FOOD SECURITY, NUTRITION AND POVERTY ALLEVIATION IN ETHIOPIA

Problems and Prospects

Proceedings of the Inaugural and First Annual Conference of the Agricultural Economics Society of Ethiopia

8-9 June 1995, Addis Ababa, Ethiopia

Edited by

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The Agricultural Economics Society of Ethiopia (AESE) is a non profit making professional society established in 19[illegible]. Its objective is to contribute to the Development of Ethiopian Agriculture by promoting research in agricultural economics and by disseminating such research finding. In addition the Society provides the fora for the discussion of problems of agricultural development.

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PREFACE

It is estimated that over 60 percent of the population (about 27 million) are food insecure or live below the absolute poverty line in Ethiopia. About 13 million people in the rural areas and 4 million in the urban areas are chronically poor. Another 3 million are among the transitory poor and millions of people are affected by drought each year.

The poor rural usually suffer a loss of income when agricultural production is reduced or disrupted owing to unusual weather. Thus food security can be provided to an individual either by increasing real income or by decreasing the price at which adequate food is made available. Agricultural development must play an important role in alleviating poverty, hunger and food insecurity. One has to recognize that to deal with food insecurity and malnutrition is to deal with poverty and under-development. The title of this proceeding was the theme for the First Conference of the Agricultural Economics Society of Ethiopia (AESE) and it would have been difficult to have chosen a more appropriate theme. The appropriateness of the theme attracted a number of participants. Many became involved in the vigorous discussions which followed most presentations.

This proceeding makes available all the major papers presented at the conference. The papers cover four major themes:

Part I Conceptual framework,
Part II Agricultural policy, production and technology development,
Part III Agricultural marketing from food security perspective and
Part IV Dimension of poverty and nutrition in Ethiopia

We hope that this volume will provide direct input to the ongoing policy formulation effort of the newly established Federal Government of Ethiopia, while simultaneously adding fresh insights into future research agenda.

Mulat Demeke
Wolday Amha
Simeon Ehui
Tesfaye Zegeye

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ABBREVIATIONS

AAU	Addis Ababa University
ADB	Agricultural Development Bank
ADD	Agricultural Development Department
ADD	Agricultural Development Department
ADLI	Agriculture Development Led Industrialization
AIDB	Agricultural and Industrial Bank
AMC	Agricultural Marketing Corporation
AUA	Alemaya University of Agriculture
BMR	Basal Metabolic Rate
CADR	Chilalo Agricultural Development unit
CIMMYT	International Wheat and Maize Research Centre
CPSC	Central Planning Supreme Council
CRS	Catholic relief Service
CSA	Central Statistical Authority
CV	Coefficient of Variation
ECA	Economic Commission for Africa
EDDC	Ethiopian Domestic Distribution Agency
EGA	Ethiopian Grain Agency
EGTE	Ethiopian Grain Trade Enterprise
ENI	Ethiopian Nutrition Institute
EPRDF	Ethiopian People Revolutionary Democratic Front
EPTP	Economic Policy of the Transition Period
FAO	Food and Agricultural Organization
FI	Food Insecure
FNU	Food and Nutrition Unit
FSSR	Food Self-Sufficiency Rate
GDP	Gross Domestic Product
gm	gram
GM	Gross Margin
GOE	Government of Ethiopia
hd	head
HDI	Human and Development Index
HHS	Households
HYVs	High Yielding Variaties
HYVs	High Yielding Variaties
IAR	Institute of Agricultural Research
IARCs	International Agric. Res. Centers
ICRISAT	International Crop Research Centre for Semi Arid Tro
IDR	Institute of Development Research

IDS	Institute of Development Studies
IFAD	International Food and Agricultural Devt.
IFPRI	International Food Policy Research Institute
IGADD	Inter Governmental Authorities for Drought and Development
ILCA	International Livestock centre for Africa
ILO	International Labour Organization
ILRI	International Livestock Research Institute
IMR	Infant Mortality Rate
Kcal	Kilo calorie
Kg	Kilo gram
LP	Linear Programming
masl	meters above sea level
MIS	Market Information System
MOA	Ministry of Agriculture
MOPED	Ministry of Planning and Economic Development
MVP	Marginal Value Product
NARS	National Agricultural Research System
NBE	National Bank of Ethiopia
NE	North East
NGO	Non Governmental Organization
NRDC	National Revolutionary Development campaign
ONCCP	Office of the National Committee for Central Planning
PAs	Peasant Associations
PCI	Per Capita Income
PCs	Producers Cooperations
RDA	Recommended Daily Allowance
RELC	Research Extension Linkage Committee
RRA	Rapid Rural Appraisal
RRC	Relief and Rehabilitation Commission
SADC	South Africa Development Cooperation
SCS	Service Cooperative
SIDA	Swedish International Development Agency
SSA	Sub-Sharan Africa
TGE	Transitional Government of Ethiopia
UNDP	United Nations Development Programme
USAID	United States Aid for International Development
WADU	Wolaita Agricultural Development
WB	World Bank
WHO	World Health Organization

FOOD SECURITY: CONCEPTUAL FRAMEWORK AND SITUATION ANALYSIS

FOOD SECURITY: A BRIEF REVIEW OF CONCEPTS AND INDICATORS

Debebe Habtewold

I. INTRODUCTION

A clear understanding of the concept of food security is an essential element to better explore the underlying causes and dimensions of food insecurity. The paper attempts to create a common understanding on the current thinking of the concept of food security and its indicators. In section II and III, the concept of food security is briefly reviewed and the major indicators and methods in food security assessments are discussed highlighting the possibilities and difficulties that prevail in monitoring food insecurity. In the last section, a brief summary is made in line with the development of the concept and its indicators.

II. CONCEPTS OF FOOD SECURITY

In the mid 1970s, food security was conceived as adequacy of food supply at global and national levels. This view favoured merely food production-oriented variables and overlooked the multiple forces which in many ways affect food access.

Available evidences indicate that during the last two decades, there has been an increasing trend in per capita food output in the world. In contrast, a significant proportion of the population, particularly in the developing world, have been suffering from hunger and malnutrition. In 1990, for example, the calorie supply at the global level was more than 110 percent compared to the total requirement. However, during the same period, more than 100 million people were affected by famine and more than a quarter of the world's population were short of enough food (UNDP, 1992). These facts indicate that availability at global level does not guarantee acquisition of food at national or household levels.

Similarly, the notion of equating national food security with food self-sufficiency is another problem area that should be clarified. Many countries, that were considered to be self-sufficient in food were found to be food-insecure due to the fact that they either lack an efficient food system or the capacity to raise the level of food entitlement. On the contrary, some countries that were food deficit were able to exercise a considerable level of national food security. These countries were able to import food through generating sufficient foreign exchange and improving the efficiency of the marketing system. Hence, in this context, attaining food self-sufficiency alone does not necessarily imply the achievement of food security.

The conceptual framework of food security has progressively developed and expanded based particularly along with the growing incidence of hunger, famine and malnutrition in developing countries. The concept of food security attained wider attention in the early 1980s after the debate on 'access' to food and the focus of the unit of analysis shifted from national and global levels to household and individual levels. The new concept and definition of food security (Annex) has also led to two additional major shifts in thinking; from a food first approach to a livelihood perspective and from objective indicators to subjective perceptions (Maxwell, 1994:1). These shifts gave way to a dynamic development in the area which in turn had served as an instrument through which the ultimate goals of human-beings are effectively addressed.

Conventionally, food security is defined as access by all people at all times to enough food for an active and healthy life (World Bank, 1986:1). From this definition, the core concept has been identified as secure access at all times to sufficient food. This definition explicitly focuses on four core concepts; 'Sufficiency' (defined as the calories required for an active, healthy life), 'access' to food (through production, purchase, exchange or gift), 'Security' (defined by the balance between vulnerability, risk and insurance) and 'time' (where food insecurity can be chronic, transitory or cyclical) (Maxwell and Smith, 1992).

The first two elements, 'sufficiency' and 'access', determine the food security situation of a given country or household. 'Sufficiency' indicates enough supply of calorie including necessary intake of proteins and micro-nutrients (Christiaensen, 1994: 8) and 'access' marks the ability of households to get command over these supplies. Intake level of nutrients is in turn determined by physical patterns of activities, body size, age and cultural aspects of the people. For sufficient calorie intake, food availability in space and time may be a necessary but not a sufficient condition for it does not guarantee effective demand over food. The recent argument rests on the consensus that a decline in food

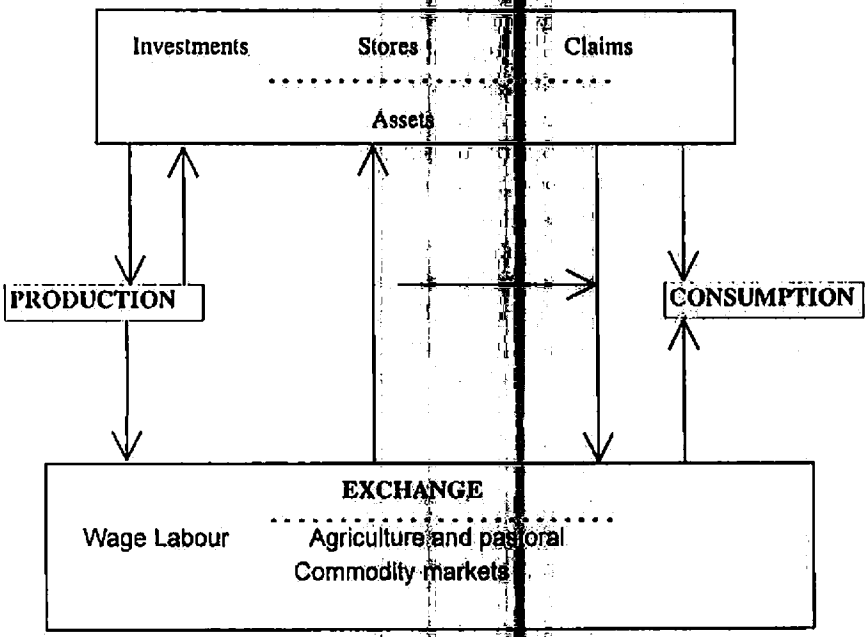
availability does neither create hunger nor does necessarily improve household food security. Hence, 'access' to food plays a crucial role in securing command over food which in turn is determined by production, exchange or transfer.

The argument on 'access' in the early 1980s was a turning point to the progress of the concept and assessment of the various food security-related problems. The concept was developed and improved through time as a result of increasing development in modern economic relationships which has caused significant changes and new paths in the systems of food acquisition. Particularly, the theory of 'entitlement'[1] has given an impetus to the development of the concept of 'access', drawing more attention to 'food entitlement' than to 'food availability'. This approach views hunger and famine as failure in specific socio-economic groups in the society to obtain adequate food by legitimate economic means (Bohle 1993: 20). That means, lack of physical, human or social resources causes people's access to food to fall below their subsistence needs. In connection with this shift, Swift (1989) identified three important sets of assets in the analytical framework of famine vulnerability; investments, stores and social claims. In his model, he argued that the multiple sources of 'entitlement' could be transformed to different forms; asset formation, production or consumption depending on the degree and characteristics of food situation in a household. More importantly, these resources can be converted into capabilities to acquire food at a time of extreme food crisis (Figure 1).

'Securing' access to sufficient food is also associated with the existence of risk which vary from natural to man-made factors. Deterioration in natural resources, disruption in food systems and distortion in state policies and social ties are some of the risk conditions that contribute to the worsening of food entitlement (Table 1). The level and fluctuation of food prices, for example, make serious impact on poor consumers since food comprises a significant share in their gross expenditure. Low prices can also affect poor households whose income is mainly dependent on the sale of food items (Anderson 1989: 13).

[1]The term 'entitlement' refers to the bundle of goods and services a person can make his own (Sen 1981, quoted in Tabatabai, 1995).

Figure 1 **Causal Pathways Between Production, Exchange and Consumption**



Source: Swift (1989:9)

Table 1 Sources of Risk to Household Food Security

Sources of Entitlement	Types of Risk				
	Natural	State	Market	Community	other
Productive capital(land, machinery, tools, animals, farm buildings, trees, wells, etc)	-Drought contamination (eg, of water supplies) -Land degradation -Fire -Flooding	-Land or other asset redistribution/confiscation	-Changes in costs of maintenance	-Appropriation or loss of access to common property resources	-Loss of land as a result of conflict
Non-productive capital (jewellery, dwellings, granaries, some animals, cash savings)	-Pests -Animal Disease	_Compulsory procurement -Villagization -Wealth tax	-Price shocks (eg, price falls in value of jewellery and livestock) -Rapid inflation	-Breakdown of sharing mechanisms (eg, communal granaries)	-Loss of assets as a result of war -Theft

Table 1 continued

Sources of	Types of Risk				
	Natural	State	Market	Community	Other
Human capital (labour power, education, health)	-Disease epidemics -Morbidity -Mortality -Disability	-Declining public health expenditure and/or introduction of user charges -Restriction on labour migration	-Unemployment -Falling real wages	-Breakdown of labour reciprocity	-Forced labour -Conscription -Mobility restrictions -Destruction of schools & clinics during war
Income (Crops, livestock, non-farm activity)	-Pests -Drought and other climatic events	-Cessation of extension services, subsidies on inputs or price support schemes -Tax increases	-Commodity price falls -Food price shocks		-Marketing channels -Embargoes
Claims(loans, gifts, social contracts, social security)		-Reduction in nutrition programs (eg, school & supplementary feeding)	-Rises in interest rates -Changes in borrowing capacity	-Loan recall -breakdown of reciprocity	-Communities disrupted/ displaced by war

Source: Maxwell and Smith (1992: 16)

Risk to food insecurity is not only related to the above factors and intensity of their occurrence, but also to the reaction of households against these stresses. According to the views of Bohle and Watts (cited in Bohle 1993: 18) and Alexander (1992), risk has three dimensions. It is a function of the risk of exposure to crises or shocks, the magnitude or consequences of crises and households' vulnerability to these crises. In an equation form,

$$\text{Risk} = \begin{matrix}\text{Exposure}\\ \text{to}\\ \text{Crisis}\end{matrix} * \begin{matrix}\text{Impact}\\ \text{of}\\ \text{Crisis}\end{matrix} * \begin{matrix}\text{Vulnerability}\\ \text{of}\\ \text{elements to crisis}\end{matrix}$$

The latter dimension, which Chambers (1989: 2) categorized as an internal side of risk, is determined by the adequacy of households capacity to cope with crises. From this perspective, Oshaug (cited in Maxwell and Smith, 1992) identified three kinds of households; 'enduring households' (which maintain food security on a continuous basis), 'resilient households' (which suffer shocks but recover quickly) and 'fragile households' (which become increasingly insecure in response to shocks). These differential responses, particularly within the crisis of 'structural' processes[2] indicate that the level of resources raised inside and outside households significantly determine the coping ability of households.

'Security' is not only governed by the magnitude and intensity of the risk or the state of exposure to risk or resilience but also by the extent of risk perception to future food crises. This issue is closely related to the broad concept of 'livelihood security'. The tendency to sacrifice current consumption for future livelihoods, to diversify source of income and develop different insurance mechanisms are some of the strategies linked to risk perception against expected crisis. It is highly affected by the ability to judge its causes and anticipate events that may disturb the 'normal' process in the flow of food supplies.

Understanding of food security also includes the 'time' dimension which explicitly describes the intensity and characteristics of household food insecurity. Food insecurity can be 'chronic' or 'transitory'. A constant failure to food 'access' is distinguished as 'chronic' while a temporary decline is considered as 'transitory' food insecurity. The former is a sign of poverty and illustrates a long term structural deficit in production and lack of purchasing power. Transitory

[2]There are two concepts of crisis; 'sporadic' and 'processual'. The former conceives crisis as being an acute, catastrophic, surprising, unforeseeable event or chain of events; the latter, by contrast is regarded as the inherent crisis-proneness of social systems, including defencelessness against crisis (Offe 1984, cited in Bohle 1993: 19).

insecurity, on the other hand, implies a short-term variability in food prices, production or incomes.

Food security in general is a concept which integrates a number of important issues the magnitude of which ranges from micro to macro economics. Its attainment involves an overall considerations in terms of policy and program development in all aspects of the food system. Hence, the success in production and distribution plays an important role in influencing the food security status of an individual or a society at large.

III. INDICATORS AND FOOD SECURITY ASSESSMENT METHODS

3.1 Determinants of Food Insecurity

A number of interrelated factors determine food security situation varying from immediate factors which affect food supply at a household level to the basic factors which condition the overall economic system of a given country (IFAD, 1992).

The state of household food security is mainly conditioned by factors which are related to the process of food acquisition, household procurement strategies and socio-economic conditions of the society. It is generally affected by two major determinants; availability of food and accessibility to it. The former is further influenced by the different sources of food and handling patterns which facilitate the time dimension of food availability in the household.

Access to different resources and the pattern of social support have greater impact on the procurement strategies of food supplies. The basic resources like cash, labour, land, markets and public services determine the possibility of increasing entitlement to food. These are the key factors for either promoting food security or increasing vulnerability to food insecurity. However, none of them by their own are sufficient to influence flow of food supplies. The characteristics of management and utilization of these resources are, in addition, crucial to the successful attainment of household food supplies in a sustainable way. Efficient allocation and use of resources significantly determine the process of securing stability in the food chains. Particularly, availability of food in the market is highly influenced by the efficiency of the marketing channels, information systems and development of infrastructures.

The social support pattern also allows additional possibility of exploiting the existing social ties and indigenous coping mechanisms against shocks in the society. As noted by Swift (1989), this category covers a wide range of important social, political and cultural processes, varying from claims on households within a community to high level of claims against the government. These include a variety of support arrangements; loan and gift systems, assistance in food and other productive resources, exemption in community contribution and government tax, and securing international assistance.

As the IFAD (1992) conceptual framework demonstrates, the aforementioned factors are in turn influenced by the availability of ample resources and the structures and mechanisms for controlling and managing these resources. The system of production as well as the rules and norms of a given society influence the decision making of households over the use of existing resources. Above all, the economic structure and political conditions of a given country highly determine the food situation in a household. Policies, for example, which affect the variability of food production and acquisition directly influence the changes in the level and patterns of food intake at a household level. Moreover, the realization of household food security is affected by the international economic environment.

3.2 Indicators of Food Insecurity

Assessment of food insecurity is a difficult issue as there are no universally established indicators which serve as measuring tools. Food insecurity requires a multi-dimensional consideration since it is influenced by different interrelated socio-economic, environmental and political factors. Because of this problem, assessing, analyzing and monitoring food insecurity follow diversified approaches; ranging from a mere quantitative to a combination of both quantitative and qualitative measurements.

Along with the development of the concept of food security, a number of indicators have been identified to make monitoring of food situation possible. Their utilization varies between the characteristics of the investigations, procedures and level of aggregation. In most cases, the purpose and depth of investigations highly influence the use of indicators. In some early warning systems, for example, three sets of indicators are often used to identify possible collapses in food security. These include food supply indicators (rain fall, area planted, yield forecasts and estimates of production); social stress indicators (market prices, availability of produce in the market, labour patterns, wages and

migration) and individual stress (which indicate nutritional status, diseases and mortality) (RRC, 1990). These indicators are very important to make decisions on the possible interventions and timely responses.

The different types of indicators, however, are classified into two main categories; 'process' and 'outcome' indicators. The former provides an estimate of food supply and food access situation and the latter serves as proxies for food consumption (Frankenberger, 1992: 84).

As described in Table 2, the major indicators that reflect food supply include agricultural production, access to resources, institutional development and market infrastructures (Ibid, 1992:77). These indicators provide a general picture of a given area and society. However, such indicators are in most cases aggregated and hardly serve to monitor food stress at household levels. Their application also varies between places depending upon the resource potentials of the area and economic activities of the people.

Unlike supply indicators, food access indicators are relatively quite effective to monitor food security situation at a household level. Their use varies between regions, seasons and social strata reflecting various strategies in the process of managing the diversified sources of food; i.e, shift to sideline activities, diversification of enterprises, and disposal of productive and non-productive assets.

'Outcome' indicators, such as the level and changes in food consumption and the amount of food in stores serve as proxy estimates for measuring household food situation. They can be disaggregated at lower level as opposed to food supply indicators. The problem with 'outcome' indicators is that some of the indicators like anthropometric results may not exactly indicate the level of food crisis since nutritional intake is affected by a number of factors like health and care.

The most important issue related to food access indicators is the diversified coping strategies[3] developed by households and the sequential responses through which people used to pass at times of decline in food availability. As Table 3 demonstrates, the responses vary from commitment of low domestic resource to distress migration depending on the intensity of crisis.

[3]As defined by Davies (1993) 'coping' strategies are the bundle of poor people's responses to declining food availability and entitlement in abnormal seasons or years.

Table 2 Indicators of Household Food Security

A. Supply indicators	
- Meteorological data	- Agro-ecological models
- Information on natural resources	- Food balance sheets
- Agricultural production data	- Information on pest damage
- Market information	- Regional conflict
B. Food access indicators	
- Land use practices	- Diversification of livestock
- Dietary change	- Change of Food source
- Diversification of income sources	- Access to loans/credit
- Livestock sales	- Seasonal migration
- Sale of production assets	- Distress migration
C. Outcome indicators	
- Household budget and expenditure	- Household perceptions of food insecurity
- Food consumption frequency	- Storage estimates
- Subsistence potential	
- Nutritional status	

Source: Summarized from Frankenberger (1992: 104)

These are further refined by Davies (1994) as insurance strategies (against the likelihood of failure of primary production) and coping strategies (employed once the principal source of production has failed to meet expected levels).

Within the framework of these sequential responses, different sets of indicators are also identified by which the levels and changes in food stress are monitored. Some indicate early changes prior to the onset of decreased food access while others serve as outcome indicators to the decline of food access (Frankenberger 1992: 92).

Though it is difficult to easily apply, these indicators serve to monitor stress and identify appropriate interventions if cautiously applied. The main problem in coping strategies-based indicators is the difficulty of differentiating 'normal' phenomena from abnormal events or risk avoiding mechanisms from stress-induced strategies. It is hard to easily distinguish, for example, between seasonal and distress migration or between people who prefer to go hungry so as

to maintain assets and those who are hungry due to lack of choices. These are some of the problems which threaten the application of indicators for monitoring food security.

Table 3 Sequential Coping Mechanisms

Sequential Use of Strategies	Examples of Strategies	Characteristics of Strategies
STAGE 1 Insurance Mechanisms	- changes in cropping and planting practices- sale of small-stock - reduction of current consumption levels - collection of wild foods - use of inter-household transfers and loans - increased petty commodity production - migration in search of employment - sale of possessions (e.g jewellery)	- risk-minimizing - loss-management - low commitment of domestic resources
STAGE 2 Disposal of Productive Assets (Coping)	- sale of livestock (e.g oxen) - sale of agricultural tools - sale or mortgaging of land - credit from merchants and moneylenders - reduction of current consumption levels	- high commitment of domestic resources
STAGE 3 Destitution	- distress migration	-failure to cope

Source: Davies (1993: 66) as adapted from Corbett 1988 and Frankenberger 1992

Generally speaking, the use of food stress indicators depends on the characteristics of households and socio-economic background of an area, scale of investigation and level of aggregation. Indicators of food demand and supply, and the import capacity of a country serve to measure food security at a national level. On the other hand, indicators related to food availability for consumption and level and changes in food intake serve as a measuring yardstick to define food security at household level (FAO/WHO 1992). In the latter case, socio-economic variables such as real wage rates, employment and price conditions can also serve as proxies to indicate food security situation. Particularly, in urban centres, these variables are quite powerful measures of changes in food stress. In rural areas, fluctuations in level of food production, possession of productive capitals and changes in terms of trade are also useful indicators.

3.3 Food Security Assessment Methods

Despite the shortcomings in the measurements, qualitative and quantitative approaches or a combination of both have been used to identify and apply food security indicators. There is no fixed rule as to which method to employ due to the diversified characteristics of food insecurity and the different levels of consideration. Other than resource and time constraints, the decision to rely on a particular method usually depends on the objective of the study, availability of data, type of users and degree of accuracy required.

Since the status of food security situation changes over time and place, relying on secondary sources may lead to wrong conclusion. Executing repeated surveys or case studies is highly important to monitor food stress situation effectively. General surveys, for example, provide information related to a wider area and to a number of household units. They indicate the degree of variation between areas (Upton, 1973) and different categories of households and more importantly allow the identification of critical information most representative to a given area and population. The main problem of general surveys is the high cost incurred.

Similarly, case studies lay better ground to obtain detailed information on typical areas and households assumed to be representative. They are particularly appropriate to identify casual relationships (Casley and Lury, 1987: 64) and assess households' attitudes and perceptions as well as patterns of consumption, income and expenditure. However, the results may not be representative and may create problem during generalization. A household which attains improved food security may not represent its neighbours though all face identical environment and system of production.

Rapid appraisal techniques that emerged in the late 1970s have also enabled researchers to undertake a comprehensive socio-economic assessments and identify levels of food insecurity and its causes. These techniques are usually categorized as purposive sampling since they are implemented in selected areas or on sets of individuals. Their growing popularity resulted from the need to understand the complexity of social conditions and the diversity of the characteristics of households with minimum time and resources. The techniques involve exploratory and iterative research undertakings, use of indigenous knowledge and multi-disciplinary approaches and flexibility in assessment techniques (Chambers, 1992:14). Maxwell (1989), for example, employed rapid food security assessment (RFSA) technique to define vulnerable groups in some

villages of the Sudan. It was possible to explain the extent of food insecurity and vulnerability by incorporating the perception of the food-insecure themselves.

In combination with participatory appraisals, the rapid assessment techniques have also enabled researchers to tap indigenous technical knowledge. More importantly, local people could easily identify the food-insecure group among themselves and the causes of food insecurity in their localities. However, despite the usefulness of the techniques, they somehow suffer from personal bias and judgement, extreme demands for interdisciplinary team work (Borton and Shoham, as quoted in Frankenberger, 1992) and inaccuracy. The methods also focus on deliberately selected societies or groups of individuals with no statistical evaluation of the results obtained.

All assessment techniques have their own advantages and disadvantages. Their application depends on the level of precision required as well as the amount of resources available. The important point lies upon the efficiency of the technique to generate the required information and diagnose the prevailing problem. They must also be cost-effective tools to measure food insecurity.

V. SUMMARY

In the mid 1970s, food security was conceived as adequacy of food supply at national and global levels. However, since the early 1980s the analytical approach concentrated on household level, with greater focus on access to food rather than simply encouraging food production.

Food security is defined by a number of scholars as 'securing access at all times to sufficient food'. The core elements in the definition, 'sufficiency' and 'access', determine household food security. The success in food security requires the realization of food availability, access to enough food and avoiding risk associated to household procurement strategies. This situation in turn is conditioned by a number of factors ranging from immediate factors at a household level to the prevailing socio-economic conditions in a given country.

Important indicators together with different quantitative and qualitative approaches have been developed to make monitoring of food situation possible. The indicators, according to their use, are distinguished as 'process' indicators which measure the underlying causes of food insecurity and 'outcome' indicators

which measure sufficiency in the level of food intake. Particularly, the 'access' indicators, which are categorized under the 'process' indicators, include the various strategies adopted by the households and vary from risk avoiding responses to a high level of distress migration. These are important indicators for planners and decision makers to make appropriate interventions.

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ANNEX

Selected Definitions of Food Security, 1975-1992

1. 'Availability at all times of adequate world supplies of basic food-stuffs ..., to sustain a steady expansion of food consumption ... and to offset fluctuations in production and prices' (UN, 1975)

2. 'A condition in which the probability of a country's citizens falling below a minimal level of food consumption is low' (Reutlinger and Knapp, 1980)

3. 'The certain ability to finance needed imports to meet immediate targets for consumption levels' (Valdes and Konandreas, 1981)

4. 'Ensuring that all people at all times have both physical and economic access to the basic food they need' (FAO, 1983)

5. 'A basket of food, nutritionally adequate, culturally acceptable, procured in keeping with human dignity and enduring overtime' (Oshaug, 1985 in Eide et al 1985)

6. 'Access by all people at all times to enough food for an active, healthy life' (World Bank, 1986)

7. 'A country and people are food secure when their food system operates efficiently in such a way as to remove the fear that there will not be enough to eat' (Maxwell, 1988)

8. 'Consumption of less than 80 percent of WHO average required daily caloric intake' (Reardon and Matlon 1989)

9. 'The self-perceived ability of household members to provision themselves with adequate food through whatever means' (Gillespie and Mason 1991)

10. 'A state of affairs where all people at all times have access to safe and nutritious food to maintain a healthy and active life' (FAO/WHO 1992)

Source: Maxwell and Smith (1992: 68); FAO/WHO (1992:2)

FOOD SECURITY IN ETHIOPIA: A SITUATION ANALYSIS

Tesfaye Zegeye and Debebe Habtewold

I. INTRODUCTION

Food security entails two conditions: enough food must be available and households must have the capacity to acquire it. Though much attention is given by the government of Ethiopia to the food availability dimension, emphasis should also be given to enhance the real income of the people to assure access to food. The objective of this paper is to review the status of food insecurity in the country as measured by the trend in food supply and the nutritional status of the people.

This paper is presented in five sections. Section II deals with the concept of food security. Section III attempts to review the food security situation in the country mainly emphasizing on the size of food-insecure people and regions. An alternative measure is also made in section IV to verify some of the estimates made by different organizations and individuals. The last section argues on what should be the possible strategies and policy measures to bring significant changes on the food security status of the people.

II. CONCEPTS OF FOOD SECURITY

Food security is defined as access by all people at all times to enough food for an active and healthy life (World Bank 1986). The two elements in the definition, enough and access, determine the food security situation of a country. Supply of enough food may be necessary but not a sufficient condition to attain command over food.

Ability to have command over food is strongly associated with risk conditions. Sudden changes in the major economic variables, such as food prices, may create disequilibrium phenomena to the relatively 'stable' situation. Unfavorable fluctuations in the level of production and prices and losses in productive capitals and disruption in marketing channels affect the situation of household food entitlement.

There are two types of food insecurity when viewed in terms of time dimension: chronic and transitory food insecurity. The former implies a constant failure to food acquisition while the latter indicates a temporary decline in food security. Chronic food insecurity, as asserted by Maxwell, coincides with poverty, vulnerability and under-nutrition (Maxwell 1988, cited in Maxwell and Smith 1992).

Scoring success in improved food security requires a multi-dimensional considerations. At a country level, food security can be met through efficient food production and distribution as well as enhancing food import capacity. At a household level it may be improved through increasing food entitlement. It will be achieved particularly when the poor and vulnerable groups get access to the food they need through improving their own production complemented with other income sources.

III. SITUATION ANALYSIS

3.1 Trends in Food Availability: A supply indicator to food security

Endowed with considerable agricultural potential, Ethiopia had been self-sufficient in staple food and was classified as a net exporter of food grains till the late 1950s. It was reported that the annual export of grain to world market amounted to 150,000 tons in 1947/48 (Alemayehu 1988). However, since early 1960s, domestic food supply failed to meet the food requirements of the people. Even though sufficient amount of food has been produced in most of the good years, the average food production during the last decade remained almost stagnant.

Since the beginning of the mid-1980s, food production has exhibited very low level of growth. Total domestic food production between 1979/80 - 1993/94 increased by only 0.5 percent per annum. The level of per capita food production in the same period drastically dropped by 2.5 percent owing to the rapid population growth. Particularly, sharp decline has been observed during the period 1984/85 (116 kg), 1985/86 (124 kg) and 1991/92 (123 kg). It was only possible

to produce a maximum of 204 kg in 1979/80 which was still far below the recommended rate of 2100 kcal[1] per day per person (Table 1).

The food self-sufficiency ratio, as measured by the extent of food demand met by domestic production, has also declined following the decreasing trend in food production. The ratio which was about 97 percent in 1980 declined to about 88 percent in the 1980s. This trend,in combination with other factors, has threatened the food security status of the people.

Based on the recommended food intake of 2100 kcal per person per day, the annual deficit in the last decade was estimated at 0.6 to 4.0 million tones of food grain equivalents. Even with the RRC estimate of 1700 kcal, domestic production could not meet the requirement in almost all years (Table 1). The gap has been covered both by food aid and commercial imports. As a result, the volume of food import increased from 177.8 thousand tons in 1979/80 to more than 1.0 million tons in 1991/92. The per capita food import rose from 5 kg in the early 1980s to 24 kg during the famine period of the mid 1980s and 19 kg in the early 1990s.

Due to differences in agro-ecological conditions and utilization of productive inputs, food crops are mainly produced in central (Arsi and Shoa) and north west Ethiopia (Gojjam). These three regions alone account for more than half of the country's grain produced almost every year. The per capita production in 1987/88, for example, was the highest in Arsi (325 kg) followed by Gojjam (242 kg) and Shoa (194 kg) (IFAD 1989). Apart from these regions, Wollega, Bale, Gondar and Keffa are considered as areas of food self-sufficient while the remaining are categorized as chronically food deficit areas.

[1]Recommended by the Ethiopian Medical Association as minimum average calorie requirement per day for an average individual (ONCCP, 1987)

Table 1 Food Production and Availability (000' tons)

	84/85	85/86	86/87	87/88	88/89	89/90	90/91	91/92	92/93	93/94
1. Domestic Supply										
Grains	4855.3	5403.7	6261.7	6769.8	6883.2	7130.4	7694.2	6389.0	7947.0	7438.0
Net Grain Crops	4127.0	4593.1	5322.4	5754.3	5850.3	66060.8	6540.4	5430.7	6755.0	6320.0
Enset & Root Crops	520.0	530.0	550.0	570.0	570.0	570.0	600.0	620.0	640.0	670.0
Milk	150.0	200.0	290.0	291.0	300.0	273.0	285.0	300.0	300.0	330.0
Meat	185.0	185.0	185.0	185.0	190.0	195.0	200.0	200.0	200.0	210.0
Total Domestic Supply	4982.0	5508.1	6337.4	6799.3	6910.7	7098.8	7625.1	6550.7	7895.0	7532.0
2. Food Availability										
Commercial Imports	168.9	340.1	157.2	216.6	269.2	107.5	109.2	96.1	88.8	20.4
Food Aid	868.9	799.2	570.3	823.8	572.8	537.5	893.9	1000.9	519.3	917.9
Total Imports	1037.8	1139.3	727.5	1040.4	842.0	645.0	1003.1	1097.0	608.1	938.3
Exports	40.1	17.2	21.2	28.9	25.7	18.9	33.5	6.0	1.9	23.0
Total Availability	5979.7	6630.2	7043.7	7818.8	7727.0	7724.9	8594.7	7641.7	8501.2	8447.3

3. Per Capita Production/Availability										
Population (mln)	42.8	44.3	45.7	47.2	48.6	50.2	51.7	53.4	55.1	56.9
Per Cap. Production (kg/hd)	116.4	124.3	138.7	144.1	142.2	141.4	147.5	122.7	143.3	132.4
Per Cap. Availability (kg/hd)	139.7	149.7	154.1	165.5	159.0	153.9	166.2	147.1	154.3	148.5
4. Food Balance										
At 182 kg/hd (1700 cal)	-1831.3	-1454.5	-1296.5	-803.2	-1142.5	-1436.6	-840.6	-2103.8	-1554.6	-1937.0
At 225 kg/hd (2100 cal)	-3650.3	-3337.3	-3238.8	-2809.2	-3208.0	-3570.1	-3037.8	-4373.4	-3896.3	-4355.2

Note: 1. 'Net grain crops' is obtained by deducting 15% for seed and loses from the total supply
2. Domestic supply of 1992/93 are FAO/WFP estimates
3. Livestock products, enset and root crops are expressed in terms cereal equivalents
4. Both beginning and end stocks are not considered in the table due to data unavailability

Source: Debebe and Sisay 1994; FAO/WFP;Samia 1993; NBE 1994; Ministry of Trade, 1994; EGTE, 1995, OPHC, 1991

3.2 Nutritional Status: A proxy indicator to food security

3.2.1 Rural areas

The 1992 nutrition surveillance report of CSA indicated that about 64 percent of all children aged 6-59 months were chronically malnourished[2]. Similarly, about 8 percent were in a state of wasting (indicating acute malnutrition) while 47 percent were underweight. At the time of the survey, all the three indicators of malnutrition were the highest among children between age 12-23 months, possibly due to feeding problems during weaning period.

Regional prevalence of stunting ranged from 49 percent in South Omo to 75 percent in South Gondar. As Table 2 indicates, this was also highest in the North and North West part of the country, West and East Gojjam and North Wello. Similarly, wasting was observed to be higher in Tigray, East Gojjam and Borena while underweight was significant in Tigray and Sidamo.

The 1992 nutrition surveillance further indicates a general trend of deterioration in all forms of malnutrition. In particular, general malnutrition increased from about 37 percent in 1983 to as high as 47 percent in 1992 (CSA, 1992). During the same reference period, stunting increased by 4.2 percent, from 59.8 to 64 percent while no change was observed in the case of wasting (8.1 percent in 1983 and 8.0 percent in 1992). In general food related problems and other factors that contribute to malnutrition have been worsened through time in the rural areas.

3.2.2 Urban centers

The most recent household food security survey undertaken in 1993 in four towns (Awassa, Bahir Dar, Dire Dawa and Jima) reported that the prevalence of stunting, wasting and underweight was 36.4, 12.3 and 24.2 percent respectively (FNU/MoPED 1994: 79).

Malnutrition in children was more serious in Bahir Dar and Jimma compared to other urban centers (Table 3). The level of wasting in these towns was also found to be higher than in the rural areas (8 percent).

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[2]Stunting (Height-for-Age) measures chronic malnutrition and is a long term nutritional deprivation; wasting (Weight-for-Height) measures acute malnutrition and is a recent nutritional situation; and underweight (Weight-for-Age) is an indicator of general malnutrition and measures past and/or present nutritional status.

Table 2 **Prevalence of Stunting, Wasting and Underweight in Rural Areas by Region, 1992**

	Stunting		wasting		Underweight	
Regions	Percent	Number	Percent	Number	Percent	Number
Arsi	62.7	941	4.6	933	41.1	939
Bale	55.0	745	4.4	743	29.2	751
N. Omo	60.7	1385	6.9	1384	48.5	1382
S. Omo	49.2	444	6.6	445	35.9	440
E. Gojjam	68.9	1052	13.3	1044	54.1	1063
W. Gojjam	73.6	992	8.1	991	53.8	995
Metekel	57.2	483	6.7	482	42.6	482
N. Gondar	66.4	985	7.7	982	52.9	987
S. Gondar	74.5	537	9.9	534	62.0	539
Illubabour	67.1	1207	9.1	1204	52.5	1217
Keffa	60.9	1102	7.3	1097	38.2	1104
N. Shoa	56.7	450	5.1	452	31.1	450
E. Shoa	57.6	768	5.7	767	40.2	770
W. Shoa	62.1	1122	5.3	1119	39.8	1125
S. Shoa	66.1	1275	6.3	1261	44.4	1285
A. Ababa	55.5	989	5.1	988	33.3	989
Sidamo	67.2	1346	10.2	1337	55.0	1356
Borena	55.9	731	12.8	722	45.4	734
Tigray	67.9	1272	14.2	1268	59.9	1284
Wolega	59.2	854	10.8	853	51.6	856
N. Wello	68.6	867	8.7	805	53.0	811
S. Wello	62.3	746	5.2	743	47.3	751
Total	64.2	20233	8.0	20154	47.6	20310

Source: CSA Rural Nutrition Survey, 1992

The household food security survey in Addis Ababa which was undertaken in 1993 by the Ethiopian Nutrition Institute further indicated that the prevalence of stunting, wasting and underweight were 31.9, 4.5 and 20.2 percent respectively. All forms of malnutrition in Addis Ababa were by far lower than the results of the other four towns and of the 1992 survey in the rural areas.

The degree of severity of the three forms of malnutrition were also found to be significant in almost all towns including Addis Ababa (Table 3). Severity in chronic malnutrition varied from about 9 percent in Awassa to 19 percent in Bahir Dar. Similarly, those with severe forms of acute malnutrition varied from 2 percent in Jimma to the highest 13 percent in Bahir Dar. Taken as a whole, anthropometric results clearly suggest that food insecurity in the country has seriously deteriorated.

Table 3 **Prevalence of Stunting, Wasting and Underweight, and Degree of Severity (Children Under Five Years) in Selected Urban Centers (1993)**

Urban Center	Stunting		Wasting		Underweight	
	No	Percent	No	Percent	No	Percent
1. Awassa	114	28.1 (8.8)	115	7.0 (3.5)	116	10.3 (2.6)
2. Bahir Dar	88	42.0 (19.3)	88	22.7 (13.6)	95	38.9 (13.7)
3. Dire Dawa	133	35.8 (17.3)	134	13.4 (5.2)	135	27.9 (13.3)
4. Jima	104	41.3 (16.3)	101	7.9 (2.0)	106	22.6 (3.8)
Total	439	36.4 (15.2)	438	12.3 (5.7)	452	24.6 (8.4)
5. Addis Ababa	580	31.9 (11.6)	576	4.5 (5.0)	580	20.2 (4.7)

Note: Figures in brackets indicate degree of severity
Source: ENI (1993); FNU/MoPED (1994)

3.3 Dimensions of Food Security

A number of studies confirmed that there is severe food insecurity in Ethiopia covering a wide range of areas and affecting a large number of people. Over 40 percent of the estimated food-insecure people in Sub-Saharan Africa are

found in Ethiopia, Nigeria and Zaire (Anderson 1989). The 1992 IGADD food security study also indicated that Ethiopia has the highest number of food-insecure in the region. The International Fund for Agricultural Development (1989) asserted that nearly 19.0 million people (equivalent to 43 percent of the rural population) were below poverty line in Ethiopia. Its estimate was based on an intake of 500 gm of cereal equivalent (Table 4). Furthermore, based on the evaluation of about 14 important socio-economic indicators (such as level of inputs and credit uses, oxen ownership, nutritional status, infant mortality rate, etc), five regions including the main cash crop producing areas (Wello, Gamo Gofa, Illubabour, Harrarghe and Sidamo) were identified as the most deprived areas. Shoa, Arsi, Gojjam and Wollega were comparatively categorized as regions with reasonable access to resources, goods and social services.

Based on the 1983 nutrition survey and population estimate of 1990, Maxwell estimated the food-insecure people to be about 38 million in 1991. The report identified the resource-poor farmers, people living in marginal areas, poor nomads, war affected, refugees and the urban poor to be the most food-insecure social groups. The estimates by the World Bank and MOPED lie between the estimates of IFAD and Maxwell. Both concluded that the food-insecure people of the country are between 21 - 27 million.

All these estimates have also been further scrutinized by Debebe and Maxwell (1992). The study estimated the food-insecure to be about 27.0 million including other social groups (such as the displaced). Of this estimate the greatest number were residing in rural areas.

The food security study in the four towns has also thrown light on the magnitude of urban food insecurity. Considering an intake of 1700 calories per person per day and the minimum food cost prevailing in each location, households with insufficient purchasing power were identified to range between 29 percent in Dire Dawa to 57 percent in Bahir Dar (FNU/MoPED, 1994). In this study, half of the total population of the four urban towns cannot afford to buy sufficient food and these were households whose income were below Birr 199/month. Similarly, a study made in Addis Ababa indicated that nearly 41 percent of the population were with insufficient income to acquire enough food (ENI 1993). Both surveys confirmed the estimates made by MOPED and Debebe and Maxwell in 1992 which argued that more than half of the urban population could be vulnerable to food insecurity.

Table 4 Estimate of Food Insecure in Ethiopia (in Millions)

Studies	Measurements/Indicators	Regions	Social Category & Size			
			Category	No.(ml)	%Total	% FI
IFAD Poverty Analysis (1989)	Socio-economic indicators (oxen ownership, input use, IMR, etc)	Regions except Gojjam, Shoa, Wollega, Arsi		18.9	43.0	
Maxwell Food Aid & Food Security (1991)	Anthropometric measurements (stunting)		Rural Resource poor Marginals Pastoralists	25.5 5.5	47.7 10	67.1 14.5
			Urban Urban poor Others (war affected,refugees	0.75 4.1	1.4 7.5	1.9 10.7
World Bank Food Security study (1992)	Physical resources and income	Tigray, N. Gondar Wello, NE Shoa, Harrarghe, Arsi,Bale	Rural Resource poor, Pastoralists, Farm settlers, Urban Urban poor & unemployed (disabled,aged, etc.)	20.7 0.6	38.0 1.0	97.2 2.8

Table 4 continued

MoPED Social Dimension of Adjustment (1992)	Oxen and land ownership, physical productivity and income	All (with different proportions)	Rural Very poor Poor Vulnerable Nomads Urban poor	 8.8 3.8 7.4 2.2 4.9	 16.0 7.0 13.4 4.0 9.0	 32.5 14.0 27.3 8.1 18.1
Debebe & Maxwel Vulnerability Profile & Risk Mapping (1992)	Reviews of evidences and interpolating data	Wello, Tigray, Sidamo, Harrarghe Gamo gofa	Rural Chronic Transitory Urban Unemployable Employed Others (Refugees, Displace,etc)	 13.5 6.5 0.2 3.8 2.75	 24.5 12.0 0.4 7.0 5.4	 50.5 24.3 0.01 14.2 10.2

Note: The '% total' and '% FI' refer to proportion of the total population and food insecure people respectively
Source: Debebe, 1993

In general, irrespective of the diverse approaches and measurement in food insecurity, the estimate and ranking result indicate that the problem is highly concentrated in structurally food deficit regions. The estimates range between 19 to 38 millions and largely refer to the resource poor households in the rural areas which are always liable to economic and environmental problems. They are concentrated in almost all regions except in some pocket areas of the surplus regions: Gojjam, Arsi, Shoa and perhaps Wollega. Similarly, low income households employed in informal sectors and groups outside the labor markets (elderly, disabled) are also the most affected people in the urban centers (Table 5).

Table 5 Classification of Food Insecure Groups in Ethiopia

	Rural	Urban	'others'
Chronic	Resource poor households - land scarce - ox-less - female -headed households - elderly - poor non-agricultural HHs -newly established settlers	Low-income households employed in the informal sector Groups outside the labour market: -elderly -disabled -some female-headed households	Refugees Displaced people Ex-Soldiers
Transitory	Less resources - poor households vulnerable to shocks, especially but not only drought - farmers and others in drought - prone areas - other vulnerable to economic shocks, eg. in low potential areas	Urban poor vulnerable to economic shocks, especially food price rises	Groups affected by temporary civil unrest

Note: 'Others' column shows groups temporarily residing in both areas.
Source: Debebe and Maxwell, 1992

IV. AN ALTERNATIVE APPROACH TO FOOD SECURITY MEASUREMENT

An attempt is made to verify some of the above findings by employing food insecurity index of Abalu (1991) which in turn is constructed using UNDP human development index (HDI). The index measures shortfall in food security indicators from the acceptable levels by focusing on three important variables: adequacy, stability and access to food supply. It generally measures movements towards a set of desired objectives with the value ranging between zero and one.

Though there are various indicators specific to different food security situations, food self-sufficiency, stability in food consumption (measured by coefficient of variation along the long-term trend) and income (a proxy to access) are only considered in the present analysis (Abalu, 1991). These three variables are identified to be the main determinants affecting the food security situation in each region. Particularly, variables related to food self-sufficiency are central to improve food security for economies such as Ethiopia where 85 percent of the population is engaged in agriculture.

For each indicator, a maximum and minimum value is determined to reflect the relative situation of food insecurity in each region. Thus, with UNDP procedure (UNDP, 1990), determination of deprivation level follows three steps. The first step is to find out the level of deprivation for each indicator, defined as:

$$I_{ij} = \frac{\text{Max } X_{ij} - X_{ij}}{\text{Max } X_{ij} - \text{Min } X_{ij}}$$

(Where I_{ij} is the deprivation level for the j^{th} administrative region with respect to the i^{th} variable and X_{ij} is the i^{th} value for the j^{th} region)

The second step is to define an average deprivation of the three indicators for the j^{th} region, i.e.,

$$I_j = \sum_{i=1}^{3} I_{ij}$$

The third step provides an aggregate deprivation of all indicators and given as:

$FSI_j = (1 - I_j)$,

(where FSI_j is the food security index for the j^{th} administrative region)

Based on the results, the regions are ranked and grouped into three categories; highly food-insecure (≤ 0.30), moderately food insecure (between 0.30 and 0.60) and less food-insecure (≥ 0.60). In this regard, Gamo Gofa, Wello, Harrarghe and Sidamo are categorized as relatively highly food-insecure regions (Table 6). This empirical assessment substantiates the inferences given by different organizations and individuals and serves as an instrument to guide decision as to which regions should be given more emphasis to alleviate the problem.

Table 6 Estimate of Food Security Index

Region	Basic variables				Deprivation index			Total Deprivation	FSI
	FSSR	CV	PCI		FSSR	CV	PCI		
			Actl	Log					
Arsi	2.11	12.75	386	2.59	0.00	0.08	0.57	0.65	0.78
Bale	0.94	24.23	332	2.52	0.66	0.43	0.65	1.74	0.42
G.Gofa	0.51	25.92	184	2.26	0.90	0.48	1.00	2.38	0.21
Gojjam	1.66	10.11	265	2.42	0.25	0.00	0.78	1.03	0.66
Gondar	1.21	19.46	320	2.51	0.51	0.29	0.66	1.46	0.51
Harrarghe	0.62	38.86	408	2.62	0.84	0.88	0.51	2.23	0.26
Illubabour	1.10	32.58	311	2.49	0.57	0.69	0.69	1.95	0.35
Keffa	0.85	25.43	287	2.46	0.71	0.47	0.73	1.91	0.36
Shoa	1.36	34.99	305	2.48	0.41	0.76	0.70	1.88	0.37
Sidamo	0.34	21.54	237	2.37	1.00	0.35	0.85	2.20	0.27
Tigray	0.65	17.24	287	2.46	0.82	0.22	0.73	1.77	0.41
Wollega	1.34	17.25	338	2.52	0.43	0.22	0.65	1.33	0.57
Wello	1.26	42.72	287	2.46	0.48	1.00	0.73	2.21	0.26

Note:
1. FSSR= Food Self-Sufficiency Ratio; CV= Coefficient of Variation; PCI= Per Capita Income
2. FSSR and CV consider the per capita production between 1979/80-1987/88
3. Since determination of consumption level at regional level is difficult, the average consumption of the country (141 kg/hd/year, with cereals, pulses and oil crops to contribute about 87 percent) has been taken for FSSR calculation.
4. The mean per capita income is calculated from the proportion of per capita food expenditure as it was worked out in the study of the 'Analysis on Household Food Expenditure Patterns in Ethiopia, 1992'
5. The logarithm form reflects the diminishing return to transform income into capabilities to command over food i.e; people do not need excessive income to ensure adequate food (UNDP 1990; Abalu 1991). Per capita income considers only the rural income.
6. The target income level, including non-food requirements, is set to be birr 1000/hd/year (the level below which a minimum nutritionally adequate food is not affordable).
7. Per capita income of Tigray is interpolated from Wello data.

Source: CSA, various statistical bulletins; FNU/MoPED 1992; 1991

V. CONCLUSIONS AND RECOMMENDATIONS

Recent evidences show that more than half of the population are food-insecure of which the largest group are the rural poor with insufficient land and capital resources to produce enough income or food. Their size, as confirmed by various studies, ranges between 19 to 38 million and are typically concentrated in structurally food deficit and densely populated areas.

Food security in Ethiopia entails two conditions: enough food must be available and households must have the capacity to acquire it. Though much attention is given to the food availability dimension, it is recommended that emphasis should be given to enhance real income of the people to assure access to food.

Increased food production and employment diversification are the main strategies to improve food security in the long-run. Boosting food and agricultural production can contribute to overcoming the food security problem, especially if the benefit of growth is distributed as widely as possible (Table 7).

Beyond agricultural development, promotion of marketing and consumption is another important measure to attain food security. Improvement in storage and transport facilities and increasing the role of private sectors in developing marketing activities and distribution are of high importance to raise the efficiency of food distribution in the country.

Improved consumption at household level is also promoted through initiating self-employment and public works programs and diversification of income. Poverty reducing programs create assets by which the poor could generate income and improve their food security status. Such initiatives increase the purchasing power of low income groups while diversification of production capacity reduces risks and maintains income levels.

Based on the discussion and the proposed measures in Table 7, the most crucial areas that require attention are indicated as follows:

a. provision of adequate inputs and credit services to improve agricultural food production,

b. development of human resource capacity in the areas of research and extension services,

c. development of improved storage capacity at all levels of marketing channels and public enterprises involved in maintaining food security reserves,

d. development of infrastructures such as rural and feeder roads required for promoting agricultural development in both drought prone and surplus regions,

e. provision of training to improve local level capacity to manage the different institutions involved in promoting the objectives of food security, and

f. initiate diversification in production capacity

Table 7 Proposed Areas and Measures for Attaining Food Security

Major Area	Proposed Measures
I. Boosting food and agricultural production	- Strengthening agricultural research and extension services and develop infrastructural and human resource capacity - Initiate and encourage provision of credit facilities and adequate inputs - Development of rural and feeder roads - Supporting development of indigenous agricultural knowledge and other technologies - Provision of training to improve local level capacity - Promoting of small-scale irrigation schemes - Development and improvement of storage capacity at the farm and other levels
II. Improved distribution and marketing system	- Encouraging private sectors in grain marketings - Expanding and strengthening public storage, distribution and processing facilities - Strengthening market information system - Ensuring minimum and stable grain price through buffer stock
III. Promotion and protection of food consumption	- Promoting self-employment schemes - Initiating labor intensive public works - Diversification of production capacity - Information exchange to mitigate drought and famine - Expanding emergency food security reserves and building-up reserve stock capacity at all levels

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AGRICULTURAL POLICY, PRODUCTION AND TECHNOLOGY DEVELOPMENT

PERSPECTIVES ON AGRICULTURAL POLICY, RURAL POVERTY, AND FOOD INSECURITY IN ETHIOPIA

Sisay Asefa

I. INTRODUCTION AND OBJECTIVES

Food insecurity is defined as the lack of access by people to enough food for active, productive and healthy life (World Bank, 1986). It is estimated that over 100 million people in Africa are food-insecure. More than half of the continent's food-insecure live in Ethiopia and six other countries- Chad, Zaire, Uganda, Mozambique, Zambia, and Somalia. Over 40 percent of the population in these countries is estimated to be food-insecure (World bank,1986).

The problems of food insecurity, poverty, and agriculture are closely linked. These linkages have both macro and micro dimensions. At the macro-economic or economy wide level, agriculture is the dominant sector where the bulk (about 85 percent) of the population in Ethiopia and many African states make their living. Agriculture also makes important contributions to economic development well known in the literature (Johnston and Mellor, 1961, Kuznets, 1965, Johnston and Kilby, 1975). These macroeconomic contributions include providing food (an essential wage good), employment, capital and raw material for industry, market or effective demand for goods and services produced in the economy, and foreign exchange to supplement export revenue in order to ease balance of payment problems. At this level, the main determinants of agricultural production include commodity prices, quantity/quality of labour and other resources such as land, technology, and government agricultural policy and institutions. Thus, moving agriculture forward requires designing policies that are complementary and favourable to commodity prices, technology, labour or employment, credit, and land resource use.

At the micro or household level, agricultural income, which is the main indicator of poverty for agrarian nations such as Ethiopia, is determined by agricultural output and wages as well as the productivity of labour and employment available to the farm household, plus non-labour income from assets such as livestock, and transfers that include food aid and remittances. Thus, in the absence of income from assets and transfers, rural poverty is determined by the level of agricultural income and productivity. Food security,in turn, is directly related to poverty since chronic food insecurity is caused by the inability of the

such as livestock, and transfers that include food aid and remittances. Thus, in the absence of income from assets and transfers, rural poverty is determined by the level of agricultural income and productivity. Food security,in turn, is directly related to poverty since chronic food insecurity is caused by the inability of the household to produce, purchase or to have access to food (Sen, 1981). Thus, the problems of rural poverty and food insecurity can not be overcome unless agricultural productivity improves by enabling economic policy environment.

The objective of this paper is to provide some perspectives on policy issues related to agriculture, rural poverty, and food insecurity in Ethiopia, with the aim of contributing to the process of a constructive policy dialogue. The paper is organized into three sections. The first section briefly discusses the important linkages among agriculture, poverty and food insecurity in the context of an agrarian economy such as Ethiopia. Section two briefly reviews some related recent empirical studies and draws some policy implications and raises some issues and questions for future research related to the problems of agricultural development, rural poverty, and food insecurity in Ethiopia, with implications for other African nations. The final section briefly outlines some of the major economic policy challenges for Ethiopia during the current transitional period and beyond.

II. REVIEW OF SELECTED LITERATURE

Ethiopia and most nations of Sub-Saharan Africa have been experiencing a decline in per capita income and food production, which has led to rising poverty and food insecurity over the last three decades. The incidence of poverty for Africa which was about 47 percent in 1985 was the highest in the developing regions of the world. Although the incidence of poverty is expected to decline to 43 percent in the year 2000, the number of people below the poverty line is expected to increase from 180 million to 265 million over this period. On the other hand South Asia, which had a higher poverty incidence than Africa a decade ago, is expected to cut the incidence of poverty by about half, and reduce the number of people below the poverty line by about 100 million in the year 2000. (World Development Report, 1990).

The shift in world poverty from growing Asia to stagnating or declining economies of Africa during the 1980's is an indication that economic growth based on agriculture reduces the incidence of poverty and food insecurity (World Bank,

1990). Specifically, Africa is loosing the poverty battle relative to Asia due to the fact that Africa has been experiencing a negative economic growth during the 1980's. Real GDP per capita in Africa has been declining at a rate of 2.2 percent compared to that of Asia's, which has been rising by about 5.5 percent on the average. Also, Sub-Saharan Africa's population driven growth in food demand which averaged slightly over 3 percent relative to food production increase of only 2 percent per annum, resulted in a decrease per capita food production and consumption during the 1980s (Teklu, 1995).

Recent empirical evidence suggests that the reduction of poverty and food insecurity has been achieved by pursuing a dual strategy of: first, promoting the productive use of unskilled labour primarily located in rural/agricultural sector and upgrading the quality of that labour through investments on health, education, nutrition, and mobility; and second, providing basic social services in the areas of primary education, health, nutrition and family planning along with targeted transfers to the poorest and most food-insecure groups (Teklu, 1995).

The economic decline and the associated rise in poverty and food insecurity in Africa is primarily a problem of policy failure. A combination of misguided domestic agricultural policies, including the global macro-economic environment of the 1980s characterized by falling terms of trade and debt crisis, have led to the declining economies and rising food insecurity and poverty. There is a crucial need for African States to adopt agricultural policies along democratic and decentralized market framework in order to promote rural and agrarian based private economic enterprises. Such a strategy will empower the majority of the agrarian based population and enable African economies to have a chance of participating in the emerging international economic order of the post cold war era. Valuable lessons can be drawn from Botswana, a Southern African nation that has been successful in achieving economic growth, challenging poverty and food insecurity on democratic and market driven strategy of economic development.

Although Ethiopia has a long experience in agricultural research and technology generation, the country's misguided agricultural policy of the past has prevented the technology from reaching the majority of the farmers. A recent study by Mekuria (1995) evaluated the profitability of new technology, based on a survey data of 426 farm households from five major wheat growing districts in the Arsi region draws some policy implications and challenges for the future. These include: (1) maintaining favourable commodity price and input subsidy policy to farmers, since the study finds farmers use sub-optimal level of inputs due to lack of credit and high input prices relative grain prices, in spite of being aware of the available improved inputs, (2) developing technologies tailored to

resource poor farmers and to those operating under different farming systems and resource constraints, (3) promoting a comprehensive agricultural research and technology policy consistent with sectoral and macro-economic policies to achieve economic development, (4) focusing on high potential areas and priority crops in order to accelerate technology development and transfer, (5) developing small scale irrigation and accelerating research on drought resistant crop varieties, and (6) strengthening extension services that link researchers and farmers in order to facilitate rapid technology development, adoption and transfer. Further research that leads to an in depth understanding of the effects of technology on household welfare and nutrition similar to a recent synthesis of evidence by Teklu(1995)is also needed.

Marketing and trade is another area where Ethiopia's policy of agrarian socialism adversely retarded agricultural development by preventing free movement of commodities and providing disincentives to agricultural production. A recent paper by Alemayehu Lirenso (1995) focuses on the effects of change in agricultural marketing policy from extreme regulation to deregulation. By examining the Agricultural Marketing Corporation (AMC), which was involved in grain marketing since 1976, he found out that deregulation of grain markets in March 1990 had resulted in a decline of the state purchasing network and reduction of the AMC's share in grain marketing, resulting in a 20 percent under-utilization of marketing resources such as storage, trucks, and manpower. The AMC's withdrawal from low potential areas as a response to competitive pressure following grain trade liberalization left these regions unserved. Lawrence (1995) also observes that while the private sector traders are able to respond to food shortages quickly, they do not have the capacity to manage and move grain in a food crisis situation such as the 1984/85 famine. The implication of his paper in this regard calls for the selective participation of the government in grain marketing for the purpose of maintaining food security and for reaching remote areas until the private sector is fully developed.

The role of rural credit institutions in agricultural development have been neglected and misunderstood by policy makers. A recent study by Amde et al (1995) presents some evidence about the determinants of rural credit market participation by analyzing the demand for credit based on survey data from 350 households in rural Botswana and 650 households in rural Ethiopia. Their paper examines the main features of rural credit markets including some demographic characteristics of borrowers, and the relationship between credit market participation and labour intensive employment programs in the two areas. The authors find that about half of the households participate in rural credit markets and the majority of the borrowers use informal markets (84 percent in Ethiopia

and 95 percent in the Botswana case). The results of this study also show that credit market participation is related to household seniority and gender as well as participation in the labour intensive employment programs such as cash-for-work and food-for-work.

The land question constitutes perhaps the most important policy failure in Ethiopian agriculture. There is a general scarcity of empirical works on land reform and land policy, especially during the post-1975 period. Recent studies by Rahmato (1994), Aredo and Regassa (1994), and Woube and Sjoberg (1995) will be referred to in this paper. The study by Woube and Sjoberg deals with the problem of land fragmentation in post-1975 Ethiopia. The authors point out that the radical land reform adopted in Ethiopia following the 1974 revolution which nationalized land, did not solve one of the major problems of the pre-reform period, namely land fragmentation. Their paper discusses the magnitude and the reasons for land fragmentation, pointing out that the land nationalization of 1975 may have been instrumental in preserving and extending the sub-division of peasant land holdings into increasing number of small uneconomic holdings. Based on a survey of 400 households from two areas of Ethiopia (Dejen and Wolmera in Gojjam and Shoa Regions respectively), the authors find a combination of factors that have contributed to land fragmentation and the associated environmental degradation. They further note that in spite of the multiple causes, the post land reform institution of undefined land rights takes center stage in inhibiting land tenure security and thereby posing a serious structural constraint and challenge on the long term agricultural development and poverty alleviation in Ethiopia.

Aredo and Regassa (1994) correctly contend that "the land question ....has so far received little attention from economists". Their paper reviews the various economic concepts and dimension of land tenure and policy to instigate further research on the subject. They point out that during the post-1975 period, the Derg used land reform primarily to fulfill its political goal-the control of the rural population. The authors find some evidence of tenure insecurity in land use based on village surveys.

The potential for generating rural employment by designing targeted labour intensive public works projects to combat rural poverty and food insecurity has not been fully exploited. A recent paper by Teklu and Asefa (1995) deals with the question of whether the rural poor and food-insecure can be targeted through labour intensive public works (LIPW). This study, which is based on a survey data from the villages of Botswana and Kenya, presents some evidence on whether labour intensive road projects have reached the poor by providing short term

employment. The authors aim is to provide some evidence on whether labour intensive employment is targeted to the poor, and whether demographic and other indicators of poverty can be identified and related to (1) the decision of households to participate in LIPW schemes such as road works, (2) the extent of participation and gender differentiation among participating households, and (3) whether participation has any impact on food access of poor households.

The results of this study show that road works are quite effective in reaching the poor both in Kenya and Botswana. The authors find that in the Botswana case, poor households tend to be young, female headed, large households with low adult household labour ratio, and with low asset endowment such as livestock. They also find that those with access to transfer income such as remittances and gifts, those with higher level of schooling, and those residing in higher wage and employment tend not to participate. But, those from low infrastructure villages tend to allocate more time to project work. The Kenyan sample also confirms that the working poor are households that are young, landless, with large dependency ratio, casual wage workers, and those chronically food-insecure. The profile of individuals from randomly surveyed villages in road schemes for Kenya summarized in this paper tells some interesting stories which confirm the findings that participants in road projects are young married families with school age children, and single parent and female household heads with school age children and/or older parents.

III. SOME ISSUES AND IMPLICATIONS FOR FURTHER RESEARCH

Although the selected studies reviewed are not intended to be exhaustive in addressing the crucial dimensions of the agricultural development, rural poverty and food insecurity, they have addressed some of the most critical aspects of the problem. What then are some of the policy implications that can be drawn from some of these studies? What are some of the unanswered policy research questions that follow from these studies?

In his essay, "Ending African Hunger", Carl Eicher (1988) outlined six challenges for researchers, policy makers, and politicians in Africa. These are: (1)the challenge of learning why the first generation of African political leaders, policy makers and their foreign advisors undervalued agriculture and food production, (2) the challenge of slowing population growth, (3) the human capital challenge, (4) the challenge of foousing on the prime movers of agricultural

development, and (5) the challenge of reducing poverty and increasing food access, and (6) the challenge of reordering foreign aid priorities. The papers reviewed have addressed these challenges to various degree.

The challenge of learning from policy experiences and mistakes of African states is a crucial one. To meet this challenge not only should Ethiopia and other African states reverse economic policies that seriously undervalued agriculture and food production, but they should also avoid the concentration of both political and economic powers in the hands of the state. Instead, they should encourage and support the free participation of farmers and merchants in economic activities. African states should divert from production and marketing activities of agricultural and food commodities and play complementary or supporting role in the areas of agricultural research, technology development and transfer, human capital development, and investment on physical infrastructure to improve the extremely poor road systems. States have no business running hotels or selling wheat, where the private sector has a comparative advantage. But, they have a legitimate and a necessary role in areas such as providing public goods, maintaining an enabling stable institutional and legal environment for economic development to occur based on the private sector and markets.

The challenge of focusing on prime movers of agricultural development is also crucial in achieving food security. These prime movers include: new technology development produced by agricultural investment, institutional building and improvement such as rural/agricultural credit, agricultural marketing, agricultural research and extension, and favourable economic policy environment. A key prime mover is human capital and managerial skill development that involves investment in agricultural education, research, training, job experience and mobility.

3.1 Land Reform and Land Policy

The issue of land reform and policy is a crucial aspect of sustainable agricultural development and food security in Ethiopia. Here, the central problem is that of undefined and/or insecure land rights, and its adverse impact on agricultural production and environment during the post-1975 period.

The appropriate form of land reform and land policy is crucial for future agricultural development and poverty alleviation. The continuation of the control of farm land by the state during the post-Derg period is likely to undermine agricultural development and environmental sustainability in the future. The fear

of large scale land sales is the main political argument made to justify the retention of state control and ownership of farm land, even though there is no empirical evidence to support the linkage of large scale land sales to individual tenure (Rahmato, 1994). Furthermore, there was no consultation with peasants at the local level and/or studies conducted as the basis for ownership of land by the state. The available evidence suggests that "peasants have a dynamic view of land tenure: They believe land must move to where it is employed most productively" (Rahmato,1994:272). Even if large scale land sales that may lead to peasant eviction were to arise under individual tenure, there are many effective legal means of addressing the problem. For instance, the United States whose rapid economic development was historically fuelled by a highly productive agricultural sector under the "family farm" system, legally protected individual land holders by requiring owner operators to live on the land that they cultivate. Thus, the question of "land to the tiller", which was the major call of student rebels that led to the fall of the Haile Selassie regime is still an unfinished business in Ethiopia twenty years after the land reform of 1975.

Ethiopia's historical experience and experimentation with the 17 years of command socialist economy and the recent comparative experiences of former Soviet state show that state control and ownership of land is likely to perpetuate economic stagnation and poverty. Almost all historical and comparative evidences on land policy suggest that agricultural development is unlikely to occur when land is owned and controlled by the state. The case of China may be cited as an exception. But, here we must remember that China undertook a major agrarian reform in the early 1980's, after about two decades of experimentation with collective agriculture. The reform involved the replacement of collectives by individual farms and the control of land by farmers through a lease system of about 15 years (longer for tree crops). But, the limited empirical evidence available on the impact of Chinese land lease system shows that it has not solved the land tenure security problem, and that farmers are not confident to make any long term investment on land, putting its long term sustainability into question (Feder, et al., 1992).

Thus, the continuation of the monopoly of land lord status of the government may be a major structural impediment to sustainable development and poverty alleviation in Ethiopia. Such a land policy is likely to fail in addressing the central problem of what Desalegn Rahmato (1994) has stated as "restoring peasant confidence and promoting tenure security ... in light of 15 years of peasant de-stabilization and damaging state intervention in the rural economy"

Currently, the TGE has adopted Structural Adjustment Programs (SAP) that include: currency devaluation, removal of controlled prices and liberalization, elimination of subsidies and export taxes, and privatization of state enterprises.It has also adopted an Agricultural Development Led Industrialization (ALDI) based on exports.This strategy focuses on the small holder agriculture combined with industrialization that utilizes domestic raw materials. (TGE/MOA, 1995).

Such a strategy and the associated policy instruments adopted, if successfully implemented, are generally in the right direction. But, although the present agricultural and economic policy environment has improved, in terms of liberalization or deregulation of agricultural marketing and trade, and other macro economic reforms such as currency devaluation required by SAP, the rigid retention of "state ownership of land is likely to recreate conditions that made state intervention and management by fiat, land eviction, and rural corruption possible as in the period of the military rule" (TGE/MOA, 1995). Therefore, it is unlikely that these economic liberalization programs will result in reducing poverty and food insecurity when major structural impediments such as land reform remain intact. The point here is that future land policy should be flexible and pragmatic, and should reflect the bottom-up local experiences of farmers and herders. Land policy should move away from ideologically driven and top-down rigid approach of the past two decades under the Derg.

Thus, the major policy research questions and issues include whether state control and monopoly ownership of land is compatible with sustainable agricultural development given Ethiopia's own historical experience and comparative experiences from former command economies? What are the alternative land tenure options conducive to move agriculture and the economy forward? What lessons can be learned both from the pre and post 1975 land reform experiences with land policy? What are the long term effects of the current structural adjustment policies on poverty and food security in an environment where structural rigidities such as state monopoly of land remain? What are the options for reaching the poor and hungry households through labour intensive public works programs such as cash-for-work and food-for-work? How can these programs be linked to long term development?

3.2 Some Challenges for Ethiopia for the 21st Century

Ethiopia is one of Africa's largest nations with over 50 million people, of which about 45 million are rural based. It comprises about 10 percent of the population in Sub-Saharan Africa. In 1974, the military regime took what was

then a poor, but a dynamic and promising economy and made it even poorer, leading it to civil war, famine, and political oppression (USAID-Ethiopia, 1993). Today, Ethiopia with per capita income of $120 is one of the four poorest nations in the World (World Development Report, 1993). Poverty and food insecurity are daily experiences of most Ethiopians. During the 1980's per capita food production fell by over 2 percent per year. Even after the record harvest of 7.3 million Mt in 1990, the country faced a shortage of 985,000MT. By 1992, the food deficit rose to 1.03 million tons, resulting in an average domestic calorie availability of 1500 to 1600 calories against the recommended daily requirement of 2300 calories by World Health Organization (world development report, 1992).

This paper has briefly reviewed some of the critical constraints on agricultural and food production, including land tenure insecurity and degradation, role of improved technology and inputs, rural credit, agricultural marketing and trade, institutional and policy environment. However, Ethiopia also faces other serious challenges not dealt in this paper in areas such as rebuilding its educational and health systems, and in democratizing its political system through a participatory and peaceful political dialogue. It shares some of these challenges with other nations of Sub-Saharan Africa. During the current transitional period and beyond, the country faces the following major policy challenges.

(a) The Human Capital and Capacity Challenge:

Successful transition to a modern market economy requires experienced and trained administrators, managers, technicians, and policy makers who have knowledge of how markets work and are capable of implementing market reforms. In this respect, it is crucial to develop and strengthen educational and training institutions at all levels. The focus on vocational and technical training is essential to meet the demand for skilled manpower. The development of human capital is a long term process.

Moreover, Ethiopia is one of the few African States with a significant amount of human capital abroad in the form of large number of educated people who reside abroad, and who can provide valuable contribution to the country's development under an enabling economic policy environment.

(b) The Legal and Institutional Challenge:

There is a critical need to rebuild and strengthen the legal and institutional framework destroyed during the 17 years of the Derg rule by adopting clearly defined property rights. Legality here means a mutually consistent set of

laws and the stability and the reliability in enforcing these laws. The legal system is likely to fail if the people, including the business community and entrepreneurs who can create wealth, believe the government will change laws any time. The legal system should be independent of politics, otherwise there will be reliance on bribery and corruption in economic transactions. Of course, even the best laws on paper are meaningless without an independent judicial system to apply laws fairly, and the free press to expose abuse and corruption. In the area of agriculture, it is critical to develop and strengthen the institutions of agricultural research, credit, technology adoption, and extension services.

(c) The Challenge of Implementing Economic Reform and Designing Effective Social Safety Net Programs:

Ethiopia is currently considered among those nations who are strong economic reformers in Africa by the Structural Adjustment Program (SAP) standards of the World Bank and the International Monetary Fund. Structural adjustment involves economic reforms designed to strengthen the role of private markets and improve government efficiency. It involves price deregulation which in the short run results in high food prices that will adversely affect the poor, especially the urban poor. Groups such as the unemployed, children, and dislocated groups are also hit hard. Even though the focus of this paper is on rural poverty, urban poverty and food insecurity is currently extremely serious. For instance, Addis Ababa streets are full of homeless destitutes, de-mobilized ex-soldiers, beggars, and prostitutes, most of them teenagers. Thus, it is necessary to design safety net programs for these poorest groups in the form of targeted labour intensive programs such as cash-for-work and food-for-work. These projects can be effective in targeting the poorest and most food-insecure groups (Teklu & Asefa, 1995). They also have the potential to rebuild badly needed physical infrastructure such as the currently damaged rural and urban road systems (Teklu & Asefa,1995). The transition from war to peace also means that significant resources are needed to demobilize and re-integrate ex-soldiers to productive civilian life.

Although economic and political reforms along democratic lines are both desirable and complementary in the long run, their appropriate sequencing is crucial in the short run. Economic reform toward the free market is a necessary (but not a sufficient) condition for political democracy, i.e. economic reforms should precede political reforms, since the latter is an evolutionary process that takes time, and that few nations have been successful in managing both economic and political reforms simultaneously. Thus, agrarian based economic development should take a priority. It should not wait until a satisfactory political framework

former Soviet Union shows, to try to achieve both political and economic reform simultaneously may lead to chaos and disintegration (Overholt, 1993).

(d) The challenge of Learning from the Past and Reversing Past Economic Policy Mistakes:

The final challenge is that of drawing appropriate lessons from its own recent economic history, and reversing past economic policy mistakes in order to design policies based on freely expressed needs of local communities. In other words, policies that affect the livelihood of the population must be formulated in a democratic and participatory manner. Such policies must not be imposed from the top down. Specifically, the country currently faces the critical challenge of adopting a flexible, pragmatic, and constructive land and regionalization policy. The consequences of rigidly adopting a land policy that has failed during the Derg era and in other countries will lead to the continuation of the cycle of poverty and famine.

IV. CONCLUDING NOTE

The lesson that emerges from this paper is that the value of learning from historical and comparative experiences of farmers, traders, and herders in their struggle to break out of poverty and hunger (including learning from mistakes and successes of policy makers) is crucial in designing effective policies that meet the challenge of poverty and food insecurity. This notion was also aptly expressed by Nobel Laureate agricultural economist T.W. Schultz(1980) when he wrote, "understanding the experiences of poor people over the ages can contribute much to understanding the problems and possibilities of low-income countries today. That kind of understanding is far more important than the most detailed and exact knowledge about the surface of the earth, or of ecology,or tomorrow's technology." (Journal of Political Economy, 88,4, p.641).

The following policy recommendations emerge from the discussion of this paper:

1. The continued implementation of economic deregulation and market oriented macro-economic policy reforms.
2. An aggressive promotion of the ALDI strategy by means of appropriate policy instruments to that end.
3. Investment on employment programs and projects in agriculture, infrastructure development such as road building, and resource improvement.
4. The opening up of the economy to foreign investment and the adoption of economic incentives to attract foreign capital.
5. Investment on human capital development in the form of strengthening educational and training institutions at all levels.
6. Direct intervention in promoting health and nutrition services to the poorest groups.

Finally, after a lost generation of the last two decades under the Derg, Ethiopia now faces its last chance to break out of the cycle of poverty and food insecurity. Not to take up this opportunity and responsibility learning from past policy mistakes by its current and future policy makers is likely to result in a zero-sum outcome for everyone involved. Whether appropriate lessons have been learned from past policy experiences and from the local objective conditions of the millions of farmers, herders, and merchants, in order to combat rural poverty and food insecurity during the rest of the 1990s and beyond remains to be seen.

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FARMING SYSTEMS AND HOUSEHOLD FOOD SECURITY STRATEGIES IN THE FACE OF PRODUCTION CONSTRAINTS: A CASE STUDY IN NORTH OMO REGION

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I. INTRODUCTION

The vagaries of climatic conditions coupled with exploitative farming intensity due to population pressure have resulted in declining soil fertility and food shortages in North Omo zone. This condition triggered development agencies working in the areas to look into various schemes to understand the situation. Thus, the study on "Promoting sustainable farming systems in North Omo" (Solomon, 1994) was carried out between July and December 1993 by FFHC/FAO project in selected *Woredas* of North Omo. This study has the following objectives:

a. to analyze the present stage of farming system with respect to resource availability and utilization, household food and income situation,

b. to identify potential production possibilities for improvement and

c. to propose areas of adjustment to farming systems that contribute to household food security.

Primary data were collected from the selected four *Woredas* involving a total of 36 participating farm households on case study basis for a period of six months. The *Woredas* selected for the study were Gofa, Ufa, Bolosso and Boreda. The areas were classified into three regions and each region was further subdivided into farm classes. Thus, region A consisted of selected farm households in Gofa *Woreda*, representing the mid-*Woina Dega* (1350-1700 masl); region B consisted of selected farm households in Ufa and Bolosso *Woredas*, representing the upper *Woina Dega* (elevation 1600-1800 masl) and region C, selected farm households in Boreda woreda, representing dry lower *Woina Dega* (1350-1600 masl).

Pre-coded questionnaires were applied for primary data collection of household resource inventory and the input/output flow data on multiple visit

basis. DBase IV programme was utilized for data compilation and tabulations. Linear programming exercises were carried out using LP88 software.

The methodology of the study focuses on the description of the farming systems prevailing in North Omo region with particular reference to the homestead farming and field crops sub-system, in order to define the production parameters that becomes the basis for analyzing the food security strategies. The production and consumption strategies are analyzed using a set of LP solutions which identify the optimal possibilities under various constrained alternatives. Thus, attempts are made to identify production strategies and improvements to meet the consumption needs of the household and narrow the food deficit gap.

II. FOOD PRODUCTION SYSTEMS IN NORTH OMO REGION

2.1 General Description of The Study Areas

Gofa *Woreda*, has steep slopes of hills and valleys broken up by streams. The southwestern part is mostly highland (*Dega*) with elevation ranging between 2300 m and 3000 masl and it consists of 10 percent of the *Woreda*. The central part is mostly mid-elevation (*Woina Dega*) with elevation ranging between 1500 and 2300 masl and comprises about 60 percent of the *Woreda*. The lowland (*Kola*) area below 1500 masl, located in the central and the north western border, comprises about 30 percent of the *Woreda*. The highlands and the mid-elevation (*Woina Dega*) hill sides have been denuded of tree cover although there are few scattered and disturbed high forests spotted in pockets of inaccessible areas. The orphic andosols is the most dominant soil type. The steeper slopes and plateau in mid-elevation (*Woina Dega*) zone consist of eroded rocky soils and reddish sandy on the farm lands. (See Relief Map of selected *Woredas* in North Omo).

Ufa and Bolosso *Woredas*, consist of more gentle slopes and undulating hills. The mid-elevation (*Woina Dega*), 1500 to 2300 masl is the most dominant agro-climatic zone comprising about 70 percent of the *Woreda* in the northern part of Ufa and the eastern part of Bolosso *Woredas*. The southern part of Ufa and the western part of Bolosso *Woredas* bordering the Omo river are mostly low lands (Kola) with altitude ranging between 1000 and 1500 masl.

In Ufa and Bolosso, the natural vegetative cover has given way to settlement in most parts of the *Woreda*, with perennial crops and eucalyptus trees

planted around the homesteads. Farmers maintain few old trees (podocarpus, junipers) in front of the homesteads as shade and relaxation spots. The soil types in this region consist of red sandy nitosols and andosols on the gentle slopes and plateau while the dark clay type dominate the lower valley bottom areas.

Boreda *Woreda* consists of low land (*kola*) zone on the Eastern part bordering lake Abaya and on the Western part bordering Maze river which covers about 50 percent of the *Woreda*. The central part of the *Woreda* stretching from North to South, comprises the mid-elevation (*Woina Dega*) and covers the remaining 50 percent. The lowland areas are covered with savanna type grasses and acacia shrubs while the *woina dega* parts consist of few remaining woira and fig trees. Charcoal making is widely practiced in the lower elevation areas contributing to the denudation of the area. The dominant soil types in Boreda *Woreda* consist of red sandy andosols in the *woina dega* area and black clay type in the lowland (*kola*) areas. This region is drier compared to Gofa, Ufa and Bolosso *woredas*, although the bi-modality of the rainfall pattern prevails.

All the classified regions experience a bi-modal type of rainfall, with the *belg* rainy season extending from March to May and the *meher* rainy season, from June to September. The *belg* rainy season is found to be more important with significantly higher rainfall in this period as compared to the *meher* rainy season unlike the situation in other parts of the country.

Among the 3 classified regions in the study area, the highest population density is in Ufa and Bolosso *Woredas* with 467 persons per sq km or about 14 persons per cultivated hectare while the population densities of Gofa and Boreda *Woredas* are found to be 135 and 138 persons per sq km respectively. Significant variations are found in population size and densities between areas and mid-elevation *woina dega* areas.

2.2. The Farming Systems In The Study Areas

At the onset, it is important to clearly state what is meant by 'farming system' in the context of small-holder agriculture. Farming system (FS) is usually presented as 'the overall activities of the farm household to attain the family needs subject to resource and environmental constraints'. A clearer statement in the context of applied Farming System Research (FSR) is given by Norman and Baker (1986).

A farming system adapted by a given farming household results from allocation by its members with their managerial know how of the three factors of production to which they have access (land, labour, capital) to four processes (crop, livestock, off-farm enterprises and household maintenance activities) in a manner which, within the knowledge they possess, will maximize the attainment of their goals. The farming system itself is recognized as being determined by the environment in which the family operates. The 'total' environment in which the family operates include technical and human elements. Technical elements determine what the potential farming system can be. The human element determines what the actual farming system, a subset of the potential defined by the technical element, will be.

The farming systems prevailing in the study areas as determined by the 'environment' are briefly presented below.

In accordance with the classification adapted by Westphal (1975), the farming system in the study areas could be classified as '*enset* as co-staple, with cereals and tuber crops'. The distinguishing characteristics of the farming systems in the areas is the significance of the homestead (or home garden) plots with inter cropping of *enset* and other tubers and root crops as major source of food supply for the household particularly in the highland and mid-elevation (*woina dega*) areas. The homestead plot or household garden has been as old as human civilization and plant domestication itself (Nunez 1985) and it is considered as a subsystem within a larger food acquisition system which aims at production of household consumption items. However, its significance in food security at the household level has not gained its due attention by investigators and policy makers.

Region A (Gofa *woreda*) is inhabited by the Gofa ethnic group. The homestead plot or home garden with the household resident located at the frontage, has an average size of 0.33 ha per family and it is permanently under the production of tubers, pulses, vegetables, fruits and other crops. The fertility of the plots is continuously maintained by incorporating manure and other organic materials by hand cultivation of the soil to control weed infestation. Inter cropping of tree crops, tubers and pulses is commonly practiced on the homestead plots. Field plots are utilized usually for producing cereals as single crops. Inter planted maize/sorghum, maize/haricot beans, or sorghum/haricot beans are found under field plots. The average size of net cropped area for all class of farms in the

region for the selected households is found to be 2.76 ha per family which accounts for 88 percent of the total land holding.

Cattle is the only important livestock in the farming system both for draft and milk production purposes. The majority of the farm families in the region own a pair of oxen for ploughing the land and one cow for milking. Extensive trading and participation in the local primary markets are carried out especially by female members of the household as off-farm occupation to supplement farm income.

Region B (Ufa and Bolosso *Woredas*) is inhabited by Wolaiyta speaking ethnic group. Being predominantly in the 'woina dega' agro-climatic zone, settlement in the region is much older and farm sizes much smaller than in other regions. The homestead plot or household garden, an important component (sub-system) of the farming system, comprise the hut, a small area of open frontage with one or two large trees for shade, and behind the hut the area is used for production of inter planted tubers, pulses, vegetables and other perennial crops. The homestead plots are well manured and maintained. Next to the homestead plots, inter planted maize, sorghum, beans, cabbage plots are cultivated for early and green harvest. Further away from the homestead, pure stand of cereals, particularly teff and maize and sometimes wheat and barely and various tuber crops are grown as field crops. The average size of net cropped area for all class of farms in the region for the selected households is found to be 1.73 ha per family which accounts for 84 percent of the total land holding of the household.

Cattle is the most important type of livestock in region B although few sheep and poultry are kept by a limited number of farm households. On the average each household owns one ox and one cow for draft and milk production purposes.

The existence of large trading centres in the region created conditions for participation by members of farm families in primary and secondary markets. Thus trading and sale of handicrafts are extensively carried out as off-farm occupation to supplement household income.

Region C (Boreda *Woreda*) is mostly inhabited by Gamu ethnic groups. As described above, the homestead plots surrounding the farm building are used permanently for the production of inter planted tubers including *enset*, vegetables, roots and permanent cash crops. Inter planted field plots followed by pure stand of cereals, mainly sorghum, maize, teff, are cultivated further away from the homesteads.

Settlement of the Amhara ethnic group has taken place in the *Woreda* during the 1972/73 and 1984 drought periods and at present the predominantly cereal based farming system of the Central Highlands is introduced to the area though they hardly grow food products such as *enset* or other root crops.

Since the area has a dry *woina dega* climate, it is relatively less densely populated as compared to the other region, the average land holding is larger, with an average size of net cropped area for all class of farm household being 2.76 ha per family which is 82 percent of the total land holding of a household. Moreover, livestock in the region comprise only cattle with an average ownership of a pair of oxen for draft and one cow for milk per household.

Primary and secondary markets exist in the region although they are fewer in number and located further apart relative to the other regions. Thus off-farm trading activities is limited to harvest season and a few female household members are involved in selling spined cotton from own production or purchased lint.

III. FOOD PRODUCTION ACTIVITIES IN THE STUDY AREA

The acquisition of homestead plots was reported to be through inheritance or allocation of land by the Peasant Associations (PAs) for nearly all sample farmers. The sizes of the homesteads vary between 0.10 ha (in government sponsored villages) and nearly 1.0 ha, the average size being 0.35 ha. Many farmers in the study areas were moving back to their original villages since the newly established villages were too crowded and the size too small for homestead plots (*Guaro*).

The average land allocation in the three regions by farm class is presented in Table 1. The average farm size for each farm class differ in each of the regions. Thus, the total net area (cropped) for 'small' class in region A is about twice the size of the cropland in region B. The total net cropped area for 'small' class of farms in region C is much larger as compared to the size of cropped land for the same class in regions A and B. As shown in the table, the same is true for 'medium' and 'large' class of farms. The delimitation among the class of farms for each of the regions is calculated on the basis of the frequency distribution of the area of holdings. No fallow land is reported under 'small' and 'medium' class

of farms and grazing land is communally utilized. Thus, the total net cropped areas reported exclude fallow and grazing land.

Table 1 Land Allocation to Field and Homestead Plots for an Average Household in the Sample, 1993

Reg.	Farm class	No.of obser.	Field cropped area (ha)	Crops %	Home stead area (ha)	plots %	Total Net area (ha)	Cropped %
A	Small	8	1.56	82	0.34	18	1.90	100
	Medium	2	3.17	82	0.69	18	3.86	100
	Large	1	6.52	91	0.68	9	7.20	100
B	Small	2	0.70	74	0.15	26	0.95	100
	Medium	7	1.25	76	0.39	24	1.64	100
	Large	3	1.82	72	0.72	28	2.54	100
C	Small	8	2.08	83	0.42	17	2.50	100
	Medium	1	3.52	98	0.08	02	3.60	100
	Large	1	7.00	98	0.10	2	7.10	100

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

In region A about 73 percent of the farms are classified as 'small', while about 18 percent and 9 percent are classified as 'medium' and 'large' respectively. In region B, about 58 percent of the farms are classified as 'medium' while 17 percent and 25 percent fall under 'small' and 'large' classes respectively. In region C about 82, 9 and 9 percent of the farms fall under 'small', 'medium', and 'large' classes respectively.

Thus, out of the total number of farm households selected for the study, regions A and C show similarity in the frequency distribution but both regions show significant dissimilarity with that of region B where the frequency distributions are reversed for 'small' and 'medium' class of farms. The discussions in this paper will concentrate on the 'small' class of farms for regions A and C and on the 'medium' class for region B.

Based on the magnitude of land allotment and frequency of occurrence, a typical case is derived to reflect the most likely enterprise combinations in the existing farm plans. Table 2 shows the land allocation for typical crop enterprise combinations for both Field plots - cereals and pulses and Homestead plots- *enset* and other tubers and tree crops. Indeed, the farming systems in all the study areas reflect the agricultural system classification of "Cereals with *Enset* and other Root Crops as Co-staples".

3.1 Major Production Activities On Homestead Plots

The homestead plots as major supplements to the food supply concentrate on inter cropped tubers and tree crops as indicated in Table 2. The average sizes of the homestead plots for regions A, B, and C are reported to be 0.35 ha, 0.40 ha and 0.15 ha respectively, their size increasing with altitude and better rainfall conditions.

Sweet potato:- is grown by nearly all farmers in all the three regions. The dominant planting season for sweet potato in region A is June/July although October is also important for planting sweet potato. Planting of the cuttings is done on group labour exchange basis or through a sort of crop sharing arrangements. The harvest of sweet potato in region A starts in mid-November by digging out enough quantities of tubers for household consumption sufficient for a day, or for one week. An average of 5 kg to 8 kg of sweet potato is dug out for consumption daily until the plot is exhausted.

In region B:- where homestead production of sweet potato is pronounced, planting and subsequent harvesting are carried out twice a year on the average farm. The sweet potato planted in October is called the 'Kiremt' main rainy season crop because it is harvested and consumed on daily basis during the months of June to September; and the sweet potato planted in May and June is known as 'belg' crop because it becomes ready for harvest and consumption from January to May depending on the availability of other cereals and tubers for home consumption. Sweet potato planting is frequently done either with the use of community labour or under share crop arrangement of 50:50 in exchange for labour input at planting and for hoeing and cultivating until harvest period. Harvesting of sweet potato is carried out on daily or weekly basis, as deemed sufficient for household consumption, by female members of the household.

Table 2 **Typical Crop Enterprise Combinations for 'small' class of Farms in Region A and C and 'medium' Class of Farms in Region B**

Region A		Region B		Region C	
Enterprise	Ave Alloc of land (ha)	Enterprise	Ave Alloc. of land (ha)	Enterprise	Ave Alloc. of land (ha)
Homestead plots	0.35	Homestead plots	0.40	Homestead plots	0.15
Tubers		Tubers		Tubers	
- Sweet potato	0.08	- Sweet potato	0.15	- Sweet potato	0.03
- Cassava	0.03	- Taro	0.12	- Enset	0.04
- Enset	0.10	- Potato	0.05		
		- Yam	0.03		
		- Enset	0.03		
Tree crops		Tree Crops		Tree Crops	
- Coffee	0.02	- Coffee	0.02	- Coffee	0.01
- Banana	0.02				
Intercropped	0.01			Intercropped	0.07
Field Crops	1.56	Field Crops	1.24	Field Crops	2.08
- Maize	0.71	Teff	0.58	- Maize	1.10
- Teff	0.64	Maize	0.52	- Teff	0.64
- Ha.beans	0.21	Haricot beans	0.14	- Sorghum	0.34
Total cropped area	1.90	Total Cropped area	1.64	Total Cropped area	2.23

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

In region C:- land preparation for sweet potato takes place in the dry months of May while planting operation is in June and July. Cultivation/weeding

of sweet potato plots is done in the months of August and September while harvesting starts in December for most of the farmers on daily basis for household consumption until it is exhausted.

Cassava:- The planting of cassava cuttings is carried out in mid-February by farmers in region A. Usually it is inter planted with other tuber crops serving as a hedge for the homestead plot. Harvesting usually starts after one year of planting in January or February by digging out the tubers for household consumption on daily or weekly basis which may last for 4 to 5 months depending on the size of family and the quantity available.

Taro/Yams:- These crops are grown more extensively in region B than in the other regions. Yam, which is the preferred tuber crop, is planted in rows mainly in November. Yam plot is cultivated two to three times before harvesting starts in July. Similar to the harvesting of sweet potato, yams are dug and collected daily, partly for home consumption and partly for sale. Taro tubers are planted in February and the crop is ready for harvest at the beginning of August. However, it is allowed to remain in the soil until November or later as required for consumption.

Enset:- as co-staple with cereals and other tubers, it is grown in all three identified regions by all classes of farmers. The crop is both a tuber and perennial taking between 4 and 6 years to reach full maturity. Different types of *enset* are recognized by farmers (at least 10 types) in each region, each type classified either as male or female. In all regions, seedling or suckers are raised from the corm at homestead plots which may take 6 to 12 months. The young suckers, known as '*Atta*' are planted in April in well prepared holes and are allowed to stay for one year. At this stage, cultivation and hoeing are carried out usually twice a month. In the second year, the suckers are transplanted to new sites within the homestead plot. The *enset* plant of 2 - 4 years are ready for consumption if they are female. These are popular among female members of the household because the edible part, i.e., the roots (corm) are ready for harvest in 2 years and are much easier to prepare. The male types are allowed to mature until flowering stage (6 years) and the preparation of '*kocho*' and '*Bula*' from mature plants is an arduous task and a heavy burden on women, although they are the preferred food items as compared to cooked corm. About 5 enset trees are cut for consumption per month for an average household.

3.2 Major Production Activities On Field Plots

Maize:- Maize is a major co-staple crop in all the regions and is grown by nearly all farmers as field crop. Land preparation using oxen plough starts in October. Depending on the onset of the 'belg' rains planting of maize takes place in February in region A, row planting with fertilizer application in February - March in region B and sowing in April in region C. Hand weeding, thinning and cultivation are carried out in the months of April to June in all the regions prior harvesting in July. In regions A and B, the harvesting of green maize at 'milking' stage for household consumption starts in June/ July by collecting 20 to 40 cobs per day depending on the family size. On the average, about 40 percent of the total production of maize is consumed at this stage. In both regions the remaining dry maize is normally harvested in September. Haricot beans inter planted in maize plot in July is harvested in green in November for household consumption. In region C, harvesting of dried maize grains is the normal practice and is carried out mainly in October. Due to unfavourable climatic condition in 1993, the reported yields of maize were very low, an average yield of 684 kg per ha for region A, 1304 kg per ha for region B and 701 kg per ha for region C. The yield of maize for region B is higher due to the practice or applying chemical fertilizers or manure on maize plots.

Teff:- the crop is grown by nearly all farms in the study area mainly as cash crop. In all the three regions teff is sown in the months of July and early August preceded by about three oxen ploughing in the months of April to June. In region B most of the teff plots are fertilized unlike the situation in the other regions where no fertilization or manure application are practiced. Crop protection is carried with 2 to 3 hand weeding in August and September in all the regions and few farmers applied herbicides in region C for control of weeds.

Harvesting of teff starts in October by cutting the stalk with sickle and heaping at nearby household residence which serves as storage of the crop in sheaves. In many instances threshing is done as the need arises for the sale of the crop. In the case farmers growing teff on share-crop rental basis (50 percent in region B) then threshing is done immediately after the cutting operation to be able to share the produce. As stated above, the unfavourable climatic condition in 1993 resulted in low yield of teff especially for region C. The average reported yields were 309 kg per ha for region A, 550 kg per ha for region B and 178 kg per ha for region C.

Haricot beans:- The crop is sown in May and also in July as inter crop on maize plots in regions A and B. Weeding is not practised for haricot beans

although hoeing is done in September to earth up the soil. Harvesting is done by pulling the 'green' plants by hand from the ground in July for early planted crop and in October for late planted crop and allowing it to dry in the sun. Consumption of the beans starts while in 'green' as 'Nifro' (cooked in mixture with wheat or maize). The average reported yield of haricot beans amounted to 133 kg per ha for region A and 260 kg per ha for region B for 1993.

Sorghum/Millet:- Drought resistance crops such as sorghum and millet are produced in dry '*woina dega*' of region C. Land preparation takes place in February and planting in April. The seeds are broadcasted and no fertilizer is applied. Hoeing and cultivation take place from May to July. Sorghum is harvested in December while millet is cut in October. The average yield for sorghum and millet for region C was reported to be 680 kg and 400 kg per ha respectively.

3.3 Livestock Production Activities

Livestock raising is considered as an important component of the farming system in the three regions of the study area. The primary purpose are reported to be for draft and milk production, for generating cash income in time of need, and for manure production. Cattle is the most dominant type of livestock raised in all regions, and the other types are found to be minor. The average number of livestock owned by selected farmers and the percentage of farmers owning in 'small' class for regions A and C and 'medium' class for region B are presented in Table 3.

The major activities in livestock production concentrate on cutting grass, herding, milking, cleaning the barn or shed and marketing of livestock products. These activities are carried out on regular basis with very little variations among seasons. The contribution of household members vary, however, as shown in Table 4 for 'small' class of farms in region A and C and 'medium' class of farms in region B. In region A, among 'small' class of farms cutting grass as supplemental feed to grazing is mostly performed by the farmers themselves. Herding is done by community labour on rotation basis. Most of the other activities such as milking, shed cleaning, marketing are done by the wife and adult females. Children are reported to contribute very little. In region B, for 'medium' class of farms, the contributions of children in the activities such as cutting of grass, herding and cleaning shed become significant, while adult males get involved marginally. Adult females concentrate on milking, cleaning shed and marketing. About 46 percent of the herding task is carried out by community

labour. In region C, the livestock activities among the 'small' class of farmers is quite similar to that of the farms in region A, except that farmers share more of the task of cutting grass and herding.

Table 3 **Average Livestock Owned and Percent of Household Owning by Types of Livestock for 'Small' Class of Farms in Region A and C and 'Medium' Class in Region B**

Livestock Type	'Small' Farms Reg. A		'Medium' Farms Reg. B		'Small' Farms Reg. C	
	Av.No.	% HH	Av.No.	% HH	Av.No.	% HH
Cattle						
male < 3yrs	1	50	1	57	-	-
draft oxen	2	100	1	86	2	78
female < 3yrs	1	63	1	42	-	-
.ws	1	63	2	100	1	78
Sheep & Goats	1	48	1	30	1	55
Horses & mules	-	-	-	-	-	
Donkeys	-	-	-	-	-	
Poultry	2	25	1	57	1	25

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

The cash inputs for livestock are limited to expenditure made for treatment of animals especially against trypanosomiasis. It is reported that 'small' class farmers in region A, B and C spent Birr 19, 25 and 23 per year for veterinary services respectively and very few farmers in region B also purchased hay for livestock during the months of December and January.

The output and sales of livestock products are also very low. Milk and butter are the major products sold in all the study areas. The average milk output for 'small' class farms in region A amounts to about 150 litres per year and for 'medium' class farms it amounts to about 300 litres per year per household. Milk is mostly consumed at the household while sales of butter among 'small' class

farms in region A and 'medium' class farms in region B amount to about Birr 100 and 150 per year respectively.

Table 4 **Percentage Distribution of Time Spent by Members of Households on Livestock Activities for 'Small' Class Farms in Region A and C and 'Medium' Class in Region B**

Region	Activities	Adult Male (%)	Adult Female (%)	Children (%)	Commun. Labour (%)
Reg A	Cut. grass	85	12	3	
	Herding	7	-	10	83
	Milking	-	100	-	-
	Clean shed	-	99	1	-
	Market	-	100	-	-
Reg B	Cut. grass	11	44	45	-
	Herding	-	-	54	46
	Milking	-	100	-	-
	Clean shed	-	59	41	-
	Market	-	100	-	-
Reg C	Cut grass	35	20	45	-
	Herding	29	-	46	25
	Milking	-	100	-	-
	Clean shed	-	52	48	-
	Market	-	100	-	-

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

IV. FOOD CONSUMPTION PATTERNS

4.1. Home Produced

The household food supply is mostly met by home produced crops on homestead and field plots. As mentioned above, the primary objective of the household is to meet its food requirements throughout the year with surplus, if possible, to meet additional expenditures. The problems associated with the availability of food from farm production to meet the nutritional requirements and the complexity of the decision process in the intra-household distribution pattern, have been documented in other studies (Webb, 1992; Gittinger 1987). The average food supply situation for 'small' class farms in region A and C and for 'medium' class farms in region B is presented in Table 5. The food supply in the aggregate ranges between an average of 1023.5 and 1712.7 calories per person per day for 'small' class farms in regions A and C respectively.

For region A, the major sources of food in terms of calorie intakes are maize, green and dry grain (46 percent), teff (29 percent) followed by enset (10 percent) and sweet potato (8 percent). Other food items include yam, haricot beans, and vegetables. For 'medium' class farms in region B, the sources of calorie intakes are similar to 'small' class farms in region A with maize (44 percent) and teff (25 percent) as major ones followed by sweet potato (8 percent) enset (7 percent) and cassava (5 percent). For 'small' class farms in region C, the composition of calorie supply differ from the above regions with the dominance of maize (56 percent) and sweet potato (25 percent) in the available food supply. Other food items include sorghum/millet (8 percent) and teff (5 percent).

Although difficult to quantify the seasonal food availability on weekly or monthly basis from the data collected, the variation in the seasonal food consumption patterns are significant. The critical food shortage periods are the months of March, April and May and also the month of September for the three regions in the study areas.

In region A, maize, the major food crop, starts to be harvested and consumed in green in the months of July and August. About 20 cobs (4 kgs) are gathered daily for household consumption as '*Nefro*'. Harvesting of dry maize grain starts in September and October and its consumption may last until March. At the same time, harvesting of haricot beans is done in August and October and a mixture of haricot beans and maize cooked as '*Nefro*' is consumed in the household until December. Teff is partly produced for home consumption

Table 5 **Average Food Supply From home Production and Availability per Person per Day for 'Small' Class Farms in Region A and C and 'Medium' Class Region B**

Crop Prod	'Small' Class Farm Reg.A			'Medium' Class Farm Reg. B			'Small' Class Farm Reg. C		
	Ave. H.H. prod kg per yr.	Kcal/ p/day	%	Ave. H.H. prod kg per yr.	Kcal/ p/day	%	Ave. H.H. prod kg per yr.	Kcal/ p/day	%
Field plots									
Maize-Green	100.0	121.8	12	245.7	340.3	23	135.6	187.8	11
Maize-dry	270.7	344.0	34	217.9	316.5	21	535.0	777.0	45
Sorghum	11.3	13.3	1	21.4	28.7	2	100.0	134.1	8
Teff	250.0	291.6	29	280.0	373.3	25	60.0	80.0	5
H. beans	7.0	8.4	1	16.3	22.4	2	-	-	-
Homestead pt									
Sweet pot.	184.3	80.6	8	247.9	124.0	8	855.0	427.5	25
Cassava	-	-	-	153.7	75.6	5	18.3	9.0	-
Yam	25.7	10.4	1	40.0	18.4	1	15.8	7.3	-
Enset	180.0	106.9	10	150.0	101.8	7	50.0	30.0	2
Potato	-	-	-	85.7	28.6	2	-	-	-
Veget.	12.0	1.5	-	12.0	1.5	-	-	-	-
Others	-	45.0	5	-	60.0	4	-	60.0	4
Total Kcal/ person/d.	-	**1024**	**100**	-	**1490**	**100**	-	**1713**	**100**

Note: The conversion of crop products into kcal/person/day is based on the work of Agren and Gibson (1968).

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

especially on holidays, and partly for sale. Its consumption starts in January and extends until mid-April.

Enset is consumed throughout the year prepared as 'Kocho' bread, 'Bula' or simply as cooked tuber. However, the dominant period of consumption is during the food shortage period of March, April and May.

Sweet potato is dug out for consumption starting in December and may last until the end of February which is followed by collecting cassava tubers inter planted with other crops.

In region B, with small land size, the yield of cereals produced on farms are higher due to application of fertilizers and manure on both field and homestead plots. Harvesting and consumption of maize starts in July with the collection of 'green' cobs until September and gathering of dry grain in October. Teff, a major cash crop, is harvested in November and its consumption may extend over a four-month period. *Enset* is consumed in the household mainly as cooked tuber during periods of food shortages, especially in the months of March, April and May.

Sweet potato, planted in October and February is ready for consumption starting in June. About 3 kg of sweet potato is dug daily for consumption while at the same time cuttings are planted in June/July for 'belg' crop consumption starting January to May. Other crops such as cassava, yam and potato are dug out for consumption in the months of February, June and July.

In region C, harvesting periods for cereals concentrate in the months of October, November and December. Maize as a major staple food crop (56 percent) is grown by nearly all farmers. Harvesting of dry grain is the normal practice although green harvest for household consumption is reported by some farmers. The dry grain harvesting for maize, teff and millet is done in October while sorghum is harvested in December. The consumption of these cereals may extend until May.

Harvesting of sweet potato starts in December on daily basis for household consumption until the plot is exhausted. Taro and yams get ready for harvest in July and August which are critical periods of food shortage.

4.2 Purchased Items

Farmers in all the study areas participate in primary as well as in secondary markets for purchase of essential goods and services by selling various household items. Since marketing activities are carried out by female members of the household, quantified items were hard to obtain in the study. From the data collected over a six-month period, the average annual consumption expenditure is calculated and the results are summarized in Table 6. The annual expenditures vary among the study sites with minor cash expenditure for the purchase of food items in region A.

Table 6 **Purchased Items and Amount of Average Expenditure per Household Among 'Small' Class Farm in Region A and C, and 'Medium' in Region B. (Birr)**

Purchased items	'Small' Class of Farms Reg. A	'Medium' Class of Farms Reg. B	'Small' Class of Farms Reg. C
Food items			
Cereals	-	43.22	-
Roots	-	30.48	-
Enset	-	-	-
Meat	-	33.6	-
Milk	6.2	-	39.12
Condiments	5.16	26.40	33.24
Non-food items			
Kerosine	24.00	30.6	32.40
Salt/Soap	29.50	20.40	30.24
Clothing & H.H goods	25.80	14.20	81.4
School exp.	14.50	43.90	-
Medical exp.	-	-	-
Edir/Ekub	100.00	100.00	-

source: FFHC/FAO promoting sustainable farming systems in North Omo, 1993

V. OPTIMAL PRODUCTION POSSIBILITIES TO MEET THE CONSUMPTION NEEDS OF THE HOUSEHOLD

The production and consumption aspects of the households presented in the sections above are summarized in Table 7 by presenting the estimated levels of farm income under the existing situation.

All enterprises are valued at the prevailing local market prices in 1993. Except for teff which is considered as cash crop in the study areas, nearly all the other crop and livestock products are consumed at the household level. Even under these conditions, the calorie intake (highly correlated with income) is far below the normal or the minimum Recommended Daily Allowance (RDA) of 2000 kcal/cap/day, especially for 'small' and 'medium' class farms in regions A and B respectively (Table 5).

A set of linear programming exercises was carried out to identify the optimal production and consumption possibilities for 'small' class of farms in regions A and C and for 'medium' class farms in region B. A number of solutions were calculated using the basic data generated by the study. Summarized versions are presented in Tables 8, 9, and 10 for the 'small' class farms of regions A and C, and for 'medium' class farms in region B. The activities are divided into production and non-production categories. The production categories indicate the optimal land allocation of the enterprises while the non-production catalogue consists of selling, buying, consumption of home produced and purchased items of a 'representative' household. The optimal solutions are presented in Table 6,8,9 and 10:

Solution I: is the initial solution whereby given the existing production possibilities gross returns are maximized by the production of mainly tubers and some cereals. Per capita calorie consumption remains at 72, 82, and 83 percent of the minimum recommended daily allowance (RDA) of 2000 kcal/p/day for regions A, B, and C respectively.

Solution II: due to increases in the productivity of maize by 50 percent and the price of cash crops (teff and yams) by 25 percent the dietary intake of the farm households are assumed to improve up to the minimum RDA for all the regions.

Table 7 **Estimated Farm Income for the Average Household 'Small' Class of farms in Regions A and C and 'Medium' Class Farms in Region B**

Enterprises	'small' Farm Region A			'Medium' Farm Region B			'Small' Farm Region C		
	Land Alloca (ha)	Total Income (Br)	Gross* Profit (Br)	Land Alloc. (ha)	Total Income (Br)	Gross Profit (Br)	Land Alloc (ha)	Total Income (Br)	Gross Profit (Br)
Teff	0.71	349.30	324.00	0.59	542.80	263.10	0.64	704.00	603.00
Maize	0.64	425.00	400.00	0.52	554.40	493.35	1.10	700.00	680.90
Haricot beans	0.21	28.00	24.85	0.14	32.80	24.00	-	-	-
Sorghum	-	-	-	-	-	-	0.34	370.00	356.70
Sweet potato	0.08	65.00	65.00	0.15	148.50	146.80	0.30	317.70	314.30
Enset	0.02	50.00	50.00	0.04	100.00	100.00	0.04	100.00	100.00
Cassava	0.03	18.00	18.00	-	-	-	-	-	-

Table 7 continued

Enterprises	'small' Farm Region A			'Medium' Farm Region B			'Small' Farm Region C		
	Land alloca (ha)	Total Income (Br)	Gross profit * (Br)	Land alloca (ha)	Total Income (Br)	Gross profit * (Br)	Land alloca (ha)	Total Income (Br)	Gross profit * (Br)
Taro	-	-	-	0.12	160.00	134.30	-	-	-
Coffee	0.02	40.00	40.00	0.02	60.00	60.00	0.01	40.00	40.00
Banana/Veg/ Yam	0.19	108.00	108.00	0.03	70.00	56.00	-	-	-
Sub-Total	1.90	1083.30	1029.85	1.61	1668.50	1277.55	2.43	2231.7	2094.90
Animal Products	1 cow	300.00	127.50	2	450.00	277.50	1	150.00	27.50
Total		1383.00	1157.35		2118.50	1555.05		2381.70	2122.40

* Gross profit is calculated by deducting cash expenses from gross receipts. The cash expenses include purchased inputs and share cropped value of product. For animal products interest and repayment on borrowed amount for purchase of an ox and veterinary expenses are deducted.
source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

Table 8 Optimal Solutions of Production and Consumptions Activities for 'Small' Class of Farms in Region A

Activities	Solution I		Solution II		Solution III	
	Value	GM/Unit Br.	Value	GM/Unit Br.	Value	GM/Unit Br.
Production						
Maize/cassava	0.80ha	-50	0.80ha	-50	1.17ha	-50
Teff/H.beans	1.10ha	441	0.74ha	551	1.54ha	465
Maize/H.beans	-	-	0.35ha	-55	-	-
Sweet potato	-	-	-	-	0.14ha	-10
Non production						
Sale H.beans	-	-	-	-	18.35kg	1.0
Sale cassava	1600kg	0.20	2440kg	0.20	3820kg	0.20
Buy maize	348kg	-1.10	184.7kg	-1.10	177.4kg	-1.10
Buy sweet potato	400kg	-0.17	560.0kg	-0.17	-	-
Consume maize	740kg		1036kg		1036kg	-
Consume H.beans	140kg		196kg		196kg	-
Consume swt potato	400kg		560kg		560kg	-
Consume cassava	400kg		560kg		560kg	-
Draft power	2	-50	2	-50	2	-50
Hire Jan labour	6.64m-d	-1.50	15.7 m-d	-1.50	23.50 m-d	

Table 8 continued

Activities	Solution I		Solution II		Solution III	
	Value	GM/Unit Br.	Value	GM/Unit Br.	Value	GM/Unit Br.
Hire Feb labour	-	-14.6	16.8 M-D	-1.50	16.8 M-D	
Cash exp. condiments	1 unit	-14.6	1.0	-14.6	1.0	-14.60
Cash exp. kerosene	1 unit	-24.00	1.0	-24.00	1.0	-24.00
Cash exp. soap	1 unit	-20.00	1.0	-20.00	1.0	-20.00
Cash exp. cloth	1 unit	-25.80	1.0	-25.80	1.0	-25.80
Investment on Draft	Br. 700	-0.10	Br. 700	-0.10	Br. 700	-0.10
Dairy cow	1	127.50	1	127.50	1	127.50
Restraints	MVP		MVP		MVP	
Land	Br 1148/ha		Br 1970/ha		Br 609/ha	
Draft oxen	Br -85/ox		Br -85/ox		Br -85/ox	
Dairy cows	Br -737/cow		Br -1641/cow		Br 127.5/cow	
Gross Return	181.46		385.16		1131.90	

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

Table 9 Optimal Solutions of Production and Consumption Activities for 'Medium' Class of Farms in Region B

Activities	Solution I		Solution II		Solution III	
	Value	GM/ Unit	Value	GM/ Unit	Value	GM/ Unit
Production						
Cassava	0.30ha	-215	0.27ha	-215	0.27ha	-215.0
Sweet potato	0.12ha	-11.0	-	-	-	-
Yam	0.20ha	1867.	.4ha	2238	1.99ha	2238.0
Maize	1.01ha	-117	1.17ha	-117	2.18ha	-117.0
Non production						
Sale cassava	434kg	.96	-	-	-	-
Sale maize	588.5kg	0.90	1050kg	0.90	2224kg	0.90
Buy swt potato	-	-	480kg	-0.33	480kg	-0.33
Buy maize	-	-	-	-	-	-
Buy H.beans	140kg	-1.00	170kg	-1.00	-	-
Consume maize	740kg	-	890kg	-	890kg	-
Consume H.bean	140kg	-	170kg	-	170kg	-
Consume swt potato	400kg	-	480kg	-	480kg	-
Consume Cassava	400kg	-	480kg	-	480kg	-

Table 9 continued

Activities	Solution I		Solution II		Solution III	
	Value	GM/Unit Br.	Value	GM/ Unit Br.	Value	GM/Unit Br.
Draft power	2 oxen	-100	2	-	2	-
Cash exp. condiments	1 unit	-26.40	1 unit	-26.40	1 unit	-26.40
Cash exp. kerosene	1 unit	-30.60	1 unit	-30.60	1 unit	-30.60
Cash exp. soap	1 unit	-20.40	1 unit	-20.40	1 unit	-20.40
Cash exp. cloth	1 unit	-14.60	1 unit	-14.60	1 unit	-14.60
Cash exp school	1 unit	-43.90	1 unit	-43.90	1 unit	-43.90
Investment on Draft Power	Br. 800	-0.10	Br. 800	-0.10	Br. 800	-0.10
Dairy cow	2	140	2	140	2	140
Restraints	MVP		MVP		MVP	
Land	Br 1059/ha	-	Br.1291/ha	-	Br1262/ha	-
Draft oxen	-Br.135/ox	-	-	-	Br-100/ox	-
Dairy cow	Br. 140/cow	-	Br 140/cow	-	B 140/cow	-
Capital	-	-	Br. 946/HH	-	-	-
Gross Return	321.32	-	579.91	-	1615.8	-

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

Table 10 Optimal Solutions of Production and Consumption Activities for 'Small' Class Farms in Region C

Activities	Solution I		Solution II		Solution III	
	Value	GM/ Unit	Value	GM/ Unit	Value	GM/ Unit
Production						
Sorghum (ha)	2.03	-39.	1.33	-39.	2.45	-39.
Swt potato (ha)	0.20	-11.25	0.20	-11	0.20	-11
Teff (ha)	-		.70	1178	.70	1178
Non production						
Sale sorghum	1230.4	1.60	754.4	1.60	1516kg	1.60
Sale swt potato	226kg	.30	136.kg	.30	1516kg	.30
Buy maize	740kg	-.85	890kg	-.85	890kg	-.85
Buy millet	150kg	-1.40	180kg	-1.40	-	-1.40
Consume maize	740kg	-	890kg	-	890kg	-
Consume sorghum	150kg	-	180kg	-	180kg	-
Consume millet	150kg	-	180kg	-	180kg	-
Consume swt potato	500kg	-	590kg	-	590kg	-
Draft power	2	-70.0	2	-70.0	2	-70.0
Cash exp. condiments	1 unit	-33.25	1 unit	33.2	1 unit	-33.25

Table 10 continued

Activities	Solution I		Solution II		Solution III	
	Value	GM/Unit Br.	Value	GM/Unit Br.	Value	GM/Unit Br.
Cash exp. kerosene	1 unit	-32.40	1 unit	-33.40	1 unit	-32.40
Cash exp. soap	1 unit	-30.24	1 unit	-30.24	1 unit	-30.24
Cash exp. cloth	1 unit	-81.40	1 unit	-81.40	1 unit	-81.40
Investment on Draft Animal	Br. 800	-0.01	Br. 800	-0.10	Br. 800	-0.10
Constraints	MVP		MVP		MVP	
Land (Br)	1049/ha		1049/ha		1049/ha	
Draft power (Br)	-110/ox		-110/ox		-110/ox	
Dairy cows	28/cow				28/cow	
Gross Return	746.		657.		1831	

source: FFHC/FAO Promoting Sustainable Farming Systems in North Omo, 1993

Solution III: since the calculated marginal value products (MVPs) for land are shown to be very high, the allocated land resources are increased by 50 percent in addition to improvements assumed in solution II.

For the average 'small' class farm in region A, the existing production and consumption levels are found to be very low. The optimal solutions indicate that intercropping on homestead plots of maize and cassava and production of teff and haricot beans and increases in the productivity of maize and teff are crucial to meet the dietary requirements of the household.

Among the non-production activities in region A, the selling of cassava crop achieves prominence so that food crops such as maize and sweet potato could be bought for household consumption.

The livestock activities are incorporated to indicate that a pair of oxen supply the draft power required by the farm household and the product which an average a dairy cow supplies is worth Birr 127.50 annually.

Land is shown to be the major constraint and the marginal value product (MVP) for land is indicated to be Birr 1970/ha for solution II. However, with 50 percent increase in allocation of land to production, its MVP declines to Birr 609/ha. The draft power on 'small' farms appears to be under-utilized, with negative MVP of Birr 85/animal. The total gross margin increases 3 times by increasing the cultivated land by 50 percent.

In region B, the production of tubers dominate for the optimal solution I. As the productivity of maize increases by 50 percent, more of the cassava plots are replaced by maize under solutions II and III. Both the food consumption and other cash expenditures are increasingly met by the sale of maize. Due to its low yield and high requirements for fertilizer, teff is not shown even with price increase of 25 percent under any of the solutions, although at present it is widely grown in the areas under share - cropping arrangements. The MVP for land is shown to be high in region B even under solution III where an increase of 50 percent shows very small decline.

In region C, sorghum is the dominant crop under the optimal solutions presented in Table 10. As the yield for teff improves as in solution II, the crop is grown as cash crop so that maize and millet are bought for household consumption. It is interesting to note that although above average land area is cultivated in region C, the MVP is still quite high even with further expansion as in solution III.

VI. STRATEGIES TO MEET THE FOOD DEFICIT GAP AT THE HOUSEHOLD LEVEL

The topic on optimal production possibilities presented above indicates that there is room for improvement to meet the food deficit gap at the household level. The strategies that could be relevant to meet this objective would be (1) production of appropriate mix of cash crops and staple food crops, (2) greater market participation by members of household; (3) off-farm employment, (4) land rental and (5) participation in income generating activities by female members of the household.

6.1 Integrated Cash Crop And Staple Food Crop Production Activities

The optimal crop production pattern presented above have shown that fewer crops with larger contribution to gross return are selected in the solutions indicating the need for specialization even in the presence of homestead plots. However, the difficulties with post-harvest management of the crops such as storage, transport and marketing may impose restrictions on specialization of production leading to concentration on few crops. On homestead plots where household labour is extensively utilized for cultivation, manuring and harvesting, efforts concentrating on production of cash crops of high values such as coffee, and yams could increase gross returns which in turn improve the level of food security. In regions A, some farmers diversify their homestead plots to the production of sugar canes and bananas.

6.2 Market Participation by Members of the Household

It can be stated that farmers in North Omo area are generally market oriented and in particular, female members of households in the study area make visits to primary markets at least twice a week. Specialization in production for the market would promote market participation in selling and buying food products. The LP models presented above, however, give the impression of smooth functioning of the marketing process as a main mechanism to close the gap of food supply and demand. Integration of the primary markets with secondary and central markets through better transport facilities,reducing the cost of marketing, etc., are elements that enhance food security.

6.3 Off-Farm Employment

The possibility for off-farm employment in the study was not found to be encouraging. Except for the months of January, February and July, most of the other periods during the year are considered as slacks. Although the average household size for the study area is calculated to be about 7, the active labour force in the family one adult male and female. This labour is not fully utilized during the whole year. Members of farm households in the study area participate in self-employing new-farm activities such as selling consumables in the house on market days, basket making, weaving other handicrafts besides farming and trading. These small-scale non-farm operations should be encouraged as sources of supplementary income and employment.

6.4 Land Rental

Land rental is extensively carried out in the study areas of regions A and B particularly on share-cropping arrangements. In view of the increased population pressure, farmers are severely restrained by shortage of cultivated land. Thus, they are forced to travel to distant locations, particularly to lowland areas that are traditionally avoided due to the presence of malaria and trypanosomiasis. The most common crop sharing arrangement in the study areas is found to be 50:50 after deducting for seed and other inputs. Most of the teff plots in region B fall under this type of land rental arrangement which appear to make teff production unprofitable and consequently could not be included in the LP solutions for region B. Thus, better share crop arrangements to the producer on cash or in-kind basis should be arranged to make the production of teff more attractive.

6.5 Income Generation Activities

Participation in income generation activities especially by female members of households are important since the possibility exist for supplementing farm income through trading and other non-farming activities.

The revolving fund schemes for women which are completely controlled and managed by women are initiated in various parts of the study areas. The schemes incorporate savings (*ekub*) with credit provisions to members for various types of small scale operations. Dairy goat keeping, pottery making and tailoring are some of the activities that women are participating for purposes of income generation to supplement the household income.

VII. CONCLUSION

The study has been carried out in North Omo region which is characterized by high population density and recently the rural communities in the area are confronted with food deficit at increasing frequency. The farm households in the area have developed traditional coping mechanisms to alleviate food shortages mainly through intensively managed homestead plots as a production sub-system with *enset* and tubers as major components. Field plots, with intercropped cereals and tubers at nearby dwellings followed by pure stands of cereals away from the residence are also major source of food for households.

Under the existing farming system, 'small' class farms in region A could meet only 72 percent, 'medium' and 'small' class farms in regions B and C were able to meet 82 and 83 percent of the minimum Recommended Daily Allowance (RDA) of 2000 kcal/person/day respectively. In the LP solutions, price improvements along with increases in the productivity of maize and expanding the area under cultivation are found to be the major means to attain the minimum calorie requirements and also generate positive gross returns. However, the assumption of the model for the possibilities of extensive marketing activities, especially the selling and buying of maize, cassava and sorghum to meet the diverse food supply may not be realistic, taking into consideration the fragmentation of the markets especially in regions A and C.

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INDIGENOUS RISK MANAGEMENT STRATEGIES OF SMALL FARMS IN THE CENTRAL RIFT VALLEY OF ETHIOPIA

Tilahun Mulatu

I. INTRODUCTION AND PROBLEM STATEMENT

1.1 Introduction

Drought, flooding, disease, pest infestation, and unanticipated interruptions in labour supply are among the risks prevalent in semi-arid tropics. Farmers in these areas use various methods to protect household food consumption from stochastic production shocks. Since these strategies condition farmers' responses to new options, an understanding of their risk management strategies is essential if productivity is to be increased. To optimize impact, technologies and policies should confirm to and reinforce these strategies. Conversely, if new interventions undermine key components of such strategies, broad adoption and impact which are components of such strategies, will be blocked and farmer welfare reduced. This lack of reinforcement of risk management strategies has been found to be an important factor explaining the low level adoption of productivity-enhancing technologies in semi-arid tropics (Kristjanson and Matlon, undated; Stroud, 1993).

The central rift valley of Ethiopia is one of the semi-arid areas in the country characterized by poor and unreliable rains. In addition, the soils are shallow and have problems of compaction and surface crusting which lead to poor water infiltration and run-off (Kidane, 1982).

Several surveys carried out in the rift valley areas of Ethiopia (Tilahun and Teshome, 1987; Tilahun et al, 1992; Aleligne, 1990; Aleligne et al, 1994) show that moisture stress is the number one constraint limiting farm productivity and expansion as well as the variability of rains imposing greater risks. Moreover, weeds, insect pests, diseases, birds, dry season livestock feed shortage, seasonal labour shortage are other important constraints contributing to low farm outputs and increased risks.

Farmers based on their time tested experiences in the area adopted several risk management strategies to reduce/avoid the consequences of risk in their production and consumption practices.

The objectives of this study, therefore, are:

1. to describe and understand the farming system of the area,
2. to identify and describe farmers indigenous risk management strategies, and
3. to draw some technological and policy measures and implications for improving the farming system.

1.2. Sources Of Risk And Uncertainty

Of all the well-recognized sources of risk in agriculture--namely market, state policies, and weather-the last is the key source of risk in semi-arid tropics. Among the elements of weather, the most important for agriculture is rainfall.

Rainfall is highly variable in the study area. More importantly, intra seasonal rainfall is also highly variable. Even years of normal rainfall are characterized by long dry spells. For instance, droughts prolong the dry season, delay land preparation and prevent timely sowing of crops resulting in a decline in cropped area as well as changes in the cropping pattern. Droughts occurring in mid-season, after the sowing of crops, cause retardation of growth; in the extreme cases, they scratch off standing crops, wasting already invested resources. The occurrence of drought towards the end of wet season may cause withering of otherwise promising crops (Jodha, 1978a; Tilahun et al 1992).

1.3. Farmers' Adjustment Mechanisms Against Risk

Details about the frequency of droughts and consequent instability of crop yields help in understanding the risky situation to which farmers in drought-prone areas are exposed. The farmers, having faced such situations in the past, have evolved several measures to live with it. These measures, put together, may be described as the farmers' adjustment mechanism against risk (Jodha, 1978).

The usual definition of risk revolves around variability of outcomes which lie below or above normal prospects. However, in keeping with the overall goals of the adjustment mechanisms in drought years, risk implies prospects which offer

lower returns than normally received or expected. The adjustment devices against risk would thus involve measures aimed at minimizing the probabilities of losses due to risk. Once losses have occurred, the next step consists of measures to supplement the lower returns by other sources of income, or manage with lower returns by curtailing current commitments. The extent to which the aforesaid devices can be readily adopted depends upon the extent to which farming systems have been prepared or adapted to face such eventualities. Accordingly, the devices constituting the adjustment mechanisms can be put under three broad categories (Table 1).

a. devices reflected in basic farming system to facilitate the adoption of alternatives under (b) and (c)
b. Specific risk/loss minimizing devices for production activities
c. Specific risk/loss management devices

Of the three categories of adjustment devices, (a) and (b) are basic to the farming system in arid and semi-arid tropics.

Evidence strongly suggests that food security is the overriding objective of household production and employment among small farmers (Norman et al. 1981 quoted in Krisjanson and Matlon, undated). Food security can be ensured through any combination of three modes of acquisition: own production, purchases and transfers.

Moreover, risk management strategies are applied at several levels of operation: (1) plant (2) plot, (3) farm, (4) whole household, (5) village, and (6) region. Methods to ensure own production involve actions at levels (1) through (3); purchases are secured at levels (3) through (6); and transfers are secured at levels (5) and (6) (Kristjanson and Matlon, undated).

Risk management strategies also differ according to the time of their application relative to the occurrence of production shocks (e.g. drought) as ex-ante, interactive and ex-post methods. Ex-ante methods are applied before the production shock occurs, interactive methods are applied when the shock happens in order to reduce the impact of the shock on farm production and ex-post methods are applied after the shock has happened in order to reduce the impact of the shock on farm family consumptions (Kristjanson and Matlon, undated; Jodha, 1978a; Jodha, 1978b; Franzel, 1985).

Tables 2 and 3 summarizes risk management strategies based on their time of application as pre-emptive (ex ante), re-active (interactive on production) and loss management (ex-post on consumption).

Table 1 Farmers Adjustment Mechanisms Against Risk and Uncertainty in Agriculture

(a) devices reflected in basic farming system to facilitate the adoption of alternatives under (b) and (c)	(b) Specific risk/loss minimizing devices for production activities	(c) Specific risk/loss management devices
(i) Diversified farming and mixed cropping to offer flexibility.	(i) Salvage operations when efforts are concentrated on recovery of byproducts in the absence of main products; concentration on hitherto low value operations/production lines due to further decline in opportunity cost of labour.	(i)Reduction in current commitments through postponement, cancellation, and reduction of consumption, and future production expenditure, non-payment of dues,etc.
(ii) Flexible production and factor use practices to fit to changing resource supply and demand situation	(ii) Mid-season adjustments in deployment of resources, resource use intensity;contracting/expanding particular – farm operations;selectivity/discrimination in treatment to different plots/crops; resowing on selective basis when possible, etc.	(ii) Resource augmentation through [illegible] and utilization techniques of resources.
(iii) Limited ex-ante commitment of resources for current production, accretionary process of capital formation to facilitate mid-season adjustments.	(iii) Reduced dependence or cut back on hired resources and restructuring of factor proportions.	(iii) Supplemental earning by working as labourer; out migration to other areas; handicrafts, etc.
(iv) On-farm storage and recycling devices, high dependence on home produced inputs-outputs to facilitate change in resource use pattern.	(iv) Changes in priorities and techniques of farm operations to minimize wastage, etc.	(iv) Asset/inventory depletion through sales/mortgage.

(v) Highly flexible propensity to consume as well as structure of demand to match the changing supply situation.		(v) Borrowing from others with or without mortgage and land and labour contracts.
(vi) Traditional forms of rural cooperation and informal institutional arrangements-helping inter-linking of factor- product markets, spatial mobility etc., to help mutual sharing of risk and switch over from private cost to social cost of sustenance during droughts.		(vi) Dependence on others, including charities/remittance.
(vii) Irrigation on part of the land in some cases as permanent defence against risk.		

Source: Jodha, 1978

Table 2 Pre-Emptive/Ex-Ante Risk Management Strategies

Action	Purpose in managing risk	Other possible reasons
1. Diversification	Low co-variation in profits for different enterprises: crop, livestock, off-farm enterprises.	1. Variety in food for family 2. Beneficial interaction between enterprises: resource allocation, byproducts, etc.
2. Mixed cropping	More dependable returns to land and peak season labour	1. Increased use of environmental factors: moisture, light, etc. 2. Reduced soil erosion 3. Reduction of adverse condition: weeds, diseases etc. 4. Higher returns to land and labour.
3. Staggered planting	Lesson risk of losing entire crop to periodic hazard: drought, pests, diseases, etc.	1. Allow continuous flow of fresh food. 2. Means of easing peak season labour concentration.
4. Low level of purchased inputs	Low possibility of losing scarce cash resources in agricultural undertakings	1. Unavailability/lack of information 2. Lack of increased output
5. Traditional forms of cooperation	Switching private cost of sustenance in time of famine towards a wider group (village etc.)	Social functions
6. Produce food for family	avoid price risk and unavailability of food stuff	More cost effective than selling after harvest and purchasing later on
7.Avoid risky enter prices and crop varieties. Emphasize on non-risky enterprises and crop varieties	Lessen risk of low returns in any given year	
8. Plant at low density	lessen risk of complete crop failure	

Source: Franzel, 1985

Table 3 Reactive Risk Management Strategies

production	Consumption/Loss Management
-Resowing -reduced dependence or cutback on hired or purchased resources (hired labour,top dressing, etc.)--substitute labour for-capital -Change in techniques to minimize waste(more careful harvesting) -contract/expand particular operations (increased thinning, rouging, weeding) -Recover byproducts when main products are unavailable -Pursue what are usually of low value -salvage operations -Sowing of short season crop when rains are delayed	-Borrowing -Asset depletion (sales of tools, livestock,etc.) -Supplementary earning (working as labourer, out migration) -Dependence on charity, begging etc. -Reduction postponement, cancellation of current consumption commitments -Substitution of food items (eg. wild greens for beans) -Substitution of favoured foods -Diversion of crops from use for brewing to use as food

Source: Franzel, 1985

II. METHODOLOGY

2.1. Data Source and Collection

This study is based on data and information generated from farm surveys during the past years and a survey carried out in March 1993 in the Nazareth area (Adama and Bosset sub-Districts) in the central rift valley of Ethiopia.

Farm Survey 1993

The primary data were collected from farmers by employing interview method with the help of a structured questionnaire. The questionnaire was developed to collect information on crop and livestock systems, input-output quantities, subjective judgement of rainfall variability by the farmers during the past 5 years (good, normal and bad rainfall years), and farmers' estimation of yields of crops during these years. The survey data pertains to the 1992 crop year.

Sampling

Variations in rainfall and other important factors such as crop types are found to exist in the area. Hence, the study area is divided into two zones: wet and dry.

The major differences between the two zones are summarized in Table 4. In order to reduce heterogeneity among the farmers or peasant associations (PAs), those PAs that are thought to be unrepresentative (with respect to the rainfall or types of crop cultivated) have been excluded.

Table 4 Variation in Farmer Circumstances Between Wet-Zone and Dry-Zone Farmers

Circumstances	Wet-Zone farmers	Dry-zone farmers
1. Location in target area	west & northwest	east & southeast
2. Annual rainfall	about 800 mm	about 600 mm
3. Soils	mostly sandy loam	mostly clay loam
4. Area cultivated per family (hectare)	2.68	2.13
5. Main crops	teff, maize, h.bean, barley and wheat	teff, maize, h.bean
6. Number of cattle per family	5.50	4.84
7. Proportion of farmers practicing transhumance	few	large
8. Food shortages	less common	common
9. Use of farm inputs	most	some
10. Rainfall reliability	more reliable	less reliable
11. Farm income	high income	low income
12. Off-farm employment	less	more

Source: Adapted from Tilahun, et al., 1992

A two-stage simple random sampling technique was used in order to select farmers for the survey. First, the PAs were selected randomly from the list of PAs. The list of PAs were obtained from the district (*Awraja*) MOA office and the list of farmers were obtained from the respective PAs. A total of 100 farmers (50 from the wet zone and 50 from the dry zone) were selected randomly for administering the interview schedule.

III. RESULTS AND DISCUSSION

3.1. The Farming System

3.1.1. Crop and livestock production

The major crops grown in the area include teff, maize, and haricot bean. Less important crops include sorghum, barley, wheat and horticultural crops. Other minor crops in the area are lentils, peas and other pulses.

In 1992, in the wet zone, teff was grown by 100 percent of farmers covering about 52 percent of the total cultivated land. Maize was grown by 94 percent of the farmers occupying over 15 percent of the farmers' cultivated land. Haricot bean is the third important crop produced by about 56 percent of farmers over 8 percent of the total land. About 64 and 66 percent of the farmers, respectively, grow barley and wheat each occupying about 9 percent of the cultivated land.

In the dry zone, teff is grown by about 92 percent of farmers covering about 40 percent of the farmers cultivated land. Maize is grown by 86 percent of the farmers and it holds about 27 percent of the total cultivated land. Haricot bean is grown by 60 percent of the farmers holding 13 percent of their average cultivated land. Barley and wheat are grown by 29 and 21 percent of the farmers, respectively, and each occupy 3 percent of the land. Sorghum is grown by 37 percent of the farmers.

Table 5 provides crops of major importance in the area and the proportion of farmers growing them. Area coverage of these crops is provided in Table 6.

Table 5 **Percentage of Farmers Growing Crops in 1992**

Crop	Wet zone	Dry zone
Teff	100	92
Maize	94	86
H.bean	56	60
Barley	64	29
Wheat	66	21
Sorghum	16	37
Lentil	34	15

Source: Farm survey 1993

Table 6 **Average Area Coverage (ha) of Major Crops for Sample Farmers, 1992**

Crop	Wet zone	Dry zone
Teff	1.40	0.87
Maize	0.39	0.60
H.bean	0.22	0.28
Barley	0.24	0.08
Wheat	0.23	0.07
Sorghum	0.10	0.20
Lentil & peas	0.10	0.03
Total	2.68	2.13

Source: Farm survey 1993

Maize and sorghum are the most important food staples that are also used for local brewing. Teff and haricot bean are mainly used as a source of cash. In 1992 teff generated 68 and 40 percent of the total cash income to the wet and dry zone farmers, respectively. In 1992 teff was a source of cash income for 94 percent of farmers in the wet zone and for 71 percent of farmers in the dry zone. Haricot bean generated 4 and 10 percent of the total cash income for the wet and dry zone farmers, respectively, in 1992.

The average cultivated landholding per farm family is about 2.68 ha in the wet zone and 2.13 ha in the dry zone. The average livestock holding per family is 5.50 in the wet zone and 4.84 in the dry zone (Table 7). Family size averages between 5 and 7 persons.

Table 7 **Average Livestock Ownership (number) for Sample Farmers, 1992**

Type	Wet zone	Dry zone
Cattle	5.50	4.84
Oxen	2.94	1.80
Bulls	0.70	0.49
Cows	0.84	1.20
Heifers	0.56	0.78
Calves	0.46	0.57
Goats	2.34	1.28
Sheep	1.94	0.75
Donkey	1.60	0.89

Source: Farm survey 1993

Most farmers that grow teff, haricot bean, wheat and barley use commercial fertilizers in their fields. In the 1992 crop season, 94 percent of the farmers in wet zone and 62 percent in the dry zone used fertilizers on their teff fields. About 38 percent of the farmers in the wet zone and 22 percent in the dry

zone fertilized their haricot bean fields using commercial fertilizers (Table 8). About 52 percent of the farmers in the wet zone and 27 percent in the dry zone used broad leaf herbicides on teff. About 30 percent of the farmers fertilized their maize fields with manure.

Table 8 Proportion of Fertilizer users for sample farmers, 1992

Crop	Wet Zone		Dry Zone	
	Growers using	Sample farmers using	Growers using	Sample farmers using
Teff	94	94	68	63
H.beans	68	38	36	22
Barley	84	54	55	16
Wheat	88	58	82	18
Maize	15	14	9	8

Source: Farm survey 1993

Crop yields are generally low. However, yields of crops were better in the wet zone compared to the dry zone. For example, average yield of teff was 1,064 kg per ha in the wet zone whereas it was 748 kg per ha in the dry zone.

Average yields of crops (1992) in the area are provided in Table 9. Yield levels vary with rainfall conditions. In good rainfall years, farmers expect good crop yields. Farmers' expectations for good or poor rains is once in three years. Table 10 provides yields of crops in good, average and bad rainfall years in the wet and dry zones.

Table 9 Average Crop Production, Crop Area and Yield for Sample Farmers, 1992

Crop	Wet zone			Dry Zone		
	Area (ha)	prod. (kg)	Yield (kg/ha)	Area (ha)	prod. (kg)	Yield (kg/ha)
Teff	1.40	1490	1064	0.87	651	748
Maize	0.39	449	1151	0.59	669	1134
H.bean	0.22	208	945	0.28	206	736
Barley	0.24	332	1383	0.08	79	987
Wheat	0.23	176	765	0.06	47	671
Sorghum	0.10	98	980	0.20	181	900
Lentil	0.10	68	680	0.03	11	367
Total	2.68	2836	-	2.12	1391	-

Source: calculated based on farm survey 1993

Table 10 Farmers' Estimate of Crop Yields in Good, Average and Poor Rainfall Years (kg/ha)

crop	Wet Zone			Dry Zone		
	good rainfall	average rainfall	poor rainfall	good rainfall	average rainfall	poor rainfall
Maize	1983	1521	428	2026	1119	382
Teff	1448	907	504	1348	831	409
H. bean	1271	710	471	1024	504	137
sorghum	2063	1212	595	1357	737	400
Barley	1800	1259	684	1568	604	500
Wheat	1320	871	340	1200	750	467

Source: Farm survey 1993

3.1.2. farm income and expense

3.1.2.1. cash income

Farmers' major source of cash is crop sales. Among the crops, teff stands first in generating cash to farm families. It contributes about 68 percent of the total cash income in the wet zone and about 40 percent of the income in the dry zone (Table 11). Livestock generates about 11 and 18 percent of the total cash income in the wet and dry zones respectively. About 31 percent of the farmers in the wet zone and about 61 percent of the farmers in the dry zone reported that they have generated some cash from off-farm works including food-for-work and aid in 1992. The major off-farm work activities are charcoal and fuel wood sale, local brewing and engagement in wage employment.

Table 11 Gross Average Cash Income by Source for Sample Farmers, 1992

Source	Wet zone			Dry zone		
Product sales	income (birr)	% farmers using	% total income	income (birr)	% farmers using	% total income
Teff	1040	94	67.75	381	71	40.49
H.bean	66	33	4.30	91	35	9.67
Maize	16	10	1.04	54	22	5.73
Barley	17	14	1.11	3	6	0.32
Wheat	22	14	1.43	0	0	0.00
Sorghum	20	8	1.30	6	10	0.64
Vegetable	12	4	0.78	11	4	1.17
Lentil and peas	65	18	4.23	0	0	0.0
Livestock	162	40	10.55	167	33	17.75
Off-farm work and aid	115	31	7.50	228	61	24.33
Total	1535	-	100	941	-	100

Source: Calculated from farm survey data 1993

3.1.2.2. farm expenses

About 94 percent of the farmers in the wet zone and 51 in the dry bought fertilizer in the 1992 crop season. Average fertilizer bought was 241 kg in the wet zone and 56 kg in the dry zone. Average spending on fertilizer was 254 Birr in the wet zone and 51 birr in the dry. About 86 and 49 percent of the farmers in the wet and dry zone, respectively, hired labour from outside and the average spending on hired labour was 201 and 88 Birr in the wet and dry zones, respectively. The average spending on herbicides was 26 and 9 Birr in the wet and dry zones, respectively (Table 12).

Table 12 Average Cash Spending on Farm Inputs (Birr) for Sample Farmers, 1992

Item	Wet zone		Dry zone	
	% farmers spending	average spending	% farmers spending	average spending
Labour	86	201	49	88
Fertilizer	94	254	51	52
Seed	10	11	35	33
Herbicide	52	26	27	9

Source: Calculated from farm survey data 1993

3.2. Farmers' Risk Management Strategies

3.2.1. Ex-ante and interactive methods

(a) Plot diversification

Land type diversification reduces the risk of crop losses due to stresses associated with specific land types.

In the study area, farmers on the average own 6-8 plots. About 90 and 94 percent of wet and dry zone farmers respectively reported that their plots vary in fertility. Farmers allocate their plots among crops according to the characteristics of the land. For example, farmers allocate their most fertile plots

of land to maize (82 percent in the dry and 64 in the wet zones) which has a high priority for farmers as staple food and gives good yield under fertile soils. Maize is also commonly allocated to bottom lands (where run-off is accumulated) because it stays longer in the field compared to other crops such as teff, beans, barley and wheat and thus it may encounter mid-season moisture stress especially when it is planted in April or early May.

Teff is usually grown on medium fertile soils. Teff and haricot beans are not commonly planted on bottom lands and on manured fields due to lodging and heavy weed infestation problems and insect pest attack.

(b) Crop and varietal diversification

Diversification of crops, cultivars, and plot locations are some of the most common means by which farmers attempt to stabilize agricultural income.

Farmers in the area grow several maize types/varieties. The main maize varieties grown include katumani, hararge, militia, limat, sheye and chore. Katumani is the most popular variety, primarily because of the high ratings by the farmers for its earliness and quality of *injera*, inspite of its poor rating on cob size, seed weight and susceptibility to weevils and weed damage. In 1992, it was grown by 70 percent of the farmers over 52 percent of the maize area in the wet zone and by 62 percent of the farmers over 41 percent of the maize area in the dry zone.

Harerge and Militia give the highest yield (about 50 percent yield increase over short maturing types) but they are not commonly grown because of their lateness. In 1992, about 14 percent of the farmers in both zones grew either Harerge or Militia maize varieties.

Sorghum is more important in the dry zone than in the wet zone. Major sorghum types grown in the area include keradabia, goronjo, keteto, ruffe and dessie. Keradabia is the most widely grown sorghum type. In 1992, it was grown by 37 percent of sorghum growers in the dry zone. Keteto and Ruffe types were each grown by about a quarter of farmers in the two zones. Keradabia is a late maturing type and hence it has to be planted in March or April. If the rains come late, there is no chance for growing Keradabia. It is high yielding, tolerant to birds attack and drought and good for *injera*. It is brown in colour. Keteto is white in colour and fetches the highest market price when sold (due to its white colour). Three types of teff are identified based on their colour: white, mixed (*sergegna*) and red (*keyi*). Red teff yields about 50 or more kg/ha higher than

white teff and matures about 15 to 20 days earlier. Because of this earliness, red teff is usually planted a bit later than white teff. Therefore, farmers usually plant red teff when rainfall is late or when labour and oxen are in short supply. An improved variety of haricot bean, Mexican 142, is predominantly grown in the area occupying about 80 percent of the bean area. Local types are produced at a lesser scale.

There are two important barley types also identified based on colour. White barley is the most preferred one both for home consumption and for sale. Black barley is less preferred by the consumers due to its colour. Israel is the dominant wheat type grown in the area. Other wheat types include lakech and enkoy.

(c) Planting strategy and soil moisture management

About 80 percent of the sample farmers reported planting crop varieties or types in a given year primarily based on the rainfall condition. Other factors that are considered at planting include labour and oxen power situation, market price expectations, seed availability and weed and insect pest expectations.

Maize planting time for the area ranges from mid-April to mid-May for late maturing varieties and from mid-May to early July for medium and early maturing varieties. This extends the available time for maize planting to about 75 days. Therefore, when rains come in April or early May, farmers plant the high yielding varieties of maize such as Limat, Hararge and Militia. If rains are a bit late, medium maturing types such as Sheye, Alaba and the like are planted. However, if rains are still late and start raining in June or early July, early maturing and low yielding maize such as Katumani have to be planted. In recent years, the planting of katumani maize is increasing whilst the growing of late types is declining. In 1989, more than 75 percent of the farmers planted maize in June due to the late rains (Aleligne et al, 1992).

Farmers also use the different varieties of crops for staggered plantings. Staggered planting helps farmers not only to avoid mid-season stresses but also for levelling-off peak season labour and animal power requirements. Farmers grow teff, maize, and sorghum varieties so that the weeding and harvesting time for these crops/varieties would not take place at the same time as their maturing time differs.

Also, the planting of early maturing maize such as katumani earlier than their recommended planting dates (early May instead of mid-June) helps farmers

overcome food grain deficit periods as the crop is harvested in August. About 50 percent of the farmers in the Nazareth area reported that they finish their stored grain in August and the rest 44 percent in September (Tilahun and Teshome, 1987).

Heavy rains after maize and sorghum are sown can cause the soil to crust, hindering seed emergence. When farmers face such problems they re-plough the field with a wide distance between each plow line so as to break the soil crust without disturbing the seeds.

Farmers reported that dry planting of maize and sorghum causes poor seed emergence and crop development and hence poor grain yields. Other reasons for not planting dry include heavy weed infestations and clay pan formation. Therefore, maize and sorghum planting is done after sufficient rains are received (this is about 4-5 days after the on set of rains).

Teff needs to be planted on rainy days. As the seed is broadcasted and left without covering, the rainfall helps to cover the seed. If there is no rain after planting, farmers cover the seed by bringing in small runimants or dragging acacia branches across the field. Unlike other cereal crops, teff is not covered after sowing using oxen plow as the small teff seeds fail to emerge if covered like other crops.

(d) Shift to early-maturing varieties and crops

Because of the unreliable and poor rains, the farmers around Nazareth are shifting to the cultivation of early maturing maize and sorghum types though these are low yielding compared to the late maturing ones. In this regard, maize types such as Hararge and Militia are loosing popularity. Table 13 provides the proportion of farmers who planted the different maize types in 1992.

Also farmers have shifted to short cycle crops such as teff, barley and haricot bean at the expense of long sorghum and maize types. Average area of teff has increased from 0.60 ha in 1985 to 0.80 in 1989 and to 1.40 ha in 1992 in the wet zone (133 percent increase) and from 0.60 to 0.87 in 1992 in the dry zone (57 percent increase). On the other hand, average maize area has declined by 35 percent during the same period in the wet zone and by 34 percent in the dry zone.

Table 13 Maize Varieties/Types Planted in 1992 (Proportion of Sample Farmers Planted)

Maize Varieties	Wet zone	Dry zone
Katumani	70	62
Limat	22	26
Militia	6	4
Hararge	8	10
Sheye	6	9
Gowe	6	6

Note: multiple answers hence % > 100
Source: Farm Survey, 1993

It should be noted that the increase in teff area is not only because of rainfall problems. The steadily increasing price of teff is another important factor that has contributed to the increase. The price of white teff has risen from 90-100 Birr per 100 kg bag in 1985 to 180-200 Birr in 1993. Moreover, farmers are heavily dependent on teff straw for livestock feed. Teff straw is the most preferred feed type.

(e) Seeding rate strategy

Another important strategy farmers use in order to reduce risk due to poor rains, insect pests and other risk factors is increasing seeding rates. In most cases farmers use close to double or more seed rates than the recommended seeding rates. They use 60-70 kg maize seed as opposed to the recommended rate of 25-30 kg per ha. The seed rate they use for teff is 50-60 whereas the recommended rate is 25-30 kg per ha. Haricot been seed rate used by farmers is 90-120 kg per ha whereas research recommendation is only 70 kg. The seed rates of farmers for barley and wheat are about 200 kg per hectare whereas the recommended rate is not more that 150 kg.

Seed quantities are increased in order to counter balance the effect of poor rains that hinder good germination of seeds as well as to reduce the risk of poor seed quality and insect pest attack on seeds. High seed rate is used to

seed rate. Through increased seed rate practice the farmers also try to get additional livestock feed sources through later thinnings. Livestock are kept by most farmers and sold during poor crop years.

Ex-post risk management methods such as livestock sale, off-farm employment opportunities, out-migration (*godantu*), borrowings, food-for-work and aid are widely practiced in order to alleviate the impact of food shortages.

Studies of the farming system and farmers risk management strategies carries several implication for technology design and policy formulation in order to improve the potential for adoption. New technologies should maintain or enhance farmers flexibility to adjust cropping patterns in response to early and mid-season shocks. For example the development of earlier maturing varieties and varieties less susceptible to the common yield reducing factors such as drought at seedling and grain filling stages, and insects and bird damage have greater chance of adoption.

Management techniques that reduce soil moisture deficits at the beginning and end of growing period would have a greater acceptance by farmers due to their impact in extending the effective growing period (for example animal drawn tied-ridging).

Research opportunities for drier environment identified by Waddington et al (1994) include breeding for drought avoidance and tolerance, timing for planting or dried seed beds, plant population densities for maximizing of yield stability, moisture conservation tillage systems and fertilizer management at low rates in relation to the use of manure and crop residues.

Farmers in the rift valley areas have labour shortages during peak periods of weeding and harvesting. Technologies that exacerbate peak season labour requirements reduce flexibility and are less likely to be adopted. On the contrary, technologies that give more flexibility to farmers and reduce labour requirements during peak periods (for example herbicides) have greater chance for farmers acceptance.

Policy instruments that improve farmers' off-farm employment opportunities have greater impact especially in the dry zone where diversification and cropping flexibility are limited. Policies that help develop more diversified non-farm income opportunities serve to reinforce ex-post risk management strategies.

Evidence from this study shows that an important risk management strategy relies upon purchasing food. Investments that reduce marketing costs is complementary to the farmers' effort aimed at ensuring food security.

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TECHNOLOGY DEVELOPMENT AND TRANSFER IN ETHIOPIAN AGRICULTURE: AN EMPIRICAL EVIDENCE

Mulugetta Mekuria

I. INTRODUCTION

The transformation of the agricultural sector will result in the production of sufficient food to feed the agricultural and non-agricultural population. The sector also releases labour and capital to the non-farm sectors. The increased agricultural production and employment opportunities would generate increased income to both farm and the non-farm families (Oehmke and Crawford, 1993). The role of technology in achieving a sustained increase in food production in Sub-Saharan Africa is documented by Herdt (1988), Delgado et al. (1987), Eicher (1990) and Eicher and Rukuni (1994).

Agricultural research produces a variety of outputs ranging from new knowledge about plants and animals to new technologies with which farmers increase agricultural production. It uses highly trained manpower and specialized equipment. Because technological change expands the production possibilities frontier, it is central to increasing agricultural production. Agricultural technology includes one or more of the following aspects: mechanical, biological, chemical and management methods. The technology may consist of a package of several components which may be adopted simultaneously or independently depending upon whether the specific practice is complementary or not. The technologies can be considered divisible (eg., hybrid seeds, fertilizer, pesticides, etc.) and non-divisible or lumpy (eg., tractor, mechanical harvesters, etc.). Most countries have attempted to encourage the adoption of new technologies in order to increase factor productivity in their agricultural sector assuming that increase in the productivity of scarce resources such as land and labour will increase aggregate output. At the conceptual level, the adoption of technology is represented as an upward shift in the production function. A shift in the production function will increase both the marginal and average product of the variable input. It is hence evident that the development of the agricultural sector can reduce food insecurity and subsequently poverty and hunger in the Ethiopian context.

The general objective of this study is to examine the social, economic and institutional factors that influence the adoption of selected wheat production

technologies in Arssi Region. Arssi is a major wheat and barley producing region and the home of the first integrated rural development project that was launched in 1967 with assistance from Swedeti. This study was undertaken in the region in order to draw lessons from the many years experiences of technology adoption in the area. The specific objectives of the study are to:

1. review the institutional base for agricultural technology, development and transfer,
2. present descriptive information on wheat production and technology adoption by smallholders in Arssi region,
3. generate quantitative estimates of the factors influencing the incidence and intensity of adoption of wheat production technologies and
4. draw implications for agricultural research, extension, and policy changes needed to overcome the constraints on adoption.

This paper is presented in four parts. Part two reviews the institutional framework of agricultural technology generation and dissemination, the components of the national agricultural research and extension services and their respective contributions and problems in technology development and transfer. Part three presents the results of an econometric analysis of technology adoption. Part four attempts to summarize the major findings and draws the implications for food security and suggests recommendations.

II. THE INSTITUTIONAL BASE FOR AGRICULTURAL TECHNOLOGY DEVELOPMENT AND TRANSFER

2.1 The National Agricultural Research Service (NARS)

Agricultural research in Ethiopia is carried by a number of institutions. The national mandate to conduct and coordinate agricultural research was assigned by decree to the Institute of Agricultural Research (IAR) in 1966. Later in 1975 the Ethiopian Science and Technology Commission was established to guide and formulate Science and Technology Policy and Development. The institutions of higher eduction, i.e., universities and colleges are also engaged in agricultural research. Specialized units in the Ministries of Agriculture, State Farms Development, Coffee and Tea Development and their respective Corporations conduct adaptive and applied research to cater for their needs. The International

Agricultural Research Centres (IARCs) have developed strong collaborative programs with the IAR and the Alemaya University of Agriculture (AUA).

The Institute of Agricultural Research (IAR) was established in 1966 as a semi-autonomous public institution by the Government of Ethiopia (GOE). The UNDP/FAO support to IAR continued for five successive phases and the emphasis was on three major areas: a) training of national researchers; b) building the research infrastructure and facilities and c) assignment of expatriate staff to conduct experiments and train the national counterparts. The initial phase focused on building research stations and training Ethiopian researchers abroad. The Alemaya College of Agriculture (now Alemaya University of Agriculture-AUA) has been conferring BSc. degrees in the different fields of agricultural sciences since 1954 (MSc degrees since 1979). The IAR recruited potential researchers from Alemaya. Both institutions used to send their employees abroad for graduate training[1]. This acted as an incentive mechanism to attract more talented and interested graduates to join Alemaya and the IAR. The GOE covered most if not all of the operating expenses of IAR. Staff salary was not significantly different from other public institutions. It can be said that the salaries paid to the staff have never acted as incentives to work in the IAR. The pride of working as researcher was a more important factor in retaining some research staff of IAR (Stroud and Mekuria, 1992).

The UNDP's support for the 5 successive phases was discontinued in 1980 except for two specific projects (i.e. Horticulture and dry land agronomy projects). In the meantime, IAR was able to negotiate with the World Bank funding to strengthen agricultural research. However, project preparations, appraisals and negotiations for the Agricultural Research Project (ARP) took at least four years (1981-84) and the first phase of the project started in 1985 and preparations for the second phase are underway.

Consolidation of Research Programs

In the last 29 years, IAR adopted different approaches to organize its research programs. Because of the need to strengthen the different agricultural disciplines, departmental approaches were adopted. Departments of field crops, coffee, horticulture, soil science, animal sciences, agricultural engineering and

[1]A large number of staff sent for graduate training did not return to the country for various reasons. Among those who returned home, some were transferred to other government institutions and state enterprises. In the 1980s, IAR had to look for senior research scientists for filling the leadership gap created by high staff attrition.

food science, and agricultural economics were established, each having a department head coordinating the program nationally and based at an appropriate research centre.

Reorganizations in 1987/88 led to a two-pronged approach to the generation and transfer of technologies i.e., commodity and zonal/regional research approach. With this set-up, the centres were made responsible for tackling the researchable problems of a particular agro-ecological region.

The research program of each centre was generally grouped into three major categories: crop production, animal production, and natural resources management. All supporting disciplines participate in each research project. The national commodity programs are designed to tackle the production problems of selected crops and livestock that are accorded top priority in the national goals of achieving food self-sufficiency, supplying raw materials for industry, and earning foreign exchange. Research problems are identified by a multidisciplinary team consisting of breeders, agronomists, crop protection specialists, soil scientists, agricultural economists and food science experts.

To build a sustainable NARS, a set of necessary and sufficient conditions have to be met. The necessary conditions refer to the recognition and the need for agricultural research and building the institution. The IAR was able to survive, sustain and attain its current status because the following sufficient conditions were met[2]:

1. continuous government funding and support,
2. continuous autonomy and depoliticized environment,
3. strong scientific leadership and dedicated national staff,
4. investment in and steady supply of human capital (continuous graduate training opportunities despite the high staff attrition),
5. articulated and defined requests for international support, including well prepared terms of reference for expatriate staff[3],

[2]According to the World Bank evaluation of the 47 African NARS, only nine meet the minimum standard to undertake efficient research. These are Cote d'Ivoire, Ethiopia (IAR), Ghana, Kenya, Madagascar, Nigeria, Senegal and Zimbabwe. Mauritius is rated above average (Cleaver, 1993).

[3]The terms of reference for the staff member focused on: the training of IAR staff; preparation of short, medium and long term research programs based on past programs and future needs; assisting in the identification, acquisition and procurement process of

6. necessary organizational developments and changes without disruption of ongoing programs and
7. control of the research agenda by national (i.e., not donor driven) (Stroud and Mekuria, 1992).

According to the review of the status of agricultural research, extension and training in Ethiopia by Seme Debela and Sentayehu G.Mariam (1990), the Ethiopian agricultural research service has made available useful research results and recommendations to the private, cooperatives and state farms. For example before 1984 over 100 varieties have been recommended for use by farmers. Since the establishment of the National Variety Release Committee in 1984, about 44 varieties have been approved for multiplication and dissemination. Agronomic recommendations (i.e. plant populations, fertilizer types, rates and application methods, irrigation systems, crop protection practices and water and soil conservation techniques) have been identified by the different research centres located in the different agro-ecological zones of the country.

2.2 Agricultural Extension Service: Review of Experiences

The MOA and the Ministry of Coffee and Tea Development operated extension systems to serve smallholders and PCs. The role of the extension system has been mainly to demonstrate technology, distribute inputs, carry out soil and water conservation projects and promote afforestation. Although there have been extension-strengthening projects in the past, relatively frequent reorganization, little in-service training for development agents, frequent transfers, and poor incentives including lack of pay raises and inadequate transportation facilities have resulted in a generally unmotivated staff (Stroud and Mekuria, 1992).

With assistance from the World Bank, the Government introduced the training-and-visit system (T&V) approach in 1986. Under this approach subject matter specialists in agronomy, soil and water conservation, crop protection, socio-economics, cooperative, livestock, and home economics are located at district centres. However, extension agents have not had access to good, appropriate information and do not generally have the training or the ability to adapt information to the farmers' situation. Furthermore, farmers often view the

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appropriate research equipment and facilities involved in the planning,design and execution of specific research projects and experiments.

extension agent with distrust and suspicion because they want to minimize government interference in their activities.

Historically, there has been a weak linkage between extension and agricultural research. For example, extension agents are not involved in IAR's on-farm research activities. The number of forums or appropriate publications where research information is passed to the extension worker has been limited. There have been few attempts by extension agents and researchers to collect farmer feedback concerning newly introduced technologies. In 1986 the Research and Extension Liaison Committee (RELC) was formed with members representing both IAR and MOA.

Farming practices, in spite of the extension advice and research effort, have remained traditional and relatively unchanged. In short, the extension service suffers from shortage of trained, experienced and motivated staff. The current extension agent to farmer ratio is 1: 1,300 which makes it impossible for the agent to render a meaningful service. The range of duties assigned to the extension agents have reduced their contributions to the smallholders.

III. ECONOMETRIC ANALYSIS OF TECHNOLOGY ADOPTION IN ARSSI

3.1 Technology Adoption: An overview

Given the rapidly growing population in Africa and continued degradation of the natural resources, the opportunity to increase production through area expansion is very limited. Since investments on irrigation are expensive and limited, the greatest potential for increasing agricultural productivity is likely to come from increasing yields on rainfed cultivated land. Yields can be increased through more intensive application of labour, more intensive application of existing technologies or adoption of new technologies. Farmers can adopt new inputs and new management practices in their production.

Preliminary observations show that farmers in Ethiopia have been very reluctant to adopt simple recommendations such as high yielding varieties and fertilizers. The yield gap between research stations, on-farm trials and farmers' fields are very high. The possible explanations for the slow adoption of improved

technology by farmers include lack of credit, lack of location specific research recommendations, poor extension service and rural infrastructure and repressive pricing policies. This large and diverse list of constraints has to be examined to identify the most limiting ones and to determine their relative importance. It is also important for policy makers to know these critical factors for efficient allocation of the country's meager resources for research and development programs. Furthermore, national research and extension services need to understand factors that induce or inhibit the adoption of technology. It is important to investigate the role and contributions of socioeconomic and institutional factors in the adoption of agricultural technologies.

Adoption of agricultural production technologies in developing countries is influenced by a wide range of economic, social, physical and technical aspects of farming. Recent adoption studies in Asia (Duraisamy, 1989; Lin, 1991; Jansent et al. 1990) and Africa (Polson and Spencer, 1991; Kebede et al., 1990; Adesina and Zinah, 1993, Green and N'Ogolata, 1993 and Hassan and Faki, 1993) have identified farmer and farm specific, technology specific, institutional and policy variables and environmental factors to explain the patterns and intensity of adoption. The literature also reveals that technology adoption is a function of various social and economic characteristics. Most studies have viewed adoption of a technological practice in isolation from other related practices, ignoring the interdependence of different technological practices. Other studies have viewed adoption as a discrete choice which assumes that farmers will eventually adopt a full range of technologies. Finally most studies have considered few explanatory variables and hence the models are underspecified.

This study takes these limitations into account and examines the interrelated technological practices of High Yielding Varieties (HYVs), fertilizer and herbicides and the incidence and intensity of fertilizer adoption. The study also includes a number of social, economic and institutional variables and adopters' perceptions of technologies.

3.2 Research Methodology

The study was carried out in the five major wheat growing districts of Arssi,namely Chilalo, Keleta, Galema,Gedeb and Ticho. A survey of 426 smallholders was conducted in the five districts from February to September 1991. Data were collected on farmer characteristics, farm resources, production practices, adoption of wheat varieties, fertilizer and herbicide and farmers' perceptions of recommended technologies. Logit and Tobit Econometric models

were estimated and statistically significant variables were identified to measure the relative importance of the variables influencing farmers' adoption decisions[4]. The components of the production package include high-yielding varieties (HYVs), chemical fertilizer and herbicides.

3.3 Empirical Results and Discussions

Adoption and Farmers Perception of Technologies: The initial benefits of the integrated rural development project in the Arssi region went largely to the land-owning class in Arssi, but the radical land reform of 1975 gave the small farmers access to land and improved production technologies. Table 1 presents the adoption rates of wheat production technologies. The sample farmers in Arssi a) have high adoption rates (87 percent) in fertilizer use, b) apply an average of 71 kg fertilizer per ha for wheat, c) fertilize 56 percent of the cultivated area per household, and d) have more than 15 years of awareness and knowledge about fertilizer use, and e) wheat has become an important food and cash crop (an average household supply to the market about half is wheat production). In terms of fertilizer application rates, there was considerable variation across the five districts. Almost half of the sample farmers in the region use 50 kg or less of fertilizer per ha. About 60 percent of farmers in the districts of Ticho and Gedeb apply 50 kg or less fertilizer per ha while the same proportion of farmers in Chilalo and Galema use relatively higher rates (75-100 kg/ha).

Wheat Varietal Adoption and Herbicide Use: Enkoy is grown in all the districts and is the highest yielder except in Ticho. Enkoy, which is grown throughout different zones of the region, has a yield gap of 45 percent between research station and on-farm trails, and 30 percent yield gap between on-farm trials and farmers' reported yields. Wheat gets priority in the use and allocation of purchased farm inputs. In Chilalo and Kelela, 52 percent and 48 percent of the farmers reported using herbicides respectively. The adoption rate and other characteristics reported in Table 1 assert that even after more than 25 years of technology development and transfer coupled with integrated rural development efforts in Arssi, adoption by smallholder farmers is a long term process.

[4]For the details on the econometric model specifications and results see Mekuria and Cawford,1994.

Table 1 Adoption of Wheat Production Technologies in Arssi Districts, 1990/91

Variety	Keleta	Chilalo	Galema	Gedeb	Ticho
ENKOY					
-Average yield kg/ha	1216	1330	1441	1068	805
-Adoption rate(% of farmers)	74	41	88	69	49
DASHEN					
-Average yield kg/ha	1057	934	900	-	-
-Adoption rate(% of farmers)	6	51	2	-	-
BULK					
-Average yield kg/ha	-	1333	1950	1025	965
-Adoption rate(% of farmers)	-	15	2	28	43
			Percent of Farmers		
FERTILIZER ADOPTION					
- Not using	13	3	14	13	26
- Using	87	97	86	87	74
Rate of fertilizer kg/ha					
-LT 25 kg/ha	30	11	5	29	28
-GT 25 LE 50 kg/ha	32	18	19	34	34
-GT 50 LE 75	21	25	20	15	13
-GT 57 LE 100	11	36	53	19	19
-GT 100	6	10	3	3	4
USE OF HERBICIDES					
-Not using	52	47	96	100	92
-Using	48	53	4	-	8

Note: LT =less than, GT= greater than and LE = less than or equal to.
Source: Field Survey, 1991

Econometric Analysis

This section presents the econometric analysis that identify the determinants of adoption and assess the effects of significant variables on the probability and intensity of adoption. Logit models are used to identify factors responsible for adoption and no adoption of fertilizers and herbicides by wheat growers. Tobit model is then used to further analyze the variables contributing to

the continued adoption and quantity of fertilizer use. The econometric analysis on the choice of the different wheat varieties did not give a satisfactory result. This could be because farmers mostly use their own seed from past harvests and even when they want to buy the improved seeds are not available. They do not have choice but to use the available local variety. However a survey of farmers' opinions on varietal preference indicate that variety-specific characteristics are important in their adoption decision. Characteristics that farmers consider important are yield, colour, resistance to diseases, tastes in local foods ('*injera*'and bread), price and adaptability in the area.

Logit Estimates of Fertilizer Adoption: Farmers' socio-economic circumstances and other institutional variables are used in the logit analysis of fertilizer adoption or no adoption. The dependent variable for fertilizer use is fertilizer applied on wheat in 1990 (FW90), coded as 0 or 1. Similarly, the dependent variable for herbicide use is APHBW90, coded 0 for not using and 1 for application of herbicides. Maximum likelihood estimation techniques are used and the results are presented in the following tables. The coefficient for farmer's age category (AGEHCAT) as expected has a negative sign implying the older household heads tend not to adopt fertilizer technologies. Level of education of household heads(LVLEDHH), family size (FMLSZ) and farm size (FARMSZHA) have positive sign. LVLEDHH and FARMSZHA are not statistically significant while FMLSZ is significant at the 5 percent level in this specific analysis. Further analysis is useful to determine whether farm size will have an effect in the intensity of input use rather than on the incidence of technology adoption. The logit analysis results suggest that access to credit (GETCRDT), herbicide use (APHBW90) and timely availability of fertilizer (GTFML) are the most important determinants of fertilizer adoption and non adoption. Their coefficients have the expected positive signs and are statistically significant at 1 percent, 1 percent and 5 percent levels respectively. Farmers' knowledge of fertilizer use, number of oxen owned and extension contact have positive signs as expected but are not significant.

The model correctly predicted the probability of adoption and no adoption for 85 percent of the cases. The partial derivatives given in column 3 of Table 2 reflect the respective effects of the continuous explanatory variables on the probability of adoption that are very minimal. The marginal effects of the binary regressors (codes as 0 or 1) are calculated by substituting their values (0 or 1) and the results are reported in Table 3. The effects of technical and institutional variables on farmers' decisions to use or not to use fertilizer are indicated in the same table. Since the farmers in the region have been aware of improved production technologies since 1968, it is not surprising that the average farmer has an 88 percent probability of using fertilizer. Those farmers having no access to

Table 2 Logit Analysis of Fertilizer and Herbicide Adoption In Arssi Districts, 1990/91

	Fertilizer Use		Herbicide Application	
Variables	Coefficients (t-ratio)	Partials	Variables	Coefficients (t-ratio)
CONSTANT	0.5202 (0.662)	0.02386	CONSTANT	-3.0574 (0.8083)
AEGHH*	-0.3151 (-1.641)	-0.0144	AGEHH	0.46805 (0.279)
LVLEDHH	0.0585 (0.289)	0.0027	LVLEDHH*	0.2505 (1.470)
FMLSZ	0.1131 (1.892)	0.0052	FMLSZ	0.5707 (1.172)
FARMSZHA	0.0756	0.00346	FARMSHA***	-0.4261 (-3.744)
OXNUM90	0.1601 (1.079)	0.0073	OXNUM90***	0.3250 (2.697)
GTFTML**	0.6338 (1.851)	0.0289	GETCRDT**	0.4527 (1.813)
GETCRDT***	0.9958 (3.071)	0.0455	FW90**	1.1432 (2.302)
KWRFTRT	0.1034 (0.385)	0.0047	DAVST90***	0.9406 (3.018)
APHBW9	1.2641 (2.537)	0.0583		
DAVST90	0.2641 (0.504)	0.0121		

Note: (***,** and * indicate level of significance at the 1, 5 and 10% levels, respectively)
Source: Field Survey, 1991

extension service, and no knowledge of the recommended rates of fertilizer and herbicides have a probability of 73 percent to use fertilizer. Subsequent provision of technical support (extension service, farmers' awareness to the recommended fertilizer rates) and institutional support (access to credit, timely availability of fertilizer and herbicide) will increase the incidence of adoption to more than 90 percent. The complete package of inputs and services will raise the use of fertilizer to 98 percent. It is worth mentioning that farmers' decisions to use fertilizer are related to their use of herbicide as these inputs are complementary in crop production. Ownership of land, labour and oxen appeared less important in determining the incidence of adoption.

Logit Analysis of Herbicide Adoption: Estimates of the logit model for herbicide use in Table 2 show that farm size has a negative effect on the adoption of herbicide in the study area. This is contrary to the previous findings on technology adoption. Farmers reported that they were unable to buy the input in the market as it was rationed by the local extension office. Government policy in the past discouraged the use of herbicides by the smallholder sector. Farmers with larger plots were not able to get herbicide for all their fields and had to use family and/or hired labour for weeding. The variable DAVST90 has a significant and positive effect on the dependent variable confirming that farmers who have regular contact with the local extension office appeared to use herbicide more than those who have less extension contact. As in the case of fertilizer use, herbicide use is also enhanced by the use of fertilizer. Most farmers indicated that credit is used primarily for fertilizer purchase. The complementarity of the two inputs is confirmed by the positive effect of access to credit on herbicide use. More credit enables farmers to buy fertilizer and more fertilizer use will encourage farmers to adopt herbicides. Family size was expected to be negatively affecting herbicide use as labour is substituted for hand weeding. The labour shortage during critical periods of weeding and harvesting of different crops that smallholders grow appeared not to have a substitution effect on herbicide use.The variable OXNUM90 has a positive relationship with herbicide use indicating the relationship between resource endowment and input use. In this particular analysis, the effects of land and labour did not conform to our theoretical expectation. The results of the analysis do not support the contention that farmers age negatively affect the use of herbicide. The model correctly predicts 78 percent of the cases and it is expected that an average farmer has only 19 percent probability to use herbicides given the mean values of the regressors. Herbicide use in the study area is very low as only 22 percent of the sample farmers reported to use the input at one time or another.

Table 3 Relative Effects of Explanatory Variables on Fertilizer Adoption in Arssi, 1990/91

Relative effects on probability selected variables	Probability of adoption
No Technical/Institutional Support	0.74
Extension Service	0.78
Access to Credit	0.88
Herbicide Availability	0.91
Timely Fertilizer and Credit Availability	0.89
Average Adopter Based on Mean Values of Ind. Vbls	0.89
Availability of Inputs and support Services	0.98

Source: Field Survey, 1991

Tobit Analysis of Adoption and Use of Fertilizer: The Tobit analysis is used to identify the effect of economic, technical and institutional variables on both the adoption and the intensity of fertilizer used and the coefficients of the model are reported in Table 4. The results of the Logit models suggest that the institutional variables are more important explaining the incidence or choice of adoption. The findings of the Tobit analysis indicate that resource endowments play critical role in the adoption and intensity of fertilizer use. Variables FARMSZHA, OXNUM90, APHBW90, and DAVST90 have a significant effect on adoption and use of fertilizer. The regression equation is computed using the mean values of the independent variables. The predicted probability of adoption for a farmer with characteristics X (the vector of explanatory variables) is estimated as[5] :

[5]The predicted probability is computed using results in Table 4
$X'B = 49.2974$
$\sigma = 46.41346$, then
$F(X'B/\sigma) = F(49.2974/46.41346) = F(1.062136)$.
from the Z table, $F(1.06216) = 0.855913$.

$F(X'B/\sigma) = 0.85591$, where F is the cumulative standard normal distribution function. According to these findings there is 85.6 percent chance that an average farmer would apply fertilizer. Expected value of fertilizer use across all observations as defined by the Tobit model (Tobin, 1958) is given as:

$E(Y) = XBF(z) + \sigma f(z)$ and substituting the values for the estimates shown in Table 4, $E(Y) = 49.2974(0.85591) + 46.41346(0.2651609) = 54.50117$ kg. where $z=XB/\sigma$ and $f(z)$ is the unit normal density. Similarly the expected quantity of fertilizer used by an adopter is:

$E(Y^*) = XB + \sigma f(z)F(z) = 63.67628$ kg. These estimates show that the average (considering adopters and non adopters) farmer is expected to use 55 kg of fertilizer while those farmers who have adopted will use 64 kg of fertilizer per farm. This expected quantity of fertilizer use per farm would be less that 25 kg/ha given an average farm size of 2.7 ha per household. The suboptimal rate of fertilizer use hence calls for a comprehensive approach to alleviate the constraints of adoption.

Furthermore, the results of the Tobit model can be used to identify the effects of changes in an explanatory variable on the adoption and intensity of use. McDonald and Moffitt (1980) present a Tobit decomposition approach to separate two effects:

i. changes due to likelihood of new adoption and
ii. expected changes in intensity of adoption by those who have already adopted.

For the study, the total probability of adoption (i.e. 0.85) is decomposed to give probability of 0.55 and 0.30 for new adoption and intensity of use, respectively. The decomposition of the effects is important to identify the influence adoption determinants on the sequential stages of adoption, i.e., to adopt or not to adopt and then to continue using the technology. Table 4, presents the elasticity of decomposition for changes in the explanatory variables. Total elasticity of a change in the level of any of the variables consists of two effects: elasticity of expected use intensity (E_1) and elasticity of adoption probability (E_2). Adding the two effects will give us the total elasticity. Given that there is a high rate or incidence of adoption it is expected that any change in the determinants of adoption will affect the intensity more than the probability of adoption. The elasticities computed, therefore, confirm that marginal changes in the independent variables listed increase the use intensities (E_1) more than the probability of adoption (E_2) are relatively smaller than E_1. Overall the elasticity estimates in

Table 4 reflect inelastic ($E<1$) response to changes in the adoption variables[6]. Farm size has the highest impact on the use intensity and probability of adoption with a total elasticity value of 0.42. This value is divided into 0.24 and 0.18 for intensity and adoption probability respectively.

The implications of these estimates are useful to evaluate proposed policy changes affecting technical and institutional variables used in this study. For example a 10 percent change in farm size is expected to result in about a 4.2 percent increase in adoption and use of fertilizer. The expected intensity will increase by 2.4 percent while the probability of adoption will increase by 1.8 percent. In addition, the wealth variable used in the analysis, i.e., number of oxen owned has a total elasticity value of 0.26, which is composed of 0.15 and 0.11, of the elasticities of intensity and adoption, respectively. The other variables are also important in affecting the adoption and quantity of fertilizer use.Adopters' Perceptions of Technologies: Recent studies identify three paradigms for technology adoption: a) innovation-diffusion, b) economic constraints and c) adopters' perceptions (Adesina et al., 1993). The surveyed farmers reported that unavailability, late delivery and high prices are the major reasons for not using fertilizer, herbicide and HYVs in Arssi. Wheat varieties are preferred by farmers for their specific attributes. Yield is the most important criterion in selecting the three most popular varieties: Dasher, Enkoy and Bulk. Other factors such as grain colour, grain price, taste in preparing local foods, resistance to lodging and diseases are listed as important criteria in varietal preference by farmers. In terms of adoption category for the entire sample,17 percent, 46 percent and 37 percent of the sample farmers are low, moderate and advanced adopters, respectively. More than half of the Galema farmers are classified as advanced adopters. About 40 to 50 percent of farmers in each of the five districts and 46 percent in Arssi are classified as moderate adopters. Among the low adopters, Gedeb and Ticho farmers constitute the largest proportion (Mekuria and Crawford, 1994).

[6]Inappropriate government intervention based on the command economy model has handicapped the performance of agriculture in Ethiopia. Consequently, input and output prices were fixed for many years by the government. The price responsiveness of small farmers and the effect of prices on technology adoption is not covered in this study. For details on prices on technology adoption is not covered in this study.

Table 4 Tobit Analysis of Fertilizer Adoption in Arssi Districts, 1990/91

Variable	Coefficient (t-ratio)	E_i	E_i
Constant	-3.6488 (0.292)		
AGEHCAT	-4.6776 (1.510)	-0.1208	-0.0894
LVLEDHH	4.1675 (1.294)	0.0472	0.0349
FMLSZ***	0.64187 (0.703)	0.0425	0.0314
OXNUM90**	8.639 (3.943)	0.1475	0.1091
GTFML	0.65634 (0.130)	0.0019	0.0014
GETCRDT	5.0806 (1.074)	0.0201	0.0149
KWRFTRT*	5.5388 (1.550)	0.0401	0.0297
APHBW90***	17.810 (3.084)	0.0366	0.0271
DAVST90**	14.557 (2.315)	0.0188	0.0139
	46.413 (26.027)		

NOTE: E_i = Elasticity of intensity and E_i = Elasticity of adoption.
Source: Field Survey, 1991

IV. CONCLUSIONS AND RECOMMENDATIONS

In many sub-sahara African(SSA) countries a green revolution type of technology should be the basis of an agriculture-led growth strategy that includes a delicate mix of policy and institutional reforms. The possibility of increasing production and solving the long term problem of poverty depends on the strength of the NARS in terms of human; scientific and institutional capacity. The role of agricultural research is to help create conditions required to increase productivity, while protecting and enhancing the natural resource for the future generation (Rukuni and Anandajayasekeram, 1994).

It is worth identifying the major empirical findings of this study pertaining to technology development and dissemination in order to get some insight on the formulation of appropriate agricultural development policy in general and agricultural research in particular. The following major findings emerge from the results of the analysis of technology adoption in the study area : a) although farmers in the study area are aware of the recommended technologies, particularly fertilizer, HYVs and herbicides, they are using suboptimal levels of these inputs because of their unavailability, high input prices relative to grain prices, or farmers' own reservations about the technologies; b) since 20 percent of the farmers use less than 25 kg fertilizer per ha, it is imperative to consider developing low input technologies for resource poor farmers. Agricultural researchers have to focus on refining the technological packages of recommendations so that they can tailor their recommendations for different farming systems and for farmers with different levels of resources; c) the IAR has recently incorporated adopters' perceptions of specific characteristics of technology into its research agenda. Future crop improvement programs have to consider the specific attributes of varieties that influence farmers' decisions. A demand-driven agricultural research program requires feedback from the users.

Implications for Agriculture Research: Based on these findings it is important that the NARS in Ethiopia to : i) develop a comprehensive agricultural research policy which is consistent with the sectoral and macro-economic policies to achieve the overall development goals. Policy research is needed to discover those options that are most likely to favour the multiple objectives of the agricultural sector including increasing productivity and reducing food insecurity, ii) give emphasis to high potential areas and focus on identified responsive or priority crops and allocation of resources to accelerate technology development and transfer, and iii) emphasize small scale irrigation development (as the country has untapped

irrigation potential) and strengthen the research on drought/stress resistant crop varieties.

Implications for Agricultural Extension: The major duties of extension agents are input distribution, organizing and managing demonstration sites and field days to promote agricultural technology transfer. The following implications are relevant for the agricultural extension service. i) During the 1974-91 period, the extension service was preoccupied with promoting collective agriculture, leaving little time for assistance to smallholders. The study reveals that since the adoption of new technology is influenced by the frequency of extension contact, the extension service needs to design a cost-effective way of reaching the smallholders who are located in the remote rural areas of the country. ii) The study found that farmers are sub-optimally using the recommended packages of technologies. With feedback from farmers, extension agents will be in a better position to understand what factors are contributing to the sub-optimal use of recommended inputs. Extension feed back will also contribute to the design of effective technology development and transfer policies.

The findings of this study reveal that smallholders are responsive to economic incentives and that the smallholder road to development should form the centrepiece of agricultural policy. The government should consider investing a higher percentage of its resources in the smallholder sector and formulate agricultural development policies to stimulate the development of the smallholder agriculture. For a successful agricultural technology development and transfer, the economic policy environment should facilitate the following: a) expand investment in research, b) promote effective research and research management, c) guide research and specify the most appropriate technology, d) accelerate technology diffusion and adoption by strengthening the extension service and other farmer support institutions, and e) avoid or correct the undesirable distributive effects of technological change on the poor.

Finally, if agricultural technology is to contribute to the alleviation of poverty and hunger by improving food security in Ethiopia, then the NARS and the government have to play a more productive role than ever before. Agricultural research and extension institutions in Ethiopia have to meet the challenge of developing and transferring technologies with benefits accruing to as broad a spectrum of society as possible. For this to happen, adequately sized and funded research and extension teams should be in place. Given the high attrition rates of experienced research scientists, the investment in human capital through graduate level training should be a major priority in institution capacity building. An

enabling socio-political environment and appropriate policy measures are the necessary conditions to get the Ethiopian economy back on the upward path.

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AGRICULTURAL MARKETING FROM FOOD SECURITY PERSPECTIVE

LIVESTOCK AND FOOD SECURITY IN ETHIOPIA: AN OVERVIEW

Mohammed Mussa[1]

I. INTRODUCTION

Per capita food production in Sub-Saharan Africa (SSA) including Ethiopia has been declining over the last three decades. Production growth rates during these decades stagnated around -0.6 percent in 1980-83 and gradually declined to -6.2 percent in 1990 (FAO, 1990). On the other hand, with a rapid population growth, the demand for food has been increasing at the rate of 2.9 percent per annum since 1970 (Yaker, 1993) resulting in food imports and international aid. Despite the available resources and the efforts made by governments in SSA, food insecurity remained one of the most crucial issues. For instance, at the beginning of the 1980s, consumption of basic staple exceeded production by about 8 million metric tons (Braun and Paulino, 1990). The International Food Policy Research Institute (IFPRI) projected that by the year 2020, SSA will have food shortages and that the net imports of basic food staples is estimated to be as high as 9-27 million metric tons (Hibler, 1988; Braun and Paulino, 1990 and IFPRI, 1995). This clearly calls for the formulation of appropriate strategies and policies to ensure food security for the growing population.

The gap between production and consumption in most SSA countries is induced by the slowdown of the agricultural production growth rates. The major causes for the slow growth rates of agriculture include various factors such as unfavourable climatic conditions, undeveloped infrastructure, inappropriate agricultural policies and predominantly traditional production systems.

In Ethiopia, agriculture accounts for about 85 percent of the working force, 90 percent of exports and 50 percent of the total Gross Domestic Product (GDP). In the 1980s, the sector grew at only 0.1 percent per annum which is 2.9 percent below the rate of population growth (USAID, 1995) while rural underemployment increased, nutrition levels declined, and food aid imports increased significantly. The gap between food production and consumption is often

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filled by imports and international aid. In 1990, the amount of grain imported and aid to Ethiopia amounted to 680 and 538 thousand metric tons, respectively (World Bank, 1992). However, commercial imports and food aid cannot be considered as feasible strategies for long term economic development. The challenge for the Ethiopian government is how to produce sufficient amount of food in order to cope with the problem of food insecurity.

To ensure adequate food supply, developing new technical innovations and appropriate utilization of existing resources becomes important. Strategies developed through experience by Ethiopian farmers to overcome problems of food insecurity are based on the combination of crop and livestock production and off-farm employment. Although livestock are one of the sources contributing to the attainment of food security, it has received relatively little attention in terms of policies, programs and budget allocation. The livestock sub-sector is constrained by several factors such as animal diseases, poor genetic improvement, feed supply, and institutional and policy factors.

The objective of this paper is to address the contribution of livestock to food security in Ethiopia and to make suggestions on how to eliminate or alleviate the constraints facing the subsector for increased and sustainable contribution to food security.

II. LIVESTOCK IMPORTANCE IN FOOD SECURITY

Ethiopia has the largest livestock population in sub-Saharan Africa. In 1993, the total number of cattle was estimated at 31 million, sheep at 28 million, goats at 27 million (FAO, 1994). The highland of Ethiopia alone accounts for 70 percent of the cattle, 75 percent of the sheep and 27 percent of the goats (Jahnke and Getachew, 1983). Not taking into account the contribution of draft power and manure, livestock constitute about 40 percent of the agricultural GDP in Ethiopia (Winrock International, 1992). Livestock play a major role in food security at national and household levels. Livestock are important to smallholder crop-livestock production systems, converting low-quality plant biomass into high-quality human food. Livestock are also the living bank for many farmers and play critical role in the agricultural intensification process by providing draught power and manure for fertilizer and fuel. They are also means of accumulating wealth and are source of foreign earnings. Cash incomes from the sales of livestock and livestock products are the sources for procuring modern agricultural inputs, such

as fertilizer, insecticides, pesticides, improved seeds and others which are the means for achieving high crop yields.

Livestock directly and indirectly contribute to food security. The direct contribution includes meat and milk whereas the indirect contributions include draft power, manure and income from sales of livestock and livestock products which are often used for the purchase of food grain during bad harvests. In mixed crop-livestock production systems, the food directly consumed from livestock is less, compared to crop products. However, the indirect contribution of livestock to food supplies in the form of draft power, manure, transport and income are high.

2.1 Food Supply

Adequate quantity of balanced and nutritious food is an indicator of a healthy life, and human welfare and development, and this food balance and nutrition are acquired from the livestock products as well. Livestock are important sources of food particularly of high quality protein, minerals, vitamins and micro-nutrients (Sansoucy et al, 1995). The total and per capita production and yield of meat in Ethiopia are given in Table 1. The table shows that Ethiopia has the largest livestock population in sub-Saharan Africa though the per capita production and yield per animal are below the average for the region partly suggesting the prevailing predominantly traditional livestock production system and other constraints hampering the subsector.

Table 1 Total and Per Capita Production and Yield of Meat in Ethiopia (1987)*

Commodity	Total ('000MT)	Per capita (kg)	Yield (kg/animal)
Beef and veal	246	5.6 (4.5)	110 (129)
Mutton	82	1.9 (1.0)	10 (13.1)
Goat meat	66	1.5 (1.6)	8.5 (11.3)

* The values in brackets are the average for Sub-Saharan Africa.
Source: ILCA, 1991

The total and per capita consumption and growth rates of total meat and milk for selected SSA countries are given in Tables 2 and 3, respectively. It is indicated that in 1987 the total and per capita consumptions of meat in Ethiopia were 582.5 thousand metric tonnes and 13.3 kg, respectively. The total consumption of meat is the highest in the selected SSA countries while the per capita is less than that of Somalia and the Sudan and is close to the average for the selected SSA countries. Regarding milk, the total and per capita consumptions were 1101 thousand metric tons and 25.6 kg, respectively. The total milk consumption is less than that of the Sudan and Somalia while the per capita consumption is less than the average for selected countries nearly by half. The growth rates for both meat and milk consumption suggest that there are increases in total consumption but decline in per capita consumption. The declines in growth rates of per capita consumption suggest that population growth rates are faster than total consumption growth rate. The indications are also that the amount of protein from livestock products per person per day is less than half a gram in Ethiopia (ILCA, 1991). Furthermore, the average amount of energy and protein obtained per person is indicated as one of the lowest in SSA despite the fact that the country has the largest livestock population (ILCA, 1991).

Table 2 **Total and Per Capita Consumption of Meat in Selected sub-Sahara African Countries**

Countries	Consumption 1985/1987		Annual Growth Rates (%)			
			1961-1974		1975-1987	
	Total ('000MT)	Per capita (kg/year)	Total	Per capita	Total	Per Capita
Ethiopia	582.5	13.5	0.2	-2.1	1.8	-0.2
Kenya	257.7	12.1	2.9	-0.5	0.6	-3.3
Somalia	149.9	22.6	2.2	-0.1	2.2	-2.1
Sudan	455.9	20.3	3.0	0.6	2.4	-0.7
Tanzania	230.6	9.8	2.9	-0.2	3.4	-0.3
Uganda	144.5	9.0	2.7	-1.1	0.5	-2.7
Total	1821.0	13.7	1.8	-0.3	1.9	-1.1

Source: ILCA, 1991

Table 3 Total and Per Capita Consumption of Total Milk in Selected Sub-Sahara African Countries

Countries	Consumption 1985/1987		Annual Growth Rates (%)			
			1961-1974		1975-1987	
	Total ('000MT)	Per capita (kg/year)	Total	Per capita	Total	Per Capita
Ethiopia	1101.1	25.6	1.6	-0.7	3.8	1.7
Kenya	1090.1	51.3	2.0	-1.3	1.0	-2.9
Somalia	1509.0	227.7	2.0	-0.2	2.9	-1.3
Sudan	3010.7	133.9	1.4	-1.0	7.9	4.6
Tanzania	519.7	22.0	2.9	-0.2	1.8	-1.8
Uganda	316.4	19.7	2.2	-1.5	-0.1	-3.3
Total	7547.0	56.7	1.9	-0.3	4.2	1.2

Source: ILCA, 1991

The inevitable population growth and urbanization in the country will result in increase in demand for livestock products, such as meat, milk and other livestock products. Since the urban population (Addis Ababa) constitutes a potential market for any rural surplus production, the disposal of such surplus livestock products depends on the income and preferences of urban consumers. Beef consumption of the Addis Ababa population by income category is given in Table 4. The table shows that the high income category population of Addis Ababa (10 percent) consumes 27 percent of the total beef with a per capita consumption of 25 kg per year. It is indicated that 50 percent of the population, the low income category, consumes very little beef (1.3 kg per person/year). The weighted average of the per capita consumption is 9.15 kg per person/year. Estimates of the income elasticity of demand vary between the three income categories of the Addis Ababa population suggesting that the middle income group is expected to have the highest propensity to increase meat consumption with increased income. Table 4 shows that for the middle income category, a 1 percent increase in income will lead to a 0.9 percent increase in demand for beef, while for the total population, the increase of demand for beef is 0.68 percent.

Table 4 Beef Consumption in Addis Ababa by Income Categories, 1994

	Income Categories			
	High	Middle	Low	Total
Population ('000)	300	1,200	1,500	3,000
% of total population	10	40	50	100
Per caput annual beef consumption (kg)	25	15	1.3	9.15
Total beef consumption (tones)	7,500	18,000	1,950	27,450
Average carcass weight (kg)	160	140	120	
Income elasticity of demand	0.7	0.9	0.5	0.68
Total number of animals	46,875	128,571	16,250	191,696

Source: Speirs, 1994

The projected beef consumption in Addis for 1995-2010 is given in Table 5. The table includes the projections of the Addis Ababa population, per capita consumption and the total number of beef animals required for the next 15 years. It is indicated in the table that to meet the demand for the Addis Ababa population in 2010, a total number of 436,000 beef cattle is required, which is equivalent to 72,500 tones of beef per annum (Speirs, 1994).

Table 5 Projected Beef Consumption in Addis Ababa, 1995-2010

Year	Population ('000)	Per capita consumption (kg/person)	Number of beef cattle (heads)
1995	3,144	9.27	201,573
2000	3,984	9.90	259,748
2005	5,068	10.54	335,967
2010	6,470	11.20	436,064

Source: Speirs, 1994

2.2 Draught Power and Manure

In mixed farming systems of developing countries, livestock are widely used for traction. In areas where crop-livestock mixed farming system is evolving and expanding, increased use of animal traction will help intensification of farming, higher output and income and therefore greater food security (McIntire et al, 1992). In the highland and mid-elevation areas (*dega and weina dega*) of Ethiopia, 90 percent of the crop production is carried out by using draught power. In the lowland areas (*kola*), extensive rangeland areas (about 60 percent of the total land of the country) are occupied by semi nomadic groups who depend on livestock as primary sources of their livelihood (Mohammed Mussa, 1994). The use of animals for traction is improved by using a single ox traction or by using a crossbred cow instead of a male. This reduces the cost of maintaining the larger herd necessary to satisfy the replacement and milk production. Nevertheless, more feed may be required for the draught cows so as to maintain their milk production and reproduction (Sansoucy et al, 1995). Furthermore, the crossbred cows require more attention since they are more exposed to various animal diseases.

In the majority of smallholder farming systems where there is little access to chemical fertilizer, manure is the source of fertilizer. It has been empirically demonstrated that in highland Ethiopia, smallholder farmers practising integrated crop and livestock production systems get more income than those practising only crop production (Omiti, 1995). This is partly because of the contributions of draft power and manure to high crop yields. However, both manure and draught power

are not accounted for in the contribution of livestock to food security or to the agricultural GDP which is underestimating the importance of the livestock industry in the national economy.

2.3 Source of Income

The indirect contribution of livestock to food security is also attributed by the income from sales of livestock and livestock products. Livestock are sources of cash income for farming households. They are often referred to as "cash crop" in most integrated crop-livestock farming systems because of the conversion of livestock and livestock products into cash income. At times of shortfall in food stocks, livestock, especially small ruminants, are first to be considered for sale when farmers have to purchase food grain (Andargachew Kebede, 1990). This is particularly true for pastoralists whose livelihood depends on livestock keeping. In the Ethiopian highlands where integrated crop-livestock production system is practised, livestock account for about 34 to 87 percent of the total cash income. In the highland areas, farm cash income comes primarily from livestock (Gryseels, 1988; Getachew Asamenew, 1991 and Omiti, 1995, quoted in Sansoucy, 1995). In addition to sales of livestock and livestock products in domestic markets, livestock are sources of foreign earnings next to coffee. For example, in the mid-1980s, export revenues from live animals came in second after coffee and comprised 12 percent of the gross annual export revenue (Coppock, 1993).

2.4 Livestock in the Pastoral System

Pastoralists are defined as people who derive most of their livings/earnings from livestock in a situation where most of the animal feed is natural forage rather than cultivated fodders and pastures (Sandford, 1983). In the Intergovernmental Authority on Drought and Development (IGADD) member countries, there is a population of 10-12 million pastoralists who are one of the most food insecure groups (Hubbard et al, 1991). Pastoralists constitute about 20 percent of the population of Ethiopia and occupy 60 percent of the land. A significant number of export animals come from the pastoral areas. Lowland cattle and small ruminants constitute about 90 percent of the legal exports of live animals (Coppock, 1993).

During normal rainy seasons, the human diet is dominated by cow milk. Milk production is however affected by reduced forage production. The 1983-84

drought has greatly affected the herds of the pastoralists and also the milk output. The drought reduced daily milk offtake to an average household by 92 percent. Losses of animals due to drought in Borana show that cattle herd experienced a lose of 60 percent (N=4143), with 42 percent lost due to mortalities, 14 percent to sale and 4 percent of slaughter (Coppock, 1993). This situation has affected not only the livelihood of pastoralists but also the livestock trade of the country.

Different traditional tactics are employed by the agro-pastoralists and pastoralists to mitigate famine during droughts. The Borana pastoralists use the following tactics during droughts/famine: (1) hunting, (2) sending the elderly or other volunteers to famine relief camps, (3) consume boiled cattle hides, (4) prioritising young children to consume milk, (5) shift diet composition for other age groups to include more cereals, meat and blood to accommodate the needs of children, and (6) reduce size and frequency of meals for adults and older youth.

There is a global trend that because of population pressure and land limitation, pastoralists are gradually disappearing and that they shift into the cultivation of crop and other economic activities. In Ethiopian pastoral areas, there is also a tendency of agro-pastoralism where the conditions permit to grow crops. However, food security of the Borana population still depends on the purchase of grain through sales of animals. Moreover, as far as cash output is concerned, the Borana pastoralists are better off compared with a highland farmer (Cossins and Upton, 1987). As indicated in Table 6, the Borana pastoralist produces less food energy per household and per capita than a mixed crop-livestock farmer. It is apparent, however, that they produce more cash output per household and per capita than a highland farmer. It follows from this that the Borana pastoral system produces more cash returns compared with the highland system mainly due to sales of animals and food security is dependent on livestock.

Table 6 **Comparisons of the Borana Pastoralism with a Mixed Crop-livestock System**

Parameters	Borana pastoralist		Mixed crop-livestock farmer	
	Cash (Birr)	Energy (MJ)	Cash (Birr)	Energy (MJ)
Per hectare	15	119	178	7498
Per household	1277	9702	445	18744
Per capita	255	1940	80	3408

Source: Gryseels and Anderson (1983)

III. CONSTRAINTS TO LIVESTOCK PRODUCTION

Livestock productivity is impeded by several constraints including diseases, feed supply, genetic improvements and institutional and policy factors. If these constraints could be resolved, then there are untapped potentials which the livestock subsector could contribute to food security in Ethiopia. These constraints are addressed in the following sections.

3.1 Animal Diseases

Ethiopia's meat and milk yields are among the lowest in SSA while animal mortality rates are among the highest. This situation can be attributed in part to animal diseases, insufficient and ineffective coverage of animal health services. Annual loss due to animal diseases in Ethiopia is as high as 30-50 percent of the total value of livestock production (Mohammed Mussa and Gavian, 1994). Animal diseases reduce not only livestock productivity and production but also eventually affects the crop production because of decreased availability of animal power and manure.

The major livestock diseases reported in Ethiopia include rinderpest, trypanosomiasis, anthrax, contagious bovine pleura-pneumonia (CBPP), African Horse Sickness (AHS), small pox, foot and mouth disease (FMD), liver fluke, and

tick and tick-born diseases (Langridge, 1976 and the Ethiopian Ministry of Agriculture, 1984). The Department of Veterinary Services in the Ministry of Agriculture has been keeping records of disease outbreaks which have been reported by the respective administrative regions/zones. The cumulative disease outbreaks for the country and trends of morbidity rates[2] for the last three years are given in Table 7. The highest morbidity rate is observed due to AHS in 1992. The trends suggest that morbidity rates due to anthrax and FMD have increased from year to year. Morbidity rates due to AHS, CBPP and small pox fell in 1993 and then increased in 1994.

Table 7 **Major Animal Diseases in Ethiopia and Trends of Morbidity Rates[3]**

	Trends of Morbidity Rates (%)		
Diseases	1992	1993	1994
AHS	6.6	0.1	2.0
Anthrax	0.3	0.4	0.6
CBPP	0.2	0.1	0.7
FMD	0.8	1.4	1.6
Small pox	3.5	0.8	1.2
Rinderpest	0.5	0.2	NA[4]

Source: Mohammed Mussa and Sarah Gavian (1994)

[2]Morbidity rates are computed as the ratio of total number of cases to the total number of animals examined.

[3]Due to lack of information, one of the major diseases, trypanosomiasis, is not included here.

[4] Data not available.

In urban and peri-urban dairy production systems, diseases of intensification, that is, reproductive problems, internal parasites, young mortality and foot-rot are considered to be important (ILCA, 1993). These diseases were identified as important by specialized dairy farmers and Addis Ababa intra urban dairy farmers. Mastitis was identified as a major constraint by a wider group, including peri-urban dairy producers in secondary towns of the dairy belt.

Thus, strategies to improve animal health services are increasingly important. Moreover, given that Ethiopia is an important exporter of livestock and livestock products, animal health certificates and meat inspection are required by the importing countries. In this regard, the improvement of animal health services are important not only to increase livestock production for domestic consumption but also to preserve the credibility of the country in the world livestock market.

3.2 Feed Supply

Feed shortages, especially during the dry season, is a major constraint to animal production in all zones in sub-Saharan Africa. In the pastoral areas, feed problem is often crucial. Even where feed is plenty, it may not provide a balanced diet or may be inefficiently converted into animal products (Fitzhugh and Saleem, 1991). In the drier areas, seasonal shortage of feed supply are common while in the wetter areas, the nutritive value of forage varies seasonally and the failure to preserve surplus therefore limits year-round carrying capacities (Fitzhugh et al, 1992).

In Ethiopia, the fluctuating quantity and quality of feed sources is one of the constraints of the livestock development. Ruminants in the highlands mainly depend on native grassland and crop residues. Crop residues provide an estimated 40-50 percent of the annual feed requirement of livestock in the highlands (Urs et al, 1995). Feed availability is seasonal. Three seasons of feed availability are identified (Saleem and Abate, 1995): long rainy season (July - September) during which feed is adequate; dry season (October - February) during which straws and other crop residues become available, and the third season, starting February is when feed availability declines. The availability of feed in the highlands by yield and source have been estimated by Jahnke and Getachew Asamenew (1983). As illustrated in Table 8, the total feed output is 33.7 million tones of which 65 percent comes from both communal and privately owned rangelands and pastures and fallows while 35 percent comes from the cropping sub-system. The recent estimates are however higher than these estimates. Total feed is estimated at 51 million tones instead of 33.7 million tones since cropped land contributed 15.3

million ha which suggests major shifts in land utilization (Mohamed-Saleem and Abate Tedla, 1995). Nevertheless, feed shortage in the highlands is still acute. The trend for the quality of feed has declined and is not enough to support animal growth, meat and milk production and traction.

To increase feed availability and quality, packages are needed that combine a variety of feed resources including forage legumes, fodder trees and agro-pastoral by-products, as well as existing pasture and crop residues. The strategies proposed to improve feed availability in the highlands include increased cereal crop production from which crop residues after harvest could be important sources of feed (Mohamed-Saleem and Abate Tedla, 1995).

Table 8 Available Feed Resources in the Highlands

Feed Sources	Area (mil. ha)	DM yield (tone/ha)	Output (mil. tones)	Percent
Rangelands and fallows	7.3	3.0	21.9	65
Cropped land:				
- cereal residue	6.1	1.4	8.5	25
- stubble grazing	-	0.4	2.4	7
- pulse residue	1.7	0.5	0.9	3
Total	15.1	-	33.7	100

Source: Jahnke and Getachew (1983), quoted in Mohamed Saleem and Abate Tedla, 1995

The problem of animal feed is more acute in the pastoral areas because of the recurrent droughts. New feed technologies which could be suitable for the pastoral areas need to be introduced. ILCA has developed ways of introducing forage legumes into the traditional farming and agro-pastoral systems to provide supplementary feed. Another method is to introduce the fodder bank, a fenced area of densely populated planted forage legumes providing a high protein supplement during the dry season (Otsyina et al, 1987). This practice has been introduced in humid and subhumid Nigeria which could also be encouraged in Ethiopia as an opportunity to resolve feed constraints for the dry season.

3.3 Genetic Improvements

For increased livestock productivity and production, genetic improvement is a key factor. In Ethiopia, the majority of the farmers keep indigenous animals of low productivity. The genetic structure of Ethiopian livestock has evolved largely as a result of disease control, availability of feed and water etc. In some areas where diseases are not threatening and water and feed are available, new technologies, such as artificial insemination (AI) have evolved and been maintained, a change in genetic structure has been introduced. This structural change has resulted in high production. As an example, a comparison of milk production of indigenous cows and crossbred cows in the Selale area (north of Addis Ababa) shows that there is a significant difference in milk production of local and crossbred cows. The milk yield per crossbred cow per day is almost more than double of that of the local cows. The lactation length for the crossbred cow is 289 days against 189 days for a local cow (Ehui et al, 1995). This indicates that there is an opportunity to increase milk output at national level by introducing improved breeds which may be conducted by using AI or bulls. It is, however, indisputable that the management cost of a crossbred cow is higher than a local cow. Although this paper does not present the costs and benefits of managing different breeds of cows, indications from peri-urban dairy production systems are that crossbred cows are more profitable than local cows.

3.4 Institutional and Policy Constraints

Policies are important instruments to promote efficient production activities. However, inappropriate policies can do the opposite. Government policies are often at macro level and do not take into account the problems encountered at micro-level. Furthermore, policies are in general in favour of urban consumers at the expense of rural producers (Winrock International, 1992). In Ethiopia, the government policies have been inappropriate and have hampered the development of the livestock industry. During the command economic system which lasted for nearly two decades, imports and exports of livestock inputs and outputs were controlled by the state. Foreign exchange and trade policies have seriously distorted markets, while excessive regulation, monopolistic behaviour and unfair competition have stifled production. The overvalued currency and the limited access of livestock producers to foreign exchange have restricted the imports of veterinary pharmaceutical, feed additives and other livestock inputs.

During the command economic system, the provision of veterinary services was carried out by the Ministry of Agriculture (MOA). However,

government veterinary services were inadequate in the face of the national demand. The delivery of veterinary services has been constrained by lack of resources and poor management leading to high transaction costs and staff disincentives. Inadequate infrastructure and the resulting high transaction costs caused limited access of farmers to animal health services. Livestock owners have relied not only on drugs from official markets but on traditional medicines and drugs from parallel (illegal) markets to a large extent because both the importation and distribution of veterinary drugs were controlled by the government. The uses of services from the parallel markets and traditional medicine increase the risks of animal mortality because of the unreliability of the drugs and services delivered.

The major constraints to and opportunities for improving cattle production systems in the highlands and pastoral areas of Ethiopia which have been discussed above are summarized in Table 9.

Table 9 Constraints and Opportunities of Cattle Production

Constraints	Opportunities
Diseases	- tsetse control - vaccine development - drug development
Feed	- cereal crops - fodder trees - mineral and protein supplementation
Genotype	- climate and disease resistant animals - improved and productive animals
Policy and institutions	- appropriate policies - market-oriented infrastructure

Source: Adapted from Winrock International (1992)

IV. CONCLUSION AND POLICY IMPLICATIONS

We have seen that livestock are sources of food security and that Ethiopia has a good livestock potential which offers a good opportunity to make a substantial impact on food security. The demand for livestock products has been growing faster than the production. Apart from domestic consumption, livestock and livestock products are sources of foreign earnings. However, livestock production and productivity are constrained by several factors including animal diseases, feed, genetic improvement, and institutional and policy factors. In order to increase the contribution of livestock to food security, the constraints of livestock production need to be resolved and the opportunities be exploited.

Appropriate policies which are supportive to the livestock industry need to be designed. For example, liberalized price policy, developing infrastructure, improving the animal health services, introducing animals which could cope with the environment and diseases of given areas, improving feed availability from increased crop production, and breed improvement by introducing AI are some of the aspects which could improve livestock productivity and production.

Annual loss due to animal diseases is estimated at about 30-50 percent of the total livestock production. Hence, improving the animal health services (reducing the loss of livestock production) would result in increase in food supplies from livestock, draught power, manure and income from the sales of livestock and livestock products. In the design of policies pertaining to the provision of veterinary services, the issues of public and private goods, and the balance between the public and the private provision of services need to be addressed. With the introduction of the structural adjustment program in Ethiopia, privatization of animal health services has been encouraged. However, privatization of veterinary services cannot be undertaken as one broad strategy but must be tailored to specific services. Given the importance of livestock for sustainable agricultural development, earning of foreign exchange and providing incomes to smallholder farmers, animal health policy must incorporate not only the need for economic efficiency but also the need for social equity and food security. Thus, under certain circumstances, some private goods could be publicly provided either in the form of partial cost sharing or even subsidies, if necessary.

Research promotes the development of the livestock industry. Considering the fact that livestock are important sources of food security, in order to resolve the constraints and exploit the opportunities, there is a need to encourage applied research geared towards the improvement of the production system. The research

results need to be shared by policy makers who are responsible for the allocation of resources to different activities. Future research directions need to focus on major issues of livestock development. Winrock International (1992) identified the following research priorities for SSA countries: crop-livestock production system, animal diseases, feed, genetic improvement and policy. Thus, some of the specific areas where future research directions need to focus on are:

. the complementarity of crop and livestock subsectors and their conflicts in demand for agricultural inputs,
. the impact of diseases on livestock productivity and the national economy as a whole,
. the costs and benefits of disease control and treatment.
. preventive, curative and promotive services, and the issues of public and private goods in the concept of provision of veterinary services, ie., where to apply public and private services (equity issues),
. the possibility of farmers' participation in the preventive veterinary services,
. monetary and institutional factors influencing farmers' demand for alternative veterinary services and the relative efficiency of services delivered,
. the identification of suitable browse and forage with high nutrition,
. the possibility of introducing fodder bank trees for dry season animal feed,
. the possibilities of introducing new high productive breeds which could cope with a given environment, and
. policy research - the impacts of macroeconomic and sectoral policies on livestock production and marketing.

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AGRICULTURAL MARKETING POLICIES AND FOOD SECURITY IN ETHIOPIA

Gezahegn Kebede

I. INTRODUCTION

Deepening food crises in several developing countries specially those in Sub-Sahara Africa, has increasingly become the concern of many researchers, planners, donors and international development agencies, who have given high priority to the study of food system and the problem of food security. It has become extremely important to understand how the food system of a particular country operates, in order to objectively tackle the problems associated with food security. The major components of a food system are production, processing and storage, marketing and distribution, and pricing policies.

Each component plays its own role in facilitating the smooth functioning of the system, thereby determining whether the result of the whole operation is found to be at desirable standards to meet set objectives. Marketing, as one of the components of the system contributes to this goal by moving food from surplus to deficit areas, signalling the incentives for transport, storage and processing, and influencing the level of prices.

It can be argued that no amount of improved efficiency in domestic marketing can compensate for structural food deficit. Since marketing influences the distribution of food available and the level of prices, its potential influence on food security is greatest where marketed surplus and/or imports are a high proportion of total consumption. But one important point to be noted here is that the marketing policy within a given system has a significant role in either enhancing or hampering the availability of food itself, i.e., agricultural production of specially the peasant sector. It is, therefore, this role of the policy which is the concern of this paper.

II. THE ROLE OF MARKETING FUNCTIONS IN THE FOOD SYSTEM

The conceptual thinking about marketing of farm outputs revolves around two major roles which it is thought to play. One such role is the transmission of marketing signals between producers and consumers. An example of this phenomenon is that, an increase or decrease in the demand of a particular crop, say coffee, causes a rise or fall in the price of that crop in the consumer areas, and this information is passed on to producers through the marketing system. The other role is the physical movement of the commodities from points of production by farmers to points of purchase by consumers or other intermediaries.

The physical movement of commodities from points of production to those of consumption is characterized by three dimensions which are the focal points in any policy analysis pertaining to agricultural products marketing. These dimensions are time, space and form. The marketing system takes care of the transformation of commodities in time, space and form, which means that analysis of the marketing system need to focus on:

1) storage facilities, because products are sold to consumers at a different time from the harvest,
2) transportation facilities, because consumers buy products at a place different from the point of production and sales by farmers, and finally,
3) processing capacity, because some products are purchased by consumers in a different form than originally sold by producers, e.g., wheat flour, tomato paste, vegetable oil, etc.

Ethiopia lies within one of the most food insecure regions in the world, with a large number of its population living at subsistence levels and dependent on farm production highly vulnerable to severe draughts. The small holder peasant sector is the most important agricultural sub sector in the country. Its emphasis is on food grain crops where considerable improvements of cultivation practices, management and marketing need to be realized. The production volume of food grain crops as well as the per capita food production, has shown tremendous fluctuations throughout the 1980's thus resulting in severe food shortage in the country. The main reasons for these are stochastic shocks such as recurrent draught, lack of incentives for the small scale food producers (a reflection of the marketing policy in force), and poor extension services for the small peasant households.

The major causes of transitory food insecurity are failure in agricultural production or instability in food supplies resulting from the above reasons. The

weak system of marketing and transport operations to procure and collect agricultural products from widely dispersed rural producers and to distribute essential agricultural inputs on time contribute not only to the fall in production in some years, but also to the problems caused by failure to move the available food itself to needy areas.

The marketing function is, therefore, the link between the two ends of the food system, i.e., production and consumption, without which no sound food system could ever be thought about.

III. EVOLUTION OF AGRICULTURAL MARKETS IN ETHIOPIA

3.1 Pre 1974

The Ethiopian agricultural marketing system has experienced a number of structural changes as a result of both evolutionary processes and revolutionary measures during the past several decades. The traditional agricultural market is characterized by a chain of participants starting from the small holder farmers selling their products in small quantities at open market prices to consumers. In the middle of these two points of the chain are, depending on the nature of the market for the product are assemblers, local merchants, commission agents, wholesalers and retailers.

The markets in which all of these actors played their respective roles could generally be classified into primary, secondary and terminal markets. Although trading activities in agricultural products appeared to be fragmented and somewhat localized, the three market levels mentioned formed an integrated national marketing system which fairly operated under the rules of demand and supply. Apparently, marketing costs and margins were high as a result of the small number of participants in the market at different levels which in turn resulted in low producer and high consumer prices.

The establishment in 1950 of the Ethiopian Grain Board (Proc.No 113/1950) and the Ethiopian Grain Corporation in 1960 (Legal Notice No. 267/1960) were the initial attempts made by the government to regulate grain marketing operations. Subsequently in 1968 came up the Third Five Year Plan (1968-73) in which agricultural marketing was given due consideration. During this period, the comprehensive regional development programs like CADU,

WADU and the Adda District Development Programs were introduced in the rural sector in the form of integrated rural development projects. The projects were aimed at protecting farmers in their respective operational areas from exploitation by private traders through purchasing their products at prices higher than local market prices during harvest seasons and storing them until selling prices in markets like Addis Ababa are favourable. Experiences from these programs revealed that among the major constraints to agricultural production were unattractive producer prices resulting from unfair marketing practices by private traders (World Bank 1991).

However, the projects were not as successful as expected in achieving market related objectives as they handled an insignificant proportion (less than 5 percent) of the marketed surplus in their respective operational areas unable to influence the market. They served less than 10 percent of their target population while their operating costs were relatively higher than those of the private sector.

3.2 1975 - 1990

The more centralized management system of the markets came with the emergence of the political upheaval of the February 1974 revolution. In February 1975, the government came up with a declaration of socialist oriented economic policy in which the roles of the government, the private and the public sectors were stated. The policy document showed the government's intention to be engaged in wholesale and retail business in order to stabilize prices of basic commodities and to protect the interests of the majority of the population. Accordingly, active government participation in agricultural marketing took place with the establishment of the Agricultural Marketing Corporation (AMC) in 1976 (Proclamation No. 105/1976) with the following objectives:

- procure grain from local and foreign sources,
- procure and distribute agricultural inputs,
- export grain, and
- maintain national grain reserve.

In accordance with the provisions of the proclamation, AMC absorbed the functions of the former Ethiopian Grain Corporation whereas the Ethiopian Grain Board was reorganized in 1977 under the name of Ethiopian Grain Agency (EGA) (Legal Notice No. 52,1977). The Agency's tasks were primarily to license grain traders and to administer price controls on cereals. The Agency licensed

grain traders until it was dissolved in 1980/81 for the purposes of eliminating duplication of function with other newly emerged institutions such as the Ministry of Domestic Trade and the Central Planning Office.

Pricing

The pricing of grain during the centralized management system is characterized by four distinct phases. The period from 1975/76 to 1976/77 represents the first phase when grain prices were fixed by the Ethiopian Grain Board (later Grain Agency). During this period wholesale and retail prices were fixed for eight central markets and prices of other subsidiary markets were determined by adding costs required to transport the grain from their respective reference markets. This system of pricing was however not effective because, on the one hand the free market retail prices in many towns remained below the fixed retail prices in local markets particularly during harvest seasons, and on the other, the producer prices for peasants far from the central markets remained low.

In 1977/78, the beginning of the second phase, attempts were made to fix producer and consumer prices in the whole country on the basis of estimates of cost of production generated by the Ministry of Agriculture and with consideration of average inflation rate applicable to major urban centres. This pricing system entailed the participation of the representatives of the then local mass organizations. Although the Ethiopian Grain Agency was charged with the enforcement of its implementation, the attempt was interrupted by the Ethio-Somale war of 1977/78 and consequently no grain pricing policy was enforced throughout the country in 1977/78 and 1978/79.

The somewhat contemptuous pricing policy came into force during the third phase in 1979/80, immediately after the dissolution of the Ethiopian Grain Agency when the task of fixing producer prices in various administrative regions was given to a team of individuals by the name of Grain Procurement Task Force (GPTF). The team was headed by the respective region's Chief Administrator and its members being representatives of the ministries of Agriculture, Trade, Transport and Communications, Housing and Urban Development, and institutions like AMC, Peasants Associations, and the Ethiopian Domestic Distribution Corporation (EDDC). This system of pricing initially came into effect not only as a result of the absence of a central authority to take the responsibility but also because of the assumption that the GPTFs had a better knowledge of some of the tools that help the fixing of prices, like production and consumption conditions prevailing in their respective regions.

However, the system did not prove effective either, as the GPTFs in different regions used different criteria to fix prices which did not take into account the behaviours of different markets in terms of the flow of grain, impact of prices on producers' incentives, responsiveness of different markets to prices, etc. Moreover, the economically unjustified price variations in adjacent regions, failure of the system to account for cost of production which could provide for a price structure with incentive to producers were characteristics of this pricing system. These shortcomings coupled with some other grey areas of operation which made the system inefficient contributed to the cancellation of the regional pricing system (1980/81) and its replacement by a uniform or pan-territorial pricing system.

The fourth and final phase of pricing in the centrally managed marketing system came into being in 1980/81 as a result of the gradual strengthening of the central planning process managed by the then National Revolutionary Development Campaign and Central Planning Supreme Council (NRDC & CPSC), (later named as Office of the National Committee for Central Planing - ONCCP, and currently known as the Ministry of Planning and Economic Development - MOPED). The period from 1980/81 to 1989/90 was characterized by a uniform pricing system which was initially put into effect in order to do away with the management problems of AMC caused by the highly decentralized regional pricing system. It never had the intention of either achieving regional equity in income distribution or providing price incentives to producers. Prices were fixed by a group of experts drawn from NRDC &CPSC, Ministries of Agriculture, Domestic Trade and Foreign Trade, and were presented to the Council of Ministers through the Executive Committee of the NRDC &CPSC for approval. This practice continued until 1983/84 when the NRDC &CPSC was reorganized as ONCCP and the task of the team was taken over by its Price Studies and Policy Department (later Price Studies Institute and currently merged with the Ministry of Trade).

Although the pan-territorial and pan-seasonal pricing system made AMC a price leader in remote areas, open market prices in areas near the capital and other terminal markets by far exceeded the prices fixed for it as a result of which parallel markets developed leading to the formation of a dual market structure in cereal marketing.

Quota System

Compulsory delivery of grain to AMC usually known as the quota system was initially introduced in 1978/79 and later systematized in 1980/81 together with the introduction of the pan-territorial pricing system. At the outset, the minimum

quota required from each peasant association was 100 quintals and 30 percent of their purchases from wholesale traders and this was later revised to 150 quintals and 50 percent respectively. State farms and producers' cooperatives were obliged to sell the whole of their marketed surplus to AMC. Initial proposal of the total quantity of grain to be procured by AMC was made by the group of experts mentioned above.

The factors considered for the determination of the annual grain purchases were the following:

- estimates of total grain production provided by the Department of Agriculture of the ONCCP,
- the marketable surplus computed by the Department of Trade and Tourism (ONCCP) on the basis of data provided by the Ministry of Agriculture,and
- the purchasing capacity of the AMC.

The proposed volume of purchases was passed on to AMC for review and adjustments depending on the circumstances. This process was in place until the reorganization of the ONCCP after which the initial proposal was prepared by the AMC itself. Once the total volume was agreed upon at all decision making levels at the centre, the remaining critical issue was disaggregation of the total to different regions. The system of quota allocation was such that each administrative organ responsible for allocation determined only the volume expected from the administrative unit immediately below it (i.e. centre to region, region to Awraja, Awraja to Woreda, Woreda to service cooperatives, service cooperatives to peasant associations, and finally peasant associations to individual farmers).

The practice of quota allocation by GPTFs and SCs also had some characteristics of administering the centrally fixed quota at regional and local levels. The GPTFs at higher levels had the power to influence those of the lower levels. At each stage, including SCs, some allowance was added to the quota figure received from a higher level before distributing it to the next lower level. This is done mainly for fear of not achieving the level of quota delivery required from the respective administrative unit. This means that the aggregate quota given to individual farmers by far exceeds the volume initially earmarked at the centre. This greatly contributed to the disgrace and ultimate failure of the system.

Problems of Inter-regional Trade

In any structure of marketing of commodities, market participants particularly wholesalers and retailers play a very significant role in the movement of commodities from areas of production and storage to areas of consumption. In this regard, the role of traders in the efficient movement of grain and other agricultural inputs can not be overemphasized.

The centralized management of the Ethiopian agricultural marketing system was, however, characterized by a strict control of product movements. One of the major tasks of the GPTFs, apart from quota allocation, was control of private grain traders. Although trade licenses were issued and renewed annually by the Ministry of Domestic Trade at various levels, issuance and renewals of licenses to grain traders were effected only based on the recommendations by GPTFs in which the Ministry itself was a member. The basis of endorsing wholesale traders' applications for renewal is fulfillment of quotas. The most 'popular' mechanism used by all GPTFs to control grain movements was the road blocks known as '*kelas*', established at boarder posts of almost all woredas particularly in surplus producing regions. They were managed and permanently guarded by GPTFs. Traders were given certificates to move grain only to the extent of their quota fulfillment. At times it was even difficult for individuals to move grains of any type and quantity even for own consumption without a written approval of the concerned GPTF in the area.

Gojam, Arsi and Shoa were the three major surplus producing regions from which AMC made 75 percent of its grain purchases and evidently the number of traders operating in these regions was also considerably high compared to others. However, the authorities in these regions, particularly in Gojam and Arsi followed a hard line as far as the operations on private traders were concerned. In Gojam, the licenses of all private grain traders were revoked in 1982/83 and only AMC was allowed to operate. Similarly in Arsi, virtually all traders were banned from operation in 1985/86 except three traders in Assella, the regional capital, who were somehow considered old enough to be involved in activities undesirable by the local authorities. According to some data sources, a total of 1,150 traders were banned from operation in Gojam and Arsi (Alemayehu 1987). In Shoa, however, traders were allowed to operate and in fact were the major instruments used by the region for the fulfillment of the grain quota levied on the region.

1990 to Date

Ethiopia has gone trough turbulent times during the 1980's. The persistent armed secessionist activity in the northern part of the country and the stringent controls on trade and production repressed both rural and urban areas forcing the government to start a reform program in 1990. Beyond the measures specifically aimed at minimizing and ultimately abolishing the participation of the private sector in general and wholesale grain traders in particular, the war resulted in substantial distraction of infrastructure in the north. It drained the country's limited resources away from development activities resulting in deterioration of performance in all spheres of the economy particularly in the social service sectors.

The increased political and military pressure from within coupled with the change in international outlook of the socialist system as a result of the gradual demise of the Soviet Union is believed to have forced the government to embark on the liberalization of the grain market in March 1990. As a result of this reform action the quota, the centralized uniform pricing and the grain movement control systems (check points) were abolished. AMC lost its monopolistic rights in grain procurement and was left to operate in a free market on a competitive basis.

The March 1990 reform had an immediate impact on the activities of parastatals engaged in grain marketing. Since March is in the middle of the procurement season following the '*meher*' (the main harvest season), the declaration of the reform immediately ceased all procurement activities because there was no earlier knowledge of the upcoming reform and as a result, no preparatory measures were designed by AMC to continue procurement activities during the remaining part of the season.

After the change of government in May 1991, the New Economic Policy of the Transitional Government came to light followed by the Public Enterprises Proclamation No. 25/1992, which reaffirmed the government's commitment to the development of the private sector. As a result, AMC was reorganized under the name of the Ethiopian Grain Trade Enterprise (EGTE) with more or less similar objectives as in the past but this time required to operate as an autonomous public enterprise competing with the private sector without any special support from the government. Ethiopian Oilseeds and Pulses Exporting Corporation (EOPEC), which used to play a dominant role in the export of oilseeds and pulses lost its legal grounds of existence.

The decline in the volume of purchases by AMC/EGTE is a clear indication of the effects of the liberalization on its performance. It is observed that its procurement level went as far down as 3 percent of the pre-reform period in 1993/94. In terms of other institutional indicators, AMC was about 4,500 men strong, with 8 regional offices, 27 branches and more than 2,000 grain collection points. Currently all the regional offices have been abolished, the number of branches reduced to 16 and the work force drastically fallen down to about 2,500.

EOPEC has totally gone out of the market as far as oilseeds and pulses that have domestic market (horse beans, peas, niger seed, lentils, etc.) are concerned. It is currently being managed by a Board of Trustees awaiting its liquidation and in the mean time doing some export business with haricot beans and sesame (which do not have local market).

As a result of the liberalization and the subsequent open market practices, AMC/EGTE ceased the mandatory distribution of grain to its former clients. Sales began to be effected based on mutual understanding between the two parties. Usually contracts are signed between EGTE and major clients for the supply of grain specifying the volume, quality, price, delivery period, terms of payment and other required terms of trade.

The most affected group by the change in the distribution system appear to be the Urban Dwellers Associations (*kebeles*) of both Addis Ababa and other regions who used to trade in low priced grain before the liberalization and are now forced to either face open market prices or abandon the grain trade altogether. Some 'kebeles' in Addis Ababa who are relatively strong in capital and organizational set up continued to supply their residents by purchasing from either EGTE or even private wholesalers as they found it profitable but many others have done away with the grain business. The government subsidy on wheat sold to flour mills by EGTE was withdrawn effective July 1991 as a result of which the price and distribution of wheat flour produced by government mills was deregulated.

The fact that all the previous rules and regulations governing the commercial activities in the country have been relaxed and some of them even cancelled particularly after the change of government in 1991, had a direct bearing on the functioning of both the domestic and export markets. Access to markets has been made easier as a result of lifting licensing barriers like ban on diversification of trading activities (traders were not allowed to have more than one trade license). This enabled several private companies both new and previously engaged in other commercial activities to enter the grain market.

The lifting of all export duties except on coffee has encouraged the export of commodities relatively competitive in the international market. Another interesting part related to the enhancement of the export market is, import duties paid on raw materials and inputs used for the production of export commodities can be claimed back at the time of exporting the product. Although the process in implementing this provision seems to be long, conceptually the measure is a step ahead in triggering the development of the export market.

Although other macro-economic changes in monetary and fiscal policy of the government (which are part of the overall economic liberalization measures and the analysis of which is beyond the scope of this paper) like devaluation, increase in interest rates, adjustments in various taxes(income,excise, etc.) and duties may not be treated as part of the agricultural marketing liberalization, these measures have got their own positive and negative impacts on the marketing of agricultural products.

As a result of the liberalization, the parallel market existed before the reform converged into a single demand-supply driven market. This definitely means a change in the price level and structure, the direction of change depending on the balance between the entrants from the supply side on the one hand and those from the demand side on the other. Although it is not possible to fully attribute the changes after the reform in prices of food and other agricultural commodities to factors associated with the reform, it is evident that the contribution of these factors to price changes is substantial. These can be observed from the retail price index of Addis Ababa which is normally termed as a representative of the overall situation. Table 1 shows the Addis Ababa retail price index from 1984 to 1994. The years from 1984 to 1989 represent the pre-reform period and the years from 1990 to 1994 relate to the reform period.

The current practice under which the government has chosen to intervene in the grain market through the reorganization of AMC does not seem to be the best alternative available. This is because, the way the Ethiopian Grain Trade Enterprise is set to operate obliges it to play two contradictory roles, i.e., providing producer support prices and stabilizing consumer prices on the one hand and on the other operating in the free market as a commercial entity without any support from the government for the potential losses that may arise out of attempting to fulfil the first objective. Drawing a line between the social and commercial objectives of the enterprise, although in theory seems to be feasible, its practicality is questionable.

Table 1 Addis Ababa Retail Price Index for Cereals and Pulses 1955/56=100

YEAR	CEREALS		PULSES	
	INDEX	ANNUAL DIFFERENCE	INDEX	ANNUAL DIFFERENCE
1984	544.5		618.9	
1985	850.7	306.2	1,098.0	479.1
1986	566.0	-284.7	791.4	-306.6
1987	464.8	-101.2	641.2	-150.2
1988	487.2	22.4	754.4	113.2
1989	491.6	4.4	799.7	45.3
1990	564.2	72.6	687.1	-112.6
1991	830.3	266.1	969.8	282.7
1992	893.4	63.1	1,133.8	164.0
1993	836.6	-56.8	1,044.9	-88.9
1994 JAN-APRIL	799.7	-36.9	998.0	-46.9

Note: The percentage changes every year indicate that prices are increasing at a faster rate after the liberalization than before.

Source: CSA - info. NO. 320 of May 1994

IV. IMPACT OF MARKETING POLICIES ON FOOD SECURITY

The two essential elements in the understanding of food security are the availability of food and the ability to acquire it. It is the combination of these two features that brings about the existence of food security which is highly dependent on the country's agricultural production and marketing policies in place.

4.1 Impact on Food Availability

The marketing and pricing policies of Derg, i.e., the low farm gate prices and the control over the movement of grain had their own negative implications not only for agricultural production in general but also contributed to the decline in rural welfare. The inappropriate agricultural policies of which the pricing and marketing policies are the major parts, led to a consistently low production of food grains which could not commensurate with the level of the food requirements of the country. Domestic food production for the period 1980 to 1989 for example could only supply about 70 percent of the minimum food requirement of the country. Average food availability for the ten years including both commercial imports and food aid was less than 76 percent of the minimum requirement.

AMC's procurement prices were consistently below import parity prices even during the years of low international grain prices. An example of this, according to a World Bank study, is the farm gate price offered by AMC in 1985/86 which varied from 40 to 61 percent of import parity prices depending on the type of crop. The weighed average farm gate price for all cereals being 50 percent of import parity price (World Bank 1987).

One among the various consequences of the quota and the fixed low prices that producers received for their products delivered to the AMC was decrease in incomes as exhibited in Table 2. This meant, lack of not only incentive but also ability to procure the relatively expensive inputs like fertilizer and other technologies which would have contributed to rise in production.

A comparison of AMC's prices with average open market prices of eight crops in 1987/88 in ten different markets located in surplus producing areas revealed that AMC's prices stood at:

- 85 %, 60% and 43% of open market prices for teff in Debre-Markos, Hossana and Nazareth respectively,
- 91%, 52% and 56% for wheat at Assella, Goba and Hossana,
- 79% and 69% for maize at Nekempt and Shashemene,
- 100% and 78% for barley at Assella and Goba,
- 49% and 39% for horse beans at Nazareth and Gondar,
- 77%, 49% and 48% for niger seed at Debre-Markos, Gondar and Ambo.

Table 2 **Comparison of AMC Farm Gate Prices and Open Market Prices in Major Towns for the Year 1987/88 (Jul.1987 to June 1988) (Birr/Quintal)**

TOWNS	TEFF MIXED	WHEAT MIXED	MAIZE	SORGHUM	BARLEY	HORSE BEANS	FIELD PEAS	NIGER SEED
ADDIS ABABA	112	54	44	53	50	86	81	136
AMBO	93	63	33	31	38	72	83	101
ASSELLA	81	35	26	-	28	53	63	-
D/MARKOS	48	41	38	34	36	52	67	62
GOBA	63	62	37	-	36	65	79	104
GONDAR	110	78	65	53	60	70	84	98
HOSSANA	68	57	36	23	33	85	81	-
METU	62	42	20	22	43	86	108	-
NAZARETH	95	55	47	50	52	55	89	-
NEKEMPT	62	48	28	36	43	96	120	133
SHASHEMENE	86	39	32	-	35	62	74	-
AMC	41	32	22	25	28	27	35	48

Source: Compiled from AMC/EGTE monthly price reports

Some studies also indicate that AMC prices were not stimulating enough for farmers to even use available credit schemes like credit for plough oxen because the prices were too low to pay back the loans (AIDB 1986). Another study, although fragmented, attempted to indicate the relationship between AMC prices and fertilizer use by farmers, and came up with a conclusion that a rise in AMC prices from Birr 22 to 29 per quintal for maize and from Birr 33 to 48 per quintal for wheat, would lead to a rise in the profitability of fertilizer use in 40 percent and 64 percent respectively, of the areas studied. This therefore, gives the indication that low farm gate prices were deterrent to the use of improved farm inputs and thereby contributed to the low level of production, i.e., a decrease in availability of food.

Because of the low level of domestic production as a result of various factors among which the marketing and pricing policies of agricultural products are the major ones, the amount of food aid coming to the country substantially increased over the last two decades. It rose from 1,800 MT in 1973, which was only about 0.4 percent of the estimated domestic production, to up to 968,900 MT or 23 percent of domestic production in 1985 (the year of a major drought); and to about 1 million MT of 16 percent of domestic production in 1991 (a relatively normal year in terms of drought).

4.2 Impact on Accessibility to Food

Food security is at stake not only because food availability is below minimum requirement, but also because the ability to acquire whatever food is available has not been there. The marketing and pricing policy which was characterized by low producer prices and forced quota deliveries imposed on farmers and traders had a significant impact on the level of open market prices. AMC could supply to only about 30 percent of the market demand through the public distribution system leaving the remaining 70 percent to be met by the open market, which was accessible at prices generally twice higher than that of AMC's retail prices. Moreover,the fact that inter regional trade was restricted and traders were required to surrender 50 percent of their procurement to AMC at reduced prices forced the traders to claim the lost revenue on the quantity surrendered to AMC from the open market by charging higher prices.

The two elements of the centralized marketing system,i.e., uniformity of producer prices and producer prices lower than open market prices, result in shifts in distribution of incomes that would have been captured by those who generated them, had this system not been in place. The fact that producer prices are kept

well below open market prices, and the other fact that customers of AMC purchase at prices again lower than open market prices clearly indicate the shift of income from the producers to consumers (subsidized at the expense of producers).

Table 3 Food Availability ('000 mt) in Ethiopia

YEAR	FOOD AID	PRODUCTION ESTIMATE	% OF FOOD AID	% OF ANNUAL INCREASE
1973	1.8	4500	0.4	
1974	96.1	4368	2.5	-3
1975	54.1	4508	1.2	3
1976	86.6	5094	1.7	13
1977	74.7	4394	1.7	-14
1978	76.0	4222	1.8	-4
1979	162.5	4166	3.9	-1
1980	115.5	6416	1.8	54
1981	208.0	5621	3.9	-12
1982	189.7	4992	3.5	-11
1983	356.4	6600	5.4	32
1984	171.9	5545	3.1	-16
1985	968.9	4249	22.8	-23
1986	928.2	4809	19.3	13
1987	378.4	5648	6.3	17
1988	989.8	5962	16.6	6
1989	493.0	6573	7.5	10
1990	891.0	6145	14.5	-7
1991	1000.0	6211	16.1	1

Source: UN/FAO

On the other hand uniform producer prices which do not take into consideration the distance between production areas and terminal and/or secondary market places (as the case may be) are other causes of shift in income, but this time from producers relatively nearer to market to those far away from markets. The extent of the shift in income may be as high as the cost of transport between the two producers assuming that they are on the same route leading to the market, and other factors remain unchanged.

With this system in operation, the shift of income from producers (who are a vast majority) to traders and other consumers who had access to AMC's low priced grains means the vast majority of the population who generated the source of the income (i.e., the products) are deprived of the opportunity to share a genuine part of it. Moreover, producers who sell most of their crops at low prices immediately after harvest in order to meet their tax and other social obligations are ultimately forced to depend on the market for their needs, but when grain prices are already high. This leads to temporary food insecurity particularly when access to food in the market is difficult not only to such producers but to most market dependent urban population due to escalation of prices as is the case in most instances.

One of the elements of the marketing policy that contributed to the disintegration of markets which led to high consumer prices was the control over the movement of grain. Controls exercised through check points (*kellas*) limit producers from access to markets offering higher prices and also hurt consumers by limiting their access to low price grain because marketing costs rise and the benefits of all players in the market (producers, traders and consumers) are negatively affected. This means that with the rise in price, the potential possibility of access to the food available in the market becomes more and more diminished.

The retail price index of Addis Ababa for the last two decades which in the absence of nationwide survey of price levels, is considered to be some how a reflection of the overall situation. From Table 4, it could be observed that compared to the levels of 1974, the 1993 prices for food items increased by 504 percent at constant 1974 prices. Considering the low average per capita income of the country, which rarely made any improvement, it is not difficult to imagine that there have been and still are many people earning far below the average per capita income, and thereby not having access to enough food.

Table 4 Addis Ababa Retail Price Index at 1974 Constant Prices

YEAR	GENERAL INDEX	FOOD ITEMS
1974	100.0	100.0
1975	105.3	105.2
1976	135.3	149.3
1977	157.9	174.3
1978	180.4	204.0
1979	209.4	240.8
1980	218.8	253.4
1981	232.2	265.1
1982	245.1	281.0
1983	244.1	283.1
1984	264.7	314.2
1985	315.2	393.4
1986	284.3	333.5
1987	277.4	313.3
1988	297.0	338.0
1989	320.0	360.0
1990	336.8	378.7
1991	457.1	535.2
1992	505.2	598.7
1993*	516.6	604.1

Source: CSA Statistical Abstracts and National Bank of Ethiopia Quarterly Bulletins
* 1993 based on January prices

V. CONCLUSION AND RECOMMENDATIONS

The main objective of any government with respect to food security is to make sure that sufficient food is available at all times and accessible to all people in the country. Marketing policy in this respect plays the role of ensuring that 1) basic food stuffs are available at affordable prices to consumers and 2) a market is available for domestic food producers and prices received by producers are reasonable enough to sustain production.

The marketing policy in Ethiopia until 1990 had its own negative impact both on the availability of food and its accessibility. The centralized marketing system, the alleged legacy of which was supplying the people with sufficient food at reasonable prices, suffered from a chronic problem created by the system itself (i.e.,lack of sufficient supplies under its control). The quota and fixed pricing system which had the inclination of imposing higher quotas on more productive farmers had negative consequences on farm production and rural welfare, as a result of which the objective of sufficiency of food and reasonableness of prices have been beaten.

Although the liberalization process which started in March 1990 paved the way for the removal of barriers to accessibility of markets, the prevailing situation in most areas of the country in terms of market accessibility to most farmers is that, it is costly, poor and in certain areas prohibitive. Part of the problem relates to obstacles in the movement of food crops, weakness of local markets and prohibitive transport cost owing to distances, poor road conditions and high vehicle costs. Liberalization alone, i.e. reducing public sector operation, reducing or removing official barriers will not automatically improve access to market. Indeed, the reduction of marketing operation by parastatals as part of liberalization has reduced the number of operational markets in remote areas where markets are already weak. Since the objective of liberalization is to strengthen markets and not weaken them further, special attention needs to be given to areas likely to be adversely affected by liberalization.

In a country like Ethiopia, where even with food imports and food aid, the minimum daily per capita food intake of 2,100 calories is not likely to be achieved in the foreseeable future, marketing policy that calls for the intervention of the government is not only necessary but also essential to safeguard the interests of its citizens both in rural and urban areas. But the question is putting in place a policy that recognizes the limitations and the comparative advantages of the public and the private sector involvement in the food system.

In light of the various constraints currently faced by the agricultural marketing operation with regard to enhancing its efficiency in general and contributing to the attainment of food security objectives in particular, the following measures are recommended.

- **Delineate the commercial and social objectives of the state marketing enterprise**

As things stand today there is no official document dealing with the questions of when and how to intervene in the market, who decides on intervention prices, who bears the cost associated with any market intervention for price stabilization. Therefore, EGTE's role as price stabilizer and the modalities under which the enterprise plays its role need to be made clear. It would be more advisable for the enterprise to concentrate on price stabilization objectives and gradually with the strengthening of the private sector, move out of the commercial activities.

- **Raise accessibility of markets to small farmers**

Since small holder farming is the dominant characteristic of the Ethiopian agriculture production, efforts in making markets accessible to small farmers through improvement of marketing extension services, road conditions and transportation facilities etc. would have tremendous impact on farmers incentives to produce more for markets.

- **More efficient public storage and reserve stocking**

The fact that less than 50 percent of the available public storage capacity is effectively utilized for purposes related to agricultural marketing signifies that there is a great deal of reserve for improvement in the utilization of the available facilities. Therefore, future moves in this direction should focus on the introduction of mechanisms for the better use of the facilities and minimization of losses associated with weak storage practices.

- **Strengthen the private and cooperative sector's role in marketing, processing and storage**

The commercial role that the public sector currently plays needs to diminish and gradually be taken over by the private sector. This presupposes the strengthening of the private sector and cooperatives. The move in the reorganization of rural institutions needs to be accelerated so that some of the

marketing functions may be shared by these institutions for efficiencies that may arise out of economies of scale.

- **Eliminate or minimize obstacles associated with the movement of food between regions**

Even after the liberalization of 1990 when check points for controlling the movement of grains were officially abolished, there is a growing tendency of local authorities to establish check points along the roads with substantial movement of commodities for the purpose of raising revenues by charging traders. The functioning of such check points not only has an impact on the direct cost of the commodity under consideration, in this case grain, but also disrupts the smooth functioning of the transport system,thereby aggravating the already mal-functioning system and contributing to the overall decline in the efficiency of the marketing system. Therefore, there seems to be a need for a general policy on the establishment and functioning of check points, which should of course be appreciated by regional/local authorities.

- **Encourage the development of warehousing services**

Although the availability of storage facilities is one critical element in the marketing process, every trader operating at any scale does not necessarily have to own storage facilities. Specialized warehousing services could be given to traders by those engaged in this type of business. On a national level, developing warehousing operations leads to efficient use of resources. Therefore, encouraging investors intending to be involved in these types of services appears to be important.

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REDUCING UNCERTAINTY IN GRAIN MARKETING THROUGH A PUBLIC INFORMATION SYSTEM AND TRANSPARENCY AT GRAIN CHECKPOINTS

Patrick Diskin and Daniel Molla

I. INTRODUCTION

The development of efficient food markets is a critical component to improve food security in Ethiopia in terms of availability and access. Uncertainty about prices and costs facing market participants and lack of transparency in grain markets may, however, constrain food market efficiency. On the other hand, reducing uncertainty and increasing market transparency may by reducing marketing margins, serve both to improve production incentives for grain producers and to drive down prices for grain consumers (Staatz et al, 1992).

Two sources of marketing uncertainty in Ethiopia are: (1) inadequate access by market participants to timely and accurate information about grain prices and other information in various markets and (2) the often arbitrary, unpredictable, and even illegal, collection of taxes (and bribes) at grain checkpoints (*kellas*). Based on a rapid informal assessment in a number of grain markets in Ethiopia, this paper discusses these two issues and makes some preliminary recommendations on how to improve them.

II. THE INADEQUACY OF CURRENT MARKET INFORMATION

Currently, private, government and donors in Ethiopia face inadequate access to grain market information. Most private grain market participants receive information about grain prices in selected markets through telephone or personal reports by friends or employees, or by visiting the markets themselves. This system of obtaining information has at least three disadvantages: (1) the information is generally limited to a very small number of markets; (2) telephoning or visiting far away markets involves significant costs, and these costs are repeated over all participants; and (3) poor and remote farmers, traders, and consumers may be unable to access information in these ways, contributing to

information asymmetry. These individuals could benefit greatly from broader and more timely dissemination of information, improving both their bargaining power and their ability to make production, investment, and marketing decisions.

In addition to current market prices, farmers and traders also lack adequate information on food stock levels, trade volumes, and the direction of trade flows, in order to develop informed expectations regarding future market demands (Kuma & Makonnen 1994). There is a need, therefore, for a system of generating and disseminating market information which can provide timely knowledge about a broader variety of markets, at less cost, and to a greater number of market participants.

Government and donors also face inadequate access to timely, accurate grain market information. Currently, the most extensive and systematic grain price monitoring in Ethiopia is being conducted by the Ethiopian Grain Trading Enterprise (EGTE). However, the use of this data is mostly limited to EGTE itself, with very little analysis and dissemination for government or donor agency purposes, and no dissemination at all to private market participants. Some fine-tuning of EGTE's price recording and reporting methods may also be necessary. For instance, while in principle prices are collected for standardized qualities, in practice quality levels are not always to be properly controlled for. There are also problems in converting non-standard units, such as the "*Menelik*" and "*tassa*". Sampling procedures are also inadequate in that they are not random or systematic, and sample sizes are not reported and tend to be too small.

Grain market data is also collected for early warning or policy purposes by the Relief and Rehabilitation Commission (RRC), the Central Statistics Authority (CSA), and various NGOs, such as CARE and Catholic Relief Services (CRS). However, these systems are inadequate in their scope and dissemination. For instance, RRC has an extensive data collection system, but data are collected only monthly, and available for use only after a three-month delay (Tschirley et al, 1995). Likewise, CSA collects data on grain prices in many markets, but it lacks a system for rapid dissemination and there is generally a long lag in the publication of its data. Data collection by NGOs is also lacking as it tends to focus only on the areas in which the NGOs are operating, and there is no system for disseminating the data more widely.

III. "*KELLA*" OR CHECKPOINTS AND CONSTRAINTS TO GRAIN TRADING

A market information system may help greatly to reduce the uncertainties and price risk that traders face. However, interviews with a number of traders have suggested that uncertainties over how much it will cost them to transport their grain may be even greater than uncertainties about market prices. The greatest source of this "cost uncertainty" seems to be regarding the charges traders must pay at grain checkpoints (or *kellas*). Therefore, trying to reduce market uncertainty through a market information system would be incomplete without addressing the uncertainties encountered at checkpoints.

In principle, national government policy in Ethiopia calls for free movement of grain between regions and outlaws grain checkpoints. In practice, however, our informal surveys have revealed that there exist a number of grain checkpoints setup by local governments which collect municipal, sales and "development" taxes. Kuma and Makonnen (1994) point out that "*kella* checks and repeated charges appear to be the major problem encountered by grain traders particularly the inter-regional traders." And KUAWAB (1994) reports that dealers may pay 5 percent of the value of their grain at an individual checkpoint, and may have to go through many such checkpoints.

These checkpoints are also inconsistent in their operation; the tax rates are not clearly known to market participants and corruption is apparent in many cases. Not only that local governments often don't receive much of the revenue from the checkpoints, but also traders are uncertain as to the amount they have to pay at each checkpoint, thereby encouraging them to stick to limited number of "known" markets or routes. Another inconsistency of the checkpoints is that some base their "taxes" on a per quintal basis while others on value.

As part of our diagnostic assessment, two research team members rode with truckers carrying grain from Alaba to Addis Ababa. Table 1 summarizes observations along the road between Alaba and Addis Ababa:

As can be observed from table 1, there are many checkpoints where time is being wasted unnecessarily trying to bargain over "taxes". Also, it appears that there is a high degree of corrupt practice. The checkpoint officials apparently pocket most of the fees collected while the local government appears to receive less than 50 percent of the revenue in both cases.

Table 1 Checkpoint Charges, Marketing Margins and Prices of Maize Traders

DESCRIPTION	FIRST TRUCK	SECOND TRUCK
Type of grain	Maize	Maize
Amount (qts)	99	120
Purchase price (Birr/qt)	105	104
Transport charges (Birr/qt)	10	10
Loading/Unloading (Birr/qt)	2	2
Number of grain check points where truck was stopped	5	7
Total time spent at the check points	1hr 28min	45 min
Check point "taxes"		
-with receipt (Birr/qt)	0.89	0.33
-without receipt (Birr/qt)	1.22	1.17
Total (Birr/qt)	2.11	1.50
"Taxes" without receipt as percent of total taxes	58	78
Broker's commission (Birr/qt)	1	1
Sales price (Birr/qt)	127	127
Trader's Margin	5.89	8.50

Source: Food Security Research Project team investigation

It is not suggested here that collection of grain trade taxes is necessarily bad. Governments (municipal, regional or national) need revenues, and therefore sources of taxation. The problem with current grain checkpoints is that, according to many traders, they are often arbitrary and corrupt in their practices, including the extortion of bribes and the use of phony receipts. These practices create at least three problems: (1) traders face uncertain and sometimes very high costs at the checkpoints, including the costs of their time, (2) much of the revenue collected does not go to government coffers, but rather to the pockets of checkpoint officials, and (3) a culture of corruption is encouraged, which is cancerous to society and the development of good governance.

IV. THE NEED FOR *PUBLIC* PROVISION OF MARKET INFORMATION

Rational decision-making by farmers and traders regarding what crops to produce and trade, where and when to buy or sell, and what types of investments to make, all depend on their access to accurate and timely information. Improving farmer and trader awareness of prices in various markets throughout the country promotes grain marketing efficiency by: (1) encouraging grain flows from relatively surplus to relatively deficit areas, thus helping stabilize prices over space, (2) improving farmers' decisions and confidence regarding what to plant, how much to invest, and where and when to market their produce, and (3) promoting a more competitive marketing system which will benefit both producers and consumers.

In particular, small-scale farmers and traders, especially in remote areas, might benefit from better dissemination of information, improving both their negotiating power, and their ability to make production investment, and marketing decisions. In addition to price data, farmers and traders also need better information on stock levels for various crops in various markets as well as information on alternative technologies and income-earning opportunities. Lack of good information for market participants leads many farm households to rely on relatively low-productivity subsistence production for most of their food needs. Dissemination of information is thus one of the important elements to transform Ethiopia from a subsistence-oriented, low-productivity, agriculturally-based economy into a modern, exchange-oriented, high-productivity economy.

Access to timely and accurate grain market information is also crucial for policy makers and food relief agencies to understand and effectively address food insecurity problems in Ethiopia. For instance, price increases may signal food supply shortfalls in certain areas and give an early warning of the possible need for food relief or other government interventions in these areas. Conversely, low grain prices may suggest the need to discontinue food relief interventions or to target them more carefully on vulnerable populations. Analysis of market information can also assist policy makers to understand the evolving structure and performance of the country's agricultural marketing system. This is especially important in a country such as Ethiopia which is emerging from more than a decade of increasing state control over marketing activities and attempting to reestablish a viable private marketing system. Under such circumstances, the nature of the food marketing system can change rapidly. Food relief agencies must understand these changes if they are to channel their resources more effectively, and government must understand them to determine where its actions in support of a competitive private production and marketing system are most needed.

Market information is, what economists call, a public good. As such, it is a good which is likely to be under-produced if left to the private market. That is because the public benefits of generating and disseminating reliable, timely market information exceed the returns that a private agent would likely receive from investing in such information generation and dissemination. For example, traders who invest in gathering information on various markets through telephone calls generally keep that information to themselves, or within a very small group. The value of that information could be much greater, however, if it were shared widely for the benefit of thousands of people (producers and consumers).

However, a trader only has an incentive to share information if he is paid for the value of the information. However, capturing anything close to the social value of the information would be impossible, because once the information is sold to a few people, it is impossible to prevent it from being spread to other people who do not pay the original information source. Economists refer to this as the problem of "high exclusion costs". For this reason, traders' incentives are to keep information to themselves. As a result of these and in the absence of a public system, all market participants must either: (1) invest to gather information themselves, or (2) accept the risks of uncertainty involved in going to market without a knowledge of prices. Neither option is socially efficient.

In addition, as experience in other countries such as Mozambique and Mali has demonstrated, a public grain market information system, by disseminating timely market information and analyses, can improve the ability of

governments and donor agencies to make appropriate policies and market interventions for promoting food security. Staatz, et al (1992) have summarized the benefits of Mali's experience with a public grain market information system which include: (1) reducing marketing margins resulting from risk premia and monopoly power in the system, (2) reducing the need for market participants to bargain over prices, (3) stabilizing food supplies over space and time by encouraging arbitrage, (4) encouraging long-distance trade by increasing information about far away markets, (5) improving farmers' planting and trading decisions, and (6) improving policy makers' understanding of food system performance for use in the design of appropriate policy interventions.

V. OBJECTIVES OF A MARKET INFORMATION SYSTEM (MIS)

The objectives of a public grain market information and analysis system would therefore include:

1. To provide timely information about prices to market participants and promote efficient allocation of existing grain supplies through time and space,
2. To contribute to the early warning system by identifying likely areas of food deficits,
3. To assess the efficiency of markets in allocating grains through time and space,
4. To provide analysis useful to farmers and traders in projecting market needs and identifying unexploited economic opportunities and
5. To provide analysis useful for policy and program planning for government agencies, donors and NGOs, such as relating commodity prices to such things as food aid and commercial import deliveries and government storage or pricing policies.

VI. RECOMMENDATIONS FOR DEVELOPMENT OF A PUBLIC MIS

This paper recommends the development of a public grain market information system which broadcasts price and other grain market information to the general public in a timely and accurate fashion. A number of key issues and recommendations for addressing them are discussed below:

1. Institutional home/s for the MIS. A key question in developing a MIS is to decide in which institution it should be located, or whether a new institution should be created for the purpose. Given the resource requirements of a MIS and existing resource constraints, it would be ideal to build on the activities of an existing institution.

Currently, quite extensive and systematic grain price monitoring is being conducted by the Ethiopian Grain Trading Enterprise (EGTE). EGTE collects price information on major grains weekly throughout the year in 93 market centres, and communicates the data quickly via branch offices to their headquarters in Addis Ababa. EGTE's price monitoring thus appears to be an ideal foundation for developing a market information system, at least on a pilot basis, particularly given its social mandate to support the development of efficient and stable markets.

However, currently, EGTE is not involved in disseminating its data to market participants, and only provides analysis to other government decision makers on a very limited basis. Also, the policy questions which could potentially be addressed by the MIS may go beyond the types and levels of data analysis currently being done by EGTE. EGTE's breadth and depth of analysis may be constrained both by the limits of its current mandate and by limited analytical capacity.

For these reasons, it would be appropriate for EGTE to work jointly with policy analysts working in the Ministry of Planning and Economic Development (MOPED) to carry out the additional data analysis and dissemination responsibilities involved in implementing a pilot public MIS. MOPED's involvement in data analysis and dissemination would be advantageous both because it can provide additional analytical capacity and because of the relevance of such data analysis to supplement their own policy making and planning activities.

One important disadvantage of using EGTE for the MIS is that the markets from where it collects its data tend to be located along main roads and do not cover many very small markets where many small farmers in Ethiopia sell their grain and where many net buyers may buy their grain. This bias towards markets that are relatively larger and better connected to infrastructure limits the usefulness of EGTE market information for smallholders who, with small margins and in the most vulnerable position, have a great need for such information. The same goes for smaller traders and farmer cooperatives who tend to operate in the smaller and more remote markets not covered by the EGTE system. This disadvantage suggests, at least in the long run, the possible participation of alternative data collecting agencies (e.g, CSA, RRC) either to supplement EGTE or to substitute for it.

2. Training/Capacity Building. Training should be provided, in the pilot phase, to EGTE and MOPED personnel involved in collecting and analyzing data. Such training should be expanded to RRC and/or CSA,should they become involved in the MIS subsequent to the pilot phase. Training should be given to EGTE market surveyors to improve the reliability of their data collection, including issues related to standardization of qualities and measures, sampling techniques, and non-sampling errors. Training on data processing and analysis skills should also be provided to EGTE, MOPED and other Ethiopian personnel. This should include training for Ethiopian personnel in SPSS/Windows, as well as a visit to a country where MIS is currently exercised (e.g., Mali).

3. Geographic coverage for the MIS. The MIS should eventually expand to the majority of current EGTE markets, in addition to other markets in chronic deficit areas of southern and eastern Ethiopia. However, the pilot phase of the MIS should be more limited in scope, covering a limited number of markets. In choosing which markets to include for broadcasting information during the pilot phase, there is a trade-off between concentrating on markets in a small number of regions, or covering all regions where EGTE collects data, but with only one or two major markets per region. Ideally, the pilot MIS should have a balance between surplus and chronic deficit areas and between major and small markets.

4. Media for disseminating market information. Another design issue for the MIS is deciding which medium to use for disseminating data to market participants and policy makers. For disseminating information to market participants, three possibilities are: (1) radio, (2) newspaper, and (3) posted bulletins. Weekly radio broadcasts appear to be the best means for reaching farmers in a timely way for reasons of convenience, timeliness, and accessibility

and low literacy rates. Informal surveys in rural markets suggest that, in many areas at least, radio ownership by farmers may be widespread enough for radio to be an appropriate dissemination medium. Even those farmers who do not have radios may be able to receive the information second-hand from those who do have radios. Also, many of the farmers and traders interviewed indicated that they would be interested to listen to weekly price broadcasts.

Newspaper reports would be a good complement to radio reports for urban traders and consumers. Where these options are not feasible, posted bulletins in villages may be the only available option. To reach policy makers, regularly published bulletins (monthly or quarterly) may be a good means of dissemination with more frequent bulletins in times of crisis. Ideally, such bulletins could be disseminated by fax and where this is not possible, by hand delivery or by express mail.

5. Developing a market research program. Development of the MIS should be closely integrated with the development of a market research program. The MIS may provide a foundation of information to better understand the organization and performance of grain markets. A successful market research program can also create insights which improve the design and implementation of the MIS.

6. Making checkpoints transport and efficient. Based on further study, alternative means for generating public revenue or taxing grain trading need to be developed. Meanwhile, government should look into ways of making grain checkpoints transparent, efficient, equitable, and non-corrupt in their practice.

The establishment and operation of the checkpoints should be rationalized and made transparent by limiting their numbers and publicizing "taxes" so that they become part of the traders' information set when they decide to transport grain to other markets.

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ETHIOPIA'S MARKET LIBERALIZATION IN AGRICULTURE: CONSEQUENCES AND RESPONSES

Wolday Amha

I. INTRODUCTION

Ethiopia has abundant resources that,if properly harnessed, are capable of producing a wide variety of food for local consumption. In spite of the very good potential, the country has failed to produce enough food. As a result, the country faces hunger and malnutrition. The situation forced the country to import massive food in the form of aid and commercial imports. Before World War II, Ethiopia was self-sufficient in meeting its domestic food requirements and even produced surplus food grain for export (Thodey 1969, 40-41). Food exports declined from 1949 onwards (which virtually ended in 1962), and throughout the period there was a concomitant increase in grain imports (Mesfin 1990:216).

Population growth, coupled with the civil war, drought, growing environmental degradation, and largely static agricultural technology, contributed to the food shortages in Ethiopia. Moreover, other factors such as poor institutional arrangements, low investment, inefficient pricing and distribution, over-valued exchange rates, inadequate infrastructure, and external factors contributed to the decline of self-sufficiency in food grain production in Ethiopia.

According to a projection of the 1984 census, about 8 million people were living in urban areas (OPHCC, 1991: 301). About 4 percent of the total population were rural cash-crop producers and about 6 percent were nomads. The grain-market-dependent population comprises about 20 percent of the total population and the marketed product was estimated to be about 18.5 percent, the remainder being consumed at farm level (Adanech, 1990: 323). Alemayehu (1993: 39) estimated a higher market dependent population of 20 to 23 million (42 percent) in 1991/92. These figures underline the crucial role of food grain marketing in overall food security in Ethiopia.

Improved technology is part of the solution to ensure adequate food production. It has to be complemented and supported by a sound policy in which food grain marketing is an important component (Pickett, 1991: 11). Actually, the

policy of the government that suppressed prices was another reason for the poor performance of the agricultural sector (Girma Kebede, 1987: 9). In the absence of well-functioning food grain markets, production faces severe drawbacks. If, for example, the surplus grain production cannot be properly marketed or producers are forced to sell at a price below the cost of production, neither the farmers nor the consumers benefit.

Ethiopia is a country of self employed smallholder farmers, where food production is primarily for the holder and his family. The availability of food is largely determined by the supply of food (either domestically produced or imported) which is influenced by the incentive structure, investment policy, import capacity, and a flexible institutional structure. In the food market, government intervention has taken two major lines. On the one hand, the government has sought to maintain low and stable consumer prices to ensure access to cheap food. On the other hand, attempts have been made to maintain high stable producer prices to induce increased food availability (the food price dilemma). However, the interests of both producers and consumers may be simultaneously promoted through policies that reduce marketing costs.

The World Bank, the European Economic Community (EEC), and the Swedish International Development Agency (SIDA) criticised the price policy and quota regulation and provided conditions relating to policy changes in order to gain access to the loans (Cohen and Isaksson 1988: 336-39). The conditions mainly included reducing the role of the Agricultural Marketing Corporation (AMC), expanding the private sector in agriculture and distribution, and allowing the market to influence more in the determination of prices. The government (Derg) was not in a position to accept the conditionalities because it was against the principles of socialist ideology. The ideological and economic policy change in the former U.S.S.R and East European countries at the beginning of the 1990 coupled with the internal and external pressure resulted in the introduction of market liberalisation in Ethiopia.

The specific objectives of this study are to: assess the problems associated with the market liberalization, provide basic field data on the policy response of small producers and traders after the market liberalization of 1990, and critically evaluate the policy reforms in agriculture.

Most of the data used in this paper are drawn from primary sources. The core data for the empirical analysis was based on primary information from 257 small household farmers and 33 food grain traders. This information was collected through a field survey form April 1991 to April 1992. The district of Alaba Siraro,

and four villages within the district were selected using purposive sampling method. The criteria behind the selection of the Peasant Associations or villages were distance and the conditions of roads connecting the PAs with the market centre. The village Adasha and Zico Dololllo are very close to the market centre. Sorgie Dorgossa is cut-off from the main road (no motorable road). Tachignaw Bedene is located 12 Km away from the market. Households were then chosen randomly from a complete list of families in the Peasant Associations. The traders questionnaire included licensed and unlicensed traders from Shashemene, Alaba, Ajie, Kofele, Alemgebeya and farmers from Sorgie Dorgossa.

This paper is organized in six sections. Section II presents the market reform during the Derg era. Section III describes the policy reform of the transitional government. Section IV shows the empirical results on the response of farmers and traders to the policy reform. Section V critically assesses the policy reform of the transitional government and section VI concludes the paper.

II. STATE AND MARKET (CONCEPTUAL FRAMEWORK)

After the 1930s, the economic systems of many countries of the world were characterized by growing government intervention and, in particular, by a spectacular increase in public ownership and management of economic activities. Supporters of state intervention usually justified this trend using the concept of market failure, and explanation that became fashionable after the great depression and received strong intellectual support from J.M. Keynes. They argued that several factors made government involvement necessary, including natural monopolies for the production of socially valuable services, the technological characteristics of those services, and capital market imperfections in the presence of large economies of scale. They also argued that public enterprises could be used to stabilize employment and improve the lot of the poor through subsidized prices and wide distribution of certain social services (Hachett, et.al, 1993: 1). State intervention can be justified through the classical arguments for protection that infant industries and underdeveloped labour need subsidies, export prices for primary products will be inelastic, and that an underdeveloped domestic capitalist class cannot respond to market incentives without special assistance (Brett 1985: 51).

Over time, however, events have revealed that public enterprises and government intervention in general are often mismanaged and frequently contributed to high public deficits and inflation, large bureaucracies, corruption,

lack of incentives and inefficient forms of marketing. The neo-classical or monetarist schools of economic thought see markets as perfect instruments of allocation of resources, competitive, efficient, and integrated (Spoor 1992 :4). The Marxist theories see markets normally as exploitative (with great inequalities in access to and control over resources), inefficient, segmented, and monopolistic.

According to Berg (1968: 24), a market economy (capitalism) was viewed as an unstable system for Africa in the 1960s. It was considered as the economy of colonisers and old fashioned (free competitive market would reinforce the power of foreign capitalist elite). It was inadequate to meet the pressing development needs of poor countries. Individual enterprises could not be counted on to mobilise resources on the required scale and the market mechanism was viewed as a wasteful, highly imperfect regulator of economic activity. Local entrepreneurs were few and local sources of capital were rare. At best, capitalist development would mean development by foreigners and permanent economic dependence on the outside world. For this reason, the political leaders and intellectuals in Africa took for granted that socialism is the realistic way of endogenous development that fits to communal traditions of Africans. This resulted in the rapid expansion of the public sector particularly the parastatal agencies which produced comfortable jobs for elites. Moreover, state intervention is justified since markets and free competitions are assumed to produce economic instability and unacceptable inequalities between individuals, regions and nations.

In the 1980s, the ambitious African political leaders were dissatisfied with the performance of the public sector. There have been widespread calls for privatisation and market liberalisation after Berg's report (World Bank, 1981), which identified government intervention in agriculture, and the resulting poor producer incentives, as the main reason for sub-Saharan Africa's poor overall economic performance compared to other developing countries. Since then, major reforms to agricultural marketing and pricing occurred in almost all sub-Saharan African Countries (Duncan and Jones, 1993: 1496).

Market liberalisation policy means the process of redefining property rights, including relative roles of the public and private sectors in the economy, not a process of simply "getting the government out of the market" (Staatz, et al, 1989: 716). It is the removal of legal prohibitions to private trade in selected commodities and taking appropriate measures in order to facilitate the functioning of the private sector, with the objective of placing greater reliance on the market to allocate resources (Staatz, et al, 1989: 703). Liberalisation of agricultural markets means freeing the markets from state monopolies so that market forces may work better (Lorenzl, 1993: 27).

Scarborough and Kydd (1992: 5), in advocating market liberalisation, argued that because many agricultural product markets had been monopolised and controlled by parastatal agencies, and because prices had been set administratively rather than through market forces, the allocation of resources had become highly inefficient. Moreover, as a result of state intervention, the economy is distorted and the monopoly rents reduced growth and corrupted the decision making process. On the other hand, state intervention (some institutional governing of the markets) is associated with the second best policy, applied when the markets are characterised by enduring market imperfections, such as externalities, low institutional capacity, etc. and the role of the state in this case is not to counteract but to promote and support the right kind of market institutions capable of influencing the behaviour of economic agents with respect to achieving the nationally set goals (Koteva, 1992:23). The question should not be either state or market since each has a large and irreplaceable role to play.

On the other hand, according to Lorenzl (1993: 37), well designed market liberalisation programmes are expected to contribute considerably towards democratisation. He argued that "getting prices right" is only a necessary condition for market liberalisation, not a sufficient measure of deregulation. "Get the rules right" should become a strategic programme arriving at protection of the market itself as well as protection against market forces badly affecting the vulnerable section of the population. The selective intervention of the government is justified for various reasons: (a) the markets are prone to greater imperfections that, if not corrected, will lead to undesirable outcomes and (b) that the state is capable of reducing these imperfections and bringing about more desirable outcomes (Ducan and Jones, 1993: 1498). Therefore, in a market-led system of reforms, state control is reduced and the state plays an important role in improving both equity and efficiency. As a matter of fact, all economies are regulated and controlled and what is required is a form of state regulation which maximises the opportunities and accountability of those who produce goods and services in the public and the private sector. The market itself must also be supervised by an autonomous authority which guarantees that its members respect the "rules of the game". These functions will continue to be performed by the state, so the pressure to ensure that it operates according to rational principles will never lose its significance (Brett, 1992: 8). Unless there is a good regulatory role of the state, and free markets are combined with social compassion, we may observe a good deal of upheaval in those countries liberalising their markets (Haq, 1992: 6).

The modern business which first transformed Europe, then the world, was not simply an individual enterprise driven by the impulse to acquisition,

pursuit of gain, or money, but a rational capitalistic organisation of free labour with business separated from the household depending on rational book-keeping, modern science, and a calculable legal system and administration in terms of formal rules (Weber, 1976: 17-25). The small private (family) enterprises in Ethiopia which mainly contain petty traders and artisans, entrepreneurs who own a few shops, a lorry, or pick-up trucks, buy and sell commodities, run a bar and 'lodge', rent out commercial property or domestic property and operate small workshop lacked entrepreneurial attitude, business ethics, seed capital, technology, and the state failed to support the entrepreneurs in terms of developing a legal system to enforce laws and contracts and had no access to institutionalised credit. Thus, liberalising the market without addressing these weaknesses will not in itself guarantee the rapid development of the private sector, particularly in the rural areas. Institutional failure in the form of weak public sector management and the deteriorating quality of the government, epitomised by bureaucratic obstruction, pervasive rent seeking, weak judicial systems and arbitrary decision making has contributed to the inefficiency of the marketing system (World Bank, 1991: 9).

III. FROM INTERVENTION TO PARTIAL REFORM UNDER THE DERG RULE

The radical political turmoil in Ethiopia in 1974 gave rise to structural changes in economic organisations. A number of macro-policy changes, minor policy adjustments and institutional changes in the socio-economic formation, which were implemented during the last 20 years, have implicitly or explicitly affected the efficiency of agricultural marketing (Cohen and Isaksson, 1988: 325-333). The main institutional and structural policy changes include: a socialist-oriented development policy and centralised planning system, land reform, establishment of state farms, development of service and producers co-operatives, villagization and resettlement program, fixing prices of basic consumer goods, the introduction of socialist wholesale food grain marketing model, implementation of the January 1988's marketing and pricing policy adjustment, the establishment of AMC (Agricultural Marketing Corporation) and the Ethiopian Food Corporation, and the policy reform of March 1990 (see the details in Wolday, 1994 : 26-39).

AMC was given an important role in the socialisation process of food grain marketing. It was considered as an instrument of providing food grain to the urban poor at a reasonable price and a means of overcoming the critical

bottlenecks in the economy. The existence of AMC was also justified for ideological and national security reasons (supplying food grain to the army and government institutions).

The marketing policy before March 1990 resulted in the development of black markets and lowered competition among food grain traders for non-quota grain. It restricted flow of grain from surplus to deficit regions and resulted in significant price variation among regions. It also lowered the price of food grain and faced enormous complaints from the small farmers (Cohen and Isaksson, 1988: 332; Alemeneh, 1987: 140; Kirsche, et al. 1989: 142). As a remedial measure to these problems, various international organisations, governments, and scholars have insisted on liberalisation of markets. Derg admitted the weaknesses of the economic policies of the late 1970s which mainly discouraged the development of the private sector as a whole. As a result of the political repression and economic mismanagement, Ethiopia had turned from a relatively prosperous and well administered economic system to a land of hunger, death and darkness. The system has enriched some corrupt government officials and businessmen and impoverished the whole society.

There were some attempts to liberalise the markets in Ethiopia in 1988 (due to donor pressure) but the major market liberalisation policy was introduced in March 1990. The reform which removed the major bottlenecks in the food grain marketing included:

a. selling or leasing the non-profitable government enterprises to private entrepreneurs,
b. attracting Ethiopians and foreigners to invest in every sector of the economy without restrictions. The "Special Decree of Investment" in 1990 provided many incentives and allowed the leasing of rural land by the government to the private investors in order to boost agricultural production (PMAC, 1990: 6),
c. removing the capital ceiling of the private sector,
d. introducing the right of employing labourers (workers) in the agricultural sector,
e. allowing private trade in the domestic and foreign trade sectors,
f. removing the road blocks (*Kella*) and allowing particularly food grain trade to function according to market equilibrium without restrictions,
g. giving the right to abandon co-operatives if the members so desired, and

h. changing the form and content of the political party i.e., Workers Party of Ethiopia (PMAC, 1990: 7-10).

Immediately after the March 1990 policy reform, collection and selling of quota grain by SCs terminated and many SCs, up to 40 percent in some administrative regions, gave up grain marketing activities and when the regime collapsed in May 1991, many of the SCs were dissolved and looted by the peasants (Alemayehu, 1992: 2-6).

IV MARKET LIBERALIZATION UNDER THE TRANSITIONAL GOVERNMENT

After seizing power in May 1991 and consolidating political power, the Transitional Government of Ethiopia (TGE) appealed to western donors and international lending institutions for economic aid. The donors, mainly the World Bank, responded positively and provided their conditionality for structural adjustment (lending conditions on specific policy changes, chiefly stabilisation, liberalisation, deregulation, and privatisation). The structural adjustment program in Ethiopia originated not only from the outside but also from within the country. Liberalisation and privatisation began by private individuals and officials as a response to the irrational state control. To this end, the government introduced the Economic Policy of the Transitional Period (EPTP) in November 1991. Finally the government received the adjustment lending of the World Bank to implement the structural adjustment programme (TGE, 1993: 405). The main macro-policy elements of the EPTP include:

a. limiting the role of the state to the level of indicating development options, drafting policies and laws; promoting private investors by creating a conducive working atmosphere, and stabilising the prices of consumer goods,

b. attracting private investors by creating an investment policy without a capital ceiling and other restrictions, improving or rewriting those laws which hinder the development of the private sector, and providing priorities to national investors,

c. improving the participation of the people in the economic development process and the implementation of development projects based on voluntary basis,

d. creating ideal conditions to foreign aid in order to implement the economic policy,
e. recognising and enhancing the role of the regional administration in the economic development of regions,
f. synchronising the economic policy of the transition period with the remaining policies.This includes designing new monetary, budgetary, credit, tax, and investment policies;labour law, demographic policy, and technological policy (TGE 1991: 17-20).

The main contents of the agricultural policies of the transitional government are as follows:

a. to give special emphasis to private smallholder agriculture which produces a significant proportion of agricultural production (preferring the smallholder model to agrarian socialism).
b. to promote modern farming by encouraging national and foreign investors with the necessary capital and know-how. The policy provides priorities to national investors and attempts to run only the few efficient state farms which can compete (without subsidy) on equal footing with similar private enterprises.
c. to foster conservation based development in order to restore the ecological balance. Due emphasis will be given to solving the problem of soil degradation, deforestation, and declining wildlife resources (TGE, 1991: 21-26).

In terms of food grain marketing, there is hardly any difference between the policy reform of March 1990 and the economic policy of the transitional government (November 1991). The March 1990 policy reform of the Derg was aimed at directing the economy to a mixed economy based on wide private sector participation and greater use of the market mechanism, competitiveness, and profitability in order to guide the economic decisions. It eliminated grain quotas, road-blocks, fixed food grain prices and the legal monopoly of AMC. In the economic policy of the transition period, it is also clearly stated that farmers will be selling their products based on demand and supply, without any restrictions in inter-regional trade (TGE 1991: 22).

In 1992 (Regulation No. 104/ 1992), the government established the Ethiopian Grain Trade Enterprise (EGTE) which replaced AMC. Among the main objectives of the enterprise are stabilise markets and prices of farm products and encourage producers to increase their output, stabilise grain prices and markets to

protect consumers from unfair grain price increase, and maintain grain buffer stocks to market stabilisation.

After the Transitional Government took power, the *Ketena* system was abolished and seventeen private sector freight associations and private sector transit agencies were formed. This has increased the number of private sector long-haul trucks. Ethiopian Freight Transport Corporation (EFTC) still effectively controls long-haul freight rates due to the size of its 22 and 30-ton capacity truck fleet. The Transitional Government, in line with the overall market liberalisation programme, is making efforts to liberalise, de-regulate, and privatise the public transport sector, thereby ending the government quasi-monopoly status. The government introduced new road transport tariffs (Regulation No. 2/1992) and a proclamation to provide for the regulation of road transport (Proclamation No. 14/1992). The proclamation explicitly indicates that the role of the government or self-governments is mainly to regulate the transport sector so that it meets public interest (TGE 1992: 69). Although the above qualitative controls or regulations are important for specifying the conditions and standards of the transport sector, the excessive regulations on the movement of privately-owned trucks before the reform has affected the efficiency of the food grain marketing system. Regulating the movement of trucks must assure that the remote markets or regions receive the necessary transport services (assuming that private owners of trucks will concentrate on the more profitable routes).

V. POLICY RESPONSE

5.1 Farmers' Considerations

The main factors which determine market supply could be divided into economic factors which include product prices, provision of consumer goods, production costs and market supply costs and political factors which include the level of government intervention (Maro 1986: 36). The most important variable which influences the behaviour of the market supply of producers is price. If prices increase, producers will gain high revenue and would be motivated to increase the market supply. Although it is difficult to test the relationship between the two variables in this cross-sectional study, a descriptive approach is adopted to measure the reaction of producers to an increase in price and production of food grain. The first attempt is to see how the producers decide the type of crops they grow.

The farmers were given all possible choices to indicate their criteria. Accordingly, the responses showed that most farmers tend to decide on what to produce by considering the food needs of the household consumption. The second,third and fourth most important considerations are the price of the products, crop rotation needs and local traditions.Very few farmers consider the availability of labour in their planting decisions (Table 1).

Table 1 Considerations of Farmers as to Their Decision on What to Produce on Their Farm, 1991

Criteria	No. of responses *				
	Adasha	Zico Dololllo	Tachegnaw Bedene	Sorgie Dorgossa	Total
Crop rotation	1	1	15	5	22
Price	42	41	7	58	148
Home consumption	43	40	35	99	217
Local tradition	3	-	12	-	15
Availability of labour	-	2	-	-	2
Total	89	84	69	162	404

Note: * Multiple responses (the total responses are not equal to the number of respondents).
Source: Own field survey

If we examine the responses in the study areas, 83 percent of the respondents in Adasha and Zico Dololllo (located near the market) and 58 percent of sample farmers in Sorgie Dorgossa revealed that price is an important factor to decide on the type of agricultural produce. This shows that the farmers in Adasha and Zico Dololllo who are located close to the market are more price-oriented. Farmers were also asked about their decision to a possible increase of production, for example, by 25 percent or more. The responses of the farmers are shown in Table 2.

Table 2 Responses of Farmers to a Food Grain Production Increase, 1991

Responses	No. of responses					
	Adasha	Zico Dololio	Tachegnay Bedene	Sorgie Dorgossa	Total	Percent
Sell all of it	3	1	8	7	19	7.4
Sell part and consume the rest	41	47	15	20	123	47.9
Consume all of it	2	3	31	66	102	39.7
No response	4	-	1	8	13	5.1
Total	50	51	55	101	257	100

Source: Own field survey

If production of food grain increases, about 40 percent of the farmers in the sample would increase their food grain consumption, about 48 percent intended to sell part of the food grain and consume the remainder, 7.4 percent responded that they would be selling all the additional increase in production. Only about 5 percent of the farmers in Adasha and Zico Dololio (villages near the market centre) decided to consume the increase in production, while in Sorgie Dorgossa (remote village), 62 percent intended to increase their domestic food grain consumption if the increase in food grain production materialises.

An attempt was made to examine the impact of price change on food grain production using qualitative and cross-sectional data. Table 3 shows that 56 percent of the respondents fit to the backward bending supply curve i.e., the rise in the price of food grain results in the reduction of the market supply. Here, as prices of food grain rise, they tend to reduce food grain supply proportionately, because they need only a given total of receipts to buy consumer goods, pay taxes and debts. About 24 percent of the small farmers behaved passively to changes in food grain prices. About 8 percent of the respondents showed their readiness to increase the market supply of food grain in order to take advantage of the available economic opportunities which reveal optimism and willingness to invest in food grain production. The results indicate that an adequate set of price and

production incentive is a necessary but not a sufficient condition for the small farmers in the district to increase the market supply.

Table 3 Responses of Farmers to an Increase in Price of Food Grain, 1991

Responses	No. of responses					
	Adasha	Zico Dololio	Tachegnaw Bedene	Sorgie Dorgossa	Total	Percent
Increase market supply	2	3	7	9	21	8.2
Decrease the market supply and increase consumption	42	44	25	32	143	55.6
No change in the market supply	-	-	19	43	62	24.1
No response	6	4	4	17	31	12.1
Total	50	51	55	101	257	100

Source: Own field survey

Lack of reliable data (before and after the March 1990 market reform of the Derg) limits a quantitative analysis of the degree to which farmers in the district responded positively to the reforms. Table 4 reveals that all the farmers in Adasha and Zico Dololio (close to the market centre) agreed that the March 1990 reform has solved the major problems of food grain marketing. About 76 percent of the farmers in Sorgie Dorgossa (remote PA) responded positively to the liberalisation policy. The rest, about 24 percent of the farmers in Sorgie Dorgossa and 27 percent in Tachegnaw Bedene insisted that the reform has not yet removed the major constraints of food grain marketing in the region.

Table 4 **Improvement Impression of Market Reform by Sample Farmers in Four Villages, 1991**

Peasant Associations	Improvements	
	Yes	No
Adasha	50	-
Zico Dololllo	51	-
Tachegnaw Bedene	40	15
Sorgie Dorgossa	77	24
Total	218	39

Source: Own field survey

Moreover, out of the farmers who said that the reform has significantly improved the marketing problems, about 45 percent in Adasha and Zico Dololllo, 57 percent in Tachegnaw Bedene, and 38 percent in Sorgie Dorgossa indicated their intention to increase food grain production and marketed surplus. The farmers were asked about the change in the pattern of food grain marketing after the March 1990 reform. Almost all the farmers noticed an increase in the price of food grain. About 51 percent of the farmers reported a rise in the demand for food grain. About 21 percent of the sample farmers indicated that the supply of food grain remained unchanged after the reform.

The farmers in Alaba Siraro district are subsistence producers from whom one can not expect large quantities of market supply of food crops. The major cash crops in the sample Peasant Associations are red pepper and Teff. The case study reveals that the smallholder producers sold on average 760 Birr and consumed the equivalent of about 812 Birr in 1990/91. Red pepper, Teff, and maize account for about 80, 11, and 6 percent of the total cash sales of the sample farmers respectively. The farmers tend to produce Teff and maize for both household consumption and sales, while red pepper is a major source of cash income. A common belief is that cash crop has undermined food security at household level. In our sample,however, the red pepper production (cash crop) in the district enhances food security as long as food markets perform reasonably well. Red pepper production also allowed farmers more flexibility in timing their cereal sales.

Table 5 Peasant Responses to Whether They Intend to Increase Market Supply After Market Liberalisation

Peasant Associations	Yes		No		No Answer	
	No.	%	No.	%	No.	%
Adasha	48	96.0	2	4.0	-	-
Zico Dololio	47	92.2	4	7.8	-	-
Tachegnaw Bedene	24	43.6	19	34.5	12	21.8
Sorgie Dorgossa	29	28.7	49	48.1	23	22.8
Total	148	57.6	74	28.8	35	13.6

Source: Own field survey

Some of the sample households who sold part of their food grain were also buyers of at least part of their food grain needs. It is necessary, therefore, to consider the smallholder as both a food grain seller and buyer. The dual role may apply even to maize which is the main staple crop in the district. This dual role of the smallholder in the food grain marketing process makes it difficult to estimate the market supply of food grain in the sample survey.

About 64 percent of the 257 sample farmers indicated that they purchased food grain to meet their home consumption requirement in 1990/91. 81 percent of the farmers in Adasha and Zico Dololio (villages close to the market centre) purchased food grain from the market. Whereas in Sorgie Dorgossa (relatively a remote village), about 46 percent of the sample farmers purchased food grain from the nearby market (Alaba)(Table 6). About 88 percent of the respondents expressed low level of grain output as the major reason for the purchase of food grain. Only 2.6 percent of the respondents indicated that the purchase of food grain is cheaper than producing it on their own farm. Moreover, increase in food grain prices after the market liberalisation of March 1990 may have benefited farmers when they sold food grain in the free market (as net sellers), but it tended to decrease their welfare when they purchase food grain at higher prices (net buyers).

Table 6 Number of Sample Households Buying and Non-Buying Food Grain, 1990/91

Peasant Associations	Buying		Non-Buying	
	No.	%	No.	%
Adasha	40	80	10	20
Zico Dololio	42	82	9	18
Tachegnaw Bedene	39	65	19	35
sorgie Dorgossa	46	46	55	54
Total	164	64	93	36

Source: Own field survey

5.2 Time of Sale and Bargaining Power of Farmers

The sample smallholder farmers were aware of the fact that by selling their food grain immediately after harvest, they would not get a favourable price since they are selling in a glutted food grain market. Farmers prefer holding back the food grain for some time or postpone sales to off-season when they receive relatively higher price. They hold reserves of food grain and seeds and prefer to sell during the pre-harvest period when they are sure of harvesting the next crop. Unfortunately, the farmers were forced to sell their food grain immediately after harvest because of pressing cash needs. Some are even forced to sell their food grain before harvest through cash advances received from farmer-traders.

The farmers' bargaining position is partly reflected on their ability to postpone food grain sales or withhold stocks based on the market information obtained. The time of food grain sales possibly depends on quantity of food grain, land size, indebtedness of farmers, condition of road network from villages to markets, and the distance of the village from the market centre. We adopted the above variables as empirical measures of the economic position of farmers which indicate the farmers' bargaining power.

The Probit model is used to analyze the determinants of a choice between two discrete seasons. The dependent variable (I) is time of food grain sales. I = 1 if the farmer sells his food grain during the off-season, 0 otherwise (harvesting

season includes October - December while the rest are off-seasons). The independent variables are: size of holding (X_1) and output (X_2) which estimate the economic position of the farmer. It is hypothesised that the economic position influences the food grain withholding power and enhances the bargaining power of the farmers. Indebtedness of the farmers prevents them from holding food grain for better price quotations. This variable is represented by a dummy $X_3 = 1$ if the farmer is in debt and 0 otherwise. The condition of the village-market road network and distance which determine the flow of market information are expected to influence the time of food grain sales. This takes a dummy variable $X_4 = 1$ if the village is located near the market centre and 0 otherwise. $X_5 = 1$ if the village is located far from the market centre and 0 otherwise. The estimated parameters of the probit model are as follows:

$$I = 0.00257 + 0.00577X_1 + 0.00026X_2 + 0.00205X_3 + 0.00165X_5$$
$$(0.21756) \quad (0.21641) \quad (0.0001) \quad (0.21925) \quad (0.22531).$$

The standard errors are in parentheses.

Distance of the household from the market centre and indebtedness are found to be insignificant variables influencing off-season food grain sales. The only explanatory variable which is significant at a one percent confidence level is the quantity of food grain produced by the farmer. The positive sign of the explanatory variables indicate that higher marketed food grain increases the likelihood of disposing food grain during off-season.

5.3 Risk and Policy Barriers in the Grain Trading

Traders were accused of hoarding, speculation, and unfair trading practices during the last 17 years, 1974-90 (Africa Watch 1991: 107). The food grain traders indicated that they were dissatisfied with the pre-March 1990 agricultural marketing policy, particularly with the AMC's legal monopoly. Some also reported that they had abandoned food grain trade and switched to other types of trade like red pepper trade where there was no state marketing institution. Some even returned their licences to the Ministry of Domestic Trade due to the non-profitability of food grain trade. The licences of some food grain traders were also withdrawn by the government in order to reduce the number of food grain traders. Some food grain traders were suspended for failing to fulfil the AMC quota. A food grain trader in Alem Gebeya (rural market) reported that he had given up food grain trading because of the government policy which discouraged

private trade in the food grain sub-sector. After the March 1990 policy reform, the trader resumed trading.

In March 1990, the government removed legal restriction on private food grain trade and abolished AMC's legal monopoly over food grain trade, the quota system and the roadblocks. The policy assumed that private food grain traders would respond quickly to the reform and fill the vacuum left by AMC. No action was taken to remove the constraints of food grain traders in expanding their operation. Traders reported lack of capital and credit as serious problems. The deregulation of the freight transport was seen as important area where the government should intervene to improve food grain marketing efficiency. The food grain traders also indicated that the urban land proclamation (which prohibited buying and selling land) restricted the building of warehouses to store food grain. It was observed that all the well-off and long distance wholesale traders who stored large quantity of food grain in their residences in the open air (covered with canvas and plastic sheet) during the harvesting season. The grain was exposed to rain, weevils, rodents, moisture, fungi, and bacteria which increase the losses and reduce the quality of food grain.

The study shows that about 62 percent of the food grain traders cited an increase in the price of food grain after the policy reform of March 1990. The price of maize and Teff in Shashemene increased by about 31 percent in 11 months time after the March 1990 reform (Wolday, 1992: 125). About 79 percent of the sample food grain traders observed an increase in the supply of food grain. About 41 and 71 percent indicated an increase in profit and demand respectively. About 45 percent of the traders indicated that profit in food grain declined after the reform because some traders in the pre 1990 reform had links with corrupt government officials at AMC's check points and traded illegally by offering bribes. This gave them the opportunity to extract excess profit and accumulate a large amount of money in a short span of time.

The risk involved in food grain trade was also an important barrier to entry in the food grain market. This included (a) demand, supply, and price instability generated mainly by the vagaries of the tropical weather. Such instability made short- and long-term storage as well as long-term investment very risky. This was aggravated by the supply of food aid and Food for Work in the area which increased instability of supply, demand, and price in the markets. (b) lack of confidence in the new reform was another factor which influenced the long-term investment in food grain marketing. Traders had hard and painful experience with inconsistent government policies. It may take quite a long time

to regain the confidence of the traders on government policies that has disappeared in the 17 years of Derg rule. (c) most contracts were oral and based on personal trust and kinship relations which had their own informal contact enforcement mechanism. Many of the new entrants may find it difficult to form close links with other food grain traders in a short period of time.

VI. REFORMING THE REFORM

The effect of structural adjustment programme such as cuts in government spending and changes in relative prices and exchange rate need to be studied in depth. Do the relative prices that adjustment encouraged in Ethiopia favour the poor, especially the rural poor? Does the expenditure and subsidy cut alleviate poverty in rural and urban areas? Does the adjustment program only focus on short-run domestic and external macro-economic imbalances by giving less priority to the long-run increase in investment and productivity? Will the liberalised markets actually be competitive or will they simply replace public monopolies by private monopolies? Are the adjustment programs consistent with sustainable development? It is too early to make any judgement on the impact and implementation of the economic policy changes. But, it is, nonetheless, useful to try to isolate a few key issues to draw tentative lessons and pose unanswered questions.

(a) Although the government has abolished the main constraints to the development of the private sector, local government officials (self-governing administrations) are failing to implement some of the policies.Misguided regional government officials attempt to create unreasonable barriers on interregional trade (eg. re-introducing the food grain check-points).

(b) Government intervention is being discouraged in every aspect without a clear model for a new production, marketing and pricing system. Although destroying bad institutions is easier than creating good ones, careful consideration should be made in dismantling the old system by considering the ultimate economic consequences and the alternative arrangements. A well-functioning markets do not appear automatically and are not a natural outcome of liberalisation and democratisation. An effective, selective, and flexible government intervention should be encouraged to accelerate economic development while premature and hasty liberalisation should be avoided.

(c) The new entrepreneurial class is very weak. Many of its members made their money corruptly and illegally. They still look to the state for easy money *"Ayer-be-Ayer"* (the invisible) trade. They are interested in purchasing the major products from the government at a cheaper price and selling them at higher prices. Significant effort remains to be made to develop an entrepreneurial class (progressive capitalists of the sort in Taiwan and South Korea) with great energy, national commitment and competitive spirit.

(d) The impact of macro-policy reform measures on the small farmers depends on the institutional arrangements and mechanisms that link the two. The development of new institutions or redesigning the existing institutions is not given proper emphasis. The belief that pre-capitalist institutions are obstacles to development is no longer valid and the traditional institutional arrangements in the society can be rational and efficient with relatively low costs of economic transactions.

(e) The government has failed to follow appropriate timing and sequencing of the reforms. A successful liberalization entails developing the private-sector capacity before curtailing public-sector marketing. The collapse of the producers co-operatives, villagization and settlement programs immediately after the March 1990 reform without preparing a guideline to dissolve them is a case in point. Moreover, when EPRDF took power (May 1991), it gave farmers the right to decide on the fate of their own Service Cooperatives (SCs). As a result, many SCs were dissolved or destroyed. In the absence of these SCs, the export of coffee declined sharply in 1991. Fertilizer distribution was badly affected. The speed of the reform should have been determined by the objective condition of the country. Complementary policies should have been introduced sequentially depending on the economic and political situation of the country.

(f) The liberalisation process is hampered by bureaucrats who perceive themselves as the likely losers of the reform. Private entrepreneurs are often hampered by corrupt public officials and unnecessary rules and regulations which impede entry into private business. Due attention should be given to increasing the competence of the public servants,i.e.,the technical capacity to analyze problems, formulate feasible solutions and implement them.

(g) The land tenure particularly in the urban areas makes it difficult to secure titles (Proclamation No. 120/1993). A clear market for land is non-existent. Without clear economic legality, it is hardly possible to implement a credible commitment to private property rights and other effective marketing incentive mechanism. An economy starting out from a command economy should make a great effort to define ownership clearly. Berhanu (1994:320) suggested an alternative to the land

holding in Ethiopia which could be based on plurality of ownership, including private, corporate and collective ownership rights. This would entail granting freehold rights outside the truly communal areas (i.e., tribal areas as in the semi-nomadic regions).

(h) The relationship between democracy and economic development remains unclear. Countries like China and South East Asian tigers which have impressive records of economic growth and poverty reduction recently had hardly been noted for their commitment to democracy. In spite of the lack of empirical and historical evidence to show the relationship between democratisation and economic development in Ethiopia, it can be argued that democratisation and decentralisation, which are equated to good governance and power sharing, are among the essential instruments for successful economic development in Ethiopia. But one should avoid the over-optimistic view that democracy would solve the complex economic and political problems of Ethiopia. Moreover, democracy should not be considered as the game of the elites restricted in urban areas with vested interest rather as an internal process of societal changes as a whole.

On the other hand, despite the factors holding back the reform, an encouraging attempt has been made by the Transitional Government to dismantle the control in domestic and foreign marketing, prices, investment, exchange rate, employment, etc. A significant improvement in the performance of the economy, a decline in inflation and increase private investment are the positive dimensions of the reform. As a matter of fact, even during the era of the Derg, the market and the private sector in Ethiopia played important role in economic development. What we need at present is only legalising, expanding, improving and encouraging the market so that it can play the key role in economic development.

IX. CONCLUSION

Ethiopia has undergone a series of far-reaching changes in the last few years. One of the most important changes introduced in 1990 was the move away from a socialist oriented system towards a market-oriented economy. Reforms have swept through agricultural policy, monetary policy, exchange, finance, employment, trade and investment. The overall intention has been to allow the private sector to take up the leading role in the allocation of resources.

The success of market liberalization programmes depend on the capacity of the private sector to expand and fulfil marketing functions previously performed by the government and parastatal agencies. Liberalization entails efficient intervention and not necessarily non-intervention. The results of this study provide a preliminary indication that the reform has met with some success. Liberalization enjoys a widespread support from farmers, since they have benefited from high prices. The high prices may be necessary, at least in the short-run, to induce increased food production; yet, this imposes a heavy cost on the net buyers and low-income consumers. In addition to the positive steps, we recommend the following:

The government should take strong measures to support the development of the private sector. Private investors, traders, and small farmers need to be assured that their legal status is not under any threat, and that they are going to retain their current freedom and action. The precise role of the local and the central governments in terms of the development of agricultural marketing needs to be clarified.

While an appropriate incentive structure is important to induce both short-run supply response and long-term agricultural sector growth, incentives are only effective with supportive infrastructural investments. Therefore, the long term policies should focus on improving transportation infrastructure and storage systems. Many farmers are having difficulty in storing their grain for not knowing simple preventive techniques. Government policies should also focus on improving the market information system in agriculture. Improved credit system is required to finance the interseasonal stockholding, the purchase of transport vehicles and the construction of storage structures.

The cooperatives were used mainly for political and administrative purposes. Under the new more liberal environment, the cooperatives could serve as conduits to development and improve the bargaining position of the farmers. Farmers can carry out primary level of marketing on a cooperative basis, selling larger volumes to interregional traders at higher prices. Cooperatives could be involved in input market. Farmers may also form saving and loans associations.

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DIMENSION OF POVERTY AND NUTRITION IN ETHIOPIA

THE DIMENSIONS OF POVERTY IN ETHIOPIA: SOME EMPIRICAL EVIDENCES

Hadgu Bariagaber [1]

I. INTRODUCTION

1.1 General Perspectives on Poverty Correlates and the Focus of the Study

The prevention of poverty or its alleviation has been the concern of humanity. Until recently, the interpretation of poverty has been associated with ideology (social system/organization), religious outlooks and preconception. Prominent people of religion, classical economics and philosophy were engaged in discussing and arguing about its manifestations.

The unequal distribution of resources among different social groups and differential access to the means of production and demographic factors were described to be the main explanatory variables of poverty and misery.For many Malthusian and Neo-malthusian writers, the demographic growth has been conceived as either the primary cause of poverty or a major hindrance to the alleviation of poverty, resulting in what is called the "vicious-circle of poverty". On the contrary, other groups have perceived demographic growth as an important factor for the advancement of science and technology. This group has attributed poverty and misery largely to the injustice in social organizations such as unequal distribution of means of production and unhealthy political structure. High demographic growth has been favoured for reasons ranging from labour supply to nationalistic motives.

There are some empirical evidences which show some demographic dynamics form the integral parts of the definition and measurement of poverty. High mortality rate and its resultant low life expectancy appears to be highly correlated with poverty. However, studies on the relationship between poverty and

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[1]Reference is made partly to the Author's original Work entitled: "*Poverty Assessment In Ethiopia with particular Reference to Addis Ababa and the Institutional Efforts and Coordination for Poverty Alleviation in the City,* " which was presented at the workshop:" Urban Poverty in Southern and Eastern Africa", 14-16 march 1995, Nairobi, Kenya, Organized by UNCHS UMP.

certain demographic dynamics tend to show inconclusive results, raising the question whether a large family size is necessarily the cause of a peasant household poverty or a high fertility level is an outcome of poverty. Consequently, there has been a need to undertake an in-depth analysis of all possible poverty-correlates.

Ideally, poverty correlates can be investigated using computer-aided complex multivariate mathematical and statistical models. The output of such models could enable researchers to identify the critical variables of poverty. Accordingly, priority projects could be formulated for the eventual alleviation, reduction or elimination of poverty. The application of such models, however, is precluded, because such sophisticated models call for massive data input. In the Ethiopian context, such data are non-existent. Thus, in this study, assessment of the quantitative extent of poverty is taken as an alternative.

With respect to measurement of the dimensions of poverty, there has been a tradition of treating population size as mere denominator and aggregated output of resources as numerator for deriving per capita income. This parameter has been used to indicate the dimension of poverty. But, it has been recognized that the per capita concept appears to submerge a lot of internal demographic and resource variations.

1.2 Objectives of the Study

Poverty can generally be conceived as having a disturbing and irritating scene, manifesting deprivations of social and material aspects of life. It is vividly reflected in the way the victims are clothed, fed and sheltered and the extent of their deprivations in getting social services such as health, education and other amenities of life.

Poverty can also be conceived as a situational syndrome consisting of deficiency in food consumption, high mortality and morbidity levels, poor sanitary and housing conditions, low educational levels and the existence of widespread marginal population in all aspects of life.

The prevalence of poverty has been a common phenomenon in the Ethiopian society. It is a common observation in the life of the majority of the peasant households that the produce of one harvest would not be sufficient to feed members of a given household members until the produces of the next harvest are collected. The question of surplus production has been unthinkable for most of the

households. The seriousness of poverty of the rural population and most of the urban population is vividly manifested in the way the majority of the people are clothed, fed and sheltered. But, the quantitative extent of their poverty has to be studied to create awareness and to stimulate priority action programs on the part of planners and policy makers.

Knowledge of the dimensions of poverty and identifying the vulnerable groups can widen our scope in developing poverty- alleviation/ reduction/ elimination projects and programs. This study, therefore, aims at analyzing and synthesizing available data to establish alternative rural/urban poverty levels in general and to identify the "poverty-vulnerable" groups in particular. It has the following specific objectives:

1. to review the definition and conceptual issues of poverty and suggest appropriate definition for the Ethiopian situation,
2. to assess the types and magnitudes of poverty in the Rural/Urban areas of the country,
3. to identify the types of the "New Poor" and estimate their size,
4. to suggest some recommendations with respect to poverty-alleviation/reduction programs and future research activities and analytical requirements.

1.3 Source of Data

In Ethiopia, there has been a serious gap in the availability and suitability of data to be used for various socio-economic development planning and for the initiation of projects and evaluation or appraisal of development programs. In fact, vital statistics and registration system have been non-existent until a little over a decade ago (1984) when the country carried out the first National Population and Housing Census. There has not been even a single undertaking of National Agricultural Census. Data on poverty have also been scanty, scattered, incomplete and unreliable. The knowledge so far gained in studying poverty levels, patterns and trends has generally been based on the limited and sporadic cases of poverty and information which have been collected by quick-adhoc surveys or intelligently guessed by a small group of researchers in the country.

This paper, therefore, tries to compile, compute, systematize and synthesize the scanty and scattered data on poverty indicators from various sources including adhoc reports, files etc. The paper tries to analyse/synthesize the

available data by applying certain selected critical values of poverty lines and using certain central statistical tendencies.

The paper is organized under four sections including the introduction. The definition and conceptual issues of poverty are discussed in section II. The general components and specific manifestations of poverty are treated in this section, identifying the definition relevant to the Ethiopian situation. Section III deals with the assessment of the dimensions of poverty in Rural and Urban Ethiopia, identifying the types and estimation of the "New Poor", their origin, and future prospects. Section IV concludes with some recommendations.

II. DEFINITION AND CONCEPTUAL ISSUES OF POVERTY

2.1 General Components of Poverty

The definition and concepts of poverty vary depending on the development levels of societies. For example, in a number of West European countries, social welfare (social security) assistance is needed if income levels are below a certain level. FAO recommends certain limits (cut-off points) of nutritional deficiency by introducing the concept of Basal Metabolic Rate (BMR), and its coefficients, defined as 1.2 or 1.4 multiplied by BMR, and age/sex, body weight and physical activities as functions of BMR. The estimation procedures are provided in FAO/WHO technical texts[2] and Hadgu's (1992) research findings. There has not been any unique yardstick which could capture all the manifestations of human deprivations resulting from poverty. However, most poverty studies accept a minimum caloric intakes varying between 2100 and 2500.

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[2]a. FAO/WHO/UN UNIV: Energy and Protein Requirements, Technical Reports, series No. 724, WHO, Geneva 1985, pp. 73-75

b. W.P.T. James etal; Human Energy Requirements A manual for planners and Nutritionist, FAO, Oxford University Press, 1990, pp. 23-30, and 32-33.

c. UN UNIV. Food and Nutrition Bulletin Vol. II, No. 2, June 1989, pp. 8-12.

2.2 Specific Manifestations of Poverty

There are two commonly used definitions and concepts of poverty; namely, "Absolute poverty" and "Relative poverty" whose definition and conceptual issues and problems are treated in detail by Rodgers (1984), ESCAP (1988), and the World Bank (1991).Absolute poverty is usually a "Consumption-based" measure referring to the inability to secure the minimum basic needs for human survival. It is equated with a latent famine with a potential threat that could develop into absolute famine (Mesfin, 1984). Its linkages with undernutrition (quantitative deficiency of food- ie. energy deficiency) and malnutrition (i.e lack of protein) are underscored by UNICEF(1994) and extensively treated by Mesfin (1984) in the case of Ethiopia.

Relative poverty is a type of deprivation, measuring the degree of inequality of income amongst the household groups or communities. It relates to the condition of the lower 30-40 percent of income distribution in any society, embracing the majority who appear to lack the means of adequate social amenities. Both absolute and relative poverty can further be defined by establishing quantitative parameters which include per capita income, per capita provision of social services, per capita food consumption and a variety of other services.

In this paper, the concept of absolute poverty is employed. For Addis Ababa and other urban areas, the "Vital-minimum" as measured by income and the level of expenditure for a minimum consumption basket for human needs, will be identified, whereas for the rural population, it is generally measured in terms of assets (i.e Land and Ox) and consumption/production relationship and levels of some socio-economic developmental indicators.

Although absolute poverty line[3] is subject to conceptual and estimation problems, it is a reliable measure of the extent of poverty as it provides a measure of the capacity to purchase the "Vital-minimum" needs. Its appropriateness can also be justified for a low income society, like Ethiopia.

[3]e.g the minimum basket is not accounted for the preference of the marginal consumer and the welfare expenditures such as housing, health and education.

The salient and abject features of poverty are the incidence of undernutrition and malnutrition whose intensities are classified[4] as chronic, transitory or cyclical. The underlying measures of poverty (i.e chronic, transitory and cyclical) in this paper are the extent of quantitative deficiencies.

2.3 Dimensions Of Poverty

Some available data indicate that poverty has been a common feature of life in almost all regions of the world. In 1988, for example, it was claimed to have affected about a billion people, which includes about 36 percent of the rural poor out of the total rural population in more than 110 developing countries (IFAD, 1993a). When information is disaggregated at continental level, the size of rural population below a certain defined poverty line[5] was estimated to be about 60 percent for sub-saharan Africa; 69 percent for Least Developed Countries; 46 percent for the Less Developed ones and about 26 percent for Near-East and North Africa (IFAD 1993b). In this connection, the food security situation of the Eastern and Southern African Sub-regions can be examined in Table 1. This table indicates that the food security situation of these countries has been characterized by low nutritional status where the food import-dependency ratio has increased between 1967/71 and 1988/90; the ratio of calorie supply to the required level remained below unity for most of the countries ranging from as low as 73 percent for Ethiopia and as high as 105 for Swaziland; the proportion of population in absolute poverty has remained high, ranging between as low as 37 percent for Madagascar and as high as 85 percent for Mozambique.

The per capita calorie supply, which is another measure of the extent of poverty, ranges from as low as 1699 for Ethiopia and as high as 2634 in

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[4] Chronic - continually high risk of inability to meet food requirements;
Transitory -temporary decline in the availability of food;
Cyclical -regular pattern in periodicity of inadequate availability of food.

[5] The manifestations of poverty are multifaceted. It is insufficient to describe the plight of the poor by a single yardstick. However, the WHO, taking an average requirement of daily caloric intake for a moderately active adult persons, has defined poverty line here to be below 2850 calories of daily diet energy supplies.

Swaziland which, together with other South African countries (Botswana and Lesotho), depends on food importation significantly, ranging from about 31 percent for Swaziland, 59 percent for Lesotho and as high as about 75 percent for Botswana.

Table 1 Some Indicators of Food Security Situation in East and Southern ECA Member States (1988-90)

Country	Per capita calorie supply	Calorie supply to requirement (in %)	Food Imported Dependency Ratio 1990		Percent of total population in absolute poverty
			1967/71	1984/990	
Ethiopia	1639	73	1.1	9.4	64
Somalia	1874	81	12.7	17.0	70
Kenya	2064	89	7.4	9.6	52
Burundi	1948	84	2.0	3.3	84
Rwanda	1913	82	2.3	7.4	60
Tanzania	2195	95	4.9	3.3	58
Malawi	2049	88	4.4	5.6	82
Zambia	2016	87	22.0	7.0	73
Mozambique	1805	77	7.3	21.9	85
Madagascar	2156	95	4.5	5.2	37
Botswana	2260	97	47.5	74.8	64
swaziland	2634	105	25.9	30.5	48
Lesotho	2121	93	30.5	59.0	54

Source:

a. UNDP: Human Development Report 1993 New York, 1993, pp. 160-66, pp.170-71.

b. World Bank: World Development Report: The Challenge of Development. Oxford University Press 1991, p.258.

c. ECA: Economic Report 1994, p. 47

d. FAO: Agrostat Data 1993, Statistics Division, Rome Italy.

III. ASSESSMENT OF THE DIMENSIONS OF POVERTY IN ETHIOPIA

3.1 Rural Poverty

An examination of the Ethiopian poverty situation shows that it is closely linked to demographic, social, economic, natural/ physical and political conditions. In recent years, various estimates of the level of poverty status have been made. The most recent estimates are shown in Table 2. The Relief and Rehabilitation Commission estimate indicates only for the rural drought-affected population, which needed relief and rehabilitation, whereas other estimates were for the whole population. Although the magnitude of the incidence of poverty varies from 46 percent to 67 percent of the total population, depending on the assumptions and year of estimation, these figures reflect the seriousness of poverty in the country.

Table 2 **Recent Estimates of the Magnitude of Poverty in Ethiopia (1987-1992) by Selected Agencies**

Name of agency	Year	Size of population at risk (in millions)	Percent affected out of total population
RRC	1987	8.7	21
World Bank	1988	20.0	46
National Nutrition Survey	1990	31.0	64
IFAD	1989	-	50
IGADD	1989/90	31.1	60
IFPRI	1991	-	67
World Bank	1992	-	50

Source:

MOPED: The social Dimension of Adjustment in Ethiopia: A Study of Poverty Alleviation, Addis Ababa, May 1992, pp. 34-35.

The best and direct method of poverty measure is the estimation based on income structure of the households. In 1981/82, the Central Statistical

Authority (CSA) carried out a Rural Household Income, Consumption and Expenditure Sample Survey. Since income data are usually defective and unreliable (for varied reasons), the domestic expenditure of all types can be taken as a more reliable proxy to rural household income. Hence, the CSA expenditure groups[6] are rearranged into convenient groupings and presented in Table 3. This table is employed as a basis for estimating the extent of poverty using the following two approaches:

1. using of 500 grams of grain equivalent (i.e. RRC rationing estimate) per capita per day as an absolute poverty line which is to be converted into rural income equivalence and
2. using a convenient central statistical tendency to be estimated from the income distribution and assuming that it will approximate the poverty line.

Using the absolute poverty line of 500 grams per capita per day and assuming an average household size of 5 persons, the per capita household consumption would be 2.5 kilograms per day. If we assume that Birr 1.62 as the cost of one kilogram grain equivalence in 1982, the cost of 2.5 kilogram would be Birr 4.05, which is the amount to be spent by a household per day. Hence, the annual expenditure would be Birr 1478.3, which is assumed to approximate the poverty line. This amount falls between the income interval 1100-1499 (Table 3). Thus, 52.9 percent of the rural households could be assumed to have been experiencing poverty.

In the light of available price index and cost of a kilo-gram grain equivalence for 1992, an attempt is made to update the magnitude of the 1982 poverty to 1992. Assuming that the 1982 income distribution (Table 3) would remain constant and assuming the cost of a kilo-gram to be Birr 1.82 in 1992, it follows that 65.5 percent of the rural households would have been undergoing poverty.

Using the second approach,i.e., when the median value and the standard deviation are estimated to be Birr 1431.2 and 191.1 respectively (Table 3) and defining median minus one standard deviation as poverty line for the "poor" and median minus two standard deviations as chronically poor, then those to be classified as poor would constitute 48.4 percent of the total households and those chronically poor would be 32.7 percent.

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[6]Since the extreme values or outliers (i.e. those more than Birr 5099) appear to exaggerate the central statistical tendency (i.e. mean, median etc.), the analysis is done between groups less than Birr 500 and up to Birr 5099

Table 3 Income Distribution of Rural Households of Ethiopia (1981/82)

Income Interval	Observations	Relative Frequency	Estimated mid point
< 5	173	5.9	225
500-799	400	13.6	650
800-1099	470	15.9	950
1100-1499	546	18.5	1300
1500-1899	425	14.4	1700
19900-2299	300	10.2	2100
2300-2699	175	5.9	2500
2700-3499	257	8.7	3100
3500-4299	150	5.1	3900
4300-5099	55	1.8	4700
Total	2951	100.0	-
median value	-	-	1431.2
s.d.	-	-	191.1

Source: C.S.A.: Rural Household Income, Consumption and Expenditure Survey, (May 1981-April 1982), Statistical Bulletin No. 61, Addis Ababa, April 1988, pp. 2-5.

Further attempts were made to assess the differential incidence of poverty among the rural population of the regions based mainly on two productive assets: size of landholding and number of active-oxen. Based on the distribution of these two assets :

i. households having land less than one-tenth of a hectare and no ox were classified as "Ultra-poor" (i.e poorest of the poor or chronically poor),

ii. households having land between 0.1 and 0.5 hectare and only one ox, were classified as "poor", and

iii. households having land between 0.51 and 1.00 ha and with two oxen were assumed to be "Vulnerable" to poverty.

The results are presented in Table 4. This table indicates that about 20.5 percent of the total households or 8.8 million persons can be classified as "poorest

of the poor". Those with ox and having cultivated land between one half and one-tenth of a hectare accounted for 8.8 percent or 3.8 million people. These two groups of households (facing chronic poverty) constituted 29.3 percent or 12.6 million people.Households on the verge of poverty (i.e. vulnerable to poverty) were estimated to be about 17.3 percent or 7.4 million people and the poor nomadic/pastoralists population were estimated at 5.1 percent or 2.2 million people.

In totality, about 51.7 percent or 22.2 million people (out of the total 43.0 million) were facing poverty of varying degrees. Chronically hard-hit regions were Gamogofa (66.3 percent), Wello (52.4 percent), Hararge (52.3 percent), Tigray (42.6 percent) and Gondar (31.4 percent). If the size of households vulnerable to poverty and the poor nomads/pastoralist is added to the proportion of the chronically poverty-striken households, the magnitude of poverty would reach as high as about 71 percent for Gamogofa, 91 for Hararghe, 84 for Tigray and 85 for wello (Table 4).

Further examination of the Regional dimension of rural poverty was made by considering a large number of socio-economic indicators. Out of the different indicators, fourteen were identified to be the most illustrative of the conditions of deprivation of access to resources, goods and social services (IFAD,1989). The relative position of each region in the level of socio-economic development is shown by a score. The scores range from 1-12, representing the total number of the regions. The maximum scores are 168 (i.e. 12x14) and the minimum 14 (i.e. 1x14). Summing up the ranks or deprivation index gives crude estimate or relative poverty among the regions (Table 5).The classification of the degree of deprivation is made as follows:

1. regions which scored less than 50 percent are classified as "Highly deprived"
2. regions scoring between 50-59 percent of the total scores are considered "Deprived" and
3. those which scored 60 percent and over are classified as having good access to resources, goods and social services.

The results of this approach are consistent with the findings obtained based on the conditions of the two productive assets, namely, land and ox ownership (compare Table 4 with Table 5 and the above summary). Both approaches have indicated that the six regions (plus Tigray), namely Gamogofa, Hararghe, Illubabor, Keffa, Sidamo and Wello, have been the most affected areas in the country.

Table 4 **Estimates of Households of Chronic Poverty and Vulnerable to Poverty by Regions(1992)**

Region	Total Households (in '000)	Affected Households (in %)			Households Vulnerable to poverty in %	Poor Pastoralist in %	All in %
		Chronic Poverty					
		Ultra Poor	Poor	Both			
Arsi	371.1	-	14.9	14.9	-	-	14.9
Bale	232.6	25.9	-	25.9	22.9	-	48.8
Gamogofa	310.5	24.0	42.2	66.2	-	4.4	70.6
Gojam	770.0	-	19.1	19.1	-	-	19.1
Gondar	699.1	13.0	18.4	31.4	-	-	31.4
Hararghe	929.9	52.3	-	52.3	22.2	16.0	90.5
Illubabor	238.2	12.4	-	12.4	43.0	3.0	58.4
Keffa	572.6	-	27.2	27.2	-	-	27.2
Shoa	1743.9	12.8	-	12.8	25.0	3.6	41.4
Sidamo	903.5	22.8	-	22.8	42.6	6.7	72.1
Tigray	499.7	42.6	-	42.6	18.4	22.9	83.9
Wellega	593.8	-	23.6	23.6	-	-	23.6
Wello	725.7	52.4	-	52.4	28.9	4.1	85.4
Total	8590.6	20.5	8.8	29.3	17.3	5.1	51.7

Source:

MOPED: The Social Dimension of Adjustment in Ethiopia -A Study on Poverty Alleviation, Addis Ababa, May 1992, Annex VII, p. 132.

In recent years, the traditional rural poverty has been aggravated by the emergence of a "New Poor" as the results of war and instability in the country. Those groups, mostly displaced including ex-soldiers and returnees, have required huge relief and rehabilitation for resettlement and self-sufficiency. Various estimates of the magnitude of the "New Poor" were made. MOPED (1992) estimated about 1.4 million "New poor", inclusive of displaced population (592,000), ex-soldiers (326,000), returnees (470,000) and Refugees in Kenya (11,000). Maxwell's (1991) estimation puts 37.9 million people as poor; constituting resource-poor (25.5 million), vulnerable population in marginal areas (5.6 million), poor Nomads (2.0 Million), Urban Poor (750,000), displaced population and ex-soldiers (3.3 million) and refugees (800,000). Attempt was

made to summarize the various estimates in Table 6. This table shows that about 60 percent of the total population experienced poverty during the period 1990-92. Out of this figure, 32 percent were under Chronic poverty and 28 percent vulnerable to poverty. While the urban poor constituted about 8 percent of the total national population, the "New Poor" was estimated to be about 10 percent.

Table 5 Extent of Deprivation Index of Access to Resources, Goods and Social Services by Regions

Region	Score	Percent of total score	Socio-economic indicator/position
Arsi	139	82.7	Relatively good
Bale	92	54.8	Deprived
Gamogofa	60	35.7	Highly deprived
Gojjam	120	71.4	Relatively good
Gondar	90	53.6	Deprived
hararghe	72	52.9	Highly deprived
Illubabor	66	39.3	Highly deprived
Keffa	81	48.2	Highly deprived
Shoa	114	67.9	Relatively good
Sidamo	74	44.0	Highly deprived
Wollega	123	73.2	Relatively good
Wello	54	32.1	Highly deprived

Note: Total scores = 168
Source: IFAD: Rural Poverty in Ethiopia, Special Programme Mission, Working Paper 7, Table 22, p.47.

From Table 5, further summary is made as follows:(Author's classification)

Socio-economic indicators	Range of scores in % out of 168 total scores	Region under such conditions
Relatively good	60+	Arsi, Gojjam, Shoa and Wellega
Poor	50-59	Bale and Gondar
Chronically poor	< 50	Gamogofa, Hararghe, Illubabor, Keffa, Sidamo and Wello

Table 6 **Estimates of the Incidence of Chronic and Transitory Poverty in Ethiopia (in millions and percentages)**

Source of target population	Type of poverty			Percent out of total
	Chronic	Transitory	Total	
Rural	12.6 (a)	7.4 (a)	20.0	38.5
Poor nomads	-	2.0 (b)	2.0	3.9
Urban poor	4.0 (a)	-	4.0	27.7
Displaced population and ex-soldiers	-	3.3 (b)	3.3	6.4
Retrenchment and others	-	1.0 (b)	1.0	1.9
Refugees	-	0.8 (b)	0.8	1.5
Total	16.6	14.5	31.1	-
Percent out of total population	32.0	27.9	59.9	59.9

Note: -Base National Population is assumed to be 51.9 million in 1992.

Source: World Bank - Ethiopia: Towards Poverty Alleviation and Social Action Programme, Agriculture and Environment Operations Division, Eastern Africa Department, Aug. 1992, p. 24.
Debebe HabteWold and Simon Maxwell: Vulnerability profile and Risk Mapping in Ethiopia, MOPED, Addis Ababa, Dec. 1992, pp. 25-26.

Although Table 6 puts the "New Poor" as transitory/vulnerable to poverty, a large number of this population has already joined the chronically poor population, apparently with a sizeable number in the major urban areas of the country, notably Addis Ababa.

3.2 Urban Poverty Situation

Various trend estimates of the minimum income requirement for the purchase of food and non-food items in Addis Ababa and other urban areas were made and summarized in Table 7. This table indicates that the cost of living in Addis Ababa has constantly been increasing. In 1976, the minimum income required for meeting a daily per capita calorie of 2330 was about Birr 47. Within six years time, it has increased to Birr 78 in 1982. In 1992, the minimum income requirement for getting a minimum daily per capita calories of 2100 rose to about Birr 193. Consequently, the total poverty line appeared to have increased from about Birr 77 in 1976 to about Birr 244 in 1992. If this figure was to be extrapolated to 1993/1994 price increase, the minimum income required to purchase food and non-food basket would be much more higher. For instance, the Ethiopian Wage Board estimated that the minimum monthly expenditure requirement of a typical household in Addis Ababa increased from Birr 255 (i.e Birr 87 for food and Birr 138 for non-food item) in February 1990 to Birr 391 (i.e. Birr 191 for food and Birr 200 for non-food item) in April 1992. From this trend, we can understand that the living standard of the majority of households in the city has been deteriorating.

Recent estimates of the income levels of Addis Ababa as compared with that of four major towns and Dire Dawa are presented in Table 8. Consistent with the previous findings, this table shows generally low levels of income structure, especially that of Addis Ababa where we have a median value of about Birr 142 for Addis Ababa as against Birr 219 for other urban areas and Birr 287 for Dire Dawa.

Table 7 **A Summary of Monthly Minimum Income Requirements (Birr) for the Purchase Food and Non-food Baskets for Addis Ababa and other Urban Areas (1976-1992)**

Year	Assumed per capita daily calorie requirement	Minimum monthly income requirement for purchasing		
		Food	Non-food	Total poverty line
1976	2330	46.7	30.2	76.9
1978	2330	56.1	37.7	93.8
1979	2330	62.0	43.5	105.4
1982	2330	78.1	55.3	133.4
1990	2100	138.0	87.0	225.0
1992	2100	193.4	50.8	244.2
1992	2100*	181.6	20.0	201.6
1992	1700*	159.0	51.0	210.6

Note: Figures with Asterisk indicate for other urban areas and other figures of corresponding dates are for Addis Ababa.

Source: 1. Vali Jamal: Aspects of Urban Poverty in Ethiopia; ILO Report,
2. World Bank: Ethiopia Towards Poverty Alleviation and Social Action Programme, August 1992, pp.14-15.
3. Shlomo Reutlinger Ethiopia: Coping with Poverty under Policy Reform, Background paper submitted to the World Bank and IMF, June 29, 1992, p.4.

Table 8 **Summary of Recent Estimates of Monthly Income Distribution (in percent) for Major Towns (Dire Dawa, Bahir Dar, Awassa and Jimma) and Addis Ababa (1993)**

Income group	All four towns	Dire Dawa	Addis Ababa
< 50	9.5	3.4	15.6
50-99	14.9	8.8	25.5
100-199	22.9	20.7	21.1
200-299	13.9	19.6	11.0
300-399	11.6	15.7	9.0
400-499	9.2	11.9	4.2
500-599	6.3	6.9	3.3
600-699	5.2	6.1	1.8
700-799	4.0	3.8	1.1
800-899	2.5	3.1	7.4
Total	100.0 (840)	100.0 (261)	100.0 (1688)
Median	219.2	286.8	141.8
S.D	79.2	131.3	61.4

Source:

a. MOPED:Report on Household Food Security Study of Four Towns (Awassa, Bahir Dar, Dire Dawa and Jimma) Food and Nutrition Unit, Addis Ababa, Feb. 1994, pp. 123-130.

b. Gebre Solomon: The Condition of the poor in Addis Ababa;A Social Problem not yet Addressed, Addis Ababa University, March 1993, p.5.

Based on the recent income information, as shown in Table 8, estimates of the extent of poverty levels can be prepared using the following assumptions:

a. Application of median value and Standard Deviation (SD) to define the size of poverty:
   i. assume median income minus the value of SD to be the poverty line for the "poor" as first alternative and
   ii. median income minus 2SD's as the second option.

b. Converting the daily per capita consumption requirements of 500 grams of poverty line into monthly household income and defining any income less than this poverty line to be the size of poverty. Here, assume the cost of one kilogram of grain to be Birr 1.65 and an average household size of 5 persons.

The results of the two approaches are presented in Table 9. Estimates based on the median value minus one standard deviation and those based on the daily per capita consumption of 500 grams appear to be plausible. Accordingly, the estimates for Addis Ababa range from about 47 percent according to the median approach and 51 percent according to the minimum per capita consumption requirements approach. Similarly, for Dire Dawa, it ranges from 22 percent according to the second option and about 34 percent according to the first option, whereas it ranges between 35-43 percent for the other major towns (Table 9).

Table 9 **Estimates of the Extent of Poverty (in percent) for Addis Ababa, Dire Dawa and Four Major Towns, According to Median Value Approach and Daily per Capita Consumption of 500 grams**

Types of measure	Addis Ababa	Dire Dawa	Four major towns
a. Median (X):			
i. x-SD	46.6	34.2	42.7
ii. x-2SD	11.9	3.3	15.9
b. Based on 500 grams per capita	51.1	22.1	35.3

Source: Author's Estimation

3.3 The "New Poor": origin, categories and future prospects

From historical perspectives, we can trace the main causes of poverty to be the consequences of primitive technology, the past episodes of famines, poor economic performance due to unfavourable socio-political environments and economic policies of the "Emperial Regime" prior to 1974, and the adamant socio-economic and political policies and programs of the "Derg Regime" during 1974-1991.

The banner of the Derg Government "Every Resource to the War Front", has brought about significant consequences to the disintegration of a lot of families and economic difficulties which resulted in a large number of Ethiopian refugees which took asylum in the neighbouring countries as well as other countries in the world. Furthermore, there occurred huge flows of population into the urban centres of the country, especially since 1992 when Mengistu's regime collapsed. In this case, Addis Ababa became the most affected. The existing infrastructural facilities, employment opportunities and the financial foundation of the city have been too weak to cope even with the existing population size. The situation further deteriorated with the new influx of migrants which resulted in ever-increasing demands for social services and jobs. Apparently, it became a common scene for every Addis Ababa citizen to see a large number of new homeless and poverty-striken destitutes.

In Conventional Rural/Urban migration, persons leave their place of birth for varied reasons: Seeking job for better life and the perceived socio-economic prospects in the place of destination as compared with the place of origin. Such movements have been phenomenal in African countries in which the influx of population has been mostly towards the primate cities, like Addis Ababa. Addis Ababa now faces "New Poor Influx" from all parts of the country. These include:

- a large number of demobilized soldiers and their families,
- displaced persons inclusive of civilians,
- handicapped people of the civil war,
- migrants caused by sporadic drought and ethnic conflicts,
- those who left the resettlement areas,
- returnees from asylum countries and
- the preponderance of migrants who have been categorized as urban unemployable such as the aged, disabled and destitute children.

These categories of people made their way to Addis Ababa and other major urban areas on the expectation that they would get relief for their livelihood.

Specific to Addis Ababa was that, besides the "New Poor Influx", the city has been encountered with widespread urban poor who have been engaged mostly in the informal sectors of petty trading dominated by female-headed households and all sorts of odd activities of survival strategies, plus those vulnerable to the policy reforms and those affected by food price rises.

As the consequences of the "New Poor Influx", there occurred two remarkable observations in the city. The first one was that the number of homeless people has been increasing from time to time, living in squatter shelters made of plastics, and ragged clothes etc. The spontaneous settlements were first made outside the church and mosque yards, but now it is becoming a common scene around big buildings, on the pavements of streets, on lanes between streets etc. The second remarkable phenomenon was that many children of the homeless households including those of other poor families are out on streets, most of them engaged in begging, carrying goods or roaming about the streets and some of them trying to follow certain survival strategies such as selling lotteries, petty trading etc.

In the light of some scanty and scattered information, an attempt is made to compile various estimates of the size of the "New Poor". Table 10 depicts some preliminary figures. During 1992-93, it was estimated that the "New Poor" of Addis Ababa was about 1.5 million and the number of the street children reached 40,000. But, the number of children at risk and those potentially to be at risk for Addis Ababa and other urban areas was estimated to be about 1.6 million. At least fifty percent of these children can be assumed to be in Addis Ababa.

In view of the high and widespread incidence of poverty in the city during the past recent years (Tables 7- 9), it is likely that a large number of children of the poor (constituting about 51 percent of the total Addis Ababa households) would turn out to be street children. In the case of the "New Poor", although it is difficult to get the actual figures of those covered by all NGO's and other projects in Addis Ababa, their number would likely increase, especially of the returnees, handicapped people of the civil war, disabled population, migration which would be caused by drought and possibly, by socio-economic push/pull factors.

Specifically, the concentration of the NGOS' activities and government rehabilitation and poverty alleviation projects and programs in Addis Ababa would definitely attract and invite more migrants to join the already existing "New Urban Poor". Furthermore, if Addis Ababa remains to be a primate city, absorbing all the national resource investments etc., the existing unhealthy urbanization and migration would be aggravated and all efforts for poverty alleviation would be futile.

Table 10 Estimates of the "New Poor" in Addis Ababa and other urban areas (1992-93)

Ser. no.	Categories of affected population	Estimated according to			
		A	B	C	D
1	Ex- soldiers and their families	300,000	229,500	-	-
2	Displaced population and related	500,000	-	-	-
3	Unemployed labour force	700,000	-	-	-
4	Street children	-	-	40,000	-
5	High risk children	-	-	-	500,000*
6	Potentially at risk	-	-	-	1,100,000
Total		1,500,000	229,500	40,000	1,600,000

Note: Asterisks are for urban areas including Addis Ababa.

Source:
A - MWUD/Ethiopian and Netherlands Gov. (Project Document): Urban Field Development in Ethiopia: Urban Poverty Alleviation, 1994, p.5.
B - Deborah Hicks: The Addis Ababa Destitute: The Silent Emergency? UN/EPPG, A Situation Report, Feb. 1992 PP. 4-5.
C - Radda Barnen Ethiopia: Office Memo, On Program Catalogue, July 27, 1994, P.7.
D - UNICEF Estimates, 1993.

IV CONCLUSION AND RECOMMENDATIONS

By compiling and systematizing the scanty and scattered data on poverty situation, the paper has tried to examine the types and levels of Rural/Urban poverty in the country.

Based on the income structure of the households and using the RRC poverty line of 500 grams of daily per capita consumption requirements, it was estimated that the level of poverty in rural Ethiopia has increased from about 53 percent in 1982 to about 66 percent in 1992.

Considering certain productive assets, assessment of the differential poverty incidence among the rural population of the regions showed that, on an average, about 52 percent of the rural population has been undergoing poverty with Wello, Tigray, Gamogofa, Illubabor, Hararghe and Sidamo being chronically poverty-striken regions.

Using a large number of Socio-economic and physical indicators, comprising access to resources, goods and social services, regional differentials in the dimensions of rural poverty and deprivation were examined and it was found out that almost all the regions were poor in all aspects of development and particularly those chronically poor (i.e. having had a score of less than 50 percent of the total scores of 168) were Gamogofa, Hararghe, Illubabor, Keffa, Sidamo and Wello.

Since 1992, it was noted that the traditional rural/urban poverty has been aggravated by the emergence of the "New Poor" which raised the level of poverty to about 60 percent of the total population.

Concerning urban poverty, the trend analysis of the minimum income requirements for the purchase of food and non-food items in Addis Ababa and other urban areas indicates that the cost of living has been increasing constantly, with a total poverty line increase from about Birr 77 in 1976 to Birr 244 in 1992. It can be extrapolated easily for the 1993/94 price increase that the minimum income required to purchase food and non-food basket would increase much more higher than that of the preceding years.

In fact, recent estimates from household income survey (1993) indicated that as high as about 51 percent of Addis Ababa households, 34 percent of Dire

Dawa and 43 percent of other four major towns were below the poverty line unable to meet the minimum requirements for food and non-food expenditures.

With the influx of the "New Poor", the extent of poverty in Addis Ababa would be much higher than it was in the previous years. Furthermore, if Addis Ababa continues to be a "primate city", absorbing all the national resources and investments, the existing unhealthy migration and urbanization would be aggravated and all efforts of preventive, remedial and developmental programs for poverty alleviation would be futile.

From the analysis/synthesis of the poverty situation in rural/urban Ethiopia, certain recommendations can be made, focusing on government policy, coordination of poverty alleviating projects and the need for carrying out research and analysis of poverty correlates.

With respect to rural poverty situation, the following suggestions are provided:

i. The most affected six regions should be given priority for their rehabilitation and development, identifying their respective low potential and degraded cereal zones,

ii. Involve those well-experienced and capable/successful old NGO's of Addis Ababa to extend their activities to the socially and economically deprived and environmentally/physically depressed rural/urban areas within these regions,

iii. Invite the multilateral and bilateral donor agencies for funding and technical assistance for the rehabilitation and development of those areas, and

iv. The implementation of suggestions i-iii above can have two-fold effects: some "new" and "old" poor of those areas who are currently in Addis Ababa and other urban areas could eventually leave those areas and go back to their place of birth and those who have been still living in the currently poor areas could be contained in the same zones.

Multilateral, bilateral and NGO's "burden-sharing" for poverty alleviation efforts should be centrally coordinated, funded, monitored and evaluated for the following reasons:

i. Avoids redundancy in project initiation, formulation and implementation,

ii. Strengthens integrated approach in minimizing rural/urban poverty; enabling amalgamation of small isolated beneficiaries into a wider domain of the target population,

iii. Facilitates for continuous appraisals on the viability or applicability, affordability, implementability and profitability of any poverty-alleviating projects,

iv. Minimizes complacency on the part of the "Line Ministries" and encourages direct involvement and enthusiasm of the relevant government institutions and donor agencies,

v. Enables to undertake the "cost-benefit analysis" on the performances/achievements of all projects involved in poverty alleviation activities,

vi. Enables to coordinate community resources, and inculcates awareness about the objectives and operational mechanisms of projects,

vii. Enables to organize training and promotion campaigns to raise the low level of experience in project formulation and management,

viii Minimizes bureaucratic problems in start up by consulting institutions involved in the preparation and implementation of urban master/development plans for land allocation to be used for poverty-alleviating projects and facilitates prompt issuance of project sites, permits etc., and

ix. Enables that poverty-alleviating projects are in line with the short, medium and long term objectives and policies of the government.

Pertaining to strategies for poverty alleviation, the following points are in order for attention and consideration:

a. There are a number of NGO's in certain major urban areas and rural communities which are still engaged in rendering relief-food rationing, even for those who are physically and mentally capable to work. There should not be any free gift (either in kind or cash) at all unless beneficiaries are initially in a very critical position for survival,

Projects such as the "Safety Net", and "Food for Work" should be an integral part of the poverty alleviation programs and should be encouraged to expand their dimensions,

c. Poverty-alleviation strategies such as the creation of Savings and Credit Associations should be encouraged to be one of the focus of interests of the NGO's for the continuity and sustainability of projects, especially income generating activities, and

d. The traditional "Burden-sharing" like *Debo* in Amharic, *Jiggi* in Oromigna, *Wefera* in Tigrigna etc. which have been programs of cooperation and solidarity largely for poor households especially female-headed households should be encouraged.

Among the research and analytical requirements for poverty alleviation programs, the following activities should be included.

a. Carrying out pre-feasibility and feasibility studies, inclusive of identification of problem areas, their sources, types and dimensions,

b. Preparation of cost-benefit analysis, beneficial linkages, financial and management considerations, replacability, and sustainability of projects,

c. Carrying out special migration studies, inclusive of the causes, patterns and motivations of the target population,

d. Study the general demographic and socio-economic determinants of poverty of the target population as well as the domain population, and

e. Carrying out continuous studies on the performance and achievements of the subsequent project activities and their impacts on poverty-alleviation /reduction /elimination.

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DIMENSIONS OF RURAL POVERTY IN ETHIOPIA: SOME PRELIMINARY OBSERVATIONS

Itana Ayana

I. INTRODUCTION

1.1 Background

During the last three decades, the position of developing countries in terms of their poverty situation is reported to have improved (World Bank, 1990). This does not, however, apply to all countries of the developing world. In fact, the distribution of some of the improvements have been very unequal between regions and even within countries. For instance, between 1965 and 1990, life expectancy in the developing countries increased from 50 to 63 years while the school enrollment ratio rose from 73 to 89 percent of the population of the primary age group and per capita consumption increased in real terms by 70 percent (World Bank, 1992). Social conditions also improved in all regions. If these improvements had been equally distributed across all countries of the world, poverty could have been eliminated altogether. However, this was not the case. In fact, 20 percent of the total population of the world are still living in poverty (Shubert,1994).

In terms of per capita consumption and value of subsistence indicators, poverty in the Sub Saharan Africa has been severe and tends to worsen compared with other regions of the world. As opposed to Africa (South of the Sahara), countries in East and Southern Asia namely; India, Indonesia, Malaysia, Pakistan and China are reported to have been successful in reducing poverty. In Latin America, however, poverty tended to rise particularly in the 1980s (World Bank, 1992). Contrary to that of the World Bank, the report of UNCTAD (1993) indicated that economic development in the Third world came to a standstill in the early 1990s. According to this report, the average income of the fourty seven poorest countries in the World declined from $324 to $311. In view of the World-wide recession, the World Bank's forecast of poverty reduction in the year 2000, and improvements of social indicators may not be sustainable. The assumptions behind the World Bank's forecast were that there will be economic recovery for the USA, Western Europe and Japan, which will continue for the rest of the decade. It was also assumed that interest rates would remain low and that world trade would increase rapidly and produce shifts in favour of the developing

countries including stabilization of raw material prices in the world. Even under the initial favourable assumptions, the proportion of the population underpoverty was estimated to increase from 47.8 to 49.7 percent by the year 2000. If the underlying economic conditions turn out to be worse, the proportion of the poor is estimated to rise by 62 percent of the overall population by the year 2000 (Schubert, 1994).

Ethiopia is among the least developed and one of the poorest countries in the world, with a per capita income of about US$133 (USAID,1993). About half of its over 50 million population lives under absolute poverty. A quick glance at its social indicators reveal that there is acute level of poverty in Ethiopia. The annual population growth rate is 3 percent and the country's average family size ranges between 6 and 7 persons. Infant mortality rate is 133/1000, life expectancy 46 years, and daily calorie supply is only 1200 Kcal. In addition, the gross primary school enrolment is 38 percent, which is one of the lowest in the world (USAID, 1993). Population below poverty line is estimated to be above 60 percent (World Bank,1978). Widespread chronic hunger, high unemployment, very poor health conditions, minimal infrastructure, wretched housing and an absence of basic services for the majority of its population is a day to day reality.

Although Ethiopia is considered to have a rich natural resource base consisting of minerals and arable land with only 15 percent under cultivation, poverty and destitution still characterize the majority of its rural population. As opposed to the world's poverty situation, which according to the world Bank's report has been improving over the last three decades, Ethiopia's poverty situation has been worsening. It is believed that the causative factors of rural poverty and destitution are more complex and needs further investigation into the various dimensions for alleviation.

In Ethiopia, several economic policies and strategies have been designed, adopted and implemented in the last three decades focusing on the development of the agricultural sector with the objectives of food self-sufficiency, economic growth and development. However, the extent to which rural poverty has been alleviated or aggravated by the policies are not known. Therefore, assessing the extent of poverty and identifying the possible causes is the starting point to design future poverty alleviation programs. The objectives of this paper are: to identify the major indicators of rural poverty, assess its possible causes, examine the nature and implications of rural poverty in Ethiopia, and suggest appropriate and sustainable approaches for poverty alleviation.

II. AN OVERVIEW OF THE RURAL SECTOR IN ETHIOPIA

The rural sector provides livelihood to about 90 percent of the population in Ethiopia. Agricultural development remains the key in terms of overall economic growth, employment, generation of foreign exchange earnings and food supply. The agricultural sector,in the first place, is dominated by peasant farming which is characterized by the use of traditional technology, the ox-plough, heavy dependence on rain, limited use of modern inputs, fragmentation of land and low yield per unit area. In the second place, production is basically for subsistence (the crops grown are subsistence crops) as a consequence of which production is preoccupied with food grains and pulses.

Undernourishment and malnutrition are common characteristics of Ethiopian rural life. More than 81 percent of peasants live under absolute poverty (Mesfin,1977). There are no indications of improvement. Highly variable rainfall, the ravages of war and tribal conflicts, dismal economic policies and serious historic underdevelopment have contributed to the impoverishment punctuated by recurrent famine.

The other characteristic of subsistence production in rural Ethiopia is a vicious circle of debt which is the inevitable result of rural poverty. Subsistence producers without any reserve of grain or cash will go for credit in the informal sector for survival to tie them until the next crop. When the crop is ready, most of the produce will either be used for the repayment of the previous season's debt in kind or will be sold for debt settlement in cash leaving small quantity which will not be sufficient to sustain the household until the next harvest. The cycle will be repeated by going for credit for survival until the next crop is ready.

Under the subsistence system, a minor variation in the natural environment easily creates disequilibrium in the life of the rural people. The disequilibrium either results in the sale of existing asset if there is any or undertaking other coping strategies like migration to urban centres looking for employment. To supplement the meager income from agricultural activities, several rural people also depend on related off-farm activities such as handicrafts and petty trade. Such activities are constrained due to lack of technologies for improvement and capital.

III. POVERTY AND FOOD SECURITY

3.1 Poverty

There is no general consensus on any meaningful definition of poverty. According to the "Ninth Report on the Development policy of the Federal German Government" (Schubert, 1994), people affected by poverty are those unable to lead a decent life. Even though this definition seems to be acceptable, the way decent life is translated may diverge depending on the culture, religion, and social value system in each country. In some cases, poverty is defined in terms of not having enough to eat, a low life expectancy, a high rate of infant mortality, low educational opportunities, poor drinking water, inadequate health care, unfit housing condition, and lack of participation in the decision making process.

Poverty can also be defined as lack of entitlement to the means of generating income to satisfy basic human needs. Different criteria can be used in defining poverty or in classifying people under different categories of poverty. In terms of food adequacy criteria, people who spend 80 percent or more of their income on food and yet fulfil less than 80 percent of the average calorie requirement for their age, sex and activity group and are both hungry and malnourished are usually known as ultra-poor. On the other hand, people spending 70 percent or more of their income on food and meeting 80 -100 percent of their calorie requirement are unlikely to be undernourished, but are sometimes hungry can be called poor (Lipton, 1985). According to this definition, the poor are defined not in terms of food alone but also in terms of deficiency of shelter, clothing and mobility.

Poverty can also be conceived as a consequence of deprivation and lack of rights. According to this concept, poverty is related to the provision of goods and resources. Although, the extent of poverty in this sense is subjective, it refers to factors such as inadequate level of provision due to lack of access to productive resources, low incomes, unemployment, undernourishment, and inadequate provision of education. When defined in terms of income and food adequacy, the ultra-poor are those at risk of being undernourished due to low income, but the poor are those not harmfully undernourished but are at risk of being undernourished and hungry.

3.2 The Relationship Between Poverty, Food Insecurity and Vulnerability to Famine

The food security concept addresses people's risk of not having access to the required food. Poverty is the major determinant of chronic food insecurity. The poor do not have the adequate means to gain access to food in the quantity needed for a healthy life. In theory, two types of household food insecurity can be identified; namely, the transitory and chronic (Von Braun, Bouis, Kumar, Pandya- Lorch,1992). In reality, however, both are closely interrelated. The dimensions, causes, and consequences of food insecurity differ widely from country to country and within the same country. On the question of who is food-insecure, the studies in Merti-Jeju, Ethiopia (Diriba, 1991, Maxwell, 1992) suggest that the most food-insecure groups are those with restricted access to land and no livestock. Transitory food insecurity is suffered by those who have slightly more resources but face crop failures during drought years.

Poverty is central to food insecurity and vulnerability to famine. The poor face the most severe constraints in their own food production and in their access to food from markets which makes them vulnerable to food insecurity crises. In Ethiopia, during the recent famine, 63 percent of the poorest households on the income scale reduced their consumption to one meal or less per day, whereas the proportion of households that dropped to such levels was 47 percent among the upper third of households (Webb, Von Bruan, and Yohannes, 1991).

3.3 How Rural Communities Define Poverty and Vulnerability

Some field studies in Ethiopia (ITAD, 1994, SOS SAHEL, 1994) have revealed that rural communities have their own perception of vulnerability. According to the case study by ITAD (1994) at Merti Jeju Woreda, Arsi Zone, vulnerability is " *HIYYUMA*" an Oromiffa word which also means poverty. A vulnerable person is called "*HIYYESSA*" / "*HIYYETI*" with the former word referring to male and the latter to female. In one way or another the community relates vulnerability to the ownership of basic resources: land, oxen, livestock ownership and labour. However, the weight attached to each of the criteria varies from one community to the other and from one condition to the other. There are other considerations taken by each community which touch not only economic but also social life. For instance, a household can be vulnerable even if it owns land and oxen but does not own labour. According to the study by SOS Sahel (1994) in Kindo Woreda, Wollaita, Southern Region of Ethiopia, individuals can be vulnerable, without necessarily creating a vulnerable household. An elderly widow

living on her own might be classified as a vulnerable household, whereas if she joins the household of a wealthy son and is looked after by him, this redefined household would not be considered to be vulnerable. On the other hand, households can be vulnerable without there necessarily being a particularly vulnerable individual within it. A young woman in a female-headed-household without adequate access to adult labour could become vulnerable, although she herself might be perfectly healthy and capable (Pankhurst,1993).

IV. MAJOR POVERTY INDICATORS IN RURAL ETHIOPIA

The proportion of female headed households in a community can be used as one of the indicators for rural poverty. In the evaluation of the Merti-Jeju Multi-Sectoral Employment Support Programme by ITAD (1994), the study found that the percentage of female headed households ranged between 18 and 23 in a sample of five Peasant Associations. In another study of ten target Peasant Associations (intended for identification of income generating activities by CPAR/Ethiopia in North- Western Shoa Zone - Itana and Fisseha Abegaz,1994), the female-headed-households were found to be 15 percent. Female headed households usually have shortage of labour for income generation.

Landlessness is also a new feature in rural Ethiopia, particularly after the recent economic reform. The reforms introduced in March, 1990, which among others, discouraged the periodic redistribution of land to accommodate new members has given rise to a new class of landless peasants in rural Ethiopia. The study by ITAD (1994) in Merti-Jeju Awraja indicated that 25.6 percent of the households in the five sample Peasant Associations were landless. The study by CPAR/Ethiopia in North-western Shoa also indicated that 37 percent of the households are landless in the ten target peasant associations. Landless households are usually the young and newly married households, displaced households due to tribal conflicts, and households who were not able to pay rural land use tax. The landless families are usually farm labourers and casual workers who earn their living by means of dependence and very low wage labour. Smallholders who have very little land of their own, frequently unproductive, for example, in drought affected areas or on ecologically jeopardized steep slopes can also be categorized under this group.

Lack of the major means of production such as draft oxen is also one of the major indicators of rural poverty in Ethiopia. The study by MOA (1983/84)

showed that about 37.5 percent of rural households do not own draft oxen. Several other studies in various parts of the country have also confirmed that a sizeable percent of rural households do not have draft oxen. The study by ITAD (1994) indicated that about 38.6 percent of the households in the five peasant associations sampled in Mert-Jeju Awraja have no draft oxen. The study by CPAR/Ethiopia in North-Western Shoa also showed that on average 50.8 percent of the households in the ten peasant associations have no draft oxen. Farmers without draft oxen should either work for three days for the oxen owner to get the service for one day or hire the services in payment of cash or in kind depending on the tradition of each locality or community. In some cases share-cropping is common among farmers with no draft oxen.

Households with large number of dependents, particularly those with no sufficient farm labour are also poor because of lack of labour to generate income.

Growing ecological degradation in Ethiopia seems to be both an indicator and cause of rural poverty. Poor households with no alternative source of employment cut down the forest trees for sale as firewood and charcoal.

Nutritional status of rural communities in Ethiopia, particularly that of child nutrition can be the other indicator of rural poverty. According to the report on the national rural nutrition survey, core module by CSA (1992), 64 percent of the children aged 6-59 months are stunted(low height-for-age), 8 percent are wasted(low weight-for-height) and 47 percent are underweight (low weight-for-age). The overall results of the study have revealed that stunting is among the highest in the world. Nutritional deficiency has a number of linked causes, the most important of which are inadequate access to food and high prevalence of infectious diseases. The widespread prevalence of infectious diseases is also related to the inadequacy of health services in Ethiopia which is one of social indicators of rural poverty. The very high population per public health centre worker (12000/PHC worker), and the small state health budget which is only about 4 percent of the government's total annual budget (World Bank, 1993) are evidences for the inadequacy of the health service in general and that of the rural areas in particular.

V. THE MAJOR CAUSES OF RURAL POVERTY IN ETHIOPIA

Natural factors such as drought, flood, earthquakes, livestock and crop disease outbreaks are among the major causes of poverty and famine in rural Ethiopia. The history of famine in Ethiopia as documented by Richard Pankhurst, for instance, does not differentiate between famine and epidemic diseases probably implying that the former has been caused by the latter (Mesfin, 1984). During periods of drought, subsistence farmers are forced to sell their productive resources such as livestock and other means of production as a copping strategy. The adverse effect on the number of oxen, for instance, can bring about a collapse in the production process. Although, the copping strategy helps them to survive during the drought situation, it will leave them as chronically vulnerable households in the future. Floods and earthquakes also disturb their normal lives and a small variation within the life of subsistence households easily lead to disposal of productive assets for survival. Livestock disease outbreaks also reduce the livestock ownership of households and increase their vulnerability to food insecurity. When crops are wiped out by insect or disease outbreaks, the affected households have no alternative, but to sell other assets for survival. In rural Ethiopia, the incidence of drought, flood, livestock and crop diseases and pest outbreaks has become very common causing disorders in the life of the rural communities. Hence, rural poverty in Ethiopia can partly be a reflection of such disorders.

Rural poverty in Ethiopia is embedded in the technology of production itself. Peasants' method of production have hardly changed. The tools and implements used are one of the oldest in the world. They are poor and inefficient. Research has not so far identified more productive technologies that can be adopted by peasants. The generation of appropriate technology by research is a necessary but not a sufficient condition for ensuring its adoption. One must develop a system of technology transfer in order to ensure access to inputs and information which farmers need to enhance their productivity. Although efforts have been made in the last two and half decades to introduce improved inputs through various agricultural development strategies based on varied extension programs, the use of fertilizers and improved seeds is still low. Even during the 1994/95 cropping year, when total fertilizer consumption reached 1.8 million quintals, the per capita consumption did not exceed 27 kgs. Assuming that the total area cultivated during the crop year was 6.0 million hectares, the average fertilizer use per hectare was estimated to be about 30 kgs. Low level of technological inputs results in low level of production as the result of which farmers enter the vicious circle of poverty. Since the farmer's annual production

fails to cover his subsistence requirements, he will be forced to sell some of his productive assets for purchase of food. Because of lack of productive assets, the farmer can not produce enough and generate sufficient income to cover his subsistence requirements. The problem is further exacerbated by fragmentation of land resulting from the steady population increase.

The social system is the most important factor for the emergence of poverty in a country. It is currently accepted that poverty is rooted to a great extent in the social system involved. The differences in the control of the factors of production: labour, capital, natural resources and technical knowledge manifest different varieties of poverty. In Ethiopia, the land tenure system, marriage and decision making system of the household, religion and traditional beliefs including social organizations and institutions have something to contribute to the cause of poverty.

During the last two decades the Ethiopian economy suffered from highly centralized decision making process. The land tenure system did not provide security of tenure. Small scale agriculture was heavily burdened by over taxation and government pricing policy that heavily discriminated agriculture. Even though free market prices have been instituted and many of the taxes levied on the peasantry has been cancelled, the absence of farmers institutions and appropriate marketing mechanisms still continue to prevent poor peasants from getting appropriate returns from their output. The policy of collectivization of the previous regime has eroded peasant's confidence on cooperatives. However, in the absence of appropriate rural institutions, the desire for development is bound to remain a dream. Technological packages and credit cannot reach the small farmer at low cost in the absence of such institutions. Even though new cooperative legislation is already in place, the reality is that very few cooperatives have been formed on the basis of the new law. Moreover,those who use the subsidized fertilizers are those who have a certain minimum size of land and hence the benefits arising from the subsidy will be reaped by the haves and not by the have nots.

The history of Ethiopia is the history of political struggle for power. In this process of the struggle for power, it is the masses who have been paying the costs of the struggle both in life and human suffering. The adverse impact of the war during the Derg period, for instance, manifested itself in a wide variety of forms. First, it directed resources from production to war. Second, it had a negative effect on production. Third, it led to the destruction of physical and social infrastructure. Above all, the human costs of war including death,

disablement, and displacement were of mind boggling proportions (Eshetu,1992). The result of all these were mass suffering and impoverishment.

Following the fall of the Derg, decentralization and democratization process has been taking place. However, the decentralization and democratization process itself are not without cost. Since the introduction of the process, several ethnic conflicts and fighting have occurred in many parts of the country, as a result of which several lives have been lost. During the ethnic conflicts, several houses have been burnt, thousands of livestock have been killed or looted and several hundred thousands of households have lost their houses and household utensils. Seven hundred thousand households have also been displaced. According to the report by the Relief and Rehabilitation Commission in 1992, problems arising from conflicts and related causes have disrupted the normal lives of the people in which many have been displaced and many more have lost the capacity to produce due to the man-made problems of different types. The problems are reported to have created a new dimension in the country's food problems.

VI. RURAL POVERTY UNDER THE STRUCTURAL ADJUSTMENT PROGRAM

Adjustment policies may adversely affect the poor in two ways. In the short-run such policies may reduce the real income and consumption of poverty groups (Demery and Addison, 1987). For such groups temporary relief is needed to help them cope with the situation. In the long-run, some poverty groups may not also benefit from the program.

According to the study by the World Bank (1994) in seven African countries- Burundi, Cote D'voire, Ghana, Kenya, Nigeria, Senegal and Tanzania, the majority of the poor live in rural areas and derive their incomes from producing and marketing food and export crops. In some of these countries the rural poor have benefited as a result of devaluation, liberalized marketing, higher producer prices and lower taxes. The study further indicates that real food prices to farmers declined in many of the countries considered, but the market output has increased replacing food imports. The study further revealed that the real income gains to food producers varied according to the incremental proportion of the produce sold in the market after adjustment. The implication of this study is that those farmers who produce export crops would benefit the most, while farmers who simply produce food for subsistence would gain the least.

In Ethiopia, no study has analyzed the impact of the adjustment program on the rural poor. However, from the implications of the studies made in the seven African countries and observation on the actual situation in the country, some preliminary expectations can be made. In Ethiopia, the majority of the smallholders produce subsistence food. A good proportion of the rural people are in fact net food purchasers. It is estimated that the marketed supply of smallholders is only about 15-20 percent. On the other hand, the price of food crops has not shown any decline after liberalization. In fact, the price of food grains increased following the liberalization, which means that the net purchasers of food are adversely affected by the market liberalization. Those who produced marketable food do not also seem to have benefitted because of the substantial increase in the price of inputs as well as other consumer goods purchased. The rural poor and the landless might be hard hit by the effects of the adjustment, because they do not have the means to produce food and cannot also afford to buy food at higher price.

On the other hand, smallholders who are engaged in the production of export crops such as coffee and beans seem to have benefitted from adjustment. However, the gains may be eroded because cash crop producers are usually net purchasers of food whose price has increased. Moreover, increase in producer prices after liberalization may accelerate peasant differentiation (Mills,1987). Poor farm labourers without access to land might be particularly hard hit by the adjustment. Under such situation targeted policies to alleviate the negative impact of the vulnerable groups need to be properly implemented.

VII. THE NEW ECONOMIC POLICY AND RURAL POVERTY ALLEVIATION

Following the fall of the Derg regime, the Transitional Government of Ethiopia (TGE) has declared a market- based economic policy and has undertaken a number of new economic reform programs. It has also declared the Agricultural Development- Led- Industrialization as its economic development strategy. For the agricultural sector, the strategy of growth is to be realized through: (a) the improvement of productivity of smallholder agriculture and (b) commercial farming of extensive and intensive agriculture. While the end results will justify the appropriateness of the strategies of TGE, it is difficult to forecast its impact on the poor at this initial stage. But, one thing that is sure is that, under competitive situation, the gap of income inequality will increase and the extent of

mass poverty will tend to increase. The introduction of large-scale agricultural production and the intensification of production by smallholders will increase the number of resource poor farmers looking for employment in the sector. On the other hand, as commercial farmers introduce mechanization, the opportunity for employment by rural masses will be reduced. This calls for the designing of development programs that are directly aimed at the poor.

VIII. THE ROLE OF NGOs IN RURAL POVERTY ALLEVIATION

NGOs usually work in the marginal areas where the potential for production is constrained by environmental factors. Even though their initial objectives focused on relief and rehabilitation, their participation in development projects is now increasing from time to time. NGOs are working closely with the community and hence are very well informed about the situation of their target community. Because of their closeness to the community they can easily identify the problems with participation of the community itself. Taking this advantage, NGOs can easily plan and implement poverty-oriented projects.

In Ethiopia, the role played by NGOs particularly in the development of infrastructure using relief food is considerable. Road construction, water development for both human consumption and irrigation, health and educational infrastructure, environmental rehabilitation through afforestation and terracing are among some of the major works accomplished by NGOs. The focus of their development programs on women has greatly contributed to the awareness of their role in development in general and to the household economy in particular.

NGOs can also play an important role in the development of financial system for the rural poor. The other area where NGOs can contribute more is in the development of mico-enterprises and income generating off-farm activities for the poor. In general, while the role of NGOs in poverty alleviation is great, there is a need to coordinate their efforts for more effective and visible impacts on rural poverty alleviation.

IX. POSSIBLE AREAS OF ACTION FOR POVERTY ALLEVIATION IN ETHIOPIA

The aim of poverty reduction should be to promote the productive capabilities of the poor and enable them to satisfy their needs through their own economic activities. Poverty reduction is also concerned with creating better living conditions including the shaping of their life and participation in the social, political and economic decisions. Therefore, the principle of poverty reduction should be based on participation and self-help of the target groups.

A relatively effective promotion of poverty groups-even if it does not reach the group of the extremely poor- can be made by developing target group-specific financial system with the long term objective of making the recipients bankable. By promoting savings and access to credit, the groups concerned can be given opportunities for productive investment in accordance with their own ideas, possibilities and willingness to take risks. A wide variety of ways along this line have already been demonstrated: the Grammeen Bank in Bangladesh, the small farmer development of the ADB in Nepal,the Linking Formal and Informal Financial Institutions in Indonesia are best Examples. In Ethiopia, efforts are already underway by some NGOs and externally financed micro-enterprise development in selected urban centres. Such efforts should also be initiated to include the rural poor.

Implementation of small-scale irrigation projects where there is potential, would be of paramount importance in improving the access of the poor to productive resources. Agricultural research needs to be oriented towards the needs of poor farmers who cannot afford to pay for expensive purchased inputs. Improved technologies also need to be developed for non-farm activities which are usually the main sources of income for the rural poor.

The poor are usually poorly endowed with human capital. Therefore, it is important to provide relevant training opportunities with more investment on the human capital of the poor. Schemes to reduce poverty are unlikely to have much chance of success in the long-run unless the poor are equipped with the necessary skill in managing their own affairs.

The main problem that poor people have with respect to borrowing is the access to the formal money and capital markets. The poor pay very high interest rates to money lenders. Therefore, what is needed is not subsidized interest rates, but the formal capital market to be opened to the poor to allow them to borrow

on regular market terms. The way how this can be done is not an easy task. It requires the institution of the poor which can act as a bridge between the formal financial sector institutions and the poor farmers themselves.

The landless rural poor usually depend on off-farm income generating activities. The identification of such activities and provision of the necessary financial and technical support can improve the situation of the poor.

As revealed by a number of authors, labour intensive public works programs can address three cental problems facing many countries- food insecurity, growing unemployment and poor infrastructure simultaneously (Dreze and Sen, 1989; Von Braun, Teklu, and Webb, 1991; IFPRI/BIDS,1989). Under the Ethiopian situation, the three problems can be addressed by proper planning and implementing such programs.

The provision of social assistance should focus on destitute households which neither have sufficient labour power to ensure their survival nor receive transfers from other households or organizations. Households eligible for such type of assistance would be those with a severely undernourished children with a severely undernourished pregnant women, elderly persons living alone and with no employable members, severely disabled people living alone, female headed households with no employable members. In rural Ethiopia, the number of such groups of people is large, particularly in marginal or drought prone areas. In any event of natural calamity, these are the first group to be afflicted.

Women play a key role in household economy. In addition to farming activities, in which they equally participate with men, they have even greater responsibility in caring for the family. In poor households, women suffer more because they have to first feed the family from whatever is available before they feed themselves. Improving the lots of women through empowerment and access to resources is not helping women alone, but the household as a whole. More decentralization of the administrative structures, and strengthening of local governments are necessary for a long-lasting solution for rural poverty.

X. CONCLUDING REMARKS

In rural Ethiopia, there are increasing number of households which are not only absolutely poor, but live far below subsistence level. The ability to work and the health of the people living in these households are threatened. Those particularly at risk are the weaker members of the household such as children, pregnant and lactating women, old and sick people. A large number of destitute households of the type listed above are not reached by traditional mechanisms of providing social security or safety-net programs. For instance, employment schemes reach only those households with members able to work. Humanitarian aid is also given only in crisis and disaster areas and only for a limited time. Destitute households outside these areas are not reached by any humanitarian aid. Any program of poverty alleviation should, therefore, take into account the existence of this class of the poor.

Finally, it should be known that whatever economic policy is adopted and whatever rate of economic growth is achieved, no peace and stability can be sustained. Democracy that cannot feed the people is hollow. Therefore, it is essential that poverty alleviation programs are planned parallel to regular development programs and that poverty alleviation components also be blended with regular development programs.

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FOOD SUPPLY, NUTRITION AND MORTALITY IN ETHIOPIA: AN OVERVIEW

John Mackinnon

I. INTRODUCTION

Ethiopia is distinctive in a number of ways. First, it has an exceptionally low income per capita. Secondly, it also has an exceptionally low availability of calories per head. Thirdly, nutritional indicators in Ethiopia are exceptionally bad, but child mortality is less bad than this might lead one to expect. Fourthly, Ethiopia is exceptionally prone to severe swings in rainfall which have a dramatic impact on food production. Fifthly, the country inherits from the Derg a relatively equal distribution of assets within some regions; but it is also characterised by enormous geographic and agricultural diversity.

The experience of the last twenty years also suggests some important observations. First, official figures suggest that food supply has stagnated in Ethiopia's recent history. Second, despite a compensating increase in imports, food availability per capita has also declined. Third, nutrition has probably declined. Fourth, there have been some significant increases in inputs into agriculture during the last decade; the number of farmers using fertiliser seems to have risen from below 20 percent to somewhere about 50 percent for the major cereal producing areas[1], and the volume of fertiliser used by the smallholder sector has increased enormously (World Bank (1991) gives figures). Fifth, infant mortality roughly halved between 1970 and 1989.

These observations suggest the magnitude of the challenge facing Ethiopia. But they also suggest that the link between mortality and nutrition cannot be taken for granted. A deteriorating food situation does not always translate straightforwardly into a nutritional decline.

The paper is organised as follows: section 2 explores the evidence for this link in the Ethiopian economy; section 3 then examines the relation between

[1] I owe this estimate to Mulat Demeke

households' access to calories and national production of calories; and section 4 examines ways of increasing food production and smallholder incomes.

II. THE LINK BETWEEN ACCESS TO FOOD, NUTRITION AND MORTALITY

For many people in Ethiopia, food shortage is a very real fact of life. Evidence from farming systems research (see for instance Aleligne 1988) makes it clear that many farmers regularly experience periods when food consumption has to be severely curtailed because subsistence production has fallen and they cannot finance cash purchases. Food is therefore a major problem for many Ethiopians; the purpose of this section is to see whether access to food influences nutrition and mortality.

The importance of famine in Ethiopia's recent history might seem to make it obvious that mortality is closely linked to food supply. However, things are not this simple. We can consider here two kinds of risk to life, which are not wholly distinct; the risks which cause mortality observed in both 'good' and 'bad' years and which may be related to chronic deficiencies of some form; and the risks which cause excess mortality in bad years, either for the households or for the community. There are time-series and cross-sectional ways of investigating these links; here I consider both kinds of evidence.

2.1 'Chronic' Exposure

In Ethiopia, between three and four children out of every twenty do not reach their fifth birthday. This proportion, although appalling and reducible, is not exceptionally high in Africa. For instance, even though calorie supply per capita is much lower in Ethiopia than Uganda, Uganda may have a higher child mortality. Clearly there is more to child mortality than food shortage.

The determinants of child mortality can be investigated either on a cross-section or time-series basis. Cross-section studies of child mortality at the level of the household have typically found that income is not the most important

factor[2]. Education is often found to be important, though sometimes only education above a certain level; also, maternal beliefs about disease are a crucial determinant of child survival in Uganda's case. In Ethiopia, Yohannes (1990) examines child mortality using Census data from Addis Ababa. Like many other studies, he finds that maternal education is more important than income; in fact his proxies for income, the possession of a telephone and a television, are not significant in child mortality when education is controlled for. Ethnicity and religion are also determining factors.

While this evidence is powerful and corresponds with studies in other countries, there are two important caveats. First, many careful studies do find some importance for income when mortality is carefully modelled. In Mackinnon (1995) and Yohannes (1990) the nature of housing is a determinant of child mortality, though (as both authors observe) this may reflect either the long-term income of the household or the direct influence of environmental factors. Hence the fact that in most studies income is not the most important thing does not mean that it is completely unimportant. Secondly, few studies of child mortality have been done calorie-poor parts of rural Ethiopia. (All the evidence suggests that both food consumption and life expectancy are much higher in Addis than in many rural areas). It seems likely that the importance of food shortage in causing child mortality, even in normal years, will be greater where food is as routinely scarce as it seems to be in parts of rural Ethiopia[3].

Another cross-section approach is to examine child mortality and nutrition at regional level. Here we can use data from the 1984 Census, which estimated mortality rates, and from the Nutritional Surveys of 1983 and 1992. Table 1 does not suggest any obvious relation between food-scarcity and mortality. For instance, Arsi, one of the main grain-producing regions, has one of the highest child mortality rates.

[2]For studies in neighbouring countries see Farah and Preston (1981) on Sudan and Mackinnon (1995) on Uganda.

[3]Similarly, there is a literature investigating the income elasticity of demand for calories, which often finds very low elasticities: see Haddad and Bouis (1992). But this literature uses evidence mostly taken from countries such as the Philippines which have much higher food availability than Ethiopia; more research is needed on whether these findings apply to very low-income countries as well.

Table 1 **Mortality Rates (per Thousand) Before the Fifth Birthday in Rural Ethiopia, 1984**

Region	Mortality
Arsi	194
Bale	224
Gamo Gofa	168
Gojjam	157
Gondar	131
Hararge	197
Illubabor	154
Keffa	202
Shoa	162
Sidamo	98
Wellega	134
Wello	154
All	162

Source: TGE (1991), Table 4.14

Table 2 repeats the same exercise for nutritional indicators based on the 1983 and 1992 National Nutritional Surveys. The nutritional indicators used in this survey are weight-for-height and height-for-age. These are measured by comparing the height of children of a given age to that of the median of an 'international reference' population (American) which is assumed to be well nourished, and measuring the distance in standard deviations of the reference population. The same exercise is repeated for the weight of children, compared to the median weight in the reference population for the same height. It should be stressed that these are considered indicators of nutritional status, but without imputing any particular cause; the cause of poor nutritional performance, on this measure, may be inadequate food or a history of illness. These indicators clearly

omit many important dimensions of nutrition; however, they have the very big advantage of being available from large-sample household surveys.

Table 2 **Mean Z-scores by region: National Rural Nutrition Surveys (1983 and 1992)**

Region	Height-for-age		Weight-for-age	
	1983	1992	1983	1992
Arsi	-2.17	-2.29	0.17	-0.40
Bale	-2.02	-2.15	0.16	-0.14
Gamo-Gofa	-2.68	-2.25	0.29	-0.49
Gojjam	-2.60	-2.76	-0.28	-0.48
Gondar	-2.95	-2.76	-0.29	-0.65
Illubabor	-1.94	-2.54	-0.38	-0.56
Keffa	-2.49	-2.65	-0.10	-0.39
Shoa	-2.48	-2.44	-0.13	-0.28
Sidamo	-2.53	-2.62	0.09	-0.56
Wellega	-2.08	-2.30	-0.65	-0.79
Wello	-2.90	-2.55	-0.65	-0.48
All	-2.38	-2.52	-0.09	-0.45

Source: CSA (1993a) Tables 7 and 8, Report on the National rural Nutrition Survey,Core Module,March 1992, Central Statistical Authority, Statistics bulletin No.113,Addis Ababa

Table 2 suggests neither any very close link between food availability by region nor any very close link between mortality and nutrition. In fact, for the 11 regions with data, a regression of mortality estimated in 1984 on the nutritional indicators in 1983 suggests that mortality is significantly positively related to weight-for-height and height-for-age as well. While these results are hard to

interpret, they do at least suggest that nutrition and mortality are not closely linked in the expected negative direction.

Cross-section estimates, then, lend absolutely no support to the view that income or access to food is the main determinant of child mortality, but studies at a household level in some countries do suggest the existence of a fairly weak link between them. Similarly, the links between nutritional indicators and mortality, and between nutritional indicators and food intake, have some support from the data but the links are weaker than people often expect. In Ethiopia's case, the low level of food consumption per capita suggests that these links between food and mortality should be stronger than elsewhere, but the regional data lend no support to this hypothesis.

Time-series evidence allows us to say the following. First, most estimates suggest a decline in food consumption per head between the late 1970s and the early 1990s; (MOPED 1994). Secondly, there is serious reason to think that child nutrition had worsened between 1983 and 1992, both in terms of weight-or-height and in terms of height-for-age. The mean Z-score for height-for-age in Table 2 declined by 0.14 and the mean Z-score for weight-for-height declined by 0.36; the standard deviation of each measure is around 1.5, which in a sample of about 10,000 gives a standard deviation for the estimated mean of only 0.015; hence these declines are statistically highly significant and are not likely to be due to sampling error. Assuming that there was no systematic change in the way weight, height and age are measured between the two surveys, it seems that nutrition had indeed worsened[4]. The fact that there was deterioration both for children between 0 and 2 and for those between 2 and 5 suggests that this deterioration is not simply due to fluctuation in the particular years but indicates a sustained decline in nutritional indicators.

The evidence on changes in mortality contrasts dramatically. The 1984 Census (TGE 1991) found a decline in the probability of dying by the fifth birthday for boys (though not for girls) from around 0.19 in 1968 to just over 0.16 in 1982, though it found a sharp peak (which was argued to be spurious) at the very end of the series. The 1990 Family and Fertility Survey (CSA 1993b) is even more emphatic; infant mortality (the proportion of infants who die before the

[4]See also the discussion in CSA (1993a) pp. 36-48; the report emphatically argues for a deterioration in nutrition, though it is less emphatic about weight-for-height where the analysis focuses on prevalence of wasting rather than the change in the mean.

first birthday) is estimated to have fallen from between 0.180 and 0.195 in 1971 to between 0.099 and 0.094 in 1989; the decline is steady throughout the period.

Putting these three pieces of evidence together, we see a simultaneous decline in food consumption per capita and in nutrition combined with a rather sharp reduction in mortality. The explanation in the reduction in mortality seems most likely to lie in an improvement in preventative health measures. The worsening nutritional picture, against a background of falling mortality, seems likely to reflect the deterioration in food supply. While this decline in nutrition may have done some damage to child mortality, the evidence is that it was outweighed by other factors. In view of this, it is impossible to say what consequences further deterioration in food consumption will have for mortality; the levels of estimated calorie consumption and of nutritional status are now so low, however, that the effects of further falls may well be much worse than the effects have been so far.

2.2 'Acute' Exposure to Risk

The mortality figures discussed above were confined to children, because the data on child mortality is almost certainly more reliable than that on adult mortality. Most of this child mortality is the realisation of 'chronic' rather than 'acute' risk; children are at risk in both good and bad years in the household. 'Acute' exposure to risk refers to situations where individuals become more likely to die in the short run. This may happen at a community-wide level because of famine or epidemic, or at the individual or household level because of sudden economic failure.

The role of 'acute' risk is likely to be more important in Ethiopia than elsewhere for two reasons. First, climatic shocks are very powerful in Ethiopia. Secondly, individual shocks can be devastating because households have limited liquid assets. Because land is not saleable, a household may have only a small livestock holding between itself and destitution (a point made by Dessalegn (1987)).

While there is no doubt about the importance of acute risk to Ethiopian households and a good deal is now known about the ways in which households and communities respond to shocks, we know much less about the relation between risk and mortality. In the case of the 1984-85 famine, there is no doubt at all that a fall in peoples' access to food led to many deaths. But the mechanism

by which this happened may be more complex than the phrase 'starving to death' suggests.

The majority of people who die during most famines die from an illness rather than directly from starvation. People are more likely to contract serious illness during famine both because their immune systems are depleted by inadequate intake and because population movement and abnormal living conditions increase their exposure to infection. They are also less likely to be able to afford treatment than at other times. The deterioration in the health environment and the increasing vulnerability of all members of a community to infection leads to epidemics which may be fairly random in who they strike. De Waal's careful study of the 1985 famine in Darfur, Sudan (De Waal 1988) found that population movement was a crucial influence on mortality but that individual wealth (measured by livestock) seemed to correlate little with mortality. He also found that this understanding of the situation corresponded with people's perceptions; death during famine was seen as something random and people's actions were aimed at preserving the future livelihood of the household rather than at simply securing food for survival.

These results suggest that even in a situation as grave as 1984-85 (which was a very serious famine year in Sudan as well as Ethiopia), the most important thing for reducing mortality may not be the direct alleviation of hunger so much as the prevention of disease. For instance, providing a given volume of food in a refugee camp may be much less effective in saving people's lives than providing a smaller amount of food in villages.

In the case of individual-specific shocks, we know rather little about the relation between destitution and mortality. Casual observations of urban Ethiopia suggest that despite the existence of informal networks of support, many people do fall through the net. But survey evidence on the destitute is hard to collect for a number of reasons: the destitute may be homeless and hard to trace; people may only persist on destitution for a limited period, especially those groups like young men for whom begging is not a feasible option; and those involved with the absolutely destitute are likely to feel obliged to intervene rather than simply observe. As a result, if significant numbers of people die every year as a result of local household-specific food shocks, statistics are likely to omit them. We reach the uncomfortable conclusion that we simply do not know how many people are exposed to catastrophic risk as a result of diminished access to food.

As with chronic exposure to risk, the results of this section are inconclusive. Probably, every year in Ethiopia there are some households which

face food crisis and as a result an increased risk of mortality. Increasing access to food would help to reduce the number of people to whom this happens, and would therefore reduce mortality. But how many people actually die because of these crises is not known; nor is the relative importance of this process in determining actual mortality compared to endemic diseases.

III. NATIONAL FOOD SUPPLY AND FOOD ACCESS BY HOUSEHOLDS

The link between food output and access to food by households has two components: the link between national food availability and access by households, and the link between food output and food availability at the national level.

3.1 National Food Availability and Household Food Security

Food availability at the national level can fail to translate into household food security because food is unequally distributed: either because of chronic inequality in the ability to buy food, or because of temporary shocks in food access suffered by some households.

Chronic inequality in Ethiopia was almost certainly reduced by the land reform of 1975, and has probably been reduced further by the removal of compulsory procurement of food grains at low prices and the liberalisation of food markets in the early 1990s. The end of the procurement of food at fixed prices benefited the whole rural sector; the liberalisation of food markets has reduced price differentials between regions, which should make food cheaper in the food-deficit areas. Both of these developments reduce the inequality in access to food.

However, there are likely to be a number of processes operating in the next few years which will increase chronic inequality. We may consider three forms of inequality: urban-rural inequality, inequality between different rural areas, and inequality within rural areas. Urban-rural inequality is likely to increase both because of an aid inflow which is likely to create income-earning opportunities for urban people and because the boom in investment which has started in the last two years seems to be concentrated in urban areas. A reorientation of government spending towards rural areas could counteract these forces, but it would be surprising if it altogether overcame them.

Inequality within rural areas is also likely to increase, because the liberalisation of agriculture and the increase in producer prices for many crops will tend to increase opportunities for the more entrepreneurial people in rural areas. These are likely to be already the better-off. Hence, although most people in rural areas should benefit from the increased opportunities, those who benefit most are likely to be the better-off. (A more even distribution of livestock might help to reduce inequality especially in highland areas).

The one kind of chronic inequality which may fall in the medium term is inequality between different rural areas. In many countries, poverty is very highly regional; it is possible to direct government spending at the poorest areas, and this can have a substantial impact. For efficient targeting, a highly disaggregated definition of areas is useful; simply to identify the poorest villages in the country, and then to target public resources at them can be a relatively efficient way of targeting the poor).

'Acute' inequality, however, can be reduced substantially by government policies. The tools which can be used are well known: the preparation of national food stocks which can be deployed in emergency, the liberalisation of food markets which has reduced inter -regional price differentials and should reduce price variability, food-for-work schemes, public purchase of the assets such as livestock which the poor sell in times of crisis (Dessalegn 1987). If, as argued above, food shortage has much less impact on 'chronic' than 'acute' exposure to risk, the reduction of acute (rather than chronic) inequalities in food access may be more important in reducing food-related mortality, as well as more feasible, than the reduction in chronic inequality.

Reducing the acute risks faced by farmers may also have another important effects; it will allow them to take more risks in production. This could have important beneficial effects on the overall level of food output.

3.2 Food Production and National Food Availability

There are two ways in which a national food deficit can be sustained; commercial imports and food aid. In Ethiopia, food aid has been much more important than commercial imports on the official figures and it seems unlikely that parallel-market imports would substantially change the picture.

Food aid is currently supporting a structural deficit in Ethiopia as well as sustaining shortfalls in particular years. However, per capita food availability

appears to have declined in the last ten years, so it cannot be relied on to keep per capita availability constant. Lavy (1992) finds that food aid in sub-Saharan Africa makes good about 45 percent of the value of food supply shocks in recipient countries but with a lag; other imports account for a further 35 percent of the shock on average. Two questions arise: first, can food aid be depended on in the medium term ? and second, will expansion in internal food supply and reduction in 'acute' inequality lead to a reduction in flows of aid ? If so, there is a cost to domestic actions which address food insecurity in terms of lost foreign resources. However, such a cost would only apply over the range where food aid is important. Moreover, it is doubtful that food aid can ever be as fast as domestic response in addressing famine could be, because donors are sluggish in responding to any but acute signals of distress. Moreover, there are signs that the donors may require commercial imports of food as a condition of the provision of food aid. Hence, while food aid is inevitably part of the picture for some years to come, it is not attractive to rely on it indefinitely.

Commercial imports of food have historically been low in Ethiopia. It is conceivable that the country could sustain a rising food deficit by increasing commercial imports, financed by increased export revenues. As food demand internally outstripped food supply, the price of food would rise and food imports would be attracted into urban areas. However, most people in Ethiopia depend for their livelihood on the production of food, and this is likely to remain true for a long time to come. While some areas are able to expand export crop production significantly, there are many parts of the country better suited to food production. Increasing the incomes of those areas is almost bound to involve increasing production of food. There is little sign in Addis Ababa that parallel market imports of food are very significant except for luxury items; this may be because staple foods are bulky and difficult to smuggle in large quantities rather than their potential profitability to import.

IV. INCREASING FOOD SUPPLY

If the arguments of the above section are accepted, food supply at least in some areas of the country, needs to increase in order to sustain or increase per capita incomes; and although the majority of mortality in Ethiopia may not be closely linked to food, food shortage does pose at least a potential and quite serious threat for many people. This section considers where increases in food supply can come from.

As in many developing countries, the Ethiopian authorities have historically expected development to come from outside the smallholder sector. There are special reasons for this in Ethiopia; the urban bureaucracy, which depended on the taxation of agriculture for its existence, dates back centuries in Ethiopia, and the Derg's Marxist suspicion of the peasantry was to some degree a continuation of this tradition. Most observers accept in principle that this has to change: in a country where most of the population live on the land, a widespread increase in incomes is not likely to be achieved without improving the performance of smallholder agriculture. The state farms are mostly perceived as expensive and inefficient experiments.

4.1 Macroeconomic Reform and Food Supply

There is a general concensus in Ethiopia that the macroeconomic policy of the Derg discriminated against rural areas and against agricultural production. Liberalisation is expected to redress the imbalance. However, it is important to distinguish between increases in smallholder income from incentives for production and short- from long-run effects.

The macroeconomic reforms affect agriculture in five main ways: an increase in the relative price of tradeable goods, an end to preferential treatment for the state farms, the liberalization of markets, the removal of the taxation implicit on forced quotas, and the redirection of fiscal resources towards support for smallholder agriculture.

4.1.1 Real devaluation

Real devaluation refers to an increase in the relative price of traded goods relative to those produced and consumed domestically. The increase in the relative price of traded goods unambiguously benefits those who produce agricultural exports such as coffee and chat. Its implications for food production are ambiguous, because it is not entirely clear whether to treat food as a tradeable or non-tradeable good in Ethiopia. Although some food is imported, the price of food seems to be very strongly influenced by domestic demand conditions; this is part of the definition of a non-traded good.

Meanwhile, food production has certainly been squeezed by the increase in the price of a tradeable input, fertiliser, which was primarily supplied through official channels and hence priced at the official exchange rate. Given that

expansion in cash crop production will come at the expense of food production, the net effects of the relative price changes are ambiguous.

One important policy issue which arises is whether the authorities should subsidise fertiliser. Currently, it is generally believed that the value marginal product of fertiliser in smallholder agriculture exceeds its price (though this is sensitive to the method used for valuing smallholder output); this may provide a justification for subsidising fertiliser on efficiency grounds depending on the cause of the difference.

(a) If fertiliser use is too low because of producer ignorance, there is a case for subsidy on two grounds: first, because each user will be using too little through underestimation of its effects; and secondly, because one person's use of fertiliser conveys information to their neighbours. Such informational externalities have been found very important in the decision to adopt coffee in Kenya (Bevan et al, 1989); fertiliser is probably less visible but the same argument holds to some degree.

(b) If smallholders are using little fertiliser because of risk, there may be a case for subsidising fertiliser; this depends mainly on whether fertiliser raises the price of goods which the people sell in difficult periods (such as labour) or lowers the price of goods which they sell in such periods. Bliss and Stern's careful study of an Indian village (Bliss and Stern 1982) suggests that in that context, fertiliser was being sparingly used because of risk; this may also play a large part in the often reported response that farmers 'cannot afford' fertiliser.

(c) If fertiliser is used by share cropping tenants who pay for the whole cost, they have an incentive to use it only to the point where the price equals their share of the value marginal product (often one half). In this case there would be a case for subsidy. Kidane (1990) cites a study by Friedrich et al. (no date given) which found this effect to be important under the Imperial regime. However, often landowners do share the costs with the tenants, and in any case tenants are only a small proportion of farmers in Ethiopia and it would not be feasible to target a subsidy only at them.

(d) If fertiliser is rationed because of excess demand, then an increase in the price may not affect the amount used, and an increase in the price may improve the efficiency of fertiliser use by reducing the demand from relatively unproductive users. Certainly, in some areas fertiliser is rationed on some occasions; whether the regime can be regarded as one of excess demand in general, or whether the occurrences of rationing are essentially due to flaws in the system of distribution,

is not so clear. (One method sometimes used for rationing is that farmers are allocated an amount of fertiliser positively related to the amount they ordered, but smaller than it. In this case it would be rational for farmers to order, on average, more fertiliser than they actually use; this would give the illusion that the market chronically experienced aggregate excess demand).

(e) Finally, if agricultural income is taxed (explicitly or implicitly), theory suggests that there is a case for a fertiliser subsidy because the income tax reduces incentives to produce (unless fertiliser is tax deductible).

The case for a subsidy needs further investigation, but these arguments do provide a serious prima facie case for a subsidy. (In distributional terms, such a subsidy may be regressive; large farms are more likely to use fertiliser in Gojjam, for instance, (Aleligne 1988) and fertiliser tends to be used in the richer areas). At the same time, it would be better if risk is the problem to provide credit which could be rolled over in the event of a bad harvest; penalties on defaulters on fertiliser loans are reported to take the very harsh forms of imprisonment or removal of cattle (Dessalegn 1992) in some cases. The fiscal implications of subsidising fertiliser also need careful thought. But economic theory gives no presumption that the optimal fertiliser subsidy in an economy characterised by limited insurance markets, limited information and significant taxation of agriculture is zero.

4.1.2 Removing the preferential position of state farms

State farms received credit and inputs on favourable terms. Their disappearance or the end of their preferential status will therefore free resources for other more efficient activities. However, the beneficiaries are likely to be competing demanders for credit, who are not primarily smallholder farmers (credit to smallholders is more often constrained by the difficulty of administration and enforcement than by supply) but by private sector activities in industry and services. Hence, although this reform makes sense, its effect on food supply may well be negative.

4.1.3 Market liberalisation

The liberalisation of domestic food markets has three main effects, all beneficial. First, it will raise prices in surplus areas and reduce prices in deficit areas. This tends to benefit people in both areas and is likely to increase food supply (on the ground that the positive supply effects in surplus areas are likely to outweigh negative effects in deficit areas). Secondly, the reduction of transport

costs allows the margin between consumer and producer prices to fall; some of these costs arose from an artificial system whereby grain was routed through Addis Ababa rather than allowed to flow directly from surplus to deficit areas (Dercon 1994). Finally, the reforms will reduce the inter temporal variability of prices in any one place, because temporary local food deficits can be made good much more quickly then before. This reduces the risks facing farmers,leading to higher food output (see section 4.4).

4.1.4 The end of compulsory quotas

Under the Derg, farmers were required to sell part of their output to the state at cheap prices. The discontinuation of this requirement has had a dramatic effect on income distribution, transferring income from the government to rural people. In Ethiopia's case this is very welcome. The effects on output are not so clear. If the quota was previously considered exogenous to the smallholder's actions, then the reduction in compulsory quotas is likely to reduce output, because the income effects will lead smallholders to reduce output while no substitution effect operates. But if the quota was believed to be assessed on the basis of past output, then clearly it would have discouraged output and a substitution effect would tend to increase output when the quotas were lifted (For a fuller discussion see Dercon (1994) and references therein).

4.1.5 Fiscal policy

The shift of government spending from military spending should release resources for support to agriculture; also, the reduced emphasis on state farms and co-operatives should leave more fiscal resources available to support smallholder agriculture. The later sections of the paper discuss the microeconomic actions which can be taken with the resources which will become available.

4.1.6 Summary: short and long-run effects

The effects of macroeconomic reform turn out to be ambiguous for food supply though more clearly beneficial for smallholder incomes. Rural incomes were immediately increased by the removal of fixed quotas. The increase in the level of incomes should be permanent but will not mean a higher rate of growth in the future. The possible sources of supply increase, including the liberalisation of food markets, can also be thought of as one-off changes, though they will operate with a lag. There is no convincing theoretical reason, however, to expect the macroeconomic reforms to cause a sustained increase in growth in food supply, which is badly needed in Ethiopia. Sustained growth will require

microeconomic changes in investment, information, and the risks facing farmers, which are discussed below.

4.2 Land

Land tenure policy remains unresolved. Most people agree that acute issues of equity and efficiency are raised by land tenure, but the economic theory of land privatisation is not well developed. If there is a consensus, privatisation is one way (not necessarily the only way) of achieving greater efficiency, but carries risks of increasing inequality. However, things are rather more complex than this.

(a) Static efficiency, under plausible assumptions, can be achieved by other means than a freehold market and might even be worse under freehold. If there are constant returns to scale in agriculture, then the equalisation of returns to all factors but one across production units using the same technology will equalise the returns to the last factor; hence the absence of a land market will not cause any inefficiency if all other markets work perfectly. If technologies differ across units or there are increasing or decreasing returns to scale, static productive efficiency can be achieved by a perfect rental market in the absence of a market for the ownership of land.

(b) In reality, there is much evidence that factor markets do not work perfectly (see Berry and Cline (1979) for a classic cross-country study. Marginal products do differ across farmers. In this case a market for the sale of land will allow more productive farmers to buy from less productive ones. This form of transaction will improve static efficiency (see Dessalegn 1994). However, transactions in the land market may also take the forms of the young buying from the old: of those with a lower discount rate buying from those with a higher discount rate: and of those with a temporary windfall buying from those who are temporarily short of cash. None of these three kinds of transactions necessarily promotes static efficiency; they may even reduce static efficiency. Until we know how important these different forms of transactions are likely to be in the land market, we are not well placed to assess the effects of introducing privatisation on static efficiency. Moreover, if land distribution were to become more unequal over time, there is a fairly strong presumption that this would promote the static inefficiencies which were identified in Berry and Cline (1979).

(c) The heart of the argument for freehold relates to the incentive to invest. One point is that freehold makes it easier to use land as collateral; however, in most

developing countries, even with well-developed financial systems, only a small minority of farmers use bank loans, and for the small farmers who constitute the bulk of Ethiopian agriculture the point is likely to be irrelevant. More important is the argument that many agricultural investments are tied to the land and that the risk that land may be removed from the owner reduces the value of the investment.

This is an extremely important argument which bears both on agricultural innovation and on anti-degradation measures. However, the importance of security of tenure (rightly seen as fundamental by Dessalegn (1994)) does not necessarily make freehold the only solution. One possibility is that rights to crops can be separated from rights to the land on which they stand. Some such separation of rights is quite a common phenomenon (for instance in the cash-crop agriculture of the South Pacific) but has limits. More important, perhaps, security of tenure of land may be achieved in a rental system; or it might be achieved by vesting rights in the family, rather than in the individual. Indeed, freehold itself gives security only if it is believed (a privatisation which is expected to be reversed will not motivate investment). It is true that freehold has the advantage that the producer can sell out if their own circumstances change and it becomes desirable of them to move.

(d) there are theoretical cases where the privatisation of land can lead to a reduction in investment. One example is where the young buy from the old: another is where assets are held for precautionary reasons: a third is where the most productive buy land instead of creating new investments (see Samuelson 1979 and Mackinnon 1995b). The importance of these effects depends on the nature of transactions in the land market.

(e) Arguments against freehold rest on two problems: one is that there are already a number of landless people in Ethiopia who would lose from an immediate privatisation of land: the other is that more people may become landless over time. The first problem could in principle be tackled by another 'final' round of redistribution, but this may well be problematic. The second problem will arise if some families either sell their land or disinherit some of their children.

One response is to argue that most smallholders are too responsible to sell off their most important asset. However, we simply do not know how many cases of one generation leaving the next landless might occur. If the problem is thought serious, family rather than individual rights may help. In Kenya, for instance, parents of young children cannot sell land, and parents of older children need their

children's consent to do so[5]. Dessalegn (1994) proposes 'associative ownership' defined as a system where 'the land belongs to the community and the individual landowners in it'; it may be important to redefine the owners to include all household members at least where disposal rights are concerned.

Another response is to argue that landlessness is inevitable as plot sizes become smaller; people have to move out of agriculture. However, all available evidence indicates that down to very small sizes, farming intensity and yield tend to be negatively related to plot size, so that fragmentation, far from reducing efficiency, actually promotes it. In Ethiopia, Assefa (1995) finds no difference in technical efficiency between small and large farmers; if it is also the case that small farmers use more labour, then one would expect them to have higher output per hectare. If the available land per capita become too small to sustain a livelihood, then clearly non-agricultural activities are needed. But it may well be best for these activities to be undertaken by households who continue to farm. Only where there are clear benefits to specialisation in off-farm activities is it desirable that some people should become completely landless. In many cases, there are considerable complementarities between off-farm activities and farming which can be exploited within the household (Mackinnon 1990).

In Ethiopia's case, the prospects for the totally landless seem particularly bleak. The country's population is overwhelmingly rural and off-farm activities are probably relatively little developed reflecting the low level of incomes. The rural landless are likely to be exactly the people least able to cope with these inhospitable economic conditions. For these reasons, however desirable the development of off-farm activities is, it is not an adequate substitute for a policy designed to ensure that people get access to land. Moreover, off-farm activities characteristically are strongly dependent on the domestic (and often very local) market; unless demand is very price-elastic movement of many people into them will drive down returns in them. It may be true, as Dessalegn (1994) says, that 'the long-term remedy for landlessness must lie outside the rural sector' but it would be dangerous to assume that this transformation is going to take anything less than several generations.

(f) One argument against the existing land system relates to the incentives for large families. Clearly, repeated egalitarian redistributions do potentially encourage large families. We do not, however, know how important these effects are quantitatively; experience elsewhere in Africa does not suggest that the

[5]I owe this information to Amos Kiprono

privatisation of land is sufficient to achieve a change in the preference for large families (for instance Kenya has one of the highest fertility rates in the world).

(g) However, freehold does have some equity advantages in the short run; it allows people who are desperate to earn some cash by selling land. The worst famine of recent times, the 1984-85 disaster, was characterised by a collapse in livestock prices and extensive distress sales. Possibly the existence of freehold would have taken some of the pressure off the livestock market. Also, as Dessalegn (1994) observes, illicit land sales in desperate circumstances are likely to give the seller lower prices than legal ones.

The arguments above do not justify any firm conclusions. There does not seem, at the moment, to be enough evidence to settle the merits of alternative land systems. However, there is a consensus that people need more security than they have had: that landlessness is, for most rural Ethiopians, an evil to be avoided: and that common property rights need to be taken seriously and protected by public action where appropriate. It is also very likely that serious action on environmental degradation requires that attention be paid to land tenure.

4.3 Information

Information has some of the properties of a public good; it is the principle of non-rivalrous, in that my use of information does not interfere with someone else's use of the same information, and it is to some degree non-excludable, because farmers can observe what each other is doing (see Romer 1990 and Bevan et al. 1989).

Ethiopia is distinctive in two ways which heighten the importance of seeing information as a public good. First, a very high proportion of the population is acutely dependant on subsistence agriculture, and food is scarce. Second, some of the main crops in Ethiopia, in particular "*enset*" and "*teff*", are almost unique to the country. These peculiarities have two important implications. (a) there is very little incentive at all for private agents to produce agricultural research in subsistence crops, except for the promotion of purchased inputs. Buyers of marketed crops, by contrast, may have a real incentive to spread the best information about techniques to the farmers they deal with,and (b) the fact that some crops are specific to Ethiopia suggests that Ethiopia cannot expect to be able to import any agricultural research on these crops from other countries. For

both these reasons, the production and dissemination of information in Ethiopia is a central responsibility of the state.

The process of disseminating information is essentially a dialogue between farmers whose knowledge is location-specific and may be restricted to crops with which they are familiar, and agriculturalists, who have a more general knowledge about crops drawn from a much wider universe than the farmers, but lack the close acquaintance with particular terrain that farmers have. It is now recognised that knowledge of farming systems is often needed in order to identify the kinds of technology that will be appropriate to farmers in a particular system, and there have been a number of farming systems studies in different areas of Ethiopia (see Aleligne 1988, Abagodu 1988, Tegegse et al. 1987). It is also widely observed that there is something of a backlog of technical innovations which have not been disseminated among farmers. This is a very strong argument for strengthening the extension system; it is not a good argument for cutting back on research, because research will be very much needed while new techniques or seeds are introduced to document farmers' experiences with them.

Although research on farming systems has increased our understanding of farmers' decisions, it tends to focus on farmers' knowledge about their own systems or about improved varieties of the crops they grow. We know very little about farmers' knowledge of crops they do not grow. Westphal (1975) points out that pre-historically, Ethiopia was a centre of experimentation and as a result there is a very high degree of biological diversity. It seems very likely that some of the biggest breakthroughs may come from introducing farmers to completely new crops, but further research on the range of farmers' knowledge and the information they use in assessing the likely merits of a new crop would be very useful.

The extent to which new techniques will be adopted by farmers depends partly on the risks involved. I therefore turn to examine the effects of risk on farmers' decisions.

4.4 Risk

Reducing the variability of people's access to food is fundamental to reducing food-related mortality. But it also has another effect. When risks are very severe, people assure their survival by adopting a number of methods of self-insurance. Some of these strategies are costly. When the amount of risk in the environment is reduced, it should become possible for people to take actions

which would previously have been too dangerous. The argument is not that smallholders are conservative by nature but that they are forced to act conservatively by their circumstances; if the circumstances change, less conservative action becomes possible.

There are a number of risk-averse strategies adopted by smallholders in Ethiopia which may reduce average levels of output but help to insure against disaster. Among these are probably the sparing use of fertiliser, the holding of a stock of cash and small livestock as liquid assets, and the choice of crops which are relatively drought-resistant, and the use of all available plots every year rather than leaving some of them fallow. Watt (1988) points out that sorghum, which is drought-resistant, has expanded markedly at the expense of other crops, and teff is also said to be relatively secure against brief rains because it is planted in waterlogged soil and then stores the water.

Some of these strategies are probably quite costly either in individual or social terms. For instance, cash has a lower rate of return than physical investment, and livestock may overgraze the land because they are so popular as stores of value. The sparing use of fertiliser is likely to reduce demand for hired labour (though the hiring of labour is very limited in most areas anyway). The absence of fallowing may contribute to the declining fertility of the soil. Finally, the limited range of assets which people can hold probably makes price collapses in these assets steeper than they would be if a wider range were available. The dramatic collapse in the value of livestock during the 1984-85 crisis is the most obvious example.

Risks facing smallholders could be reduced in a number of ways. Public food stocks are being increased. Dessalegn (1987) has suggested the emergency purchase of cattle by the government. Product market liberalisation should reduce local swings in availability. The development of a labour market would certainly help in providing poor people with ways of surviving food supply shocks. While a case can be made for defending the 1975 land reform on efficiency and equity grounds, it is very hard to see any justification for prohibiting the hiring of labour when the land market is frozen, and the prohibition will have hurt both the poor and the well-off. Consumption credit would also potentially be a great help; it is quite possible that an expansion of consumption credit would increase output more than an expansion of credit tied to agricultural projects, because it would allow the poor to take more risks in production. Existing informal credit institutions, though well-developed, are bound to have limited efficacy in community-wide shocks when all members of an association need to borrow. The design of successful

consumption credit is not easy, but it deserves more attention (relative to production credit) than it has generally received.

Released from the burden of risk which they now carry, smallholders might use fertiliser more intensively and innovate more. It is possible that people could move into higher-yielding crops; teff, for instance, is generally considered to be low-yielding compared to most other cereals. However, the taste preference for teff in some parts of the country seems to go very deep and may prevent this change for some time to come. It is in any case worth bearing in mind that Ethiopia probably has some scope for increasing yields by switching crops; in this sense the food situation is less desperate than it appears at first sight.

4.5 Mobility and Transport

The Derg discouraged voluntary inter-regional travel with adverse consequences for some groups such as the Gurage who depend on circulating migration. At the same time, it created some compulsory movement with consequences which are well documented. In Ethiopia's case migration between rural areas, both temporary and permanent, can be a valuable way of expanding production. While the liberalisation of movement is very welcome, there may be a significant state or community role in facilitating movement.

If movement is desirable, it can take a number of forms. One is that people move temporarily to look for work. This can be facilitated by allowing the labour market to operate freely, and possibly by providing information on labour market conditions on national radio. Another form is that people move permanently to new rural areas. If this involves losing all land rights, it will be associated with impoverishment. If it involves finding new land, then there is a potentially serious conflict between migrants and those into whose areas they migrate. This sort of conflict has been much documented in Ethiopia, especially in the case of agriculturalists who move into pastoralist areas. If land is to be found for migrants, it is likely to be at someone else's expense. One possibility is a rental market; another possibility is negotiated compensation for the residents in the areas of immigration. It is very doubtful that a laissez-faire approach will allow such negotiation to take place; for instance, no individual will willingly migrate unless they have serious reason to believe that land is awaiting them at the other end, and most smallholders are hardly in a position to mount negotiations with people many hundreds of kilometres away. Negotiation between communities, with some help from the central government, is likely to be needed. However, movement by individuals should always be voluntary; the state knows

too little about individuals' circumstances to be able to choose their place of residence better than they can.

The argument about risk (section 4.4 above) also provides a serious argument for improving the transport network, which is currently one of the most sparse in the world. As well as reducing transport costs (a first-order effect), the provision of transport infrastructure would also be likely to reduce variability in prices and therefore reduce risks faced by smallholders (a second-order effect, but potentially very important).

4.6 Investment and Livestock

The 1984/85 famine reduced livestock holdings and the extent to which they have recovered is not clear. Ownership of a pair of oxen is widely thought the most obvious differentiating feature among rural households, and extending ownership more widely would certainly improve distribution. However, an increase in the number of livestock might make little difference to output; many highland areas are already very intensively farmed and an increase in the number of oxen might simply mean that each ox will work less hard.

V. CONCLUSION

The paper has surveyed the links between food supply, nutrition and mortality in Ethiopia. Most deaths in Ethiopia are not closely linked with food deficiency, but some certainly are; we do not know how many. The main danger to life probably comes from collapses in the access to food rather than in chronic inadequate access; however, chronic food shortage is likely to result in some acute crises. In Section 3, it was argued that in order to expand access to food, Ethiopia probably needs to expand the supply of food. Section 4 examined the possible sources of growth in food output. The effects of macroeconomic reforms or of a possible future privatisation of land on food supply are ambiguous. The most promising sources include better transport infrastructure, a more secure environment for smallholders which allows them to take more risks in production, and better dissemination of information.

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FOOD AID IN ETHIOPIA: TRENDS AND POSSIBLE IMPACTS

Getinet Astatike

I. THE PROBLEM

The structure of the Ethiopian economy is highly dominated by agriculture. This has been reflected, among other things, in the sector's contribution to the national economy (some 50 percent of the national income), employment generation (some 85 percent) and export earning (some 90 percent). As a result, the performance of the overall economy very much depends on the agricultural sector. Unfortunately, the performance of the sector and hence the overall economy has never been satisfactory. Ethiopia's agricultural sector is not even able to fulfil its most basic and important function: the provision of food to a large and expanding population (Brune, 1990, P.19).

Both food production and per capita food availability have been declining. Such has been the case particularly during the 1980s. Total domestic food production decreased on average by 1.1 percent per annum while the level of per capita food production dropped by 4.3 percent during this period (Debebe and Sisay, 1994, P.207). In terms of minimum daily calorie requirements, per capita food availability declined from about 82 percent during 1979/80-1981/82 to 75 percent during 1986/87 - 1988/89 (Eshetu and Mekonnen, 1992, P.19). A steadily declining food production and availability per head have generally been the feature of the Ethiopian economy. Contrary to the traditional and most important role of the sector, Ethiopian agriculture has failed, for the most part, to satisfy the growing food demand.

This decline in food production and availability is best reflected in the increasing number of people affected by drought. Table 1 shows the increasing number of people affected by drought.

Corollary to the steadily declining food production and availability per head, dependence on food imports has been increasing. Obviously, if the domestic capacity fails to satisfy demand, then countries must either purchase food on the commercial market or rely on some form of food aid - or perhaps both. Indeed, this has been the case in Ethiopia. Food import, specifically food aid has been increasing.

Table 1 Drought Affected Population (1973/74 - 1990/91)

Year	Population Affected
1973-74	4,874,047
1975	2,664,000
1979-1980	2,000,000
1983-1984	7,900,000
1990-1991	5,000,000

Source: TGE, National Report on Environment and Development (1992)

II. HOW IT ALL BEGAN

Ethiopia was "self-sufficient" in food production until late 1950s. It was in the late 1950s that the problem became visible and the country required food imports. The 1958/59 drought and locust infestation that affected the production of cereals was, in fact, the first such incidence to give rise to emergence of food aid (Alemayehu, 1988, P.68).

Looking at the international sphere, this period coincided with the application of the Marshall plan in its modified version to the developing countries.

> Many of the principles and objectives of the Marshall plan were subsequently applied to the developing countries, especially in the 1950s and 1960s, when a large number of former dependent territories were granted or obtained their independence and needed considerable support in the initial development of the economies. These initiatives were started under what came to be known as the PL 480 programme. (Singer, Wood and Jennings, 1989, P.6).

As the need for the aid packages of the Marshall plan, whose dominant component was food aid, declined gradually in the countries (i.e. European countries) it was originally meant for (Singer, wood and Jennings, 1989, P.5), Ethiopia became one of the new beneficiaries of this plan and the PL 480. It was in 1959 that Ethiopia received the first food aid from the USA with the purpose of relieving the critical food shortage in the then drought affected provinces. (Alemayehu, 1988, P.63).

The first and immediate cause of food shortage in Ethiopia was, therefore, attributed more to natural calamities than to other problems. In fact, this problem became a persistent feature of Ethiopia, necessitating food aid in ever increasing magnitude. On top of this, there were other problems too. For instance, the then policy environment, as it has mostly been the case, was giving less attention to the agricultural sector. By the late 1960s the adverse effects of the previous policies were being increasingly felt as cereal production lagged behind the growth of urban and rural population (Dejene, 1990, P.49). This, in fact, was one of the reasons that forced development planners to give more attention to the agricultural sector during the Third Five Year Development plan. Nonetheless, the increasing food demand due to the rapidly growing population could not be met and the food gap continued to widen. The international environment, on the other hand, offered easy access to food aid through the PL 480 and the modified version of the Marshall Plan.

III. TRENDS IN FOOD AID

3.1 General Trend

Flows of food aid has generally been increasing although there has been fluctuation. As can be seen from Table 2 the total food aid has been growing at an annual rate of 0.5 percent, on average, during the period 1977/78- 1990/91. The most significant increase came in 1984/85.

The data on per capita food supplies also substantiate this fact. The per capita domestic supply of food has been declining continuously since 1988/89, reaching 136.8 kg per person in 1993/94 from 155.1 kg per person in 1988/89 (Annex 1). Food aid per capita, on the other hand, has generally been increasing during this same period. It was 11.1 kg per person in 1988/89 but increased to 15.5 kg per person in 1993/94. In fact, food aid per capita during the first four

years of the 1990s has generally exceeded the level of the drought and subsequent years of the 1980s.

Table 2 Food Aid Deliveries to Ethiopia (1977-1991)

Year	cereals (MT)	Non-cereal (MT)	Total	Annual* increase (%)
1977/78	76,000	-	76,000	-
1978/79	162,600	-	162,600	1.34
1979/80	111,400	8,700	120,100	-0.30
1980/81	227,900	11,070	238,970	0.99
1981/82	189,700	10,952	200,652	-0.16
1982/83	356,300	11,810	368,110	0.83
1983/84	171,900	15,831	187,731	-0.49
1984/85	868,900	17,126	886,020	3.72
1985/86	799,200	82,821	882,821	0.005
1986/87	510,300	53,397	623,697	-0.29
1987/88	823,800	7,531	831,351	0.33
1988/89	572,800	37,643	610,443	-0.27
1989/90	537,500	37,507	575,007	-0.06
1990/91	893,900	43,880	937,788	0.63

Note: * - computed based on total food aid data (column 4)
Source: TGE - National programme for disaster prevention, preparedness and mitigation, 1993

Cereals accounted for some 95 percent of the total food aid, on average, during the period 1977/78-1990/91. Of the cereal food aid import, wheat takes the lion's share, accounting for some 83 percent (TGE, 1993, p.28).

The trend in cereal food aid to Ethiopia vis-a-vis other countries' in the region has also grown significantly. The amount of cereal aid donated to Ethiopia was only 0.4 percent of total cereal aid in sub-Saharan Africa in 1972 but this rose to over 21 percent in 1985 (Alemayehu, 1988, p.76). According to the report of the World Food Programme, Ethiopia has continued to be the major food aid

recipient in Sub-Saharan Africa, the region that received 70 percent of global relief food aid in Cereals and 72 percent of non-cereals in 1991 (World Food Programme, 1992).

In terms of its contribution to the total cereal supply, the role of cereal food aid cannot be underestimated. Concessional cereal imports as a percentage of total cereal supply has fluctuated in recent years, but has never declined to the levels of the pre-famine years (Table 3). In fact, in 1992 concessional cereal imports accounted for 15.5 percent of total cereal supply surpassing figures of the famine year 1984/85 (Aylieff, 1993, P.6).

Table 3 The Contribution of Cereal Food Aid to Total Cereal Supply (In Thousands of Metric Tonnes)

Year	Net Domestic Supply	% total	Food Aid	% total	Commercial imports	% total	Total
1979/80	5,746.5	97.0	111.4	1.9	66.4	1.1	5,924.3
1980/81	5,319.3	93.8	221.4	3.9	127.4	2.2	5,668.1
1981/82	5,063.9	94.3	184.4	3.4	120.3	2.2	5,368.6
1982/83	6,235.6	96.3	331.3	5.0	37.0	0.6	6,603.9
1983/84	5,140.3	92.7	161.9	3.0	38.0	0.7	5,340.2
1984/85	4,708.3	84.0	858.4	15.1	126.7	2.2	5,693.4
1985/86	5,069.6	91.5	802.9	03.3	163.0	2.7	6,035.5
1986/87	5,788.3	87.2	299.0	4.7	242.0	3.8	6,329.3
1987/88	6,768.3	93.8	894.7	11.5	100.6	1.3	7,763.3
1988/89	6,768.0	92.6	310.1	5.0	75.0	1.2	6,245.5
1989/90	5,835.2	88.4	465.4	7.4	0.0	0.0	6,300.6
1990/91	6,008.9	84.4	790.9	11.6	0.0	0.0	6,799.8
1991/92	5,453.9	84.4	1,000.9	15.5	10.0	0.2	6,464.8

Source: WFP Food Aid information unit, Statistical Summary of Food Aid Deliveries to Ethiopia. June 1993

Table 3 indicates that cereal food aid (relative to commercial imports) has increased both in absolute and relative terms; especially in the early 1990s. The most recent figures on food aid (as can be seen from Annex 2) also show the increasing (though fluctuating) trend. In 1991 the total food aid donated was some 925,296 MT. This amount declined in the following two years and then increased to 980, 116 MT in 1994, exceeding the 1991 level.

3.2 Use and Source of Food Aid

Food aid has generally been categorized into three major types, viz, emergency food aid, project food aid and programme food aid. Emergency food aid which is delivered in response to sudden natural or man-made problems (disasters) has been dominant in Ethiopia. The bulk of food assistance that Ethiopia received in the past is categorized under emergency food assistance (TGE, 1993, P.1). Between 1979 and 1984 for instance, 70 percent of cereal aid was used for emergency purposes (Alemayehu, 1988, P.72).

As can be seen from Table 4, the dominant form of food aid in recent years has been emergency cereal aid. Except in 1989, in which case emergency cereal aid accounted for some 40 percent of the total, it has constituted well above 50 percent of the total food aid. In fact, during the period 1987-1992, emergency cereal aid has accounted for more than 66 percent of the total (cereal) food aid on average.

Project food aid, which is food aid used for development related activities usually in the form of Food-For-Work, has been the second important type of food aid in Ethiopia. It accounted for 23.8 percent of the total cereal food aid donated between 1979 and 1984. (Alemayehu, 1988, P.72). This indicates that food aid used for development purposes like soil and water conservation has been very small, especially compared with emergency food aid.

The third category of food aid is programme food aid. It refers to food supplied for bulk sale or bulk distribution as budgetary or balance of payment support, price stabilization or for reserve purpose. In the Ethiopian context, the use of food aid for this purpose has been very little. Considering the period between 1979 and 1984, for example, the amount of food aid used for programme purposes was quite small. Unlike emergency food aid and project food aid, the role of food aid used for balance of payments support, price stabilization or national food reserves has been limited (Alemayehu, 1988, P.75).

Table 4 Food Aid Deliveries to Ethiopia (1987-1992)

Use year	Emergency cereals	Emergency non-cereals	Non-emergency cereals	% Emergency	% Non-emergency
1987	189,099	6,576	126,968	60.54	39.46
1988	895,605	60,662	213,680	81.14	18.86
1989	132,251	27,980	181,938	38.29	61.71
1990	450,000	24,321	155,386	73.31	26.69
1991	591,040	43,363	267,719	67.68	32.32
1992	818,125	74,707	263,501	75.91	24.09

Source: TGE - National Programme For Disaster prevention, preparedness and Mitigation, 1993

According to a joint study by the World Bank and the World Food Programme, Ethiopia was the major recipient of emergency and project food aid in Sub-Saharan Africa during the 1987-90 period (WB/WFP, 1991, P.10). This shows the fact that even in recent years the bulk of (cereal) food aid has been used for emergency purposes.

As Table 5 shows, Ethiopia was first in sub-Saharan Africa in terms of emergency and project food aid received during the period 1987-1990. It received some 44 percent of the total cereal food aid donated to Africa for emergency purpose and some 18 percent of the total donated for project purpose during the period under consideration. Ethiopia, however, was not in the list of countries that received programme food aid.

The source of food aid, as it has always been the case, is dominated by western donors (see Annex 2). Thus, The USA, the EEC, Canada, Germany and the UK have been the most important donors of food aid to Ethiopia.

Table 5 Major Recipients of Cereal Food Aid, 1987-90 Average (in Thousands of Tons Grain Equivalent)

Emergency		Program		Project	
Ethiopia	582	Mozambique	303	Ethiopia	108
Sudan	170	Sudan	258	Ghana	37
Mozambique	128	Zaire	116	Mozambique	33
Malawi	117	Kenya	68	Mali	31
Somalia	88	Madagascar	49	Senegal	26
Angola	50	Zambia	46	Lesotho	25
Uganda	18	Ghana	40	Malawi	25
Niger	16	Cape verde	37	Sudan	25
Zambia	15	Senegal	36	Burkina Faso	24
Botswana	13	Angola	34	Kenya	20
Other	121	Mauritania	34	Other	241
		Other	283		
Total Africa	1,318		1,304		595

Source: WB/WFP, Food Aid in Africa: An Agenda for the 1990s, 1991

IV. POSSIBLE IMPACTS OF FOOD AID

There are two extreme views regarding food aid which have to be considered at this juncture. One of such views takes food aid as the best form of external assistance since it saves the lives of millions of people desperately in need of food while at the same time helping dispose excess food output of the surplus producers. According to this view, food aid achieves a happy union between the interests of the recipients and those of farmers in the donor countries (Stevens, 1979, P.13). Apart from this, it is argued, food aid can further economic development through several ways (Srinivasan,1989,pp.40-41). In this regard, food aid:

- adds resources for current consumption or accumulation;,
- provides Balance of Payments support as does any other form of aid by reducing foreign exchange spent on food imports,
- can alleviate poverty depending on whether it is directed at the poor,
- can promote development if tied to development-oriented projects that would not have been undertaken otherwise, and
- can be credibly tied to the initiation of growth-promoting policies and reform of policies detrimental to growth, thereby promoting development.

The other extreme view holds that food aid is to the advantage of donors and it spoils the social and economic fabric of the recipient economies (societies).

> ... food aid is particularly pernicious since it exists largely to help sustain inefficient agricultural policies in developed countries and to increase the leverage that its donors can exert on poor countries, and that furthermore it not only fails to benefit the recipient adequately to compensate for these costs but it actually puts developing country farmers out of business, leads their children to adopt exotic tastes that can be satisfied only by imports, and enables their governments to neglect agricultural reform (Stevens, 1979, P.13).

It may be quite important to look at the impacts of food aid in the light of these extreme views. The bulk of the food aid Ethiopia has received to date is emergency food aid. And as such it has saved the lives of millions of Ethiopians who could otherwise have perished. As against this benefit, food aid is said to have disincentive effects. The most common disincentive effects are:

- the dependency aspect,
- disincentive effect on consumption, and
- the disincentive effect on domestic agricultural production.

The dependency aspect is reflected, among other things, on whether government depends heavily on counterpart funds from food aid or not, whether there is significant penetration of the domestic economy by foreign capital or not,

and whether there is an increasing trend in the flows of food aid. As noted above, emergency food aid has been the dominant form of food aid in Ethiopia. Such type of food aid has mostly been distributed in the form of free handouts. This means food aid couldn't discourage domestic tax collection efforts as counterpart fund from such aid has not been significant in Ethiopia. Penetration of foreign capital has never been a problem as well. However, dependency on food imports especially, dependency on food aid imports has been observed when we look at other indicators. For instance, food aid imports constitute a growing part of the domestic grain market, increasing from approximately 17 percent of the market in 1982/83 to 45 percent in 1993/94 (Table 6). Such dependency, in turn, has its own implication on grain prices, consumption patterns and farm income. There is concern that the size and composition of these imports vis-a-vis the local grain markets (85 percent of food aid imports in recent years being wheat) are distorting domestic grain markets, shifting consumption patterns and depressing farm prices (USAID/Ethiopia, 1995, p.5). The disincentive effect on consumption may not actually be that significant as the grains that have been delivered are not new to Ethiopians. Nevertheless, the impact of this dependency on grain prices and hence farm income cannot be underestimated, leading to the other disincentive effect of food aid-the disincentive effect on domestic agricultural production. Thus, through the price and income operations, food aid can discourage agricultural (grain) production.

The other disincentive effect of food aid on domestic agricultural production, according to Clay and Pryer, is mainly reflected through its effect on government policy. Given the fact that the bulk of the food aid received has been emergency type, impact of the same on government agricultural policy could not be that significant. The comparison of trends of food aid and fund allocations to agriculture, for instance, showed that the massive flow of food aid during the 1970s and 1980s has not created any policy disincentive to government investment in agriculture (Alemayhu, 1988, P.176). However, though food aid might not have such direct and visible disincentive effects on agricultural policies (if at all such was the case in other agricultural policy areas), it could possibly have less visible effect on agricultural policies. It might, for instance, have created some sense of complacency on the part of the government in years of relatively better harvest instead of a continuous effort at getting out of dependency. This less visible disincentive effect of food aid may be more at the individual (household) level. Although this needs a detailed micro level analysis, "why should I care as far as it rains in Canada" type of thinking seems to have been spreading through time. And, if such has been the case, it obviously erodes the motive of individuals for getting out of the dependency problem. The population dynamism, even in areas that have been hit hard by drought and famine, and the strong demand at

least in some areas for food aid even in relatively good harvest years, supports this argument to some extent. In any case, the disincentive effect of food aid on domestic agricultural production seems to have been significant.

Table 6 Food Aid and Commercial Imports as a Percent of Domestic Marketed Surplus, 1980 to 1994 (in 1000 MT)

Year	Marketable Surplus	Food Aid	Commercial imports	Food Aid as a % of Marketable Surplus	Comm. Imports as a % of Marketable Surplus
1982/83	1504.6	258.0	95.0	17.1	6.3
1983/84	1493.3	239.3	65.5	16.0	4.4
1984/85	1380.0	466.0	68.0	33.8	4.9
1985/86	1193.6	613.7	115.6	51.4	9.7
1986/87	1330.8	656.9	186.1	49.4	14.0
1987/88	1566.0	674.1	177.7	43.0	11.3
1988/89	1795.2	513.2	149.2	28.6	8.3
1989/90	1774.3	572.0	65.7	32.2	3.7
1990/91	1808.4	536.8	31.5	29.7	1.7
1991/92	1802.2	773.9	3.3	42.9	0.2
1992/93	1844.9	722.7	20.0	39.2	1.1
1993/94	1827.6	817.3	36.7	44.7	2.0

Source: USAID/Ethiopia (1995), Food Security and Economic Growth in Ethiopia

The above mentioned impacts of food aid are not, in fact, the only disincentive effects of the same. There are numerous such effects of food aid, especially at the micro level that need a detailed investigation. These types of studies should compare the case in the absence of food aid with the after effects of food aid, making the exercise difficult.

V. PROSPECTS AND WAYS OUT

Given the present state of the agricultural sector, the population dynamics, the degraded environment and other related factors, the prospect for food self-sufficiency is gloomy for some time to come. Prospects for a quick recovery are bleak. Ethiopia's dependence on food aid and commercial grain imports can be expected to continue for years, regardless of climatic conditions (Brune, 1994, P.12). Projected requirement, production and supply of cereals, for example, give an insight into the situation. As can be seen from Table 7, the projection indicates an increasing deficit in food (cereal) availability. Nevertheless, the recent policy changes seem to favour the peasant sector which is the backbone of the Ethiopian agriculture. Major efforts are being made to disseminate agricultural inputs and to meet the need of grassroots-level and participatory development (Loerbroks, 1994, p.67). Given the dominant position farmers give to food crop production, such efforts could reverse the food aid dependency situation. Apart from this, Linking relief and agricultural development could also contribute a lot to the long-term development of the country.

> Ethiopia has typically received one million tons of food aid in a drought year, almost exclusively for direct distribution as relief. If used instead as a wage on food for work, one million tons of food would be enough to pay for over three hundred million days of work at standard work norms. A workforce of this size could build 167,000 km of access road or 417,000 km of artificial waterway or 2,700 earth dams, all in a single year (Maxwell and Alemayehu, 1994, p.65).

Thus, food aid could have contributed a lot to the long-term development of the country had it been used as a wage on food-for-work activities. As can be seen from Annex 2, Ethiopia has received huge flows of food aid even in relatively better (non drought) years indicating, again, the use that could have been made out of food aid.

Linking Relief and Agricultural Development in addition to the current policy direction which gives more emphasis to the peasant sector can contribute significantly to the long-term development apart from reversing the dependency situation. Introducing population control would also play a vital role to get out of the prevailing situation.

Table 7 **Projected Cereal Requirement, Production, Supply and Deficit (in '000s Quintals)**

Year		Requirement	Production	Supply	Deficit
1995			56,729	48,200	
	High variant	87, 170			-38,950
	Medium variant	86,891			-38,671
	Low variant	86,168			-37,948
2000			58,053	49,345	
	High variant	103,412			-54,067
	Medium variant	102,373			-53,028
	Low variant	101,097			-51,752
2005			59,408	50,497	
	High variant	123,389			-72,892
	Medium variant	121 743			-71,246
	Low variant	118,806			-68,309
2010			60,794	51,675	
	High variant	147,828			-96,063
	Medium variant	144,572			-92,807
	Low variant	138,206			-87,060
2015			62,212	52,880	
	High variant	176,534			-123,654
	Medium variant	170,493			-117,613
	Low variant	160,206			-107,326
2020			63,664	54,114	
	High variant	209,756			-155,642
	Medium variant	199,141			-145,027
	Low variant	182,176			-126,062

Source: MoPED, Proceedings of the National Workshop on Integrating Population and Development Planning, 1994

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Annex 1 Per Capita Food Supplies by Source, 1980 to 1994 (in Kg. per Person)

Year	Domestic Supply		Food Aid		Commercial imports		Per capita food Availability
	Amount	Recent of total	Amount	Percent of total	Amount	Percent of total	
1982/83	150.9	94.5	6.5	4.1	2.4	1.5	159.8
1983/84	145.6	95.1	5.8	4.2	1.6	1.0	153.1
1984/85	130.9	91.2	11.0	8.5	1.6	1.1	143.5
1985/86	110.6	86.7	14.2	12.3	2.7	2.1	127.5
1986/87	120.4	86.3	14.9	11.7	4.2	3.0	139.5
1987/88	138.5	88.0	14.9	10.4	3.9	2.5	157.3
1988/89	155.1	91.6	11.1	7.2	3.2	1.9	169.4
1989/90	149.7	91.8	12.1	8.1	1.4	0.8	163.2
1990/91	149.1	92.7	11.1	7.6	0.6	0.4	160.8
1991/92	144.5	90.3	15.5	10.2	0.1	0.0	160.1
1992/93	143.8	90.9	14.1	9.8	0.4	0.2	158.3
1993/94	138.6	89.5	15.5	11.0	0.7	0.4	154.8

Source: USAID/Ethiopia (1995) Food Security and Economic Growth in Ethiopia

Annex 2 Food Aid Deliveries to Ethiopia by Major Donor Countries and Year, in Metric Tonnes (1984-1994)

Donor	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Grand Total	% of Grand Total
Australia	0	26,798	28,904	27,883	9,703	12,397	6,810	5,400	9,151	7,782	20,233	155,061	1.92
Canada	3,317	104,271	76,213	84,999	71,769	36,450	26,951	54,445	29,645	38,999	29,979	557,037	6.90
EEC	36,422	201,549	217,187	40,889	204,795	39,824	179,312	160,847	181,489	82,367	236,370	1,581,051	19.60
France	1,095	26,273	8,000	0	13,952	13,900	6,570	10,560	0	0	14,580	94,930	1.18
Germany*	14,732	55,080	22,809	12,629	19,846	30,066	31,631	955	46,036	2,897	15,054	251,735	3.12
Italy	0	12,626	22,244	17,440	32,325	214	6,409	1,135	1,000	0	12,104	105,497	1.31
Japan	73	15,393	0	5,624	7,088	12,623	14,212	21,319	12,376	12,700	6,196	107,604	1.33
UK	6,500	41,914	13,717	12,034	41,683	17,350	26,360	24,405	29,664	13,782	54,865	282,274	3.50
USAID	8,629	478,084	327,172	28,194	245,082	54,498	130,219	121,754	221,790	121,173	409,213	2,145,808	26.60
USSR	0	0	0	0	253,033	12,860	0	0	0	0	-	265,893	3.30
WFP	41,750	032,755	121,971	31,485	146,139	215,004	188,307	482,430	226,205	217,782	124,736	1,928,564	23.90
Total food aid Received	114,665	1,272,221	926,230	276,819	1,096,205	460,599	657,464	925,296	840,177	519,326	980,116	8,068,518	-

Note: * Figures upto 1993 are for the West Germany only.
Source: WFP Addis Food Aid Information Unit

SEASONAL AND EXCEPTIONAL FOOD SHORTAGES, THEIR CAUSES AND SOCIO-ECONOMIC CONSEQUENCES: A CASE STUDY OF WOLAITA DISTRICT IN SOUTHERN ETHIOPIA

Dagnew Eshete

I. INTRODUCTION

Over the last two decades, the agricultural sector in Ethiopia has been seriously affected by man-made and natural disasters that have led to a sharp decline of food production, food shortages and famine. Various sources (Hancock, 1985; Glantz, 1987; Raikes, 1988; Webb, 1989 & 1992) indicate that, although famines and food shortages are not new to the country, disaster-induced food crisis have increased in frequency and severity in the last two decades. Several disaster-induced food shortages or famines have occurred in different parts of the country, causing massive loss of life and property (including severe degradation of the natural environment - most seriously in the periods of 1972-74 and 1983-85). The resultant loss of the resource base among poor farm and pastoral households has led to serious economic deprivation and often destitution, starvation, mass migration and family disintegration, tragic human and animal death, etc. in many parts of the country. Recovery of the rural economy and the national economy as a whole will be formidably difficult and there is no guarantee that similar disasters will not re-occur.

Ethiopia is one of the most populous Sub-Saharan African countries with 88 percent of its population concentrated in the highland regions (44 percent of the total land area of the country) (World Bank, 1989). Land use and population settlement patterns in some parts of the country pose real problems in terms of the person/land ratio. This is true particularly in highland areas where the average population density is about 69 persons/Km^2, with an obvious consequence of intense pressure on the land and human-induced land degradation. This problem is aggravated by inadequate land use, poor farming management practices and overgrazing. Although the lowlands cover 56 percent of the total land area of the country, they support mainly the vulnerable pastorialists (7 persons/Km^2) who are particularly at risk due to environmental disasters.

Until 1991, the Ethiopian government had been following short and long-term development objectives that primarily aimed at increasing the national and household-level food security and nutrition through increasing the marketable surplus of food production. This strategy addressed food insecurity and associated problems with a conservation-based approach aimed at increasing food production and marketable surplus in high potential areas.

According to Cohen and Isaksson (1988), the two competing agricultural sector development strategies (i.e., individual smallholder and agrarian socialism approaches) consistently followed by the military Government (1974-91) have resulted in progressive food production decline and increasing insecurity of food supplies. The Land Reform of 1975 has not so far delivered the expected return in the peasant sector, since it did not fully take into consideration other crucially important productive factors. Most importantly, unequal distribution of draught oxen and land among rural households has resulted in income differentials among rural peasants. The overall performance of the producers' cooperatives, state farms and the villagization programme had been disappointing. The production and of smallholder agriculture also failed to meet the fast-growing domestic food requirements.

It is generally argued that many of the government's agricultural sector policies (such as the villagization policy, re-settlement, collectivization, state farming, mechanization and imposed marketing policies, etc.) have been counter-productive, contributing to increased food insecurity and vulnerability to sudden disasters or famines. Other factors in the recurring food crises include, increasing population pressure on land, rising rates of environmental degradation, failure of agricultural technology to adapt to changing needs, shortages of productive assets, civil and military disorder, lack of agricultural investment, and frequent drought and other natural phenomena.

In general, the lesson to be drawn from the experience of the country is that the Ethiopian government must develop policies which are supportive, not disruptive, of peasant production activities and efforts, and this must include drawing upon existing peasant knowledge and experience. Peasant participation in the development and production process must be enhanced if the food self-sufficiency goals at the household and macro-levels are to be achieved.

This paper examines a particular food deficit area (Wolaita District) in the south-central region of Ethiopia. The major emphasis of this study has been on the causes and socio-economic impact of disaster-related food

shortages/famines in the recent decade. The study is mainly based on the 1990/91 household-level sample survey.

A variety of research methods and procedures are used to investigate the key questions in relation to the types of food shortages, and their causes and socio-economic impacts. The general approach of the study includes:(a) interviews with various appropriate individuals, policy-makers and implementers concerned with the problem of the agricultural sector; and (b) a field survey in 16 peasant associations (65 villages) in Wolaita District. The fieldwork was carried out in three major agro-ecological zones using 534 sample households (including 12 oral historians) selected across all peasant income groups in five sub-districts[1]. Information was also collected on weekly rural market demand and supply situations of basic necessities for peasant population within and/or adjacent to the study sites. In this study, a household is taken as a unit of analysis. The findings of the field investigation with particular focus on the causes and socio-economic impacts of food shortages are presented in part two of this paper.

II. SEASONAL AND EXCEPTIONAL HOUSEHOLD FOOD SHORTAGES, THEIR CAUSES AND SOCIO-ECONOMIC CONSEQUENCES

2.1 General Background About Wolaita

Wolaita Awraja (district) covers an area[2] of 3,178 Km^2 and it is characterized by extremely undulating topography with lowlands and highland areas (WADU, 1981). It is located in North Omo Administrative Zone of Southern Ethiopia some 400 Km south-west of Addis Ababa. Wolaita Awraja is

[1]In addition to the information collected from 534 sample households (including 12 oral historians), discussion with PA leaders, PA executive committee members and village informants was made in order to collect village and community or PA-level related socio-economic information.

[2]The basic data estimate is provided by Wolaita Agricultural Development Unit (WADU) - Phase 2 (1972).

divided into seven Woredas (sub-districts). Its economy and employment is based on the agricultural sector.

Studies by the former Wolaita Agricultural Development Unit - WADU (1981) and the NORAGRIC[3] (1986) show that the Awraja is characterized by three major agro-ecological zones which are controlled by altitudinal differences. The three prevalent agro-ecological zones in the Awraja include: (a) *Dega* (highland) covering about 14 percent of the land area; (b) *Woina-Dega* (medium altitude) covering 57 percent of the land area; and (c) *Kolla* (lowlands) that covers 29 percent of the land area in the Awraja.

Wolaita Awraja is generally poor with respect to development resources. In particular, land is scarce and people are hardly able to depend on it for their seasonal farm activities and income. Although there has been no accurate and detailed study of farmland ownership, official reports indicate that average estimated rural land holding is about 0.5 and 2.5 ha./household in the *Dega* (including *Woina-Dega*) and *Kolla* areas respectively. On the basis of the indicative gross land ownership figure, the per capita land ownership would be about 0.11 ha in *Dega* and *Woina-Dega* and 0.53 ha in *Kolla* areas. Official reports also indicate that the partitioning of the land among the growing extended families in the *Dega* and *Woina-Dega* areas has led to a reduction in farm productivity and seasonal returns. This continuing land fragmentation makes land management an increasingly difficult task and greatly contributes to the land degradation.

Information from the 1990/91 district level survey (Dagnew, 1993) and available literature (WADU, 1974 & 1981; NORAGRIC, 1986; Redd Barna, 1989; Rahmato, 1990) indicate that, historically Wolaita has been a food deficit Awraja for many generations. Although recorded evidence is lacking, official sources from the offices of the Awraja Administration and the Ministry of Agriculture indicate that the food production and supply situation of the Awraja has clearly deteriorated since the 1960s. This is due to the increasing population pressure particularly in the *Dega* and *Woina-Dega* areas where land scarcity has led to serious tenancy problems up to the 1975 Land Reform.

Various studies (Rahmato, 1990; Redd Barna, 1989; NORAGRIC, 1986) indicate that household food insecurity in Wolaita has become a growing problem,

[3]Norwegian Agricultural University Centre for Development Studies (NORAGRIC).

and people are vulnerable to both seasonal and recurring disaster-related food shortages of differing magnitudes by seasons and income groups. The root causes for the growing food insufficiency and poverty are indicated to be shortages of productive resources (including land, oxen, capital inputs, etc.), the risk associated with rainfall variability, and inadequate policy support, including some policies which act as disincentives to production.

2.2 Differential Asset Ownership and Its Impact on Household Incomes and Periodic Food Supply

Based on the results of the fieldwork (1990/91), we were able to establish the three major income groups of peasant households (i.e, poor, middle and rich) and the major causes of their income/ economic differentiation. Household income is shown to be related to a series of independent variables including productive assets, labour, family size, sources of employment and agro-ecological zones.

The results show that the average family size of all income groups is 10.32. The highest average family sizes are observed in the rich income group (13.6 family members/household) which is by about 36 and 21 percent higher than the average family size of the poor and middle income groups respectively.

The results of this study show the key productive assets that influence households' seasonal or annual incomes. In order of importance: (a) draught oxen and breeding cattle; (b) farmland; (c) farm implements such as plough-points, sickle, and digging hoe; (d) small animals; and (e) transport animals. The existence of a marked difference in the distribution of ownership of all these productive assets between the poor, middle and rich income groups is quite apparent (see Table 1). The high variation in the ownership of productive assets (in particular, variation in the ownership of draught oxen, breeding cattle and farmland) between different income groups is the primary cause for the prevailing marked annual income and overall economic differentiation.

In terms of household occupation, the results of this study reveal that the dominant sources of both output and income is agriculture (crop and livestock farming). Rural household food security is particularly dependent on cropping activities. The other important source of income (next to crop and livestock farming) is petty trading. The majority of peasant households, from almost all income groups, depend on such trading both during the farming seasons and slack periods. Casual wage employment and other off-farm (formal and informal)

activities may also provide vital sources of income, particularly for poorer households. There are a number of other secondary occupations (subsidiary activities) that farm households undertake either all year round or seasonally with the objective of supplementing income from the primary sources (crop and livestock farming).

The results of this research reveal that many members from relatively high income groups (as observed in the 1984/85 famine) had lost this status by 1990/91. Such income decline was triggered by the recurrent disasters (mainly drought). Recurrent disaster in the 1980s generally made the poor more and more vulnerable and markedly reduced the wealth and status of even the rich peasants.

2.3 Types of Household Food Shortages

It is clear that people from various social groups in Ethiopia have experienced food insecurity of differing magnitudes for the last two decades. The per capita nutritional level that prevailed within the peasant households has been indicated to be far below the minimum nutritional requirement (183 kgs./year/person)[4]. The field work in Wolaita indicates that the food situation both at Awraja and household-level has been far below the national average figures for the 1980s and early 1990s. This is due to the complex production constraints such as:

a. serious shortage of productive resources (e.g., land, oxen and seasonal farm inputs),
b. very high population pressure particularly in the *Woina-Dega* and *Dega* agro-ecological zones, and
c. recurring disasters resulting in crop and livestock production losses.

According to the 1989/90 and 1990/91 data, the annual food supply situation (in cereals equivalent) at Awraja-level was 0.16 tonnes/person/year. This means that the overall average food supply/capita/day was 37 percent below the standard food requirement (i.e., 0.26 tonnes/person/day) in the Ethiopian situation (Dagnew, 1993).

[4]This is equivalent to about 500 grams (or 1776 calories) per day/person.

Table 1 Summary of Mean Asset Ownership Per Household and per Capita by Income Groups (Wolaita)

Type of Asset Ownership	POOR (n_1 =252)		MIDDLE (n_2=170)		RICH (n_3=100)		TOTAL CASES (N=522)	
	Per HH	Per Capita	Per HH	Per Capita	Per HH	per Capita	Per HH	Per Capita
1. Farmland (in hectares)	1.32	0.15	1.52	0.14	2.39	0.18	1.59	0.15
2. Livestock: (in number)								
Oxen	0.09	0.01	0.88	0.08	1.92	0.14	0.70	0.07
Breeding cattle	0.82	0.10	2.18	0.20	6.60	0.49	2.37	0.23
Small animals	0.37	0.04	0.84	0.08	2.30	0.17	0.89	0.09
Transport animal	0.04	0.01	0.21	0.02	0.88	0.07	0.26	0.03
3. Farm Implement: (in number)								
Plough-point	0.49	0.06	0.97	0.09	1.26	0.09	0.79	0.08
Sickle	1.71	0.20	2.51	0.23	4.07	0.30	2.10	0.20
Digging hoe	1.17	0.13	1.74	0.16	2.88	0.21	1.68	0.11
Axe	1.18	0.14	1.75	0.16	2.68	0.20	1.65	0.16
Matchet	0.11	0.01	0.21	0.02	0.34	0.03	0.19	0.02

Note: N= Total sample population; n_1, n_2 and n_3 are sub=sample populations. HH = Household statistical test results shown in Table 7.6l (using kendall's Tau-b approach) suggest that there is a positive and significant relationships between productive asset ownership and the economic status (income groups) of sample peasants at a household and per capita levels.

Source: Survey data, 1990/91 (Dagnew, 1993)

With the exception of some parts of the *Dega* agro-ecological zone, most of the Awraja (*Woina-Dega* and *Kolla* agro-ecologies) has been very vulnerable to the recurring disaster-related food shortages and famine during the past three decades. In particular, Kolla areas below 1500 m.a.s.l. were extremely vulnerable to the recurrent disasters (primarily drought and pest outbreaks) with devastating socio-economic consequences. This is due to the erratic nature of seasonal rainfall resulting in frequent crop losses and poor grazing pastures. *Kolla* areas also regularly face high risks of human, livestock and crop disease outbreaks. Peasants in the *Woina-Dega* areas are relatively less vulnerable to disaster-related food shortages. This is because of the greater possibilities of crop diversification (next to the *Dega* areas) combining cereals and different horticultural crops (mainly root crops and *enset*).

The 1990/91 fieldwork shows that hailstorm-related crop loss and food shortages has been a common problem for peasants in all areas; but with higher intensity of occurrence in the *Dega* agro-ecologies. Crop disease outbreaks, like Bacterial wilt and Late blight, seriously affected the production of *enset* and potatoes respectively in the 1980s. An unidentified pest on sweet potatoes was reported to be a recent phenomena, experienced since the early 1980s. According to respondents and reports of rural extension agents of the Ministry of Agriculture (MOA), these seasonally recurring disease and pest outbreaks have greatly contributed to the three major severe disaster-related food shortages and famines of the 1984/85, 1987/88 and 1990/91. MOA officials, extension agents and peasants have also reported crop losses due to sudden outbreaks of army worms and wild animals in *Woina-Dega* and *Kolla* agro-ecologies.

2.3.1 Seasonal food shortages, its causes and socio-economic consequences

The analysis of the data for a normal production year (1989/90) indicates that the general level of nutritional intake in terms of calories would fall below the international and national average standards[5] by 32.5 and 25.1 percent respectively. This is also 11.4 percent less than the national survival nutritional requirement (which is 1776 calories/person/day). This low level of undernourishment indicates not only seasonal hunger, but also very low level of production and serious resource constraints in Wolaita.

[5]The international and national standard average calories considered to be nutritionally adequate for consumption is 2330 and 2100 calories/person/day respectively (ONCCP, 1987 & 1989).

The food supply situation both at a household and Awraja levels varies greatly between the two major seasons (*Kremt* and *Bega*). *Dega* and some parts of *Woina-Dega* agro-ecological areas of Wolaita receive a "bimodal" rainfall. *Kremt*, sometimes called *Meher*, is the main rainy season which extends from May/June to September and is the major crop production season. *Belg* is a short rainy (growing) season that generally extends from part of February to April. *Bega* is a dry and often a harvesting season that falls between *Kremt* and *Belg* seasons.

Table 2 **Responses of Sample Households on the Experiences of Seasonal Food Shortages**

Responses	Number of Sample Households	Percent
Yes, often a problem	368	71
Not often	82	16
Very rarely	60	12
Not a problem at all	12	2
Total	522	100.0

Source: Dagnew, 1993, (fieldwork, 1990/91)

All households in the sample areas were asked about their past experiences of seasonal food shortages (see Table 2). Some 71 percent replied that they often face varying degrees of (chronic & serious) food shortages. Others, 28 percent, answered that they did rarely face food shortages while 2 percent said that seasonal food shortage is not a problem to their family at all.

The responses to questions about the causes of seasonal food shortages (see Table 3) indicate the following results: some 96 percent replied variations in seasonal rainfall and distribution, 83 percent lack of draught oxen, and 48 percent replied inadequate size of farmland ownership. Moreover,shortages of capital (finance) to purchase farm inputs such as seeds, fertilizers, including farm implements are also among the major constraining factors stressed, by the

Table 3 **Household Responses by Causes of Seasonal Food Shortages by Income Groups (in order of importance)**

Causes of Food shortage	Household Responses			Total Cases N=507
	Poor n_1 =252	middle n_2 =168	Rich n_3 =87	
Seasonal variation of rain fall (in amount and distribution)	95	97	93	96
Lack of Oxen	94	89	43	83
Lack of fertilizers	60	61	52	59
Lack of veterinary support	37	61	66	50
Seed shortage	56	44	31	48
Inadequate farm size	49	51	44	48
Poor soil due to erosion and other factors	23	22	26	24
Labour shortage	30	14	10	21
Shortage of implements for farm and cottage industry	30	10	13	20

Grazing and watering problem	12	20	18	16
High grain and input prices	16	8	7	12
Lack of capital (finance)	1	1	-	1
landlessness	0.4	-	-	0.2
pest and wild animal outbreaks	-	1	-	0.4
Seasonal hailstorm	0.4	-	-	0.2
Others*	0.4	1	-	1

Note: Each sample household has given more than two (multiple) answers, and because of this response figures do not directly add up vertically. All figures are percentages, and they are calculated directly from the vertical respective totals (i.e., it is not summed up directly both vertically and horizontally). Fifteen sample households from the rich income group (who do not face seasonal food shortages) are not included.

* Others, include causal factors like accidental fire on houses or crops, health problems, collectivization and/or villagization, etc.

N= total sample population; n_1, n_2 and n_3 are sub-sample populations of the poor, middle and rich income groups respectively.

Source: Dagnew, 1993 (survey data, 1990/91)

respondents. These are also the factors that have been responsible for the gradual decline of the economic status of households, making them more and more vulnerable to any unforeseen disasters. Many sample households have mentioned that because of the complex productive resource constraints they often face, achievement of adequate seasonal production and income to meet their household food requirements has not been possible.

The 1990/91 fieldwork also examined the months of the year that sample households of different income groups in Wolaita face various degrees of seasonal recurring food shortages (see Table 4). The study showed that seasonal food shortages in general extend from January to July (for about 7 months). The most crucial months extend from April to mid-July. However, as mentioned above, all peasant households do not face the same degree of food shortage in the same period. For example, most of the poor households face food shortages from October to July (for 10 months), while middle income groups face relatively lesser degree of food shortages from January to July (for 7 months). The stores of better-off (rich) income group get empty by about April and for the rest of the three months (till July). They supply their households through grain purchases from the sales of small animals. From the middle of July onwards fresh harvests of crops start to satisfy household needs and local markets provide supplies at a relatively low and affordable price for the poor. This provides the income groups with low purchasing power a better access to fresh local market supplies. In general, poor peasants often suffer pre-harvest food insecurity of differing magnitudes from direct (i.e, production) and indirect (i.e, trade and exchange) entitlement failures.

The study also attempted to examine the peasant perceptions by asking questions like: "if food shortage has been a common problem, how seriously and frequently has it been affecting your family?". The responses indicate that 92 percent of the poor, 71 percent middle and 38 percent of the rich income groups faced both serious seasonal and recurring disaster-induced food shortages. Some 24 percent from different income groups replied that they faced less serious seasonal and recurring disaster-induced food shortages in the recent decades.

Table 4 **Responses of Sample Households on the Months of Food Shortages and Food Self-sufficiency in a Year by Sample Woredas (Sub-districts)**

Periods of Food		Sample households by woredas (Percent)					
Shortage (Months)	Self-Suff*	Damot Gale	Humbo	Kindo Koysha	Offa	Sodo Zuria	Total Cases
		$n_1=134$	$n_2=115$	$n_3=108$	$n_4=68$	$n_5=97$	$n_5=522$
0	12 (All months)	-	3	-	1	8	3
1 (June)	11	-	3	-	-	-	1
2 (May-June)	10	2	1	-	-	3	1
3 (May-July)	9	4	6	1	3	3	4
4 (April-July)	8	6	7	6	4	7	6
5 (March-July)	7	15	16	7	13	15	13
6 (Feb.-July)	6	25	23	29	13	37	26
7 (Jun.-July)	5	15	21	21	31	10	19
8 (Dec.-July)	4	19	12	19	15	11	16
9 (Nov.-July)	3	13	5	12	4	3	8
10 (Oct.-July)	2	1	3	3	15	1	4
11 (Sept.-July)	1	-	-	1	-	-	0.2
12 (All months)	0	-	-	1	-	-	0.2

Note: N = total sample population.; n_1, n_2, n_3, n_4 and n_5 are sib-sample populations from five woredas (sub-districts), namely: Damot Gale, humbo, Kind-Koysha, Offa and Sodo Zuria respectively. "0" (zero) in the first column means that households referred are self-sufficient in food supply and income in all months of the year; while in the second column, the same symbol indicates that the households referred suffer food shortages in every month of the year. All figures are percentages.

* Self-sufficiency

Source: Dagnew, 1993 (survey data, 1990/91)

2.3.2 Disaster-induced food shortages and its causes

The information collected from various sources during the fieldwork (Dagnew, 1993) indicated that periodic food shortages and famines have been problems for many generations in Wolaita. Elders of the community and Ato Wolde Semayat (former District Governor in the 1960s to early 1970s) explained that the history of Wolaita has been punctuated by recurrent disaster- induced food shortages or famines for the last 60 years. They also mentioned that there has not been a single period that the Awraja's food production and supply showed any improvement or growth. Instead it has been showing a gradual decline in the economic status and increased vulnerability of peasants to any sudden disasters.

The information from oral historians indicate that before the 1980s, the main causes of food crisis (famines) were generally natural disaster-induced factors. A new man-made problem (in addition to natural factors) has recently emerged. Since the 1980s, a policy-induced recurrent food crisis has been a common experience. This has been reported to have greatly aggravated the impact of the natural disasters on rural household food production and food supply activities. The policy induced problems refer to:

a. forced villagization and collectivization measures which resulted in severely reduced output and sometimes total loss of output; and
b. the massive forced military service and deaths of active rural productive labour force.

Oral historians and other key informants reported that such policy measures had resulted in a serious reduction in planting and hence declines in production or loss of crop output in many areas of the Awraja. This clearly indicates that the Government policies have been major contributors to the present food insecurity situations.

Table 5 The Awraja-Level Disaster-Induced Major Food Crisis/Famine Years, Its Causes and effects as Reported by Oral Historians in Wolaita

Disaster/famine years	CAUSES	Effects	Coping Methods
Late 1920s	-rain failure (drought) -disease outbreaks on humans, livestock and crops; insect and wild animal out-breaks on crops	-serious food shortages -lesser human and animal deaths, and less human migration	-Intensive use of wild foods and hunting -support from kin, local churches and patrons
Earlys	-locust outbreak in Koysha Worada	-serious food shortage	-the same coping methods to the late 1920s
1947/1948	-rain failure -human disease outbreaks	-famine -widespread human deaths	-kin and friends support -support from local churches and patrons -rating wild foods,begging & sale labour
1963/64	-heavy army worm outbreak on crops -total rain failure similar to 2984/85 -widespread human livestock diseases	-total loss of crop & serious food crisis -famine-related widespread human deaths -shortage of forages and livestock deaths	-same coping methods to that of 1947/48 and intensifying petty trading
1965/66	-rain failure (very erratic in highlands drought in lowlands) and resettlement	-crop loss and very serious food shortages particularly in lowlands resettlement areas	-kins and friend support, relief support -eating wild foods and petty trading
1970/71	-late rain followed by drought -wild animals outbreaks on crops	-heavy loss of crop and livestock deaths (not at famine stage)	-support from kin and friends -eating wild food and petty trading -labour hire including temporary immigration

Table 5 continued

Disaster/famine years	CAUSES	Effects	Coping Methods
1980/81	-rain failure; animal disease outbreaks -price rise	-serious food shortages and starvation -human and animal deaths	-same coping strategies mentioned above and some relief support from the government
1983/85	-total rain failure for two seasons -human and animal disease outbreaks -crop disease and pest outbreaks -high price rise of food crops -depressed livestock price	-total crop forage loss -severe food shortage/famine -heavy loss of human and animal lives -serious family dislocations	-institutional integrated support -intensifying all coping strategies mentioned above,borrowing, productive asset sales, migration, reducing conception and rationing, etc.
1987/88	-rain failure -outbreaks of human diseases (meningitis and malaria) and animal diseases outbreak -crop disease outbreak (on sweet potato)	-heavy crop loss and serious food shortage -Less human death due to relief and medical intervention support -heavy loss of animals	-all coping strategies mentioned above and better medial support
1990/91	-rain failure (drought in lowlands) -human, animal and crop disease outbreaks -insect and wild animal outbreaks on crops	-effect are more or less similar to that of 1984/85, but with more serious impact in lowlands, and more widespread animal losses	-all coping strategies mentioned for 1984/85 with a more intensified petty trading and other non-farm activities

Note: in all disaster periods cropping changes and reducing food consumption and rationing has been experienced at different intensities depending on the economic position of peasants.
Source: Own Survey data, 1990/91

A closer examination of Table 5 indicates the increase in the frequency of famine occurrence; types of causal factors; seriousness of socio-economic effects of disasters; and nature of household coping strategies developed in Wolaita from 1920s to 1990/91.

The information from oral historians revealed that a total of at least 10 noticeable periods of serious disaster- induced food crisis (see Table 5) have been experienced in the last seven decades. The recurring total rain failure, crop pest and disease outbreaks are the most dominant causal factors of all for the food crises or famines in Wolaita. Such disasters resulted in devastating socio-economic consequences in the past three decades especially in the *Kolla* and *Woina-Dega* agro- ecologies. The *Kolla* (drought-prone) agro-ecologies of Humbo, larger parts of Koysha, Damote Woyde and parts of Damot Gale Woredas were extremely vulnerable and heavily devastated by the recurring famine crisis. These areas have also been very prone to disease and pest outbreaks. Most recently (1994), many parts of Kindo Koysha and Bolosso Sore faced devastating famine. Moreover, the policy-induced villagization activity that was undertaken during planting time of 1986/87 in some lowland areas in particular (e.g., in Koysha and Humbo Woredas) did result in severe food crisis. Local institutions that could take initiatives to build up food reserve/food security stores as famine prevention and preparedness measures are also non-existent in Wolaita (with the exception of the Relief and Rehabilitation Commission-RRC).

Table 6 shows the responses of sample households to the severe food shortages or famines experienced in the 1984/85, 1987/88 and 1990/91. Nearly 100 percent of the sample households replied that the primary cause of exceptional food shortages was climatic - namely, recurring rain failure at critical times in the cropping cycle. Additional problems listed include: human and animal disease out-breaks; crop pest and disease outbreaks; forced villagization; and hailstorms were among the other major causal factors for exceptional food shortages. This can be compared with the causes of seasonal (chronic) food insecurity indicated earlier where lack of oxen was identified to be the most important factor.

The study also revealed that 93 percent of the households reported grain price increase as the most important factor for aggravating the severity of food shortages in periods of disasters. Major factors that aggravate exceptional food shortages, in order of their importance, include: lack of purchasing power; low livestock price; food availability decline in local markets; human and animal disease prevalence; and lack of labour demand. In many parts of disaster-prone areas, death of family members (mainly husband and/or wife), theft and robbery, and family separation were also reported as the aggravating factors.

Table 6 **Responses of Sample Households on the Types of disasters They Faced (in order of importance)**

Types of Disaster	Household Responses (%)			Total Cases
	Poor	Middle	Rich	
Rain Failure	100	100	99	100
Human disease outbreak	52	55	50	52
Crop pest & disease outbreaks	44	47	37	44
Forced villagization*	22	19	16	20
Animal disease outbreaks	18	21	22	19
Hailstorm	14	14	11	13
Crop destruction by wild animals	2	2	10	3
Curse of God	2	4	2	3
Death of husband and/or wife	2	-	-	1
Fire danger on crop and/or property	0.4	-	-	0.2
Theft and robbery	0.4	-	-	0.2
Other	3	2	3	3
	$n_1=252$	$n_2=170$	$n_3=93$	N=515

Notes: The periods of forced villagization of peasants by the Government at peak planting and/or harvesting seasons is considered as policy-induced disaster period leading to crop loss and family dislocations.
Source: own survey, 1990/91

2.3.3 Socio-economic consequences of disaster-induced food shortages

The following section will attempt to discuss the socio-economic consequences of disaster-related food shortages/famine crises of the three major disaster years.

Famine-Induced Death Incidences

The survey information shows that a greater proportion of the household respondents stressed that the recent 1990/91 drought-induced crisis was even more devastating than previous crises when measured in terms of losses of human lives and livestock. Both 1984/85 and 1990/91 famine years were more or less equally catastrophic. Another disaster-related famine year, but with lesser severity, was 1987/88. Other localized disaster years include 1988/89, 1983/84 and 1980/81. The trend also shows that the severity and frequency of famine crises has been increasing.

Because of the unreliability of official estimates of disaster induced human deaths in the 1980's, we had to rely on the questionnaire-based information collected by individuals and groups interviews at various levels. Households were asked whether or not there was any death within their family members during the recent famine periods; and if 'Yes', to state the cause(s) of death (see Table 7). The results show that 51 percent of the total sample households (i.e, 64 percent from poor, 48 percent and 25 percent from middle and rich income groups respectively) had faced one or more deaths of their family members. Some 36 percent from poor, 52 and 75 percent from middle and rich (i.e, 49 percent of all) income groups respectively answered, 'no family death, but disease problem'.

With regard to the causes of death, 68 percent of all income groups (i.e, 68 percent poor, 73 percent middle and 56 percent rich) answered that it was due to nutrition-related diseases. Some 25 percent and 17 percent of the samples replied that the causes of death were 'hunger only' and 'disease outbreaks' or epidemics respectively. Nine percent of them (mainly lowlanders) replied that malaria outbreak had been the cause of the deaths of their family members. Less than 50 percent of the affected people depended on the local health centres as regards the diagnosis of health and nutrition problems while the rest used the traditional approach (self-diagnosis and treatment using traditional medicines). By and large, many of the disease outbreaks, like under-nutrition or hunger-related diseases, serious diarrhoea and other infectious epidemic diseases (with the exception of malaria and meningitis disease outbreaks) are famine induced in the case of humans. Meningitis disease outbreak was reported only in 1987/88.

Table 7 **Responses of Sample Households on the Death Incidence Faced and Specific Causes of Death of Family Members in the 1984/85, 1987/88 and 1990/91 Crisis periods**

Household Responses	Percent of Responses			Total Cases
	Poor	Middle	Rich	
a) Death Incidence Faced:	n_1=252	n_2=170	n_3=100	N=522
Yes, suffered family death	64	48	25	51
No family death, but disease problem	36	52	75	49
b) Causes of Death:	n_1=162	n_2=82	n_3=25	N=269*
Nutrition-related disease	68	73	56	68
Hunger only	29	17	28	25
Disease outbreak (epidemic)	14	17	36	17
Malaria Problem (in lowlands)	7	7	24	9
Other diseases	6	7	-	6

Note: Each sample household who lost his/her family member(s) due to famine (under 'b') has given more than two answers, and because of this response figures do not directly add up vertically. All figures are percentages, and they are calculated directly from the respective sub-sample populations (i.e., it is not summed up directly both vertically and horizontally). N= total sample population; n_1, n_2 and n_3 are sub-sample populations from the poor, middle and rich income groups respectively.
* this total response is given only by samples who lost their family member (s) during the recent famine periods.
Source: Dagnew, 1993 (survey data, 1990/91)

In 10 PAs alone, 91 households, together with all their family members (9 families/PA) were reported to have perished during the three major famine periods of the 1980s. Of these deaths, 65 percent perished during the famine period of the 1984/85. In 8 PAs, all parents of 260 poor households (33 parents/PA) perished leaving helpless children behind. Over 56 percent of the parents died during the 1984/85 famine, and the other 32 and 12 percent during the 1987/88 and 1990/91 famine periods respectively. With regard to deaths of either a husband or wife, an average of 27 single parents/PA were reported to have died in 16 PAs during the four famine periods since 1980. Again, the majority of these parents (68 percent) died during the 1984/85 famine.

Regarding child mortality, all children of 17 families in 2 PAs, and some children among 1071 families in 16 PAs (67 cases/PA) were reported to have perished due to hunger and hunger-related diseases. Deaths of children in both cases was the highest during the 1984/85 famine crisis. The majority (over 80 percent) of all these deaths were reported to be from the poor and middle income groups. During the group interviews, it was reported that many poor peasants lost their lives as the result of eating poisonous plants. Many lost their lives while trying to steal crops and other property from better-off peasants. Such incidences have been kept secret from outsiders and even from unrelated neighbours due to the feeling of humiliation and insult to the whole extended family network. The problem of theft and robbery by the hunger-stricken and unemployed rural poor was reported oral historians and during group discussions with PA leaders and other informants.

Table 8 analyses the responses by individual households on the socio-economic consequences of the three major disaster-induced food crises periods. From the total of 518 interviews, 82 and 78 percent replied that they suffered hunger and hunger-related diseases respectively during the three major famine periods.

Family Separation and Migration

Peasants in Wolaita have experienced serious family dislocations since 1980/81. These include famine-induced family migration to varying destinations, including temporary migration, child migration (under the age of 15) and abandonment of children and/or other family members either. The PA-level group discussions revealed that an estimated 310 families were affected migrations (see Table 9). The respondents indicated that the movement was mostly to non-famine areas in search of support from kin and employment. Some 4270 people (854 families) joined the government settlement program in the western part of the country. These types of distress migrations took place during the 1984/85 and 1990/91 famine periods.

According to the key informants other group discussants, temporary migration mainly by young and adult men to distant state farms and urban centres (in search of work) took place during the recent famine periods. In particular, during and after the severe famine periods of 1984/85 and 1990/91, many young boys and girls migrated to urban areas to look for any type of work for survival. A few migrated to start begging as a means of survival.

Table 8 **Responses of Sample Households on Socio-economic Consequences of Serious Disaster-Related Food Shortages in the Years of 1984/85, 1987/88 and 1990/91 (in order of importance)**

socio-economic Effects	Household Responses (%)			Total Cases
	Poor	middle	Rich	
Hunger	98	77	40	82
Human disease	83	76	55	78
Total cattle loss*	51	37	22	42
Human death*	50	36	22	41
Partial cattle loss*	30	65	84	53
Family separation	13	8	-	9
Sales of productive assets**	6	5	6	6
Temporary migration	5	6	-	5
Begging and eating wild food+	7	3	-	5
Labour shortage	3	4	6	3

Permanent migration	5	1	-	3
Shortage of farm inputs	2	2	2	2
Sale Labour (mainly for payment in kind)	4	2	-	3
Sale grass and wood	2	0.6	-	1
School drop-out	2	2	-	1
Theft and robbery	0.4	-	-	0.2
other	18	6	5	13
Sample size	$n_1=252$	$n_2=170$	$n_3=96$	N=518

Note: * This includes livestock losses due to sales as a means of coping strategies and deaths caused by disasters.
** This mainly refers to the sales of plough-oxen, farm implements and breeding cattle during stress periods.
+ Eating wild food includes consumption of wild plants (leaves, roots, stems, grasses) and wild animals (including some insects) which are not eaten in normal years.
++ Four sample households from the rich income group (not affected by disaster) are not included.
source: Own survey, 1990/91

Child migration and aimless wandering from one zone to another (in search of any life saving support) is another tragic consequence of famine (see Table 9). In 5 PAs alone, the case of 22 child migrants (an average of 4 children/PA) was reported during the 1984/85 and 1990/91 famine years. These were children who were either abandoned by impoverished families and/or lost their parents due to famine. According to the group respondents, 55 percent of the child migrants were observed during the 1984/85 famine crisis.

The other serious social consequences of the famine were distress abandonment of a family by husbands, wives and/or both. An average of 3 families were abandoned by husbands; 2 by wives and 6 by both parents in the major crises years of the 1980s.

Family separation was reported to be one of the most tragic effects of the recent famine years. According to the key informants and group discussants, this happened as a result of temporary migration. In many cases, family members moved-out in search of wild food, charity and other for survival means. It was reported that many of such family members were not able to re-unite with their families after the crisis was over. Many remained separated permanently and many are reported to have perished on the way. In 5 PAs alone, it was reported that 267 families (53 families/PA) have remained separated permanently from their families. Some 66 and 29 percent of such tragic family dislocation took place in the 1984/85 and 1990/91 famine periods respectively (see Table 9). During the famine periods, many families in many famine-prone localities of Wolaita are reported to have remained split as men left in search of work.

In all cases, analysis of the survey data revealed that those who suffered all the devastating effects of famine (i.e., severe starvation, family dislocations and mental and physical agonizing effects, etc.) were the assetless poor and destitute. Above all, children under the age of 5 years were the most vulnerable to these recurring famine years. Women and children under 14 were reported to be the next vulnerable group who suffered the effects of the same famine.

Impact of Disasters on the Agricultural Production Performance and Productive Resources

According to the estimates of actual sample respondents in the 16 PAs, individual peasants from different income groups consume 200 - 500 grams of cereals or cereal equivalents/day (an average of 350 gm/day). This would generate about 1145 calories/person/day, which is 20 percent less than the standard (normal) calories requirement in the Ethiopian situation. This is also 19 percent

Table 9 **Reports of Peasant Association (PAS) Leaders and Village Informants on the Famine-Induced Death Incidence, Migration and Family Separation During Disaster Periods of 1984/85, 1987/88, 1990/91 (Wolaita Awraja)**

Type of Socio-economic Consequences	No of Sample	Number of People Affected by Famine Years an reported					
		1980/81	1984/85	1987/88	1990/91	Total	Average/PA
1. Permanent Migration: -Whole family	12	-	273	-	37	310	26
-Part of the family	4	-	35	-	2	37	9
2. Temporary migration	4	-	190	-	16	206	52
3. Family separation	5	15	175	-	77	267	53
4. Death Incidence: -Whole family	10	-	59	7	25	91	9
-All parents	8	35	62	150	91	260	33
-Husband or wife	16	10	295	92	39	436	27
-All children	7	-	10	1	6	17	2
-Part of children	16	25	756	167	123	1071	67
5. Abandonment: -Abandonment of family by a husband	6	-	8	-	9	17	3
-Abandonment of a family by a wife	4	-	3	-	6	9	2
-Abandonment of children by both parents	7	-	10	-	30	40	6
6. Child migration (under the age of 15)	5	-	12	-	10	22	4

Note: Average cases indicated on the extreme right-hand column are calculated out of the respective sample cases (PAs). These sample figures are taken to indicate the magnitude or severity of the famine conditions of the three disaster years of the 1980s. Actual figures and the overall impact may be far more than what is reported. Respondents were able to reply what they could recall for each and the agony they faced due to famine and its related consequences had been beyond what could be expressed in words and figures.
Source: Survey data, 1990/91

less than the two years' Awraja-level estimated average calorie intake per person/day. Undernourishment and malnutrition have generally worsened in the study area. This has meant little room for planning contingencies and diversifying the seasonal economic activities to avoid any risky situations.

Analysis of the sample responses on the economic impact of rain failure and related disasters during the three major famine periods revealed that 47 and 41 percent of the sample households from all income groups faced a total crop and livestock loss respectively. Also, 53 and 52 percent of the samples faced a partial crop and livestock loss respectively over the same period. This include some distress sales of sheep/goats and non-breeding cattle as a means of survival strategy. The distress sales of key productive assets includes the sale of possessions like plough oxen, farm implements and breeding cows. During the serious famine periods, 6 percent of the poor and 5 percent of the households from the middle income groups were reported to have sold their key productive assets. Six percent of the sample households from the rich income group reported also to have sold their extra plough oxen to purchase food from local markets.

Total failure of small *Belg* rains (February - April) followed by a failure in the big '*Meher*' rainy season (June - September) in 1984/85 resulted in almost a total loss of both '*Belg*' and '*Meher*' productions at all levels in the Awraja. Highland areas are exceptional among the very few localized areas where the impact of disasters was less severe. These rain failures were also responsible for the failure of forage (pasture) in grazing areas.

The famine in the 1987/88 was reported to be less severe than the 1984/85 and 1990/91 disasters. This was triggered by a failure in *Belg* rains of the 1987 that resulted in *Belg* crop production failures in *Woina-Dega* and *Dega* areas. In Belg crop producing areas (i.e., in *Woina-Dega* and *Dega* areas), when the *Belg* rains fail, the *Belg* crops as well as the long maturing crops (e.g., maize, sorghum, etc.) are affected. Most households in Wolaita depend on long maturing maize and *enset* (false banana).

Analysis of the 1990/91 survey data indicate that the farm production performance of many peasants in Wolaita was severely affected by shortages of family labour and key farm inputs. Some 3 percent of the sample households from the poor and middle income groups (mainly women-headed families) reported that farm activities have been seriously hampered by lack of family labour. Six percent of the rich households also reported that they faced labour shortage to undertake normal farming operations. With regard to farm inputs, 2 percent of sample households reported that the problem of getting farm input supplies (e.g., seeds,

fertilizers, pesticides, etc.) became a critical problem. In particular, land owned by the poor peasants was either being used by better-off neighbours with some kind of arrangement or left idle. This was because of the critical shortages of seed and farm implements. The farm activities of the majority of the peasants have been seriously hampered by lack of income to purchase farm inputs.

Other Economic and Social Impact of Disaster-Induced Food Crisis

There are other consequences of famine in Wolaita. These include a shift in food habits (relying on wild foods), decline of labour demand, sale of grass/wood, school drop-out, begging, theft and robbery, etc. as means of survival techniques.

As a result of food scarcity, there may be a shift in diet from staples to non-staple crops produced in different areas. For example, a change from maize to wheat and/or shifting to any imported charity food has been observed. As the food crises deepened during the three respective crisis years, thousands of disaster victims were reported to have become dependent on wild foods. Wild foods are said to have saved the lives of many hundreds of famine victims in Wolaita Awraja. Out of a total of 522 peasants interviewed, some 39 percent, mainly the poor households, replied that they have been using wild foods during the serious famine periods of the 1980s. On the other hand, many famine victims are also reported to have died through consuming poisonous plants. Peasant leaders and key informants reported that out of the many famine related deaths, an estimate of up to 5 percent are said to have died from consuming poisonous plants.

Postponement or reducing consumption has been widely used among the poor groups. These strategies in particular were used by the poor and destitute during and immediately after crisis periods. Reduction of current food consumption in amount, type and frequency of meal (e.g., from three to two meals or from two to one meal a day) had been a regular practice of the poor during famine periods. Postponement of social commitments that require costs (e.g., wedding and other expensive ceremonies) were reported as means of reducing expenditure. Many peasants also reported that such postponement of social commitments has been experienced even during post-crisis periods.

Nearly all of the peasants interviewed reported that the gradual erosion of the economic status of the majority of peasants did not only end in impoverishing the affected group, but it also seriously weakened the traditional social network support system. Many sample households and other informants

explained that the recurring disaster-related famines in the 1980s, particularly the 1984/85 and 1990/91 disasters, had a shattering effect on their kinship and other social support systems. Some of the support systems that were seriously affected during and since the famine years include the decline of financial and material transfers in times of need within the extended kinship system, transfers between friends, and the loosening of the client-patron relationship. The practice of mutual labour exchange at times of peak seasonal labour demand and borrowing (borrower-lender relationship) has seriously diminished.

Another problem noted was the reduced demand for labour in the face of very fast growing rural unemployment. Household food shortages during the recent periods of crisis have been predominantly aggravated by sharp grain price increases and lack of purchasing power coupled with low livestock prices. Some 93 percent and 67 percent of the sample peasants replied that large grain price increases and lack of purchasing power respectively seriously affected the status of their family food security. For example, the price of maize has increased by some 600 percent since the 1984/85 famine period. Such price increases have not been limited to food items only. The price increases on basic consumer items and farm inputs during and after each famine-induced crisis period was also beyond what the poor could afford.

According to the household responses and physical farm visits by the author, most farm plots owned by the poor and many middle income groups appear to have lost their productive potential due to erosion and lack of conservation-based farming practices. Even though many peasants like to use manure in place of fertilizers, this has also been seriously affected by the livestock losses due to the recurrent disasters. Because of such production constraints, the agricultural production performance has been severely affected, particularly since early 1980s, thus reducing the food security situations of the poor households. In the face of such serious decline in the household food security situation, the problem of acquiring farm inputs has been given secondary importance by the poor peasants. Much more important is sheer survival.

In many of the sample PAs, it was reported that during and after the crisis of the 1980s, hundreds of school age children were unable to go to school. This has been due to the lack of finance to cover schooling expenses and starvation and the critical need for labour in acquiring the daily food needs.

The major contributions of children in acquiring the daily critical household requirement during the crisis periods included the collection of wood and grass from distant bushes and forests for sale, collecting wild foods and

participating in household petty trading activities. Selling labour for food or being employed as servants elsewhere (reducing the family size burden) is another significant role of children during periods of food crisis. During the fieldwork, we were able to observe hundreds of children below the age of 15, either school drop-outs or those who were unable to join schools, wandering aimlessly within villages in every PA. A minimum of 15 unemployed senior high school drop-outs (over the age of the 17) were reported to be found in every sample PA.

2.4 CONCLUSIONS AND POLICY IMPLICATIONS

CONCLUSION

Analysis of the study revealed that the dominant source of both output and income of households in the study area is agriculture (crop and livestock farming). Household food security is particularly dependent on cropping activities. There is a highly significant income differentiation between income groups and the and the key source of income or economic differentiation among the households lies in variations in asset ownership (e.g, draught oxen and breeding cattle) and family labour availability.

On the basis of the results from this study, the root causes of household-level food shortages and famine can be related to an 'entitlement failures' resulting mainly from a collapse in the ownership of key productive assets and purchasing power among poor rural households. This study has attempted to demonstrate that the fundamental causes of peasant vulnerability to food shortages/famines and mass hunger are " entitlement failure " rather than natural factors. Natural causes, it is argued, have precipitated the tragedies of recent years, but are not the fundamental causes.

The nature, consequence and severity of food shortages are dependent on the type and intensity of causal factors, nature of agro-ecological setting and the economic status of households. *Kolla* agro-ecologies are identified as the most vulnerable and disaster-prone areas of all in Wolaita. Although there is some variation between the responses of highlanders and lowlanders, the individuals in the study areas broadly agree that all of the recent famines were triggered by the recurring droughts.

The adverse and compounded socio-economic effects of disaster-induced famines fall most heavily on the vulnerable poor and destitute, who are left with

little or no opportunity to recover. Those who suffered the full spectrum of devastating effects of the recent famines were these assetless social groups. Above all, children under the age of five years were the primary victims of the famines. Women and children between the ages of 5 and 14 also suffered horribly.

This study has revealed that the regular seasonal food shortages have a more serious impact on the economic status of the poor and some middle income groups. This is because as severity of food shortage deepens, affected households are often forced to sell their key productive assets to ensure current family food security. The gradual erosive effect of seasonal food shortages often leads households to be more and more vulnerable to any unprecedented disasters. As the severity of a food crisis deepens, temporary, informal or marginal economic activities tend to increase. Periods of disaster-induced crisis exacerbate existing problems.

POLICY IMPLICATIONS

On the basis of the policy documents reviewed, there does not appear to have been any attempt to develop effective policies that address the problem of the poverty-stricken and direct victims of disaster-induced crisis. Past institutional efforts to alleviate Ethiopia's worsening socio-economic problems have not been encouraging. The institutional relief support approach of the past has been generally weak.

A general area-targeting approach which focuses on the provision of services and aid distribution, regardless of the individual economic positions of the people living in any a given locality or community, is not an effective approach. Such an approach fails to meet the needs and plight of the poor and has led to an inappropriate use of national scarce resources. Our evidence from the fieldwork (see Table 10) shows the failure of the government to address the priority needs of the poor. The results of the study clearly show that government relief support (aid distribution) in the 1980s was not based on a proper assessment of the relative needs and income of rural people.

Table 10 **Household Responses by Income Groups on Government Supports Provided During and Post-Crisis Periods of 1984/85, 1987/88 and 1990/91**

Types of support	Household Responses			Total cases N=522
	Poor $n_1=252$	Middle $n_2=170$	Rich $n_3=100$	
Relief food support	144 (57)	86 (56)	50 (5)	280 (54)
Health care	113 (46)	83 (53)	50 (50)	246 (50)
Seed and farm implements	66 (27)	42 (27)	32 (32)	140 (28)
Restocking	2 (0.8)	1 (0.6)	1 (1)	4 (1)
Plough oxen	8 (3)	8 (5)	3 (3)	19 (4)
Food for work	24 (10)	14 (9)	7 (7)	45 (9)
Others	4 (2)	4 (3)	1 (1)	9 (2)

Note: all figures in brackets are percentages. Figures (including percentages) do not add up vertically. This is because each respondent gave more than one answer. N=total sample population; n_1, n_2 and n_3 are sub-sample populations.
Source: Own survey, 1990/91

This paper attaches prime importance to selective targeting approaches for both emergency and development planning and programming processes. The following are some key policy implications (suggestions) drawn from the research undertaken in Wolaita:

i. Selective area and population group-based targeted intervention: This refers to the application of emergency and rehabilitation-development planning and implementation approaches based on the priority needs of the needy population groups in areas vulnerable to disasters. This approach involves the allocation of national manpower, financial aid, and investment resources in order of priority. This must embrace a strategy for protecting key productive assets from distress sales

during emergency periods and appropriate research and technology dissemination,

ii. agro-ecology (area) based targeting approach,

iii. land tenure reform allied to conservation-based development strategy,

iv. a systematic and well planned food and nutrition strategy,

v. population control in the form of improved family planning, and voluntary settlement distribution measures in less populated areas with agricultural production potential, and

vi. other policy support for social facilities and infrastructure.

Above all, development strategies must be targeted on the poor and the needy households or population groups because their plight is the most desperate.

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CONFERENCE RECOMMENDATIONS

1. A strategy oriented to the development of rural areas (which might, for example, take the form of developing rural and provision of infrastructure, inputs, and credit, etc.,) would contribute to improve agricultural productivity and this suggests the need to look into the positive experience of the integrated rural development experiences of the 1960s and the minimum package programme of the early 1970s.

2. In rural areas many farmers do not produce sufficient amount of food that would last one production season. 20-40 percent of rural households are estimated to be net purchasers of food grain. In this regard, implementing labour-based income generating activities in rural areas need to be promoted in order to improve household food insecurity;

3. An estimated 30-40 percent of the gross annual production is not available for consumption due to post-harvest losses. Attention should, therefore, be given to the development and dissemination of post-harvest technology that would contribute to reduce such losses;

4. The level of technology adoption in Ethiopia is low due to the prevailing institutional arrangements, and particularly those related to agricultural research and extension whose linkages and coordination seems to be very weak. Hence Agricultural extension services should be strengthened and better synchronized with agricultural research (for which additional investment is required);

5. Attention should also be given to the development and dissemination of mechanical technologies in addition to chemical and biological innovations;

6. The rural land tenure situation in Ethiopia requires further dialogue. For instance, in the past, tenure insecurity in rural land ownership is found to be one of the constraints that have hampered farmers' investment in the agricultural sector. Even at present the guidelines expected to be promulgated by the various regions regarding rural land holdings are long over due. There is a need to do research on land holding systems. The experiences of developed and newly developing countries should also be reviewed in order to learn from their experiences;

7. The development of human capital in agriculture is one of the pre-requisites for agricultural development in the country. Hence the provision of further training and incentives particularly to research, extension and university staffs are issues that needs to be given serious attention.

8. Further research should be carried out on the role of women in agricultural production and marketing (focusing on female-headed households);

9. There is a need to establish a public agricultural market information system in order to create awareness among farmers, merchants and consumers.

10. A 'proper' regulatory mechanism (which might take the form of proper licensing, taxation, etc.,) should replace the rather haphazard '*kella*' system to control grain movements;

11. Markets should be regulated to avoid monopoly in grain marketing and to create efficiency in the marketing system;

12. Grass-roots level organizations (Services Cooperatives, farmers' associations, etc.) should be promoted as they could contribute to a better access to credit and inputs as well as to increase the bargaining positions of farmers;

13. Agricultural marketing extension services (such as grading, standardization, farm-level storage, etc.) should be provided to farmers;

14. The development of rural infrastructure (such as roads, warehouses, etc.) should be promoted in order to facilitate agricultural marketing;

15. Available information on poverty situation in Ethiopia are scanty. This suggests the need to carry out further (empirical) research in the area;

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