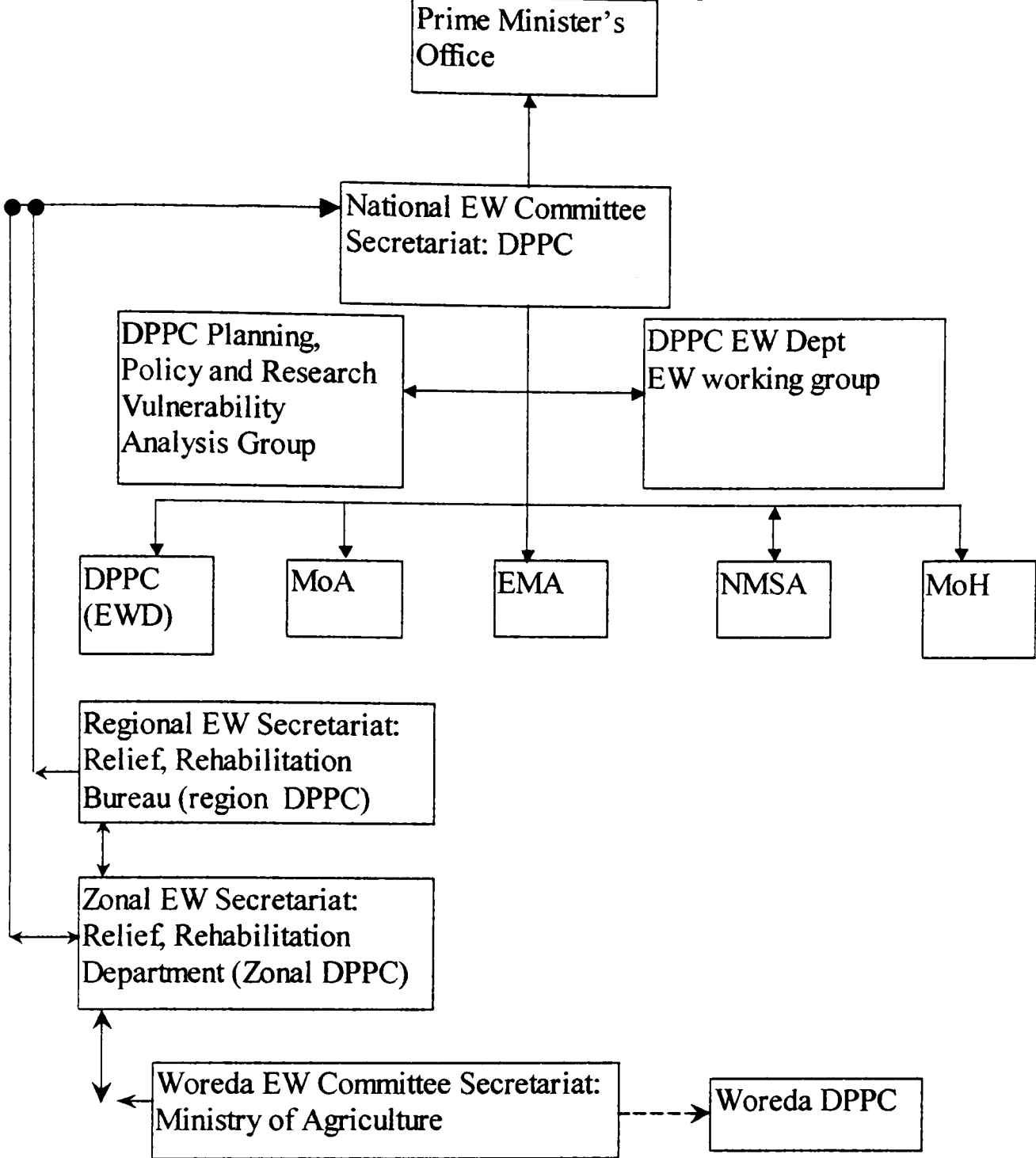
These issues were less evident in the respondents’ organisational diagrams. The diagram in Figure 1 is consistent with the descriptions in the National Policy on Disaster Prevention and Management (NPDPM), the DDPC early warning guidelines and those of the interviewees. The bottom-up approach to data gathering represented in this diagram shows a decentralised system and this disguises the fact that the real ownership of information does not lie with farmers. The people interviewed described a system in which data on farmers’ conditions were filtered through local and regional government offices, through a multi-layered process of targeting and needs assessment, before finally reaching the national early warning system. At the national level, the information was analysed in committees of national and international institutions. When needs were calculated and published by the government, they were not disaggregated to farm level and they differed considerably from the original estimates delivered by local administrations and communities. The diagram reflects certain primary activities, a popularised concept of how the NEWS works and or what it is

supposed to achieve. In contrast, the issues people mentioned in Table 1 determined what activities actually took place.

Soft Systems Methodology sees the human activities described in Figure 1 and in the Wolayta and Borena scenarios as systemic constructions called 'holons'. Holons represent world views. Hence, the following famine/food security holons were uncovered from Ethiopian food policy when the methodology was applied.

1. Provide access to food
2. Provide access to resources
3. Assess crop production
4. Develop nutritional balance sheets
5. Consider alternative food sources

Figure 1 *Ethiopian Famine Early Warning System Organisational Structure*



An examination of system definitions was needed to develop a conceptual model to further articulate the logical and cultural processes in the NEWS. Each holon was derived based on this. Ideally, interviews, definitions and world views, holons and activities, may serve as the components for engaging the people involved in the system in a debate that can generate a plan of action for change. Time and resource constraints did not allow me to ask people to reflect on conceptual models, and thus the application of SSM has been restricted to developing only a conceptual model and possible indicators for assessing the effectiveness of early warning.

International and national policies and early warning activities

Certain national policies and international agreements during the 1990s guided the concepts about vulnerability and food insecurity available to policy designers and the activities were expected to deal with food insecurity. As discussed in Chapter Five, most of the staff interviewed would have framed early warning activities by the tenets of international agreements like those made following the 1996 World Food Summit, which upheld a right to food and emphasised individual and household access to food. Early warning personnel would also have been influenced by a new national policy direction established when the transitional government took over in the early 1990s. The focus was on understanding more about vulnerability at the household level, and from these policies some of the formal definitions of famine, food security, vulnerability and the purposes of early warning systems were perpetuated.

The government, the WFP, and the USAID, all conceptualised vulnerability in relation to disasters and risk. For the DPPC vulnerability leads to disaster and has both current

and chronic causes (DPPC, 1997¹⁴). When there is a hazard within a vulnerable system there is also disaster. This is classified as current vulnerability. The prevailing WFP and USAID definitions of vulnerability assessment also made distinctions between immediate and ongoing states of vulnerability, which supported a wider concept of vulnerability (WFP and USAID-FEWS (1994). For all institutions, vulnerability involved a wide range of problems including food insecurity. The World Bank definition of food security was commonly accepted among institutions. This placed the emphasis on access to food for individual households.

Despite the broad aim of policy to address people's vulnerability to a range of disasters, many organisations demonstrated difficulty in translating this into action. At the system level, this was partly attributed to the fact that the NEWS was shifting from a relief orientation to a livelihoods orientation, but hadn't the institutional capacity right away to build from the bottom up as intended, nor did it openly coordinate the development activities of other institutions (Buchanan-Smith and Davies, 1995; Maxwell and Lirenso, 1994). Another factor was how activities were conceptually framed and conducted. There appeared to be some confusion between how the problem was conceptualised in institutional documents and how practitioners dealt with and defined the problem. Staff defined famine and food insecurity as both environmental and socio-economic. The environmental factors were mainly given as poor rainfall and land degradation; socio-economic factors differed depending on the institution.

All interviewees were engaged in an analysis of famine and food insecurity but the vulnerability analysis aspect was still developing. This offers one explanation why

¹⁴ See DPPC report on Vulnerability Assessments.

despite being members of the vulnerability assessment group, only two of the people (in two separate institutions) interviewed defined their activities as vulnerability assessment, and they were only in the beginning stages of operationalising it. Understanding and addressing vulnerability was not immediately the outcome of policy, despite having this activity as a stated goal. Indeed, vulnerability has only slowly been incorporated as an object of analysis in the past few years.¹⁵ And it has been three years since the DPPC formally undertook an assessment of household vulnerability through efforts to develop vulnerability profiles.

Information

Both policy and peoples' definitions of the problem and their activities shaped the kinds of information they relied on, but these were not the only determinants of information. The other factor was how people transformed information into specific outputs.

I centre this discussion on the primary type of information used by the Ethiopian NEWS for the purposes of assessing vulnerability to food insecurity. The information was mainly used to make need assessments and it routinely arrived among decision makers through two distinctly separate processes and sources. Crop production data formed the basis of needs assessments and came down to the number of people who had a production shortfall in a given year. 'Development agents', who were employees of the ministry of agriculture, collected data. These figures were passed from one layer of bureaucracy to the next, from peasant association, to wereda ministry of agriculture, to zone, then region and finally to national DPPC. The socio-economic information

¹⁵ It is mentioned in the National Policy on Disaster Prevention and Management, 1993.

behind the figures was assessed at the local level, but this was not reflected in the final documentation of need. They were mainly used for targeting once aid was distributed.

Independently, the annual WFP/FAO assessment teams contributed to the analysis of national crop production and data. They calculated national food needs based on an assessment of import needs and food aid needs (WFP, 1997¹⁶). Their analysis of vulnerability drew on weighted indicators of current and chronic socio-economic and environmental conditions, including NDVI (the normalised difference vegetation index). NDVI measures various stages of plant formation derived from satellite images covering geographically large areas. The US government developed the index and it was mainly used and interpreted by the national DPPC, WFP and USAID. WFP and USAID incorporated the data into their own systems for assessing vulnerability. The fundamental problem for the final assessment was reconciling the different methods used to analyse information coming from different sources. Often the results from different institutions were not the same and this led to negotiations over the outputs

The activities in which crop production data were gathered from farmers or NDVI measurements were used by international organisations to assess crop production resulted from distinct socio-political processes. Within these processes early warning personnel balanced, incorporated or discarded the messages resulting from international agreements and national policy such that their activities were more reflective of the fundamental issues and constraints they faced daily. These issues drove the production of specific outputs. In Table 2, the socio-political transformation of information, from an input stage to an output stage, is shown to derive from different interpretations of the information processes and of individual and organisational needs. Any one

interpretation could be paired to a view, a world view, about food insecurity and famine.

In Table 3 the holons listed earlier are linked to intermediary activities (inputs), issue-driven activities (outputs) and the world views that might be inferred from the analysis of holons, activities and definitions. The world views presented in Table 3 were derived from my analysis of interview responses and food policy statements. The exercise of building Table 3 demonstrated that the only activities that directly addressed the underlying factors restricting access to food were the employment generation schemes. The food need discussions were the only area indirectly connected to addressing people's needs, and even this was an inadequate matching because need discussions centred more on number crunching than on people. Food and resource poverty, the primary factors in access to food and resources were addressed in the government's economic plans, not in early warning.

In Table 4, the processes come full circle. Keywords from the respondent's definitions of food security are added to world views. It is notable that the people actively engaged in analysing crop production data held a view of food insecurity as related to socio-political and environmental issues, like access (to food, services), rainfall and land size. The determinants of access to food were not clearly articulated in their analysis. Approximately one half of the people analysing crop data connected it to poverty, while only one of them mentioned vulnerability as a component of food insecurity.

Based on this linking of root definitions, holons and world views I articulated a conceptual model of the early warning activities and information flow processes. The

¹⁶ WFP Assessment Guidelines, 1997

result is the diagram in Figure 2. This adds operational inputs and issue driven activities to the previous organisational and informational flow diagram in Figure 1. Figure 2 shows the existence of an international sphere of influence, a concentration of policy and data analysis at national levels, minimal intermediary functions at the zone and regional levels, and no meaningful engagement with farmers in terms of decision-making, save for the collection of data.

Table 2 *The transformation from primary to issue-driven activities*

Holons	Inputs	Outputs (Issue-driven activities)
Assess Crop production	-Crop Assessment	-Food Supply prospects
Consider Alternative food sources	-Crop Assessment	-Food Supply prospects
Assess Crop production	-GIS analysis	-Mapped assessment of vulnerable regions
	-Risk Mapping	
Provide Access to food	-Discussion of Need	-Revised need estimates
Provide Access to resources	-Discussion of Need	-Employment Generation Schemes, Food-for-Work
		-Funding Requests
		-Food Distribution and Targeting
Develop Nutritional and food Balance Sheets	-Crop assessment	-Food Balance sheet
	-Nutritional surveillance	-Funding requests
		-School feeding program

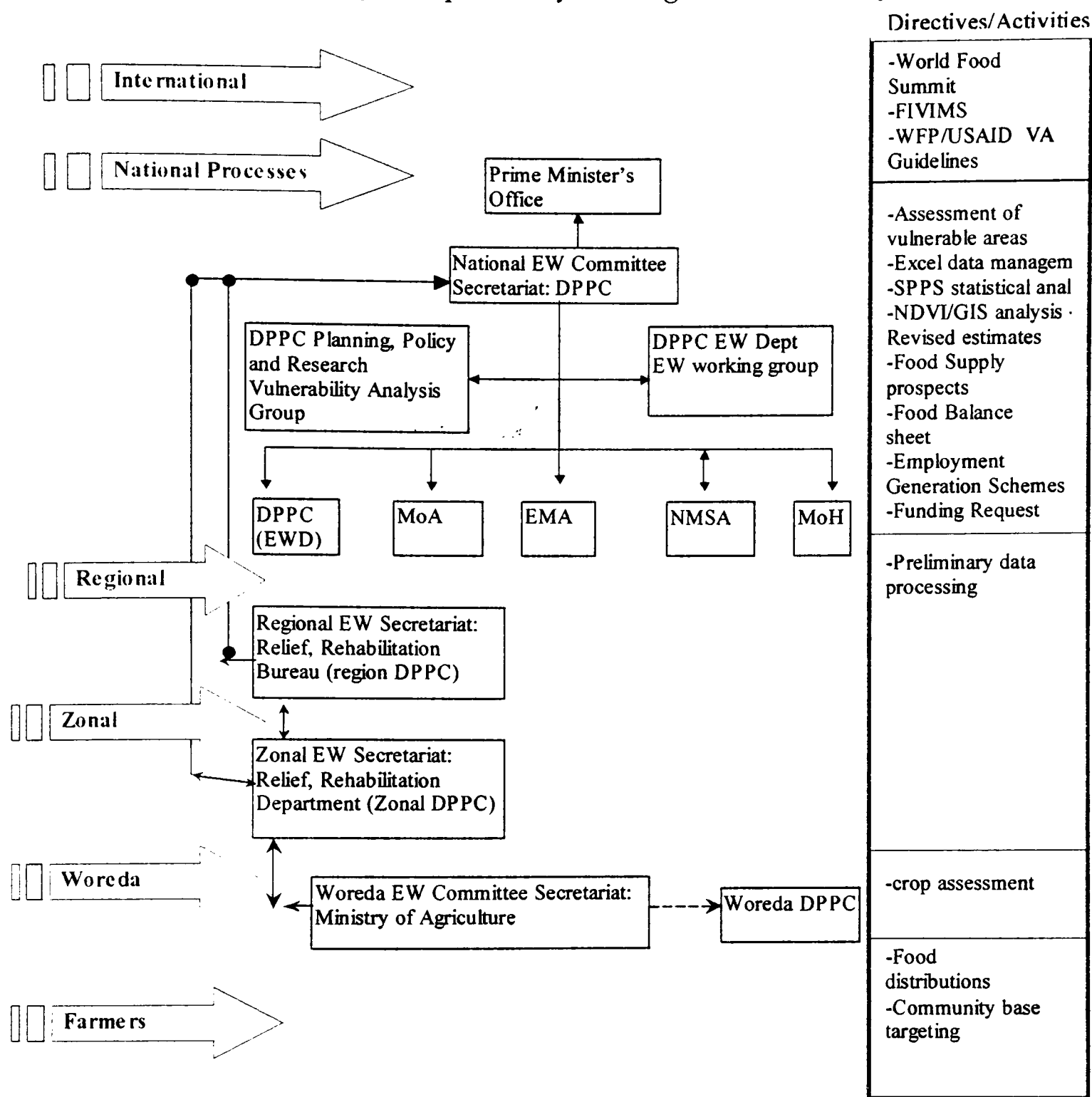
Table 3 *Transformation processes including implied world view*

Holons	Inputs	Outputs (issue-driven activities)	Implied World View
Assess Crop production Consider Alternative food Sources	-Crop Assessment -Crop Assessment	-Food Supply prospects -Food Supply prospects	-Farmers rely on rain-fed agriculture therefore crop production will be an important indicator of food prospects.
Assess Crop production	-Excel data managemnet -SPPS statistical analysis -NDVI/GIS analysis -Risk Mapping	-Mapped assessment of vulnerable regions	-Some regions of a country are more food insecure than others and technology aids the analysis of differences.
Provide Access to food Provide Access to resource	-Discussion of Need -Discussion of Need	-Revised estimates -Employment Generation Schemes, Food-for-Work -Funding Request -Food distribution and targeting	-Access is determined by need -An institution's assessment is negotiable -A person's food insecurity is negotiable. -Donors want this information
Develop Nutritional and Food Balance Sheets	-Crop assessment -Nutritional surveillance	-Food Balance sheet -Funding request -School feeding programs	-Tackling famine and food insecurity are functions of balancing aggregate food supply to food need. -This is information donors want

Table 4 Implied world views linked to food security and famine keywords

Implied World View	Food Security/Famine keywords	Number of responses
Farmers rely on rain-fed agriculture, therefore crop production will be an important indicator of food prospects.	Rainfall	4
	Production	3
	Farm inputs	1
	Land (shortage of land, land degradation, soil erosion, poor soil fertility)	2
	Food distribution	1
	Geography	1
	History	1
Some regions of a country are more food insecure than others and technology aids the analysis of differences.	Climate	1
	Population size	1
	Access (to food, health, resources, institutions, information)	7
	Vulnerability	1
Access is determined by need. An institution's information assessment is negotiable. A person's food insecurity is negotiable. This is information donors want.	Population size	1
	Intra-household allocation	1
	Policy	2
	Conflict	1
	Poverty	5
	Rainfall	4
	Production	3
	Farm inputs	1
	Land (shortage of land, land degradation, soil erosion, poor soil fertility)	2
	Food distribution	1
	Intra-household allocation	1
	Access (to food, health, resources, institutions, information)	7
	Vulnerability	1
	Population size	1
Tackling famine and food insecurity are functions of balancing aggregate food supply to food needs. This is information donors want.	Intra-household allocation	1
	Policy	2
	Conflict	1
	Poverty	5
	Rainfall	4
	Production	3
	Farm inputs	1
	Land (shortage of land, land degradation, soil erosion, poor soil fertility)	2
	Food distribution	1
	Intra-household allocation	1

Figure 2 *Conceptual model of Ethiopian early warning activities and information flow*



6. Implications: Towards an alternative world view

At the outset of this chapter I asked: where does food aid targeting and vulnerability analysis go wrong? To answer this question my aim was to expose the institutional weaknesses as seen in the organisational culture of early warning and the socio-political processes that shape activities in the system. Organisational culture and socio-political processes have contributed to a lack of consistency between theoretical concepts and practical operations, competition and poor communications between early warning members, conflicts over information (quality and type) and challenges the implementation of methods which place farmers first. This discussion has aimed to show that the National Early Warning System has been dominated by a world view in which the vulnerability of the food insecure may be assessed homogenously and may be contested within national committees who maintain little contact with farmers once data has been collected and processed outside of their communities. The trend in current research seems to suggest that the disjuncture between policy and practice in the NEWS, between global world views and household vulnerability, is indicative of a crisis of direction facing food security policy makers. Should decision makers return to the national production focus of the 1970s or should they push on towards a thorough, disaggregated assessment of localised vulnerability (Devereux and Maxwell, 2002)? In addition, today's early warning activities betray a failure to fully embrace a livelihoods framework for analysis. The livelihoods framework focuses on an understanding of household assets, activities and strategies for obtaining income and the mediating processes that place vulnerable households into the larger social, political and economic context.

Farmer vulnerability at a distance

A large part of the failure to take on an assessment of livelihoods is that farmers are often not participants in relief or development decisions. The food security survey of Delanta showed that people consistently represented themselves as *receivers*: of aid, employment generation programs and agricultural extension schemes. Their responses were less consistent in relation to *participating* in decision making: 74 per cent (sample size= 189) showed a dependence on foreign institutions and government for information about aid activities and projects, while 43 per cent said they were not consulted before, during or after relief and development activities were in place. This suggests that contrary to what one might expect, the clients—the beneficiaries of vulnerability assessments and interventions—were not the farmers. For farmers to have benefited from early warning, vulnerability analysis and food aid, they would have needed to participate in decision processes. Handmer, Keys and Elliot (1999) observed that effective early warning starts locally—within communities. Local people must be convinced that the concepts and strategies are appropriate and furthermore, they must be committed to the guidelines presented to them. Thus it must be a participatory and reciprocal process. Sharp's (1998) is one of the few published studies to explore the depth of the commitment to early warning and development approaches amongst communities in Ethiopia. Others who are critical of food policy and strategies in Ethiopia have concentrated on comparing need with delivery, but have said little about what people really think about whether government and international institutions' strategies work.

Ellis (2000) refers to the ‘mediating processes’ that are exogenous to the livelihood and food security of farmers and which may have contributed to the disjuncture between farmers and decision makers in Ethiopia. One external but contributing factor was the continuing legacy of the Derg regime—where questioning authority was punishable. Farmers in Delanta identified the importance of that regime on the historical timelines they created during the participatory rural appraisal survey. The Derg era has been likened to a ‘reign of terror’ (O’Kane, 2000) under which people became conditioned to accept governmental decisions with little contest. Further, the violence and manipulation of the regime along with their open alliance with the former Soviet Union instigated donors to place additional conditions on aid during a period when foreign aid was declining in all countries. The cautious relationship between donors and government continued on into the 1990s, even after a new democratically orientated government was in place. Consequently, farmers in Delanta approached the government’s data collectors with a degree of subservience while the aid they were to receive in turn was given frugally in light of Ethiopia’s declining share.

A second factor has been the lack of accountability — farmers have been geographically and institutionally distanced from early warning systems in most parts of Africa (Buchanan-Smith and Davies, 1995). In Ethiopia, accountability to vulnerable farmers and among the departments responsible for early warning and decision-making has been mixed. On the government’s side, their policies indicate the intention to reach vulnerable households, but poor communications between government bureaus and resource considerations for the whole country relegated individual households to a lower priority. The government’s Ministry of Agriculture was the locally based agency responsible for

interacting with local institutions and farmers and collecting data, but the decisions taken at zonal, regional and national levels were those of the DPPC. I observed that the attitudes about duties between DPPC personnel and the Ministry of Agriculture differed and I argue that this fractured continuity and accountability between agencies. In addition, since a focus on tackling long-term vulnerability was still in the development stage, up to the time of my interviews accountability to farmers had been rather weak.

On the donor side, true accountability, to people not numbers, existed only among a few dedicated individuals and much less so at national institutional levels. The WFP for example stated that the core responsibility of their vulnerability analysis and mapping unit was to analyse vulnerable populations (WFP-VAM, 1999), yet carrying this forward in the truest sense was undermined by the logic of the organisation's commitment to partnerships with national authorities first and foremost¹⁷. One of the WFPs central aims has been to assess national level food security.¹⁸ In a critique of methods for sub-national food security assessment, Devereux (2001) points out that the WFP-VAM reports reflect the methodological difficulties associated with aggregating food security information. In the Zambia and Senegal reports in the mid to late 1990s, the analysis of vulnerability by district disguises inequality within districts and differences across diverse groups of people. A considerable amount of diversity existed among farmers in Delanta. A wealth ranking exercise conducted in three peasant associations revealed different levels of assets that were spatially dependent on altitude and village. Table 5 repeats a graphical presentation made in Chapter Four, which shows the percentage of households in wealth

¹⁷ See WFP report *Enabling Development*, 1999

¹⁸ WFP *Assessment Guidelines*, 1997

ranked categories. The table illustrates that those households holding the most assets (Category One) were resident in the lowland villages of Kess and Wohaw Mender. The lowest asset holders (Category Three and Four) resided in the midland village Firja Mareja.

Table 5 *Percentage of households in wealth ranking categories by altitude and village*

Village	Cat. One	Cat. Two	Cat. Three	Cat. Four	Cross-Categories	TOTAL
Highland:	7.8%	31.9%	36.1%	11.3%	13%	100
Tina						
Millawa	5%	35%	45%	15%		100
Midland:	13%	31.2%	36%	18.4%	1.4%	100
Firja						
Mareja						
Lowland:	22%	27.8%	27.8%	20.8%	1.6%	100
Kess/Wohaw						
Kiltu	20.4%	24.4%	43.8%	10%	1.8%	100

This diversity would not have been captured by a WFP-VAM mapping exercise as those account for regional and national diversity not community level diversity. The WFP and USAID showed a dependence on remotely sensed information during the period of interviews for this thesis. This technological analysis lent clarity and validity to ongoing donor and governmental programs aimed at calculating national need. It did little to clarify the evolving livelihood strategies of poor people. Thus, technological approaches also served the purpose of reinforcing the status quo.

From the NGO point of view, accountability to farmers was sometimes overshadowed by the role designated to them by more powerful forces within the system. The only NGO

operating in the Delanta region during the research period for this thesis (1997 and 1998) was Oxfam GB. For the first ten years their program was restricted to emergency food aid and rehabilitation with a gradual shift towards long term reconstruction efforts in the mid to late 1990s. Much of their work however, was designed to support existing government agricultural extension programs, credit schemes and the food-for-work program.

Getting a new world view in place

Although the physical operations of the NEWS had decentralized in the 1990s, the quality of needs assessment activities indicated that the government's institutional memory was still 'centralised'. The responsible government departments maintained an important measure of control at the national level, as reflected by their focus on aggregated cereal quantities, rather than the 'who's, where's and what's' of vulnerability. The hierarchical communications network in operation did not effectively connect farms to national early warning committee rooms. Among institutions, there was no shared functional vulnerability or livelihoods framework that would offer the opportunity to connect the activities of poor farmers to macro-level activities, events, or strategies in order to design better interventions. Therefore, little attention and resources were allocated under an overarching policy to evaluate the assets of poor people, which is fundamental to an appraisal of vulnerability and livelihoods. There were only a few individuals within early warning organisations independently conducting this type of analysis. Additionally, farmers had little representational capacity at the national level, where decisions were taken, to challenge dominant perceptions or images presented about them.

Furthermore, in a recent study of Ethiopian food aid targeting, Clay et al (1999) observed that systemic inflexibility in famine early warning [primarily on the government's part] continued to be a major cause of food aid mis-targeting. Table 6 shows that the aid contributions between 1991 and 1999 were consistent with crisis periods. Yet, less than 25 per cent of the chronically poor received aid in 1998. There were 3.8 million households in which members did not attain the minimum 1680 kilo calories required per day and 12.6 million people who were chronically poor, yet only 1.8 million received aid.¹⁹ A recent report from the Food and Agriculture Organisation (FAO) says that Ethiopia's production of cereal is improving, but 5.2 million people will still depend on food assistance in 2002 and that this is caused by localized drought, population displacement and limited access and entitlement to food.²⁰ It is important to add that poor targeting and insufficient aid are the result of the lack of accountability and responsibility taken among decision makers at the national level.

¹⁹ The data on beneficiaries comes from WFP report: Country Programme-Ethiopia (1998-2003).

²⁰ Report found at <http://www.fao.org/news/global/2002/GW0202-e.htm>, accessed: February 2002

Table 6 *Food donations and crisis periods, 1991-1999* ²¹

Year	Amount (Total metric tons from all donors)	Exceptional Shortage Year (Yes/No) ²²	Food
1990	1,102,571	Yes	
1991	1,248,832	Yes	
1993	897,565	No	
1994	939,505	No	
1995	589,592	No	
1996	306,494	Yes	
1997	716,232	Yes	
1998	713,039	Yes	
1999	1,306,021	Yes	

The NEWS functions broadly according to the mechanisms of a policy network. It is a product of ongoing processes of social and political construction intertwined with broader complex systems of governance (Evans, 2001). As such, changes to the operational structure are likely to be incremental, not radical. For members of the early warning system to take on board a world view centred on supporting livelihoods requires a new approach to standardising how people work within the early warning system. Maxwell (1990) has argued for an approach to food security planning, which is integrated planning, but independent implementation. The effort towards collaboration on vulnerability assessments and the current joint vulnerability-profiling project throughout Ethiopia is the first step in this direction. Following the view of some researchers (Edmunds and Wollenberg, 2001), I argue that collaboration should not be an end in itself nor should the

²¹ Source of donations: FAO agricultural statistics (<http://apps.fao.org/>, accessed: October 2001).

²² FAO 'Food Supply Situation and Crop Prospects in Sub-Saharan Africa- Global Information and Early Warning System on Food and Agriculture (GIEWS)' (Available at: <http://www.fao.org/WAICENT/faoinfo/economic/giews/english/eaf/eafdoc.htm>, Accessed: February 2002)

aim automatically mean consensus without the proper representation of the poor and an open process of negotiation in which stakeholder positions are made clear. The second step, that of independent implementation would allow organisations to satisfy their separate mandates and priorities apart from that set out for them by the Ethiopian government. This of course would entail some relinquishing of governmental control.

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Annex: Interview format and Interviews

Institution Interview Format

I. Description of Work
• Organagram • Decision Process diagram---Flow of info. diagram • Number of Years employed • Number of years in this type of work • Job Title • Job Description. Tasks per week or month • Percentage of time spent on task per week or month
II. Constraints
III. Technological knowledge and experience
• Uses of technology
IV. Definition of food Security, famine causation in Ethiopia
V. Data Collection Methods and Constraints
VI. Other

Persons Interviewed

Name	Position	Institution	Date and City Interviewed
Robin Wheeler	FEWs Country Representative	US Agency for International Development (USAID)	19 February 1998, Addis Ababa
Tafesse Olkeba	Assistant FEWS Country Representative	US Agency for International Development	19 March 1998, Addis Ababa
Daniel Molla	Assistant FEWS Representative	US Agency for International Development	19 March 1998, Addis Ababa
Ben Watkins	Development Economist	UNDP secondment to DPPC	18 February 1998, Addis Ababa
Zenet Ahmed	Statistician, Crop Section	Disaster Prevention and Preparedness Commission (DPPC)	19 February 1998, Addis Ababa
Mengistab Haile	Agro-meteorologist	Disaster Prevention and Preparedness Commission (DPPC)	23 March 1998, Addis Abeba
Abraham Gorfu	Cartographer	Disaster Prevention and Preparedness Commission (DPPC)	18 March 1998, Addis Abeba
Ato Haregawi	Head of Early Warning Dept.	Disaster Prevention and Preparedness Commission (DPPC)	23 March 1998, Addis Abeba
Pippa Coutts	Nutritional Surveillance Project Manager	Save the Children Fund, UK	17 March 1998, Addis Abeba
Tanya Boudreau	Food Security Consultant	Save the Children Fund, UK	19 March 1998, Addis Abeba
Alemayu Kassa	Vulnerability Analysis National Officer (WFP Title) Senior Information Assistant (UN title)	World Food Program (WFP)	18 March 1998, Addis Abeba
John McHarris	Head, Vulnerability Analysis and Mapping Unit-Ethiopia	World Food Program (WFP)	20 March 1998, Addis Abeba
Pablo Recalde	Head of Vulnerability Analysis and Mapping Unit- Rome	World Food Program (WFP)	4 May 1998, Rome

CHAPTER EIGHT

Scaling Down: a comparison of analytical concepts and technological methods for vulnerability assessment and household level targeting

This chapter has been published in slightly different format as:

‘Getting the Scale Right: A Comparison of Analytical Methods for Vulnerability Assessment and Household Level Targeting’, in *Disasters* 25(2): 113-135, June 2001.

Elements of chapters 6 and 7 were included in expanded versions presented as follows:

1. Stephen, Linda (2000) Monitoring Famine and Vulnerability: Lessons from international and national experiences, *proceedings from the 29th International Geographical Congress*, Seoul, Korea, 14-18 August 2000.
2. Stephen, Linda (2001) Who is Vulnerable? Using a Neural Network to Target Vulnerable Households, *proceedings of the Association of American Geographers 97th conference*, New York, New York, 27 February – 3 March 2001.

1. Introduction

In the 1990s, early warning systems began incorporating more socio-economic and inter-disciplinary technological approaches into vulnerability to food insecurity analyses. Yet today many continue to deal only superficially with the great diversity in vulnerability to food insecurity between households. The resource poverty of institutions in developing countries can only partly explain the inconsistency between the low volume of studies of local areas and the evidence that localised data adds value to broad scale vulnerability assessments. Chapter Four illustrated that vulnerability to food insecurity is highly dependent on the socio-economic characteristics of a population, what livelihood strategies they employ and where they are geographically located. Chapter Five argued that global vulnerability myths, policy and institutional positioning contribute to the failure to direct strategies at geographically disaggregated, local places. And in Chapter Seven, it was argued that the interactions among individuals in early warning institutions contribute to the inability to target locally. The disparities between local realities and nationally focused strategies are further examined in this chapter, first by a brief review of the socio-geographic literature that critiques technological applications dedicated to solving complex socio-political problems. In section two, I argue that the socio-political construction of geographic space and scale limits vulnerability and food security targeting. The final sections of the chapter investigate some of the assumptions behind technological approaches currently used in vulnerability analyses. All of these discussions are used to support the argument that policy makers are implicated in the political manipulation of space and scale, as evident from the regional and national attention given to vulnerability, and that technological methods facilitate processes for transforming socio-political attitudes and spatial strategies into specific types of analyses. The scale at which vulnerability is

measured and the analytical tools used are vital for determining the outcomes and impacts on vulnerable people.

Some of the current approaches, such as that of the FAOs global information and early warning system (GIEWS), maintain a global remit. Others perform more localised analyses and have become operational in the 1990s. Among those are the RiskMap computer program, developed following the Save the Children Fund's (UK) household food economy approach (HFE) and the Classification and Regression Tree (CART) methodology, which is a commercially sold statistical package, used by the International Food Policy Research Institute (IFPRI) (see program manuals for specifications in FAO, 1996; Save the Children Fund (UK), 1997 & 2000; Yisehac and Webb, 1999). Some members of the Ethiopian early warning systems have used GIEWS and HFE-RiskMap approaches for analysing food systems. The CART analysis has been processed using Ethiopian datasets but has had no practical application among early warning staff. All of these approaches employ some of the latest computer technology and are ultimately used for food aid targeting. In this chapter, I demonstrate how the HFE-Risk Map and CART technologies might be influential in communicating specific concepts, measurements of vulnerability, geographic targeting and scale. These methods and technologies are compared to the findings from an artificial neural network, which was used to analyse vulnerability to food insecurity between households using the Delanta data.

2. Technological applications and the handling of socially determined problems

Many of today's early warning systems are increasingly dependent on technology that handle multi-variant problems, a trend that is connected to theoretical insights gained from the social sciences during the 1980s and 1990s, which have been adopted by donors, multi-lateral institutions and governments. Sophisticated technologies are regularly used among institutions in Ethiopia's national early warning system and the food security units of the Southern African Development Community (SADC). Data from satellite images of vegetation cover are imported for analysis into geographic information systems (GIS), and this offers the possibility of combining socio-economic and environmental components of vulnerability. The theoretical basis to these 'new' methods and techniques for evaluating vulnerability such as the HFE-Risk Map or CART have been designed along with the insights gained from post-modern modes of analysis; for example, that space, place and scale are social constructs¹. The post-modern framework emphasises the intrinsic variability in human behaviour across space and time, and therefore locality and context frame an intimate picture of behaviour. Many of the underlying assumptions about vulnerability to famine in the current stream of technological models therefore centre on its variable and dynamic nature. In application, all of the meta-theories about the subject are taken as given, and are in practice enhanced by a focus on specific variables like gender inequities in access to food, local trading patterns, ethnicity, seasonality of rainfall. Together, these aspects contribute to an overall picture of vulnerability and food insecurity. The application of these concepts can be seen in analytical models aimed at interpreting the interacting details of the problem, the socio-economic and environmental patterns that determine

¹ The postmodern analysis of food security shifts focus from macro-economic indicators like GDP/GNP towards micro-economies and the dynamics of local places. See Maxwell (1994). See also the compilation of Foucault's writings (1980), in which he articulates the social construction of knowledge, such as the influence of gender and

vulnerability to famine, and inform the choices of vulnerable people. These models appear to conform to the current view that disaggregation yields a better analysis of famine.

Nevertheless, the success of early warning is the outcome of political will, socially sensitive policy and economic resources, without which the advances in technology and theory are considerably less effective. Indeed, there is some justification for the critiques of technological approaches to famine assessment, as found in geography. Human geographers have faulted the advocates of technologies, like the GIS and other quantitative methods, for promoting a positivist approach to analysing social phenomenon. Taylor (1990, 1995) believed GIS was only suited to managing facts. Smith (1992) saw it as a tool for describing the world, not analysing social problems. Goodchild (1991) argued that people experienced in examining geographic phenomenon should only use it. A concurrent movement challenged users and developers to be more self-critical of its functions. Sheppard (1993), for example, expressed concern that the algorithms, upon which quantitative models relied, privileged a Boolean type of logic and therefore led to reductionism in problem solving. This idea of technological inequalities was elaborated in a later piece (1995) in which Sheppard argued that GIS was not a 'democratised' technology. Its sophistication and cost alone made it inaccessible to many. Law (1994) and Pickles (1997) taking a more philosophical line to this view, saw the development of maps as critical in imposing and representing a certain 'truth'; generally the ideas of the developed countries of the western world.

culture on our interpretation of events. Derrida (1976) methods are to 'deconstruct' text, a post-modern form of text analysis.

In the midst of this attack there were some fairly consenting voices, like Clark (1992) and Curry (1997), who were able to see both the advantages and weaknesses of the growing reliance on technological approaches in the social sciences. Yet each in different ways built on Pickles' argument that context and representation framed the development of technological tools. Clark discussed how the commercial interests in GIS threatened the type of analysis and research that endeavoured to model the world more precisely. Curry held that the reliability of the technology depended on its social context.

The tenor of these arguments ranges from technological scepticism, dismissive of the value of quantitative approaches, to the philosophical, and to the social theoretical, those who seek greater social responsibility in the use and development of quantitative tools. The social theory arguments could equally apply to a criticism of the adoption of early warning technologies, where various socio-political interests influence the approaches used. Hence, accepting that there are limitations to quantitative approaches to vulnerability analysis but also assuming that they have some value, I argue that a technological analysis of complex social phenomenon that predominantly focuses on higher geographical scales is merely an action through which the discourses within early warning are reproduced. In this way, the scale at which vulnerability is analysed for the purposes of designing interventions and eliciting a response from donors, is actually constructed by the socio-economic and political relations of the society in which decision makers practice. The social construction of scale offers an important explanation as to the theoretical and technological limitations of vulnerability analysis, and this will be discussed in the next section.

3. Targeting, geographic space and scale

An important issue for measuring vulnerability to food insecurity is the issue of scale; because an important part of targeting effectively is getting the spatial scale right.

In geographical and environmental studies there are two issues related to scale. Of interest to social theorists, is the social construction of scale. That means that scale is not an objective category, but instead is ‘produced’ by socio-political processes (Marston, 2000; LeFebvre, 1991). In contrast physical geographers tend to be interested in the empirical issues, that is spatial resolution. In the following discussion, both perspectives are used to illustrate the conceptual and technological meanings accompanying vulnerability analyses.

The social construction of spatial scales

Over the past 20 years an important part of the geographical and socio-philosophical literature has shown a concern with making theory more socially and politically engaged and has found the outlet for this interest in analyses of spatial scale. In the 1980s, Smith (1984) grappled with the issue of uneven economic and spatial development. He presented a Marxist argument that drew on interpretations of capitalist socio-economic processes, particularly Harvey’s (1982). Harvey has also examined the social and geographical differences affecting social justice and class-based inequities, which are defined as characteristics of capitalist societies. He discussed the socio-economic relations that determine the institutions we put in place and how we organise ourselves spatially (1996). Another perspective on socio-spatial relations is Latour’s (1986, 1991, 1994) notions that society does not only determine material structures,

such as space and institutions. Social differences are actually reinforced by materiality, and therefore the common activities of individual actors include a spatial structure and material components. The actions of different agents form a network that determines what activities, responsibilities and institutions are to be considered local, regional or global. The polarisation of concepts like local and global that accompanies socio-spatial analyses has prompted some writers to search for a mid-point to the analyses that would allow fuller understanding of the social construction of space. Murdoch's 'middle passage' (1997) thus builds on Latour's actor-network theories as the emphasis is on 'actors' rather than 'spaces' over time, since actors create the local and the global through specific activities. An alternative approach has been to concentrate on institutions and political strategies that politicise scale (MacLeod and Goodwin, 1999 and Swyngedouw, 1997). The argument from this point of view is that policy and institutional networks support state strategy and therefore an examination of these networks will help build associations between specific actions and activities.

Elements of these perspectives are found in Brenner's (1997) research on state territorial structuring in Germany. That case study serves as a good example of how political and social processes and institutional arrangements influence analysis and physical outcomes. Brenner demonstrated that the reconfiguration of space was a spatial tactic used by the state to best maximise capital. Also, Smith (1995), wrote that different societies produce different kinds of geographical scale for containing and enabling particular forms of social interaction. In the Ethiopian early warning system for example, the spatial analysis of famine at high levels of aggregation has been a tactical measure, exercised by the state and international funding bodies, through both their own organs and non-governmental agencies. It is a policy designed to control the dispersal of scarce resources, but also to preserve the status quo. In an appraisal of

Ethiopian famine policy during the 20th century, Mesfin Wolde-Mariam (1986) demonstrated that government self-interest and a disinterest in the prospects of the poor, led to untimely and insufficient responses and policies. It is possible to hypothesize that where there have been similar policies of exclusion, this has limited the development of technological instruments to only a superficial part of the analysis. The scale at which a technology operates can be seen as a pre-described statement of certain political objectives. Marston (2000: 219-242) notes that scale is not necessarily a 'naturally' pre-designed or hierarchical ordering of the world, it is the outcome of tensions existing between structural forces and the practice of agents. Drawing from these theories of scale, I propose that early warning decision makers conceptualise the spatial dimensions of food security as aggregated because it serves their own agendas. In contrast, the reality of food security among households in Delanta Ethiopia is much more immediate and local, as it is conditioned by peasant livelihood strategies.

Spatial resolution

It has been shown that it is not always possible to interpret from one scale to another and therefore a central issue is whether information about a phenomenon occurring at one scale can be applied to another scale. One reason is that the processes appearing homogenous at a small scale can be heterogeneous at larger scales (Lam and Quattrochi, 1992:90). Using the example of coniferous forest infested with pine bark beetle blight, Lam and Quattrochi (1992) discussed how the patterns of infected individual or infected small groups of trees are not evident at small spatial scales. At large geographic scales, however, groups of infected trees appear as patches of dead trees and can be easily distinguished from the others. The reverse can also be true, particularly in the case of socio-economic phenomenon. The factors contributing to

poverty are often interpreted homogeneously at broad spatial dimensions, which are assumed from aggregated census data. Rather, the patterns which identify 'who' could be poor (small farmer, single females, etc.) are more visible at smaller scales. Fotheringham (1997) notes that the importance of analysing at 'local' levels is particularly important when dealing with multivariate and complex problems. In addition, local statistics help in understanding points of error in spatial analysis. Lam and Quattrochi's studies of fractals in the mapping sciences emphasise the point that most of the real world is not constant at all scales, but there are techniques whereby the dimensions and changes in patterns at different scales can be summarised. For example, using geographically weighted regression allows local rather than global parameters to be estimated (Fotheringham, 1997). Another statistical technique is mathematical flow modelling, which can encompass social processes such as migration, residential choice, retailing and recreational behaviour. Other techniques employ regression models in which smaller-scale patterns are nested within larger-scales ones (Morris, 1996). However, there has been a limited use and application of such methods for bridging scales in famine, food security and vulnerability assessments. Some of the reasons are directly associated with the fact that the organisations developing much of the technology have a distinct international and global policy emphasis, which skews their interests to aggregated information. The famine assessment and alleviation strategies, which dominated early warning 15 and 20 years ago (i.e. the wide reliance on national food balance sheets), give evidence of this.

The problem of accurately linking analyses drawn from different scales presents a difficulty for targeting food aid, but tackling this problem is not readily a top priority for policy makers. Hoddinott (1999) noted that the principal considerations in targeting have been to increase the overall impact of an intervention on improvements to food

security and to reduce the overall costs of providing the intervention. Administrative costs reduce the amount available for interventions and therefore the administration of village and household level targeting, which can be more costly than broader geographic levels, is less favoured. However, Hoddinott also indicates that in the first instance geographic targeting may be relatively cost-less, and is also easier and less expensive to administer. Geographic targeting works best when the geographic units are relatively small districts as opposed to states. The geographic or administrative boundary is widely accepted as an indicator of the location of vulnerability, especially as vulnerability is variable across a country, region or even a village (Webb et al, 1994; Downing, 1991). This is also true in emergency situations. Jaspars and Shoham (1999) advise that in emergency targeting, and where there are scarce resources, targeting of needy people should be done on the basis of geography and nutritional status. Often, however, one-single targeting method is applied generically to situations of diverse context. The effect of food insecurity at all scales becomes 'generalised' when data are collapsed into regional and national analyses. As for impact on food security, Hoddinott (1999) demonstrated that concentrating resources on fewer units, like the district, village or household, could have a larger, improved effect on food security.

Targeting even if based on geography is not always a good thing. There are many examples of communities resisting the notion of household or individual targeting because of traditional practices, hierarchies and beliefs. The current targeting practices force them to prioritise and justify externally derived targeting priorities in ways that may be contrary to their own traditional systems. Another issue is that communities sometimes misrepresent themselves, making it difficult to assess the real effects of the problem (Hoddinott, 1999). Sometimes, community based representatives belong to the dominant groups and carry their own biases. Or, often the ones who are truly

vulnerable are marginalised and therefore have no voice in the targeting exercise (Jaspars and Shoham, 1999).

Lam and Quattrochi (1992:90) indicate that, ultimately, the best resolution at which to conduct a study will depend on the study's objectives, the type of environment under consideration and the kind of information desired. For this reason, the failure to conduct vulnerability assessments and use data at the level most appropriate for accurate analysis will depend on their remit. An early warning system that remains emergency focused will have different constraints and goals than one that incorporates a developmental approach. Where there are sufficient resources and interest in conducting small-scale analyses, however, the effort will be made to conduct more localised studies.

4. Three Methods for Vulnerability Assessment

This section reviews the SCF (UK) Household Food Economy Approach and RiskMap (HFE-RiskMap), the Classification and Regression Tree (CART) and an Artificial Neural Network (ANN). The HFE-RiskMap and CART were selected because they have the remit of providing local analysis of household food security. I am proposing the ANN as an alternative; to evaluate its potential alongside more established systems. I assess each program's potential given both the policy constraints in early warning systems and the design limitations of the technology. In particular, I aim to demonstrate how the models specify the problem of food insecurity, at what scale vulnerability is assumed, and how they express the variability of vulnerability at the household level. Each approach is discussed from a theoretical and an applied standpoint.

Integrated Assessment and Mapping: SCF Food Economy Approach/RiskMap

The use of techniques to summarise data have been employed by the GIEWS, who in 1992, collaborated with Save the Children Fund (UK) and contributed to developing a methodology for famine prediction, assessment and monitoring, called the Household Food Economy approach (HFE). They developed a system for integrating socio-economic data into global-scale analyses, which had previously relied considerably on remotely sensed data. According to the authors, the underlying thrust to their analysis rests on Sen's (1981) view of famine as entitlement failure. Entitlements refer to the social, political and economic access of affected populations to food, ultimately related to access and power. The HFE methodology aims to provide an understanding of household economy and its relationship to markets and employment opportunities in a baseline or reference year. This information is used to estimate the effect of a 'shock' on household income and food supply and the likely ability of the household to compensate for this by implementing the various coping strategies available to it. This helps in constructing an argument about peoples' behaviour when their access to food is restricted by environmental and political events (Save the Children Fund, UK/Food Security Unit, 2000). It proposes to do this by examining the 'entitlement set' of each household, which is equal to the sum of household income, the exchange value of household labour and other assets (Seaman, 2000:1). The HFE approach is an attempt to describe the economy of vulnerable households of which a large portion of the household economy centres on food (production and consumption). The RiskMap program is a database system that enables the analysis of household food economies.

Three algorithms have been employed to carry out the assessment of household food deficit based on calculations of normal consumption, food stocks and an estimation of need. The calculations are based on arithmetic calculations and a price model based on

a linear relationship between supply and demand. Typically, the program describes income and reserves for three household categories (rich, modal and poor) based on: the normal pattern of employment, specific employment, livestock and other markets used, and the likely distribution of food and other goods between households. Surveys are conducted amongst experienced field-based and international staffs, in collaboration with local 'informants', who generally live in the area and follow local market and trading patterns.

A focus on entitlements appears consistent throughout the development process of applying the HFE and the RiskMap program. The program's output illustrates the features of households that will determine their access to food. The analysis does not focus on specific households, but instead identifies populations with similar characteristics, then describes different types of households within that population. The description of typical households is meant to provide insights into the dynamics of rural economies.

While the clustering of households can provide a useful profile of vulnerability for a given target area, HFE profiles are sometimes used to describe and classify households in areas for which there is little sample data, and this clustering leads to generalizations. There is always the danger that generalizations of any kind will yield misleading results. Further, while in practice the HFE has been used at the level of a village, the RiskMap program has not been capable of assessments at or below the village level. The RiskMap output is expressed in terms of the typical household from defined wealth groups within a defined population, which is usually well above the village boundaries. Yet, it incorporates the variation between households within a specific wealth group using data in the form of ranges.

Two striking inconsistencies in the overall program are the absence of variables for labour supply and seasonality, yet these variables are crucial to an analysis whose aim is to anticipate peoples' behaviour in response to change. The authors specify the incorporation of the 'exchange value' of labour as an aim, yet go on to say that no data on household labour availability are included (Seaman, 2000). In the RiskMap program there is no explicit variable describing the size of the labour supply. Labour supply and demand (or lack of it) are both important indicators of the state of local and regional economies. Labour availability is critical to an analysis of household food security because it affects household income and partly determines how rural households cope with environmental and socio-economic change. Rural agricultural households are highly dependent on their own labour supply to earn income. In addition, it is unclear whether the program has a way of linking demand for labour at one scale, with supply at another. Seasonal climate change is also a strong factor fundamentally affecting household food security. Failed rainy periods jeopardise healthy and sufficient crop growth, which can lead to the employment of coping mechanisms like labour migration. Without these variables the analysis is considerably less robust and an unintended assumption is made that household food security will be static over time.

Finally, Sheppard's (1995) concern that technology privileges some worldviews over others may be evident here. The classification of households into rich and poor categories, for example, is partly acquired through qualitative information using rapid rural appraisal (RRA) methods. RRA methods can be a useful tool for self-targeting in the context of food distribution programmes and they are also a tool for the qualitative assessment of a wide range of phenomenon. However the methodology sometimes results in some groups favored over others (see Jaspars and Shoham, 1999) or a false

identification of who is vulnerable (Young, 1990). The logic of the equations in RiskMap follows the common modes in economic and sociological studies of developing countries. Data on social systems are incorporated along with quantitative price information. Thus, the calculations are as good (or as bad) as that found in current practice.

Classification System: CART Analysis

The Classification and Regression Tree (CART) is a statistical approach used in many fields for classifying data. The use of Classification and Regression Tree in an analysis of food policy and vulnerability in developing countries was based on International Food Policy Research Institute's (IFPRI's) ongoing experience in adapting microcomputers in policy research (see Breiman et al., 1984 for further details of the CART methods). CART was used to identify the key variables contributing to household food security in Ethiopia. This was based on their famine research program, which was completed in 1998. The use of CART assumes that vulnerability is multifaceted and multi-variant. The variables in the analysis include household income, food production, prices and consumption, markets, and purchasing power. They can be categorical and continuous variables (Yisehac and Hoddinott, 1999). The CART analysis is used to identify the indicators of a number of outcomes, like vulnerability. It does this by building a statistical picture of vulnerability. The goal is to produce an accurate set of data classifiers through the analytical process, in which the choices of indicators can be based on reliable alternatives.

The application of CART to an assessment in Ethiopia was aimed at understanding which indicators of vulnerability best explained the reported numbers of 'people in

need’ across geographic regions. Based on extensive time-series survey data, households were placed into two broad classes: vulnerable and not vulnerable. The original sample was split repeatedly based on a series of questions to which households could be classified as ‘yes’ or ‘no’. The first question was whether the households were in an area of ‘green’ vegetation cover (as indicated by NDVI² measurements). Another question was whether annual income was less than or equal to 2000 Ethiopian birr (about \$240). The outcome or result of this ‘sample splitting’ was a number of ‘terminal nodes’ that consisted of groups of sample households who shared some characteristics of vulnerability (see Table 1 for an example of two groups).

Table 1 *CART outcome for two vulnerable groups*

Group 2	Group 7
Average household size ≤ 4.4	NDVI (estimation of vegetation health)≤ 0.05
Average persons in need = 74%	Average persons in need = 68 %
Sample size concluding at this node=3	Sample size concluding at this node=5

Source: Yisehac and Webb (1999)

The average percentage of needy people at each terminal node (or group) adds to the total at the district level. The average district in Ethiopia covered 11,314 square kilometers.³ In this example, there were 10 groups, the total sample at the district level was 462 households and the average number of people in need was estimated at 11 percent. At each stage in the process, sub-samples were created and each step represented a branch in the tree. Statistical classification rules enabled the prediction of vulnerable versus non-vulnerable.

² NDVI is the normalized difference vegetation index, which measures vegetation ‘greenness’ detected by remote sensing. The range of possible values is –1 to 1, where – 1 is not green and 0.6 to 1.0 is green. This is elaborated on the following web-site: www.infocarta.es/new.htm, accessed February 2001.

³ The District refers to the Awaraja, which was a sub-regional designation until the early 1990s. The average size was calculated based on an approximation of the total square kilometres of Ethiopia.

The operational scale was set at the district level, however it could also have been set to smaller geographic areas. The analysis was useful for identifying and understanding the interaction among variables as well as the characteristics of affected households. For the most part, it is an objective tool, but there are subjective elements that could enter the process during the development and administration of surveys on which the program relies. Another aspect is that the program produces different trees based on transformations of the data. The program allows different trees to be cross validated, but ultimately the choice of the 'best' tree will depend on the user's goals and choice.

A limitation of CART is that no probability is associated with the outcomes. There is no confidence interval associated with predictions that could help classify a new set of data in a reliable manner (Yisehac and Webb, 1999). Thus, a question remains: since the outcome is based on the tree's own historical accuracy, how well would it predict the desired response in other circumstances? Statistical testing, which is based on probabilities, is a way of ruling out chance and decreasing subjectivity. Therefore, if the process includes no probability values, the validity of classifications is reduced or could be due to chance alone (examples and discussion of probability in Sokal and Rohlf, 1981; Zar, 1984). In fact, it is even difficult to show that the variables selected are the best predictors of vulnerability.

Pattern Recognition in an artificial neural network

Artificial Neural Networks (ANNs) are designed to solve problems for which there is no known algorithm or defining set of logical rules. They are computer systems that can 'learn' outcomes from pre-selected data. Learning means the process through which neural networks process the information and the structure inherent to input data

from which they then classify that data-set (Kohonen, et al, 1991). ANNs have been widely used in the physical and chemical sciences, but have only recently been applied to environmental and social problems (Pearson et al, 2000; Kropp, 1998). The ANN approach employs a wide range of input variables that can be derived from various methods. The neural network was used for a food security analysis, on the assumption that vulnerability to food security is multivariate and therefore its assessment must consider the whole set of its potential indicators. The indicators would include exogenous political and environmental stress and the capability of individual households to cope with food crises. It was also assumed that vulnerability is variable at the household level and that capturing this variability would be critical to any thorough vulnerability analysis and response. Furthermore, an aim of the analysis was to identify other inherent processes of household vulnerability. The possibility of applying a neural network to analyzing complex, socio-economic problems, as in cases of food insecurity, was evaluated.

An ANN can model two types of learning processes: supervised and unsupervised (Kohonen et al 1991). A supervised neural network is one that requires prior knowledge of the values of the dependent variable (e.g. a variable discriminating between vulnerable and non-vulnerable households). In this way, the number and kinds of potential categorical outcomes of the dependent variable are known *a priori* and are entered into the calculation. Unsupervised network outcomes are entirely data driven. In the beginning, no targets are established that would influence the identification of the final classification of cases into functional groups. Unsupervised learning performs a similar function to cluster analysis, where variables or data are classified according to their similarities (Tabachnick and Fidell, 1996). The unsupervised learning process

operates by generating a self-organising map (SOM) of the input data. This means that the program autonomously finds patterns within the data.

An example of an unsupervised network was a study that used data from World Bank studies to develop a 'poverty map' of countries grouped by their wealth (Kohonen, 1980). Kropp (1998) showed that it is possible to identify places (and households) that are susceptible to perturbations in human-environment interactions, including those that possibly lead to a disaster. In this post-hoc way, the learning algorithms were also able to calculate 'fuzziness' and uncertainty in the data in order to produce a distinct, logical outcome. The self-organizing map uses specific algorithms to cluster data (see the annex for a mathematical description of the SOM).

Using data from the Delanta, Ethiopia household food security survey (data presented in Chapter Four), a supervised neural network was trained to identify the vulnerability of 189 households. Selected data from the food security survey were used as inputs. The surveyed population was a statistically representative proportion of the total households within the Delanta sub-area. The raw data were first processed and analyzed statistically to identify vulnerability variables. The US Agency for International Developments (USAID-FEWS) current vulnerability assessment system was used to first code each families' socio-economic group, then to identify four vulnerability classes: extremely food insecure, highly food insecure, moderately food insecure, and food insecure (the USAID processes adapted for this thesis are described in Chapter Three). In order for the ANN program to identify existing and potential patterns of vulnerability to food insecurity, it was trained on 1/3 of the households in the data set. The remaining 2/3 of the households were used to test the validity of the ANNs predictions. The ANN accommodated quantitative and qualitative data. For

example, the data were both environmental and social, such as soil type (not specified categorically) and variables related to socio-economic entitlements (e.g. total household expenditures, land size, number of oxen owned, number of laborers). All values were normalized to range between -1.0 and +1.0. We examined populations within peasant associations, villages and households.

The network was trained until the output values and the input values could be closely matched. A three-layered, back-propagation network was run with the following structure (Figure 1). The three layers are the arenas in which the data are first fed forward from the input layer and then are propagated backwards from the output layer. The first layer, the input layer, was the storage point for the variables and households (1/3 for training). There were 20 nodes (or storage points) in the input layer. The second layer was a hidden layer, part of whose function was to process the data. The hidden layer consisted of 41 nodes. The third layer was the output layer containing the four vulnerability classes, which were represented by four nodes. When the ANN runs, the values in the input layer are weighted then passed through connecting links to the hidden layer. The nodes in the hidden layer then produce outputs that are based on the sum of the weighted values passed to them. ANNs are designed to repeatedly adjust the weighted links connecting each layer, as the model learns to match the patterns in the input layer to the categories in the output layer. The training algorithms for this process are given in the Annex.

After training the model to identify vulnerability, the validation data set (the remaining 2/3 data) was run through the network and this achieved a vulnerability score for each household. The validation data set was used to test how well the network trained, and this testing occurred every 100 cycles. When the program had run through 10,000

cycles we stopped the validation process. At that point, the minimum mean standard error was .00025. Beyond this error value, the network began ‘over-training’, which meant that it started to simply memorise the patterns presented in the training data (1/3 of data set) and was not generalising well with the new patterns in the validation set. When examined, however, the scores produced by the network made sense matched to the initial USAID vulnerability code assigned to each household.

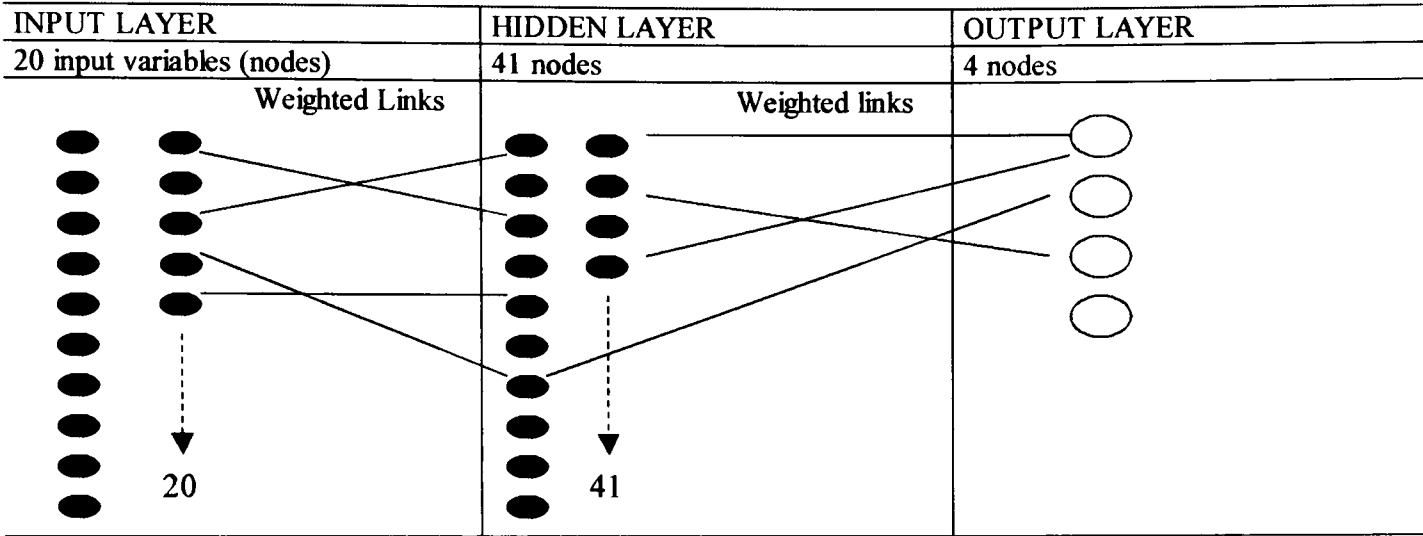


Figure 1 *Layers and nodes in the neural network*

Using a supervised network a vulnerability score for each household was obtained as a result of the calculations generated from a series of algorithms within the program. Households were classified in hierarchical, ordinal sets (such as rich, middle income and poor). As shown in Table 2, 65% of the households classified as highly to extremely food insecure by the model were also below the average income for the study area.

Table 2 *ANN analysis of household food security compared to household income*

	Food Insecure Households	Food Secure Households	Total
Income > birr 1716	28	42	70
Income < birr 1716	53	32	85
Totals	81	74	155
Percentage with income below average	65%	43%	

(Source: Data from Delanta, Ethiopia household survey, 1998.)

This ANN analysis was useful, as it provided a basis for observing the variability between households in the sample. This was supported by a cluster analysis of the data, which also showed a high differentiation between households. By using three different scales, it was observed that the identification of vulnerable households could be extrapolated from the smaller (households) to larger (peasant association) scales.

The program trained on static information, which can serve as a baseline for predicting future household vulnerability. It established profiles of vulnerable households in the form of ranges of numbers representing different levels of need. The added value in having a score for each household is that one household could be distinguished from another, which has not been achieved using different methods. Consequently, if there were a drought in the study area this year, an analyst would be able to make a preliminary target of vulnerable households based on their individual scores. This estimate could then supplement other targeting mechanisms. There are, of course practical and economic constraints of distributing relief to individual households, which must be taken into consideration when selecting appropriate targeting instruments.

An important limitation of the ANN is that it does not provide insights to the processes by which people become vulnerable. The ANN equations can handle time-series data,⁴ which can be a basis for predicting change. However, given the dynamic nature of vulnerability, the model better serves as a tool for targeting rather than as a fully comprehensive analytical system.

The ANN may have additional potential as a tool for vulnerability assessment, which has not been demonstrated so far. The next step would be to test the *supervised* ANN (trained on Delanta data) on a different region and with new data. This can be accomplished by using the new data as inputs and then observing how closely they match the Delanta outputs. That will be a way to prove the robustness of the method used in this analysis for selecting variables, for establishing the vulnerability codes used for the output, and the capability of the program to learn patterns of vulnerability.

Another useful analysis for future study would be to train an *unsupervised* neural network, as this method has been proven to illustrate inherent patterns in the data set without the need of prior assessment. The unsupervised approach lessens the bias that may result from using pre-analysed and subjective data, such as that derived from the USAID process. To test the influence of subjective ideas, one would need to apply vulnerability classes derived from different methods to the *supervised* ANN. Finally, the intention is to incorporate the nutritional status of household members, the numbers of people receiving external assistance, and seasonal forecasts. Each of these variables is important in calculating vulnerability (see Hoddinott, 1999).

⁴ The cases must reflect the whole range of possible values for each variable, in order for ANNs to calculate changes in data over time.

5. Facing the practical challenges of conducting vulnerability assessments within current early warning systems

In addition to the challenges of carrying out a vulnerability analysis at the appropriate scale, any analytical approach needs to perform amidst the practical challenges facing institutions in early warning systems. A brief discussion of each program in the context of the political, technical and administrative constraints is presented below.

Vulnerability Assessments in Multi-agency Settings

While the theoretical basis to SCFs methods has hardly been questioned, the methods themselves have been held up to intense scrutiny (see discussion in Chapter Five). Until recently, this has had the effect of limiting the method from wide circulation and thereby also limited its use in assessments of livelihoods. The SCF method itself has merit for its dynamic approach to understanding food insecurity, the incorporation of both qualitative and quantitative analyses and the use of expert knowledge wherein local people contribute. It also has limitations that reflect the fact that its development was more influenced by the worldview of the designers than of vulnerable people.

The general aim of the method seeks to examine household economies and food deficit, which is done by grouping households into larger categories of analysis (e.g. poor, rich), and this cuts across villages and communities to form food economy zones. This is useful for profiling vulnerability in a given target area. However these profiles are sometimes used to describe and classify households in areas for which there is little sample data. They generalize about problems that can be variable from one household to another and categorise households according to the designers' specifications and not

necessarily according to the reality of the official geographic administration of local territories. In an evaluation of RiskMap in Zimbabwe, Mosely and Logan (2001) demonstrated that the SCF classifications posed practical limitations for the allocation of food aid, as they could not be easily matched to the government's administrative designations.

Furthermore, the data SCF uses comes from its own databanks, local experts and secondary sources. While the data from secondary sources is used mostly for comparative purposes, it is also used to establish trends and baseline conditions. Secondary source data generally come from government statistics offices, which can be unreliable (Mosely and Logan, 2001; Casley and Lury, 1987). The ability of these methods to explore the nature of food insecurity and to identify vulnerable people will only be as effective as the data the government produces. This demonstrates that no matter the quality of the method, the source of data and other social relations within institutions and systems will determine which methods are adopted, how they are applied and what outcomes they produce.

Today, there appears to be growing interest in the HFE approach and RiskMap, which can mainly be attributed to more openness on the part of the authors to explain its operations. Its calculations are more transparent. Some of the initial 'bugs' in the software program have been eliminated so that it can be proposed for testing in various settings. Another reason for interest in the program is the rationale of its methodology, which is based on the household economy approach (HFE). Save the Children Fund (UK), and some multi-lateral agencies (FAO, WFP) and national governments are increasingly using HFE in countries that are most under threat from food insecurity and humanitarian crises (Save the Children Fund/Food Security Unit, 2000; Seaman, *pers.*

comm., 2000). More than that, HFE-RiskMap can now be seen to offer a comprehensive analysis of famine processes, using a transparent methodology that is applied to levels of aggregation at which administrations are comfortable basing their decisions.

CART has not been extensively adopted by any early warning system as a mechanism for analysis, despite several published manuals and software programs. Experienced and trained personnel can understand the program, but the difficulty lies in the time it takes for the initial set up. Given the time constraints of early warning staff, there would need to be adequate support and justification for the CART approach, before resources could be allocated towards it. It would therefore require some consensus on the conclusions drawn from the input data. Perhaps for these reasons, the CART is only available through commercial sale and remains a marketed tool for analysis. In addition, because the CART analysis has not been widely tested, it has not been well proven as an effective system to use for vulnerability analysis.

ANNs have been introduced in this chapter as a potential alternative to other methods for vulnerability analysis and targeting, and have never been used in early warning settings. However, it is possible to hypothesise about their place in early warning. Designers and policy makers may use their own data, which is likely to be analysed and agreed before input into the program. Obviously, data taken from different sources may produce a 'nonsense' output, and, therefore, the pre-analysis must be initially 'ground truthed' against real situations. Once this is done, however, the network can be trained on 10 to 30% of the data set, validated on the remainder, and tested on new data sets using the same categories of variables (e.g. income, land size, nutritional status) and at the same scale. There is the possibility that supervised ANNs, in this context, will

learn the biases of institutions, therefore an unsupervised network is recommended. The processes through which the program's algorithms derive the outcome could be questioned, as they were with RiskMap. For this there is an abundance of published material explaining the calculations, which could also be explained by a technician. But we would suggest that the calculations become a secondary concern, once the output is found to be accurate after a few trials and validation.

Capability of meeting goals of vulnerability assessments and measuring vulnerability to food insecurity

Table 3 shows that each program exhibits a medium capability of addressing the dual processes of vulnerability: environmental and non-environmental (social/economic/political). In each program, the process of selecting indicators and measurements of vulnerability requires collaboration and careful pre-analysis. Variables tend to come from both quantitative and qualitative surveys, which can contain their own bias. Of the three, the CART and the unsupervised ANN are the most philosophically versatile and objective, meaning that it would be more difficult to impose subjective viewpoints into CART or the unsupervised ANN. However, the quantitative operations of ANNs in general (supervised and unsupervised) provide one reason why they are limited as a tool for a comprehensive vulnerability assessment. They can incorporate qualitative and quantitative data, but they do not analyze the data qualitatively, and thus are not able to provide sufficient insight to the processes leading to vulnerability. In contrast, the RiskMap aims to follow a pre-determined theory of famine, Sen's entitlement theory, and in doing so presents some of the underlying logic to vulnerability processes. RiskMap loses effectiveness not so much because of an in-built 'subjectivity', as because it omits key food security variables.

Levels of Disaggregation (scale)

The scale of the analysis in each program is dependent on their design capabilities (see Table 4). Each program employs techniques for integrating data from different scales. In the case of RiskMap, the programme was not well developed to analyse below a certain level of aggregation. Instead, the RiskMap adapts the principles of mathematical flow modelling, in which the peoples' choices and behaviours are the focus of the model given their differing alternatives and assets. The CART program relies on a set of 'sample splitting' rules to create both classification and regression trees and to disaggregate the data. Ultimately, the households are disaggregated according to various characteristics of food insecurity and this could also be applied to their individual levels of food insecurity. The neural network can also differentiate levels of need between households, using various equations to calculate ranges of difference in the data.

Costs and skills needed

The initial costs of the neural network are moderate to low in comparison to the other programs considered in this chapter. Some neural network programs (including that discussed in this chapter) are available free from the Internet, which makes it inexpensive as compared to any standard GIS and as compared to CART or RiskMap (see Table 3). As the RiskMap and CART are more expensive, institutional funding restrictions could make their functions more accessible to the needs of early warning personnel. The time involved in pre- and post-analyses, and the levels of skill required,

are comparable among the three approaches. Each requires some experience and training.

Tables 3a,b *Comparison of ANN and other methods from a conceptual basis*

	ANN	CART	HFE/RISKMAP
Accounts for dual processes of Vulnerability: Environmental and Socio-politico-economic	Medium to low- incorporates qualitative and quantitative data representing socio-economic and environmental processes, but the interaction of these variables is analysed mechanically through algorithm and does not necessarily follow the logic of real situations.	Medium- follows a logical process in which environmental and social factors influence the final outcome.	Medium to high- illustrates the dynamism and interaction of the two processes in context and explores a range of possible outcomes. Limited by lack of variables for labour supply and seasonal forecasts.
Facilitates a range of variables and key indicators	High	High	High
Accuracy at household level	High	High Targets at HH level but is designed to identify key variables not key vulnerable households	Medium to low Lowest level targets for HFE are village levels. RiskMap targets typical household expressed at 'community' scale, usually above the village level.

Table 3b.

	ANN	CART	HFE/RISKMAP
Theoretical basis	Vulnerability is highly variable --employs algorithms whose purposes are to calculate the interaction of variables and classify the 'patterns' found in the data set.	Food Security variables are diverse— Classification and Regression analysis is used to refine the process of identifying key outcome indicators	Entitlement theory— household vulnerability to food security is determined by their 'set' of entitlements (assets, availability, utilization)
Scale – the logic behind different scales used, in terms of production	Program designed to model the least scale. Broader parameters can be set.	Used for analysis of District levels in Ethiopia, but also capable to reach smaller levels	By definition, aggregates to self-determined groupings generally larger than community or household scale. Funding restricts testing of reliability at smaller scales.

Table 4: Comparison of ANN and other methods in terms of costs, time, skill level and advantages

	Neural Network	CART	HFE/RiskMap
Initial Costs	Free download or USD\$30	USD\$600-\$1000	USD\$50 (includes VAT)
Time required for data analysis	1 day	Labor intensive. Initial data acquisition and set-up ½ day	1 day
Skill level required	Requires basic training	Requires training and knowledge of statistics	Requires basic training
Advantages	Finer level of detail Classifies varying degrees of vulnerability Policy neutral-can incorporate various concepts of vulnerability	Quick analysis Copes well with large data sets Data can be categorical or continuous Exploratory analytical tool	Captures regional determinants of HH food insecurity (i.e. price changes) Helps create good hypotheses of what affects behaviour
Disadvantages	Provides a static picture while famine situations are dynamic	No probability. Accuracy of results depends on a tree's historical accuracy.	Excludes important variables (i.e. labour supply, seasonality of income, economic activities and rainfall.

6. Conclusion

In this chapter I have argued that there is a lack of attention given to the diversity of vulnerability at local scales, that this is evident from technological applications which are better designed for regional levels of aggregation, and that the adoption of such applications may be manipulated for political strategies whose aims are different than that of helping vulnerable people. I have outlined the basic conceptual and methodological knowledge that should underlie interventions and measurements of vulnerability. Using current technological applications, I have shown that in practice analytical methods are less determined by the conventional knowledge about vulnerability and food security than by other factors, some of which are largely socio-political. The end result is that decision makers generalise about the spatial dimensions of vulnerability and thereby minimise its complexity and variability.

The purpose of the vulnerability assessment is to target vulnerable people, who are best examined in data disaggregated to the household level. Yet, the social environments of early warning systems produce technological methods and outcomes that are inconsistent with this aim, reflecting the social shaping of technology. It is important to consider the social construction of scale in relation to vulnerability analysis in order to understand these inconsistencies. When tested, the methods and technologies presented here gave an output that was accurate within the parameters the designers set for them. The weaknesses in their design may be attributed to the way institutions or individuals conceptualise the problem and choose to respond to it. For example, it is clear from its application and outputs that the HFE-RiskMap software was not necessarily designed to perform household level analyses, although the program's assumptions suggest that it is conceptualised that way. The software is designed to

describe vulnerability at scales that are inconsistent with the best knowledge of where vulnerability should be measured. Its objective is to establish arguments about behaviour in the face of crises. A further limitation of RiskMap was present when it was initially introduced to early warning systems as a famine assessment tool. At that time, the program's underlying assumptions and quantitative manipulations were not made clear, and therefore contention arose when the application was proffered in the context of early warning. The underlying principles became the focus of discussion and were used to disqualify the value of the methods and those who developed them. As such, unclear agendas embedded in methods and techniques reinforce the conflict and competition over scarce resources that are prevalent within early warning systems. The ANN as an alternative method for targeting has the advantage of being able to incorporate different viewpoints while targeting to the lowest level. However, if an analyst chooses to use a supervised ANN as the sole analytical instrument in an assessment, and the outcome values are derived using only qualitative methods, he or she would have introduced a subjective bias. The assessment will be less robust than in an unsupervised analysis, and it will not clearly show the processes leading to vulnerability. In complex socio-natural problem analyses, a supervised ANN is advisable and it should be used together with other methods. Finally, to select only the CART approach, one lessens the credibility of the assessment because the CART lacks the probability statistics to support its outcomes and has not been widely tested. In each case, the quality of the outcome will always be dependent on the quality and accuracy of the input data.

Inconsistencies are not a threat to theorising, but to effective early warning and response. The discussion in this chapter suggests that the theories point us in the right direction, while the limitations are found in formal and informal analytical systems and

their implementation. The political manipulation of the concept and scale of vulnerability forms part of larger processes of capitalist accumulation in which the Ethiopian government has conducted specific strategies for shifting from a command to market economy. This has had various spatial outcomes affecting vulnerability analysis in Ethiopia. This chapter has touched on a few, but has tried to deal with just one: the conceptual and technological approaches that distance decision makers from vulnerable people. Elements of some of the other outcomes were discussed in preceding chapters. These include, the Ethiopian government policies (i.e the policy to restructure regional territory along ethnic lines) which had the effect of socially and economically marginalizing the most vulnerable people and maintained the status quo. In addition, regionally and nationally linked networks of decision makers and early warning institutions have ultimately supported state and donor strategies.

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Annex: Artificial Neural Network Algorithms

Type of Network	Error Calculation	Parameters
Supervised (Feed-Forward, Back Propagation)	^cQuadratic (mean squared error): $E(t) = \frac{1}{2} \sum (d_j(t) - y_j(t))^2$ $e(t)$ = global error function at discrete time t, $y_j(t)$ = predicted network output at t, $d_j(t)$ = the desired network output at t.	^{c,d}Connection weights adjusted using the delta rule: $\Delta w_{ij}(t+1) = \eta \delta_j o_i + \mu \Delta w_{ij}(t)$ $\delta_j = (f_j^1(\text{net}_j) + c)(t_j - o_j)$ if unit j is an output unit $\delta_j = (f_j^1(\text{net}_j) + c) \sum_k \delta_k w_{jk}$ if unit j is a hidden unit η = learning parameter (a constant – typically in the range 0.1 to 1.0) δ_j = error (difference between the real output and the teaching input) of unit j t_j = teaching input of unit j o_i = output of the preceeding unit i i = index of a predecessor to the current unit j with link w_{ij} from i to j j = index of the current unit k = index of a successor to the current unit j with link w_{jk} from j to k.
Unsupervised (Self-Organising Map)	^aQuantization (mapping) error: $D(x, m_c) = \min_i \{d(x, m_i)\}$ x=input vector, m_i = reference vectors, $d(x, m_i)$ = generalised distance function of x and m_i, c= index of closest reference vector to x in the space of input signals	^bEuclidean Distance to all nodes: $\ x - m_i\ \leq \min_{\forall j \in A} \ x - m_j\ $ input x is presented to the network where all nodes compete to represent the input pattern. Output node i is selected to represent x. Modify Weights of closest matching 'winner' node: $m_i(t+1) = m_i(t) + e(t) \cdot h_{ic} \cdot [x(t) - m_i(t)]$ $e(t)$ is a decreasing learning parameter and h_{ic} is a time-dependent neighbourhood function, which defines the vicinity of the mesh in which other nodes learn from the same input stimulus.

Sources: ^a Kohonen (1980: 118-121), ^b Kropp (1998: 84-85), ^c Pearson et al (2000), ^d Stuttgart Neural Network Simulator (1995)

CHAPTER NINE

Conclusions: Vulnerable Regions versus Vulnerable People

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(2003) 'Drought and Vulnerability in Ethiopia', in *World Vulnerability Report 2002*. Bureau for Crisis Prevention and Recovery, United Nations Development Program, Geneva.

1. Introduction

Throughout the dissertation I have argued that the description and treatment of drought vulnerability and food insecurity has often had a regional focus, which effectively distanced and marginalized the most vulnerable people. Characteristics of vulnerability in local areas are often lost in analyses that target regions rather than people. In this dissertation, Delanta, Ethiopia was used as an example of an area in which vulnerability to food insecurity is quite diverse across space and between individuals. Delanta is chronically food insecure. It is a small wereda (subdivision) in the northern Ethiopian highlands, 1,533.25 square kilometres in size, spreading from lowland to highland, with a population less than 1% of the Ethiopian population. When there is a serious drought, the livestock and dairy farmers in the highland areas of the wereda fare a bit better. They have milk, cheese and butter from their livestock to fall back on. In the worst years, however, even the highlanders suffer because their livestock cannot find sufficient grazing land. For many years, the 'regionalisation' of drought in Ethiopia created a false homogeneity of the scope, causes and outcomes for food insecure and vulnerable people in Delanta and throughout the country. The aggregation of analyses fits within a global purview. Global processes support ideological, economic and political tensions which polarise countries in the northern hemisphere versus the southern hemisphere; national interests versus sub-national and local ones; rich versus poor. A disadvantage is that localised problems do not command the solutions or resources that they should. For many years in Ethiopia, drought early warning and interventions were highly centralised. This had the effect of distancing decision makers from subsistence farmers. One of the outcomes of centralised policies and ideologies has been a generalisation of coping strategies, socio-economic conditions, and the

different impacts of drought on the food security of local people. Today, as Ethiopia is within the throes of yet another food crisis, policies targeted to vulnerable people in local places are important for evoking appropriate and timely donor responses. Vulnerability profiling has become important for saving lives.

This chapter provides a final comment on the influence of global discourses, early warning social politics, socio-spatial strategies and analyses as discussed in preceding chapters. Throughout the thesis I have maintained that the emphasis on broad scale vulnerability is detrimental to good analyses and is shaped by international and national discourses. This was discussed in the Ethiopian context during the mid to late 1990s. The Ethiopian case illustrated that some of the ambiguity characteristic of Maxwell's fifth phase of food security policy and practice are ever present (Devereux and Maxwell, 2001). The phase, commencing around the time of the World Food Summit in 1996, marks a period in which policy makers are drawn towards the global food production focus of the 1970s, while moving uncertainly towards implementing projects addressing household consumption and access, which was the thrust emerging in the 1980s. To further explore the reasons behind national/regional versus local analyses in Ethiopia, the following sections link the key issues to specific activities and reports, produced by Ethiopian early warning institutions in 1997, 1998 and 1999, and propose an alternative discourse to guide future vulnerability analyses. The final section offers concluding remarks. The following section is a background discussion of the regional themes that influence and frame the Ethiopian government's analyses of local vulnerability.

2.1 Regional themes and local analysis in Ethiopian vulnerability analysis

In the 1970s, 80s and 90s drought and erratic rainfall were commonplace in Ethiopia, leading in some cases to large-scale famine. The most severe problems occurred most frequently in the northern regions. An estimated eight million people were affected in one of the worst famines in the last century (1982-1984). Agro-meteorological analyses informed decision makers which geographic areas of the country should be targeted for assistance. But it was the international media's photo-journalism that issued the most compelling socio-economic analyses. Western press reports provided one of the first lessons of the importance of vulnerability profiling: exploring *who* could be vulnerable to famine, *why* and *where* they were located. It is now common knowledge that the communities in the north of Ethiopia, particularly the Tigrinyan speaking populations who had an organized alliance against the government, were political targets in the 1982-84 droughts. In addition, relief distributions to the most severely affected places, including Tigray, were funneled towards the army who were engaged in the country's civil war.

The Government's rationale for generalisations about vulnerability are founded on this history of regionally specific famine affecting the north, particularly in 1974 and 1982-1984; and calculations based on the number of times in the past five years that people in a region experienced hunger (DPPC, 1997). There are also socio-economic similarities amongst people in specific areas in terms of income and economic constraints. Yet, the findings in a study done by Clay, Molla and Habtewold (1999) leads one to question whether sub-regional variability is of high relevance to decision makers. They have shown that the actual relationship between food availability and food aid receipts in Ethiopia is not conditioned on localised need. The attention given

to similarities obscures the specific vulnerabilities of the north's sub-regions that would add substance to assistance efforts. As the Ethiopia regions and zones maps show (see figures 1 and 2 in the introductory chapter) the area to which generalisations are applied is extensive and diverse.

One of the lessons being learnt from the 1980s famine is that within drought affected regions, vulnerability varies among communities and households. Differences result from both exogenous and endogenous processes. On the exogenous side, the weaker ethnic group in a two-party civil war may be deliberately excluded from food distributions and targeting. Or taxes placed on community grain storage schemes may leave some farmers being forced to rely on less secure home storage methods. In contrast, examples of endogenous processes include variations in household abilities to cope, asset bases, income and food acquisition strategies, access to markets and rainfall. Another critical factor is geographic location. Within one of the smallest administrative subdivisions in Ethiopia, the wereda, communities are generally dispersed across the three agro-ecological zones. In any given year, rainfall and climate conditions may differ across zones, with the effect that conditions for healthy crop growth change from one area to the next.

An example of how government generalisations cloud local scenarios was the description of 1998 crop prospects for Delanta, Ethiopia and surrounding weredas. These were described as poor to very poor (DPPC, 1997:5). In contrast, the analysis of Delanta household survey data from 1997-1998 (in Chapter Four) indicated that crop production was more variable than these classifications suggest, and this was across

altitudes and peasant associations¹ in Delanta. Similarly, the Delanta case study data showed that in that period, people received various types of aid quite generically, regardless of whether they had produced more or less than previously.

Figure 1 returns to the data in the vulnerability profiles presented in Chapters Three and Four, which show the assets among rural people in Delanta. A radial diagram is used to graphically illustrate the nuances between the five groups of people in the profile. The two main economic activities among the five were crop and dairy farming; thus the five groups consisted of people involved in either activity or a mix of the two. However, the different levels of income and assets they possessed distinguished these groups. It was clear that the low-income crop farmers had the highest levels of vulnerability. In addition to income, their labour supply, land holdings, food aid, livestock holdings and sales in difficult years were well below those in other groups. Conversely, the middle and high-income crop and dairy farmers showed a comparatively moderate level of vulnerability because they had greater access to the assets and resources identified as important for food security.

¹ The peasant association is the lowest administrative level where data is collected.

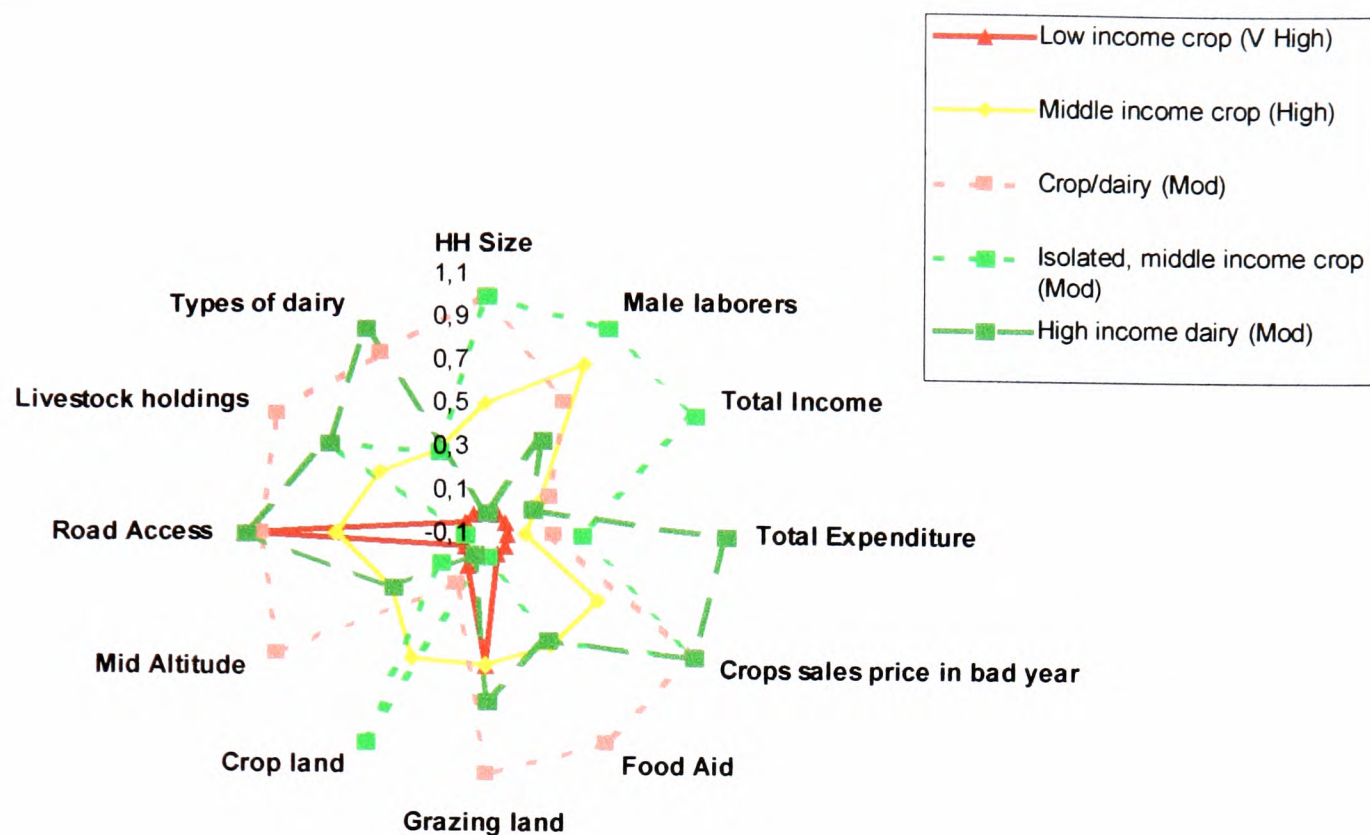


Figure 1 *Vulnerability profile for Delanta Dawint, Ethiopia*

There was also a great deal of variance between members of the vulnerability groups in terms of frequency of meals. Seventy-five percent of the families in the survey said they ate only one meal in a day during hard periods. This was true for 73% of those classified as extremely food secure in our vulnerability profile, and 64% of the moderately food secure. This variability in vulnerability to food security was found among people living in a very small sub-division in Ethiopia. One could reasonably expect there to be a similar diversity among other communities of farmers across Ethiopia. The variability in vulnerability and food security suggests the need for different intervention strategies attuned to the different needs seen here.

Given the importance of scale and diversity among families as factors affecting variability in vulnerability, the scale at which institutions in Ethiopia chose to operationalise interventions may be seen as pre-described statements of certain political objectives. Marston (2000: 219-242) notes that scale is not necessarily a pre-designed, hierarchical ordering of the world; it is the outcome of tensions existing between structural forces and the practice of agents. Drawing from theories of scale, I propose that early warning decision makers conceptualise the spatial dimensions of food security as aggregated because it serves their own and international agendas. In contrast, peasant farmers necessarily hold to a concept of food security, which is more immediate and local. The evidence from research aimed at effective analysis, measurement and targeting strategies validates that the farmers' localised concept of food security is more than a self-centred viewpoint. The literature also supports an appraisal of the livelihoods, specifically the assets, of poor individuals and households, as fundamental to understanding the options open to the poor, their vulnerability to adverse trends and events and the strategies that will support them (see Ellis, 2000; Bebbington, 1999; and Scoones, 1998).

2.2 Framing the regional analysis

Drought alleviation, vulnerability and food security strategies in Africa are tied to changes in public policy. In Namibia, for instance, drought alleviation strategies in the 2001/2002 drought emphasized the vulnerability of target groups who were selected by local governments. In the 1990s, the new policy to identify vulnerable groups at local levels was symbolic of the direction taken after independence from South Africa (S.A). Under the S.A apartheid system, ethnicity was the basis for targeted and exclusionary policies. The vulnerability of ethnic groups and socio-economic sectors of the

population did not factor in relief and development policies. Following independence at the beginning of the 1990s, there was a push towards economic and political self-sufficiency, which by the middle and end of the decade resulted in a decreased reliance on international assistance and a program for targeting people identified as vulnerable (i.e. pregnant and lactating women, children under the age of five, elderly persons) who resided in the most environmentally and economically vulnerable regions of the country (Stephen, 2002). Likewise, in Ethiopia, policy assumptions throughout the last thirty years were influenced by changes in governance from monarchy to socialist ideology to democratic republic, and the influence of global agreements, diplomatic relations and trends. Moreover, under each administration, distinct characteristics of the Ethiopian state were reflected in the strategies executed. As in Namibia, political transitions, sovereignty, nationalism and ethnicity played a critical role in supporting interventions. However, in Ethiopia, some of those policies further alienated and marginalized subsistence farming communities who were the most vulnerable to drought and food insecurity.

As discussed in Chapters Two and Five, there are different ways to decipher the 'generalised', regional framework of vulnerability in Ethiopia. One way is to frame analysts' discussions within the context of the sociology of scientific knowledge (SSK), which, according to its proponents in environmental studies, says that at policy levels, scientific claims are often intermingled with policy claims (Wynne, 1994). I have been arguing that in a food vulnerability assessment, the SSK framework advances the argument that the socio-economic impact of drought on vulnerability to food insecurity is obscured by the broad-scale scientific data used and by the *quantitative* needs estimates decision-makers debate. SSK shows how the demands for rationalism and objective science facilitate the formulation of some beliefs and values while defining

others as irrelevant (Wynne, 1987). A limitation of this view however, is that it accounts for the persistence of objective truths, such as the reliance on quantitative assessments of vulnerability, but it does not fully explain the interplay of other voices and the power struggle whereby some claims gain advantage over others. Discourse analysis offers the analytical tools to investigate the framing of the food aid discussion, and allows us to show the ways in which food insecurity is homogenised to fit within the prevailing socio-political setting.

Two relevant contributions to discourse analyses are works by Foucault (1977) and Hajer (1993). Foucault argued that societal and institutional practices and interactions bring to life the dialogues structuring policy and action, and that these practices often run contrary to stated goals. Hajer (1993) showed us how discourses dominate the definition of environmental problems; and that the ensemble of concepts, ideas and categorisations are always being produced, reproduced and transformed through a particular set of practices. In Chapter Five, discourse analysis was used to explain why stated policy and theory so often differ from practice in the Ethiopian early warning context.

3. The influence of global vulnerability and food security discourses

In Chapter Five I argued that some of the most influential global discourses affecting Ethiopian policies on vulnerability and food security in the 1990s gained prominence through historical precursors and international mechanisms. The example I have used was the World Food Summit of 1996. The summit forum articulated a human rights agenda, which had the objective of ensuring the right to food and the reduction of

malnutrition to 1/2 by 2015.² The summit came in the wake of a decline in international food aid, and this had an important impact on national food security policies. In addition, the end of the cold war, which ushered an era of capitalist restructuring among socialist economies like Ethiopia's, promoted greater attention to acquiring economic capital and the reshaping of policy to suit this aim.

These frameworks had particular outcomes. Vulnerability to food insecurity framed within the concept of global rights to food presented two myths related to addressing vulnerability; 1) that assisting vulnerable people would be a globally shared challenge; and 2) that conditions for individual households could improve through institutional collaboration. Yet the rules by which rights-based was framework operational, in which there was a hierarchical division between global and national responsibilities for assistance and conditional international economic arrangements, suggested that household level vulnerability to food insecurity would be alleviated primarily by the efforts of national governments. The burden on national governments was enhanced by a gradual decline in overseas development assistance, specifically food aid for development purposes, which began in the 1980s. Much of the food aid decline has been in bilateral aid transfers directly from governments in aid-giving countries to governments in developing countries. Multilateral food aid targeted for emergency relief declined at a slower rate. Ethiopia's ODA actually increased between 1980 and 1996 because of repeated famine and food insecurity (World Bank, 1999). Yet even in those cases where aid is still provided or where it has not declined appreciably (such as in Zimbabwe and Ethiopia), assistance is provided on conditions which place more

² Several International Development Targets (IDTs) were established at the World Summit for Social Development in Copenhagen (1995). In addition to the reduction in malnutrition, they include gender equity in education, poverty reduction, improvements in maternal and child health. In 1996 the World Food Summit upheld the goal of halving the cases of malnutrition by 2015.

responsibility on national government budgets. In the Ethiopian case, the decline in aid meant that there would be the administrative task of juggling food security programs with competing poverty alleviation programs.

4. Further comments

Global discourses, political interactions in the early warning system and the scale at which vulnerability is conceptualised, bias vulnerability assessments, especially targeting, in significant ways. Sharp (1998) drew attention to the fact that ineffective targeting strategies in Ethiopia were as much to do with local authorities resisting the general principles for targeting the needy as to other factors. Who else might be implicated in poor targeting and the conceptual biases that work against farmers?

If we consider the activities of the larger and more influential aid institutions in Ethiopia like the WFP and USAID, we would note that their written policies support good targeting, but some of their methodologies do not. They have shown an interest in working within current knowledge of vulnerability and food security through policy statements that express the global concepts such as food security as 'access to food'. To this end, some have designed methods for vulnerability profiling within villages, which considers the socio-economic determinants of vulnerability in individual sub-regions. However, throughout the 1990s, the dominant methodology continued to be an assessment of national needs, using technological equipment whose purpose was to provide a broad-view. These methods of analyses fell in line with the greater demand for information in emergencies and the greater amount of resources available for relief, as opposed to long-term development. This was also consistent with the type of report

regularly provided by the Ethiopian government. Further, it catered to the needs of a donor and government ministerial clientele, not the local farmer. Donors and the government were the primary financiers of vulnerability profiling and assessment in Ethiopia during the 1990s.

Turning to the Non-governmental organisation (NGO), we would note that while their efforts were more grass-roots than other institutions in the Ethiopian early warning system, and therefore they were generally more informed about locally specific vulnerability, their activities were largely controlled by the government. They were compelled to adhere to an NGO code of conduct prepared and enforced by the government. They did not command the type of financial resources that has been shown to influence decision-making. Therefore, the government's framework for operation had an enduring influence on what they did and how they did it.

As for the government, the data and analysis discussed in Chapters Four and Seven provide evidence that the Disaster Prevention and Preparedness Commission (DPPC) were skilled at deflecting blame for ineffective targeting away from themselves and towards local people. They have said that local wereda administrations were responsible for selecting beneficiaries along with a committee of elders and community representatives, while the national DPPC were given responsibility for establishing the overall framework in which targeting was conducted. Yet, a lack of flexibility in the famine early warning system was noted by the fact that food aid continued to flow to the same areas as before—areas known for chronic drought and food shortfall. They have been slow in their efforts to create a deeper understanding of spatial and temporal changes in vulnerability. In the 1995/96 harvest period for example, 63 per cent of the

regions were at or above the requirement of 1680 kilo calories³ per person per day yet food aid distributions bore no relationship to this fact. This has been documented by Clay et al (1999) who also showed that food aid increased in relation to the greater number of years regions had received aid in the past.

Many DPPC reports give the impression of making a fair appraisal of each wereda's need, which helps satisfy the conditions for the continuation of aid. Yet, the focus remains somewhat superficial with respect to what farmers actually experience. It is useful to note the government's language in relation to food needs in the Amhara Region, North Wollo Zone and in Delanta. Table 1 shows the descriptions of regions and zones to be quite specific and quantitative, while those of the Delanta wereda give a vague impression of need. On a GIS map in the DPPCs report, Delanta is shown as risking a 'medium' decline from normal food consumption, yet the report never explains what is meant by a 'medium' decline.

One might assume from this report that medium decline refers to a mid-level drop in cereals available affecting the achievement of a minimum of 1680 kilocalories per day. What one cannot assume is how that might impact on the consumption of different groups of people, like the different household groupings in the Delanta vulnerability profiles (in Figure 1). One may not expect the prospects for the middle-income crop farmers in the profile, who have a high level of vulnerability, to differ greatly from the low-income crop farmers who are also considered to be highly vulnerable, but without the proper analysis one cannot automatically assume this. Another assumption one might make with caution is that a single alleviation strategy suffices for both the

³ See Clay et al (1999) in which it is explained that conventional wisdom in Ethiopia sets 1680 kilocalories as the daily requirement per person, which comes from grains alone. The government's target is 2100 kilocalories from all sources.

vulnerable crop and dairy farmers in Delanta. It is likely that their different livelihood strategies require different interventions. Yet, it has been demonstrated that although production, type of income (crop, livestock, both or other) and altitude were variable between villages and peasant associations in the Delanta, Ethiopia case, such variables did not greatly affect who was selected for participation in government administered food aid programs (a more extensive case is presented in Clay et al, 1999).

Table 1 *DPPC descriptions of need for Amhara Region, North Wollo Zone and Delanta, 1998*

DPPC Descriptions	Amhara Region	N. Wollo Zone	Delanta:
People affected	2,854,800	482900	No data
Population needing relief	2,121,100	No data	Risk of medium decline from normal food consumption in 1998
Food Needs	287198 metric tons	68672 metric tons required	Crop prospects 'poor'

The issue of ineffective targeting and differences between regional analyses and local realities illustrate the cross-purposes of global and national agendas and vulnerable people. The nexus of control and certainly the responsibility for fair distributions exists at the national level, where the motives for aid giving are shaped by many factors peripheral to farmers' needs.

Vulnerability science: Framework for an alternative discourse

Decision makers and practitioners may address the issues discussed in this dissertation by considering vulnerability within the framework of a scientific approach. New academic frameworks may never fully change the way governments and international institutions operationalise a vulnerability intervention, as it has been shown here that they can be considerably more influenced by how the world of food policy and food

assistance works. Nevertheless, viewing vulnerability as a science could alter the way they approach the subject.

Understanding vulnerability within a scientific approach encompasses: a definition of the nature of the problem, a theoretical framework, and suitable methods for collecting data to test our theories. The nature of vulnerability could be defined as a place based issue affected by global and local climatic and environmental conditions and by various administrative levels of social, economic and political issues. The theoretical framework for dealing with vulnerability would conceptualise the significance of its diversity and would account for the varied and sometimes conflicting socio-political and scientific mechanisms that influence outcomes. The methods for information gathering would explore the socio-political, economic and institutional questions—particularly how these shape policy and interventions; and the environmental questions—specifically why certain climatic and man-induced patterns trigger certain problems. Each of these factors has been considered independently within many bodies involved in assessing vulnerability to global change, including those dealing with food policy. Few have brought the elements together into a comprehensive strategy. Climate change and environmental researchers are beginning to make advances by finding ways of merging scientific research and social science methods to deal with socio-natural issues (Downing et al, 1999). This has furthered the understanding of human adaptation to changes in the environment. However, the scientific approach has not yet been applied to make a comprehensive assessment of vulnerability to food insecurity. The advantage to be gained from approaching vulnerability through a scientific approach would be to understand why and how these issues coalesce to affect livelihoods in some areas and not others. This brings considerable weight to place-based local analyses which will only strengthen regional and global scale research,

increase our knowledge of human adaptation in different contexts, and help us to design appropriate interventions.

5. Conclusions

In the recent past, drought, vulnerability and food insecurity in Ethiopia were appraised through the lens of international agreements, the changing priorities under national political transitions and concepts of sovereignty, nationhood and ethnicity. Each had the effect of producing policies and strategies that de-emphasized the situation of poor, economically and socially vulnerable people, while targeting analysis and response to the region and nation.

Now the pattern is changing. With new alliances between the government, non-governmental organisations and aid agencies, the vulnerability of people, rather than vulnerable regions, are given the attention they deserve. This is reflected in the profiles of the worst affected administrative sub-sections of regions, which now forms part of Ethiopian government's appeal for assistance in the 2001/2002 drought.

One of the outcomes of this new direction in drought strategies is evident from the recent profiles of the worst affected regions, zones and weredas in the 2001/2002 drought. The government issued the following analysis of drought and food security at region, zone and wereda levels, which adds depth to both analysis and targeting.

Afar: The region is at present experiencing the effect of a very severe drought. The February - May rains completely failed. The rainfall situation in the preceding seasons was also poor. Water and pasture are seriously short in several areas, most notably in Abala, Berahile, Erebiti, Koneba, and Dalol weredas of Zone two, Amibara, Buremodaito, and Awash Fentale weredas of Zone Three, and Fursi, Artuma, and

Semurobi weredas of Zone Five. In these areas, the watering points have dried up, while pasture is seriously short. The water level in the perennial rivers is also very low.

Many livestock in Zones Two and Three have died while the rest are in bad shape. Massive livestock death is in evidence in several areas, such as the Halideg grazing area in Amibara Wereda. The shortage of pasture and water has caused abnormal migration of livestock from one wereda to the other. At present, large migration from Gewane, Buremodaito, and Amibara Weredas in Zone Three to the neighboring Dawa Cheffa area of Kemissie Zone in Amhara Region can be witnessed. Likewise, many livestock have migrated from Fursi, Semurobi, Artuma, Dawa, and Telalak Weredas of Zone Five to Alidebe in Zone Three of the Region (Government of Ethiopia, 2002).

This analysis was done for all the affected areas. This new emphasis on differences in vulnerability at community level is the outcome of both a change in policy and collaboration amongst early warning institutions. The information supplements and better informs the quantification of the numbers of needy people and metric tons of food aid required, which are a part of the traditional relief assessment.

These positive developments should be viewed with caution, however. Vulnerability profiles help create a more accurate picture of affected people, based on which donors and the public might be convinced to act, *but they do not assure timely and appropriate responses*. In a study of the government's food aid targeting policies and strategies, Sharp (1998) made two important observations. First, that the Ethiopian government's area level targeting would be essential as a *first layer* in the distribution system and that it is where the greatest potential gains in effectiveness and efficiency could be made. Secondly, the impact of schemes for channeling food aid would be improved by a 'system for monitoring and evaluating its impacts and record-keeping that focuses more on the people involved than on the physical outputs and sacks of grain moved'. In my view, the recent improvements in Ethiopian area-wide targeting are the result of greater attention being placed on the *second layer*, the communities. There is now a stronger linking of information between the two geographic scales. However, donors are sometimes still slow in their response to local needs.

An area for further improvement is getting the target audience right. As long as the 'end users' for policies, methodological development and information are largely heads of State and international institutions, while the capacity and knowledge base of local institutions remains limited, the bulk of affected populations will remain disenfranchised. Furthermore, as discussed previously, NGO potentials are not fully tapped within the Ethiopian early warning system, as only a few institutions are given top priority compared to the status given to multi-national and bilateral institutions and donors. The Ethiopian state has shown some interest in *protecting entitlements* (through the implementation of community level food and employment access schemes) but has done less in the area of *promoting entitlements* (by making early warning a more participatory process). Donor agencies do not always fulfil their responsibility to eradicate hunger because they are more allied to the need for broad scale analyses and tend to be caught in the dynamic of Ethiopian State needs vs. Donor Domestic needs, which effectively has ignored farmers' needs. Farmers tend to be organised very locally through traditional institutions and government managed farmer's associations, but the effort is well contained and seldom extends beyond the peasant association or Woreda level. A greater number of coalitions between farmers' groups across the larger administrative boundaries in association with key local and international NGOs could bring strength to a farmers' movement based on the promotion of rights to food.

As the Delanta vulnerability profiles illustrated, relying on the regional analyses produced by the government or the national perspectives offered by international institutions, could lead to wrong assumptions. This would particularly apply to areas in Ethiopia traditionally labelled as self-sufficient but where food insecurity has occurred (Wolayta is an example). The absence of localised information is a disadvantage to our knowledge of the dynamics of vulnerability and of societies' adaptation to

environmental and socio-political change. Bankoff's (2001:31) comment underscores the issue: 'adaptations are not characterised by *homogeneity* but by their own singular interpretations of hazardous uncertainty and by their own context'. Further, food security is largely determined by poverty, and therefore policy ought to be geared towards raising the asset status of the poor. This strategy can only be effective with the proper evaluation of asset diversity and impacts among different socio-economic groups at a disaggregated level. A vulnerability science approach could bring the structure needed to attend to the variability of vulnerability in local settings.

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