

The Ethiopian Economy Poverty and Poverty Alleviation

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Editors

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of the papers, by Bigsten and Negatu Makonnen, by Mekonen Taddesse and by Abdulhamid Bedri Kello, draw from the data collected in 1994. The paper by Bigsten and Negatu focuses on the employment status and income distribution of the population in the seven urban centres. The paper by Mekonen defines urban food poverty lines and makes a comparative analysis of levels of poverty in the urban centres. Abdulhamid's paper examines the relationship between poverty and nutritional status in urban areas. Goitom Ghirmatsion, using other data sources, analyses social and economic aspects of poverty in Addis Ababa.

In the reform process, some segments of society are negatively affected. As part of structural adjustment, safety-net programmes are designed to mitigate these negative impacts. Alternatives in safety-net programmes and their efficacy is discussed in Abbi Mamo's paper.

One of the "missing links" which perpetuates poverty is the inability of the poor to get access to financial resources. For poor households, informal sources of credit are extremely important, if not the only source. The papers by Bekele Tilahun and Solomon Damte examine problems related to micro-enterprise credit schemes. The former reviews the overall experiences in other countries and Ethiopia and the later focuses on financing micro-enterprises in Debre Berhan, North Shoa.

The impact of many macroeconomic policy changes are transmitted to households through markets. Both macroeconomic and sector-specific policy changes affect the welfare of the population. How these reforms affected welfare through grain markets is examined in the paper by Bekele Sinkie.

We hope the papers presented in this volume will contribute towards a better understanding of poverty issues in Ethiopia and raise the dialogue to a higher level.

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Conceptual and Measurement Issues



Issues in the Measurement and Dynamics of Poverty: A Survey

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1. Introduction

The measurement of poverty has been the main preoccupation of studies on the subject of poverty in the recent literature. A significant amount of progress has been made in formulating poverty measures that attempt to capture certain characteristics of the poor.

Recent empirical studies on poverty also concentrated largely on the construction of poverty profiles at various levels of aggregation. The robustness of the poverty profiles lies in the particular indicator of welfare selected, in the type of data available and the particular poverty index chosen.

The objective of this paper is to review the literature on the objective measures of poverty in view of its multi-dimensional character. It attempts to draw attention to the peculiarities of the rural poor in Third World countries by noting the institutional arrangements that directly affect the welfare of households in various ways. The paper is organised as follows: Section 2 reviews the aggregate poverty indices in the literature and discusses issues on the empirical implications of aggregate poverty indices and some of their limitations in view of the dynamics of poverty in poor countries; Section 3 outlines the impact of certain institutional arrangements on poverty and the different levels at which poverty analysis must be tackled; and Section 4 is summary and conclusions.

2. Issues in the Measurement of Poverty

Poverty is an issue that has witnessed shifts of emphasis in the development literature over the past five decades. As a result, it has suffered the perils of ambiguity and discord in concept, definition and measurement.

Fortunately, the measurement of poverty, unlike other issues in poverty is one that has attracted a large body of the literature recently, which was mainly spurred by the pioneering exploration of the issue by Sen (1976). In the current literature, there is a significant number of aggregate poverty indices that satisfy certain desirable properties acceptable by an additive, S-concave social welfare functions¹ (SWF).

The objective of this section is to review important issues that evolved in the literature of the measurement of poverty. Sub-section 2.1 discusses various poverty indices in view of the desirable properties they are expected to meet and 2.2 reflects on the empirical implication of poverty indices and their relevance to policy discussions in the context of poor countries.

2.1 Review of Aggregate Poverty Indices

The earliest and perhaps the most popular measure of poverty is the head-count ratio (H) which is simply the ratio of the number of the poor, q , who are defined in a certain way, to the total population in a community, n . The most common way of defining the poor is to take those people who for one reason or another are unable to secure a certain income level, called the poverty line, which may be relative or absolute in magnitude. Later on, the poverty-gap or the total income shortfall to eradicate poverty was suggested. We may formally state these measures of poverty by considering an income-distribution structure given by the vector $(y_1, \dots, y_n)$, such that, $y_1 < \dots < y_n$. y_i represents the income of individual i in the community. Given that z represents the level of the poverty line, then, H can be written as:

$$H = q/n \quad (1)$$

where q represents the number of people earning an income no higher than the poverty line z and n represents the total number of individuals in the community. In the same manner, we may express the poverty gap as follows:

$$PG = \sum_{i=1}^q (z - y_i) \quad (2)$$

In his seminal work, Sen (1976) argued that H and PG lack such desirable properties as monotonicity and transfer. As is clear from equations (1) and (2), H remains invariant to any changes occurring in the income of individuals below the poverty line, that is it does not respond to the relative deprivation of the poor, and PG is insensitive to income transfers of equal magnitude occurring among the poor. These deficiencies of H and PG motivated Sen to pursue an axiomatic approach to the measurement of poverty by using concepts of income inequality.

Sen begun from what he called the basic equation to measure poverty defined as:

$$S(z) = A(z,y) \sum_{i=1}^q (z-y_i) v_i(z,y) \quad (3)$$

where $S(z)$ is an aggregate income-gap of people whose income is no more than z , $v_i(z,y)$ is a non-negative weight given to the i th individual and $A(z,y)$ is a normalising factor. Sen considered the poverty index, $P(z,y)$ given by:

$$P(z,y) = \text{Max} S(z) \quad (4)$$

That is, the poverty index is such that it is the maximum aggregate income-gap of the poor in the community. Invoking rank preserving welfare criterion and the desirable properties of monotonicity, transfer and normalisation, Sen suggested a specific poverty index given by:

$$S(z,y) = H [I + (1-I) G_p] \quad (5)$$

where

$$I = \sum_{i=1}^q (z-y_i)/z$$

where G_p is the Gini index among the poor. The poverty index given by equation (5) led to a series of reactions that formed a large body of the literature in the measurement of poverty. In the index given above, Sen tried to capture these aspects of the poverty phenomenon: who the poor are, their relative

deprivation compared to one another and their average deprivation. These are reflected respectively by the use of H, G_p and I.

We may say that the subsequent developments in the measurement of poverty in the wake of Sen's index followed three approaches: the first is to pursue Sen's axiomatic approach as in Thon (1979, 1983), Kakwani (1980), Takayama (1979), Foster, et al. (1984), Foster and Shorrocks (1991) in order to derive a poverty measure that satisfies certain desirable properties; the second approach is to use the notions of social-welfare functions to define a poverty measure that carry properties easily discernible in their construction in the manner of Blackbory and Dandolson (1980), Clark, et al. (1982) and Chakravarty (1983), and the third approach is one that tried to disentangle poverty from inequality in the strict sense using the social-welfare function framework as in Vaughan (1986), Pyatt (1987) and Lewis and Ulph (1988), who specifically went a step ahead to endogenize the determination of the poverty line within the context of utility maximisation.

The first two approaches do not seem to have any inherent conflict at all since they entail in the final analysis some kind of value judgements that are comparable. This issue goes back to the popular statistical measures of inequality as the Gini index which imply a certain ordering that can be justified by a social welfare function that meets acceptable criterion. In this context it is important to note that the popular poverty measures introduced in the literature are extensions of the inequality measures of the Dalton-Atkinson (hereafter DA) inequality measures. In fact, in the case of poverty indices, Hagenaaers (1987) succinctly showed that all poverty measures known to us can be deduced from a social-welfare function that is defined over individual utility functions that are strictly concave, continuous and increasing in income.

The third approach is different in that it tries to derive poverty indices that are conceptually different from income inequality measures. Vaughan's (1987) approach is to use the analogy of the DA inequality measure to the measurement of poverty. As the DA measure of inequality is the ratio of actual SWF to a SWF without poverty. "In most cases this is taken to be the distribution in which every individual below the poverty line is raised to the poverty line" (Vaughan, 1987:161). On the other hand, Pyatt (1987) concentrated on the derivation of a poverty measure by dichotomising income (not people) into what is necessary for subsistence and what goes for non-

subsistence consumption and the poverty index is derived using Atkinson's (1970) notion of equivalent income. Lewis and Ulph (1988) argued that Pyatt and Vaughan failed to successfully disentangle the conceptual differences between poverty and income inequality. The effort by Lewis and Ulph embodied the central idea of individual utility functions being discontinuous at a certain level of deprivation to signify poverty. That level of deprivation is determined within the system. Their analysis came up with the result that H is a welfare-consistent measure of poverty when a given individual experiences a single type of deprivation. But, the literature has not yet gone far to warrant an empirical relevance.

The most widely used poverty indices are the ones generated using the first two approaches described above and subsequent discussion is focused particularly on them.

It is now an agreed matter that any poverty index is expected to possess the following properties as desirable:

- i. Monotonicity Axiom: A decrease in the income of a poor person should increase the poverty index, and vice versa.
- ii. Transfer Axiom: A transfer from a poor person to a richer person should increase the poverty index and vice versa.
- iii. Population Symmetry Axiom: If two or more identical populations are pooled, the poverty index should not change.
- iv. Proportion of Poor Axiom: An increase in the relative number of poor should increase the poverty index.
- v. Focus Axiom: The poverty index should be independent of the income levels of people above the poverty line.
- vi. Transfer Sensitivity Axiom: The increase of a poverty index as a result of a fixed transfer of money from a poor to a richer person should be increasing in the income of the donor.
- vii. Decomposability Axiom: The poverty index should increase when poverty in a sub-group increases, other things being equal and vice versa.

While these properties form a complete set of criteria one would regard as desirable, the fact that they can be met simultaneously by any poverty index remains an impossibility. Hagenaars (1987) has shown that no poverty index is capable of meeting all the above properties and thus the choice of a given poverty index implies the desirability of a specific aspect of poverty over another. Earlier, Kundu and Smith (1983) have shown that if variable population is assumed in the axioms, then no poverty index can meet the simple properties of monotonicity or transferability.

We may thus conclude that depending on the type of social-welfare function we are constructing we can deduce a poverty index that may reflect either of the properties explained above. Hagenaars (1987) have shown that the poverty indices suggested by Sen (1976), Kakwani (1980) and Takayama (1979) could be deduced from a social-welfare function of the Gini type and those by Foster, et al. (1984), Clark, et al. (1981), Chakravarty (1983) and their variants can be deduced from a utilitarian type of social-welfare function.

Following Hagenaars (1986), this issue can be demonstrated by considering a social welfare function (SWF) of the general form given by:

$$S(y) = \sum_{i=1}^n a_i u(y_i) \quad (6)$$

where a_i is the weight determined by the type of value-judgement placed on the welfare of individuals with different income levels. The social-welfare based measures of inequality suggested by Dalton (1920) and Atkinson (1970) (hereafter Atkinson-Dalton) is thus:

$$A = 1 - \frac{S(y)}{\max S(y)} \quad (7)$$

Equation (7) implies that inequality can be measured as a deviation of actual social welfare from an ideal type of social welfare which is usually interpreted as a social welfare where all individuals get equal income. Thus, equation (7) can be written as:

$$A = 1 - \frac{S(y)}{S(y^*)} = 1 - \frac{\sum_{i=1}^n a_i u(y_i)}{au(\bar{y}^*)} \quad (8)$$

where $\bar{y}^*$ is an equally distributed income and $u(\bar{y}^*)$ is the maximum attainable social welfare. Equation (8) can serve as a basis to derive a poverty measure by censoring the income distribution at the poverty-line income z , so that,

$$\begin{aligned} S(y_p) &= \sum_{i=1}^q a_i u(y_i) \quad \text{if } y_i < z \\ &= \sum_{i=1}^q a_i u(z) \quad \text{if } y_i \geq z \end{aligned} \quad (9)$$

where y_p is the censored income distribution. Then define A_p as a poverty measurement so that:

$$A_p = 1 - \frac{S(y_p)}{\text{Max } S(y_p)} \quad (10)$$

It can be shown that A_p reduces to :

$$A_p = \sum_{i=1}^n \frac{au(z) - a_i u(y_i)}{au(z)} \quad (11)$$

If $a_i = 1/n$, as in the utilitarian tradition, then,

$$A_p = \frac{q}{n} \left[\sum_{i=1}^q \frac{u(z) - u(y_i)}{qu(z)} \right] \quad (12)$$

and if $a_i = (n+1-i)$, that is, the underlying SWF is of the Gini type, then,

$$A_p = 1 - \left[\sum_{i=1}^q \frac{(q+1-i)u(y_i) + (n-q)u(z)}{nu(z)} \right] \quad (13)$$

By an appropriate choice of $u(y_i)$, we can derive a poverty index that can meet some of the above desirable properties. This generalisation of existing poverty indices in a social-welfare function framework is a significant step in the measurement of poverty. It shows that the choice of any poverty index always implies the perception one may have about the condition of poverty.

2.2 Empirical Implications of Aggregate Poverty Indices

The kind of emphasis one is making in poverty analysis leads to choice from the different indices discussed above. For example, by construction the Sen index implies that the most efficient way to reduce poverty is to help the least needy first and to help the most needy last (see Blackwood and Lynch, 1994). Obviously this is not acceptable to egalitarians or even to those with the Rawlsian view of equity.

If we take the most commonly favoured measure of poverty index suggested by Foster, et al. (1984), which is given by:

$$p(z, y) = q/n \sum_{i=1}^q \frac{(z - y_i)^\alpha}{z}, \quad \alpha \geq 0 \quad (14)$$

Various values of α imply the weight the researcher is giving to the poorest of the poor. If $\alpha=0$, then, $p(z, y)$ reduces to H , and for $\alpha=1$ it reduces to average income-gap, or I . As the researcher assigns more weight to α , then the concern shown to the poorest of the poor increases. In terms of interpretation, Ravallion (1992) suggests that H measures the prevalence of poverty, I its intensity and $\alpha=2$ its severity.

In this connection, Ravallion (1994) offered an insightful empirical illustration and interpretation on the link between measures of poverty that give no weight to the income of the population above a certain poverty line and a situation where one may be interested in the entire distribution (inequality). As indicated above, all poverty indices popularly in use in the literature are special cases of the general income inequality indices based on social-welfare functions. While the distinction at the theoretical level is clear, the empirical aspect remains vague. This arises, according to Ravallion (1994) for two reasons:

"measurement errors in the distribution indicator and uncertainty about key parameters of the measure used in aggregating over that distribution" (Ravallion, 1994:360). Following the structure of the measurement error in the indicator of the distribution it is possible for a poverty measure to encompass the entire distribution.

Interesting in the measurement error is the interpretation Ravallion (1994) gives to poverty measures such as the Foster, et al. (1984). Suppose the poverty measure is based on the poorest person's welfare as a means of comparison, the indicator of which is measured with error. Let x_i denote the welfare of the i th person, $i=1, \dots, n$ where x_1 is the lowest value. The observed welfare indicator is $y_i = x_i + v_i$, where v_i is a measurement error. If we take the mathematical expectation of the welfare of the poorest person to be:

$$\sum y_i \Phi(y_i) \quad (15)$$

where $\Phi(y_i)$ is the probability that $y_i = x_i$. If the probability function declines as we move from the worst-off persons to the well-off, then we can suggest a function that is exactly identical with poverty index such as the Foster-Greer-Thorbecke (FGT) index. In this case a beta function for the error distribution with an appropriate parametrization yields the above poverty index (Ravallion, 1994:361). Therefore, a poverty index can take the form of a density function for the measurement error in the indicator used. In an empirical illustration Ravallion (1994) shows that the measures of poverty and inequality make no difference in ranking welfare.

In a similar manner, the properties that we desire a poverty index reflect in our analysis depend on the relative difference between the poverty line, z , and the average income of the population. In most poverty studies the measurement of poverty focuses on the ability of society to alleviate absolute poverty by means of a transfer. In the case of poor countries this objective is defeated by the sheer size of poverty and it seems quite appropriate to focus on the determinants of poverty to seek an alleviation mechanism that is largely related to raising the average income.

In this regard, the poverty indices presented above are far from complete in reflecting the dynamics of poverty and indicating the desirable direction of poverty alleviation. The following are some of the caveats to be considered.

Poverty indices do not take into account the leisure-labour trade-off. The situation is very important in the context of poor countries because a large number of the poor people toil for long hours. In terms of poverty alleviation it is clear that neither employment nor income transfer can bring a lasting solution. Assuming a virtual equivalence between an income earned through hard work and simple beggary misses an important element in the perpetuation of poverty in these countries. Related to this fact is the definition of poverty that is implicitly implied in the poverty indices discussed above. By their construction poverty indices point towards poverty experienced at a given point in time and the indices are deterministic. In analysis therefore one may be occupied with the individual characteristics of poor households, which is a customary approach in the study of poverty in industrialised societies. But, quite distinctively, poverty in poor countries is largely correlated with vagaries of weather, price shocks, low productivity, etc.³ Therefore the issue of chronic poverty appears to be more relevant than say transitory poverty, which is captured by the conventional indices.

The measurement of chronic poverty is distinct in that one needs to specify a permanent income model with inter-temporal utility functions. In such an exercise constraints such as lack of credit and insurance, appear to be important determinants of poverty.

The issue of estimating poverty indices is another aspect of the problem. One advantage that is expected from the measurements of poverty is to inform policy makers of the status of poverty over time and across different social groups. In this context, data constraint stands as the most challenging problem in poor countries.

Apart from statistical problems, there are some conceptual issues that render estimates of poverty the impression of being inaccurate and suspect to be of any use. We may mention the question of equivalence on "needs" among different sub-populations or households and the issue of the poverty line.

Theoretically, the structure of income distribution can be looked at the level of individuals. In reality, in nearly all societies the smallest unit we may find is, the household whose needs varies with its size, the age of its members, etc. There is always therefore, the issue of aggregation of needs across members of households. Studies in this regard have shown that poverty indices are strongly

sensitive to alternative methods of equivalence measures (Phipps, 1991) and, theoretical enquiries imply the desirability of alternative poverty lines for each household characteristic (Coutler, et al., 1992). It is, therefore, clear that the unit of analysis in poverty measurement occupies a significant amount of empirical relevance. Most studies so far disregard household equivalence measures in estimating poverty; and those which consider them never do so more than to use ready-made scales instead of one determined from available data.

The other conceptual issue in the measurement of poverty is the poverty line which has served the vital role of differentiating the poor from the non-poor. In most poverty studies, the poverty line is a concept that has been treated very cautiously and so far remains operational for lack of an alternative. The view among researchers about the role of the poverty line is different. Some do not accept the impression that a person shall become suddenly non-poor because he is richer by one extra dollar above the poverty line. For them, being non-poor is a process of gradation in the ladder of the income distribution. For others, the converse is acceptable. That is either a person is poor or not. This "either-or" position has significant impact on the interpretation given to a poverty index. In fact, some poverty indices exhibit discontinuity in the neighbourhood of the poverty line, like H and Sen's index (see Ravallion, 1994). To circumvent these conceptual problems, an alternative approach to the measurement of poverty has been suggested. First Degree, Second Degree and Third Degree Stochastic Dominance rules introduced by Shorrocks (1984) and later developed by Atkinson (1987) guide the direction of poverty index under alternative poverty lines.⁴

As is clear from the preceding paragraphs, income has been taken as the only indicator in measuring poverty. It is quite controversial how far one can go with income as the only indicator of well-being. First, there is the issue of the controversy that characterised well-being as being monotonic in income through the utility function, usually known as the welfarist approach and well-being as being capable of attaining a standard of living characterised by a myriad of social indicators,⁵ known as the capabilities or non-welfarist approach. Even if one decides to carefully avoid this thorny issue in the analysis of welfare, there are cases that need to be faced squarely in empirical works.

Anand and Harris (1994) demonstrated that there is a substantial amount of measurement error (or noise) to be faced if current income is used as an indicator to compare distributions and poverty. They argue that in most household budget studies there is a tendency of current income to fall short of total expenditure for households at the lower decile. This is mainly because of the inherent measurement error which they call a noise around permanent income. They suggested that a proxy to permanent income such as total consumption or expenditure on food are better indicators in ranking distributions than current income. A poverty index may be significantly sensitive to the kind of indicator we are using to compare distributions.

3. Issues in Understanding Rural Poverty

In the previous section we reviewed the indices developed to measure poverty. But a more profound understanding of factors affecting poverty that are not captured by the indices is needed for these measurements to be used more effectively. Here, we roughly classify factors affecting poverty into community, household, intrahousehold and intergenerational variables. Neither do we have any illusion that these factors can clearly be delineated from each other nor exhaustively summarised in a section as short as this one. Our purpose here is not to have an exhaustive review of literature but to touch upon some of the important issues that should not be lost sight of when doing poverty analysis.

Our discussion concentrates on the rural sector of the developing world due to the importance of the sector. In addition, this will help us to give focus to our discussion by drawing our illustrations only from rural relationships.

3.1 The "Moral Economy", "Rational Peasants" and Poverty

Poverty indices usually are based on household-level variables. In doing so, the impact of community level institutions in overcoming or mitigating poverty are more often forgotten.

The environmental and technological characteristics of rural areas in developing countries influence both the nature of poverty and the type of institutions that evolve for its alleviation. Rosenzweig (1988: 1150) mentions six characteristics that must be incorporated in an analysis of institutions in rural areas: "(A) an

important production input (weather) is stochastic, its realisation during the course of production being unpredictable and exogenous. (B) The intertemporal distribution of weather outcomes is characterised by stationarity. (C) Positive correlations in weather outcome diminish with distance. (D) Another important production input, land, is immobile. (E) The technology of production is stable. (F) Costs of acquiring information are high." These characteristics highly influence both the type of shocks the farming communities face as well as the institutions used to overcome them.

For understanding the rural economies of developing countries, some (for example, James C. Scott) have characterised them as "moral economies" where solidarity mechanisms based on the right to subsistence and the principle of reciprocity play a more important role than individual self-interest. But this group failed to explain how mutual insurance systems survive in spite of incentive problems. Another group of writers (e.g. Samuel L. Popkin) argued that the peasant is as rational as an individual in a capitalist system; but the latter group failed to account why solidarity networks still exist in many rural areas. A third group of writers argued that solidarity systems can be sustained by self-interested individuals who have long-lasting relationships with each other (Fafchamps, 1992: 147). For them the rural economies of the developing world are "moral economies" with "rational peasants".

The interpretation of rural economies as "moral economies" with "rational peasants" seem to be a more appropriate framework for understanding rural poverty in particular and the socio-economic setup in general in developing countries.

The characterisation of the rural areas as "moral economies" with "rational peasants", has a direct bearing on the nature of the social welfare function that must be considered. Incorporating the utility levels of individuals without considering the specific way in which they are related to each other through solidarity networks will omit an important aspect in the welfare of the individuals.

Solidarity institutions that function both at the local and regional levels thrive in most developing countries. In understanding these, it is better to represent them as "networks". They operate as



a network in which individuals are connected to a small number of other people, who, in turn, are connected to other people. The end result is a net or mesh of interpersonal relationships in which individuals are connected to each other either directly or indirectly. Lineage, kinship, neighbourhood, or consanguinity often are major axes of solidarity networks, but friendship and patron-client relationships also matter. Although customs and traditions influence the structure and operation of the solidarity network, in practice, mutual obligations between each participant are personalised and based on trust" (Fafchamps, 1992: 158).

If the importance of these networks in influencing the standard of living is high, poverty indices based on household variables may miss much information that determine poverty profiles. Hence, the construction of poverty indices must carefully identify which variables are considered and which are ignored.

Solidarity systems operate around "delayed reciprocity contingent upon need and affordability" (ibid.). It is a form of social insurance and how much help people get usually is not entirely specified. These solidarity networks usually function not as mechanisms for fully pooling income of people but as means of guaranteeing subsistence.

The solidarity network may function as an *ex ante* or *ex post* insurance mechanism. "While *ex post* solidarity compensates someone for a shortfall in income, *ex ante* solidarity attempts to prevent the occurrence of a shortfall" (Fafchamps, 1992: 157). Helping someone who has lost his/her harvest is an example of *ex post* solidarity; but helping others during agricultural activities so that they are done in good time and minimise failure (say in the form of labour-sharing arrangements in Ethiopia) is an example of the former.

In trying to understand how solidarity networks function, modelling them as one shot insurance arrangements does not help since that has no risk-pooling equilibrium; it leads to autarky. The existence of solidarity networks can be more fruitfully understood in a repeated game scenario. "The theory of infinitely repeated games has shown ... that cooperation can be supported if people are allowed to interact over a long period of time. The reason is that cooperation can be rewarded and opportunistic behaviour can be penalised in the future. People who breach their promise can be punished by being treated less well afterward" (Fafchamps, 1992: 150). In rural areas, where you have closely related groups of people, conditions similar to a repeated game hold:

people know each other closely, they have lived together for a long period of time, etc.

One problem in repeated games is the existence of multiple equilibria. But this formal problem in the analysis of repeated games perhaps explains the variety of solidarity networks that thrive in rural areas. The specific types of networks that actually exist may be explained by path dependence; customs, traditions and ethics may provide what are called focal points in game theory (Fafchamps, 1992: 159).

The contingent nature of reciprocity creates incentive problems; people will try to misrepresent their needs and affordability. Hence, one challenge in understanding the economics of solidarity systems is to understand how these incentive problems are solved and the solidarity systems survive.

The development of game theory has also helped the analysis of incentive problems in solidarity systems. Incentive problems are very much related to the observability of needs and efforts. If the needs of people are not transparent to others how far they must be helped cannot be known and there would be a problem of exaggerating their need (moral hazard). On the other hand, if people's efforts are not observable, many will shriek from exerting their efforts so as to get more help from the solidarity network. "... if individual income and wealth are entirely unobservable, there is no way opportunistic misrepresentation can be prevented, and the mutual insurance system collapses" (Fafchamps, 1992: 152). In different solidarity networks different signals may be used both to monitor needs as well as work effort: for example, income, crop output, consumption, etc. Crop output may be the easiest to observe but "people have an incentive to shift away from crops and secure sources of income that are easy to dissimulate" (Fafchamps, 1992: 153). This has been observed in some African countries. Since ultimately the deprivation of people will manifest itself in their levels of consumption, signals used in solidarity systems must give information about consumption levels. But consumption is a delayed signal and it is also manipulable.

In solidarity networks we also usually find patron-client relationships. "Patron-client relationships are a formal way of organising the compensation of wealthy individuals for their continued participation in the solidarity system The rich promise to help the poor in times of hardship and, in particular, to insure

the poor against starvation. Since the rich have little to gain from a risk-pooling arrangement with the poor, the poor have to reciprocate in some other ways. Repeated small gifts are thus made" (Fafchamps, 1992: 160-161). Without the wealth accumulation of the patrons the solidarity system's capacity to overcome collective risk will very much be undermined. This fact has an obvious implication for poverty alleviation.

The way solidarity systems function may make some of the axioms mentioned in Section 2 above meaningless. For instance, according to the transfer axiom, a transfer from a poor person to a richer person should increase the poverty index. But in the context of patron-client relationship the transfer can be understood as a "premium" paid by the poor for long term insurance as a protection against possible future risk.

Analysis of solidarity systems helps us to understand how conditions on the community level influence poverty profiles. Hence, the analysis of poverty must be coupled with the study of community level solidarity networks.

Another dimension to poverty analysis is conditions at the household level. Some of these issues are discussed in the next section.

3.2 Households and Poverty

In a sense, households can be understood as smaller units of the overall solidarity network. "Households are a basic unit of interpersonal interaction, generally reflecting both biological and economic commonalities. For purposes of observation, say in census or survey, coresidency is often primary in determining what interactions are deemed intrahousehold as opposed to other social and commercial affiliations. ... for a number of purposes, the functional household is not a coresident unit (Alderman, et al., 1993: 1-2). If the functional household is not a coresident unit (cases in point are polygamous and "extended" families) the relevance of poverty indices based only on variables from households living in the same place will be restricted.

Households are risk-mitigating institutions. "The *diversification* of family income source *combined with* intrafamily (and interhousehold) income sharing is a means of smoothing consumption given imperfect covariances between kin-related households' stochastic realisations of income" (Rosenzweig, 1988: 1152).

In a risk-ridden environment, such as the rural economies of developing countries, diversification of income sources plays an important role. But poverty indices consider only the total amount of income, not how much diversified the income sources are. In addition, the indices do not consider the level of covariances in intra family and kin-related households' income which are important in income sharing and maintaining an "insurance" against risk.

Household members consume two types of goods: private and public. Alcoholic beverages and women dresses are examples for the first and heating and lighting are cases from the second. One advantage of households relation to individuals living alone is the economies of scale they enjoy in using "public" goods. This advantage generally is not taken account of in the poverty indices.

In trying to understand how households in the rural areas of the developing world function, many agricultural household models have been developed. The basic nature of these models is that they analyse households as consumption and production units (they synthesise consumption and production theories). In most of the agricultural household models, the household is taken as unitary decision-making unit. The theoretical bases for considering the household as one unit differ. Samuelson suggested that the household welfare function reflects a consensus among members. Sen used a model developed for the analysis of cooperatives and interpreted family welfare as the weighted sum of the net utility of all members. Another possibility is to assume that there is a dictator (the household head) who is capable of enforcing his/her preferences on other members (for details see Alderman, et al., 1993). In all cases, possible differences of interests among household members do not affect the way households function.⁶

But the use of a unified household welfare function has become controversial. With the empirical evidence on the existence of conflicts of interest among household members accumulating (see Alderman, et al., 1993 and Bereket, 1993) this assumption of one welfare function in the household was challenged leading to intrahousehold models.

3.3 Intrahousehold Poverty

In analysing poverty at the household level differences in the preferences of individuals and issues of inequality and poverty at the individual level are not

focused upon. Since the ultimate objective of policy is influencing the welfare of individuals, intrahousehold issues must not be neglected in poverty analysis.

Many empirical studies have shown that there are differences of interest among household members. Who controls which resources has important bearing on health status, educational levels, etc., of household members (for example, some studies have shown that the more the income controlled by wives the better the nutritional status of children). Hence, another dimension in poverty analysis should be the intrahousehold aspect.

Haddad and Kanbur (1990) examined by how much conventional measures of inequality and poverty differ if intrahousehold variables are included or left out. In addition, they analysed how the patterns of inequality and poverty differ when account is taken of intrahousehold inequality. They arrived at the following conclusion:

Our theoretical analysis suggested that potentially serious errors could be made so far as the *levels* of inequality and poverty are concerned. Empirically, we showed that this is indeed the case — the errors are of the order of 30% or more. In the case of poverty measurement we showed theoretically and empirically that for certain measures of poverty the errors could be of either sign — a careful analysis is therefore required before any claims are made as to whether poverty is understated or overstated.

So far as the *patterns* of inequality and poverty are concerned, our theoretical analysis was more equivocal — significant differences in the cross group pattern of intra-household inequality are required to reverse the true rankings of policy-relevant socio-economic groups by inequality and poverty, when intra-household inequality is ignored. Our empirical analysis lends support to this equivocation — the changes in patterns of inequality when intra-household inequality is ignored are by no means dramatic; sometimes, they hardly change at all (Haddad and Kanbur, 1990: 879-880).

In an attempt to examine intrahousehold issues, many models have been developed. Most of these models are based on a game theoretic framework. The models are broadly divide into two:

- a. ***Models based on Noncooperative Game Theory:*** In this approach it is assumed that members cannot enter into binding and enforceable contracts. Decisions in this models are made by different members of the household.

Members maximise their utility given the utility level of others in the household. These types of models imply that (i) when the income share of one member increases, expenditures made on those commodities preferred by him/her increases; (ii) "if members disagree over the preference ordering of some goods, this theory suggests they have a strong incentive to make some strategic purchases in order to precommit the household to a minimum expenditure on these item"; and (iii) the ability of individuals to force their preferences depends on their 'perceived contribution' to the household (see Alderman, et al., 1993: 8-9).

- b. ***Models based on Cooperative Game Theory:*** In this approach individuals have the option of either remaining single or forming a household. These models can further be divided into those which assume that household decisions are always Pareto optimal and those which represent household decisions as the outcome of some bargaining process.

In the bargaining models, spouses compare the utility they get if they are single with the utility in marriage. In other terms, they maximise the difference between their utility levels while single and married. The gains from marriage will be apportioned between the spouses by bargaining (arriving at binding and enforceable agreements). The bargaining position of members are influenced by what are called "extra household environmental parameters" (EEPs). These are variables external to the household affecting the bargaining power of the spouses. The ability of women to return to their natal homes and prohibitions on work outside homes are some examples of EEPs. The EEPs shift threat points of spouses (for details, see Alderman, et al., 1993: 9-11).

Generally, in using intrahousehold models, a general welfare function for all household members is not defined. Instead we have utility functions of individuals reflecting their own interests. This goes against the underlying assumption of a household welfare function in most of the poverty indices.

The above models have obvious advantages if one is focusing on intrahousehold poverty and inequality. Since an examination of intrahousehold issues is important in analysing welfare of individuals, the use of models based on this framework is necessary. But using these models for empirical analysis is not without problems. The more important problems are:

- i. Obviously the availability of data on the level of individuals in households is limited.
- ii. The number of utility parameters to be estimated will be about twice in intrahousehold than in unitary models (Kooreman and Kapteyn, 1990: 585).
- iii. The models which assume Pareto optimality in household decisions are not empirically distinguishable from unitary decision-making household models (for details see Kooreman and Kapteyn, 1990).

In addition to intrahousehold relationships, intergenerational issues also help us to understand poverty.

3.4 Intergenerational Issues

The allocation of resources is also influenced by intergenerational considerations. Inheritance plays an important role in explaining existing distributions of resources. In addition, the existence of intergenerationally extended families influences poverty and inequality.

The question of intergenerational resource allocation revolves around three issues: "at the parental level, what (equity, efficiency or both) determines how resources are allocated amongst children; are parental preferences unified and; do parents, individually or collectively, have an incentive to behave strategically with respect to their offspring" (Alderman, et al., 1993: 18).

Different approaches have also been developed to examine intergenerational issues. In one approach (Becker and Tomes, 1976, cited in Alderman, et al., 1993), it is assumed that parents are concerned solely with their children's total wealth. Parents have equal concern for each child and transfers are made so that the children's wealth is equalised. The implication of this approach is that intergenerational transfers help decrease inequality.

The second approach is the "separable earnings-transfer model". In this model both equity and efficiency concerns can be entertained (for details see Alderman, et al., 1993).

A third approach is that of Berheim, Shleifer and Summers (1985) (see also Alderman, et al., 1993 and Bereket, 1993). They "develop a collective model of parent-child relations in a non-cooperative bargaining framework. They assume that parental utility is a function of parental consumption, utility of their child and 'child's attention to parents'. The child is assumed to tire of giving attention before his parents tire of receiving it. The model, therefore, considers differences in preferences across generations, although it presumes a unitary model for parents" (Alderman, et al., 1993:17).

The above approaches are related to the allocation of resources across generations. But intergenerational issues influence the status of households in another way. Many households in rural areas of developing countries are intergenerationally extended (more than one generation living in the same household). Rosenzweig and Wolpin (1985) have used this fact to examine whether specific experience of elders in relation to plots of land they own creates an efficiency advantage. They explore a "theory in which the predominance of intergenerational extension, family labour profitability, and the scarcity of land sales are manifestations of an optimal implicit contract between generations that maximised the gains from (farm) family-specific, experientially obtained knowledge" (Rosenzweig and Wolpin, 1985: 963). In this framework transfers of land and use of family labour are Pareto optimal. Since elders provide location specific information about agricultural land, specific experience creates an incentive for offsprings to work on family land.

Rosenzweig and Wolpin tested their arguments on data from Indian villages. Their findings suggest that elders contribute more than the young to profits when weather conditions are bad. In addition, families with elders are less significantly likely to sale land.

The findings of the specific experience model suggests that families which are intergenerationally extended have the advantage of the specific experience of elders which increases efficiency and income. Still another variable relevant for poverty analysis is intergenerational extension and the effect of specific experience.

4. Summary and Conclusions

The measurement of poverty, defined either in absolute or relative sense, witnessed significant improvements, both at the conceptual and empirical levels in the literature.

This paper attempted to look at some of the salient features in the measurement of poverty. It has been pointed out in the literature that all poverty indices introduced so far can be derived from the social-welfare-function based inequality measures. This has created the conceptual difficulty of distinguishing poverty from inequality. On the other hand, the properties that are expected to be met by a given poverty index have been shown to be mutually competing in cases where the mean income is so low as to fall below the poverty line and variable population proportion between the poor and the non-poor is assumed. In addition, the choice of any poverty index implies a certain amount of value judgement.

The issue of poverty in the context of poor countries goes beyond the individual attributes of the poor. In this sense, available poverty indices fail to capture the process of income earning which plays a crucial role in the persistence of poverty in poor countries. A related issue is, thus, in poor countries, it is chronic poverty, instead of transient poverty, that is of importance to the issue of poverty alleviation and targeting.

The individual, which is the unit of analysis assumed in poverty indices, cannot be seen in isolation from the family he belongs to in budget surveys. Thus variations across household characteristics severely affect the estimation of poverty indices. It is very important that such issues are addressed in estimation.

Welfare indicators again pose serious problems in the measurement of poverty. It is important to consider the sensitivity of poverty indices to alternative indicators of welfare in empirical applications.

Consideration of community, household and intrahousehold variables is paramount for understanding poverty. Our argument is not to say that a poverty index should incorporate all these dimensions; this is impossible. Our discussion is an attempt to put the indices in the context of overall poverty

analysis: it is an attempt to show which aspects of poverty analysis are covered by them and which neglected.

The discussion on the institutional arrangements affecting the process of decision-making and income transfer of rural households has direct implication to targeting. Poverty alleviation may take either the form of direct transfers or a series of interventions that may increase productivity of the poor. It may thus happen that targeting of the rural poor without recourse to intrahousehold inequality, community level links and other issues may turn out to be futile.

NOTES

1. Additive and s-concave (scur-concave) social welfare functions derive their properties from the underlying utility functions that are constructed on the basis of diminishing marginal utility of income. For the mathematical properties of such SWFs see Lambert (1989).
2. The presentation is based on Hagenars (1986:584-585) and for alternative representation see Rodgers (1991).
3. See Morduch (1994) who alternatively used the term stochastic poverty to distinguish from transitory poverty.
4. See Ravallion (1994) for an illustration of a poverty line that can be conceptually appealing.
5. See among others Anand and Ravallion (1993), Streeten (1994), and Aturupane, et al. (1994) for the discussion of the controversy centring around the broader issue of the welfarist approach and the capabilities approach, which recently took a twist to the issue of human development as a means or an end by itself.
6. The literature on agricultural household models is wide and well-documented (for example, I. Singh, L. Squire and J. Strauss, eds., 1986, *Agricultural Household Models*, Baltimore: The John Hopkins University Press) and it is not our intention to review it here. But in making poverty analysis at the household level considering the more general framework of agricultural household models seems to be more instructive than only looking at income levels.

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Poverty and Demography

Demographic Characteristics of Poor Households in Urban Ethiopia: The Case of Dire Dawa Town

Yohannes Kinfu

1. Introduction

Like several other developing countries, poverty is a major social and economic problem in Ethiopia. Current studies show that roughly over half of the country's population live in abject poverty (MOPED, 1994). Problems of poverty are multi-dimensional and hence have multiple sources. In the case of Ethiopia, poor economic performance, rapid rate of population growth, low technological base, periodic draught and famine and, internal displacement have continued to exacerbate poverty in the country.

Poverty affects people of different characteristics in different ways, because they play different roles, have different needs and face different constraints. It is most likely that households in extreme poverty differ from the average and non-poor households in several distinct ways such as in demographic behaviour and socio-economic conditions. Proper understanding of these associated factors, hence constitute an essential starting point and a key to a set of policies and practical steps that the Government can take in order to alleviate poverty and promote sustainable growth in the country.

The aim of this paper is to present evidence on the links between poverty and demographic variables such as marriage patterns, household size and composition, fertility and mortality experiences, perception and preferences for children as well as knowledge, attitude and practices of family planning, using data for Dire Dawa in the early 1990s. Dire Dawa represents one of the largest industrial and commercial centres in the country. Thus, there is a reason to believe that the existence of diversified social groups and, hence, pronounced disparities in economic status among the residents of Dire Dawa makes the research area an ideal place to understand the nexus between poverty and demography in an urban setting.

2. Concepts and Measurements of Poverty

According to the growing literature, poverty is said to exist in a given society when one or more persons do not attain a level of material well-being deemed to constitute a reasonable minimum by the standards of that society. Hence, the starting point in any poverty study is the question of how one measures or assesses well-being and at what level of measured well-being does one say that a person is poor or non-poor.

Ideally, there are quite a number of alternative indicators that one may use to quantify well-being or welfare at individual and household levels. These include per capita or per household income, consumption, and food expenditures; nutritional and anthropometric indicators, proportion of household budget spent on food, known as food ratio; basic needs and so on. Given the strength and set backs of each indicator as a measure of welfare, the choice of a particular procedure largely depends on the nature of the source data and the objectives of the study. But still, selection of a particular welfare indicator does not by itself give a definition of poverty. Since defining poverty consists of classifying the population into poor and non-poor, one must also decide where to draw the poverty line to transform welfare indicators into definitions of poverty.

Poverty line is a cut-off living standard level below which a person is classified as poor (World Bank, 1993). In setting a poverty line three alternative approaches can be followed. These are absolute, relative and subjective poverty levels.

An absolute poverty level is one which is fixed in terms of the living standard indicator being used, and fixed over the entire domain of the poverty comparison (Ravallion, 1992). The most usual practice in defining an absolute poverty level involves estimation of the cost of a bundle of goods (both food and non-food) deemed to assure that basic needs are met in the specific domain of the poverty comparison. In most developing countries, absolute poverty lines have been set based on food expenditure necessary to attain some recommended food energy intake plus, in few cases, essential non-food requirements. Similar procedure was, for instance, followed by Dercon, Krishnan and Abdulhamid (1994) in their study of rural poverty in Ethiopia.

The method, however, has some shortcomings. According to Ravallion (1992), the major pitfall relates to determining the minimum food energy requirement, which can vary across individuals and over time for a single individual. In addition, the procedure is more of measuring food poverty. But, as noted by several writers attaining adequate nutrition is not the sole motive for human behaviour, even for the most poor; nor is it the sole motive in food consumption.

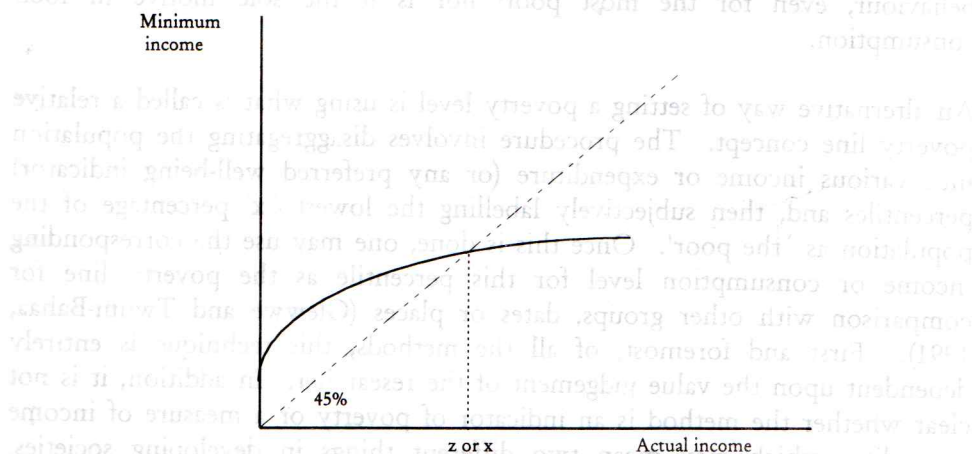
An alternative way of setting a poverty level is using what is called a relative poverty line concept. The procedure involves disaggregating the population into various income or expenditure (or any preferred well-being indicator) percentiles and, then subjectively labelling the lowest 'x' percentage of the population as 'the poor'. Once this is done, one may use the corresponding income or consumption level for this percentile as the poverty line for comparison with other groups, dates or places (Glewwe and Twum-Bahaa, 1991). First and foremost, of all the methods, this technique is entirely dependent upon the value judgement of the researcher. In addition, it is not clear whether the method is an indicator of poverty or a measure of income inequality, which may mean two different things in developing societies. Moreover, as argued by Ravallion (1992) such a method is technically feasible only for developed countries. This is because the basic assumption of the method that poverty line is a constant proportion of the mean and thus the elasticity of the poverty line with respect to the mean is unity, is only true amongst the industrialised countries.

The third variation is to define poverty based on survey responses to an attitudinal question such as the following:

What income level do you personally consider to be absolutely minimal? This is to say that with less you could not make ends meet (Ravallion, 1992).

The poverty level set on the basis of such an approach is called the subjective poverty line. This approach explicitly recognises that poverty lines are inherently subjective judgements people make about what constitutes a socially acceptable minimum standard of living in their own societies. Studies that have made use of this procedure found the relationship between actual income and what is considered as the minimal income to be an increasing function as shown in the following graph (Kapteyn et al., 1988). "The point 'x' or 'z' in the figure

is a good candidate for a poverty line; people with income above x or z tend to feel that their income is adequate, while those below x tend to feel that it is not" (Ravallion, 1992).



Due to the minimum element of subjectivity involved in the procedure (at least from the side of the investigator) and its special relevance to the study objective, this method was used to identify the poor and measure well-being in the present study. The discussion on the application of the method and its relevance in relation to the nature of the data will immediately follow the discussion on the sources of data.

3. Sources and Nature of Data

The study was based on a cross-sectional single period survey data collected from a sample of households in Dire Dawa in 1994 by the Demographic Training and Research Centre of Addis Ababa University. The sample population was obtained on the basis of a two-stage simple random sampling procedure. At the first stage, out of the 23 *kebeles* in the town a sample of nine were chosen. And from these *kebeles*, in the second stage 2,000 households were randomly drawn, though only 1,899 households were successfully

interviewed (see Table 1). Finally, appropriate weighing procedure was applied on the sampled data in order to ensure the overall selection of a representative sample.

The content of the survey data is reasonably comprehensive by most standards. Data on the economic status of the household were collected in several forms. These included data on household income and expenditure, possession of household items (such as car, TV, radio, telephone, refrigerator, tape recorder, air conditioner, etc.), house tenure status, materials used for construction, sources of fuel, type of toilet and an attitudinal question on the adequacy of household income. The consumption data covered all monetary expenditures on goods and services consumed plus the monetary value of all consumption from income in kind such as food produced on the family farm and the value of owner-occupied housing. Similarly, the income definition included personal income in cash and in kind, remittance from children and others and other sources of income, such as the monetary value of children's activity in family business. Apart from data concerning wealth (i.e., household possessions), the period of observation for all income and expenditure related data referred to a single month. No information on food and non-food items were collected.

Table 1: Numerical and percentage distribution of sampled household by kebele, Dire Dawa 1994

Sampled Kebeles	Sampled households*	Actually number of households responded	Response rate	Weighted responses of each Kebele	
				No.	% share
02	145	123	84.8	1769	13.96
03	265	251	94.7	1231	9.71
04	142	122	85.9	1240	9.78
05	225	219	97.3	1415	11.16
07	261	251	96.2	1391	10.97
09	275	269	97.8	1170	9.23
10	155	137	88.4	493	3.89
11	230	230	100	1834	14.46
12	302	297	98.3	2138	16.86
Total	2000	1899	94.9	12681	100.0

* In this study, a household is defined as a group of people who have a common source of major income, who share a common source of food and who sleep under the same roof.

4. Identifying the Poor and Poverty Profile

Making use of an attitudinal question concerning household income, welfare in this study was measured by using the concept of a subjective poverty line approach. The following question was asked of all sample households and responses were recorded on the basis of four possible pre-coded non-numeric responses provided along with the question.

In your opinion is the household income sufficient to make the family's ends meet?

- | | |
|------------------------------|---------------------------|
| (i) Inadequate or too little | (ii) Moderate |
| (iii) Sufficient | (iv) More than sufficient |

Except for the response for one household which was reported in the last category and later merged with the welfare group immediately below it (i.e., category sufficient) at the analysis stage, the remaining responses were maintained as they were reported, and considered as indicators of self-declared welfare status. Accordingly, three welfare categories were identified: *those who reported their earnings to be inadequate or too little are renamed as Poor; those who considered their income as Moderate and, those who regarded their own incomes as Sufficient.*

Below a brief comment on the major advantages of the procedure is given. The first relates to the validity problems related to the conventional measures of welfare (such as income or expenditure) in relation to the study objectives. As it may be noted, most of the demographic variables that would be investigated in the study (such as marriage, fertility and mortality) are life-time events whereas data on either monthly expenditure or monthly income, which are often used as measures of well-being, in the strict sense are current status indicators and are also more likely to vary over time. Therefore, the major advantage of classifying the population based on self-reported welfare status is that it is less likely to be affected by such problems, since it does not explicitly involve a specific time element. The second reason that necessitated the use of the subjective poverty level approach, on the other hand, emanated from recognition of problems that might possibly emerge from problems related to the quality of the income and expenditure data. Like the case in many related surveys, if the data, by any chance, suffer from poor responses and if these are

also systematically correlated with true level of well-being, using such data for any type of analysis is likely to lead to erroneous conclusions. Thus, the best thing that can be done is to make use of less of such data and depend more on information that do not directly involve numerical estimates, such as the attitude question. Lack of relevant data from the survey was also an additional reason that motivated the use of the subjective poverty line approach. For instance, as duly noted earlier, the procedure of setting an absolute poverty level, apart from information on household monetary expenditure, requires data on food and non-food items consumed at the household level. It also needs information on prices of commodities prevailing in the study area. Even though price data could be obtained from secondary sources, data on items consumed by the household, was not collected in the survey being used. This limits the application of an absolute poverty line approach, even if one wishes to do so.

To help assess how robust were the welfare groups identified based on self-declared responses in relation to conventional indicators, they were compared with selected alternative welfare measurements as shown in Table 2.

Table 2: Selected living standard indicators by self-declared welfare groups for sample households, Dire Dawa, 1994

Indicator	Self-declared welfare groups			All Dire Dawa	F-ratio	Significant pairs at 5% level (Scheffe Test)
	Poor	Moderate	Sufficient			
Household monthly expenditure	277.38	487.21	796.63	360.00	1424.66	All
Household monthly income	313.58	645.54	1552.47	468.75	1786.91	All
Per capita monthly expenditure per adjusted adult equivalent units	69.08	121.63	189.83	89.23	1261.07	All
Per capita monthly income per adjusted adult equivalent units	77.77	160.22	368.63	115.20	1687.70	All
Food expenditure as a percentage of total expenditure	81	67	62	76	12.06	(1,2) (1,3)*

Note: * 1 stands for poor 2 represents moderate and 3 stands for sufficient.

Source: Author's calculations based on Fertility and Family Welfare Survey data, DTRC, AAU.

A glance at these parameters revealed encouraging evidence of clear and statistically significant association between those conventional indicators of

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well-being and welfare, as measured by self-declared welfare status. People who felt that their income was sufficient consistently showed better status by every well-being indicator under study, while the reverse was the case for people who considered their income as inadequate. For instance, considering per household monthly expenditure as an indicator of welfare, those households which regarded themselves as poor show 65 percent lower consumption levels than those who reported their income as sufficient. The differences, in fact, were much more than this when per capita indices instead of per household indices that tend to favour pro-natalist tendencies, were used. The per capita monthly income per adjusted adult equivalent constructed following Collier, Radwan and Wangwe (1986) procedure showed that those who regarded themselves as poor had per capita income which was barely a little in excess of one-fifth of the average per capita income of persons in the sufficient category. The per capita income of those who claimed earning moderate income was also only two-third of the average income of those who had reported sufficient. The statistical tests, namely ANOVA and Scheffe, carried out to test the overall and pairwise significance of the relationships, respectively, showed that the hypotheses of no difference between self-declared welfare groups in terms of those conventional welfare measurements were rejected at a P-value of less than one per cent level. From this we may safely conclude that, if income or expenditure data were used as a criterion of classification, one would have also reached at similar results.

Once households are classified into different welfare groups, one can also derive the various measures of poverty (such as its incidence, depth and severity) using the corresponding average per capita income or consumption level computed for the group 'poor' as the 'poverty line'. Accordingly, considering per capita monthly income of Birr 77.77 as the poverty line for Dire Dawa three poverty measures were calculated: the head count index (P_0), the poverty-gap index (P_1) and the Greer-Thorbecke measure of intensity (P_2). The calculations suggested that about 51% of the people of Dire Dawa lived under the poverty line (P_0), with on average a 19 % per cent shortfall (P_1) to reach poverty line and severity level (P_2) of 0.09.

5. Demographic Characteristics of Poor Households

Interrelationships between population and poverty can be viewed at different levels and from several perspectives. Perhaps the most common approach is macro-level analysis, which looks into the pressure of growing population on resources such as social services, investment and natural resources. However, many of the interactions between population and poverty originate, or are felt most strongly, at the micro-level, that is at the level where fertility related decisions are made, and where the effects of poverty on mortality are absorbed. In this section, we shall examine the relationships between selected demographic variables and standard of living, with emphasis on the poor households. Nevertheless, it should be noted that observed associations do not necessarily imply causation.

5.1 Marriage and Household Composition

Although marriage is the predominant context for childbearing and rearing all over the world, the structure and the customs, prevalence and stability as well as age at marriage vary from country to country and within country between social groups. Table 3 provides comparison of mean age at marriage between the different categories of the study population.

Clear pictures of association emerge between welfare and age at marriage in the study area. It appears that average age at first marriage tends to be relatively higher among those respondents in the higher welfare category followed by those in the moderate group; it was the least for the poor households. However, from the results of the F- test, it was noted that these differences were statistically significant only for females. In addition, the results of the Scheffe test also indicated that, even for females, pairwise differences in mean age at first marriage were significant only between the poor and the adequate group and between the moderate and the adequate group. No significant difference in age at first marriage was noted between the poor and those who declared themselves as moderate. Thus, in general the results of the analysis suggested that women in poor and moderate households were more likely to marry earlier than their counterparts in the adequate category.

Table 3: Family formation and household structure indicators by self-declared welfare groups, Dire Dawa, 1992

	Self-declared welfare groups			All Dire Dawa	F- ratio	F Prob	Significant pairs at 5% level (Scheffe Test)
	Poor	Moderate	Sufficient				
Age at first marriage							
Males	27.72	27.78	28.35	27.80	1.34	0.2630	---
Females	19.70	19.85	20.71	19.80	15.00	0.0000	(1,3) (2,3)*
Mean spousal age difference	8.07	7.87	7.62	8.00	1.86	0.3057	---
Mean household size	6.34	5.9	5.10	6.27	9.28	0.0001	All
Average age of head of household	46.0	45.6	46.2	45.7	15.65	0.0915	---
Ratio of children to adults	1.1292	1.0442	0.8921	1.09	30.47	0.0000	All

Note: * 1 stands for poor 2 represents moderate and 3 stands for sufficient.

Source: Author's calculations based on Fertility and Family Welfare Survey data, DTRC, AAU..

Education can be one possible reason that explains the differences. For instance, as noted from the survey data, female school attendance was both universal and prolonged among the well-to-do group in contrast to women in poor and moderate households. Other things being equal, this longer years of schooling probably might have acted as a cause for delayed marriage among the women in the adequate category and the other way round for women in moderate and poor categories.

The differences in age at first marriage observed among the different groups of the population could have far-reaching demographic implications some of which are poverty related. For instance, if the poor have limited knowledge of and access to family planning, as would be demonstrated in the following sections, early marriage implies longer exposure to childbearing, and hence high fertility. In fact, this argument fairly agrees with the finding shown in the same table that the poor households in the study area were characterised by both large household size and high proportion of dependants. As can be observed from Table 3, the average poor household had at least one additional member, compared to an average household in the adequate category and about half a person, compared to moderate households. Similarly, as shown by the child-adult ratios in the same table an adult in a poor household was expected to care for himself and support an additional 1.13 dependants as compared to less than

one for the adequate group. Over all and pairwise differences in average household size and proportion of dependants, as tested by the F-ratio and the Scheffe test respectively, were all statistically significant at the specified levels. The potential effects of such high dependency among the poor goes far beyond the immediate implications. With increasing weathering away of subsidies in the social service sectors, such as education and health, the poor would be in a much difficult condition to send their children to school and provide them with the necessary health-enhancing goods and services. And, the lack of such opportunities implies the possibility of inter-generational poverty transmission.

5.2 Achieved Fertility

A substantial volume of empirical as well as theoretical work has, for over three decades, explored the determinants of fertility at the household level. Among behavioural factors found to be associated to fertility, many are closely related, in one way or the other, to poverty indicators.

The data from the present study, shown in Table 4, also convey clear inverse association between well-being and fertility, as measured by mean parity. Compared to women in both moderate and adequate categories, women in poor households consistently registered higher number of children per woman. For instance, the average parity which was in the neighbourhood of two children per woman for all welfare groups at age group 20-24 increased to about four in the age group 30-34 in the case of poor women, while it is at least less by one child for women in the same age in the adequate category. There were, of course, some variations in the level of statistical significance of pairwise differences in observed mean parities by age cohort of mothers, as confirmed by the Scheffe test.

For the younger ages (ages less than 30 years), the differences in the observed mean values were significant only between moderate and poor and adequate and poor, but not between moderate and adequate categories. While for women over 40 years, the pairwise mean differences were significant only between adequate and poor and adequate and moderate, but not between moderate and poor women. The probable reason for the insignificant pairwise parity differences between the categories of moderate and adequate, for the younger ages and between the poor and the moderate among older women,

could be that these women probably had more or less similar characteristics in certain variables that would affect fertility.

Table 4: Average number of children ever born by age of mother and self-declared welfare groups for sample households, Dire Dawa, 1984

Age group	Self-declared welfare group			All Dire Dawa	F- ratio	P Value	Significant pairs at 5% level (Scheffe Test)
	Poor	Moderate	Sufficient				
20 - 24	2.38	2.04	2.00	2.30	4.59	0.0118	(1,2) (1,3)*
25 - 29	3.09	2.70	2.60	2.93	11.53	0.0000	(1,2) (1,3)
30 - 34	3.84	3.60	2.94	3.74	15.41	0.0000	All
35 - 39	4.86	4.51	4.18	4.62	25.42	0.0000	All
40 - 44	6.06	5.48	4.96	5.74	28.91	0.0000	(1,3) (2,3)
45 - 49	6.69	6.56	5.75	6.61	8.42	0.0002	(1,3) (2,3)

Note: * 1 stands for poor 2 represents moderate and 3 stands for sufficient.

Source: Author's calculations based on Fertility and Family Welfare Survey data, DTRC, AAU.

In the case of the middle age groups, that is between 30-39 years, the differences were, however, all significant for each of the pairs, meaning that over this age interval the fertility experience of poor and moderate women, poor and adequate women and adequate and moderate women were all significantly different from each other. In addition, the analysis also conveyed statistically significant difference in both completed and life-time fertility at all ages between poor women and women who considered their income as adequate. Observed differences in fertility experience can be partly explained by differences in the choice available in reproductive strategy and imperfection concerning fertility control devices. Differences in the value of children and child mortality experience could also be other valid reasons. The target of household reproductive strategy is presumably surviving children. And, other things being equal, any actual or perceived mortality is, therefore, more likely to raise fertility in order to assure a certain number of surviving children.

5.3 Ideal Family Size and Demand for Additional Children

The relationship between standard of living and family size goals, as measured by desired number of children, observed in the study area is an interesting one

with a number of policy implications. As can be seen in Table 5.a, on average, most women in the sample population wish to have less than four children; and for that matter, ideal family size have been found to be the lowest for the poor women followed by women in the moderate category. Women in the adequate income group in contrast had the highest desired number of children, which was in the neighbourhood of four children per woman. The low family size desires among the poor could be a behavioural response to the increasing costs of children and, if properly addressed by policy makers and service providers, it would probably help to bring down expressed family size levels to the level of family size goals.

A closer look into the data on ideal family size in conjunction with reported achieved fertility levels shown in Table 4 is more instructive to examine the links between these two important indicators of current and future trends of fertility. For instance, if we compare desired number of children for women in the age group 20-34 with mean parity that these women had by the same age from Table 4 by level of self-declared welfare status, we may observe that women in the poor category have already exceeded their ideal number by 1.06 children and those in the moderate group by 0.61 child, while women in the adequate group still need an additional 0.83 child to reach to their family size goals. This can be interpreted in several ways. One possibility is that fertility among the poor and the moderate groups is probably a matter of chance than choice, which as we shall demonstrate below is to be the case. On the other hand, as we have mentioned earlier, since the target of reproductive strategy is surviving children the excess of expressed fertility may be seen as an insurance strategy against future possible deaths. The latter, however, is less likely to be the case and, may be proved indirectly from the data on demand for additional children shown in Table 5.b, which shows lesser demand for additional children among poor women than women in the adequate group.

As it can be noted from the table, the percentage of younger women (aged below 35 years) demanding no additional child increases from about less than a quarter among women who consider their income as adequate to 41 percent among those in moderate groups and more than 55 percent among women in poor households. Similar pattern of relationship also exist for the older cohort (35 through 49 years). The percentage of women demanding no more children increases from less than 5 percent in the adequate group to, almost one in five in the moderate category and about one-third among women in poor households.

The above observation also suggests that given the tendency that fewer younger women are generally demanding additional children than the women in the older cohort, *ceteris paribus*, there is a greater potential for future fertility decline in the area.

Table 5a: Mean number of ideal family size by age of mother and welfare group, Dire Dawa, 1994

Age of mother	Self-declared welfare groups			All Dire Dawa	F-ratio	P Value	Significant pairs at 5% level (Scheffe Test)
	Poor	Moderate	Sufficient				
20 - 34	2.78	2.99	3.77	2.89	20.07	0.0000	(1,3) (2,3)*
35 - 49	3.74	3.38	4.01	3.26	27.29	0.0000	All
All ages	3.00	3.17	4.04	3.11	57.81	0.0000	All

Note: * 1 stands for poor, 2 represents moderate and 3 stands for sufficient.

Source: Author's calculations based on Fertility and Family Welfare Survey data, DTRC, AAU.

Table 5b: Demand for additional children by welfare group (percentages)

Responses by age of women	Self-declared welfare group			All Dire Dawa
	Poor	Moderate	Sufficient	
20 - 34				
Yes	19.7	28.8	37.6	23.2
No	55.8	40.6	23.4	49.2
Up to God	24.7	30.6	39.0	27.1
$\chi^2 = 211.311^* \text{ d.f.} = 4$				
35 - 49				
Yes	6.3	7.1	11.5	6.8
No	57.6	18.3	4.0	80.0
Up to God	11.2	17.4	19.5	13.2
$\chi^2 = 59.83^* \text{ d.f.} = 4$				
All Ages				
Yes	10.7	15.7	21.8	12.8
No	74.7	62.5	55.6	70.2
Up to God	14.6	21.8	22.6	17.0
$\chi^2 = 151.1^* \text{ d.f.} = 4$				

* The hypothesis of no correlates between demand for children and welfare is rejected by the chi-square test at the one percent level.

5.4 Knowledge, Attitude and Practice of Family Planning

We have earlier argued that part of the explanation for the deviation between achieved and desired family size lies on differences in the level of choice in reproductive strategy. Knowledge and attitude about family planning and use of contraceptives are, hence its practical expressions.

As it may be learned from Table 6.a, attitude towards family planning was generally more favourable among women who consider their income as sufficient followed by those in the moderate category. Women in poor households had relatively less favourable attitude towards family planning. Looking at the data given for all ages, the percentage of women who approve family planning increases from about 70 percent for women in poor households to close to 80 percent for women in the adequate category. Using the chi-square test, these differences in attitude were found to be statistically significant at less than one percent level.

Table 6a: Attitude towards family planning by age of mothers and welfare group, Dire Dawa, 1994 (percentages)

Age of mother	Self-declared welfare groups			All Dire Dawa
	Poor	Moderate	Sufficient	
20 - 34				
Approve	84.3	85.8	98.3	85.4
Disapprove	15.7	14.2	1.7	14.6
$\chi^2 = 22.19^* \text{ d.f.} = 2$				
35 - 49				
Approve	64.2	69.5	72.1	65.9
Disapprove	35.8	30.5	27.9	34.1
$\chi^2 = 19.66^* \text{ d.f.} = 2$				
All Ages				
Approve	70.5	75.2	79.9	72.2
Disapprove	29.5	24.8	20.1	27.8
$\chi^2 = 21.45^* \text{ d.f.} = 2$				

In fact, the differences in attitude concerning family planning that exist between the different self-declared welfare groups become much wider when age

differences are considered. For instance, among the younger cohort only less than 2 percent of the women in the sufficient category disapprove family planning compared to a little higher than 15 percent among the poor women. It is likely that part of the differences in attitude are outcomes of differences in knowledge about family planning and are likely to create differences in the use of family planning methods, which, at the same time, might be the underlying reasons for the differences in fertility levels observed in the earlier sections.

There were also statistically significant differences in knowledge about family planning methods between different welfare groups as confirmed by Table 6.b. Knowledge was generally high among women who consider their income as sufficient followed by those in the moderate category. Women in poor households had relatively low knowledge about family planning. Looking at the data reported for all ages, the percentage of women who know any family planning methods declines from about 74 percent for those in the sufficient category to less than 60 percent for the poor category. As shown by the chi-square test, the observed differences in knowledge were statistically significant at less than one percent level.

Although knowledge and attitude about family planning show how much people are ready to exercise reproductive related-choices, the ultimate determinant is the practice or use of effective fertility control devices. Consistent with the observation of high fertility, relatively low knowledge and less favourable attitude towards family planning, the poor continue to be the least users of modern family planning with a contraceptive prevalence rate of less than 5 percent. In contrast, the prevalence rate among those women in the adequate category is observed to be twice of those in the poor category and 40 percent higher than those in the moderate group.

Welfare Group	All Ages		15-49	
	Know	Disapprove	Know	Disapprove
Sufficient	74.2	1.2	70.2	2.2
Moderate	70.2	2.2	65.2	3.2
Poor	58.2	15.2	52.2	18.2

Table 6b: Knowledge of any family planning method by age of women, current use of modern family planning methods and self-declared welfare group, Dire Dawa, 1994 (percentages)

	Self-declared welfare group			
	Poor	Moderate	Sufficient	All Dire Dawa
20 - 34 (Knows any family planning method?)				
Yes	78.4	75.2	91.5	78.2
No	21.6	24.8	8.5	21.8
$\chi^2 = 19.04^* \text{d.f.} = 2$				
35 - 49 (Knows any family planning method?)				
Yes	49.2	60.4	66.5	52.9
No	50.8	39.6	33.5	47.1
$\chi^2 = 81.89^* \text{d.f.} = 2$				
All Ages (Knows any family planning method?)				
Yes	58.3	65.6	73.9	61
No	41.7	34.4	26.1	39
$\chi^2 = 91.5^* \text{d.f.} = 2$				
Currently using modern FP	4.6	7.2	12	5.8

5.5 Mortality

The relationship between mortality and poverty or generally standard of living is perhaps one of the most extensively researched area. In the present study, four different, but related, indicators of mortality were calculated from survivorship data on children ever-born by age of mother in order to investigate the links between mortality and self-declared welfare status. These were infant mortality, mortality between exact age 1 and 5 years, under five mortality and expectation of life at birth (see Table 7).

Table 7: Mortality and standard of living

Mortality indicators	Self-declared welfare groups			All	Significant pairs at 5% level (Z-Test)
	Poor	Moderate	Sufficient	Dire Dawa	
Infant Mortality Rate					
Male	95.4	85.0	42.2	90.4	(1,3) (2,3)*
Female	86.2	56.3	39.8	79.8	All
Both Sexes	90.9	70.7	41.0	85.2	All
Child Mortality					
Male	31.0	21.8	9.8	28.4	All
Female	26.0	14.6	5.6	19.0	All
Both Sexes	28.5	18.3	7.7	23.8	All
Under Five Mortality					
Male	123.4	107.7	51.6	116.2	All
Female	110.0	70.1	45.2	97.3	All
Both Sexes	116.8	87.7	48.4	107.0	All
Expectation of Life at Birth					
Male	58.8	60.4	68.4	59.5	(1,3) (2,3)*
Female	60.2	66.1	70.9	62.4	All
Both Sexes	59.5	63.2	69.6	60.9	All

Note: * 1 stands for poor, 2 represents moderate and 3 stands for sufficient.

Source: Author's calculations based on Fertility and Family Welfare Survey Data, DTRC, AAU.

Irrespective of the measurement used, as expected, death rates were consistently higher among the poor and lower among the well-off. The average expectation of life of a newly born baby in a poor household was at least 10 years shorter than his/her counterpart born in households which regarded their income as adequate. Similarly, with respect to infant mortality, out of 1000 infants born in poor households 91 of them die before their first birthday and this is in contrast to only 41 per 1000 among infants born to households with adequate income. This represents a 270 percent higher risk of death among infants of poor households compared to babies born into households with sufficient income.

There were also significant differences in mortality experience between the poor and moderate and between the moderate and the adequate. But interestingly,

for most mortality measures the difference between the poor and the moderate was only statistically significant for females than males.

A number of possible explanations can be given why mortality should be higher among the poor and lower among those with sufficient income. Higher income guarantees a household to provide children with sufficient amount of food. It also provides a means to pay for preventive services including for the physician, hospitalisation, drugs and also maternity care during child birth. Moreover, since both size and quality of housing are likely to be correlated with household income those with higher income enjoy better facilities and hence reduce the chance of environmental exposure of their children to infectious agents.

Generally, it is believed that those households with better economic status have the opportunity to provide more health enhancing goods and services that affect child health and survival through increasing per capita calories and nutrients, clothing and shelter, sanitary facilities, use of medical facilities and adult supervision than the lower income households.

6. Summary and Conclusion

Interrelationships between population and poverty can be studied at different levels and from several perspectives. Perhaps the most common approach is macro-level analysis, which looks into the pressure of growing population on resources such as social services, investment and natural resources. However, many of the interactions between population and poverty originate, or are felt most strongly at the micro-level; that is, at the level where fertility related decisions are made, and where the effects of poverty on mortality are observed. The present study, making use cross-sectional data from Dire Dawa collected in 1994, made an attempt to examine the micro-level relationships between selected demographic variables and standard of living, with emphasis on the poor households.

The findings of the study are that poor households tend to experience early marriage, have large family size, high dependency of children and high fertility. But interestingly, compared to others, poor households wished to have fewer number of children (and most of them also need no more additional children) which was interpreted in the study as a behavioural response to the increasing

costs of children. However, the study also found out most of these women had limited knowledge of family planning methods, and even those who know about it had rarely practised it. In relation to mortality, as may be expected, death rates were consistently higher among the poor and lower among the well-off. For instance, infant mortality risk was observed to be 270 percent higher among infants of poor households compared to babies born into households with sufficient income.

The implications of the findings are that concerned bodies should attempt to provide the poor with facilities that enable them to exercise their choice, particularly in the area of fertility regulation. Adequate IEC programmes and expanded family planning services could be useful in this direction. Provision of expanded primary health-care facilities that are known to significantly reduce infant mortality rates could also help to bring down health related disparities between the haves and the have-nots.

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Demographic Influences on Food Availability and Incidence of Undernutrition and Malnutrition: The Case of Private and Cooperative Households in Arsi Region (Ethiopia)*

Hadgu Bariagaber

1. Introduction

1.1 Scope, Coverage and Data Source of the Study

Availability of food in a rural household is the result of production pre-harvest and post-harvest losses, food aid and gifts (if any), purchases, etc. When food reaches the household, the level of intakes, among other variables, could be influenced by certain demographic factors.

Estimates of the different losses of food during various stages of food production and processing are beyond the scope of this paper. The analysis deals briefly with the general assessments of factors contributing to food availability as related to some aspects of demographic responses and examines the extent of undernutrition and malnutrition in surplus-producing areas of Arsi Region.

A purposive sampling design was adopted, covering three communities of private and cooperative households, located within about 5 radius from Iteya town. The study areas were Hatie-Tulu, Iteya-Zuria and Adea-Shaki. The total households covered in these communities were 701, consisting of 359 private and 342 cooperative households. The survey was conducted by the author during January-February 1990. In addition to the paper uses information from UN (1974), UN(1984) and ECA (1984).

* Reference is made to some of the primary data which were collected, cleaned and organised by the author for writing his Ph.D. thesis on the topic entitled: "Impact of Demographic Variables on Nutritional Status in Arsi Region of Ethiopia" at the UN Regional Institute for Population Studies - UNRIPS, University of Ghana, December 1992.

1.2 Rationale and Objectives of the Study

In recent years, the study of relationships between demographic variables and food resources has become a concern at both the international and national levels, especially after the 1974 Bucharest World Population Conference and similar subsequent quinquennial conferences. In these conferences, there had been unanimous resolutions and recommendations on the need for the integration of demographic variables in formulating and implementing development planning processes. The broad recommendations in the World Population Plan of Action include the following three issues:

- study the implications of demographic variables on socio-economic resources;
- study the effects of social and economic changes on the demographic dynamics, including the need of women's participation in the social, economic and political life of a nation;
- study the reciprocal effects between demographic factors and socio-economic resources.

Until quite recent years, demographic factors related to household food balance have been considered utmost at macro level in that population size was used as denominator and food supply as numerator to derive per capita food supply. Such macro-level considerations of the population-food nexus appeared to conceal a lot of internal demographic and food supply/availability variations at household (micro) levels.

In research, although it has been recognised that the determinants of nutritional status have largely been economic/social as well as demographic, much attention and resources were focused on the economic perspective, contrary to the international recommendations. This has been particularly true in the case of Ethiopia.

This paper tries to contribute to the understanding of the influences of demographic factors on the availability of food and the level of undernutrition and malnutrition in supposedly surplus-producing areas where a normal life situation (absence of severe environmental stress such as drought, famine and war) and the absence of widespread pathological conditions prevail. It was

believed that it would be demographically and nutritionally important to include private and cooperative households, for some background information indicated that households of the two sectors had different demographic and socio-economic characteristics.

Furthermore, the incidence of undernutrition and malnutrition is one of the parameters of poverty, especially for "absolute poverty", which is a "consumption-based" measure, referring to the inability to secure the minimum basic needs for survival. It is equated with a latent famine with a potential threat to develop into absolute famine (Mesfin Woldemariam, 1984:3-10). The linkages of nutritional deficiency (i.e., undernutrition-quantitative/food energy deficiency and malnutrition-qualitative/protein deficiency) with absolute/relative poverty have been well established by Rodgers (1984:1-7), ESCAP (1988:53-70), World Bank (1991:44-50) and UNICEF(1994:86). In fact, most poverty studies accept minimum caloric intakes varying between 2100 and 2500 as critical values for undernutrition.

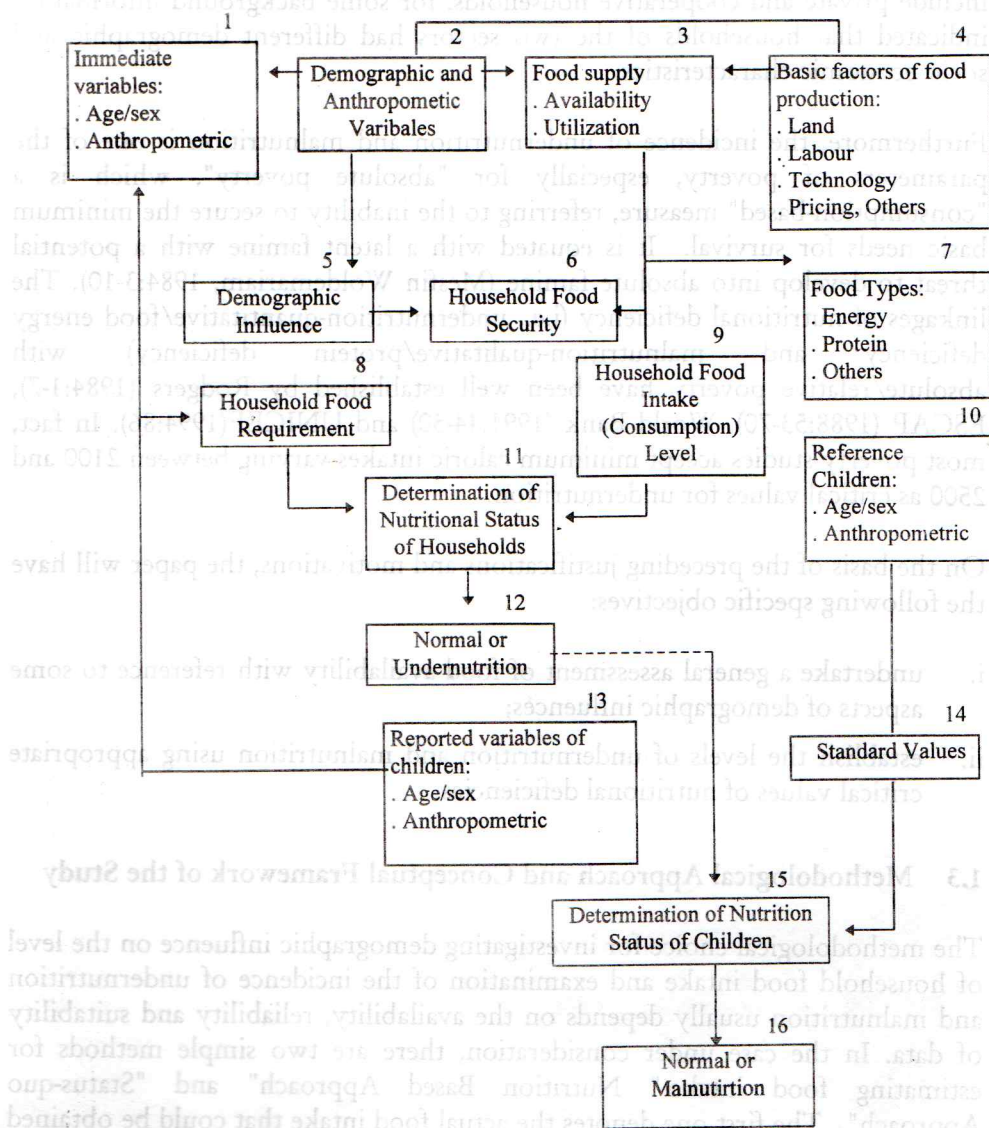
On the basis of the preceding justifications and motivations, the paper will have the following specific objectives:

- i. undertake a general assessment of food availability with reference to some aspects of demographic influences;
- ii. establish the levels of undernutrition and malnutrition using appropriate critical values of nutritional deficiencies.

1.3 Methodological Approach and Conceptual Framework of the Study

The methodological choice for investigating demographic influence on the level of household food intake and examination of the incidence of undernutrition and malnutrition usually depends on the availability, reliability and suitability of data. In the case under consideration, there are two simple methods for estimating food intake: "Nutrition Based Approach" and "Status-quo Approach". The first one denotes the actual food intake that could be obtained by conventional nutrition surveys. In this case, the food intake is converted into calorie equivalence using appropriate conversion factors (SIDA and Ministry of Health, 1968:1-10). In the second case, assessment of gross household food availability from the total gross food production for

Figure 1: Logical Structure of the Study



consumption is made. This is also converted into gross per capita calorie availability.

For the determination of the nutritional status of the households, the food intake has to be compared with the food requirement. Certain aspects of demographic factors would, therefore, be involved in estimating the quantitative and qualitative food requirement. In the case of qualitative requirements, there are two approaches:

- i. the amount of animal protein and the proportion of calories obtained from cereals and starchy roots can be indicative of the extent of qualitative food equation; and
- ii. the results of observed anthropometric measurements of children less than five years of age as compared with certain standard or reference groups can indicate the extent of qualitative nutritional status.

In the case of quantitative food requirement, the approach is different from the derivation of qualitative one. Food requirement is basically a fixed biological urge the status and variations of which are largely determined by demographic factors such as population size, age/sex structure being controlled for body weight /size and physical activity level. The requirement can only change quantitatively when individuals within the population structure change their occupational status and physical activities and when age/sex cohorts shift demographically from one age/sex group to the next or when certain physiological changes such as pregnancy, lactational process and child growth occur. For the estimates of food energy requirement, the Basal Metabolic Rate (BMR) Approach¹ is the basic methodology that enables to complement the total energy requirements of individuals.

1.4 Organisation of the Paper

In order to achieve the stated objectives, the paper is organised under four sections, including the introduction. Section 2 deals with the general assessment of food availability and the demographic responses to the situation in the households of the communities, whereas Section 3 will cover the extent of undernutrition and malnutrition in the sample households. Finally, Section 4 will present the conclusions, highlighting the salient features of the findings.

2. Demographic Responses to Food Availability

2.1 General Assessment of Type and Availability of Food in the Study Areas

The major crops grown in the study communities are cereal crops (wheat, barley, maize, sorghum and *teff*) and pulse (beans, peas and lentils). Table 1 presents the relative contribution of each cereal and pulse to total food production. This table indicates that cereals constituted about 95 percent of the total food production (i.e. 95.6 percent for the private farming households and 94.5 percent for the cooperative ones) and pulses accounted for about 5 percent. These results appear to be in consonance with estimates of the FAO/WHO (1961) Tedeg Debesu (1988) and Mulugeta W. Aregay (1986) which ranged between 80-90 percent of the total calories being contributed by carbohydrates.

Table 1: Percentage distribution of food production by type of crop, average yield per household (in quintals) and type of farming sector 1988/89

Type of crop	Private sector		Cooperative sector		Both sectors	
	Percent	Average per household	Percent	Average per household	Percent	Average per household
Cereals						
Wheat	52.9(3372.2)	9.6	74.1(7763.5)	24.1	66.1(11136.2)	16.5
Barley	26.4(1684.3)	5.6	16.7(1751.0)	5.4	20.4(3435.3)	5.5
Maize	9.3(590.9)	4.4	3.2(339.5)	1.3	5.5(930.4)	2.4
<i>Teff</i>	3.1(199.0)	1.9			1.2(200.)	1.9
Sorghum	3.9(248.0)	4.0	0.5(48.2)	0.2	1.8(196.2)	0.9
Subtotal	95.6(6095.5)	17.0	94.5(9902.2)	29.0	94.9(15997.7)	22.8
Pulses						
Beans	2.7(170.9)	1.1	2.6(273.8)	0.9	2.6(444.7)	1.0
Peas	0.8(53.8)	0.8	2.5(261.0)	0.8	1.9(314.8)	0.8
Lentils	0.9(57.5)	0.8	0.4(44.5)	0.3	0.6(102.0)	0.5
Subtotal	4.4(282.2)		5.5(579.3)	1.7	5.1(861.5)	1.2
Total	100.0(6377.7)	17.8	100(10481.5)	30.7	100.0(16859.2)	24.1

Notes: Figures in parenthesis show total production in quintals.

Source: Survey Results(1990).

2.2 Demographic Factors and Land Allocation Among the Households of the Communities

The information in the survey indicates that land had been allocated among the private farming households according to household size as follows: 2.50 hectares to households of 10 persons and over; 2.00 hectares to households of 6 to 9 persons; 1.75 hectares to households of 4 to 5 persons; 1.50 hectares to households of 1 person and 0.30 hectare for disabled/retired persons.

Information on land distribution among households of different number of children with less than 15 years of age was collected at household level for both farming sectors and the relationship is examined in Table 2. This table generally confirms that land allocation was positively related to number of children. Another salient feature is that the mean land area of the cooperative household is almost twice as large as that of the private household.

Table 2: Average land area (in hectares) per household by number of children and type of farming sector

Number of children	Private sector			Cooperative sector		
	Male-headed	Female-headed	Total	Male-headed	Female-headed	Total
0	1.36	1.11	1.21	2.64	1.93	2.54
1	1.32	1.15	1.24	2.58	2.57	2.58
2-3	1.36	1.24	1.32	2.52	2.33	2.48
4-5	1.59	1.43	1.56	2.61	2.51	2.60
6+	1.76	1.50	1.74	2.78		2.78
Total	1.45	1.20	1.37	2.59	2.39	2.55

Note: If any member of the cooperative uses land privately, its size was measured in *timad* and added to his/her share of the cooperative land.

Source: Survey Results(1990)

As presented in Table 3, similar patterns emerge when per capita food production was related to number of children. This table shows that the household per capita food production appears to increase positively with the increase in the number of children of a household, especially in the case of private farming households. The same table also manifests significant variations

in the household per capita food production between the two sectors where it is about 18 quintals for the private as against 31 for the cooperative households.

Table 3: Household per capita food production (in quintals) by number of children and type of farming sector 1988/89

Number of children	Private sector			Cooperative sector		
	Male-headed	Female-headed	Total	Male-headed	Female-headed	Total
0	16.4	8.3	11.6	33.2	22.1	31.5
1	16.3	8.4	12.6	29.4	32.7	30.1
2-3	19.0	14.7	17.6	30.1	28.7	29.8
4-5	21.6	20.7	21.4	33.2	31.5	33.0
6+	28.2	-	28.2	36.2	-	36.2
Total	19.8	12.6	17.8	31.6	29.6	30.7

Source: Survey Results (1990)

2.3 Demographic Responses to the Adequacy of Cultivated Land in the Communities

The relative shortage of cultivated land for food production in relation to the number of children in a household is examined in Table 4. Despite the fact that land has been allocated according to the size of households, this table indicates that the proportion of households which responded that currently cultivated land size has not been sufficient to feed their respective members, tended to increase with the increase in the number of children. For instance, the proportion of households responding that their cultivated land has been inadequate increased from 0.51 for households with no children, to 0.83 for households having six children and above in the case of private farming households. The same trends hold in the case of cooperative farming households. However, the proportions of households in the private farming sectors which responded that their cultivated land was insufficient for producing enough food for the household members appeared to be more than twice than those in the cooperative farming. This is consistent with the earlier observation on land allocation patterns between the two sectors.

Table 4: Proportion of households with inadequate cultivated land by number of children and type of farming sector

Number of children	Private sector			Cooperative sector		
	Male-headed	Female-headed	Total	Male-headed	Female-headed	Total
0	0.63(19)	0.43(23)	0.51(17)	0.24(17)		0.24(17)
1	0.66(38)	0.50(33)	0.59(71)	0.24(39)	0.08(31)	0.20(51)
2-3	0.86(91)	0.76(42)	0.82(133)	0.31(120)	0.26(31)	0.30(151)
4-5	0.84(68)	0.70(20)	0.80(88)	0.31(88)	0.33(9)	0.31(97)
6+	0.83(18)		0.80(18)	0.43(23)		0.43(23)
Total	0.87(234)	0.60(357)	0.73(357)	0.30(287)	0.24(52)	0.29(339)

Note: Figures in the parentheses are number of households.

Source: Survey Results (1990).

2.4 Demographic Factors and the Availability of Food Till Next Harvest

Experience can tell that food produced in one harvest has never been sufficient to last till the next harvest for most rural households in Ethiopia despite the fact that their whole efforts are directed towards this end.

In this paper interest will be focused on the influence of demographic factors on food production and utilisation. Analysis of the relationship between the number of children in a household and food shortage and the duration of the shortages showed positive correlation.

These relationships are presented in Tables 5 and 6. The proportions of households which responded to have faced food shortages before reaching the next harvest tended to increase with the increase in the number of children. For example, the proportion increases from 0.55 for households with no children, to 0.83 for households with six children and more in the case of private farming households and there appear similar patterns for the cooperative farming households (see Table 5).

Analysis of duration of food shortages also showed similar trends. As presented in Table 6, duration of food shortages tended to increase from about 12 weeks for households with one child, to about 17 weeks for households with six

children and over in the case of the private farming households, and from 10 to 13 weeks for the cooperative households, respectively.

Table 5: Proportion of households facing food shortages before next harvest by number of children and type of farming sector 1988/89

Number of children	Private sector			Cooperative sector		
	Male-headed	Female-headed	Total	Male-headed	Female-headed	Total
0	0.32(19)	0.71(28)	0.55(47)	0.35(17)	-	0.35(17)
1	0.66(38)	0.67(33)	0.66(71)	0.28(39)	0.17(12)	0.25(51)
2-3	0.68(91)	0.62(42)	0.66(133)	0.62(120)	0.42(31)	0.58(151)
4-5	0.79(68)	0.75(20)	0.78(88)	0.86(88)	0.56(9)	0.84(97)
6+	0.83(18)	-	0.83(18)	0.83(23)	-	0.83(23)
Total	0.69(234)	0.67(123)	0.69(357)	0.65(287)	0.36(52)	0.60(339)

Note: Figures in parentheses are total observations.

Source: Survey Results (1990).

Table 6: Mean number of weeks of household food shortages by number of children and type of farming sector

Number of children	Private sector			Cooperative sector		
	Male-headed	Female-headed	Total	Male-headed	Female-headed	Total
0	14.3	15.3	15.1	12.0	-	12.0
1	10.3	14.5	12.2	10.0	12.0	109.4
2-3	13.4	13.2	13.4	9.4	9.0	9.4
4-5	15.2	12.3	14.6	10.6	11.3	10.6
6+	17.4	-	17.0	13.0	-	13.0
Total	14.1	13.8	14.0	10.4	10.4	10.4

Source: Survey Results (1990).

Furthermore, households which experienced food shortages during the last 12 months, preceding the survey date, were asked whether or not they had taken any measures to ease their food problems. The heads of all surveyed households were asked to mention any three major sources of supplements to relieve their problems. The following are some of the major sources of supplements/assistances:

- receiving assistance from own children or relatives;
- borrowing in cash or in kind from neighbours, service cooperatives,
- traditional associations and traders;
- selling own animals and their products;
- selling firewood and other items (grass, dung, tubers, etc.);
- carrying on petty trading (local drinks, tea, etc.);
- other measures such as becoming daily labourer, guard, potter maker, etc.

The percentage distribution of the households receiving some sort of assistance during food shortages by number of children is presented in Table 7. This table also confirms that the need for getting supplements/assistance was directly proportional to the number of children in a household for both farming sectors. The proportionate increase for the male-headed households in the private farming sector appeared to vary from 21 percent for households with no children to about 94 percent for those having six or more children and as against 12 to 87 percent for the cooperative households. One striking point about female-headed households in the private farming sector is that very high proportions of them with less number of children were depending on some food assistance. For example, the proportions for households with zero to three children ranged between 61 to 70 percent. Their situation could be explained by the fact that these households were headed mostly by females of dissolved marriages and aged ones with high rate of disability.

The overall situation of food availability in the households indicated that only about 30 and 35 percent of the total male-headed households in the private and cooperative farming sectors respectively and only about 34 and 73 percent of the female-headed households were reported to have been self-sufficient during the preceding 12 months. This means that about 66 and 70 percent of the total female-headed and male-headed households, respectively, in the private farming sector and 27 and 66 percent of the total female-headed and male-headed households in the cooperative sector were reported to have faced food shortage and resorted to some sort of assistance or borrowing to overcome it. Their problems appeared to be positively correlated with the size of children in the household.

Table 7: Percentage distribution of households facing food shortages and needing relief assistance by number of children and farming sector

Number of children	Male-headed hhs			Female-headed hhs		
	Assisted	Well-off	Total	Assisted	Well-off	Total
Private						
0	21.0	79.0	100.0 (19)	60.6	39.4	100.0 (28)
1	60.5	39.5	100.0 (38)	69.7	30.3	100.0 (33)
2-3	68.1	31.9	100.0 (91)	61.9	38.1	100.0 (42)
4-5	85.3	14.7	100.0 (68)	75.0	25.0	100.0 (20)
6+	94.4	5.6	100.0 (18)	-	-	-
Total	70.1	29.9	100.0 (234)	66.4	33.6	100.0 (123)
Cooperative						
0	11.8	88.2	100.0 (17)	-	-	-
1	20.5	79.5	100.0 (39)	16.7	83.3	100.0 (15)
2-3	65.8	34.2	100.0 (120)	25.0	75.0	100.0 (32)
4-5	89.8	10.2	100.0 (88)	62.5	37.5	100.0 (8)
6+	86.8	13.2	100.0 (23)	-	-	-
Total	65.5	34.5	100.0 (287)	27.3	72.7	100.0 (55)

3. Estimates of Undernourished and Malnourished Households in the Communities

Some important clues about the supply of food availability and some demographic responses to the food situation in the communities are indicated in Section 2. This section attempts to estimate the magnitude of undernutrition and malnutrition.

The daily food energy requirement and intake of the total population of the communities were estimated to be 6,991.3 thousand and 6,317.2 thousand kilocalories, respectively, giving 674.1 thousand or 10.7 percent intake deficit from requirement. A direct relationship similar to the one in section 2 was also observed when the ratio between requirement and intake was considered as dependent variable and number of children in a household as independent variable. The relation is presented in Table 8 showing that the ratio increases from 1.06 for households with no children to 1.25 for households with six children and over in the private farming households and between 1.02 and 1.24 for the cooperative ones.

Table 8: Ratio of energy requirement to energy intake by number of children in a household and type of farming sector

Number of children	Private sector			Cooperative sector		
	Male-headed	Female-headed	Total	Male-headed	Female-headed	Total
0	1.044	1.066	1.057	1.018	-	1.018
1	1.095	1.029	1.064	1.020	0.931	.999
2-3	1.166	1.072	1.137	1.126	0.959	1.091
4-5	1.225	1.122	1.202	1.226	1.189	1.223
6+	1.256	1.156	1.246	1.236	-	1.236
Total	1.169	1.069	1.134	1.145	0.994	1.120

Source: Survey Results, (1990).

However, these ratios don't show the extent of undernutrition and malnutrition of the population. To this effect, estimates of the magnitude of the deficiencies were prepared using:

- Deficiency Risk Estimates (see Lorstad; n.d.);
- Critical values of undernutrition based on the Basal Metabolic Rate (BMR) concept (FAO/WHO/UNU, 1985:73-75; James, et al., 1990:32-33; UN University, 1989:8-12); and
- The Anthropometric Reference Values or Reference Population for Malnutrition (WHO:32-33; 1983:61, WHO; and Mason, et al., 1984:2-4).

When examination of the extent of undernutrition was made with respect to number of children in a household, the variability of the deficiency appeared to be very large. Table 9 depicts clearly the positive correlation between the proportions of undernutrition and the number of children, showing that the extent of undernutrition increases from about 31 percent for households with no children to about 88 percent for households with six or more children and the level of undernutrition is about 59 percent for both farming households. The results of the study are summarised and presented in Table 10 for the extent of undernutrition and Table 11 for long-term malnutrition.

Table 9: Demographic correlates of the extent of undernutrition for both private and cooperative households

Number of children	Nutritional Status			
	Total	Normal	Undernourished	Proportion
0	67	46	21	0.313
1	122	78	44	0.361
2-3	284	127	157	0.551
4-5	185	34	151	0.816
6+	43	5	38	0.884
Total	701	290	441	0.586

In the case of undernutrition, the magnitude ranges from about 63 percent, based on critical values, to about 69 percent, according to Deficiency Risk Estimates Method for households in the private farming sector, whereas it ranges from about 54 to 65 for households in the cooperative farming sector (see Table 10). Decomposing the status into mild and severe undernutrition for nutritional planning and programmes, the rates become about 55 percent and 8 percent for mild and severe undernutrition respectively for the private farming households and about 47 and 8 percent in cooperative farming sector.

Table 10: Estimates of the size of undernourished households in the communities by type of farming sector

Type of Farming	Extent of undernutrition in percent			
	DRE	Based on critical values		
		Mild	Severe	Total
Private				
- Male-headed households	74.3	57.6	10.3	67.9
- Female-headed households	59.3	48.8	4.0	52.2
Sub-total	69.2	54.6	8.1	62.7
Cooperatives				
- Male-headed households	70.0	50.0	8.7	59.2
- Female-headed households	45.7	24.5	3.6	29.1
Sub-total				
Both Sectors				
- Male-headed households	71.9	53.7	9.4	63.1
- Female-headed households	55.1	41.7	3.9	45.6
Total	67.6	50.6	8.0	58.6

Regarding malnutrition, interest was focused on long term episodes of child nutritional problems. Accordingly, as shown in Table 11, the magnitude of child malnutrition ranges from about 53 to 66 percent, on the basis of 2SD, in the case of children of private farming households and from about 52 percent to 68 percent for children of the cooperative farming households (refer to Table 11 for apparent tenure and sex differentials in the degree of nutritional deficiencies of the children).

Table 11: Proportions of malnourished children (in percent) based on height-for age variable by sex and type of farming sector

Type of Farming	Based on - 2SD	Based on 90 percent of reference medians	Total observations
Private			
Male Children	68.7	56.3	144
Female Children	63.0	49.3	146
Sub-total	65.9	52.8	290
Cooperatives			
Male-children	69.8	56.4	172
Female-children	65.9	48.0	179
Sub-total	67.8	52.0	351
Male-children	69.3	56.3	316
Female children	64.6	48.6	325
Total	66.9	52.4	641

Note: 2SD denotes Reference Median Value minus two Standard Deviations.

Source: Survey Results (1990).

Contrary to the assumptions and official statements that the areas under consideration were among the surplus-food-producing communities of Arsi Region, the nutritional status at the micro (household) level was found to be deplorable. It appeared to be more so for households with large family size. From this study, one can easily imagine the situation of other regions with subsistence production and traditionally prone to drought and famine and affected by war. In fact, different estimates (MOPED, 1992:34-35) showed that between 60-67 percent of the rural population of Ethiopia had faced "absolute poverty" in 1990/91. Based on the income distribution of rural households, available price index and cost of a kilogram of grains, Hadgu Bariagaber, (1995:3-14) estimated that the poverty level of rural households would be as high as 66 percent in 1992. Similar levels of poverty in the country were estimated by UNDP (1993:160-66,170-71), World Bank (1991:258, 1994:24) and

IFAD (n.d.:47). For example, some indicators of the food security situation in rural Ethiopia showed the following levels:

- 1,699 per capita calorie supply, which appears to be significantly lower than the recommended calorie requirement, ranging between 2,100-2,500 calories;
- calorie supply was estimated to fall short of calorie requirement by 73 percent;
- 64 percent of the total population is estimated to be in "absolute poverty".

4. Conclusions and Recommendations

4.1 Conclusions

Analysis of food availability in the communities has clearly shown that wheat and barley are the staple food items and constitute about 90 percent of the total food production, and 86 percent of the total cereal and pulses production. The results of the daily consumption survey has shown that 87.5 percent of the total food consumption consisted of cereals, mainly, wheat and barley, and only 12.5 percent is accounted for by pulses. Meat and dairy products were noted to be occasionally used by few households, for these items were observed to be luxury commodities and consumed at best during major feast days. Thus, the diet of the population has been unbalanced, being overdependent on cereals.

With respect to the relationship between population and food production, it was found out that family size was the most important criteria for allocating land among the private farming households of the study areas. This motivates households to increase family size. Though this land allocation system could be said to be socially desirable, it may go against the long-term objective of creating equilibrium between population and food resources.

The analysis has tried to reveal the demographic influences on food availability and utilisation in several ways. Two salient findings are:

- i. despite the fact that land allocation to households was directly proportional to family size as measured by number of children in a

Rural Poverty

A Consumption-based Measure of Poverty for Rural Ethiopia in 1989 and 1994*

Stefan Dercon and Pramila Krishnan

1. Introduction

Ethiopia has undergone substantial changes in the last five years. Politically, an alliance of guerrilla groups has overthrown the military government which had been in power since 1974, and the country has returned to relative security and peace after decades of civil war. Economically, a programme of reform has started, involving the removal of substantial taxation of the agricultural sector, market liberalisation and devaluation. Finally, a series of relatively good rainfall years have followed the 1980s, in which not only one of the worst recorded famines devastated substantial parts of Ethiopia, but even in subsequent years many harvest failures were recorded. In this paper, we try to assess what these changes have implied for rural Ethiopia, using data from two surveys. The first one has been conducted in 1989 in some vulnerable areas on the eve of the reforms, at the end of a sequence of poor harvests. The second one has been conducted on a larger scale in 1994, in different parts of northern, central and southern Ethiopia, but including the households surveyed in 1989. In this way, we have access to a unique longitudinal data set of households in some of the poorest areas in Ethiopia.

The objectives of this paper are, first, to establish a poverty line for 1989 and for 1994 which will allow the calculation of poverty measures for rural Ethiopia in each of these years. Since the sample of 1994 could be considered representative of the major socio-economic conditions in rural Ethiopia, a quantification of the present extent of rural poverty can be obtained. Secondly, we will investigate the changes in poverty between 1989 and 1994 amongst the traced households in the panel. The households considered are situated in areas which were vulnerable during the 1984-85 famine, and must be considered to

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belong to the lower parts of the wealth distribution in rural Ethiopia during the 1980s. Thirdly, some elements of a poverty profile will be presented to characterise the poor and those who have moved or stayed into poverty during the five years between the two surveys. Finally, since a considerable number of households was receiving food aid during the survey period, a simple evaluation of the effectiveness of this food aid is presented as well.

Methodologically, poverty analysis on the basis of micro-level data has made substantial progress in recent years. The use of intuitively appealing, additive and decomposable poverty indexes (Forster, Greer and Thorbecke, 1984) has given rise to substantial empirical evidence on the state and the nature of poverty in Africa, via poverty profiles (see Demery, Grootaert and Ferroni, 1993). Also, the analysis of the changes of poverty using large cross-sections has been initiated as well. A methodology to decompose these changes into growth and distributional effects has been proposed in this context (Ravallion and Datt, 1991; Ravallion and Hippi, 1992; Kakwani, 1991). Thus far, most of the analysis of poverty changes in Africa and elsewhere have been conducted on large cross-section data sets. The implication is that changes in poverty can only be considered in aggregate, without knowing who moved in or out of poverty. Implicitly, all changes in poverty within society are treated as uni-directional. For example, a decrease in poverty at the level of the society between two periods using a head-count index is treated as if it implies that some people moved out of poverty but the remaining poor are the same in both periods. Falling below the poverty line is therefore mainly treated as a permanent state. Very little evidence exists about the correctness of this view. To assess this one needs longitudinal data about the same households. Grootaert and Kanbur (1992) have looked at this at a descriptive level using the Living Standards Measurement Study (LSMS) data for Côte-d'Ivoire, which consist inter alia of a series of two-year panels between 1984 and 1988. They found substantial movements in and out of poverty, beyond the overall increase in poverty levels. This paper incorporates the cross-sectional type of analysis of the level and the changes in poverty, and the descriptive analysis of movements in and out of poverty.

2. Ethiopia in Recent Years

The Ethiopian economy is dominated by agriculture. At least 85 percent of its population lives in rural areas. Rural Ethiopia is characterised by substantial diversity in its farming systems. Westphal (1975) distinguishes four main groups. The first is the plough-cereal farming system in which *teff* is the main crop in most areas, and wheat and barley its main alternatives. It dominates most of the central and northern highland areas of Ethiopia. The second is the *enset*-based farming system, which is characterised by mainly permanent crops, of which *enset* (a root crop) is the main one, with, in some areas, also coffee or *chat* as cash crops. The system can be found, for example, in the densely populated areas of Gurage in Shoa and in Wolayta in Sidamo, but also in other areas. A third system is a hoe-cereal farming system, in which sorghum dominates, sometimes complemented with permanent crops such as coffee, or tubers and maize. It can be found in some drier highland areas, such as in Hararge or in some Southern areas. Finally, there is the pastoralist farming system, characteristic of the lowlands of Ethiopia, accounting for a not insignificant proportion of the rural population.

Recent history is full of occurrences affecting the rural economy. First, there have been the decades of armed insurgency, mainly (but not exclusively) affecting the Northern provinces. In 1974, the then emperor, Haile Selassie, was deposed and the regime of the *Dergue* began, which promoted Marxist-inspired policies. These affected the agricultural sector, first, through the beginning of the land reform in 1976, which for many people provided access to their 'own' land for the first time. This period also heralded the beginning of controls on agricultural marketing and increased taxation. In the 1980s they implied the forced delivery of a quota of cereals by farmers to a parastatal grain marketing agency, at prices well below the market prices, and substantial taxes on produce moved across regions. In 1984-85, one of the worst famines ever hit Ethiopia, and was followed by further disastrous conditions after several localised droughts.

In 1990, the total collapse of the economy, and the demise of the financiers of the government in Eastern Europe and the Soviet Union, triggered the start of a liberalisation programme. This involved the removal of food marketing controls and most of the agricultural taxation, including the quota system.

Nevertheless, this had little effect on the widespread smuggling of coffee and imports, and the booming black market, given the strong overvaluation of the exchange rate. In 1991, the *Dergue* was defeated at the hands of the Ethiopian Peoples' Revolutionary Democratic Front (EPRDF), a coalition of guerrilla movements, led by the Tigrayan Peoples' Liberation Front (TPLF). In September 1992, a devaluation of the Ethiopian birr by 145% heralded the start of a structural adjustment programme, with aims including the further liberalisation of the economy and a reduction of export taxation. By 1993, the start of limited foreign exchange auctions has eroded further the premium between official and parallel exchange rates.

Initially, the devaluation seems to have had no inflationary consequences. In fact, it was followed by *declines* in CPI¹. Urban food prices were, by 1993, at their lowest level in real terms since the 1970s. This is, however, mainly due to the much lower trading margins in the open market, following liberalisation. In surplus areas, prices have not declined: on the contrary, they improved (on this see Dercon, 1994). There is also some evidence that coffee is moving back into official marketing, even though the potential coffee quantities are likely to be far smaller than what is needed to strongly improve the trade balance (see Dercon and Ayalew, 1995). Nevertheless, during 1995 inflation has picked up, although the monetisation of the coffee boom foreign exchange may well have played a big part in this. In any case, the data used in this paper preceded the coffee boom and the increase in inflation².

Rainfall since 1989 has been normal or even better on average. In 1993/94 the main rains were somewhat less than normal, and the failure of the short rains in 1994 triggered the first drought shock for many years. Some densely populated parts of southwestern Shoa were worst affected because their vulnerability had been increased in the preceding year following cattle disease and pests; some northern parts were also affected. A quite speedy response from donors and government, and the timely arrival of the main 1994 rains, averted large scale tragedy, even though, during May and June, several thousand people died, made vulnerable by malnutrition.

The events since 1989 have had fundamental implications for the rural sector. In many ways, the rural economy faces quite different conditions at present from those in 1989. First, there has been the change in incentives to the agricultural sector. The devaluation has raised prices for exportable crops such

as coffee. Liberalisation and the abolition of the forced delivery system have increased the actual average prices received by farmers. These measures therefore increased incentives to produce more, without having fear of being taxed for higher productivity.

Another change was the end of the continuous land reform, under which households were, every year, at risk of losing to newly formed households. Consequently, even though land transactions are still illegal, better incentives (in particular better prices) exist to invest in own land to raise its productivity. Furthermore, the end of the civil war has resulted in a return to relative security. One important consequence is the possibility of gains from trade in goods and labour. These may however still be hindered by lack of infrastructure or delays in their repair after the war. Finally, since 1989, a series of normal or above normal rainfall years have occurred, at least until the rains in 1993/94, in contrast to poor weather in the late 1980s.

3. Background to the Rural Household Survey

During 1989, the International Food Policy Research Institute (IFPRI) conducted a survey in seven areas in different parts of Ethiopia. The sites were chosen on the basis of the fact that all reportedly suffered from the 1984/85 famine. In some form or another they all had been the beneficiaries of some national or international donor intervention during the famine years. Furthermore, they were chosen to have some regional, ethnic and agro-ecological diversity. The survey is discussed in detail in Webb, Von Braun and Yohannes (1992) and in Webb and von Braun (1994). In total, about 547 households were interviewed, even though complete information on consumption and wealth is only available for about 400 households.

The recent end of the civil war and the substantial changes in economic policy implemented in recent years imply that conditions are likely to have changed considerably. Nevertheless, the political turmoil has also meant that rural data collection by the Central Statistical Authority has for the time come to a standstill. In trying to fill this gap, the Centre for the Study of African Economies (CSAE), Oxford University, and the Department of Economics of Addis Ababa University decided to implement an in-depth rural household survey, as a first wave of a panel data set. To immediately have the start of a

panel, it was decided to include in the new sample the households interviewed by IFPRI in 1989. Since this survey was conducted just before the fundamental change in the economic and political situation, the data set will be unique to allow the study of the changes in rural Ethiopia following peace and liberalisation.

The ultimate aim of the study is to provide insights in the processes of the changes in wealth: why do some people stay poor and why do others get richer? The present paper only aims to provide a first glimpse about the type of wealth changes the analysis of wealth dynamics may have to explain.

Some characteristics of the 1994 survey are given below. First, the sample consists of 1,477 households in 15 areas of the country, including about 400 households interviewed by IFPRI (one of the 1989 clusters were pastoralists which have now moved to very different pastures; they were dropped from the sample; about 50 households were lost because of imperfect lists of names, i.e., no attempt could be made to trace them). The attrition rate between the 1989 and 1994 sample is approximately 7 percent.

No attempt has been made to have a 'representative sample' of rural Ethiopia and its more than 45 million people. Instead, a sample of clusters, representative of main agro-ecological zones in the country was drawn (see Bereket Kebede, 1994). Given the importance of agriculture, the problem of comparability of slightly different farming systems would encourage reasonably large clusters. Nevertheless, given the geographical spread over the main rural areas of Ethiopia, the sample is very likely to provide a very relevant, if not a representative picture of the state of rural Ethiopia. Random sampling has been applied within each site, and the number of households interviewed in each site was proportional to the population of the region relative to the national population. The panel sites include some of the poorest areas of the country. Consequently, it will be very suited to study changes in poverty over time.

The survey consists of three 'rounds' spread over an 18 month period. Each round consists of up to five hours of interviews, conducted in one-hour blocks during a period of several weeks. Enumerators are usually from the surrounding area and reside in survey sites during the field work. At present,

Table 1: Characteristics of the sample sites

Survey site	Location	Background	Main crops	Rainfall	Panel site
Haresaw	Tigray	Poor and vulnerable area.	Cereals	Bimodal	no
Geblen	Tigray	Poor and vulnerable area; used to be quite wealthy.	Cereals	Bimodal	no
Shumsheha	S.Wollo	Poor area in neighbourhood of airport near Lalibela.	Cereals	Bimodal	no
Korodegaga	Arsi	Poor cropping area in neighbourhood of otherwise quite rich valley.	Cereals	Bimodal	yes
Domaa	Gamo	Resettlement Area (1985); semi-arid; droughts in 85/86, 88/89, 90; remote.	Enset, maize	Unimodal	yes
Dinki	Gofa	Badly affected by famine in 84/85; not easily accessible even though near Debre Berhan.	Millet, <i>teff</i>	Bimodal	yes
Garagodo	N. Shoa	Densely packed <i>enset</i> -farming area; famine in 83/84; malaria in mid-88.	Barley, <i>enset</i>	Bimodal	yes
Adele Keke	Sidamo (Wolayta)	Highland site; drought in 85/86.	Millet, maize	Unimodal	yes
Imdibir	Hararghe	Densely populated <i>enset</i> area.	coffee, <i>chat</i>	Bimodal	no
Aze Deboa	Shoa (Gurage)	Densely populated; long tradition of substantial seasonal and temporary migration.	Enset, <i>chat</i>	Bimodal	no
Adado	Shoa (Kambata)	Rich coffee-producing area; densely populated.	Enset, coffee	Bimodal	no
Yetmen	Sidamo (Dilla)	Near Bichena; highland ox-plough, rich cereal-farming system.	maize, <i>teff</i> , sorghum	No clear pattern	no
Turfe Kecheme	Gojjam	Near Shashemene; ox-plough, rich cereal highland area.	Coffee, <i>enset</i>	Bimodal	no
Sirbana	S. Shoa	Near Debre Zeit; rich area, much targeted by agricultural policy, cereal, ox-plough system.	<i>Teff</i> , wheat and beans	Bimodal	no
Godeti	C. Shoa	Highland site; near town.	Wheat, barley <i>teff</i> , potatoes	Bimodal	no
Debre Berhan	N. Shoa		<i>Teff</i>	Bimodal	yes
Berhan			<i>Teff</i> , barley beans	Bimodal	yes

only data from the first round have been analysed, with an emphasis on 1,477 households in 15 sites.

Table 1 gives the characteristics of the sample sites. Details on the sites surveyed in 1989 can be found in Webb, von Braun and Yohannes (1992). Details on the new sites from the 1994 survey can be found in Bereket Kebede (1994) and in Table 1.

4. The Construction of the Poverty Line

Broadly speaking, the methodology described in Ravallion (1993) has been used. First, all the consumption information, including the consumption from own production and stocks, was expressed in money terms. In the 1994 survey, in each site a separate price survey was implemented in the nearby markets at the same time of the expenditure and consumption survey, and those prices could be used to value subsistence consumption. In 1989, such a survey was not implemented, and Central Statistical Office data were used, rather than within sample price information.

Secondly, consumption per household was rescaled to take into account the household size and composition. Adult equivalent units (AEU) were derived for each household, and used to calculate consumption per adult equivalent. Data provided by the World Health Organisation was used to convert household members of different age and sex into equivalent male adults³.

Thirdly, a representative diet for a poor household was derived. This is not without problems. Since poverty lines are essentially tools to allow comparisons of welfare across households and regions, one would like to construct a diet for the poor which is identical for all households. For example, it is often found that urban households consume far more expensive nutrients than rural households, even if they have access to the same commodities in the urban market. In other words, urban *tastes* are often far more expensive. But should this mean that urban *needs* are more expensive, so that we should put a poverty line for urban areas much higher to pay for this more expensive diet? The answer is probably no (see for discussion, Ravallion and Bidani (1994)). However, across rural areas in Ethiopia there are important cultural differences which cannot easily be dismissed. In particular, in *enset*

areas (such as in the sample in Gurage, amongst the Gedeo, or in Kembata), a diet based on *enset* and not on *teff* or cereal substitutes is consumed. Further investigation suggested that *enset* is a cheaper calorie source at present than a cereal-based diet. Nevertheless, it is extremely rare to find in other areas much *enset* consumption at all, especially in more central or northern areas of the country. These dietary differences seemed too important to dismiss and therefore two different diets are used: one for the three areas in which consumption of *enset* is very important (Imdibir in Gurage, Aze Deboa in Kembata and Adado near Dilla) and another for all other areas⁴.

The two diets were based on the average consumption pattern amongst the lower half of the consumption distribution in the sample. For these diets the relative contributions of the different food items in terms of calories were calculated. These are given in Table 2. Following Ravallion (1993), these caloric contributions were used to construct a diet that yields 2200 Kcal per adult, which is the minimum needed for an adult to perform normal daily duties, as suggested by WHO.

The typical diet in the sample for the poorer half of the consumption distribution included also some items with low caloric value, but which consistently entered for most of the households. It was decided to add the average quantities for the lower half of the consumption distribution for the following items to the minimum diet per month: 0.34 kg coffee, 0.1 kg sugar, 0.15 l vegetable oil, 0.7 kg salt, 0.25 kg *karia* and 1.45 l *tella*. Coffee and *tella* (a traditional form of beer) may by some be considered as 'luxuries'. Nevertheless, in Ethiopia they are important items, fulfilling a social and cultural function, which could not easily be forgone by the poor to save money. The final baskets of commodities used for each of the two areas are reported in Appendix 1. The minimum caloric diets plus the few additional items form the minimum consumption baskets. The costs of these baskets were calculated for 1994 using the data supplied by the price survey mentioned above. The cost of the 1989 diet was obtained using regional price data from the Central Statistical Office.

Fourthly, the problem of what to do with non-food consumption in the poverty line has to be tackled. The cost of the minimum food basket would provide a 'food consumption poverty line', and can be interpreted as 'absolute poverty': households whose total expenditure is below this, do not ('cannot')

spend enough to provide minimum food consumption (irrespective of whether they actually spend all on food, or whether they also buy some non-food items).

Table 2: Caloric composition of diet of the poor (percentages)

Calorie source	Cereals areas	Enset areas
Cereals	86	13
Pulses	11	8
Enset + potatoes	2	77
Vegetables	0	1
Milk	1	1

Table 3: Poverty lines in 1989 and in 1994 (in Birr per adult per month)

Region	Site	1994		1989	
		Food	Total	Food	Total
Tigray	Haresaw	37	44		
Tigray	Geblen	44	51		
N. Shoa	Dinki	35	43	22	26
N. Shoa	Debre Berhan	36	44	21	26
Gojjam	Yetmen	37	48		
S. Wollo	Shumsheha	39	44		
C. Shoa	Sirbana Godeti	34	47		
Hararghe	Adele Keke	46	60	24	32
Arsi	Korodegaga	41	49	22	26
S. Shoa	Shashemene	34	43		
Gurage	Imdibir	26	33		
Kembata	Aze Deboa	27	35		
Sidamo	Adado	28	35		
Wolayta	Garagodo	44	57	18	23
Gamo Gofa	Dorffaa	45	58	22	28

The poverty concept used in most of the analysis will however follow Ravallion (1993) and add some sum to the minimum food basket to obtain 'a cost of minimum basic needs'. The approach in Ravallion and Bidani (1994) is followed to find the non-food share of those people whose food consumption is exactly sufficient for basic food requirements, through estimating an Engel-curve, correcting for household characteristics and with regional dummies to account for relative price differences. The estimated minimum non-food

expenditure was added to the minimum cost of the food consumption basket to obtain the poverty line used in this paper. Table 3 reports the poverty lines for each site and year. The poverty lines range from about Birr 33 to 35 per adult per month in 1994 for the three *enset* areas, Birr 43 to 51 per adult per month for most of the central or northern areas, about Birr 57 to 58 per adult per month for the remote areas near the border between Gamo Gofa and Wolayta and about Birr 60 for the Hararghe site. In 1989, the poverty line is estimated between Birr 23 and 32 per adult per month, suggesting close to a doubling of the cost of living for the poor in most areas between 1989 and 1994. These poverty lines were used to identify the poor and the intensity of poverty in each year. In two cases (Domaa and Garagodo in 1989), no total expenditures were available from the 1989 data, but only food expenditures. For those villages, the cost of the minimum food basket was used relative to food expenditures whether households were poor or not.

Note that the poverty lines implied are quite low. In dollar terms, this means only about \$5 to \$10 per adult per month, well below measures of poverty suggested by the World Bank of \$30 per month per person (or \$1 per day). Also, poverty lines used on LSMS data sets by the World Bank suggest to use 2/3 of mean consumption as the poverty line, which, in our sample, would imply about Birr 69 per adult per month. Consequently, our poverty measures will be minimum poverty levels, especially compared to studies on other countries.

5. Measures of Poverty in 1994

Using the consumption per adult equivalent data and the poverty lines obtained, three poverty measures were calculated: the head-count index (P_0), the poverty-gap index (P_1) and the Foster-Greer-Thorbecke measure of intensity of poverty (P_2). These indexes are calculated using the formula:

$$P_a = \int_0^z \left(\frac{z-y}{z} \right)^\alpha \cdot f(y) dy$$

with α equal to 0, 1 and 2 for P_0 , P_1 and P_2 respectively, with y equal to consumption per adult equivalent, z equal to the poverty line and $f(y)$ the

density function of consumption per adult⁵. Effectively, P₀ simply counts the number of poor in the sample. Since this does not give any information about the depth of poverty, P₁ is given as well, measuring the average share of the minimum standard of living which the poor are lacking—in other words, it is a measure of the transfers needed to bring the poor to a minimum level of consumption. Finally, P₂ measures the intensity of poverty by squaring the transfers needed, so that very poor households are given a larger weight.

In Table 4, the poverty indexes for 1994 are given for each site in the entire sample. To facilitate the interpretation we have also given them according to broad geographical areas.

Table 4: Poverty indexes in 1994

Region	Site	P ₀	P ₁	P ₂	Sample*
Tigray	Haresaw	0.20	0.07	0.04	84
Tigray	Geblen	0.62	0.24	0.12	66
N. Shoa	Dinki	0.46	0.15	0.07	87
N. Shoa	Debre Berhan	0.14	0.03	0.01	183
Gojjam	Yetmen	0.12	0.02	0.00	59
S. Wollo	Shumsheha	0.16	0.03	0.01	148
C. Shoa	Sirbana Godeti	0.08	0.02	0.01	96
Hararghe	Adele Keke	0.10	0.04	0.02	97
Arsi	Korodegaga	0.61	0.26	0.13	109
S. Shoa	Shashemene	0.14	0.05	0.03	101
Gurage	Imdibir	0.12	0.02	0.00	67
Kembata	Aze Deboa	0.09	0.01	0.00	75
Sidamo (Dilla)	Adado	0.15	0.04	0.02	130
Wolayta	Garagodo	0.76	0.38	0.22	96
Gamo Gofa	Domaa	0.60	0.23	0.12	72
ETHIOPIA	all sites	0.27	0.10	0.05	1470
<i>In summary:</i>					
Northern Highlands (Tigray, Wollo)		0.28	0.09	0.04	298
Central Highlands (Gojjam, Shoa)		0.19	0.05	0.02	425
Enset Areas (Gurage, Kembata, Sidamo)		0.10	0.04	0.02	272
Wolayta, Gamo Gofa		0.45	0.20	0.11	168
S. Shoa, Arsi		0.39	0.16	0.08	210
Hararghe		0.10	0.04	0.02	97

* Number of households sampled minus households with incomplete consumption data; this applied to seven households in the entire sample.

In the total sample, about 27 percent of households fall below the minimum consumption level. However, as argued before, one should be very careful to treat it as an exact measure of poverty on the national level or to compare it with results from studies in other parts of the country or the world. Nevertheless, they give an impression of the differences in poverty in different areas and, for particular *woredas* and villages, they are likely to be reliable.

The poorest areas are in Wolayta and Gamo Gofa, in parts of Tigray and in the area considered in Arsi, with 60 percent or more of the population having insufficient consumption levels. Some villages are also relatively rich, such as the one near Debre Zeit, Aze Deboa in Kembata or Adele Keke in Hararghe, with less than 10 percent of the population being poor. Some villages show less poverty than one would have thought a priori, such as the area near Lalibela or Geblen in Tigray. As it turned out, substantial levels of food aid were distributed there and we will return to its contribution to these results above.

These results are very sensitive to the type of poverty line used and to facilitate the interpretation with results from other studies, we calculated poverty also using some alternative measures as proposed in the literature. Table 5 gives the results. First, instead of adult equivalent scales, per capita consumption levels are used. Since household size in numbers will (virtually) always be larger than household size in equivalent male adults, the resulting consumption levels will be lower. Applying these data to the (absolute) poverty lines calculated above gives a poverty of 34 percent. Secondly, one could use calorie-intake (on the basis of the quantity data) and check whether, per adult equivalent, 2,200 calories are being consumed. Those below this level are characterised as poor. The resulting figure is 39 percent of the population. Thirdly, an alternative introduced by Greer and Thorbecke (1986) is applied to calculate poverty using the food expenditure level spent by the marginal household consuming exactly 2,200 calories. To control for measurement errors, a regression was implemented with the log of calorie-intake per adult equivalent as an explanatory variable for the log of food consumption expenditure per capita. The resulting poverty line was Birr 45.8 per adult per month and poverty implied by this poverty line was 42 percent. Next, we used a poverty line regularly used by researchers working on the LSMS by the World Bank (e.g. Boateng, et al. (1991) on Ghana). They take households consuming less than 2/3 of mean per capita consumption in the sample as being poor, combining relative poverty concepts with some absolute levels, albeit taking from within

the sample. This implies in our sample a poverty line of Birr 58.2 per month per person. Applying this line on the per capita consumption data yields 47 percent of the population as poor. Finally, the poverty line proposed by Ravallion and others in World Bank comparative studies suggests \$1 per person per day. Using the official exchange rate prevalent at the beginning of 1994, this implies a poverty line of about Birr 150 per person per month. Since mean per capita consumption is only Birr 87 per month in the sample, the resulting poverty level is 85 percent.

Table 5: Rural poverty using some alternative measures

	Poverty line	Proportion of poor %
Absolute poverty using adult equivalents	Birr 30-60	27
Absolute poverty using per capita consumption	Birr 30-60	34
Calorie poverty using calorie data	2200 Kcal	39
Food poverty using food expenditure for minimum calories	Birr 46	42
Poverty as below 2/3 of mean per capita consumption	Birr 58	47
Poverty as below \$1 per day per person	Birr 150	85

6. The Effect of Food Aid on Poverty

At present, substantial food aid is being distributed in the country. In many of the sites during the survey, agencies were distributing food aid. For example, Relief Society of Tigray (REST) was distributing relief food in Geben (Tigray), while the Ministry of Agriculture (MOA) runs food-for-work projects in the same area. RED BARNNA had food-for-work projects in Garagodo (Wolayta). In Shumsheha (Wollo), the Ethiopian Orthodox Church had relief food distribution (up to 44 kg per person) and also employs farmers in food-for-work. The Relief and Rehabilitation Commission (RRC) was also active in relief food distribution in the same area, providing free and non-targeted food aid. At least four other agencies (World Vision, Dutch SNV, MOA and DICAC) are active in the same *woreda* in Wollo.

In the data it was possible to distinguish the source of the food consumption and especially whether it was obtained as food aid (directly or as part of food-for-work). As it turns out, the effects of food aid or food-for-work in some of

the poorer areas are quite dramatic. Calculations for poverty with and without food aid are given in Table 6 for seven of the poorest villages. Overall, poverty in the sample was reduced by a fifth through food aid: before food aid it stood at 34 percent, and declined to 27 percent after food aid⁶.

As Table 6 shows, substantial reductions in poverty and the extent and intensity of consumption poverty can be attributed to food aid in Haresaw (Tigray) and Shumsheha (Wollo) and to a lesser extent in Korodegaga (Arsi) and Geblen (Tigray). It is also striking that some very poor areas such as Dinki in North Shoa or the Wolayta areas were not receiving any substantial amounts of food aid. Note that the date of data collection was in the latter areas a few months before the worst months of the 1994-crisis in the areas. These results suggest substantial problems in reaching all poor and vulnerable areas, although if food aid is given, it results in substantial improvements in consumption levels. Whether one can call this a 'reduction in poverty' in any long-term sense is of course questionable.

Table 6: The effect of food aid and food-for-work on consumption and poverty

	P ₀			P ₁			P ₂		
	Before	After	Change (%)	Before	After	Change (%)	Before	After	Change (%)
Haresaw	0.61	0.20	-67	0.25	0.07	-72	0.15	0.04	-73
Geblen	0.80	0.62	-23	0.41	0.24	-41	0.26	0.12	-54
Dinki	0.46	0.46	0	0.15	0.15	0	0.07	0.07	0
Shumsheha	0.36	0.16	-44	0.15	0.03	-80	0.09	0.01	-89
Korodegaga	0.81	0.61	-25	0.45	0.26	-58	0.28	0.13	-53
Garagodo	0.78	0.76	-3	0.40	0.38	-5	0.23	0.22	-4
Domaa	0.60	0.60	0	0.23	0.23	0	0.12	0.12	0

Although food aid has a substantial effect on poverty in the areas it is distributed, it definitely does not lift all households above the poverty line. One reason may be that the poor are not systematically reached. In Table 7, some indicators of the effectiveness of targeting the poor are given. First, the percentages of the poor and non-poor receiving food aid are given (using poverty measures calculated using consumption excluding the food aid given). As can be seen a lot of 'non-poor' are receiving food aid, although usually a higher proportion of the poor receive the aid than the non-poor. Note that only in Shumsheha more than 90 percent of the poor receive aid. In Geblen a third of the poor is missed, while in Dinki, Garagodo and Domaa the numbers

are virtually negligible. The amounts received per person per month (expressed in value terms) also show the substantial leakage of food aid away from the poorest. Only in Haresaw in Tigray (where World Vision and the Ministry of Agriculture are active), somewhat more food aid per adult was given to the poor than to the non-poor. In Geblen and Korodegaga targeting appears to be lacking. Shumshaha is clearly a remarkable case. It appears that more than 90 percent of all inhabitants get food aid in one form or another (probably from the Church or the RRC) in quite substantial levels (although, in quantity, less than in Haresaw). The virtual absence of targeting may paradoxically contribute to the high number of the poor obtaining food aid (and thereby helping more of them and reducing consumption poverty more).

Table 7: The effectiveness of targeting the poor

Site	% Receiving aid		Amount received (in birr per adult per month)	
	Poor (%)	Non-poor (%)	Poor	Non-poor*
Haresaw	80	52	36	31
Geblen	64	54	14	41
Dinki	3	0	0	0
Shumshaha	94	89	25	29
Korodegaga	73	76	16	23
Garagodo	9	5	1	3
Domaa	0	0	0	0

* The percentage of poor and non-poor households is calculated on the basis of the data *without* food aid.

7. Poverty Changes in Panel Households

The 1994 Ethiopian Rural Household Survey also allows us to obtain some findings about the changes in poverty in the period since 1989. In six areas, i.e., Garagodo, Korodegaga, Domaa, Adele Keke, Debre Berhan and Dinki, consumption data are also available for the two periods on a total of 352 households. Note that these areas represent not only some of the poorest but also some of the richest areas in the 1994 survey. In Table 8, we give the incidence of poverty and the measures of size and intensity of poverty for the households in both periods.

The overall picture is one of a decline of poverty in this period, at least on the basis of the consumption-based measures of poverty used above. In particular, in the entire sample, poverty went down by 24 percent using the head-count index and up to 50 percent using measures of intensity of poverty. The largest decline can be observed in Adele Keke, with a decline of more than 70 percent, followed by strong improvements in Debre Berhan. It is striking that both these areas were also in the better league in 1989 than some of the others. Garagodo and Dinki showed very little or no change using the head-count index, although important declines in the severity of poverty could be observed in both places. Korodegaga also showed an improvement, but looking at the data in Table 6 it can be seen that was virtually entirely caused by food aid; otherwise the incidence of poverty would have remained the same. In short, poverty has not been increasing since 1989 in these areas, at least comparing the two snapshots. The extent of the decline has nevertheless not been universal and a stagnation in poverty levels has occurred in at least two of the areas. Adele Keke has definitely benefited from the boom in *chat* production, while the improvements in Debre Berhan may be due to the effect of extension services by the International Livestock Centre for Africa which operates in the area. The other areas remain clearly in a quite desperate situation.

Table 8: Poverty indexes across panel households 1989-1994

Site	P0			P1			P2			Sample
	1989	1994	Change (%)	1989	1994	Change (%)	1989	1994	Change (%)	
Dinki	0.48	0.48	0	0.13	0.13	0	0.06	0.05	-17	54
Debre Berhan	0.23	0.13	-43	0.07	0.02	-71	0.03	0.00	-62	62
Adele Keke	0.48	0.14	-71	0.15	0.04	-73	0.07	-0.02	-71	42
Korodegaga	0.78	0.61	-14	0.43	0.26	-40	0.29	0.13	-55	88
Garagodo	0.86	0.84	-2	0.52	0.44	-15	0.36	0.26	-28	56
Domaa	0.86	0.58	-33	0.49	0.24	-49	0.32	0.14	-56	50
All sites	0.63	0.48	-24	0.31	0.20	-35	0.20	0.10	-50	352

8. Movements in and out of Poverty

Underlying these declines in poverty is a significant growth of consumption in real terms. In Table 9, we present average consumption growth between 1989 and 1994 for the households in the panel⁷. Also, we give the number of households experiencing real consumption growth in that period.

Overall, consumption grew by an average of 39 percent over the period. Two-thirds of the sample experienced consumption growth. Mean consumption growth is dominated by important increases in Debre Berhan and Adele Keke, but also somewhat surprisingly in Domaa where consumption grew but not enough to bring more people out of poverty. In all sites, the majority of people saw their consumption grow, although in Adele Keke this is most widespread.

Table 9: Consumption growth (in real terms) 1989-94

	Mean consumption growth (%)	% in sample with growth in consumption
Dinki	17	57
Debre Berhan	69	65
Adele Keke	93	84
Korodegaga	4	61
Garagodo	13	57
Domaa	69	68
All sites	39	64

While overall consumption growth has allowed a large number of households to grow out of poverty, the substantial number of households facing real consumption decline may well have implied people moving into poverty. This is investigated in Table 10. The table gives the number and proportion of the sample that stayed poor in both periods, stayed non-poor in both periods, became non-poor in 1994 or became poor in 1994. It shows that despite a large decrease in poverty, some households moved, during the period, under the poverty line⁸. Note also that a large number of households crosses the poverty line in 1994 in both directions: despite a large decrease in poverty, some households became poor. In particular, 12 percent of the sample has moved below the poverty line in 1994, while 36 percent was poor in both periods. Of

the sample, 26 percent moved over the poverty line to become non-poor in 1994, while 26 percent was non-poor in both periods. This is an important result: substantial movements have taken place in the relative position of households in this five year period.

Table 10: Movements in and out of poverty

All sites	Poor 94	Non-poor 94	All
Poor 89	36% (128)	26% (92)	48% (220)
Non-poor 89	12% (42)	26% (90)	52% (132)
All	37% (170)	63% (182)	100% (352)

10. Some Aspects of a Poverty Profile

In this final section, we will try to give the main characteristics of the poor in the sample as well as some more details on those in the panel. In Table 11, we have provided some descriptive statistics on the poor and the non-poor in the 1994 sample, on household demographics, labour, land and livestock ownership. In the table we have also given the significance of t-tests on the mean differences (using two-tailed test assuming unequal variances in sub-samples). Poor households appear to be characterised by larger household size, mainly due to more children up to 15 years of age. The poor also have heads of household who are significantly older and more often female: in fact, more than a quarter of the heads of households of the poor are females. The educational level is also significantly higher for the non-poor although it remains low in general.

Livestock is an even more pronounced difference between the poor and the non-poor: although the difference in the number of households owning oxen or bulls is not very large (albeit significant at 5 percent), in terms of value, the non-poor own 50% more oxen and bulls and even almost double if one counts all types of livestock. They also cultivate significantly more land (about a quarter) and obtain more often land from others via sharecropping or renting. In short, poverty in Ethiopia is characterised by lower assets in terms of land and livestock and smaller supply of labour relative to the number of dependants.

Table 11: Characteristics of the poor and the non-poor

	Non-poor	Poor	T-test on mean differences
Household size	5.8	6.5	**
Male adults	1.7	1.6	
Number of adults	3.5	3.4	
Children < 5 years	0.8	1.0	**
Children 5- 15 years	1.7	2.1	**
% female-headed households	20%	27%	**
Age of household head	46	48	*
% head with prim. educ.	11%	4%	**
Oxen/bulls value (birr)	692	437	*
Percentage owning oxen	53%	47%	**
Livestock value (birr)	2003	1076	**
Cultivated land (ha)	1.7	1.4	**
% sharecropping	18%	12%	**

Note: * and ** indicate 1 and 5 percent levels of significance, respectively.

Next, we will investigate the characteristics of the panel households in terms of the different groups implied by the movements around the poverty line. In Table 12, the characteristics are compared between those remaining poor in both years, those becoming poor in 1994, those becoming non-poor in 1989 and those remaining non-poor in 1994.

Within the six panel sites, household size, and especially the number of children up to the age of 15, seems to be a characteristic of households remaining poor, but not for those becoming poor in 1994. Female-headedness seems higher for both those remaining poor and those becoming poor in 1994. The latter also seem to have relatively fewer male adults, while those moving above the poverty line seem to have especially more male adults.

Land and the value of livestock (or oxen and bulls) clearly suggests a division in three, with those moving up or down having quite similar land and livestock holdings. The bottom group of households being poor in both years has a much lower land and livestock holdings and the top group a much higher endowment of both land and livestock. Those moving up or the 'permanently' non-poor also sharecrop or rent land more often.

Comparing the 'permanently' poor and the 'permanently' non-poor, the same conclusion can be reached as when describing the profile of poverty in the entire 1994 sample: poverty is characterised by low land and livestock endowments, and a relatively high dependency ratio within the household. The 'transitory' group, i.e. those moving up and down the poverty line does not have very different livestock and land endowments. Those who moved up seem to have a relatively better labour position, in terms of male adults and male head of household, compared to the dependent children, than the households who moved into poverty in 1994. Their relative lack of sufficient land and livestock holdings (although much better than the permanently poor) may then be a cause of vulnerability in terms of fluctuating household consumption, influenced by the present household structure⁹.

Table 12: Characteristics of the panel households by change in poverty status

	Poor 89, Poor 94	Non-poor 89, Poor 94	Poor 89, Non-poor 89	Non-poor 89, Non-poor 94
Household size	7.4	6.6	6.9	6.2
Male adults	1.8	1.7	2.0	1.8
Number of adults	3.9	3.7	3.9	3.4
Children < 5 years	1.0	0.7	0.9	0.8
Children 5- 15 years	2.4	2.3	2.2	1.9
% female-headed households	18%	21%	14%	12%
Age head of household	46.5	48.0	46.5	48.8
% head with prim. educ.	4	2	4	1
Oxen/bulls value (birr)	456	801	750	1106
Percentage owning oxen	61	64	65	76
Livestock value (birr)	1050	2256	2889	4113
Cultivated land (ha)	1.8	2.6	2.6	3.3
% sharecropping	7%	10%	16%	24%

This interpretation is however preliminary. It is established in this paper that poverty remains high in Ethiopia with important variability across regions. Also, a substantial reduction of poverty could be observed since 1989. Nevertheless a significant number of households moved below the poverty line. The descriptive statistics reported in this last section can only be the start of much more substantive work to understand these dynamic processes.

NOTES

1. Better than normal rains played a role in this, but given the state of the economy before the devaluation, the result was not very surprising (see on this Collier and Gunning, 1992).
2. Subsequent data collection (two rounds) has been completed and, in the near future, results on poverty changes since 1994, using these data, will become available. It will also allow an evaluation of the coffee-boom effects on the rural economy.
3. This is not an ideal approach, but calculating household equivalent scales directly from the data is cumbersome. Deaton (forthcoming) has suggested that it may not be worth the trouble, although in due course the results will be checked with estimated equivalent scales, including corrections for scale economies for the household.
4. We found that in two other villages, i.e., Domaa in Gamo Gofa and Garagodo in Wolayta, potatoes and sweet potatoes were quite substantial in the diet compared to other areas. However, the cost of the diet turned out to be virtually the same if one used the general cereal-based diet or if one used a specific representative diet for the two villages.
5. In analysing the extent of poverty, it would generally be preferred to use individual rather than household data. Clearly, they are not available. In practice, results are often presented by reweighing the data according to household size as an alternative, but this makes the (misleading) assumption that consumption is evenly distributed within households.
6. There is of course a methodological flaw in the argument. If food aid had not been forthcoming, households are likely to have changed their consumption and savings pattern to cope as well as possible. Consequently, consumption levels are likely to have been slightly higher if this behavioural responses would have been accounted for. Another issue is to control exactly for sales of food aid and the expenditure effects of this increased incomes. In the questionnaire, questions were specifically asked about the consumption of food aid in the recall period. This should control for double-counting of the revenue from sold food aid (i.e. the value of the food aid plus the value of the goods bought by the sale of food aid). Of course, respondents' errors cannot be excluded, especially, since in other modules, they were not very forthcoming to discuss the sale of food aid.
7. We use the poverty line as a deflator.
8. This result may be somewhat misleading since consumption in 1994 is after food aid was received. However, if one checks those moving up and down using consumption before food aid, the picture does not change a great deal. Food aid 'caused' less than 4 percent of the panel households to move out of poverty and helped 1 percent to stay out of poverty.
9. This result changes somewhat if we exclude movements out of poverty via food aid (i.e., use poverty levels excluding food aid). Then the group moving up has the same oxen ownership although more livestock in total, but in land terms it has now somewhat less than those moving into poverty. Labour characteristics remain however clearly different.

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APPENDIX 1

Minimum food requirements for poverty line giving 2,200 kcal
(per month per adult)

	Cereal	Enset
Cereals (in kg)		
<i>Teff</i>	1.70	0.35
Barley	4.85	0.80
Wheat	3.15	0.46
Maize	4.48	1.01
Sorghum	2.67	0.00
Pulses (in kg)		
Horse Beans	1.29	0.72
Cow Peas	0.23	0.34
Chick Peas	0.69	0.63
Vegetables (in kg)		
Gommen	0.38	1.49
Onion	0.20	0.41
Root Crops (in kg)		
Potato	1.51	0.18
<i>Enset</i>	0.19	26.54
Other Necessities (in l or in kg)		
Milk	0.55	0.61
<i>Tella</i>	1.45	1.45
Coffee	0.34	0.34
Sugar	0.10	0.10
Salt	0.70	0.70
Oil	0.15	0.15
<i>Karia</i>	0.25	0.25

Measuring Wealth and Poverty in Rural Ethiopia: A Data-based Discussion

Philippa Bevan and Bereket Kebede

1. Introduction

This paper is about the conceptualisation and measurement of rural poverty and wealth in areas where subsistence farming dominates. We start from the position that there is no one right way to define and measure poverty, or its obverse, wealth. Useful definition depends on the problem in hand while measurement is as much a practical matter as a theoretical one. What the paper is intended to do is to provide material to deepen our understanding of the parameters of rural poverty. This material can also be used to construct a range of poverty measures or indicators, and to explore how they relate to each other and to other relevant variables.

We believe it is useful to focus on the problem from two distinct viewpoints. The first approaches poverty as a personal experience which may occupy all or parts of an individual's lifetime. The focus is on individuals as actors or agents involved through time in a range of social relationships. At any point in time an individual may be viewed as the "embodiment" of past experiences of advantage and deprivation (or as possessing "personal capital"). Some of these embodiments can be "objectively" measured relatively easily, as for example nutritional status, health, and longevity. Others, such as skill, knowledge, personality, and motivation, are harder to measure. Through their lifetimes individuals have access to different kinds of resources some of which are material, and some of which involve relationships (informal and formal) with other people.

Poverty defined as experience is a subjective and relative matter, and from this perspective we are interested in developing measures based on local definitions of poverty and wealth which are meaningful to the people involved. What forms of "capital" do they regard as most important and how does this vary between farming systems and cultures? What coping strategies do different groups adopt in relation to their particular circumstances. To what extent is there mobility (both intra- and inter- generational) between richer and poorer

categories? This viewpoint focuses attention on the dynamic aspects of rural poverty: for example, seasonality, "annuality", life cycle influences, and shocks all have effects on lifetime poverty and wealth experiences. Analyses in this framework tend to focus on diversity, and the kind of information they generate is particularly relevant for policy interventions at micro and meso levels.

Our second viewpoint changes the focus from people in relationships to features of the economic and social systems which produce, reproduce and change the conditions in which they live. To analyse these complex structures it is necessary to simplify. To date such analysis has tended to be rather narrowly economic. Rural economic poverty has usually been defined as the bottom end of some distribution: it may be consumption, income, assets or other resources (such as access to health and education services). Measurement generally takes place at household level and the data generated is usually used in conjunction with other household data to analyse determinants of household poverty (and wealth), or it is aggregated to give regional or economy-wide measures of poverty for purposes of macroeconomic analysis and policy recommendation. Such measures are also used, along with aggregated measures of personal capital (such as morbidity rates, percentage of population at school, etc.), to make international comparisons. For these purposes poverty measures need to be comparable across farming systems, rural and urban economies, cultures etc. although this is very often hard to achieve in practice.

While this discussion starts from the first of these viewpoints, and moves towards the second, our longer-term aim is to broaden both of them and to contribute to closer integration in future. With this in mind we use qualitative and quantitative data from 15 areas in rural Ethiopia to pursue five goals:

1. to explore definitions of household poverty and wealth in the 15 areas and highlight some key common features;
2. to compare community views of what constitutes poverty and wealth across farming systems and cultures and highlight some major differences;
3. to construct new community-defined measures of poverty/wealth for each of the households in the household survey samples drawn in ten of the rural areas;

4. to use these measures to compare local views of inequality across some of the rural areas; and
5. to compare this community measure with other poverty indicators constructed from survey data collected from the same households.

Before turning to the substance of the paper we will briefly describe the research on which it is based.

2. The Rural Research

Our findings are based on an economic household survey and a community wealth-ranking exercise conducted in 15 rural sites in Ethiopia during 1994/5.

The sites: A brief description of the major features of the farming system is contained in Table 1.

The wealth-ranking: Site managers prepared a card for each of the households in the survey sample. The managers were asked to select three sets of rankers: one richer, one average, and one poorer. They discussed local concepts of wealth and poverty to ensure participants understood what they were being asked to do. Ranking was done either by groups or individuals. Rankers sorted the cards into piles ordered in terms of wealth/poverty (they could choose the number of piles). The manager then gave them the opportunity to change the number of piles or the location of any of the households. The number of piles the rankers had chosen, together with the pile number of the particular household, was recorded on each household card for each set of rankers. The rankers were then asked to explain why they had allocated each household to the pile they had chosen¹. In ten sites the rankers gave particular reasons for each household which the manager recorded. In the other five the rankers gave general reasons for each of the wealth groups they had isolated.

The household survey: In addition to the wealth-ranking, structured questionnaires were administered to the 1,500 households covered in the wealth-

Table 1: The fifteen rural sites

Site	Agriculture	Terrain/ soil	Subsistence crops	Main cash sources	Technology and infrastructure
Adele Keke Kersa Near Harar	cereals, <i>chat</i> potatoes rich	flat hills <i>woyena dega</i>	maize sorghum wheat, barley, millet, lentils field peas	<i>chat</i> , potatoes, cattle sheep, goats	oxplough, PA linked to Dire Dawa, Alemaya (7 km), Harar by main road
Sirbana Godeti Adaa Near Debre Zeit	cereals (<i>teff</i>) pulses vegetables rich	flat <i>woyena dega</i> <i>lem</i>	<i>teff</i> , wheat, beans, maize chickpeas, sorghum barley	<i>teff</i> , wheat, cattle, meat, milk, sheep, trade	oxplough, PA next to main road to Debre Zeit (1 hour walk)
Yetmen Enemayi Gojjam	cereals, especially <i>teff</i> and wheat rich	flat <i>woyena dega</i> <i>lem</i>	<i>teff</i> , wheat, maize, lentils chickpeas	<i>teff</i> , wheat, cattle, milk, skins, sheep, wool bees, trade some migration	oxplough, PA linked to Bichena (15kms) and Dejen (17kms) by all-weather road
Turufe Kechema Shashemene	cereals, diversified rich	flat <i>woyena dega</i> <i>lem</i>	<i>teff</i> , <i>dagusa</i> , millet, barley, maize, wheat horsebeans, potato, <i>enset</i> vegetables	potatoes, maize, wheat barley, <i>teff</i> , cattle, milk, butter, goats, sheep, eggs trade, baskets	oxplough, PA linked to Shashemene by 10kms allweather road and 2-4 kms dryweather road
Debre Berhan (four peasant associations)	cereal producing self-supporting	flat <i>lem/lemtaf</i>	barley, peas, horsebeans wheat, linseed	dungcakes, sheep, goats cattle, milk, butter crops (if harvest is good)	oxplough 4 PAS in the vicinity of Debre Berhan
Adado Bule Near Dila	coffee-growing <i>enset</i> rich	mountainous <i>woyena dega</i> <i>lem</i>	<i>enset</i> , barley, maize, beans, cabbage	coffee, fruit, <i>enset</i> , cattle sheep, goats, trade, migrate for land, goldmining	hoe/few oxplough. The nearest big town is Dila (23km) on dryweather road. Nearest town 5 km.
Aze Deboa Kembata	cereals and permanent crops, very mixed	flat and hilly <i>woyena dega</i>	<i>enset</i> , wheat beans, barley <i>teff</i> , sorghum peas, potatoes <i>gommen guderie</i>	cattle, butter, cheese, eggs, sheep, goats, <i>gesho</i> eucalyptus, <i>chat kocho</i> , coffee, trade migration	hoe/oxplough, An allweather road links Aze Debo'a to Durame (4 kms) and Hosaina.

Imdibir Cheha	<i>enset</i> *		<i>enset</i> , maize potato <i>gommen</i>	cattle, sheep, bananas, oranges, coffee, eucalyptus, trade, spinning, pottery	hoe / rare ploughing. The PA is on the all-weather road between Hosaina and Wolkite
Harresaw Tigray	cereals formerly rich but now vulnerable to famine	flat, slopes <i>woyena dega</i>	barley, wheat, lentils, <i>genfo tuffulo</i> , beans peas, cabbage	cattle, milk, sheep, goats, salt trade migration to Eritrea and Saudi Arabia	oxplough, There is a dry- weather road to Atsbi (1and 1/2 hours on foot)
Korodegaga Near Sodere	cereals bordering nomadic vulnerable to famine	flat <i>kola</i> erosion	maize, <i>teff</i> barley, wheat haricot beans millet, beans peas, vetch	selling firewood cattle, goat, sheep	oxplough, was irrigation PA linked to Dheera by dirt road and Awash Malkaasa by a raft over Awash
Shumsheha Wollo	cereals famine for the last ten years	flat <i>kola</i>	<i>teff</i> , chick-peas, lentils sorghum, barley, peas, linseed	spinning, basket work, selling <i>tella</i> and <i>araki</i> , selling firewood, migration for agricultural wagelabour	oxplough, The PA is on the dry-weather road from Lalibela to Woldia, near airport and new all-weather road
Geblen Tigray	cereals vulnerable to famine	on escarpment <i>dega</i> <i>taf</i>	barley, maize <i>teff</i> , cactus (wild food) wheat (aid or buy)	goats, cattle, sheep (few) casual labour in town migration to Tigray, Eritrea	oxplough, 3 hours walk from Adigrat, water and soil conservation techniques
Dinki Near Ankober	cereals bordering nomadic vulnerable to famine	hilly gorges <i>kola</i> erosion	<i>teff</i> , sorghum maize, banana, sugarcane	cattle, sheep, goats, animal products, spinning, yarnmaking, weaving	oxplough, irrigation, <i>wereda</i> capital is 24 km from village
Domaa Daramalo Gamo Gofa	cereals resettlement village vulnerable to famine	flat <i>kola</i> <i>lem</i>	maize, sweet potato, <i>teff</i> <i>goderie</i> banana	cotton, weaving, spinning, trading, cattle, milk, butter	irrigation, oxplough, nearest town of Wacha is 20 minutes walk
Garagodo Wolayita	<i>enset</i> and cereals vulnerable to famine	flat <i>woyena dega</i>	maize, sweet potato, <i>teff</i> cassava, <i>enset</i> potato, yam soybeans vegetables bananas, oranges	trading, food for work, migration to Awash to harvest cotton, butter coffee, cattle, goats sheep	oxplough, spade and axe, densely populated area

ranking. As an integrated household survey, the questionnaire covers different aspects of the households' activities and in order to capture seasonal variations the whole field work of the survey was done over three rounds which cover a whole year. These are the major parts that were included in the first round questionnaire: household demographics, education, changes in household composition, mortality, asset ownership, credit, non-food expenditure, non agricultural activities, vulnerability, land and its use, inputs, crop outputs and sales, recall on previous harvests, land rented to other households, livestock ownership, recall on livestock ownership, livestock expenditure and income, health status, illness and visits for treatment, breastfeeding, anthropometrics, consumption habits, food expenditure and consumption, energy, water and household consumables and female business activities.

Many of the variables in the questionnaire are related to the wealth of the household. Amount of land, oxen and assets owned, income generated either from agricultural or non-agricultural activities can help us know about the wealth of the household. One alternative for assessing the wealth of households is to use these variables. In addition, other variables which influence the levels of income and wealth such as educational level and labour available for the household, are also incorporated in the questionnaire.

In the household survey, unlike wealth ranking, the respondents are mainly household heads. This introduces a different type of bias than that of wealth ranking (the survey being self-reporting and the latter evaluation by others).

In the next section we will report on the definitions of wealth by local people.

3. Local Definitions of Wealth and Poverty Arising out of the Wealth-ranking

The reasons given by wealthrankers for allocating each household to the chosen category were listed and coded. In this section we classify these reasons under different "wealth" headings and use this classification to suggest new analytical and measurement categories useful for understanding rural poverty and wealth. A summary of the 15 major headings these reasons seemed to fall under is given in Table 2. The frequency with which these reasons are mentioned is considered

later. Here we are concerned to look at the conceptual categories that arose during the wealth-ranking process.

Table 2 shows that, in addition to the usual factors of production —land, capital (in this case often livestock), and labour — people living in rural communities have a concept of wealth which includes non-economic factors. These can be considered under the headings of social capital (e.g. ox-sharing, dependency, family structure, getting remittances), political capital (e.g. political office) and cultural capital (e.g. management skills, female head, inherited land)². Access to these different kinds of resources tends to go together since one kind of capital can often be used to acquire another. All forms of capital require the investment of time and often of other resources as well.

Table 2: Reasons for wealth and poverty provided by wealthrankers

General category	Features
1. Land	Size; Quality; Rents land in/out; Landless
2. Farm and household management	Technical skills; Personal behaviour; Other characteristics; Motivation; Management skills; Non-farmer
3. Farm labour and human capital	Non-family labour; Family labour; Motivation of labour; Education of labour
4. Crops	Cash crops grown; Quality of crops; Crop problems; Subsistence crops
5. Livestock	Oxen owned; Income from cattle; Ox-sharing; share-ploughing and ox-renting; Cattle/livestock; Death; theft and disease; Livestock other than cattle
6. Off-farm income	Rents; Trade; Migration; Extra-household income; Off-farm productive business; Off-farm service business; Employment; Remittances; Children
7. Income and consumption	Income from sales; Overall income; Consumption
8. Assets	Quality of house; Other assets
9. Savings and credit	Savings and credit
10. Social security	Has dependants; Is dependent; Has no-one to depend on
11. Social mobility	Inheritance; Mobility and immobility
12. Life and farm cycle effects	Young/new farmer; Returnee; Lack resources to farm; Oldage; Household no longer in Peasant Association
13. Life events and problems	Illness; Disability; Death; Other problems; Luck
14. Family characteristics	Large family; Small family; Female head; Polygyny
15. Political power	Political office; Political influence; Status

Social capital: Under this heading one can include both intra-household and extra-household factors. Within the household it is not only the composition of the membership that is important but also the skill with which their activities are co-ordinated and their goals harmonised. The organisational structure and management of the household have consequences for the production of goods and services and the production and reproduction of people (who are, or will be, the labour force). Inter-household relationships are important for non-market exchanges (land, labour, oxen) and for support in times of crisis and dependency. Through them people build trust and obligation. Maintenance of social capital requires investment in social relationships, organisation and networks.

Political capital: Rural communities have both informal and formal political structures. Local rural politics are often factional. The formal political structures provide access to extra-community resources, while access to the informal structures (which are not mentioned by the wealthrankers) provides a greater voice in collective decision-making and implementation which may affect individual welfare. For example, community level information not included here suggests that political capital was important in land allocation during the time of the Dergue. Now, local decisions as to whether, and in what way, people who do not have it get access to land (e.g. by inheritance, use of communal grazing, share-cropping, removal from people who cannot pay land tax etc.) are the result of political processes.

Cultural capital: Under this heading are included knowledge, information, values, beliefs, norms, rights and obligations. People have differential access to some of this capital — such as knowledge, and benefit differentially from other aspects such as commonly held norms and values. Relevant institutionalised forms of cultural capital include religion, formal and informal education, rules governing working times, etc. Status in the community derives from valued attributes and behaviour, involves relationships of deference and derogation which may have economic implications, and carries obligations as well as rights. In rural areas it is very important to "belong" and this usually means obeying local norms and rules even if they are not immediately in one's self-interest. The threat of expulsion from the community is a major sanction ensuring investment in cultural capital.

4. Differences in Definitions of Wealth and Poverty Between 10 Rural Sites

In Appendix 1 we show how forms of economic and non-economic capital are valued differently in different farming systems and cultures. Appendix 1 is based on the wealth-rankings done in 10 of the rural areas. In these sites the rankers identified reasons for the ranking of each household individually. These reasons were coded for each household at each of the sites and then aggregated under the 15 headings already described. The percentage of responses falling under each of the headings was then calculated for each site.

In aggregate, the most important basis for wealth-ranking are farm-related factors: most reasons given relate to livestock, followed by land, farm and household management, labour, then crops in that order. There is considerable variation between sites. Livestock is most important in Korodegaga, followed by Debre Berhan, Shumsheha, then Domaa. Land is most important in Adele Keke, followed by Imdibir and Domaa (where it is irrigated land that matters). Farm and household management is mentioned as important in Sirbana Godeti. Reasons relating to labour are the highest relative proportion of farm-related reasons in Korodegaga. In Adele Keke nearly 30 percent of the reasons given related to crops (*chat* quality usually), in Imdibir almost 18 percent of reasons are related to crops, but in other sites reasons related to crops were rarely mentioned.

The second most important basis for household wealth-ranking are non-economic factors. For the 10 sites the relative frequencies of mention of the different reasons were: (1) family-related; (2) related to life events; (3) to do with life-cycle factors; (4) to do with prior poverty/wealth; and (5) to do with politics. Family reasons were prominent in Dinki and Sirbana Godeti. In Shumsheha poverty and wealth were strikingly associated with life events. There was a concern with mobility in Yetmen. Life-cycle reasons were mentioned most frequently in Turufe Kecheme and Dinki. In six sites the wealth status of a few households was associated with politics.

Non-farm economic factors are mentioned least frequently as reasons for allocating wealth status. Off-farm income is mentioned most frequently followed by social security factors. Off-farm income is most important in

Table 3: Information on the wealthranking in the 15 rural areas

Rural area	Type of wealth ranker			No of ranks			Correlation			No of initial groups	No of final groups
	WR1	WR2	WR3	WR1	WR 2	WR 3	WR1/WR2	WR2/WR3	WR1/WR3		
Adele Keke	group	group	group	6	4	5	0.78	0.76	0.77	38	6
Sirbana Godeti	group	group	group	3	3	3	0.76	0.95	0.80	7	3
Yetmen	indivi d	individ	individ	3	3	3	0.92	0.89	0.88	7	3
Turufe Kecheme	group	group	-	5	5	-	0.85	-	-	9	5
Debre Birhan:											
Fagy and											
Bokafia	individ	individ	group	2	3	2	0.13	0.49	0.33		
Karafino	individ	group	group	2	2	2	0.35	1	0.35		
Koremargefia	individ	group	individ	2	3	3	0.73	0.85	0.69		
Milki	group	group	individ	3	3	3	0.80	0.89	0.82		
Adado	group	individ	group	4	4	4	0.5	0.49	0.32	10	5
Aze Debo'a	group	individ	group	4	3	4	0.66	0.65	0.63	11	3
Imdibir	group	individ	individ	3	3	3	0.68	0.81	0.78	7	3
Harresaw	group	group	group	4	4	5	0.75	0.73	0.75		
Korodegaga	group	group	group	4	3	3	0.66	0.74	0.71		
Shumsheha	individ	group	group	3	3	3	0.53	0.72	0.75		
Geblen	group	individ	group	3	4	3	0.59	0.47	0.63		
Dinki	group	group	group	3	3	3	1	1	1		
Domaa	group	individ	group	5	4	5	0.78	0.86	0.84	14	6
Gara Goda	group	individ	group	4	3	3	0.72	0.67	0.62		

Imdibir. Social security aspects are cited most frequently in Dinki, followed by Yetmen. Assets are mentioned in five of the 10 sites; most frequently in two of the poorest sites, Dinki and Shumsheha. Savings are mentioned most frequently in Domaa (referring to food stocks) and then in Yetmen and Debre Berhan (usually referring to cash). Consumption is rarely mentioned anywhere.

5. Community Measures of Wealth and Poverty

Using the wealth-ranking data a community measure of wealth/poverty for each household was constructed in eight sites (the remaining seven will eventually be included). There were considerable variations between sites in the number of groups that were isolated and the numbers of households allocated to each group. Table 3 shows the variation between sites in numbers of groups isolated and the correlation of ranking between rankers. Households in seven sites were wealth-ranked by three rankers; in Turufe Kecheme there were only two rankers. The rankings did not always coincide. Variations may be attributed to different reasons: (1) the rankers used different criteria; (2) the rankers isolated a different number of wealth groups; or (3) the household was not well-known to one or more of the rankers. The meaning of each score can be easily assessed given the information available for each household at each site. For example, in all sites a score of 100 ensues when each ranker puts the household in the poorest group. In most sites the lowest score reflects agreement by the rankers that the household is in the richest groups. The exceptions are idiosyncratic and require particular explanations by looking at the different reasons given by each ranker. So far it has proved possible to construct a meaningful number of wealth/poverty groups for each of these sites into one of which each household can be placed, using the information as to which group each of the rankers had allocated the household, plus the reasons they gave for the allocation. Cases where there was irreconcilable disagreement (e.g. Ranker 1 said the household had a large amount of land, while Ranker 2 claimed it had little land) were allocated to a group which was characterised as "not well-known in the community".

6. A Comparison of Local Views of Inequality Across Eight Rural Areas

Table 4 describes the community wealth scores that were worked out for eight of the sites and shows the distribution of households among the wealth categories.

Table 4: Social stratification in eight sites

Rural Area	Groups	Major Features*	% of sample in group	% "poor"
Adele Keke	1 richest	very large size of land; good quality <i>chat</i> ; some have 2 oxen; some have fertile land; some hardworking	10	45
	2 rich	large size of land; good quality <i>chat</i> ; some hardworking	10	
	3 middle	enough land; most have good quality <i>chat</i> ;	20	
	4 poor	small size of land; less quality or no <i>chat</i> ; some have large households, or no husband, or are old	15	
	5 poorest	very small size of land; less quality or no <i>chat</i> ; no husband or old or sick	30	
	6 not well-known	disagreement about ranking	15	
Sirbana Godeti	1 rich	enough oxen; enough land; inherited land; leases land; sharecrops land in; rents out oxen; ox-fattening; strong farmer; enough sons; lends money; help from (educated) children; hard worker; trader; wise use of money; additional off-farm income; sells <i>tella</i>	22	59
	2 middle	doesn't plough; only 1 ox; being female; works at mill; sick; no helper; old age; a lot of children; unwise use of money; drunker; wife died; not enough oxen; very large family; cannot manage family	20	
	3 poor	no ox; not enough or no land; rents land out; very lazy; drinker; smoker; extravagant; being female; large family; lazy wife; lazy oxen; sick children; divorced; no helper	59	

Yetmen	1 rich	owns land; sharecrops (lots of) land in; strong farmer; uses enough fertiliser; good harvests; (very) hard worker; good manager; wise use of money; hires labour; lots of oxen; crossbred cows; beehives; cash savings; moneylender relatively good income; off-farm income; owns land; uses some fertiliser;	18	
	2 middle	doesn't use enough fertiliser; can manage in bad times; enough farmworking kids; enough livestock; a few livestock; small household; new household	30	
	3 poor	land shortage; sharecrops land out; landless; works less hard; extravagant; no labour; no livestock; usually needs credit; dependent	52	52
Turufe Kechemba	1 rich	many livestock; inherited land and wealth from before Revolution; off-farm income; share-rents land in; hardworking; was PA/ <i>wereda</i> official; good at using income; enough male labour; keeps farming seasons	14	
	2 average	good farmer; good house manager; has leprosy; hardworking; recent farmer; large family; extravagant; 2 families; enough labour; enough land;	20	
	3 poor	enough farm but less male labour; lazy, drinker, smoker; large family/ies; less land; new household; old; sick; female-headed; gets remittances; no male labour; returned from army;	25	
	4 very poor	not enough land; rents land out for cash/ share-cropping; no oxen; new farmer; old; sick; no male labour; lazy	27	64
	5 very very poor	gives land to sharetenant; no oxen; lazy; no male labour; very old, female-headed; ill	12	
	6 not well-known	disagreement about ranking	2	

Adado	1 rich	have many plots; saving in the form of cash; have sufficient coffee/ <i>enset</i> ; have sufficient clothes; do not borrow; galvanised iron roofs; can use effectively what they have; produce many products and sell some; employ daily labourers	7	54
	2 middle	fewer plots than rich; cannot overcome problems of coffee berry disease; less coffee and <i>enset</i> than rich; have sufficient land; work day and night to compete with rich farmers; able to manage household; do not borrow; roof made of thatch (sometimes galvanised iron)	24	
	3 poor	a very small plot; inadequacy of farm product for food consumption; employed in SC coffee milling; work for individuals; do not have savings and exposed for borrowing; roof of <i>enset</i> leaves	23	
	4 very poor	no land and food consumption; employed in coffee milling; employed in local households and town for daily food consumption; or go to Shakiso goldmining; unable to borrow since have no collateral; house of twig and <i>enset</i> leaves; those who are drunkard; those who are going to steal if there is a possibility	31	61
	5 not well-known	disagreement about ranking	15	
Aze Deboa	1 rich	cultivate large size of land; head and children engaged in off-farm activities; own more livestock; get remittances	12	61
	2 middle	cultivate more land and own more livestock than group 3 but less than group 1; business activities smaller than group 1	27	
	3 poor	cultivate less land; own fewer livestock or none at all; some returned from resettlement; some landless; land less fertile; some are dependent	61	

Imdibir	1 rich	was/is engaged in trade; large land; large cash crops; large family; was/is government employee; inherited large land; hires labour; fertile land; have livestock;	13	
	2 middle	medium-sized land; receives remittances; grows cash crops; works hard; off-farm income; land fertile	30	
	3 poor	small plot of land; medium plot but large family; has lost land; land less fertile; no man in household; sick; concentrates more on wage; lazy wife; old	57	57
Domaa	1 very rich	more livestock ; provide oxen to many households as sharecropping arrangement; own irrigated land; large amount of food stocks and cash savings ABOUT 5 FARMERS IN PA: NONE IN SAMPLE	0	
	2 rich	more livestock (about 10), irrigated land; fertile land; enough family labour; sharecropper by providing oxen; very hardworking; large cash saving;	12	
	3 middle	occasional trading in livestock; off-farm income fewer livestock; 1 or no ox; irrigated land; hardworking; drunk; extravagant; off-farm income; some own non-irrigated land	9	
	4 poor	young household; no irrigated land; landless; irrigated land sharecropped out; sick; lazy; no livestock; old; land not fertile; large family; livestock death	19	
	5 very poor	female-headed household; too old to work; no livestock; dependent; sharecropping for oxen; hardworking; very large family; landless; new settler; land fallow; wage labour; selling firewood	51	70
	6 not well-known	disagreement about ranking	8	

* Not all these apply to all households.

7. Community and Household Measures Compared

This section of the paper is based on the household survey data. We are neither using all the information available nor have we employed rigorous econometric or statistical procedures. Therefore, the results are preliminary. It is presented here to give an idea of how the community score might be used in conjunction with the survey data.

Comparing the wealth ranking with data from the household survey is a useful exercise. While the information from the household survey gives us what we may call an "objective" measure of income and wealth, the wealth ranking gives us the perception of community members about wealth and income distribution. This comparison on the one hand informs us which correlates of wealth are more observable and on the other it helps us to examine the reliability of the data generated in one way by counter-checking it with the other.

In this section, first we will compare poverty profiles generated by using consumption data with wealth ranking results. Then, we will relate the wealth strata defined by people involved in wealth ranking with correlates of wealth recorded in the structured questionnaire.

7.1 Comparing Poverty Profiles From Household Survey and Wealth Ranking

Dercon and Krishnan (see paper in this volume) divided the sampled households into two groups (poor and non-poor) by using a poverty line determined by the level of income needed to cover a certain level of food and non-food consumption. Here we will compare this classification with that generated by wealth ranking.

The measure used by Dercon and Krishnan (henceforth P_o) gives the percentage of households, falling below the poverty line (the poor). But the wealth ranking (community measure) divides them into different groups; the number of strata being different in some of the sites.

To compare the two results we cross-tabulated the number of households in the poor and non-poor groups by using the P_o measure with the number of

households in the different wealth strata (the first strata by wealth ranking is the richest). The results are given in Table 5 below.

One problem in comparing the wealth ranks and the Po measures is the fact that consumption of food may not be very transparent (outsiders may not have much information on the household's consumption). But as wealth and income increases, consumption may become more conspicuous. This seems to be suggested by the results in the table. As shown in the table, in the predominant percentage of cases those in the higher wealth ranks are also in the non-poor group by the Po measurement.

Table 5: Cross tabulation of number of households by Po measures and wealth ranking (percentage in brackets)

Sites		Stratum				
		1	2	3	4	5
Sirbana Godeti, Adaa n	Non-poor	21(100.0)	17(89.5)	49(87.5)		
	Poor	0	2(10.5)	7(12.5)		
Imdibir, Cheha	Non-poor	6(66.7)	12(60.0)	22(57.9)		
	Poor	3(33.3)	8(40.0)	16(42.1)		
Adele Keke, Kersa	Non-poor	9(90.0)	10(10.0)	17(89.5)	14(100)	25(86.2)
	Poor	1(10.0)	0	2(10.5)	0	4(13.8)
Turufe Kechma, Shashemene	Non-poor	12(92.3)	19(95.0)	22(91.7)	19(73.0)	7(63.6)
	Poor	1(7.7)	1(5.0)	2(8.3)	7(26.9)	4(36.4)
Domaa, Dargmalo	Non-poor	0	6(66.7)	4(57.1)	2(14.3)	13(35.1)
	Poor	0	3(33.3)	3(42.9)	12(85.7)	24(64.9)
Adado, Bule	Non-poor	7(77.8)	23(69.7)	17(56.7)	25(67.6)	
	Poor	9(42.8)	10(30.3)	13(43.3)	12(32.4)	
Yetmen, Enemay	Non-poor	11(100.0)	17(94.4)	26(83.9)		
	Poor	0	1(5.9)	5(16.1)		
Aze Deboa, Kedida Gamela	Non-poor	8(88.9)	15(75.0)	34(75.6)		
	Poor	1(11.1)	5(25.0)	11(24.4)		

When we go to the lower wealth ranks, except in the case of Domaa, the percentages of households which are non-poor is far greater. This most likely reflects the relative affluence of the sites considered. Most of the sites, may be with the exception of Domaa and Aze Deboa, are relatively well-off implying that even the poor are capable of covering their basic food consumption needs.

Apart from the above observations, it seems that there are no other significant patterns emerging.

7.2 Wealth Ranks and Correlates of Wealth

To relate the wealth ranks to the variables that appear in the questionnaire, we considered the following: age of household head, whether the household is female-headed, the value of household assets, education of the household head, number of persons in the household, off-farm income, number of oxen and bulls owned by the household, total land used by the household, income from different crafts, income from female business activities (like selling *tella*, dung, etc.), and income from livestock. We calculated the averages of these variables for the households that are found in the different wealth ranks for five sites (Sirbana Godeti, Adele Keke, Yetmen, Imdibir and Adado). The major observations are (we have not presented the means and standard deviations here because they are too long):

- i. In all the sites, on the average female-headed households are considered to be poor. This may reflect the perception of the respondents ("a woman without her man is weak") or may be related to the fact that the absence of an adult male "really" matters.
- ii. In all the sites, the number of people in households is positively related with wealth. This may imply, at least in the perception of the respondents, that labour is crucial.
- iii. Except in the case of Sirbana Godeti, the number of oxen and bulls owned by household heads increases with wealth. This implies that oxen are important status symbols in different farming systems even if they are not used as a source of draught power (in *enset* farming systems).
- iv. With the other variables, we do not see any clear pattern emerging. But an interesting fact about female business activities is that in Yetmen and Adele Keke income from it is generated only by the lower wealth ranking

households. But in the case of Adado, income from female business activities increases with wealth. Female business activities seems to play a highly differentiated role in generating income in different farming systems.

8. Conclusions

On the basis of our analysis of the data so far we can draw a number of conclusions:

1. In all sites personal, social, political and cultural capital are important dimensions of wealth and poverty.
2. There are variations between sites in the forms of economic capital that are valued. Within communities different social groups depend differently on different forms of capital: for example for the old, sick and some female-headed households social capital is of vital importance.
3. There is social differentiation within most communities which groups and individuals recognise. The number of categories recognised within different communities varies widely: from one in Dinki to five in three sites. While differentiation is greater in two of the richer sites (Adele Keke and Turufe Kecheme) it is also high in Domaa (which is very poor). Conversely, Yetmen and Sirbana Godeti, both relatively rich sites, differentiate people into only three groups. In all sites there are people who are regarded as poor or very poor and in most sites these are in the majority.
4. Questions about wealth and poverty in household surveys may not always be answered truthfully. In particular the wealthy may have incentives to hide their wealth. There is likely to be cultural variation.
5. There is a question about when consumption should be used as a measure or indicator of poverty. The great advantage is that, with the correct adjustments, it is comparable across sites. Disadvantages include the fact that the measure is very sensitive to how the questions are put, it is very hard to make the correct adjustments for seasonality differences, prices, nutritional requirements, etc. and the judgement about where the poverty line should be drawn is left to external observers. It may not correlate strongly with subjective aspects of poverty — people might choose to eat less than outside

observers think they should without considering themselves poor or being considered poor within their communities. Other indicators may be more useful depending on the purpose of the investigator.

6. For some purposes rigorously-conducted wealth-ranking (at least three groups; all households in a community/area; individual reasons for the placing of each household) may produce more reliable community-level data on wealth and poverty more cheaply than household surveys. Additional questions on seasonality, mobility, etc. could be added.

This is a very preliminary paper which has not made use of major parts of the household and community data. We are now in a position to use the two sets of data together to explore in a number of directions. For example, of particular interest to economists is the fact that the wealth codes and measures can be added to the variables used in broader analyses of the household survey data. They will be particularly relevant for studying local determinants of poverty. Future household surveys at community level can be informed by similar wealth-ranking exercises, while future household questionnaires about rural poverty and wealth could be extended to include measures of social, political and cultural capital. Sociologists will be interested in extending the analysis of inequality, stratification and social mobility within the 15 rural areas, making comparisons between them, and locating them in the broader economic and social structure.

Finally we should say that it is not sufficient to analyse wealth and poverty only at household level. Individual poverty may occur within "wealthy" households and vice versa. Within economies there are inequalities at higher levels: spatially between communities and regions; spatially and socially between urban and rural areas; socially between elites and the rest. And the location of economies/nation-states within wider unequal global structures is a fundamental determinant of poverty.

NOTES

1. Depending on how the question was put in the local language answers might be construed as describing what it was about the households that qualified them for that group (i.e. a local *definition* of poverty) or as describing the reasons why the household was in that group (i.e. a local *explanation* of poverty). Social scientific discourse suffers from the same

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definitional problems - discussions of what actually is poverty, what are its correlates, determinants, causes etc. may be illuminating but, given that poverty is an "essentially-contested" (i.e. value-ridden and politically loaded) concept, they are never conclusive.

2. A fifth type of capital involving violence and fear (coercive capital) was not mentioned by wealthrankers and is not discussed here.

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Abbildung 1

Appendix 1

Wealth-rankers reasons for household rankings by site

	Farm-related factors (% of reasons)				Non-farm economic factors (% of reasons)						Non-economic Factors (% of reasons)				
Site	Land	Management	Labour	Crops	Live-stock	Off-farm	Consumption	Assets	Savings	Security	Mobility	Life-cycle	Life events	Family	Politics
Adele Keke	47	3	2	29	2	1	0	0	0	0	0	4	2	10	0
Sirbana Godeti	24	21	8	0	18	3	0.16	0	0	0	1	6	3	14	0.16
Yetmen	27	13	4	0	19	6	0.1	1	2	3	8	7	2	7	0.1
Turufe Kecheme	25	23	14	0	4	4	0.66	0	0	1	1	12	6	8	0.66
Debre Berhan	16	16	4	0	45	1	0.17	1	2	1	1	5	2	4	0.5
Imdibir	34	7	5	16	1	25	0	0	0	1	1	2	5	3	0.85
Koro-degaga	0	12	17	0	55	0	0	0	0	0	0	3	4	9	0
Shumsheha	13	6	0	2	37	2	0.84	3	0	1	0	5	29	1	0
Dinki	21	3	4	1	29	1	0	3	0	4	0	10	8	16	0
Domaa	33	3	1	1	33	7	0.23	0	7	2	0	4	1	8	0.23
All sites	24	11	5	4	27	5	0.23	1	2	1	2	5	6	7	0.26

Non-farm Activities in Ethiopia: The Case of North Shoa

Mulat Demeke and Teferi Regassa

1. Background

1.1 The Setting

Sub-economic holdings, bad weather conditions, massive land degradation, and lack of basic infrastructure for intensive land use have undermined agricultural growth and reduced the labour absorption potential of agriculture in Ethiopia. Over 65 percent of the holdings are below one hectare in size and are cultivated only once a year. The vast majority of the rural population lives below the absolute poverty line and the level of unemployment/underemployment is estimated at 25 to 40 percent of the labour force.

Reduced access to land and declining farm size would not necessarily translate into underemployment and poverty if non-farm activities can provide alternative employment opportunities.¹ A dynamic non-farm sector could provide employment in its own right and stimulate agricultural production by providing important farm inputs.

The magnitude of non-farm activities in Ethiopia is largely unknown. The first survey (the only one of its kind) on handicraft activities in the rural areas was carried out in 1973, about 20 years ago. According to this survey, about a quarter of a million² people, roughly about 2.5 percent of the rural population, were engaged in such activities. The 1984 Rural Labour Survey estimated the proportion of people employed in the non-farm sector as 1.6 percent of the rural labour force. However, the survey contained no information on full-time or part-time involvement or the contribution of traditional handicraft activities to rural household income.

The potential of increasing employment opportunities in non-farm activities is not realised in Ethiopia. In fact, the previous regime favoured the promotion of rural handicrafts and industrial activities under a co-operative arrangement. It actively discouraged private ownership of these activities, thus stifling the development of the sector during the 17 years of its rule.

Agriculture is unlikely to absorb all the new entrants into the labour market without reducing land-holdings and corresponding declines in per capita incomes. In this regard, non-farm activities will need to be vigorously promoted to offer real opportunities for the creation of alternative sources of employment outside agriculture. The new economic policy of the current government is expected to create more favourable conditions for the development of the non-farm sector.

The removal of occupational restrictions, price and market liberalisation, and the elimination of restrictions on hiring of labour are expected to have a positive impact. The supply of raw materials is expected to improve and thereby stimulate small industries and handicraft activities. The rise in agricultural income, following the liberalisation of prices and markets, is thought to stimulate demand for non-farm goods.

1.2 Objectives and Methodology

The overall objective of this study is to investigate non-farm activities in one of the most impoverished regions of Ethiopia. More specifically, the research intends to

1. describe the role and scope of farm and non-farm activities;
2. examine the relationship between farm and non-farm activities;
3. analyse the poverty alleviation effects of off-farm income; and
4. identify the major constraints to non-farm activities and suggest policy framework to develop the activities.

Primary data generated through a survey is the main source of information for the study.³ The survey was conducted in North Shoa in February to April 1995. A total of 268 households, drawn from three districts (Debre Berhan Zuria, Ankober and Gera Medir) were interviewed. Debre Berhan is some 130 kms north of Addis Ababa on the main road connecting the capital city with Dessie. Ankober is situated about 45 kms north-east of Debre Berhan. Mehal Meda, the district (*woreda*) capital of Gera Medir, is located about 150 kms north-west of Debre Berhan. Three peasant associations (PA) were surveyed in each district. The number of sample households was 101 in Debre Berhan, 92 in Ankober and 75 in Gera Medir. A minimum of 30 households were interviewed from all but

one PA. Different statistical techniques including regressions are used for analysing the data.

1.3 The Study Area

North Shoa is located on the western edge of the Rift Valley System-Escarpment of central Ethiopia. The Escarpment forms a watershed between the Awash drainage system to the east and the Blue Nile drainage to the west. The region is characterised by a very rugged topography with the altitude ranging from 1000 to over 3500 masl.

The mean annual rainfall varies between 700 and 1800 mm. The rainfall is bimodal with the *belg* (small rain or spring season) rains in March, April and May and the *meher* (main or summer season) in July, August and September. Although the *belg* season cultivation accounts for about 47% of the total annual harvest in some areas, the *belg* rains are generally unreliable (Daniel Gemechu, 1990).

The total population of North Shoa is estimated at about 2.3 million. The level of urbanisation is very low, with only 5.5 percent living in settlements of more than 1,000 people. Among the major towns are Debre Berhan (the regional capital), Debre Sina, Efeson and Mehal Meda. The Addis Ababa-Dessie highway passes through the region and most of the towns are situated along this road. There is only one industrial establishment (the Debre Berhan Textile Factory) in the region.

Unlike Wollo and Tigray, North Shoa became critically famine-prone relatively recently. The most devastating famine occurred in 1984/85 when more than 100,000 people required emergency assistance in the region. With rapid population growth, especially after the 1940s, renewable natural resources such as soil and vegetation were exploited at unsustainable levels due to intensification of land use and reduced fallowing period. Nowadays, the region is classified as one of the most impoverished in the country. The problem of the region was compounded by the civil war which overthrew the Military Government.

2. Theoretical Framework

Studies on non-agricultural employment are currently pursued along three lines (Byceson, 1993):

- rural industrialisation
- rural labour markets
- rural household livelihood strategies

Rural industrialisation: The rural industrialisation perspective derives inspiration from historical work on the development of European 'cottage industries' and the more recent experience of Chinese rural industrialisation. This approach emphasises the process of development as a transition from peasant agriculture to modern industry. Rural industrialisation is the vehicle for effecting both the necessary primitive capital accumulation (Marx's concept) from the agricultural sector and its subsequent investment in industrial activities.

As opportunities in the non-farm sector increase, there will be greater incentives for certain households to abandon agriculture altogether, especially those engaged in small manufacturing enterprises. As the Japanese experience shows, it becomes increasingly hard for some households to combine agricultural and industrial enterprises while the prospect of tying up capital in agriculture gradually becomes less attractive (Francks, 1984). Nonetheless, the contemporary Italian and Taiwanese cases demonstrate that there may well be a continuing rôle for small household-based enterprise in the countryside which may take a form of flexible micro capitalism distinct from a simple mechanistic notion of the development of large-scale capitalist production.

The relationship between agriculture and industry is central under the rural industrialisation approach. An attempt is made to discern forward and backward linkages between the two sectors. Overall, the magnitude of linkage in sub-Saharan Africa (SSA) is considered to be smaller than that found in rural Asia.

Given a widespread disillusionment with industrial performance in SSA, a new strategy of 'agricultural-led industrialisation' (ADLI) is being advocated (Mellor,

1976). ADLI aims at creating an agrarian middle class and domestic mass market through a unimodal agricultural policy including land tenure reform, the promotion of rural small-scale industries and infrastructural improvements.

Rural labour markets: Labour market analysis provides a broader perspective of non-agricultural employment. Numerous economic activities originally carried out within households are transferred to emerging firms, resulting in an institutional division of labour between households, supplying resources such as labour and capital, and firms demanding these resources. There are substantial differences in both absolute and relative factor endowments among smallholder households. Such differences arise partly because of underlying entitlement differentiation resulting from demographic, ecological or economic processes. Landless households earn their livelihood by hiring their family labour. Population pressure on the available land has also become a 'push' factor, encouraging households to consider migration on a circulatory, or even a permanent basis, as a solution to their income-generating problems. Supply and demand of resources are coordinated by factor markets.

Livelihood strategies: Economic diversification and local adaptive strategies now form a central part of new attempts to conceptualise the nature of change in the countryside. This often takes the form of inter-sectoral diversification as illustrated by the expanding off-farm economies in rural Asia. In other cases, it may be seen in the form of intra-sectoral diversification.

Household diversification has already extended the concept of the family farm into a family firm where household members often complement primary-sector work in agriculture and animal husbandry with secondary activity in minor agro-processing, tile and brick making, weaving, etc. and/or tertiary-sector services in repairs, carpentry, trading, retailing, transport, etc.

Empirical studies on non-farm employment have focused on a number of issues. The relationship between non-farm income and the growth of agriculture and the equity effects of off-farm income are among the major issues extensively discussed in the literature.

With regard to the relationship between non-farm activities and agricultural production, the main issue is whether rising income from agriculture drive the

growth of non-farm activities. Similarly, the interest to know whether increased income from non-farm activities spur the growth of agriculture is quite strong.

It has been shown that increased demand associated with rising farm income leads to the diversification of the local economy, and the growth of jobs in non-farm activity. Hence, in order to promote broad-based rural development, priority should be given to the agricultural sector with the goal of raising farm incomes, from which all else will follow (Mellor, 1976). Raising farm labour productivity is important not only because it permits the release of labour from agriculture to non-agricultural pursuits, but also because it boosts per capita income to levels that enable consumer diversification from food into non-food items (Haggblade et al., 1987).

On the other hand, studies have shown that the percentage of non-farm income to total income tends to be high in arid and semi-arid zones where cropping income is risky (e.g. Sahelo-Sudanese Zone of Niger, Botswana and western Sudan) or where land-to-labour ratios are low due to high population pressures (e.g. Rwanda). Within the same country, the shift to non-farm income tends to be intensified in drought years (Tefaye, 1994).

Extrapolating from the above arguments, it appears that income diversification is positively related to income in growth-mediated environment where consumption and production linkages are well developed. The share of farm income declines with an increase in income level since the rural population shifts into high-productivity high-wage non-farm activities. On the other hand, the pattern tends to reverse in an environment where growth is depressed. The share of non-farm activities rather rises in the face of declining income. Poor households diversify into low-paying activities. The failure of agriculture to absorb the growing labour force in productive employment spurs the process of diversification. Consequently, it is hypothesised that there is a U-shaped relation between the share of non-farm income and income level.

Studies on the relationship between farm size and off-farm income have reported an inverse relationship (e.g. Anderson and Leiserson (1980) on Pakistan, Thailand and South Korea; Shand and Chew (1986) on Malaysia; Ho (1986) on Taiwan). For instance, Ho (1986) has demonstrated that in rural Taiwan, although off-farm activity increased for all farm size groups, the share

of off-farm employment is considerably higher for smallholdings of less than 0.5 ha than for farms of over 2.0 ha. In Malaysia, Shand and Chew (1986) reported that the off-farm share of total income stood at 70 percent for smallholdings of less than 0.5 acres but was only 21 percent for farms over 5 acres.

The long-term impact of off-farm diversification on agricultural production is a contentious issue. It is argued that diversification has an adverse effect on farming in situations where off-farm activities compete with agriculture for scarce resources. Labour is diverted away from farming in a manner that reduces optimal intensity and skill. For instance, in Taiwan, households that earn around 80 percent of total income from off-farm sources have an average yield that is only 57 percent of those households with an off-farm income of less than 20 percent of total income (Ho, 1986).

By contrast, some studies have suggested that rising income from non-farm employment makes it easier for households to accept risks associated with innovation and hence enable farm households to raise levels of productivity and output in agriculture. For instance, Evans and Ngau (1991), using farm-level data from Kenya, concluded that not only the amount of non-farm income revenue but also the number of sources of non-farm revenue is important in providing the household with a sense of financial security that enable them bear the additional risks necessary to become more productive farmers. It is also possible for the decline in family labour to be compensated (or even more than compensated) through hiring labour with money earned from non-farm employment.

The equity effect of off-farm income in levelling disparities between families of different land-holding status has been widely explored. The growing contribution of off-farm income, particularly for the smallest land-holding groups, has been very important in Japan and Taiwan. The overall distribution of rural family income improved considerably as a result of non-farm employment. Micro-level evidence from Sri Lanka also showed that, in some cases, tenant farmers had been successful in securing higher family earnings than owner operators through the more effective exploitation of off-farm opportunities (Slater, 1991).

Shand (1986), on the other hand, accepts that off-farm earnings have generally led to a substantial reduction in rural inequality, but qualifies the over-generalisation of this phenomenon. He pointed out that off-farm activities improved the distribution of income in Thailand in only two of the four provincial samples. His own study in Malaysia also showed little improvement in the distribution of income.

Rural non-agricultural development has become a key component of China's development strategy. The government wants to shift rural workers from agriculture to non-agricultural activities, but it wants to achieve this with only a limited amount of rural-urban migration. The slogan is 'Leave the land but not the countryside; enter the factory but not the city'. The policy is to transform agriculture from self-sufficient and semi-self-sufficient production to large-scale commodity production. This involves increases in farm size and a substantial share of the agricultural population moving out of cultivation. Private undertakings in small industries, handicrafts, commercial food and beverages, services, transport, etc. are encouraged (UNDP, et al., 1988).

The growth in part-time farming and off-farm opportunities in Taiwan has been greatly facilitated by the country's decentralised industrial structure. The 1971 industrial census showed that 50 percent of all manufacturing employment was located outside the main urban centres accounting for 48 percent of manufacturing value added. The development of a highly productive smallholder agricultural system (consolidated by the 1949-53 land reforms and various rural development programmes) also created a vigorous market for non-food products, thus facilitating the growth of domestic manufacturing and location-specific services (e.g. furniture, furnishing, clothing, etc.) (Ho, 1979).

3. The Farm Economy

Like any other community in highland Ethiopia, mixed farming is the mainstay of the households in the study area. The farmers grow only food grains, largely barley, wheat, *teff*, sorghum, various types of pulses and oilseeds. There are almost no perennial or cash crops in the region. This section describes the farming activities which are categorised as crop and livestock production.

3.1 Crop Production

3.1.1 Land

The average holding size for the study sites is 2.3 ha. It is largest in Debre Berhan (3.4 ha) followed by Ankober (1.7 ha) and Gera Medir (1.4 ha). The average size of land under field crops is 1.67 ha (73.6 percent of the total holdings) for all sites, 2.4 ha for Debre Berhan, 1.4 ha for Ankober and 1.0 ha for Gera Medir (Table 1).

The size distribution of cultivated land varies considerably between the three sites. About 77 percent of the farmers in Gera Medir cultivate less than 1 hectare of land. Those who cultivated more than 2 hectares constituted less than 3 percent in Gera Medir. By contrast nearly 60 of the households in Debre Berhan cultivate more than 2 ha of land.

Land allocated for grazing, garden crops, fallow and forest constituted 13.2, 6.6, 4.0, and 2.6 percent, respectively. Forest land is less than 0.1 ha in all the three sites.

The tenure system is dominated by owner cultivators. All but two households have their own land for cultivation. Sharecropping is reported by 37 households in Debre Berhan, 22 in Ankober and eight in Gera Medir. Only eight households in Debre Berhan, five in Ankober and nine in Gera Medir reported land rent for cash.

The majority of the sample households (63.4%) classified their land as semi-fertile (*lem-tef*), while 31 percent described it as in-fertile (*teff*). Only 5.6 percent reported to cultivate fertile land (*lem*). None of the farmers in Gera Medir classified their land as fertile, reflecting the poor or marginal agricultural potential of the area. The proportion of farmers reporting fertile holdings is 13 percent in Ankober and only 3 percent in Debre Berhan (Table 1).

Holding size has declined over the years because of population pressure. Elder farmers (during the group discussions) noted that when land was plentiful in the past, every one practised fallowing or soil-burning to maintain soil fertility. With population growth, land use was intensified and fallowing period was

reduced. According to the household survey, fallowing and soil-burning (*gyu*) is currently practised by only 3.4 and 4 percent of the respondents (Table 2). Since the use of other fertility-restoring techniques is limited, soil fertility has sharply declined. Although 76 percent of the respondents reported to have used manure, much of it is applied on garden crops or plots around the homestead. This is due to the fact that animal dung is the main source of fuel throughout the region. In addition, its supply has declined because of the decline in the number of livestock ownership (see section 3.2 below). The use of non-traditional inputs like fertiliser is also limited as shown below.

3.1.2 Use of non-traditional inputs

The use of non-traditional inputs such as commercial fertilisers and chemicals is limited mainly to Debre Berhan. Some 68 percent of the sample farmers in the area reported to have used fertilisers during the last cropping season. Fertiliser-using households were only 8 (10.7%) in Gera Medir and 23 (25.0%) in Ankober. The average fertiliser purchase (for all sample households) was 163, 13, and 4 kg in Debre Berhan, Ankober and Gera Medir, respectively. Improved seeds were used by 7 percent in Debre Berhan, 11 percent in Ankober and 35 percent in Gera Medir.⁴ No farmer in Gera Medir reported to have used herbicides or insecticides (Table 3).

3.1.3 Use of draft animals

Farmers without oxen constituted 18 percent in the study sites. Those with one ox were 28 percent and two oxen 49 percent. Farmers with three and four oxen were only 3 and 2 percent, respectively. The proportion of farmers with no ox or only one is highest in Gera Medir (81.3%).

Over half of the reporting farmers (mainly those with no or only one ox) have encountered draught power problem and the problem is more serious in Gera Medir (81%) than in Ankober (42%) or Debre Berhan (39%). A combination of different measures are used to overcome the problem. Most farmers facing oxen shortage relied on labour-oxen exchange (78%) and/or assistance from relatives (76%). *Mekenajo* or teaming up of households with one ox is reported by 58 percent of the households and oxen-hiring by 2 percent (Table 4).

3.1.4 Use of labour

The average household size is 5.7 for the entire sample. It is lower in Gera Medir (5.0) than in Debre Berhan and Ankober (5.9) (Table 5). Assuming that persons between the age of 10 and 70 take part in productive activities in the rural areas and assuming further that this age group accounts for 60 percent of the population, each household can potentially engage at least three family members in farm work.

Shortage of labour is reported by 32 percent of the households. The problem is more serious in Debre Berhan (44%), reflecting the larger holding size in the area, than in Ankober (28%) or Gera Medir (20%). Most farmers with labour shortage reported to have used traditional labour exchange and support arrangements such as *debbo* and *wonfel* (60%). Some 40% used hired labour to work on the farm. None of the farmers in Gera Medir reported to have hired labour (Table 5).

Leisure time seems to be significant in the study areas as over 80 percent of the farmers do not work on some 8 Saints' days of the month and nearly 100 percent refrain from work on Saturdays and Sundays (Table 5). There are also many other Saints' days and holidays observed by a number of farmers. It is estimated that, on the average, about 15 days of the month are non-working holidays. There is a strict religious belief that working on these days could result in punishment by God. Crop failure due to rain or disease problems is often attributed to punishment by God for working on religious holidays.

3.1.5 Output, yield and revenue from crop sales

The mean annual crop output⁵ per household (for both *meher* and *belg* seasons) is 7.2 quintals. Grain output is the highest for Debre Berhan (10.9 quintals), followed by Ankober (6.3 quintals) and Gera Medir (3.3 quintals) (Table 6).

Crop yield are generally low in the study area. The average output of barley per hectare is only 5.7 quintals for *meher* and 5.3 quintals for *belg*. Yield levels for wheat are 3.6 and 3.4 quintals for *meher* and *belg* seasons, respectively. *Teff* is cultivated during the *meher* season only and the average yield is 4.2 quintals per hectare. Yield variation between the three sites is significant. For instance,

barley yield is 5.9 quintals per hectare in Debre Berhan, 5.0 quintals in Ankober and 2.7 quintals in Gera Medir.

The overall average grain yield per hectare is 3.9 quintals for *meher* and 5.1 quintals for *belg*. Overall grain yield levels are relatively high in Ankober, with 6.0 and 4.4 quintals for *belg* and *meher* seasons, respectively. Farmers in Debre Berhan do not have *belg* crops, and the average yield for *meher* is only 3.9 quintals per hectare. In Gera Medir, yield rates are 4.1 and 3.0 quintals during the *belg* and *meher* seasons, respectively (Table 6).

Table 7 shows the amount of revenue obtained from crop sales. The mean revenue amounted to Birr 42.27 for all sites. It varied from Birr 64.42 to Birr 8.87 in Gera Medir or Birr 45.19 in Ankober. A total of 15 households (14.9%) in Debre Berhan, 23 (25%) in Ankober and 14 (18.7%) in Gera Medir reported that they have sold no grain. As many as 68, 55 and 61 households obtained less than Birr 100 from crop sales. None of the sample farmers in Gera Medir received more than Birr 100.

Household interviews and group discussions with the farmers revealed that output and yield levels have sharply declined over the years. The main constraint to production is declining soil fertility as identified by 94 percent of the sample households. Diminishing farm size, low and erratic rainfall, growing incidence of crop pests and diseases, excessive rains and weed were pointed out as serious problems by 89, 78, 51, 46 and 41 percent of the farmers, respectively. In Gera Medir, poor soil fertility, declining farm size and shortage of rain were observed as major constraints to agricultural production by 100, 96 and 93 percent of the farmers, respectively (Table 8).

3.2 Livestock

The average number of cattle (including oxen, cows, bulls, heifers and calves) owned is 3.7. The corresponding figures for Debre Berhan, Ankober and Gera Medir are 4.8, 3.8 and 2.0, respectively. The mean number of sheep and goats is 5.5 in Debre Berhan, 3.1 in Ankober and 5.2 in Gera Medir. The respective average number of pack animals owned is 2.0, 1.2 and 0.7 (Table 9).

The single most important constraint in livestock production is shortage of grazing land as indicated by 97 percent of the respondents. The growing

population pressure has resulted in the expansion of cultivated land at the expense of pasture land. Other problems included lack of breeding stock (75%), disease (59%), shortage of water (35%), predator animals (22.9%) and theft (19.2%) (Table 10).

The average earnings from livestock sales was Birr 423.80 for all sites. It is highest in Debre Berhan (Birr 581.30) followed by Gera Medir (Birr 363.59) and Ankober (Birr 297.76). The sale of livestock products generated an average cash revenue of Birr 41.05 in Debre Berhan, Birr 42.39 in Gera Medir and Birr 19.48 in Ankober.

To sum up, agricultural output and productivity is very poor by all standards. With less than 5 quintals per hectare, yield levels are only half as much as the national levels. Poor soil fertility and limited use of modern inputs, together with high variability or delay/absence of rain, have reduced productivity. A marked variation in output and yield levels is observed in the survey area. Households in Debre Berhan are relatively well off both in crop output and livestock ownership. In fact, they obtained grain output which is more than 3 times the output obtained in Gera Medir. The latter is the poorest in all respects and Ankober comes in between the two.

4. Characteristics of Non-farm Activities

It has been documented that non-farm activities are part of survival strategies, offering cyclical and seasonal employment, to supplement meagre farm incomes in many drought-prone areas of Africa. This section explores the characteristics of non-farm employment in the study area.

Off-farm economic activities that earn some income in the survey areas include traditional crafting, selling of food and drinks, trading, engagement in wage employment and various other sources of income.

4.1 Traditional Handicraft

There are a number of crafting activities in which farmers can potentially participate in the study area. These include weaving, pottery, tannery,

blacksmithing, tailoring, carpet-making, masonry, etc. Nonetheless, the rate of participation and income derived from handicraft activities is very low. Only 20 of the 268 sample households (7.5%) reported to have augmented their farm income through such means. The rate of participation in crafting is 10 percent in Debre Berhan, 5.4 percent in Ankober and 6.7 percent in Gera Medir.

The average annual income derived from handicraft activities for reporting households is Birr 480.65. There is a significant variation between the sites with 1,027.95 in Gera Medir, 308.05 in Debre Berhan, and Birr 278.40 in Ankober. Less than Birr 100 was derived from crafting by 5 of the 20 households (Table 11).

According to the group discussions and household interviews, the major constraints to participation in handicraft employment are high price of raw materials, low demand because of weak purchasing power, lack of training and lack of equipment and tools. High price of raw materials is a serious problem particularly in the case of weaving and tannery. Many farmers believe that they can get more income from farming, however unproductive the soil may be, than from handicraft activities. They also indicated that the revenue-generating capacity of handicraft activities has declined over time.

4.2 Sale of Local Drinks

A total of 67 households (25 % of the sample) reported to have earned income from the sale of local brews (*araki* and *tella*). The level of participation is highest in Debre Berhan (33.7%) followed by Ankober (29.3%) and Gera Medir (8%)(Table 12).

The average annual income earned for the reporting households was Birr 980.92. It amounted to Birr 1,451.40 in Debre Berhan, Birr 561.64 in Ankober and Birr 201.63 in Gera Medir.

Since its introduction to the region some 40 or 50 years ago, *araki* has rapidly gained popularity. It is widely consumed by both the rural and urban people, especially around Debre Berhan. *Araki* is prepared by women using barley as the main raw material. Many single women in the urban areas are also engaged in the selling of the drink.

The main problems in producing and selling local brews are increasing price of barley, cumbersome distilling process, competitive market (caused by the involvement of too many women in the trade), and lack of capital to start the business. The market for local brews is limited in Gera Medir probably because of the low purchasing power of the inhabitants as well as low level of urbanisation (compared to Debre Berhan).

4.3 Trade

Only 12 households (4.5% of the one sample) reported income from trading activities. Of these 11 are from Debre Berhan, one from Ankober and none from Gera Medir. The rate of participation in trade is 10.9 percent for Debre Berhan (Table 13).

The average annual earning for reporting households is Birr 351.57 in Debre Berhan. Several problems were reported in undertaking trade activities: lack and/or high cost of transport, shortage of capital to start the business, lack of permit or licenses, and check-point (*kella*) charges and low purchasing power of the community. Although the policy of the former government which prohibited farmers from engaging in non-farm activities including trade has been lifted, new forms of restrictions such as license requirements and *kella* charges have been introduced.

4.4 Wage Employment

A good many of the respondents have earned income through wage employment. A total of 75 households (28%) have participated in wage employment, including food-for-work. The rate of participation was highest in Gera Medir (54%), followed by Ankober (28.3%) and Debre Berhan (7.9%) (Table 14). It should be noted that the high rates in Gera Medir was due to the participation in the food-for-work schemes operating in the area. There is no reported case of hiring labour by individual households in Gera Medir.

The average annual income earned for the reporting households was Birr 597.82. The level of income varied from Birr 871.84 in Ankober, to Birr 480.93 in Gera Medir and Birr 306.28 in Debre Berhan.

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Among the major problems of wage employment are limited job opportunities and low pay. With the exception of food-for-work, other forms of employment have tended to lose importance over the years. The capacity to hire labour has declined because of the diminishing farm size or falling income.

4.5 Other Non-farm Activities and Income

Over 60 percent of the respondents (164 households) have secured income from various other non-farm activities which range from the sale of fire-wood to support from relatives and friend. The number of households reporting income from these sources was 79 (78.2%) in Debre Berhan, 41 (44.6%) in Ankober and 44 (58.7%) in Gera Medir (Table 15).

A total of 76 households earned income from sale of animal dung and wood as fuel (applicable mainly to Debre Berhan), 45 from *ikub* (rotating saving associations), 35 from the sale of home-made wool yarn (true only in the case of Gera Medir), 27 from the sale of hay and other animal feed and 22 households from taking loans (Table 16).

The mean annual income from other non-farm activities for reporting households was Birr 431.95. The corresponding figures for Debre Berhan, Ankober and Gera Medir were Birr 447.16, 496.89 and 345.82 respectively.

4.6 The Relative Share of the Different Non-farm Activities

Table 17 shows the percentage share of the five different categories in the total non-farm income. The largest contributor is the 'other non-farm' category in all sites, accounting for 61.3, 41.7 and 47.3 percent of the total non-farm income in Debre Berhan, Ankober and Gera Medir respectively. The next important category is the sale of drinks in Debre Berhan (25.2%) and Ankober (26.4%) and wage income (i.e. food-for-work) in Gera Medir (46.0%). Revenue from handicraft and trading activities accounted for 3.7 and 2.5 percent, respectively.

5. Determinants of Non-farm Income

Several factors are postulated to influence decision regarding participation in non-farm employment. These factors can be broadly grouped into four

categories: (1) personal attributes, (2) farm income, (3) land endowment, and (4) food balance (defined grain sales less grain purchase).

It is hypothesised that personal attributes such as age, sex, family size and education are important determinants of non-farm income.

- Older farmers are expected to be less active and hence rely more on farm than on non-farm income. The variable AGE (defined as the age of the household head) is expected to have a negative coefficient.
- Women generally have less option than men when it comes to participation in economic activities. The variable SEX refers to the sex of the household head (male = 1, female = 0) and it is expected to have negative coefficient.
- Access to information and opportunities increases with education. The variable EDUCATION (measured by grades completed) is hypothesised to have a positive influence on non-farm income.
- The larger the family size the greater is the pressure to increase income in order to ensure subsistence requirements of the family. FAMILY SIZE is expected to have a positive coefficient.

The level of farm income is hypothesised to be negatively correlated with non-farm income in the study areas. As the dominant objective is subsistence and most non-farm activities are low-paying, households with higher farm income are expected to show less interest in non-farm employment. The level of farm income is approximated by CROP REVENUE and LIVESTOCK REVENUE. YIELD is also included to see if it is negatively correlated with non-farm income as suggested by some studies (Ho, 1986).

The land endowment of the farmer is expected to have a positive impact on non-farm income. Some non-farm activities such as the sale of fire-wood (including animal dung), hay and other animal feed as well as home-made wool yarn are directly related to the size of holdings. In addition, only those who can raise the necessary capital can PARTICIPATE in other non-farm activities. Resource endowment is approximated by the HOLDING SIZE, including cultivated, garden, grazing and forest land. The number of livestock owned cannot be used as it is highly correlated with income from livestock.

Given the fact that the region is generally known as food deficit and the overriding objective of the farmers is to meet food requirements, it is hypothesised that FOOD BALANCE is negatively related to non-farm income.

The results of the regression are given in Table 18. The dependent variable is defined as the ratio of non-farm income to farm income (cash). A separate regression for each site as well as a combined regression was run to test our hypothesis.

The variable AGE has come out significant in 3 of the 4 equations. However its signs are positive in one case (Debre Berhan) and negative in the other (Gera Medir and overall). It is also negative, though insignificant, in the case of Ankober. It appears that, as expected, age has a negative influence in the more marginal areas. The share of non-farm income is higher for the younger age group than the older farmers. By contrast, the result for Debre Berhan may suggest that non-farm income increases with age in impoverished areas.

As anticipated, the coefficient of SEX is negative in most of the equations fitted (3 out of 4), but it is significant only in one case (Ankober). The evidence does not suggest female-headed households are strongly disadvantaged with respect to non-farm earnings. It should be noted that sale of local drinks is the sole task of women.

Education has a positive coefficient in all but one equation. However, it is significant only in one case (Debre Berhan), indicating that positive impact of education is limited to areas that are relatively better. In the more marginal areas, education may have very little to contribute.

None of the coefficients of FAMILY SIZE is significantly different from zero. The evidence is not consistent with the view that the more intense the subsistence pressure the greater will be the tendency to diversify the sources of income.

Revenue from crop sales does not have a significant impact on the share of non-farm income as evidenced by the insignificant coefficients of the variable CROP REVENUE in all the equations. The variable has, however, a negative coefficients in 3 of the equations. Households with higher level of cash income from crop sales do not seem to be more interested than those with low income

when it comes to non-farm employment. This is probably due to the low level of grain sales in the region. However, the same cannot be said for LIVESTOCK REVENUE. The variable has a negative and a highly significant coefficient in all the equations. As revenue from livestock increases, the farmers tend to show less interest in non-farm activities. It is possible that livestock husbandry is more rewarding than non-farm employment in the study area.

The coefficient of YIELD is negative in all the four equations and significant in two cases (i.e. for Ankober and the overall). As anticipated, the results seem to suggest that farmers with higher yield levels are less interested or have limited time for non-farm engagement.

HOLDING SIZE has a positive coefficient in all the equations. The coefficient is also significant in two cases (Debre Berhan and the overall). The larger the land owned the greater is the level of participation in non-farm employment. As already indicated some categories of non-farm activities are directly related to holding size.

As expected, FOOD BALANCE has a negative and significant coefficient in all the equations. As far as non-farm participation is concerned, farmers who are net sellers of grain are less interested than net buyers. This is consistent with the view that the interest to participate in non-farm activities declines once the food requirement of the family is satisfied.

6. Coping Strategies and Poverty

That the agricultural sector has failed to support the livelihood of the rural dwellers in North Shoa is evidenced by the growing dependence of the community on the market for food. As shown in Table 19, 65.3 percent of the total respondents are net buyers of grain. The proportion of net buyers is 63.4, 55.4 and 80.0 percent in Debre Berhan, Ankober and Gera Medir, respectively. Households who emerged as net sellers constituted 21.8 percent in Debre Berhan, 20.6 percent in Ankober and none in Gera Medir. Among the sample households with net sales, 63.4 percent managed to attain a surplus of less than Birr 200. The corresponding proportion was 77.3 and 47.4 percent in Debre Berhan and Ankober respectively.

One notable response to the declining level of food self-sufficiency has been increased dependence on livestock. This is also manifested in the high share of revenue from livestock and livestock product sales in the total farm cash income. Overall, about 75 percent of the total farm cash income was derived from the livestock sub-sector. The share was 81.7 percent in Debre Berhan, 65.0 percent in Ankober and 76.9 percent in Gera Medir (Table 20).

The increasing dependence on livestock, however, has resulted in the depletion of livestock assets. The group discussions revealed that farmers have been forced to sell their breeding and draught animals to buy food grains. Most farmers during the household interviews also reported that livestock ownership has declined. The number of oxen, cows and sheep/goats declined for 56.7, 50.7 and 56.3 percent of the total respondents. Increased ownership was reported by only 15.3, 10.8 and 9.0 percent and no change by 22.8, 24.3 and 13.8 percent, respectively (Table 9). The survey results also revealed that no farmer invested on livestock in Gera Medir and only three in Ankober. More number of households reported to have spent on livestock purchase in Debre Berhan (see section 5).

With the decline of agricultural production, farmers in the study area have tried to diversify into various types of non-farm activities to support their livelihood. Indeed, in the total annual mean cash income of Birr 1,235.72 (for all respondents), non-farm income accounted for 59.5 percent (Birr 734.61) (Table 21). The share was 57.5 percent (Birr 931.40) in Debre Berhan, 64.8 percent (Birr 669.52) in Ankober and 57.0 percent (Birr 549.45) in Gera Medir.

It is interesting to note that despite their meagre agricultural output or income, households in the marginal site of Gera Medir earned the lowest amount of non-farm income. The possibility of moving into non-farm activities seem to have been constrained by lack of markets and resources. Non-farm income was highest in Debre Berhan where farm income is relatively high and the degree of urbanisation is greater.

When the possibility of maintaining previous consumption levels through farm and non-farm means has been exhausted, households have no other choices but to modify their overall consumption patterns. According to Cornia (1990), the first to eliminate from the list are usually non-basic items such as clothing, consumer durables and leisure. The last to be reduced is expenditure on basic

staples and children's education. In fact, this has been the case in the study area. In particular, households in Gera Medir and Ankober seem to have no choice but to reduce their consumption of food and non-food items as the last coping strategy.

Table 22 reports non-food expenditure¹ in the study area. Some of the most important items of expenditure (in terms of total amount spent) were clothing, coffee, pepper and spices, *ikub*, ceremonial expenses, investment on livestock, flour mill expenses, onions, salt and cooking oil in that order. In nearly all cases, the level of mean expenditure as well as the proportion of farmers who reported to have incurred cost is lower for Gera Medir and Ankober than in Debre Berhan. For instance, farmers in Ankober¹ and Gera Medir spent on average Birr 117.58 and Birr 151.85 on clothing, respectively, while those in Debre Berhan incurred Birr 195.35. The contrast is more illuminating if one looks at the percentage of households who have not bought clothing in Gera Medir, 21.3 percent, as opposed to 6.5 percent in Ankober and 5.9 percent in Debre Berhan. Many households in Gera Medir are forced to go beyond cutting on clothing expenditure, i.e. stop buying altogether.

All the respondents have bought coffee, but the mean expenditure varies enormously between the sites. It amounted to Birr 169.72 in Debre Berhan, which is two times higher than in Gera Medir and Ankober. A similar difference is observed in the case of sugar and recreation, investment in livestock, ceremonial, education and medical expenses. The mean expenditure on education, for instance, is Birr 57.27 in Debre Berhan, Birr 32.97 in Ankober and Birr 28.05 in Gera Medir. Moreover, only 29.33 percent of the households in Gera Medir incurred costs associated with education, as compared to 48 percent in Debre Berhan.

No significant difference was observed across the sites for some expenditure items. These include taxes and church-related expenses. It is surprising that households in Gera Medir pay the same amount of taxes as their counterparts in Debre Berhan.

The evidence also suggests that the coping strategy has affected food consumption. This is evidenced by the food available per household which is estimated to be 12.8 quintals in Debre Berhan, as against 6.8 in Ankober and

Gera Medir (Table 23). The calorie equivalent of per capita food availability is well below the recommended requirement, especially in Ankober and Gera Medir.

7. Conclusions

The poverty in North Shoa has its root mainly in the declining productivity of agriculture which in turn is related to the rapid population growth. As the land resources became subdivided and fragmented, marginal or fragile lands were cultivated, fallow periods were reduced, vital forests were cut, and animal dungs were used as fuel (rather than as manure). The result was a continuous decrease in overall agricultural productivity. The average yield of grain currently stands at a dismal 3 to 5 quintals per hectare.

In an attempt to maintain their subsistence income levels, farmers have diversified into various types of non-farm activities, including traditional crafting, selling of food and drinks, trading, engagement in wage employment and various other sources of income. Non-farm income accounted for 59.5 percent of the total annual cash income of the respondents. It is a critical survival strategy in the more marginal district of Gera Medir. Nonetheless, like the agricultural sector, the productivity or the return from the non-farm sector is very low. Participation in non-farm employment is largely dictated by the need to meet subsistence food requirements. As confirmed by the regression analysis, the tendency to engage in non-farm employment declines if the food balance position of the family is better. Because of the low return, non-farm activities are viewed as survival strategies, rather than as a remunerative source of livelihood. Some of these activities such as the sale of animal dung have in fact detrimental effects on agriculture. Despite its growing popularity, the sale of *araki* (the alcoholic content of which is said to be very high) has adverse social implications.

Traditional handicraft activities and small enterprises have strong backward and forward linkages with agriculture. But very few people have earned income from such sources in the study area. A variety of problems including low demand, primitive technology, shortage of raw materials, lack of skills and training and lack of access to credit have reduced the income-generating capacity of crafting or micro-enterprises. In particular, the expansion of small enterprises

is blocked by the low and declining levels of rural income. Farmers use nothing beyond simple tools in their farm operations. The range of consumption items purchased from the market is limited.

A number of measures may be suggested to overcome the problems constraining non-farm employment. But the primary thrust of any promotional effort should focus on removing the demand constraints. Macroeconomic policies favouring the growth of rural income should be given priority. The importance of policies which influence agriculture cannot be overemphasised. Apparently, the areas under consideration may seem to have very limited agricultural potential. Increasing crop production obviously calls for a sizeable investment which is not readily available. But the livestock potential cannot be underestimated at least in the case of Debre Berhan and Gera Medir. The former has a comparative advantage in dairy and the latter in wool production. Forestry programmes can also be initiated as an important economic activity and conservation meserhan and Gera Medir. The former has a comparative advantage in dairy and the latter in wool production. Forestry programmes can also be initiated as an important economic activity and conservation measure.

The intense desire to become food self sufficient by the farmers in the study area has resulted in inefficient resource use. If a hectare of land is yielding only 3-5 quintals of grain, then it makes sense to look for alternative land uses. Reallocation of land and labour resources in favour of livestock production could lead to a substantial increase in income. Only increased market supply of dairy products and wool can provide a sustained growth in income. Measures aimed at intensifying animal husbandry have powerful effects on a number of complementary non-farm activities such as milk processing and carpet-making. More attention needs to be devoted to increasing the linkages between the farm and non-farm sectors in north Shoa.

NOTES

- 1 Off-farm activity includes all secondary and tertiary sector employment of both permanent and casual nature. Since the activities in this area are quite diverse, a number of different terms are used in the literature to refer to off-farm employment. For instance, rural industrialisation, as a counterpart to agriculture, is widely used. But this appears rather narrow as most activities are not strictly of an industrial nature but of a service orientation. Rural enterprise is also seen to have a sufficient non-farm connotation. But

this again is inadequate since these characteristics are not exclusive to non-farm activity. Many of the activities (e.g. traditional crafts) are also below the level of enterprise; they are part-time activities and are a source of (principal or secondary) additional income to agriculture

- 2 Broadly speaking, non-farm activities in the rural areas can be divided into the following categories:
 - a) small-scale industrial activities such as food-processing (e.g. flour milling, oil processing, soapmaking, food-processing),
 - b) cottage industries (e.g. handicrafts, spinning of cotton or wool, cloth weaving and dying, pottery, leather tanning and distilling local brews),
 - c) artisanal activities (e.g. black-smithing, masonry, woodwork/carpentry, house construction, repair services and fabrication of farm tools),
 - d) commercial activities (e.g. trading and transportation),
 - e) infrastructural development activities (e.g. special public works, feeder roads and irrigation works, and food for work programs), and
 - f) formal employment including professional administrative and clerical works
3. This figure does not include nomadic areas and Eritrea.
4. The survey is an integral part of the De-agrarianization and Rural Employment (DARE) Program of the Afrika-Studiecentrum (ASC). The fund for the study is provided by the Dutch Government.
5. The use of improved seeds is high in Gera Medir probably because of the distribution (free of any charge) of these seeds by NGOs (e.g., World Vision) following the 1993 drought in the area.
6. Total output is obtained by a simple summation of all the different crops. The method has no serious problem for Debre Berhan and Gera Medir where the cropping pattern is similar and *teff* cultivation (the high value crop) is not important. *Teff* is important in Ankober and this has resulted in slight underestimation in value terms.
7. This includes all expenditure including investment on livestock. Only expenditure on commercial inputs and land rent is excluded.
8. The case of Ankober may be explained by the heavy dependence in the area on the cheaper home-made clothing.

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Table 1: Average holding size, tenure type, soil fertility and size distribution in ha.

	Debre Berhan	Ankober	Gera Medir	Total
I				
Average Lands Size	3.42	1.66	1.44	2.27
Cultivated Land (farm)	2.44	1.35	1.02	1.67
Garden Land	0.26	0.05	0.12	0.15
Forest Land	0.07	0.06	0.03	0.06
Grazing Land	0.49	0.14	0.24	0.30
Fallow Land	0.16	0.07	0.03	0.09
II				
Tenure Type-Cultivated Land (Average Size) (Farm)	2.44	0.35	1.02	1.67
Owned: Mean size	1.96	1.15	0.88	1.38
Rep. HHs	100	91	75	266
Rented: Means siz.	0.12	0.07	0.07	0.09
Rep. HHs	8	5	9	22
Sharecropped: size	0.35	0.10	0.07	0.19
Rep. HHs	37	22	8	67
III				
Soil Fertility (frequency distribution (%))				
Not Fertile	45.55	15.22	30.67	31.0
Semi Fertile	51.49	71.74	69.33	63.4
Fertile	2.97	13.04	0.0	5.6
IV				
Size Distribution of Cultivated Land (%)				
1 < 0.5	0.00	9.52	18.57	8.33
0.51 - 1.0	7.14	41.67	58.57	32.94
1.1 - 1.5	17.35	27.38	11.43	19.05
1.6 - 2.0	27.55	8.33	8.57	15.87
2.1 - 2.5	14.29	5.95	1.43	7.64
2.6 - 3.0	13.27	3.57	1.43	6.75
3 >	20.41	3.57	0.00	9.13

Table 2: Use of manure, fallowing, soil burning and irrigation

	Debre Berhan	Ankober	Gera Medir	Total
(i) Used manure(%)				
Yes	88.12	69.23	68.92	76.3
No	11.88	30.77	31.08	23.7
(ii) Used Irrigation (for garden crops)				
Yes	10.31	6.52	1.33	6.4
No	89.69	93.48	98.67	93.6
(iii) Used (a) following				
Yes	3.96	1.09	5.30	3.36
No	96.04	98.91	94.70	96.64
(b)soil Burring				
Yes	9.09	1.09	0.00	4.11
No	91.10	98.91	100.00	95.89

Table 3: Use of non-traditional inputs

	Debre Berhan	Ankober	Gera Medir	Total
I Fertilisers				
(a) Used fertilisers(%)				
Yes	68.32	25.0	10.67	37.31
No	31.68	75.0	89.33	62.69
(b) Average Per HH (kg)				
DAP	132.61	6.52	1.33	52.59
Urea	30.45	6.79	2.67	14.55
Total fertilisers	163.05	13.32	4.00	67.14
II Used Improved Seeds (%)				
Yes	7.0	10.87	34.67	16.1
No	93.0	89.13	65.33	83.9
III Used Weed-killers (%)				
Yes	1.98	6.52	0.00	3.00
No	98.02	93.48	100.00	97.00
IV Used Pesticides (%)				
Yes	6.93	8.79	0.00	5.6
No	93.07	91.21	100.0	94.4

Table 4: Use of draft animals

		(i) Used manure (%)			
		Debre Berhan	Ankober	Gera Medir	Total
		88.13	69.73	68.92	78.7
		88	70.77	31.08	53.7
		(ii) Used Irrigation (for garden crops)			
		Debre Berhan	Ankober	Gera Medir	Total
		10.31	6.52	1.33	6.4
		89.69	93.4		93.6
(i) Distribution of oxen Owned					
	0	12.87		36.00	18.28
	1	15.84		45.33	27.99
	2	59.41	1.09	18.67	48.88
	3	6.93	98.91	0.00	2.99
	4	4.95		0.00	1.87
(ii) Have Oxen Problem					
	Yes	39.39		81.33	52.3
	No	60.61		18.67	47.7
(iii) Measures Used to Overcome the Problem (As a % of those reporting the problem)- allowing multiple response					
	(a) Oxen-exchange	53.85		50.82	57.97
	(b) Assistance from Relatives	84.62		80.33	76.09
	(c) Labour-Oxen exchange	87.18		75.41	77.54
	(d) Oxen-hiring	5.13		0.00	2.17
		(p) Average Per Hlt (kg)			
		Debre Berhan	Ankober	Gera Medir	Total
		132.61	6.52	1.33	52.29
		70.42	6.79	2.67	14.22
		163.02	13.72	4.00	67.14
		(q) Used Improved Seeds (%)			
		Debre Berhan	Ankober	Gera Medir	Total
		7.0	10.57	74.67	16.1
		93.0	89.43	25.33	83.9
		(r) Used Weed-killers (%)			
		Debre Berhan	Ankober	Gera Medir	Total
		1.98	6.51	0.00	3.00
		98.02	93.48	100.00	97.00
		(s) Used Pesticides (%)			
		Debre Berhan	Ankober	Gera Medir	Total
		6.93	8.79	0.00	2.6
		93.07	91.21	100.0	97.4

Table 5: Average family size and labour use

	Debre Berhan	Ankober	Gera Medir	Total
I Average family size	5.91 (2.34)	5.90 (2.37)	5.01 (1.82)	5.66 (2.24)
II Faced Labour Shortage (%)				
Yes	44.0	27.48	20.27	31.7
HHs rep. yes	4.4	25	15	84
No	56.0	72.53	79.73	68.3
III Measures Taken to Overcome the Shortage (%)				
a) Hired labour				
Yes	53.9	23.3	0.0	38.9
HHs rep. yes	28	7	0	35
No	46.1	76.7	100	61.1
b) Used Traditional Labour Exchange Arrangement (Debbo, Wonfel)				
Yes	52.17	88.46	53.33	63.2
HHs rep. yes	24	23	8	55
No	47.83	11.54	46.67	36.8
IV Non-Working days-percent of households refrain farm work				
Saturday	100.0	98.91	100.0	99.63
Sunday	100.0	98.91	100.0	99.63
Abo	61.39	44.57	64.0	56.34
Selassie	80.20	73.91	100.0	83.58
St.Michael	100.0	94.57	98.65	97.39
Egziabeher	90.10	43.48	40.0	60.08
St.Gabriel	83.17	95.65	96.0	91.05
Kidane Miheret	55.45	95.78	81.33	64.18
St.Mary	100.0	98.91	100.0	99.63
St.Giorgis	98.02	97.83	97.30	97.39
Holy Saviour (Medhanealem)	80.02	85.87	97.33	86.6
BealeWold	98.02	98.91	100.0	98.88

Table 6: Mean output and yield of crops cultivated

	Meher				Belg			
	Debre Berhan	Ankober	Gera Medir	Total	Debre Berhan	Ankober	Gera Medir	Total
(i) Barley								
Land (ha)	1.03	0.22	0.03	0.48	0.00	0.29	0.35	0.2
Output(kg)	609.14	109.10	7.99	274.08	0.00	188.25	147.47	106.78
Yield(kg)	591.40	495.91	265.33	571.00	0.00	649.14	421.34	533.90
(ii) Wheat								
Land (ha)	0.57	0.05	0.33	0.32	0.00	0.02	0.02	0.01
Output(kg)	221.29	7.99	105.17	115.57	0.00	7.50	2.74	3.35
Yield(kg)	388.23	159.80	318.70	361.16	0.00	375	137	335
(iii) Teff								
Land (ha)	0.01	0.24	0.01	0.09	0.00	0.00	0.00	0.00
Output(kg)	0.00	107.28	2.67	37.58	0.00	0.00	0.00	0.00
Yield (kg)	0.00	447.0	267	417.56	0.00	0.00	0.00	0.00
(iv) Total								
Land (ha)	2.77	0.94	0.60	1.55	0.00	0.36	0.38	0.23
Output(kg)	1086.17	411.57	178.26	602.51	0.00	216.91	154.25	116.79
Yield(kg)	392.12	437.84	297.10	388.72	0.00	602.53	405.92	507.78

Table 7: Revenue from crop sales

A. Crop	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Revenue	75.66	60.25	10.91	52.45
(ii) Distribution				
No Revenue : (%)	14.9	25.0	18.7	19.4
HHs rep.	15	23	14	52
1-100 Birr: (%)	67.3	59.8	81.3	68.7
HHs rep.	68	55	61	184
101-200 Birr: (%)	10.9	4.3	0.0	5.6
HHs rep.	11			
201 and Above: (%)	6.9	10.9	0.0	6.3
HHs rep.	7	10	0	17
B. Livestock				
(i) Average income from livestock sales	581.3	297.76	363.59	423.84
(ii) Average income from the sale of livestock product	41.05	19.48	42.39	34.02

Table 8: Major constraints to agriculture (% reporting)

	Debre Berhan	Ankober	Gera Medir	Total
Poor Soil Fertility	93.0	90.2	100.0	94.0
Shortage of Land	84.0	88.0	96.0	88.8
Shortage of Rain	69.3	75.0	93.3	78.0
Pests	54.6	54.4	41.9	50.9
Excessive Rain	52.5	40.2	44	45.9

Table 9: Average livestock ownership

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Number Owned				
a) Cattle	4.84	3.82	2.04	3.71
b) Sheep and Goats	5.53	3.05	5.20	4.59
c) Pack Animals	1.97	1.17	0.69	1.34
Trend in Livestock Ownership				
(ii) Trends in the Number Owned (%)				
(a) Oxen				
Decreasing	58.8	56.0	56.0	56.7
Increasing	16.2	20.8	5.3	15.3
No Change	22.1	18.4	30.7	22.8
(b) Cows				
Decreasing	51.5	49.6	52.0	50.7
Increasing	13.2	12.0	6.7	10.8
No Change	25.0	23.2	25.3	24.3
(c) Sheep				
Decreasing	73.5	44.0	61.3	56.3
Increasing	11.8	12.0	1.3	9.0
No Change	5.9	16.0	17.3	13.8
(iii) Average Income from Livestock Sales	581.30	297.76	363.59	423.84
(iv) Average Income from the Sale of Livestock Product	41.05	19.48	42.39	34.02

Table 10: Major problems of livestock raising (% reporting)

	Total
Shortage of Grazing Land	97.0
Lack of Bleeding Animals	72.8
Disease	59.0
Water Shortage	35.3
Wild Animals	22.9

Table 11: Income from handicraft activities (birr)

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Income (for all sample households)	308.05	278.40	1,027.95	480.65
(ii) Distribution of Handicraft Income				
No income: HHs rep.	91	87	70	248
%	90.1	94.6	93.3	92.5
Birr 1-100: HHs rep.	4	1	0	5
%	4.0	1.1	0.00	1.9
Birr 101 and above: HHs rep.	6	4	5	15
%	5.9	4.3	6.7	5.6

Table 12: Income from the sale of local brews (birr)

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Income (for all sample households)	1451.4	561.64	201.63	980.92
(ii) Distribution of Handicraft Income (%)				
No income: HHs rep.	67	65	69	201
%	66.3	70.7	92.0	75.0
Birr 1-100: HHs rep.	2	0	1	3
%	2.0	0.0	1.3	1.1
Birr 101 and above: HHs rep.	32	27	5	64
%	31.7	29.3	6.7	23.9

Table 13: Income from trade (birr)

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Income	351.57	2000.08	0.00	488.88
(ii) Distribution of Income				
No Income: %	89.1	98.9	100.00	95.5
HHs rep.	90	91	75	206
Birr 1-100: %	1.0	0.0	1.3	0.4
HHs rep.	1	0	0	1
Birr 101 and Above: %	9.9	1.1	0.0	0.4
HHs rep.	10	1	0	11

Table 14: Wage income (birr)

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Income	306.28	871.84	480.93	167.30
(ii) Distribution of Income				
No Income: %	92.1	71.7	45.3	72.0
HHs rep.	93	66	34	193
Birr1-100: %	1.0	0.0	5.3	1.9
HHs rep.	1	0	4	5
Birr 101 and Above: %	6.9	28.3	49.3	26.1
HHs rep.	7	26	37	70

Table 15: Income from other non-farm activities (birr)

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Income	447.16	496.89	345.82	431.95
(ii) Distribution of Income				
No Income: %	21.8	55.4	41.3	38.8
HHs rep.	22	51	31	104
Birr1-100: %	13.9	9.8	9.3	11.2
HHs rep.	14	9	7	30
Birr 101-200: %	20.8	7.6	12.0	13.8
HHs rep.	21	7	9	37
Birr 201 and Above: %	43.6	27.2	37.3	36.2
HHs rep.	44	25	28	97

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Income	351.57	2000.08	0.00	488.88
(ii) Distribution of Income				
No Income: %	89.1	98.9	100.00	95.2
HHs rep.	90	91	75	106
Birr 1-100: %	1.0	0.0	1.3	0.4
HHs rep.	1	0	0	1
Birr 101 and Above: %	9.9	1.1	0.0	0.4
HHs rep.	10	1	0	11

Table 16: Mean income from major components of other non farm activities (birr)

	Debre Berhan	Ankober	Gera Medir	Total
Relative Support	392.7 (6)	255.25 (4)	275 (2)	327.25 (12)
Fire Wood Sold	163.57 (56)	301.4 (9)	214.7 (11)	187.3 (76)
Carpentry	480 (4)	100.3 (3)	87.5 (2)	266.2 (9)
Masonry	400.0 (1)	1 (1)	126.7 (3)	156.2 (5)
Hay Sold	167.0 (25)	1 (1)	250 (1)	163.93 (27)
Gesho sold	50.0 (1)	195.25 (4)	283.3 (3)	210.13 (8)
Vegetables	105.0 (2)	457 (3)		133.4 (5)
Credit	700.0 (4)	355.29 (7)	238.18 (3)	359.41 (22)
Iqub	425.18 (28)	756.0 (13)	202.5 (4)	500.96 (45)
Other	278.3 (3)	355.17 (6)	244.0 (26)	266.0 (35)

Note: Figures in parentheses are number of households

Table 17: Non-farm income by source (percentage)

	Debre Berhan	Ankober	Gera Medir	Total
Revenue from Handicraft Activities	3.24	3.16	4.60	3.65
Revenue From Sale of Food and Drinks	25.15	26.38	2.10	18.14
Wage Income	4.22	28.14	45.98	24.47
Revenue from Trade Activities	6.06	0.58	0.00	2.54
Other Non-farm Income	61.33	41.74	47.32	51.20
Total	100.00	100.00	100.00	100.00

Table 18: Regression results

Dependent Variable	Ratio of Non-farm Income to Total Cash Income			
	Debre Berhan	Ankober	Gera Medir	Overall
Crop Revenue	0.009188 (0.576)	-0.049727 (-0.809)	-0.751496 (-0.11611)	-0.003103 (-0.197)
Education	7.073896 (2.187)	6.018583 (1.177)	-0.731994 (-0.179)	1.741410 (0.718)
Yield	-0.005290 (-1.024)	-0.029313 (-1.639)	-0.013648 (-0.929)	-0.009235 (-1.853)
Holding size	5.16764 (2.149)	6.477569 (1.544)	6.071655 (1.307)	1.44279 (1.681)
Food balance	-0.007821 (-1.645)	-0.066543 (-2.268)	-0.041901 (-1.821)	-0.012258 (-2.574)
Sex	0.048451 (0.005)	-26.193432 (-1.657)	-14.595126 (-1.306)	-7.195878 (-0.945)
Livestock Revenue	-0.025902 (-5.208)	-0.047077 (-4.639)	-0.041959 (-5.424)	-0.30833 (-8.130)
Age	0.503257 (1.760)	-0.226478 (-0.693)	-0.617433 (-1.763)	-0.336581 (-1.867)
Family size	0.767667 (0.448)	1.094766 (0.652)	-2.128586 (-1.020)	0.871719 (0.846)
Dummy variable with 1 for Debre Berhan				-1.982638 (-0.440)
Constant	3.641309 (0.171)	88.754981 (3.081)	124.488764 (5.299)	82.528534 (6.089)
N	96	81	67	246
R ²	0.33172	0.45722	0.57226	0.29614
R ² (adjusted)	0.26258	0.38937	0.50589	0.26631
F ratio	4.79822	6.73889	8.62197	9.92917

Note: T-Values are given in parentheses

Table 19: Food balance

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean (for the entire Population)	-199.40	-65.91	-141.21	-137.29
(ii) Distribution				
Negative (net buyers): HHs rep. (%)	64	51	60	175
Zero balance: HHs rep. (%)	63.4	55.4	80.0	65.3
Net sellers: HHs rep. (%)	15	22	15	52
Net sellers: HHs rep. (%)	14.9	23.9	20.0	19.4
Birr 1-100: HHs rep. (%)	22	9	0	41
Birr 1-100: HHs rep. (%)	21.8	20.6	0.0	15.4
Birr 101-200: HHs rep. (%)	8	5	0	13
Birr 101-200: HHs rep. (%)	7.9	5.4	0.0	4.9
Birr 201 and above: HHs rep. (%)	9	4	0	13
Birr 201 and above: HHs rep. (%)	8.9	4.3	0.0	4.9
Birr 201 and above: HHs rep. (%)	5	10	0	15
Birr 201 and above: HHs rep. (%)	5.0	10.9	0.0	5.6

Table 20: Farm cash income by source (%)

	Debre Berhan	Ankober	Gera Medir	Total
Revenue from Crop Sales	18.33	35.03	23.09	25.40
Revenue From Sale of Livestock	64.90	44.32	56.81	55.60
Revenue from the Sale of Livestock Products	16.77	20.65	20.10	19.01
Total	100.00	100.00	100.00	100.01

Table 21: Farm and non-farm cash income

	Debre Berhan	Ankober	Gera Medir	Total
(i) Mean Income				
Farm Cash Income	687.64	363.62	415.08	501.11
Non-farm Income	931.40	669.52	549.45	734.61
Total Income	1619.04	1033.14	964.53	1235.72
(ii) Share in Total Income (%)				
Farm Income	42.5	35.2	43.03	40.55
Non-farm Income	57.5	64.8	56.97	59.45

Table 22: Mean expenditure on some major non-food items (birr)

Exp. Items	Debre Berhan	Ankober	Gera Medir	Total
Clothing	195.35 (95)	117.58 (86)	151.85 (59)	156.79 (240)
Coffee	169.72 (100)	81.87 (92)	73.60 (75)	112.45 (267)
Pepper and Spices	83.32 (101)	75.15 (87)	61.52 (75)	74.40 (263)
<i>ikub</i>	358.93 (28)	460.13 (15)	149.20 (5)	368.71 (48)
Ceremonial exp.	98.64 (84)	72.13 (64)	58.67 (49)	80.09 (197)
Investment on cattle	733.75 (16)	486.67 (3)	0	694.74 (19)
Flour mill exp.	52.82 (100)	36.92 (89)	48.63 (71)	46.23 (260)
Onions	46.17 (99)	31.87 (79)	34.75 (61)	38.53 (239)
Salt	39.97 (100)	31.40 (90)	39.88 (74)	37.02 (264)
Cooking oil	56.33 (89)	39.35 (77)	41.07 (30)	47.32 (196)
Education	57.27 (48)	32.97 (37)	28.05 (22)	42.86 (107)
Medical exp.	70.46 (28)	19.70 (25)	20.58 (36)	36.03 (89)
Kerosene	43.61 (101)	30.03 (90)	34.04 (73)	36.34 (264)
Soap	34.13 (101)	27.85 (89)	29.49 (69)	30.74 (259)
Taxes	21.80 (100)	19.89 (89)	19.86 (73)	20.61 (262)
<i>idir</i>	21.48 (70)	7.60 (72)	9.04 (61)	12.82 (203)
Chrurch related exp.	12.97 (97)	11.18 (84)	9.75 (71)	11.46 (252)
Recreation	43.70 (64)	29.65 (49)	17.28 (32)	13.12 (145)

Note: Figures in parantheses are number of reporting households.

Table 23: Average food available and percentage contribution of different sources

	Debre Berhan	Ankober	Gera Medir	Total
Mean Food Available (in qts)	12.79	6.80	9.76	9.12
Percentage Contribution				
From Own Cultivation	84.10	86.87	54.73	76.82
From Purchase	15.90	13.13	23.35	17.06
From Food-for-work	0.0	0.0	21.92	6.11

Common Property Rights, Poverty and Environmental Degradation in the Borana Plateau

Yohannes Benyam

1. Introduction

The Borana plateau is found in Borana Administrative Zone, Oromiya National Regional State, in the southern part of Ethiopia. It occupies most of the area (about 95,000 km²) of the savannah plateau which now, in terms of productivity, constitutes one of the best remaining pastoral areas in Africa.

The Borana plateau is located in the foothills of the Bale-Sidamo massif. The landscape slopes gently from the northwest to the southeast. Most of it falls under the altitude of 1,000 to 1,500m, although there are occasional abrupt mountain areas reaching 2,000m or more. It is dominated by semi-arid climate and the mean annual temperature varies from 19°C to 24°C with little seasonal variation. Rainfall varies from 500mm in the southeast to over 700mm in the northwest and is bimodal. The main rains occur from March to May and the small rainy season, which lasts from September to November, is erratic. The period from June to September is characterised by heavy cloud cover, fog, mists and occasional showers while the main dry season is from November to March.

The Borana Plateau is characterised by a general scarcity of surface water. There are over 540 hand-dug wells found in some 40 clusters largely to the west. These wells provide over 95 percent of the permanent water points and about 84 percent of the total accessible water in a typical dry season. The wells also provide about half of the annual water requirements for people and livestock, with the remainder provided by ephemeral and permanent ponds (Coppock, 1994).

The Boranas (the people) live in a highly organised pastoral society and depend almost exclusively on their herds for subsistence either directly in the form of milk, milk products, blood and meat or indirectly in the form of imported cereal which is exchanged for cash earned through sale of cattle or barter of animals or animal products. Crop cultivation, however, was started only recently and is practised on a very low scale.

Pasture is communally owned. Thus, every Borana pastoralist has the right to graze his livestock wherever he likes within the Borana areas. The tribal lands of Borana are divided into at least 75 concise and demarcated pastoral districts (*meddas*). Each of the *medda* has one or more permanent wells and ownership and regulation of access are complex.

Every well belongs to a certain clan. Each member of the clan has the right to use the wells. This right is realised by participating in the well council and the practical tasks of maintaining the physical structure of the well and its day-to-day operation.

The predominant breed of cattle owned by Borana is the Zebu (*Bos indicus*) known as the Boran. It has a high production performance and is well adapted to the environment. The Boran is considered one of the outstanding beef breeds in Africa. The Borana also own a few small ruminants, camels and equines.

2. Background of the Study

The Borana pastoral production system operates under a common property ownership of grazing land and permanent watering wells. Grazing land is a free access resource to the Borana pastoralists while the right over the use of watering wells is defined to a specific clan which at least owns one.

The International Livestock Centre for Africa (ILCA, 1985) argues that the Borana pastoral production system is a system in balance. It further describes that the society has evolved relationships with the environment whereby the various resource components are skilfully managed by a complex social structure which is directly related to the regulation of the access and utilisation of the critical resource, permanent water. But it adds that the ability of the Borana to manage their pastoral resource has reached its limit and that the value and standards of general pastoral life is in decline.

Nowadays, environmental degradation is an evident phenomena in the Borana plateau. Bill (1986) has described that the intensive grazing pressure on the disputed areas between the Somali and Borana has resulted in a change from savannah grasslands to heavier wooded and bushed country. ILCA (1986) states

that the replacement of grasslands by ligneous growth, a phenomenon common in Africa wherever grazing pressure is high, is transforming the southern rangelands [among which is the Borana rangelands]. Based on a study made on an area of 29,000 km², ILCA (1986) has revealed that the potential grazing lost due to bush encroachment in the study area over the last century is equivalent to a carrying capacity of at least 20,000 tropical Livestock Units (LSU) or 8 percent of the then cattle population (one TLU is equivalent to 250kg live animal).

According to the same source, the location and stability of encampments affects vegetation succession in Borana since most camps are located on high ground, with the area around each camp (0.5 to 5km radius) being heavily grazed and most nearby trees cut for fire wood. Eshete (1991) also describes that bush encroachment is threatening the [Borana] range due to increase in livestock number. (Increase in woody vegetation have been commonly reported as a response to heavy grazing elsewhere (Coppock, 1994)).

ILCA (1986) states that nearly one-third of the Borana rangelands can be considered degraded in the sense that primary productivity is less than the potential or where plant cover is severely reduced and erosion is clearly visible.

In spite of the highly sophisticated social organisation of the Borana society which plays a significant role in regulating the stocking rate on grazing land, the pastoralists had always been keeping a large number of animals which well surpass the carrying capacity of the rangelands. Eshete (1991) has described that according to the livestock census carried out by the Southern Rangelands Development Unit (SORDU), since 1989, even though the 1984/85 drought has killed thousands of animals, the livestock number in Borana was found to be 3 million TLU where as the carrying capacity estimate was 1.2 million TLU.

The pastoralists tend to keep a large number of livestock mainly for risk aversion against calamities (like drought and livestock diseases) which could significantly reduce livestock number and bring about famine. Donaldson (1986) has reported a 42 percent drought induced mortality rate during 1983-85 drought. The 1990-91 drought had also detrimental effects on the production system.

Overstocking is the most important reason for environmental degradation in the Borana Plateau. It is caused by the large number of animals kept by the pastoralists as a guarantee against significant reduction in the number of animals that can bring about famine; it can be deduced that poverty is the underlying reason for degradation of rangelands in the Borana Plateau which is a common property resource.

Although the common property right over the use of the rangelands gives the Borana pastoralists the opportunity to free-ride, in the sense that every herdsman could keep as many animals as possible on the rangelands, there are certain physical limitations to this possibility. Hence, "the tragedy of the commons" of Garrett Hardin (1968) does not completely apply to the Borana pastoral production system. However, environmental degradation in the Borana Plateau induced by poverty and the freedom to use the rangelands as a common property resource is likely to make the pastoralists poorer.

3. Analytical Framework: Common Property Rights and Environmental Degradation

"Property" and "Property Right" should not be confused. If the term property leads one to think of things rather than rights then it will be misleading. A property right can be defined as a set of rules specifying the use of scarce resources and goods (Fourerboth and Pejovich, 1972). The set of rules includes obligations and rights; the rules may be codified by law or they may be institutionalised by other mechanisms such as social norms together with a pattern of sanctions.

Feeny, et al. (1992) distinguish four types of property rights: private, state, open access and communal.

- i. **Private property:** Under private-property-right regime, the right to exclusively use a resource and to regulate its use are vested in an individual or a group of individuals like a corporation. In some cases the right to use an object or to receive a service is not transferable. Examples of this type of right include licences to derive a taxi and notarised documents (Sievert, 1987).

- ii. **State property:** Under state-property-right regime, rights to the resource are vested exclusively in the government which in turn makes decisions concerning access to the resource and the level and nature of exploitation. State property differs from the other regimes in that, in general, the state, unlike private parties, has coercive powers of enforcement (Feeny, et al. 1992).
- iii. **Open access property:** This property regime represents de facto no ownership because it grants the right to everybody to use any type of property without charge, permission or hindrance for any purpose at any time. Feeny et al. (1992) define open access as the absence of well-defined property rights. Dales (1992) states that property that is freely available to all [open access property] is unowned except in a purely formal, constitutional sense and lack of effective ownership is almost always the source of much mischief.
- iv. **Communal property:** Under this regime, a resource, unlike open access, is not free to all. It is rather held by an identifiable community with communal arrangements for the exclusion of a non-community member and regulation for the use of the resource among the users. Feeny, et al. (1992) states that within the community, rights to the resource are unlikely to be either exclusive or transferable; they are often rights of equal access and use. Some inshore fisheries, shellfish beds, rangelands and forests have been managed as communal property. The rights of the group may be legally recognised. In other cases the rights are de facto, depending on the benign neglect of the state.

Two important characteristics apply to all common property resources: first, exclusion or control of access of users to this resources is problematic and the situation brings about externalities that emanate from the direct interactions among the users. Second, each user can take out from the resource causing reduction in the welfare of other users. Berkes, et al. (1989) stated that even if users cooperate to enhance the productivity of their resource, for instance by replanting trees, the nature of the resource is such that the level of exploitation by one user adversely affects the ability of another user to exploit the resource. Subtractability (or rivalry) is the source of potential divergence between individual and collective rationality.

The difficulty of exclusion from the use of a common property resource brings about the possibility of free-riding by every member of the community and joint use of a resource which involves subtractability, in the final analysis, brings about deterioration of the resource.

Dale (1992) stated that common property will be over-used relative to both private property and public property. He adds that common pastures were so overstocked during the medieval period that their productivity fell to vanishing point. Siebert (1987) also noted that parts of North Africa were the granary of the Roman empire; after property rights were changed into a common property pasture system by the Arabs in the 16th century, the conservation of the land was neglected.

4. Communal Property, Poverty and Rangelands Degradation in the Borana Pastoral System

4.1 Wealth Stratification in the Borana Plateau

As it is true for all pastoralists in Africa, the Boranas occupy marginal land in terms of productivity. They practice a subsistence agriculture (pastoralism) which is always under the risk of natural vagaries and livestock sweeping diseases.

The Livestock and Meat Board (1974) states that the Borana rely almost exclusively on cattle breeding for subsistence and farming is practised by a third of the breeders, but on a very small scale. Getachew Eshete (1991) also states that the Borana pastoralists keep the animals mainly to satisfy food requirements.

The Third Livestock Development Project (1981) argues that although there is a conjectural pattern of decline in pastoral life in the Borana Plateau, a generally accepted picture is painted of a Borana society in retreat with the other social groups in no condition to exploit the resultant position. Cattle numbers are said to be down by 60 percent in the decade, farming is gradually engulfing the better grazing areas around settled centres; population is projected to increase by 50 percent over the next 20 years; and a steady trickle of highland farmer immigrants is gradually increasing. It had also been estimated that within the

Borana area 20 percent of families can be considered poor and 10 percent destitute and without livestock holdings.

In a study conducted on 633 households in the Hara and Dubluk *medilas* (districts), Mulugeta Assefa (1990) has exercised a wealth stratification and considered 51 percent as poor, 31 percent as intermediate and 18 percent as wealthy. These categories correspond to 0.8, 2.9 and 6.0 milk cows per family member or 2.3, 7.3 and 14.2 heads per family member. This situation would imply that most of the Borana families cannot satisfy their energy requirement since 0.8 milk cow per family member is too low to supply the calorie need in any way (see Donaldson, 1986:13-14 and Upton 1987:131,212-213).

ILCA/RDP (1985) noted that, measured against the cash income per capita for Ethiopia, the Borana are relatively poor. Although it is estimated by the World Bank (1984) that GDP per person (per capita income) for Ethiopia was US \$ 140 (Birr 280) in 1982, per capita income of the Borana is below this. Based on a stratified random sampling in the vicinity of Dublak and Mega towns (both found in the Borana Plateau), Holden and Coppock (1992) have reported average annual income ranging from Birr 93 to 445 and 784 for poor, intermediate and wealthy households, respectively. This would also imply that most of the Borana pastoralists earn an annual income which is much lower than the average figure for the nation.

ILCA/RDP (1985) noted that the proportion of sales income available for the acquisition of additional stock or other items by the highest income group in the household survey [conducted by ILCA/RDP, 1985] was 17 times that of the lowest income group.

Mulugeta Assefa (1990) has revealed wealth effects on family size, livestock holding and various productivity parameters as shown in Table 1 (below).

Except for age at first calving, calving interval, calving rate and daily milk off-take, all other aspects did vary among the three wealth categories. Poor families had the lowest number of cattle including cows with the longest lactation period, lowest amount daily milk production and daily milk intake by calves and with the highest rate of daily milking frequency per cow and average teats milked/cow/day. Calve mortality was also the highest for the poor households.

Table 1: Household wealth effects on family size, per capita cattle holdings and herd size, composition and various production aspects of cattle in the southern rangelands, 1985-89¹

Variable	Units	Wealth classes ²		
		Wealthy	Middle class	Poor
Family size	no	6.4x	4.8y	5.6z
Cattle herd	no	91x	35y	13z
Mature male cattle	no	24x	9y	3z
Female cattle (< 4 years old)	no	27x	12y	5z
Mature cows	no	39x	14y	5z
Cow/person	ratio	6x	4.5y	0.8z
Age at first calving	years	4.5x	4.5x	4.4x
Calving rate	%	71x	70x	56x
Calving interval	days	455x	454x	462x
Lactation period	months	7.5x	8.2x	8.4y
Daily total milk yield	ml	1983x	1899x	1570y
Daily milk off-take	ml	864x	836x	832x
Daily milk intake by calves	ml	1119x	1063x	737y
Daily milking frequency/cow	no	1.4x	1.7y	1.8z
Average teats milked/cow/day	no	1.4x	1.6y	1.8z
Calf mortality				
All years	%	23.9x	16.5y	30.4z
Average rainfall year ³	%	19.4x	18.4x	25.1x
Dry year	%	21.4x	11y	24.7x
Drought year	%	69.2x	50y	89x

- Note:**
1. The data are based on interviews of households regarding production history of 482 cows and 1540 calves. Entries in the same row accompanied by a different letter (x, y, z) were significantly different ($p < 0.05$).
 2. Wealth classes are based on ratios of cattle to people per household.
 3. An average rainfall year has 600mm or more of rainfall, a dry year has 450mm or less and a drought year is a second consecutive dry year.

Source: Mulugeta Assefa (1990).

4.2 Resource Holding Pattern, "the Tragedy of the Commons" and the Poor

Pasture in the Borana plateau is commonly owned by the Boranas. Every member of the community has an equal right to graze his livestock anywhere within the Borana territory. The Third Livestock Development Project (1981) stated that the Borana are highly organised pastoral society and have divided their tribal lands into at least 75 concise and demarcated districts. Each of these have one or more permanent water points and there is no restriction or control of grazing access between one district and another.

Helland (1980) noted that pasture is free and cannot be monopolised by any particular group or person. He adds that the only limitation on this free access (for the Borana) is that the lactating herds kept near the homestead and brought back for milking every night (*loni worra*) have priority over the dry satellite herds (*loni fora*). A *fora* herd may thus not move into an area occupied by *worra* cattle while a *worra* herd may displace a *fora* herd.

The right of use over a (permanent) well, unlike pasture, is limited to the members of the clan owning it. Helland (1980) describes that watering rights in any particular well must be gained through participation in a well council and constant participation in the practical tasks involved in running the well.

The shortage of water during the dry season limits the grazing radii to shorter distances, around permanent wells. Hence, areas with ample pasture but no permanent watering points cannot be utilised during the dry season. Pasture is also limited by the erratic and unreliable rainfall. This, together with high run-off, produces a situation where good pasture and no pasture at all may be found side by side.

When Hardin (1968) arrived at the conclusion that "freedom in the commons brings ruin to all" has asked the reader to picture a pasture which is open to all and that it is to be expected that each herdsman will try to keep as many cattle as possible on the commons. He added that as a rational being, each herdsman seeks to maximise his gain.

He further said that the utility that each herdsman gets has one negative and one positive components. The positive component is a function of the

increment of one animal but the effect of overgrazing is shared by all herdsmen. The negative utility for any particular decision-making herdsman is a fraction of -1. But this is a conclusion reached by each and every rational herdsman sharing the commons. There-in is the tragedy.

Hardin, in the synthesis of his article "The Tragedy of the Commons" has not ruled out the possibility of non-owners from using the common property pasture.

As mentioned earlier, in the Borana plateau, pasture is exclusively owned by the Borana community and permanent wells (the crucial resource in the Borana pastoral system) by a certain (Borana) clan each. No person belonging to another community can graze his livestock in the Borana territory neither can his livestock drink from the wells owned by the Borana clans.

Moreover, the limited availability of dry-weather watering points limits the number of livestock that can be added to the herd. The Livestock and Meat Board (1974) states that livestock population of the southern rangelands (among which is the Borana Plateau) is now limited by the carrying capacity of limited areas exploitable during dry seasons. ILCA/RDP (1985) also supports the above arguments that in Borana, there are physical constraints on livestock accumulation which are imposed by the primary productivity of the rangelands and the available water supply. Hence, Hardin's model does not work in the Borana pastoral system.

The mode of ownership of resources (pasture and permanent wells) in the Borana Plateau, however, helps the rich over the poor. Since the wealthy and the poor pastoralists have equal rights to use the resources, the wealthy families get a larger return as they own a larger number of animals. The poor families could have shared this return if they had owned a large number of livestock which would have definitely reduced the gain by the wealthy families.

This situation will be exacerbated when pastoralists are compelled to sell animals. When animals are to be sold, priority is set with regard to the type of animal to be disposed in such a way that the sustainability of the herd is assured as much as possible. Coppock (1992) states that the priority is usually set as follows (from highest to lowest): i) cull cows (19+ years old); ii) mature males in descending order of age (from 10 to 5 years old); iii) immature males (1 to 4

years old); iv) male calves (less than 1 year old); v) female calves (< 1 years old); vi) immature females (1 to 4 years old); vii) heifers (4 to 5 years old) and viii) prime cows (5 years old and above).

Wealthy herd owners would have all these types of cattle at their disposal. The poor, however, may only have a few cows and immatures. Animals are thus sold in reverse order of their importance to herd-generating capacity, which makes the poor poorer.

4.3 Effects of Drought and Severe Drought Seasons in the Borana Plateau

A dry year and a drought year were defined by Cossins and Upton (1988) as years in which the length of growing period is less than 75 and 50 percent of the long-term mean, respectively. And he concluded that a dry year occurs once in 5 years and a drought year once in 20. Bill (1983), however, argues that a regular rainfall cycle [dry and drought years cycle] does not exist in the southern rangelands.

Based on a study conducted on 15,475 km² of area in the Borana plateau, Cossins and Upton (1987) reported stocking rate of livestock in the wet season to be 20 head/km² for cattle in the dry season. However, it is decreased by 20 percent. Cossins and Upton (1988a) estimated for the study area mentioned above that net primary production (NPP) drops by 25 to 50 percent in dry and drought years, respectively. It thus may be anticipated that the carrying capacity for livestock would similarly decline by 25 to 50 percent in dry and drought years.

Donaldson (1986) has revealed a drought induced mortality rate of 42 percent based on a study conducted in 5 Borana encampments. Mortality rate by age and sex classes were: i) calves 57 percent, ii) immature females 27 percent, iii) immature males 44 percent, iv) mature cows 45 percent, and v) mature males 22 percent. He further stated that 55.9 percent of *worra* and 75 percent of *fora* cattle have died of starvation during 1984-85 drought. A survey conducted by Coppock (1988) and Webb, et al. (1992) on 96 households have revealed a 24 percent mortality during the 1983-84 drought.

Drought mortality for cows in different regions was calculated from the data provided by Donaldson (1986) and yielded rates of 25 percent (north) to 35 percent (east) and 50 percent (central). Assuming a series of post-drought average rainfall years, it was predicated that complete recovery in cow numbers would take from six years in the north to nine and 14 years in the east and central regions, respectively (Coppock, 1994).

During the 1989-90 dry season about 5 percent of the cattle population died and losses of cattle were on the order of 50 percent of pre-drought holdings during the drought of 1990-91 (Coppock, 1994).

A number of parameters affect the productivity of an animal. Regarding dairy cow, however, calving rate, calving interval and production potential of the cow are prominent. These parameters are highly affected by nutrition.

Donaldson (1986) noted that the calving interval for 67 percent of cows in four encampments was at least 18 months during the drought, about 20 percent longer than the pre-drought value of 15 months. And the calving percentage (the proportion of cows that give birth per year) has declined abruptly from 75 percent before the drought to 90 percent during the drought. Average daily milk off-take per cow during the height of the drought dropped for about 500ml/head/day from November 1984 through January 1985 to about 260ml/head/day in March 1985 just before the drought ended (Donaldson, 1986). Daily milk off-take during the worst time of the drought was reduced by about 92 percent compared to the total daily milk off-take for an average family in the dry season of an average rainfall year.

Cossins and Upton (1988a) noted that the drought (1984-85) diet was composed mostly of grain and was substantially below minimum daily energy requirements (Coppock, 1994).

Drought brings about a decline in the pastoralist's terms of trade. Coppock (1994) stated that the decline in terms of trade between live animals and grain observed in the central part of Borana plateau equals to 70 percent reduction in the monetary value of cattle, a 150 percent increase in the price of grain and 90 percent net loss in pastoral purchasing power.

4.4 Risk-aversion Mechanisms Among the Borana Pastoralists

As it is mentioned earlier, the Borana pastoral production is a system operating under risks of climatic vagaries and livestock sweeping diseases, which at any time could significantly reduce the number of livestock. This situation has always been subjecting the pastoralists to famine (see Section 4.3). Since the absolute number of animals they hold are fewer in number, poor pastoralists are most affected by calamities.

The wealthy families may lose a larger number of livestock in absolute terms but they will remain with a certain number of animals which enable them to regain the initial position during post-drought periods. The uncertainty in the production system has always forced the Borana pastoralists to practise risk-averting mechanisms which could protect them from losing all animals.

Although there are certain risk-aversion mechanisms practised by the Borana pastoralists such as species diversification and herd dispersal, holding large number of animals is the major one.

Species diversification is not much exercised among the Boranas since cattle are the most important animals in the pastoral system (the Borana mostly depend on cow milk). Cossins and Upton (1987) stated that small ruminants account for 7.4 percent of the TLUs and dromedary camels constitute a very small fraction of livestock on the Borana Plateau.

As far as the practice of the dispersal is concerned, the Boranas practise a *worra-fora* herd splitting system (see Section 4.2). Although this system can serve as a risk-aversion mechanism, its prime function is to expand grazing area in relation to a decline in net primary production (Donaldson, 1986).

Getachew Eshete (1991) stated that there is a tendency of keeping more animals (than the number that fulfils food requirements) among pastoralists (in the southern rangelands) as a risk-averting measure against drought and/or severe dry season. He added that the off-take rate is very much lower than it has to be. Coppock (1992b) has also noted that the effect of drought which may make the poor to lose enough to be pushed out is also a valid hypothesis for the motivation of the Borana who reportedly desire large cattle herds.

The Borana do not sell livestock except when they encounter indispensable cash needs, which emanates from the tendency to keep a huge herd as risk-aversion mechanism. Coppock (1994) stated that the tendency for the Borana to try to avoid selling cattle in wet periods when forage (and thus milk) production is high and to sell during dry periods of stress when they are forced to purchase grain.

This supports the general observations that pastoralists principally sell animals to remedy a specific cash need that usually appears in a dry season or drought. They try to endure periods of stress so they do not have to make a "withdrawal" from their pool of herd capital. The households with marketable animals restrict food intake and undergo other severe hardships during drought (Webb et al., 1992) and this is hypothesised to be a manifestation of the above mentioned behaviour.

When given no other income-generating option, the Borana reportedly prefer to sell mature male cattle because the gross income received allows them to purchase food plus replacement calves; and thus attain two goals, namely commodity procurement and herd building. The Borana do not seem to sell in anticipation of a future crisis, but instead wait until they have no other recourse.

To illustrate, they do not appear to understand the implications of seasonal fluctuations in the terms of trade of livestock for grain, and do not sell cattle at the time of year which would maximise their returns. They merely wait until they have no choice, regardless of how detrimental the terms of trade happen to be (Coppock, 1992b).

The Borana practice of livestock accumulation as the major risk-averting mechanism regardless of an obvious overstocking of their rangelands emanates from the communal property ownership regime. This situation may be beneficial at individual level. However, since the long-term effects of it are detrimental, it is not viable at the community level.

4.5 Environmental Effects of the Borana Pastoral System

The common property ownership of pasture and permanent water wells and thus the possibility of free-riding by the users of the resources has always kept

the number of animals on the Borana plateau above its carrying capacity. The major underlying reason for a large number of animals kept is risk aversion (see Section 4.4).

According to the livestock census carried out by the Southern Rangelands Development Unit (SORDU) since 1989, even though the 1984/85 drought has killed thousands of animals, the livestock number was found to be 3 million TLU. However, the 1984/85 carrying capacity estimate was 1.2 million TLU (Getachew Eshete, 1991). The off-take rate varies much lower than it has to be and this condition is resulting in a high grazing pressure on the pasture and improper utilisation of resources.

One of the prominent environmental impacts of holding a number of animals that exceeds the carrying capacity of rangelands is manifested by bush encroachment and an increased woody vegetation on rangelands. Increases in woody vegetation have been commonly reported as a response to heavy grazing (Coppock, 1994).

ILCA/RDP (1985) also stated that heavy grazing accelerates bush encroachment. Getachew Eshete (1991) stated that bush encroachment is further threatening the Borana range due to increase in livestock number and absence of bush control measures making the grass cover to decline in proportion.

Coppock (1994) noted that bush encroachment is perhaps the most ubiquitous consequence of heavy grazing pressure in the Borana Plateau. Recent and heavy grazing pressure in Did Hara (a district found in the Borana plateau), which had previously been relatively undisturbed by livestock because of poor access to water, elicited a new way of woody encroachment. Heavy grazing at Medecho (another district in the Plateau) in the past was evident in the mature age structure woody populations. Goloicha (another district), under the highest rainfall regime, exhibited a particularly strong tendency for woody encroachment from grazing perturbation (Bill and Assefa Eshete 1984).

ILCA/RDP (1985) stated that the location and stability of encampments also affects vegetation succession in Borana. Most camps are located on high ground, with the area around each camp being heavily grazed and most nearby trees cut for firewood. The 0.5 to 5 km radius is heavily grazed, but the trees

are not cut, and tree and shrub growth is boosted by nutrient transfer from more distant areas grazed by passing stock. After 3 to 7 years a camp may be moved, leaving behind a nucleus of cleared grassland which is high in nitrogen, and a large peripheral area where sustained high grazing pressure and a consequent lack of grass fire, has encouraged bush and tree growth.

Based on a study conducted on an area of 29,000 km² in the Borana Plateau, ILCA/RDP (1985) reported that much of the study area is at the intermediate phase of bush invasion where grass production may be lowest.

The replacement of rangelands by ligneous growth, a phenomena common in Africa wherever grazing pressure is high, is transforming the southern rangelands. The potential grazing lost for bush encroachment in the 29,000 km² of the study area over the last century is equivalent to a carrying capacity of at least 20,000 livestock unit or 8 percent of the present cattle population (ILCA/RDP, 1985).

In a study conducted in Did Hara and Medecho districts of Borana, Bill and Assefa Eshete (1984) revealed that erosion and grazing intensity appeared to be interrelated and both were ranked from high to very high at half of the sample points (Coppock, 1994).

Pratt (1987) has recognised the heightened soil erosion on slopes at higher elevations and speculated that it was caused by high stocking rates and the trekking of cattle to up-country markets. Hacker (1990) confirmed a high incidence of soil erosion (in 68 percent of 801 survey sites) which appeared to be pronounced on slopes comprising of red soils where grass cover was reduced by grazing. Based on 47 sample points in the upper semi-arid zone, Bill and Assefa Eshete (1984) have described that erosion and grazing intensity appeared to be interrelated and both were ranked from high to very high at over half of the sample points.

5. Conclusions and Recommendations

The Borana pastoralists practise a subsistent agriculture (pastoralism). Their living condition is highly linked to the pattern of rainfall which is erratic and unreliable in the area. Natural vagaries which would entail a severe dry season

or a drought year may be detrimental to the extent of inducing famine. The pastoralists practice certain risk-averting measures against these unforeseen calamities. The prominent risk-averting mechanism practised by Borana pastoralists is holding a large number of animals which would enable them to have a certain number of animals after a loss to rebound to the needed number of cattle. This situation has always subjected the Borana rangelands to overstocking.

Herd building by the Borana which is practised regardless of the obvious overstocking emanates from the "common property ownership" regime of pasture and permanent water points. Every Borana family tries to maximise his benefit out of these common property resources by taking the position of a free-rider. This on the aggregate level, however, leads to overgrazing and ultimately to environmental degradation which further reduces the carrying capacity of the rangelands. Hence, it is concluded that poverty in the Borana plateau has induced the accumulation of a large number of animals which has brought about an environmental degradation in the area.

Although the pasture in the Borana plateau is not an open access resource, and "the tragedy of the commons" of Hardin (1968) does not apply to the Borana pastoral system in the sense of the said property ownership regime, the communal ownership pattern of pasture and well water gives the wealthier (but a small proportion) pastoralists an advantage over the poor. This is so because under the condition of a communal ownership of resources, every member of the community is free to use the resources equally. However, since the communally owned pasture, in this case, is transformed into private wealth (animal), the community member with a large number of animal takes out much more from the commons and transforms it to his own wealth, which otherwise could have been shared by other members who actually own a small number of animals and cannot share it.

Dry season water source is found to be crucial in the Borana plateau for production. The availability of dry season watering points determines the grazing radii during the dry season. A large area of land with good pasture could not be utilised because of unavailability of water, whereas areas around permanent water wells are overstocked and hence overgrazed mainly in the dry season.

The following recommendations are forwarded with the belief that their implementation would bring about a more sustainable pastoral production in the Borana Plateau.

- i. Since the pastoralists primarily hold a large number of animals, which surpasses the carrying capacity of the rangelands, for risk-aversion purposes, assurance by the government to support them during severe dry seasons, drought years and post-drought recovery periods, would encourage the pastoralists to sell animals in excess of the carrying capacity of the rangelands. The pastoralists should, however, be made aware of the effects of overstocking. Favourable terms of trade are also essential for the pastoralists to encourage them to sell livestock.
- ii. Carrying capacity and the number of animals that graze on the rangelands should be balanced. This may be achieved by introducing a grazing and watering scheme which would gear the use of pasture and water towards sustainability. The scheme should be one that favours the poor pastoralists. The social organisation of the Boranas which divides their land into at least 75 *meddas* (districts) could be exploited in this regard.
- iii. Development projects in the area should target a long-term sustainable pastoral production unlike the previous ones which have ultimately enabled the pastoralists to accumulate more animals.
- iv. If the large stretches of pasture land which could not be utilised because of dry season water shortage are provided with permanent water sources, the overstocking in the areas around permanent wells could be reduced. Hence, development of water resources in the Borana Plateau can play a great role in reducing overgrazing.
- v. Destocking should be put into effect in areas with extremely high stocking rates. This measure may be effective if the pastoralists are made aware and convinced of the effects of overstocking and if it is accompanied by compensation.
- vi. Bush encroachment can be controlled at least to a certain extent by range burning. The ban on range burning by the government should then be lifted and burning should be exercised under the supervision of professional range managers.

- vii. The already degraded areas should be allowed to regenerate by avoiding grazing on such lands for a certain period of time.
- viii. A considerable change in the production system is important which in the long term would change the attitude of the pastoralists towards commercialisation. The limited resources in the Borana Plateau may in the long run, reach to a point where they can no more support population.

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Diversified Uses of Animal Traction for Poverty Alleviation in the Ethiopian Highlands

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1. Introduction

In most developing economies, the subsistence of the growing population depends mainly on agriculture. However, increases in agricultural production have not kept up with population growth due to various factors including unfavourable climatic conditions, poor infrastructure, inappropriate agricultural policies and predominantly traditional production systems. Consequently, the magnitude of poverty in most sub-Saharan African (SSA) countries including Ethiopia has become a serious problem. It has been projected that with an average annual growth rate of 4 percent, the number of poor people in absolute poverty in Africa will double from the current 184 million people to around 304 million by the year 2000 (Action AID, 1993).

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, Ethiopia, 1995). As a result, rural underemployment increased; nutrition levels declined; and the gap between food production and consumption widened. The gap is often filled by imports and international aid. For example, in 1990, the amount of grain imports and aid to Ethiopia amounted to 680 and 538 thousand metric tons, respectively (World Bank, 1992).

Quite a significant proportion of the population in Ethiopia lives in absolute poverty without enough resources to acquire the minimum dietary requirements. Previous studies indicate that from 0.6 to 4.4 million urban and 12.6-33.0 million rural Ethiopians do not get adequate diet (USAID, 1995 and World Bank, 1992). The challenge for the Ethiopian government is to increase agricultural productivity to cope with the problem of food insecurity. One means of doing this could be intensifying the production system of the smallholder farmers which constitute about 95 percent of the country's agricultural sector.

2. Livestock and Poverty Alleviation

Ethiopia has the largest livestock population in SSA. Without accounting for the contribution of draught power and manure, livestock production constitutes a large portion of the agricultural GDP. The total number of cattle is estimated at 31 million of which 9 to 10 million oxen are used for traction (FAO, 1994). The highlands of Ethiopia alone account for 70 percent of the cattle, 75 percent of the sheep and 27 percent of the goats (Jahnke and Getachew, 1983).

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 in the intensification of farming which could result in higher output and income, and therefore poverty alleviation and food security (McIntire et al., 1992).

In order to alleviate poverty and ensure food supply, searching for new technical innovations and appropriate utilisation of existing resources become increasingly important. Appropriate utilisation of resources would foster production and alleviate poverty. However, in addressing the issues of food security, an important source of food supplies, livestock, is often neglected. The production system of most Ethiopian farmers is based on the combination of crop production, stock raising and off-farm employment. Livestock are important to smallholder production systems, converting low-quality plant biomass into high-quality human food. They are important as draught power, transport, as source of food (milk and meat), sources of income from sales of milk, meat, hides, skins and live animals. Where crop and livestock are integrated, crop residues provide a major share of the livestock feed while livestock plays a critical role in the intensification process by providing draught power and manure. Furthermore, cash incomes from the sales of livestock and livestock products are the sources for procuring modern agricultural inputs, such as, fertiliser, insecticides, pesticides and improved seeds.

With the large potential for cattle rearing in Ethiopia, there is an opportunity to make an impact on poverty alleviation by diversified uses of animal traction. Traditionally, animal traction is used for cultivation. However, research conducted by the International Livestock Centre for Africa (ILCA, currently the International Livestock Research Institute (ILRI)) suggests that animal

traction could also be used for surface drainage and for constructing water reservoirs. In this connection, the diversified uses of animal traction will contribute to the alleviation of poverty by increasing agricultural productivity and water supply for domestic uses and irrigation.

Animal traction has been an integral part of most agricultural systems in Ethiopia. In the highland and mid-elevation areas (*dega* and *weina dega*) of Ethiopia, 90 percent of 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, 1995). However, it is not clear how differences in oxen holdings influence the cropping patterns and the income of the farmers, and how diversified uses of animal traction (ploughing, surface drainage and water conservation) could also alleviate the problems of food insecurity. This paper is concerned with the assessment of the contribution of diversified uses of draught power to increased agricultural production in the Ethiopian highlands. Data collected by ILCA/ILRI around Debre Zeit, Debre Berhan and Were Ilu (south Wollo), and other sources will be used to illustrate the uses of oxen for ploughing, surface drainage and water conservation for increased agricultural productivity.

3. The Production Environment

The highland eco-zone is extremely diverse in its geology and soil formation. It is fragmented by valleys and rivers into many land forms, consisting of plateaus and flatland surrounded by escarpments. The main soils are alfisols, vertisols and inceptisols. Stony mountain slopes and seasonally flooded bottomlands are marginal for cropping, and therefore, are used mainly for grazing. The major soil related problems are erosion on the slopes, poor drainage on the bottomlands and plant nutrient deficiencies.

The rainfall is bimodal, main rains occurring from June to September and the short rains occurring during February to May. In some highland areas the "small rains" are not sufficient to grow crops, and generally, farmers prepare their land during the "small rains" for planting. The mean annual rainfall in the highlands varies from 500 to 1,500 mm depending on the altitude and orientation to the direction of the rain. In spite of 2,000 mm rainfall per year, 5

to 6 months water storage per year is a common problem in many parts of the highlands.

Mixed smallholder rain-fed agriculture in the Ethiopian highlands is dominated by *teff*, wheat, barley, sorghum, maize, horse beans, peas, lentils and local type of hops. Annual crop yields average from 400 to 1,000 kg per ha (Gryseels and Anderson, 1983). A widely practised crop rotation is two consecutive years of cereal crops followed by a pulse crop. Although in some highland areas, the fallow period extends up to 5 years, because of the growing population and land fragmentation, majority of the farmers are compelled to continuously cultivate the land. Soil fertility is declining in the Ethiopian highlands and use of chemical fertilisers for replenishing soil nutrients is not yet a widely used practice. Manure is normally dried and used as fuel, while only fewer than 10 percent of the farmers use small quantity of chemical fertilisers or improved seeds.

Most farmers own two oxen, a cow, a few sheep, a donkey and some chicken (Gryseels and Anderson, 1983). Sheep and goats require minimum inputs and provide investment and security in times of need. Donkeys are extensively used to transport agricultural inputs and farm produce. It is estimated that there are 3.9 million donkeys 1.4 million mules and 1.5 million horses (FAO, 1979).

Livestock productivity is low for all species. Seasonal shortage of livestock feed is acute in the highlands. Grazing on communal lands and fallow plots constitute the main source of feed, and this is supplemented with straw, crop residue and stubble grazing. As grazing lands are encroached for growing crops, feed inadequacy is further aggravated. Preferential supplementation of work oxen and cows in milk with straw or hay is therefore a common practice during the dry season.

3.1 Ox Ownership and Cropping Patterns

Except for small and very difficult areas of the highlands where hoe cultivation is still practised, all cultivations are carried out by oxen pulling the traditional plough, the *maresha*. Farmers in the Ethiopian highlands maintain cows mainly to produce the needed replacement oxen. Cattle reach physical maturity at 4 to 5 years of age, averaging around 210 kg for cows and 280 kg for oxen. When physically mature, the males are castrated at 4 to 5 years of age.

Surveys run by ILCA/ILRI (Gryseels et al., 1984) have shown that the number of oxen owned by a farmer strongly influences both the area cultivated and the cropping patterns (Table 1). To ensure timely cultivation, farmers with less draft power cultivate smaller areas and to avoid risking lower yields by delaying the time of sowing with the available draught power. The choice of crops is also influenced by the availability of draught power. Land preparation for cereal crops is more labour intensive, and requires more draught power than preparation for pulses. Only farmers with adequate draught power are able to grow more cereals. Cereals generally have higher prices for than pulses and this probably explains why farmers with less draught power have lower incomes.

Table 1: Impact of ox ownership on area cultivated and cropping pattern at Debre Zeit, Ethiopia 1980

	Average area cropped per farm (ha)	Percentage area to cereal	Percentage area to pulses
None	1.2	54	46
One	1.9	44	56
Two	2.7	67	33
Three or more	3.6	92	8

Source: Gryseels, et al. (1984).

3.2 The Traditional Tillage Implement

It is not certain when animal-powered tillage implements began to be used in the agricultural economy of Ethiopia. It has been conjectured that the Ethiopians inhabiting the highland areas of the country were introduced to the ard between 1000 and 400 BC by the Semitic-speaking invaders from South Arabia (Goe, 1987). Recent archaeological evidence, however, suggests that the ard may have been used even before the Semitic invasion by the Cushitic speaking peoples from an ancient Nubia region in north-eastern Sudan (Goe, 1987). Regardless of who introduced, the ard, *maresha* had remained the traditional animal traction implement in Ethiopia and has contributed to the evolving of crop-livestock integration in the country.

The *maresha* consists of a metal point or tine, fastened to a wooden arm of a long pole, at the opposite end of which is fastened a wooden neck yoke. At each side of the metal point are two wooden wings which push the soil aside.

The traditional implement weighs between 17 to 26 kg with the yoke (Goe, 1987), and is therefore light enough to be transported easily by one person to and from the field and over difficult terrain. Except for the metal tine, which the farmer has to buy from the blacksmith, the *maresha* is home-made. The *maresha* is a versatile implement and can be used on all soil types. Depending on the crop and soil types, two to five cultivations are required by the *maresha* before a field is ready for planting. The seed covering of all crops with soils, except *teff*, is done with the same traditional implement.

Each cultivation pass with the *maresha* is made perpendicular to the one before so as to ensure loosening up of the whole soil. The depth of the first ploughing ranges from 5 to 8 cm while with the last pass may be up to 20 cm deep. The time required for land preparation also varies from 100 hrs/ha to 150 hrs/ha for light soils and deep vertisols, respectively (Abiy Astatke and Matthews, 1982). The *maresha* has the advantage of being pulled by a pair of indigenous oxen, each weighing not more than 300 kg. The power developed by a local zebu oxen pulling the *maresha* ranges between 0.50 to 0.90 kw (Abiy Astatke and Matthews, 1982), depending on the soil type, soil moisture, soil compaction status, depth of ploughing and the pulling power of the animals.

A serious disadvantage of the *maresha* is that it is a cultivating implement rather than a plough. As the soil cannot be inverted, the *maresha* is of very little use for turning the stubble and weeds into the soil. Weeding is the major activity in the agricultural calendar, making it one of the most serious bottlenecks for agricultural production. Uniform seed coverage is another problem with the use of the *maresha*, which explains why farmers use double or triple the seed rates recommended by research institutes.

4. An Example of Improved Soil and Water Management on Vertisols in the Ethiopian Highlands

4.1 The Scenario

Vertisols account for 12.7 million hectares in Ethiopia of which 7.6 million hectares are in the highlands. Only about 2 million hectares (25 percent) of the vertisols in the Ethiopian highlands is presently cultivated which accounts for about 23 percent of the total Ethiopian arable land (Getachew Asamenew, et al.,

1993). Vertisols are generally hard when dry and sticky when wet and therefore present various limitations to their use.

Poor internal drainage is a major constraint associated with vertisols in high rainfall as well as in irrigated areas. As a result of this, the roots of the crops are poorly aerated and nutrient uptake for growth and development impaired. Traditional farming has developed a wide range of drainage practices (construction of hand-made broadbeds and furrows such as in Enewari plateaux, planting on ridges, soil burning, etc.) and the use of low-yielding crop varieties and late-planting practices to avoid waterlogging periods. Waterlogging of vertisols is more severe in the Ethiopian highlands where rainfall is higher and evaporative demands are lower.

It has been recognised that, with the exception of the hand-made broadbeds and furrows, the technical efficiency of the traditionally applied surface drainage techniques is not sufficient to allow full use of the potentials of these soils. Cambered beds which are constructed with heavy machinery gave remarkable effects on crop growth and fertiliser efficiency. However, the viability of using this technology in the smallholder subsistence sector is out of question.

4.2 Animal-powered Surface Drainage Implement

Research by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) showed that preparing broadbeds and furrows (BBFs) which are raised beds with shallow ditches in between the beds on vertisols increased grain and straw yields of traditional crops dramatically and also allowed high-yielding crops to be grown (Ryan and von Oppen, 1983). ICRISAT used an oxen-drawn wheeled tool-bar, drawn by a pair of oxen, to construct the BBFs. The tool-bar costs more than US\$ 500 and thus it is hardly relevant to smallholder subsistence farmers. ILCA, in collaboration with other national institutions, started work on developing low-cost land-shaping implements using local materials in 1986. From the beginning of the implement-development programme, farmers in the on-farm verification were invited to test the implement and their suggestions were incorporated in the design-refinement undertaking.

After several designs and testings, it led to developing the BBM which is in use today. It was made out of two *mareshas* connected in a triangular structure.

The top ends of the *maresha* beams are tied together and connected to the yoke as the traditional method. For maintaining the 1.2 m between the *maresha* tips a crossbeam was tied between the two poles of the '*mareshas*' at about a meter from the lower edges of the poles. A steel wing of moldboard is then attached on each of the inner flat wings of the *maresha* to push the inside and form the BBF. The chains attached at the edge of the metal wings not only shape the beds evenly but also cover the seeds uniformly. The power requirement of this BBM is lower (0.62 kw) than the previous designs and can be attributed to the metal wings which have lower frictional force through the soil than wood (Abiy Astatke and Kelemu, 1993). The area constructed into BBF in six working hours by a pair of oxen ranges from 0.4 ha to 1.2 ha. This large time variation depends on the tilth status of the top soil for the use of the BBM and the condition of the working oxen. The cost of the wings and the chain for assembling the BBM is estimated at US\$ 30.

5. Impacts of the Animal Powered Surface Drainage on Crop Yields and Labour Use

The effects of drainage, achieved by the BBF on crop growth are substantial in a series of on-farm verification tests. There was a consistent increase in crop and straw yields. However the percentage increase over traditionally planted crops varied between locations and years (Getachew Asamenew, et al., 1993).

In the baseline survey carried out at Were Ilu, in southern Wello, one of the verification sites of the collaborative vertisil management project, 109 farmers were interviewed to indicate average crop yields in bad and good agricultural years (Table 2). Bad agricultural years were with too heavy rainfall leading to serious waterlogging. Surface drainage provided by the BBF effectively enabled to change a potentially bad crop season for crops planted on flats to a good one for both wheat and faba beans as shown in Table 3 (Jutzi, et al., 1987).

At Inewari, in the central highlands of Ethiopia, BBFs are traditional methods of preparing vertisols for cropping at a cost of some 60 hours of human labour per ha. BBM replaced the drudgery of constructing manual BBF. Women and children are the main labour force for the construction of the BBFs at Inewari.

Table 2: Average yield expectations in bad and good agricultural years for wheat, teff and faba beans at Were Ilu

Crop	Yield in bad years (kg/ha)	Yield in good years (kg/ha)
Wheat	225	758
Teff	297	651
Faba bean	90	612

Source: Jutzi, et al. (1987).

Table 3. Drainage effects on grain and straw yields of wheat and horse bean at Were Ilu, 1986

Crop	Land preparation	Sample size	Grain yield (kg/ha)	Straw yield (kg/ha)
Durum wheat	BBF ¹	163	759 ³	1140 ³
	Traditional ²	163	311	449
	BBF ¹	170	683 ³	572 ³
Horse bean	Traditional ²	166	172	162

Note: 1 BBF: Broadbeds-and-Furrows, 120cm wide.

2 Traditional: Ridges-and-Furrows, ridge 30cm wide.

3 Difference between land preparation systems for each crop significant at P = 0.001.

Source: Getachew Asamenew et al. (1993).

Use of the BBM reduced the average labour required by 67 percent (Getachew Asamenew, et al., 1993). Manually made BBFs are equally effective to drain the excess water and therefore, crop yields are not significantly different from BBFs formed by the BBM. In years when start of the rainy season is late however, the scooping of dry soil by hand for making BBFs is difficult. During such years, use of the BBM helped to significantly increase crop yields and economic benefits even in Inewari (Getachew Asamenew, et al., 1993).

Use of the BBM also resulted in increased vertisol productivity in the medium altitude highland sites where crops are traditionally grown on flat plots. At Debre Zeit, for a period of five years there was a 32 percent average net return from wheat production as a result of using the BBM (Getachew Asamenew, et al., 1993). Getachew Asamenew, et al. (1993) also report that at Ginchi, the average yield of wheat production on BBM plots was 1.8 tons per hectare in 1988

and 1989 while it was less than one ton per hectare on traditionally flat and late planted wheat plots.

In 1989, the latest version of the BBMs were being produced in small numbers for on-farm verifications by ILCA. By 1993 an individual entrepreneur started producing the BBMs and by 1995 has produced and sold more than 10,000 BBMs to individual farmers, non-governmental organisations (NGOs) and the Ministry of Agriculture (personal communication). These implements are now being tested on vertisols in the central highlands for a variety of crops in addition to improved wheat varieties.

In 1994/1995 cropping season, in Chefe Donsa, 80 km east of Addis Ababa on plateau of 2400 masl with an average rainfall of 1200 mm, a total of 44 farmers selected from four peasant associations, participated in a farmers manage trial of the BBF technology and its package on half hectare plots. Yield across the 44 fields ranged between 2.8 to 4.2 tons per hectare with a mean of 3.6 tons per hectare. This is twice as high as the traditional management practice. The variation observed among the yields were primarily caused by timing and frequency of weeding. For instance, 24 percent of farmers who did their first weeding within the recommended dates obtained an average yield of 4.1 tons per hectare in contrast to 2.9 tons per hectare obtained by the 15 percent of the farmers who delayed their first weeding and subsequent urea dressing by 15-25 days (ILRI, et al., 1994).

If we assume an increment of 5 quintals per hectare which is half below the actual yield obtained by farmers using BBM, then the total yield increase of wheat in the Ethiopian highlands (from the 2 million hectare of cultivated land) will reach 1 million tones of wheat. This could substitute grain imports or international aid coming to the country and could lead to ensuring food supplies.

6. Water Conservation Using Animal Power

6.1 The Concept

Water is a scarce resource in many parts of rural Ethiopia. Both people and their livestock commonly travel long distances daily to obtain the water they

need. Much time and energy is expended during dry season trekking to distant water sources. As a result, animals lose condition and productivity is reduced. Existing water supplies can be supplemented by improving water collections at spring sites, by constructing wells to tap ground water supplies or by harvesting runoff in water reservoirs. Constructing reservoirs, using either manual labour or heavy earth-moving machinery may not be appropriate in rural areas because these methods are too labour intensive or very expensive. The use of animal power for the construction of water reservoirs is an option in countries where draught animal is common. In rural Ethiopia, harvesting runoff with animal power is a viable means of improving water supplies as this is a low-cost technique within the reach of the population. The provision of water reservoirs could contribute to the intensification of agriculture thus increasing the overall crop and livestock production.

6.2 Research on Pond Excavation in Ethiopia

In Ethiopia, ILCA in cooperation with the Ministry of Agriculture (MOA), has investigated the use of animal drawn scoops for excavating new ponds and for desisting old ones. The aim has been to supplement dry season water supplies for both humans and livestock.

The basic scoop design employed in the initial trials was similar to the Dutch horse-drawn 'moldboard' and the British eighteenth century 'levelling box' (Branford, 1976). These European implements had been designed to be drawn by large animals. A smaller version with a capacity of 0.15 m^3 that could be pulled by a pair of Ethiopian zebu oxen was developed. Initial testing of the technology began in 1983, with an excavation of a 7000 m^3 pond on ILCA's research station in Debre Berhan, 120 km northeast of Addis Ababa (Abiy Astatke, 1984).

Pond construction requires the use of two simple implements: the *maresha* and the animal drawn scoop. The *maresha* is first used to break up the soil surface where the pond is to be excavated. The loosened material is removed with the scoop to a dumping site at one end of the pond. The *maresha* is then used again to break up the subsoil which in turn is removed by the scoop. This continues until the pond is completed. The time spent for scooping depends on the size and condition of the draught animals and the friability and moisture content of the soil. At Debre Berhan, approximately 10 hours of tillage were required for

each 100m³ of soil removed (Abiy Astatke et al., 1986). The average draught power developed by a pair of local zebu oxen pulling a full scoop was 0.92 KW, which falls within the upper range of power needed for the first pass with the *maresha* (Abiy Astatke, 1984). Subsequently the MOA redesigned the scoop to reduce power requirements. The new models are about 15 percent smaller than the first prototypes and have two metal skids on the bottom to reduce friction. The scoops are robust and if the wooden handles break they can easily be repaired by the farmers themselves.

Two ponds each of 9,500m³ and 8,700m³ capacity were constructed in 1985 using animal drawn scoops by two peasant associations. Farmers worked about 75 days and employed 900 ox-pair days in total for constructing each pond. On an average oxen worked about 6 hours a day with net excavation rates (including both ploughing and scooping) of 6.8 m³ of soil per oxen pair per day (Anderson and Abiy Astatke, 1985). Pairs of oxen used for desalting existing ponds were able to excavate 13m³ of silt per 5 hours of working (Abiye Haile Selassie and Cossins, 1985).

6.3 Use of Scoops on a Large Scale

Approximately 1,300 scoops were distributed throughout the country in 1987. By 1988 farmers excavated 18 ponds using scoops in north and north-eastern part of Ethiopia under the supervision of MOA. After 1988 there is no evidence of using scoops for pond construction. The major problems experienced by the peasant associations in constructing ponds had been organisational. MOA lacked the resources and personnel to provide technical guidance in all locations. The frequency that farmers brought their animals to work was not accurately planned to ensure that ponds were completed on time in some locations. This created difficulties for further excavation the following year as it took some time before the previously dug area dried up before work with animals could begin (Anderson and Abiy Astatke, 1985). This work was done and experience gained during the last totalitarian government when peasant associations had power of controlling individual farmer's activities.

The scoops are simple but they are expensive relative to the income of individual farmers. Individual farmers cannot excavate ponds alone and scoops have to be acquired by the community. This requires considerable cooperation

within the community, for the planning, siting and construction of large ponds if the work is going to be successful at present.

7. Conclusions and Policy Implications

We have seen the importance of livestock as sources of income, particularly as sources of draught power and their potential for intensifying agricultural production. By diversifying the uses of animal traction, an impact on food security could be made in Ethiopia. The intensification of agricultural production will lead to breaking the poverty cycle and a better management of agricultural resources.

The traditional land use in the Ethiopian highlands can no more support the present population. New production systems to intensify land use for higher grain and livestock production are needed. The multiple use of animals has a major role in changing the traditional systems of production, which entirely relies on the use of oxen for draught power. The need to match appropriate breeds and implements with soil types and farm resources are topics that will have to be resolved through research.

The use of appropriate animal drawn implements, for example, increased productivity of the vertisols when tested in the farmers fields in the Ethiopian highlands. This could serve as an incentive to curtail movement of cultivation to steeper slopes which are prone to land degradation. Guided conservation of runoff in water reservoirs and excavation using animal power could enhance crop and livestock production and, most importantly, provide the much needed water within easy reach for household use. How potential benefits of animal traction can be tapped on a country-wide scale by smallholder farmers to meet their immediate and future needs from agricultural production will be a challenge to policy makers.

Although we have advocated that livestock are important sources of food security, animal traction being one of the aspects, it should be noted that the carrying capacity of land, livestock stocking rates and land degradation in the highlands of Ethiopia need to be investigated. Furthermore, the gap between research and extension is one of the problems of implementing improved

technologies. Research is needed on how the technologies (diversified uses of traction) could be diffused to the farmers.

The uses of more productive animals (intensive animal farming systems), alternative feeding systems and the impacts of animal diseases on the productivity of draft animals should be looked into and recommendations be made for wider dissemination into the community.

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The Ethiopian Economy: Poverty and Poverty Alleviation

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Some Results on the Level and Distribution of Income in Urban Ethiopia

Arne Bigsten and Negatu Makonnen

1. Introduction

This paper examines the level of income and the degree of income inequality in urban Ethiopia using data from a socio-economic survey conducted in 1994 in selected urban centres. We present estimates for the total sample as well as for the different urban centres separately. The levels of monthly household and individual incomes, the sources and structure of incomes, and income inequality will be analysed.

The analysis is mainly based on monthly total household income, defined as the sum of incomes from wages, businesses, female household business activities, children's activities, pensions and remittances, and farming and livestock. Total monthly household income, includes all types of income in kind, in addition to cash income, while the consumption value of self-produced products, and the imputed value of owner-occupied dwellings, are excluded. The former will in most cases be small in urban Ethiopia, while the latter could be large for some households. Lack of information on these two items will bias the results to some degree, but should not seriously distort the overall picture.

For analysis of the level and distribution of income we employed three different concepts: household income, income per capita, and income per consumption unit. In welfare evaluation, use of the household as the unit of analysis is somewhat problematic, since the same weight is put on a household with many members as on a single-person household. It is therefore more appropriate to use the individual as the unit of analysis and compute per capita income within the household, but this still assumes that every individual in the household has the same consumption need. This is an improvement over a straightforward comparison across household units, but welfare comparisons between households would still be more relevant if household incomes were adjusted not only for the size of households, but also for their composition. The way this adjustment is done is to reduce the members of the household to adult equivalents, or consumption units. To our knowledge, empirical equivalence scales, based, for example, on nutritional requirements of individuals of

different ages and sex, have not been estimated for Ethiopia. As an alternative to the ideal equivalence scale however, we applied the following: a one person household is composed of one consumption unit; each additional adult is counted as 0.7 consumption units; and each child (up to 15 years) as 0.5 consumption units.

2. The Household Survey Data

The data used in this paper is from the 1994 Ethiopian Urban Socio-economic Survey carried out by the Departments of Economics of Addis Ababa University and Göteborg University. The survey, fully described in the report of preliminary results (Department of Economics, AAU & GU, 1994) was carried out in seven urban centres during the course of four weeks, 13 November to 4 December 1994. The selected urban centres were Mekele and Dessie in the north, Bahir Dar in the northwest, Addis Ababa in the centre, Dire Dawa in the east, Awassa in the south, and Jimma in the southwest.

A sample of 1500 households was drawn, distributed over the selected urban centres proportional to their population size based on the CSA 1992 projections. Accordingly, the sample included 900 households in Addis Ababa, 125 in Dire Dawa, 75 in Awassa, and 100 in each of the other four towns. However, at various levels of analysis some households were excluded due to missing data.

The sample households from each urban centre were selected from 50 percent of the *kebelles* (urban dwellers association) and then using systematic sampling from each *kebele*. The survey provides data on a wide spectrum of socio-economic variables, including household composition and structure, education, migration, employment and income, and consumption expenditure, and health status and other welfare indicators.

3. Distribution of Monthly Household Incomes

The percentage distribution of total household incomes is presented in Table 1 below. About 47 percent of all sample households had total monthly income of less than Birr 300; almost 34 percent had total monthly income between Birr 300 and Birr 800; while only 19 percent of households had total monthly income of Birr 800 or above. The proportion of households with income less than Birr 300 was higher in Dessie (59 percent) and Mekele (56 percent), while the proportion of households with income of Birr 800 and above was lower (16 percent in both towns). The two lowest average household incomes are also observed in Dessie (Birr 307) and Mekele (Birr 419), while the highest average is reported for Addis Ababa (Birr 673). The capital also has a large proportion of poor households, and Awassa actually has a higher proportion in the highest income bracket than does the capital. The distribution of households by income group in the remaining urban centres is similar to that of the overall picture. Thus all urban centres have a high proportion of low-income households, but there is an over-representation of low-income households in Dessie and Mekele, which have been severely affected by both drought and war.

Table 1: Distribution of total households incomes by income group and urban centre (percent)

Income group (Birr)	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All Towns
0	-	-	1.3	-	-	1.2	2.9	0.4
1 - 49	9.7	8.6	15.4	20.0	1.9	12.2	19.1	10.7
50 - 99	8.3	8.6	5.1	10.0	1.9	8.5	14.7	8.0
100 - 199	14.9	17.2	11.5	18.6	15.4	18.3	20.6	15.6
200 - 299	13.8	10.3	10.3	10.0	14.4	7.3	8.8	12.4
300 - 449	14.6	10.3	19.2	18.6	21.1	15.9	5.9	15.2
450 - 599	8.6	12.1	6.4	8.6	14.4	12.2	4.4	9.2
600 - 799	9.1	12.1	11.5	4.3	13.5	8.5	7.4	9.4
800 - 1499	12.9	10.3	17.9	8.6	8.7	12.2	13.2	12.4
1500 -	8.2	10.3	1.3	1.4	7.7	3.7	2.9	6.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Monthly income per household	623	570	436	307	559	459	419	557
Number of households	673	58	78	70	104	82	68	1133

4. Income by Household Size and Composition

Average monthly total household incomes are shown in Table 2 distributed by household size and in Table 3 distributed by household composition. In general, average monthly total household income increases with household size, although households with 3 or 4 members tend to have less income than those with 1 or 2 members. Since average monthly total household income does not rise as fast as household size, per capita income tends to decline with household size (see Table 2 below).

It is the only in Dire Dawa where income rises consistently with household size; there are interesting anomalies in every other case. We have already noted the low average household income in Dessie; as expected, each of the size groups there also has low average income, but surprisingly, the two largest groups have declining incomes, and the largest group has less than the average for Dessie. In Mekele, the 1-2 person group and the 5-6 person group have strikingly low incomes. Although average monthly total household income is a very crude indicator of economic welfare, these results indicate more extensive poverty in Dessie and Mekele than elsewhere.

Table 2: Average monthly total household income by household size and urban centre

Household size	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All Towns
1 - 2 person	504	395	328	241	229	362	35	370
3 - 4 person	333	482	511	277	405	324	311	353
5 - 6 person	655	941	455	417	522	452	271	584
7 - 8 person	712	417	378	307	594	486	752	626
9 + person	772	591	461	209	1042	658	636	726
Total	623	570	436	307	559	459	419	557

From a look at the relationship between income and household composition (Table 3 below), it is clear that average monthly household income is closely associated with the number of adults in the household: for instance, average income for one adult households is Birr 217, for 2 adult households Birr 538, and for 3 or more adult households Birr 708. Having more children generally lowers household income, although, in some cases households with three or more children have more income than households with only 1 or 2 children —

and this may be the explanation for the result noted in the previous table, i.e. the fact that 3-4 person households tend to have less income than 1 or 2 person households.

Table 3: Average monthly total household income by household composition and urban centre

Household composition	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All Towns
1 adult only	277	-	190	141	283	-	33	217
1 adult 1-2 children	159	-	19	-	138	212	50	130
1 adult 3+ children	191	-	-	143	382	60	80	133
2 adults only	654	395	520	656	162	272	-	538
2 adults 1-2 children	312	405	200	399	297	415	321	329
2 adults 3+ children	539	197	420	458	430	299	215	433
3+ adults only	794	1079	744	287	394	619	297	708
3+adults 1-2 children	684	629	598	279	653	333	786	637
3+adults 3+ children	571	566	360	282	840	693	624	576
Total	623	570	436	307	559	459	419	557

5. Comparison of Income per capita and per Consumption Unit

Table 4 shows the percentage distribution of total household income per capita, and Table 5 per consumption unit. The overall average per capita income is Birr 101, while average income per consumption unit is Birr 140. The highest average income per capita and per consumption unit are observed for Addis Ababa (Birr 109 and 151, respectively), followed by Dire Dawa (Birr 109 and 149, respectively). The two lowest average income per consumption unit are observed for Dessie (Birr 97) and Mekele (Birr 103), both roughly two-thirds the level in the capital. In the middle range are Awassa (Birr 138), Bahir Dar (Birr 124), and Jimma (Birr 119).

Overall, in terms of consumption units, almost 63 percent of households had average monthly incomes of less than Birr 100, while 16 percent had income of Birr 250 or above. As we expected, Mekele and Dessie, as well as Jimma, had higher than average proportions of households under Birr 100 per month:

Mekele 86 percent, Dessie 72 percent, and Jimma 71 percent. By contrast, Dire Dawa had only 47 percent and all other locations fell in between. The proportion with incomes of Birr 250 or above was below average for Mekele, Dessie, and Jimma (10-13 percent), and above average for the others.

Table 4: Distribution of total income per capita (percent)

Income per consumption unit	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All towns
0	-	-	1.4	-	-	1.3	3.2	0.4
1-24	27.6	30.2	24.3	38.8	6.5	26.7	46.0	27.4
25-49	21.2	18.9	24.3	17.9	18.3	26.7	19.0	21.1
50-99	24.4	22.6	25.7	26.9	45.2	18.7	11.1	25.2
100-124	5.7	1.9	5.7	6.8	9.7	9.3	7.9	6.3
125-149	5.1	11.3	7.1	1.5	6.5	6.7	3.2	5.4
150-199	1.3	-	-	1.5	-	-	1.6	1.0
200-249	5.3	3.8	2.9	4.5	5.4	4.0	4.8	4.9
250-299	3.2	3.8	2.9	-	1.1	2.7	-	2.6
300-499	3.0	5.7	4.3	1.5	6.5	4.0	1.6	3.4
500+	3.2	1.9	1.4	1.5	1.1	1.3	1.6	2.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Income per capita	109	97	90	72	109	81	70	101

Table 5: Distribution of total income per consumption unit (percent)

Income per capita	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All towns
0	-	-	1.4	-	-	1.4	3.4	0.4
1-24	19.4	18.2	21.4	31.3	4.4	23.6	41.4	20.4
25-49	19.0	20.0	8.6	15.6	6.6	15.3	12.1	16.4
50-99	23.4	18.2	27.1	25.0	36.3	30.6	22.4	25.0
100-124	9.7	7.3	10.0	7.8	17.6	2.8	1.7	9.2
125 - 149	5.0	7.3	5.7	6.3	12.1	4.2	3.4	5.7
150 - 199	0.3	-	1.4	-	-	-	-	0.3
200 - 249	6.5	10.9	7.1	3.1	5.5	9.7	5.2	6.6
250 - 299	5.2	3.6	8.6	3.1	5.5	1.4	1.7	4.8
300 - 499	7.1	10.9	4.3	4.7	7.7	6.9	5.2	6.9
500+	4.5	3.6	4.3	3.1	4.4	4.2	3.4	4.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Income per consumption unit	151	138	124	97	149	119	103	140

6. Sources and Structures of Incomes

Next we analyse the structure of incomes by source. First we consider the main sources of income for the households. Table 6 shows the importance of wages in all urban centres: about 65 percent of all sampled households report wages as their main source of income, and nowhere is the proportion less than 52 percent. The importance of wages is highest in Addis Ababa (69 percent), Bahir Dar (68 percent), and Jimma (66 percent), and lowest in Mekele (52 percent), Dire Dawa (54 percent), Awassa (57 percent), and Dessie (61 percent).

The other two important sources of income are business and female household business, being the most important source for 9 percent and 14 percent of the sampled households, respectively. The importance of business as a source of income is most pronounced in Awassa (17 percent) and Dire Dawa (13 percent), and lowest in Bahir Dar, while female household business income is widespread in all urban centres, though highest in Mekele and Dessie. Pensions and remittances are main sources of income for about 7 percent of the whole sample, and highest in Mekele (14 percent) and Dire Dawa (12 percent). Farming and livestock income is most important in Bahir Dar, which is located in an important cereal-growing region. Children's activities are the most important source of income for 2 percent of households overall, and twice that in Jimma.

Table 6: Distribution of households by main source of income and urban centre(percent)

Main source of income	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All towns
Wages and salaries	68.5	56.9	67.5	61.4	53.8	65.9	51.5	64.9
Business	9.2	17.2	1.3	8.6	13.5	9.8	7.6	9.4
Female household business	12.9	17.2	10.4	20.0	17.3	12.2	22.7	14.3
Children's activities	2.2	3.4	1.3	-	1.9	4.9	1.5	2.2
Pensions and remittances income	5.8	1.7	7.8	5.7	11.5	6.1	13.6	6.7
Farm/livestock	1.3	3.4	11.7	4.3	1.9	1.2	3.0	2.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of households	673	58	77	70	104	82	66	1130

The importance of wages can also be seen in Table 7: 73 percent of total household income comes from wages and salaries. The wage share varies from 80 percent for Bahir Dar to 58 percent for Mekele. The high dependence of all households on wages, both in terms of the share in total income, and as the main source of income, is not surprising, as most of both government and non-government wage employment is concentrated in urban centres. The share of business income and female household business income in total household income is 8 percent and 12 percent, respectively, for all sample households. Thus, female business income is significantly higher than general business income. The share of income derived from pensions and remittances is about 5 percent, highest for Mekele (14 percent). Children's activities, and farming and livestock provide the least income.

Table 7: Distribution of total household income by source and urban centre (percent)

Source of income	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All towns
Wages and salaries	76	68	80	66	62	76	58	73
Business	7	15	1	8	15	7	8	8
Female household business	11	11	10	18	16	10	17	12
Children's activities	1	2	1	0	0	2	0	1
Pensions and remittances	4	1	5	5	7	4	14	5
Farm/livestock	1	3	3	3	0	1	3	1
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Number of households	673	58	77	70	104	82	66	1130

Considering average monthly total household income by main source of income (Table 8 below), households with business as their main source of income have the highest average income by far (Birr 1,181), as we might expect. The average income of households whose main sources of income are wages and salaries, is less than half of this figure (Birr 505), and slightly below the overall average. Households mainly dependent on female household business, children's activities, pensions and remittances, and farming and livestock, have average incomes well below the overall average.

Table 8: Average monthly total household income by main source and urban centre

Main Source of Income	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All Towns
Wages and salaries	554	571	471	346	376	408	414	505
Business	1353	690	1100	316	1223	890	1290	1181
Female household business	82	136	108	96	289	170	54	116
Children's activities	36	14	25	-	95	20	19	34
Pensions and remittances	275	91	118	81	166	132	98	202
Farm/livestock	532	21	54	290	101	-	582	270
All	623	570	436	307	559	459	419	557

Table 9: Distribution of total household income by main source and quintile (percent)

Main source of income	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Average
Wages and salaries	42	79	83	87	75	73
Business	4	3	6	6	20	8
Female household business	36	12	7	4	1	12
Children's activities	5	1	-	-	-	1
Pensions and remittances	10	5	4	2	2	5
Farm/livestock	3	-	-	1	2	1
All	100	100	100	100	100	100

The distribution of total household income by main source and quintile (Table 9 above) also shows that wages are overall the most important income source (73 percent), ranging from a high figure of 87 percent for quintile 4, to 42 percent for quintile 1. The relatively low shares of wages in total income of the lowest quintile is compensated mainly by a higher than average share from female household businesses (36 percent), and from pensions and remittances (10 percent). Thus, female household business activity seems to be essentially a coping strategy for the poor; as incomes rise, households are less and less involved in this activity. As in most African cities (see for example Bigsten and Kayizzi-Mugerwa (1992) for a study in Kampala) the poor in urban Ethiopia

manage to scrape out a living from a wide range of activities. Households in the top quintile, on the other hand, get 20 percent of their income from ordinary business activities, far above the overall average (8 percent). It is not possible to get to the highest income levels on the basis of wage incomes only.

As the results in Tables 6-9 show, wage employment is a crucial determinant of the economic well-being of most urban households. However, business activities are important for households both at the bottom and at the top of the income scale.

7. Income Inequality

In Table 10, the decile cumulative shares for two different variables are reported: the first is monthly income per consumption unit, and the second is monthly total household income. The overall Gini coefficients (at the bottom of the last two columns) are almost identical for the two variables. We use only monthly income per consumption unit to examine the distribution of income in the various urban centres.

Table 10: Distribution of monthly income per consumption unit by urban centre and decile, and of monthly total household income by decile, with Gini coefficients

	Addis Ababa	Awassa	Bahir Dar	Dessie	Dire Dawa	Jimma	Mekele	All	Monthly total household income All
Mean monthly income per cons. unit	151	138	124	97	149	119	103	140	557
Cumulative share percent									
Decile 1	0.00482	0.00319	0.00185	0.00366	0.01938	0.00184	0.00325	0.00401	0.00350
Decile 2	0.01844	0.01701	0.01152	0.01480	0.05904	0.01146	0.01188	0.01735	0.01614
Decile 3	0.04052	0.03927	0.03885	0.03445	0.10812	0.03574	0.02741	0.4092	0.4000
Decile 4	0.07269	0.07132	0.08288	0.06641	0.16806	0.7573	0.04943	0.07684	0.07471
Decile 5	0.11776	0.12128	0.13780	0.11860	0.23710	0.12640	0.08453	0.12603	0.12349
Decile 6	0.17891	0.19460	0.21603	0.18868	0.31675	0.19388	0.14074	0.19225	0.18864
Decile 7	0.25767	0.29115	0.31882	0.28778	0.41136	0.28903	0.21539	0.27811	0.27450
Decile 8	0.37247	0.43772	0.45868	0.41797	0.530086	0.43802	0.36527	0.40009	0.39155
Decile 9	0.53890	0.63639	0.65929	0.60475	0.69623	0.63537	0.56130	0.57504	0.56660
Decile 10	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000	1.00000
Gini	0.59927	0.54630	0.52423	0.56475	0.39955	0.54798	0.62378	0.57504	0.58140

Comparison of the cumulative income shares show that there is the least inequality in Dire Dawa, which has the highest cumulative income share at every level, and of course the lowest Gini coefficient. The highest inequality, considering the share of the bottom 40 percent of the population, is observed in Mekele, followed by Dessie. However, considering the share of the top 20 percent, Addis Ababa represents the second highest inequality, after Mekele. Based on Gini coefficients, the most unequal urban centres are also Mekele, the capital, and Dessie. Next to Dire Dawa, the least inequality is observed for Bahir Dar, Awassa, and Jimma. Inequality in Addis Ababa depends to a considerable degree on the high share of the top decile, while the even higher Gini-coefficient for Mekele depends on both the low share of the bottom decile and high share of the top two deciles.

8. Conclusions

Our results on the level, structure, and inequality of income, both of the overall sample and of the various urban centres can be summarised as follows.

First, a high proportion of urban households have very low incomes. About 50 percent of households have a monthly income of Birr 300 or less. Nearly 20 percent of households have a monthly income of less Birr 100. The highest concentration of poor households is found in Dessie and Mekele.

Second, average monthly total household income increases generally by size of household and, more specifically, by the number of adults within the household, but income per capita, as well as income per consumption unit, are lower in larger households.

Third, wage employment is the main source of income for 65 percent of all urban households, and provides 73 percent of their incomes. It is only for the lowest 20 percent of households that the share of wages in total income is low (42 percent), while for all the remainder its share is above the overall average. The two other most important activities are female household business and general business, which are reported as main source of income for 14 percent and 9 percent of all urban households, respectively, generating 12 percent and 8 percent of total household incomes. Business income is 20 percent of total

income for the top 20 percent of the population, while female household business income is 36 percent for the bottom 20 percent. However, the average level of income derived from female household businesses is very low compared to wage income and business income, the latter being the highest by far. Nevertheless, diversification is a typical characteristic of the poor, while the better-off derive more than 75 percent of their incomes from wage employment.

Fourth, income inequality is high in urban Ethiopia. The bottom 40 percent of all households received only about 7 percent of total income, while the top 20 percent received nearly 60 percent of both income per household and income per consumption unit. The overall Gini coefficient is 0.58. The least income inequality is observed for Dire Dawa, while the highest inequality is found in Mekkele, Addis Ababa and Dessie.

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Food Consumption and Poverty in Urban Ethiopia:

A Preliminary Assessment

Mekonen Taddesse

1. Introduction

* Ethiopia is one of the poorest countries in the world. Although there is no comprehensive assessment of the extent of poverty in the country, available indicators show that quite a sizeable percentage of the population lives in abject poverty. It is no wonder then that poverty reduction is high on the agenda of the Government, donors and non-governmental organisations operating in the country. Rural poverty reduction and famine prevention, however, have been major preoccupations — for quite understandable reasons. The bulk of the Ethiopian population (85 percent) lives in rural areas where incomes, largely derived from agriculture, are very low and subject to the vagaries of nature. Decline in agricultural output due to unfavourable climatic conditions often affect millions and drives them to the brink of death from starvation.

By rural standards, urban areas are probably better-off. Recently, however, there are clear indications that urban poverty is rapidly on the rise and quickly building up to crisis proportions. This is largely due to the influx of migrants from rural areas and small towns to large urban centres. Most of these migrants are rural destitutes moving in search of better life or households dislocated by war, civil conflict and social unrest. The standard of urban life is also very likely to be hit hardest by such policy reform measures as liberalisation of markets and decontrol of prices, depreciation of the exchange rate, public expenditure reductions and monetary contraction and revisions in the system of taxes and subsidies.

Despite the depth of the problem, the extent, incidence, severity and distribution of poverty in the country in general, urban centres in particular, has been hardly studied. Undertaking such studies in the past has been constrained by the unavailability of relevant household level data. Available studies are either conjunctural estimates or limited to a few urban centres, in particular the capital, Addis Ababa and are not based on comprehensive household income and expenditure survey data (see for example, MOPED, 1992; World Bank, 1992; and Solomon Gebre, 1993).

This study tries to contribute to the better understanding of poverty in urban Ethiopia on the basis of survey data collected from seven major urban centres. In particular, it describes the pattern of food consumption and attempts to measure the extent, incidence and severity of food poverty in urban Ethiopia. The scope of the study is limited to food poverty, rather than to the inability to satisfy all basic needs, for the three main reasons. First, poor urban households spend the largest proportion of their income on food consumption (the food budget share for the urban poor is as high as three-quarters of total expenditure, and about 65 percent, on average, for all households in the seven urban centres covered in this study) and hence the satisfaction of basic food requirements is a major problem for poor households. Second, the food poverty line can easily be calculated on the basis of a recommended daily nutritional requirement. Third, food expenditure data are relatively more accurate as compared with components of non-food consumption.

The paper is organised as follows. The next section describes the data used in the study and how it was generated. The third section presents the pattern of food consumption among the sampled households while the fourth section describes the method used for constructing the food poverty line, the poverty measures and estimates of these for urban Ethiopia. The final section provides some concluding remarks.

2. The Data

The data used in this study is drawn from the Ethiopia Urban Socio-economic Survey undertaken jointly by the Department of Economics of Addis Ababa University and the Department of Economics of Goteberg University. The survey covered 1,500 households in seven major urban centres — Addis Ababa, Awassa, Bahr Dar, Dessie, Dire Dawa, Jimma, and Mekele.

The predetermined sample of 1,500 households was allocated in proportion to the total population of the selected urban centres in 1992 as estimated by the Central Statistical Authority (CSA). Accordingly, 900 households in Addis Ababa, 126 in Dire Dawa, 73 in Awassa, 101 in Dessie and 100 in each of the rest of the towns were sampled. Proportional samples were then taken from all *weredas* in each of the urban centres and 50 percent of the *kebeles* (urban dwellers associations) selected randomly from each *wereda*. Finally, households

from each *kebele* were selected using systematic sampling based on the registration of residential houses at the *kebele* administrative office as the sampling frame. While this frame captures households living in own residences, government and *kebele* houses and tenants in registered private housing, it misses lodgers (as they are not usually registered with the *kebele*) and homeless households (which are sizeable groups and with obvious implications on the magnitude of poverty).

Interviews using a detailed questionnaire was conducted over four weeks during 11 November to 6 December 1994, a period chosen for the survey because it was felt that seasonal factors affecting the patterns of household consumption and prices will be least operative. The selected households were visited only once during the survey and asked to provide information on the structure and composition of the household, the educational and health status, employment and income of members as well as on the consumption and expenditure of the household. Regarding food consumption, the households were required to state the amount of the different food items they consumed during the week preceding the day of interview and the corresponding expenditures.

Households were also asked to state their expenditures on clothing and footwear, furniture and household equipments, energy, personal care goods, medical care, education, ceremonial expenses, taxes and contributions, purchase of building materials, rent and other non-durable non-food items for the month before the date of interview as well for the preceding year. Households were also asked if they have covered medical or educational expenditures of individuals outside the household during the last month, and if anyone from outside the household has paid for the health care and education of any household member. Expenditures on local and long distance transport was collected for the last seven days before date of interview.

3. Food Consumption and Expenditure Patterns

Expenditure on food consumption is by far the most important in the household budget. The weekly average household food expenditure for all urban centres stands at about Birr 107 and accounts for 62.7 percent of the

budget (see Table 1). The budget share nowhere falls below 60 percent (about 61 percent for Addis Ababa) and rises to about 74 percent in Dessie.

The food consumption data presented in Tables 1 and 2 are categorised into the nine major commodity groups: (1) cereals, (2) pulses, (3) spices, (4) dairy products and eggs, (5) meat, chicken and fish, (6) vegetables and fruits, (7) drinks, (8) other food items, and (9) purchased food consumed outdoors.

Of these nine commodity groups, cereals stand out as the most important food items in all cities. On the average cereals cost the household nearly Birr 39 (Table 1) and account for 36.3 percent of the household food budget (see Table 2). And cereal consumption is more important in some cities than in others. In Bahr Dar, and Dessie, and Mekele all located in mainly cereal producing areas, the cereal food budget share is as high as 43-45 percent, while in Dire Dawa, a mainly trading centre, it is only a quarter of food expenditure. In the remaining three cities, the budget share is in the range of 35-37 percent.

Next in importance are what are classified as 'other food items', which include bread, sugar, salt and cooking oil, among others; they account for 17 percent of food expenditure. While pulses; dairy products and eggs; meat, chicken and fish; vegetables and fruits; and drinks have budget shares in the range of 6-9 percent (7.5, 6.6, 9.0, 8.0 and 6.4 percent, respectively), spices and purchased outdoor meals account for only 3.5 percent and 6.0 percent, respectively.

When we look at the more disaggregated food expenditure data, we see that households spend a good deal of their food budget on a few food items. Of cereals, *teff* is the most important food crop in all cities; it alone accounts for over a quarter of household food expenditure. Wheat is the next important cereal among urban households with a budget share of 5.3 percent. While maize accounts for less than 2 percent of food expenditure, barley and sorghum account for not much more than 1 percent. However, maize and sorghum stand next to *teff* in two of the towns, Awassa and Dire Dawa respectively, with budget shares of 6 percent and about 8 percent in each case.

Table 1: Average weekly household consumption expenditure on major food items by urban centre (in birr)

Food Item	Addis Ababa	Awassa	Bahr Dar	Dessie	Dire Dawa	Jimma	Mekele	All towns
Cereals	38.03	36.31	49.31	42.10	33.18	40.79	40.47	38.90
Teff	28.55	23.53	37.12	29.99	20.61	27.54	22.32	27.80
Barley	1.17	0.81	3.92	1.77	0.37	2.31	1.56	1.41
Wheat	5.64	5.33	2.14	8.11	1.05	5.01	14.96	5.73
Maize	1.69	6.53	3.83	1.38	0.17	3.92	0.22	1.97
Sorghum	0.38	0.01	1.99	0.68	10.21	0.69	1.35	1.41
Pulses	8.44	7.05	8.71	7.69	6.98	9.11	5.75	8.09
Lentils	2.72	2.14	1.96	1.98	2.35	3.45	1.59	2.54
Cow peas	1.56	1.49	5.18	0.99	2.67	3.13	0.62	1.90
Chick peas	0.62	0.22	0.24	0.11	0.05	0.41	0.21	0.46
Horse beans	0.40	1.73	0.59	2.05	0.38	1.03	0.02	0.59
Other pulses	3.14	1.47	0.74	2.56	1.53	1.09	3.31	2.60
Spices	3.64	4.56	3.29	3.65	5.17	4.03	3.47	3.81
Berberie	3.19	3.63	2.38	2.50	4.55	2.55	2.62	3.15
Other spices	0.45	0.93	0.91	1.15	0.62	1.48	0.85	0.66
Dairy products & eggs	7.11	9.39	5.80	4.53	10.03	9.09	2.08	7.02
Milk/cheese	2.02	1.84	1.66	1.36	3.45	2.11	0.38	1.97
Butter	4.49	6.83	3.09	2.86	5.54	5.99	1.12	4.37
Eggs	0.60	0.72	1.05	0.31	1.04	0.99	0.58	0.68
Meat, chicken & fish	9.12	9.77	11.54	8.62	12.57	7.72	6.56	9.41
Meat	8.38	8.25	9.48	8.12	12.11	6.92	5.84	9.00
Vegetables & fruits	8.78	8.33	6.96	6.98	12.10	7.37	7.26	8.61
Drinks	6.69	4.67	8.16	4.71	8.10	8.41	6.83	6.81
Coffee	4.90	3.21	6.03	4.07	5.96	5.60	4.96	4.98
Other food items	18.31	15.98	14.71	11.06	33.43	15.80	12.08	18.21
Bread	4.04	1.68	2.38	1.83	7.30	2.50	0.40	3.61
Salt	0.61	0.60	0.73	0.53	0.74	1.58	0.48	0.68
Sugar	4.00	4.73	3.18	2.17	6.05	2.52	2.53	3.84
Cooking oil	5.44	6.68	5.82	4.57	7.69	4.59	4.97	5.58
Enset	1.02	0.87	0.89	0.46	3.40	1.04	0.34	1.31
Food consumed outdoors	6.83	5.52	4.36	8.42	5.57	7.92	4.03	6.48
Total Food	106.96	101.58	112.85	97.77	127.11	110.24	88.53	107.24
Non-food	71.07	59.12	54.06	34.60	57.68	52.91	49.15	63.69
Total	178.03	160.70	166.91	132.37	184.79	163.15	137.68	170.93

Table 2: Percentage distribution of average weekly household consumption expenditure on major food items by urban centre (birr)

Food Item	Addis Ababa	Awassa	Bahr Dar	Dessie	Dire Dawa	Jimma	Mekele	All towns
Cereals	35.56	35.75	43.69	43.06	26.10	37.00	45.71	36.28
Teff	26.69	23.17	32.89	30.68	16.21	24.98	25.21	25.92
Barley	1.10	0.80	3.47	1.81	0.29	2.09	1.76	1.32
Wheat	5.27	5.25	1.90	8.29	0.82	4.54	16.90	5.34
Maize	1.58	6.43	3.39	1.41	0.13	3.56	0.25	1.84
Sorghum	0.36	0.01	1.77	0.69	8.03	0.63	1.52	1.32
Pulses	7.89	6.94	7.72	7.86	5.49	8.26	6.50	7.54
Lentils	2.54	2.11	1.74	2.02	1.85	3.13	1.79	2.34
Cow peas	1.46	1.47	4.59	1.01	2.10	2.84	0.70	1.77
Chick peas	0.58	0.22	0.22	0.11	0.04	0.37	0.24	0.43
Horse beans	0.37	1.70	0.52	2.10	0.30	0.93	0.02	0.55
Other pulses	2.94	1.45	0.66	2.62	1.20	0.99	3.74	2.42
Spices	3.41	4.49	2.92	3.73	4.07	3.66	3.92	3.55
Berberie	2.99	3.57	2.11	2.56	3.58	2.31	2.96	2.93
Other spices	0.42	0.92	0.81	1.18	0.49	1.34	0.96	0.62
Dairy products & eggs	6.65	9.24	5.14	4.64	7.89	8.24	2.35	6.55
Milk/Cheese	1.89	1.81	1.47	1.39	2.71	1.91	0.42	1.84
Butter	4.20	6.72	2.74	2.93	4.36	5.44	1.26	4.08
Eggs	0.56	0.71	0.93	0.32	0.82	0.90	0.65	0.63
Meat, chicken & fish	8.53	9.62	10.23	8.81	9.89	7.00	7.41	8.78
Meat	7.84	8.13	8.40	8.30	9.52	6.28	6.60	8.38
Vegetables & fruits	8.21	8.20	6.17	7.14	9.52	6.69	8.20	8.02
Drinks	6.26	4.60	7.23	4.82	6.37	7.63	7.72	6.35
Coffee	4.58	3.16	5.34	4.16	4.69	5.08	5.60	4.64
Other food items	17.12	15.73	13.04	11.31	26.30	14.33	13.65	16.98
Bread	3.78	1.68	2.38	1.83	7.30	2.50	0.40	3.37
Salt	0.57	0.59	0.65	0.54	0.59	1.43	0.54	0.63
Sugar	3.74	4.66	2.81	2.22	4.76	2.28	2.85	2.36
Cooking oil	5.09	6.57	5.16	4.68	6.05	4.17	5.62	4.63
Enset	0.95	0.86	0.79	0.47	2.68	0.94	0.38	1.21
Food consumed outdoors	6.39	5.44	3.86	8.62	4.38	7.19	4.55	6.04
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Food	60.08	63.21	67.61	73.86	68.79	67.57	64.30	62.7
Non-food	39.92	36.79	32.39	26.14	31.21	32.43	35.70	37.26

Similarly, two pulses, lentils and cow peas, have together a food budget share of 4.1 percent. *Berberie* (red pepper) and cooking oil and butter account for 2.9, 5 and 4.1 percent of food expenditure respectively. Meat, both beef and mutton, and vegetables are also very important with budget shares of over 8 percent. Most households also spend a lot on coffee, on average Birr 5 per week and 4.6 percent of their food expenditure. Purchased food consumption outdoors is no less substantial and accounts for over 6 percent of food expenditure. Most of the sample urban households however reported very little consumption of milk, cheese, chicken and eggs; the proportion spent on these is not much greater than 1 percent.

4. Food Poverty

In this section, an attempt is made to measure the extent of food poverty in the seven major urban centres based on the food consumption data summarised above. Two scenarios are presented. One is based on a single poverty line for all urban centres. Such a scenario, however, will not adequately incorporate spatial differences in the cost of living and tastes and preferences (see, for example, Ravallion, 1992). In an attempt to take into account such factors affecting welfare levels, another scenario is constructed using poverty lines specific to each urban centre.

4.1 The Poverty Line

The first step in measuring the food poverty is to set the food poverty line which serves as a deflator of nominal expenditures and allows the comparability of standards of living of different sub-groups of a population. By food poverty line we mean the cost of the minimum amount of food an individual must consume to stay healthy and fit.

One method of setting the food poverty line is to stipulate a food consumption bundle considered to be adequate to meet a predetermined food energy requirement just sufficient to keep a person healthy and estimate its cost (see, for example, Ravallion and Bidani, 1994). An alternative to this method is to estimate the poverty line from the empirical relationship between calorie consumption and food expenditure (see for example, Greer and Thorbecke

(1986), Kyereme and Thorbecke (1987), Paul (1989)). In this study we follow the latter procedure, in particular the one suggested by Greer and Thorbecke (1986). This procedure derives the poverty line by estimating the cost-of-calories function, which may be specified in semi-log form as

$$\ln X_i = \alpha + \beta C_i \quad (1)$$

where X_i is total food expenditure of household i and C_i the calorie consumption of household i , both expressed per consumption unit (i.e., per adult equivalent).

For a predetermined minimum calorie requirement, R , the monetary poverty line is then estimated as

$$Z = \exp\{\alpha + \beta R\} \quad (2)$$

where $\hat{\alpha}$ and $\hat{\beta}$ are the regression estimates of the coefficients of Equation (1).

The choice of this method is dictated more by its computational simplicity and data requirement than by the robustness of its results or the plausibility of its assumptions. In fact, equation (1) is based on the strong assumptions of households with similar tastes and preferences and facing identical prices. However, the relationship specified in the equation is sensitive and will shift in response to differences in tastes and relative prices, among other things (for more details regarding the limitations of this method, see Ravallion and Bidani (1994)).

To estimate equations (1) and (2), household food expenditure and calorie consumption had to be derived in terms of consumption units and the minimum calorie requirement had to be set. Calorie consumption at the household level is obtained from survey data using Ethiopian Nutrition Institute (ENI) conversion factors. Reliable adult equivalent conversion factors are not, however, available and estimates used for other countries are employed (1 for adult male, 0.8 for adult female, 0.65 for persons aged 5-15, and 0.35 for children). Following the World Health Organisation, the minimum calorie requirement is set at 2,200 kg calorie per adult equivalent per day (which is close to the ENI national estimate of 2,100 calorie per capita).

Table 3 presents the regression and food poverty line estimates for each urban centre and for all urban centres put together. The overall food poverty line is Birr 15.09 per day or Birr 72.88 per week per adult equivalent (which converts to Birr 291.52 per month per household). The poverty lines vary from Birr 13 per adult equivalent per week (or about Birr 55 per household per week) for Awassa and Dessie to Birr 24.61 per adult equivalent (Birr 107 per household) per week for Dire Dawa. The poverty line for Addis Ababa, from which 60 percent of the sample is drawn, is Birr 14.51 per adult equivalent or Birr 73.57 per household per week, while the corresponding figures for Jimma and Mekele are nearly Birr 14 (Birr 65.33) and Birr 15.63 (Birr 61.74).

These figures contrast markedly with earlier government estimates and the results of other studies. A government estimate for urban areas in 1991 puts the food poverty line at Birr 182 per family of five (MOPED, 1992), while, for the same family size, the World Bank (1992) estimates it at Birr 193. Even allowing for the larger household size (6 persons on average) recorded in our survey and the rate of inflation, these figures fall far short of our estimate.

Table 3: Regression and poverty line estimates

Urban centre	Regression results ¹		Poverty line (Birr)	
	Constant	Slope	Per adult equivalent per week	Per household per week
Addis Ababa	2.02	4.2E-05	14.51	73.57
Awassa	1.94	4.09E-05	13.01	69.73
Bahr Dar	2.44	1.97E-05	15.47	71.00
Dessie	1.78	5.01E-05	12.99	54.34
Dire Dawa	2.83	2.43E-05	24.61	107.05
Jimma	1.88	4.92E-05	13.99	65.33
Mekele	2.41	2.17E-05	15.63 ²	61.74
All Urban ³ Centres	2.18	3.45E-05	15.09	72.88

Note: 1. All coefficient estimates are significant.

2. Consumption includes a sizeable amount of food aid and when the variables of the regression is netted out of this the poverty line is much lower.

3. Computed from the pooled expenditure data of all towns.

4.2 Poverty Measures

After drawing the two sets of poverty lines, three poverty measures are estimated corresponding to each poverty line: the head-count index (P_0), the poverty-gap index (P_1) and Foster-Greer-Thorbecke (FGT) measure (P_2).

The head-count index is the proportion of the population whose consumption is below the poverty line. This index tells us only the percentage of the poor and says nothing about how poor are the poor. The poverty-gap index, on the other hand, measures the depth of poverty and is defined as the mean proportionate deviation from the poverty line across the whole population but with deviations set at zero for the non-poor. Though this index measures the depth of poverty, it does not reflect the severity of poverty. The FGT index, defined as the mean of the squared proportionate gap, is used for this purpose.

Table 4: Poverty measures based on overall (Z1) and town-specific (Z2) food poverty lines (percentages)

Urban centre	Z1			Z2			n
	P_0	P_1	P_2	P_0	P_1	P_2	
Addis Ababa	44.2	17.09	9.47	42.1	16.31	8.6	895
Awassa	47.9	19.72	11.7	43.7	16.67	8.8	71
Bahr Dar	30.0	9.54	6.05	31.0	10.74	5.86	100
Dessie	39.8	14.67	8.05	31.2	12.14	6.88	93
Dire Dawa	10.3	2.75	1.01	42.1	10.8	4.52	126
Jimma	34.3	13.57	6.89	31.3	11.61	6.0	99
Mekele	33.7	1.57	13.64	34.7	11.86	5.61	98
All towns	38.9	14.09	8.65	39.6*	14.63*	7.61*	1480

Note: *Computed as the weighted means of the town poverty measures.

The estimates of the three poverty measures are provided in Table 4. The results suggest that nearly 39 percent of the population in the seven urban areas is below the poverty line. The head-count index for each urban centre computed on the basis of a single poverty line shows that the percentage of the poor is highest in Awassa (nearly 48 percent), followed by Addis Ababa (44.2 percent), and Dessie (about 39 percent). The lowest percentage is obtained for Dire Dawa (10.3 percent) and the next lowest for Bahr Dar (30 percent), followed by

Mekele and Jimma (in the vicinity of 34 percent). When town-specific poverty lines are employed, the estimates of the head-count indices for Dire Dawa and Dessie are substantially affected, resulting in rank reversals, which in the case of Dire Dawa, could be explained by the relatively high cost of living. Relatively more consistent rankings are obtained using the other two measures.

5. Concluding Remarks

The results of the assessment of the poverty profiles of the seven urban centres covered in the study suggest that the incidence, depth and severity of poverty is quite high. The robustness of these results depends, among other things, on the quality of the data and on how the poverty line is constructed. Some degree of arbitrariness in the construction of the poverty line, in particular in the choice of minimum consumption bundle, is unavoidable. The use of a single minimum calorie requirement ignores differences in individual food intake needs in the different urban centres due to variations in activity types, climatic conditions and other factors affecting energy requirements. Estimating separate poverty lines as the nominal consumption expenditures for each urban centre from food expenditure and calorie consumption does not solve the problem either because of variations in relative prices and systematic differences in tastes. It is in view of this limitations that the results have to be understood.

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Urban Poverty and Income Distribution

Profile and Policy Implications

Goitom Ghirmatsion

1. The Development of Ideas About Poverty

In reviewing and assessing poverty situation for the purpose of drawing up policy options, it is pertinent to review the gradual development of the understanding of poverty. The theory of poverty dates back to the development of welfare economic theory of the 1930s and the 1940s when the property taxes were enacted in order to attain basic welfare for the poor, with the objective of gradual eradication of the deplorable living conditions of the poor.

Lewis (1966) came in the forefront in the reconstruction of the history of poverty theory. This concept of culture of poverty has achieved widespread popularity. In its crudest form, this theory promoted the idea that the poor are poor because they are poor and encouraged the poor to accept their poverty as inevitable. He attributed poverty to the poor's own-creation of marginalisation, deviant attitude, incapable to cope with the development process, socially disorganised, politically apathetic and loss of aspirations. This hypothesis of the separate sub-culture was used to explain the perpetuation of their poverty from generation to generation. This view was quickly challenged by Valentine (1968), Perlman (1976) and Portes (1979). They argued that, while the poor undoubtedly contribute at times to their own poverty, the basic causes of that poverty are beyond their control. Poverty is a reflection of having insufficient money and lack of economic opportunities and other means to fulfil and realise their aspirations. Perlman, in fact, provided empirical evidence to challenge Lewis' hypothesis.

Moser and Salterwaite (1985) reinforced Perlman's view and provided evidence of squatter settlement data that the poor were highly heterogeneous and that they were fully integrated in the city's economy. This and other evidence suggest that Lewis failed to provide adequate empirical evidence to prove the relevance of his theory. The research method, the non-representative sample he used and ethnocentric view from which he judged the poor are critically

questioned today. He failed to incorporate the perception of the poor about their own poverty nor did he consider the opinion of other scholars or the views of government about the causes, and macro and micro solutions to poverty. His theory was neither relevant nor true during that period and today. Surprisingly enough however, Wilson (1991) advanced Lewis's culture of poverty in his theory of underclass hypothesis, i.e. the creation of ghetto underclass. Although he attributes certain elements of poverty like crime and other anti-social activities to binding the poor, unlike Lewis, he accuses the failure of U.S. government policy in overcoming the poverty trap. He thus argues that the poor are essentially victims of the system.

The non-relevance, the non-applicability and invalidity of the culture of poverty theory led to a new thinking in the 1970s. The macro- and micro-economic thinking in light of the issues of poverty emerged with a blueprint development strategy based on rapid and sustained growth of output and employment as the surest and the most durable route to alleviating the scourge of poverty and accorded a residual role for social policy. More development thinking emerged thereafter. Dependency theorists claimed that the root causes of poverty in the developing economies essentially emanated from the disproportionate capital accumulation of the European economies with which these poor countries are intrinsically linked and whose economic development depended on investment from loans, international trade and the international economic order in general.

It was therefore suggested that restructuring this development path in favour of the overall economic growth of the least developed economies is a necessary condition in triggering the growth potential of developing economies and thereby strengthening their financial, institutional and technical capability in addressing and tackling the problem of poverty. The proponents of economic development strategy did not address explicitly the issue of equity. This issue was raised by proponents of basic needs strategy, which called for a redefinition of the goals of development in order to emphasise equity in addition to economic growth.

In the 1980s the economic growth strategy prescription re-emerged mainly with the support of the International Monetary Fund and the World Bank under the banner "structural adjustment programme" (SAP). It is believed that the implementation of these reforms would bring about better macroeconomic performance and growth with the possibility of gradual reduction of poverty.

Having briefly sketched the development of the ideas of poverty reduction, the following section will deal with the economic aspects of poverty in Addis Ababa, the city covered in this study, followed by the social aspects of poverty and the policy options that can be drawn from the analysis.

2. Income/Expenditure Poverty

The dearth of reliable poverty related data for the city of Addis Ababa poses problems in our analysis. In addition to the limitations and deficiencies of data, there are conceptual problems of definition and measurement. Different definitions of poverty point to different levels or magnitude of poverty and hence appropriate definition should emanate from policy consideration of government.

The data permitting analysis of poverty in the 1970s constituted the 1976 and 1978 Manpower and Demographic Surveys, respectively. Analysis of these data indicate that a significant proportion of the households fall in the lower income scale. Fifty-seven percent to 59 percent of the households fall below Birr 100 average monthly income. Food and non-food consumption expenditure are estimated at Birr 76.9 in 1976 and Birr 93.8 in 1978. During this period the minimum average received Birr 59.5 in 1976 and Birr 66.5 in 1978 and the corresponding costs of food were Birr 46.7 and Birr 56.1 respectively. This means that a family of minimum wage-earner was able to satisfy its need for food with 78.5 percent and 84.4 percent of its income respectively for the two years. By 1982, however, the minimum food basket alone cost 102.7 percent of the household income. Examination of the behaviour of wage rates indicates that between the year 1976 and 1985 wage rates declined by a range of 28 percent to 34 percent on the basis of the retail price index of the city. This led to a fall in real income and pushed the minimum wage earner below the poverty line. The preceding discussion is summarised in the following table.

Table-1: Incidence of poverty and food expenditure 1976-1982

Year	Food expenditure (Birr/month)	Food as % of total household expenditure	Minimum wage	Food costs as % of minimum wage	% of population in poverty	% of population in food poverty
1976	46.7	69.8	59.5	78.5	51	33
1978	56.0	59.8	66.5	84.4	56	34
1979	61.9	58.8	68.8	90.1		
1982	78.1	58.6	76.1	102.7		

Source: Extracted from ILO/JASPA: Accumulation, Employment and Equity in Ethiopia, Vol. 1, Addis Ababa, 1982.

The evidence from the above table indicates that the city's population affected by poverty in 1976 and 1978 were 51 percent and 56 percent of the total population, respectively. From these computations the number of poor people increased from 504.9 thousand to 630.2 thousand, an increase of 89.3 thousand in two years. Moreover, close to 33-34 percent suffered from primary poverty.

2.1 Evolution of Income

It is imperative to examine the household income distribution as income distribution is linked to the household expenditure profile for determining poverty lines. The evolution of income for the period 1976-1986 is shown in Table 2.

The table demonstrates that households earning less than Birr 100 declined from 57.2 percent in 1976 to 35.1 percent in 1983, and increased to 38.2 percent in 1984 and further declined to 23.9 percent in 1985, indicating an upward shift to the higher income bracket. Those earning more than Birr 300 but less than Birr 600 stood at 7.4 percent in 1976. This rate, however, increased to 12.8 percent in 1983 and to 23 percent in 1986. Those in the income bracket above Birr 600 more or less stood at 6 percent to 8 percent. The declining pattern of the Gini coefficient from 0.7 to 0.5 indicates an improvement in income distribution.

Table 2: Evolution of income: household income distribution by income group 1976-1986

Income group	Income distribution (in percentage)			
	1976	1983	1984	1986/87
< 50		9.33	16.17	
50-99	57.20	25.77	22.00	23.91
100-199	21.72		22.60	
		44.0		
200-299	7.45		12.34	22.77
300-399			8.26	23.67
400-499	7.41	12.76	4.60	22.97
500-599			3.14	
600-699			2.52	
700-799			1.77	
800-899			1.72	
900-999			1.24	
1000-1099			0.95	
1100-1199	6.22	8.14	0.61	6.68
1200-1249			0.32	
1250+			1.76	
Total	100.00	100.00	100.00	100.00
Gini Coefficient ¹	0.65	0.55	0.54	0.50

Note: The Gini Coefficient measures the relative equality of income distribution. A decrease in the coefficient is observed indicating an improvement.

- Source:** (1) Central Statistical Authority (CSA) (1976) Addis Ababa Manpower and Housing Survey.
 (2) Ethiopian National Energy Committee (ENEC)/CESEN (1983) Household Energy Survey.
 (3) Addis Ababa Master Plan Project Office (AAMPO) (1984) Addis Ababa Socio-economic Survey.
 (4) Ministry of Labour and Social Affairs (MOLSA) (1986) Public Sector Establishment Survey.

2.2 Recent Estimates of Poverty Lines

There is considerable controversy over the concept of poverty, its appropriateness for the purpose at hand and its validity over time. Despite these drawbacks, household expenditure for 1990-1992 are estimated here as

input for poverty line estimation. The results of this exercise are provided in Table 3.

Table 3: Addis Ababa food and non-food consumption expenditure estimates (1990-1992)

Items	Kg/month	Prices (Birr/kg)			Household consumption expenditure (in birr)		
		1990	1991	1992*	1990	1991	1992
Maize	25	0.73	1.20	1.32	30.0	30.0	33.00
Teff	25	1.72	2.35	2.58	58.75	58.75	64.50
Wheat	15	1.27	1.81	1.99	27.15	27.15	29.90
Beans	10	1.25	1.75	1.92	17.50	17.50	19.20
Sugar	6	4.00	4.50	4.95	27.00	27.00	29.70
Oil	2	8.50	11.75	12.92	23.50	23.50	25.80
Others (onion, tomatoes, spices)					25.00	25.00	25.00
Food expenditure (77%)					158.00	181.9	227.10
Non-food expenditure (23%)					47.40	54.6	68.10
Total expenditure					205.40	236.5	295.20

Note: *Value in 1991 multiplied by 1.10.

From Table 3, it can be inferred that total household expenditure per month for a family of five members increased from Birr 205 to Birr 236 in 1991 and Birr 295 in 1992 indicating 15 percent increase over 1990 and 24.8 percent over 1991 respectively. Based on these estimates, the income distribution for 1986 and other assumptions, the employment distribution by employment status, the growth rate of GDP, the growth rate of labour productivity and the assumption of one wage/salary earner per household of five members, poverty lines are estimated and the distribution of poverty computed as shown in Table 4.

These estimates indicate that the percentage of population of the city affected by poverty increased from 45.4 percent in 1990 to 51.4 percent in 1991 and to 63 percent in 1992. Moreover, those affected by primary (food) poverty increased from 35.3 percent in 1990 to 39.7 percent in 1991 and to 48.4 percent in 1992. When these estimates are examined in absolute terms, the number of poor people increased from 882 thousand to 1.3 million in 1992, an increase of 448.3 thousand over a two-year period and those affected by primary

poverty increased from 686 thousand to 1 million, i.e. an increase of 333.9 thousand over the same period.

Table 4: Estimated number of poor people by primary and total poverty group and as percent of total population 1990-1992

Year	Primary poverty	Total poverty	Primary (food poverty %)	Total poverty (%)
1990	686,260	882,335	35.3	45.4
1991	803,605	1,039,405	39.7	51.4
1992	1,020,135	1,330,610	48.4	63.0

Source: Estimates based on CSA 1984 Population Census, MOLSA Employment Survey 1986/87 and various assumptions.

The main argument of the above section hinges on an estimate of the income or expenditure level at which expenditure on food consumption meets a specified minimum requirement. There is, however, neither a consensus nor an official position on the adequacy of the minimum food requirement or of the non-food requirement. Many essential expenditures are excluded from the generally used poverty line. These poverty lines represent conditions of abject poverty.

3. Social Aspects of Poverty

In addition to the weakness of the measurement of income/expenditure poverty line and the inadequacy of the index to depict visibly the poverty situation, analysts have devised social indicators to supplement the generally used poverty threshold. These aspects of poverty are examined briefly below and include unemployment situation, conditions of shelter, basic amenities such as water and sanitation and living environment.

3.1 Unemployment and Poverty

Estimate of the rate of unemployment from the population census of 1984 is 10.5 percent. Further, the data indicate that the unemployment rate is in the order of 14 percent for the age group 15-34 suggesting the problem of unemployment is more serious among the youth. These rates in themselves are not revealing nor alarming. But the pressure of unemployment is potentially threatening when the absolute number is considered. The above rate refers to

an unemployed population of 49 thousand from a base population of 1.4 million and a labour force of 407 thousand. The rate is probably underestimated because the unemployed population is underestimated due to conceptual, definition, measurement, survey and employment exchange registration problems.

The employment exchange does not show the full picture because all the unemployed do not register, implying under-coverage. The survey data suffer from similar deficiencies because there is cultural taboo that a household would not report any member of its household as unemployed for fear of other consequences. If 5 to 10 percent of those reported economically active population is categorised as unemployed the possible real unemployed population would be in the range of 81 thousand to 106 thousand, putting the unemployment rate in the range of 15 to 20 percent. Based on data assembled from various sources new estimates of unemployment and unemployment rate have been estimated and are shown in the following table.

Table 5: Estimates of unemployment for 1992 and 1995

	1992	1995
(1) Total population	2,107,895	2,382,555
(2) Population aged over 15 years ((1) * 0.57)	1,201,500	1,358,056
(3) Economically active population ((2) * 0.55)	660,825	749,931
(4) Government employment ¹	175,354	179,677
(5) Total employment ²	513,375	544,477
(6) Unemployment ((3)-(5))	147,450	202,454
(7) Rate of unemployment in % ((6)/(3))	22.3	27.1

Note: 1. Government employment for the city is 30 percent of total government employment for the country.

2. Government Employment is 34 percent of total employment.

Source: CSA (1984) Population census; MOLSA (1986/87) Public Sector Establishments.

The evidence from the table indicate an unemployed population of 147 thousand for 1992, i.e. a rate of 22.3 percent. In 1995 the unemployed population grew to 202 thousand, indicating a rate of 27.1 percent or an increase of 55 thousand in three years with an average of 18 thousand per annum. All those in regular employment with regular jobs and income are not

outside poverty but all the unemployed fall entirely within those in poverty. For 1995, assuming average household size of 5 members and assuming grossly the unemployed constitute heads of household, the estimated households affected by unemployment is in the range of 8.5 percent of the total households of the city. This would also mean that 8.5 percent of the households are affected by poverty due to unemployment. The significance of this situation is reflected by the duration of unemployment. A large proportion, in the order of 50 percent, have remained unemployed for over one year.

Before the reform to a market economy, the policy pursued was that many workers were placed on the payroll of public enterprises which were overstaffed and unproductive. Large decline of employment and rise of unemployment stemmed from the process of reallocation and restructuring. There is indication that 15 percent of the total public sector employment have been retrenched. This has added to the pool of unemployment, in addition to demobilised soldiers and sizeable vulnerable groups constituting the street children, the beggars, the prostitutes, the pensioners, the physically handicapped which could go as high as half a million. Slow economic recovery, retrenchment of workers, rapid population growth could be spelled out as factors exacerbating unemployment and poverty. As a result of retrenchment, the unemployment level increased from 202 thousand to 253 thousand, thus raising the unemployment rate from 27 percent to 34 percent.

3.2 Poverty, Housing Shortage and Housing Conditions and Facilities

Shortage of housing and poor housing conditions are visible manifestation of poverty. The 1984 housing census indicate that 15.4 percent of the total housing stock were occupied by two to three households. Moreover, the occupancy rates as measured by persons per room range from 2.6 to 3.5, indicating a very serious overcrowding in most of the dwelling units.

Further analysis of the housing conditions suggest that 23.5 percent of the total housing stock require either to be totally demolished or require expensive maintenance. To this can be added that more than 4 thousand housing units are located along river courses which are prone to flood.

The material of construction of the housing units exhibit a revealing feature of poverty. 81.1 percent of the households reside in housing units whose walls are

made of wood and mud and 51.5 percent whose floor is earth mud, exposing a large proportion of the city population to hazardous health conditions. Examination of water supply, water consumption, toilet facilities, sewerage, sanitation and lighting facilities also demonstrate poor conditions of the city. Six percent of housing units fetch their water supply from wells and springs; 29 percent have no toilet facilities; 8 percent use kerosene lighting facilities; refuse disposal coverage is 40 percent and estimated water consumption per capita per day as low as 26 litres for 1987 (Hadgu Bariagabir, 1987) down from 40 litres in 1984. Moreover, ownership profile of assets suggests that 36 percent of the households do not own radio. All these figures, though of different order of magnitude, indicate the prevalence of high level of poverty.

3.3 Poverty and Mode of Transport

Empirical evidence from ENEC/CESEN study of 1984 indicate that out of 81 percent of the working age population of the city, 70 percent travel on foot to work or other business places, whereas 13 percent and 10 percent used the public buses and taxis respectively. Income data obtained from the census recorded that 60 percent of the employed persons were earning less than Birr 200. The low income level and the high and rising unaffordable public bus and taxi fares force the residents to commute on foot.

3.4 Poverty and High Infant and Child Mortality

Infant mortality in the city of Addis Ababa declined from 170 per thousand in the 1960s to 120 in the 1970s, and the 1980s adjusted figure point to 100 per thousand. This high level of mortality is the direct outcome of poor health care, absence of safe drinking water, poor sanitation and malnutrition amongst mothers and children. The high mortality may induce parents to have more children so as to ensure a minimum number of children.

Of the leading causes of infant and child mortality, malnutrition accounts for a significant proportion of deaths. About 65 percent of the children suffer from stunted malnutrition (weighted for age).

3.5 Energy Consumption and Poverty

Results of the Census 1984 and the ENEC/CESEN study are drawn upon in the following table for purpose of comparison.

Table 6: Percentage of energy consumption by type of energy

Energy type (total)	1984 Census	(ENEC/CESEN)
	%	(%)
Electricity	6.3	4.8
Electricity and gas	6.0	-
Kerosene	-	7.6
Gas	4.2	-
Wood	40.9	62.0
Charcoal, gas and firewood	6.5	21.4*
Animal dung and vegetable residue	34.5	1.8
Unknown	1.6	2.4

Note: *Charcoal only.

Source: Population Census (1984); ENEC/CESEN Main Report September, 1981.

The table reveals an important feature that a large proportion of households, in the range of 60 percent, use firewood as source of energy for cooking. The census shows that 34 percent of households consume animal dung and vegetable residue as their main source of energy for cooking. This suggests that a magnitude of that order come under the poverty group. Shortage and unaffordability of the other energy sources makes them inaccessible to the poor.

3.6 Poverty, Urban Population Growth and Economic Growth

According to the Census of 1984, the population of the city was estimated at 1.4 million. CSA projections for 1994 indicate a population size in the range of 2.3 to 2.8 million. This constitutes 30 percent of the total urban population and 4 percent of the total population of the country.

Evidence from available data indicate that the city grew at 7 percent in the 1960s, 5 percent in the 1970s and 4.5 percent in the 1980s and 1990s. Despite declining pattern, the rate of urban growth is high largely due to natural rate of increase. Results for 1984 indicate that 48 percent of the growth is attributed to rural-urban migration. A rapidly growing population means greater demand

for education and health care services that require larger and continuing investments. Currently the health care coverage and the education coverage are 46 percent and 50 percent, respectively. These suggest that it is extremely difficult to maintain even a minimum level of efficiency in providing health and education facilities. Low health coverage and high charge prices of health services create appalling conditions of the city. Low education coverage create low level of educational qualification and poses difficulty in obtaining employable skill and aggravates poverty situation. This is the vicious circle of poverty. High poverty leads to high population growth, high population growth creates low health and education coverage and therefore high level of poverty.

In addition to demographic factors, economic factors are essentially responsible for the high and visible incidence of poverty. Recent macroeconomic performance is depicted in Table 7.

Table 7: Gross domestic product (GDP) and external debt ratio 1990-1992

Year	GDP at factor cost (million US\$)	Total external debt	Total external debt as % of GNP	Total debt service as % of exports
1990	5420	3263	55	33
1991	5393	3477	53	25
1992	4844	3676	58	30

Source: ECA and World Bank (1993).

The table posts low and declining pattern of GDP at factor cost. It declined from US\$5.4 billion in 1990 to 4.8 billion in 1992. Total external debt stood at 3.7 billion in 1992 and the total external debt as percent of GNP increased from 55 percent in 1990 to 58 percent in 1992, whereas the total debt service as percent of exports stood at an average of 30 percent. The figures suggest that the low macroeconomic performance recorded in the 1990s is the root cause for the high incidence of poverty in the city.

3.7 Estimates of Vulnerable Social Groups

Assembled data from different sources and national data point to the following estimates of vulnerable groups in the city:

Table 8: Estimated number of vulnerables by social group in 1993

Social groups	Estimated figure	Adjusted figure	% of total*
(1) Prostitutes	34,500	17,250	7.5
(2) Street children	69,460	34,370	15.1
(3) Beggars	42,780	21,390	9.3
(4) Destitute elderly	94,300	47,150	20.3
(5) Physically handicapped	214,820	107,410	46.7
(6) Orphans	41,820	20,910	0.9
Total	460,000	230,000	100

Note: * total is 460 thousand.

The table indicates a size of 460 thousand people of vulnerable groups, which constitute 20 percent of the total population of the city. This is an extremely high estimate. A 10 percent reduction of the estimate may approximate the true figure. Nevertheless, this figure could serve as a benchmark for future study.

4. Conclusions and Policy Implications

Adequate, reliable, periodic and recent data were not available to allow a comprehensive poverty analysis. A multitude of other factors were also responsible for limiting the scope of analysis. Among these factors are problems of definition and measurement of poverty, the dynamic aspect of the poverty line which makes one time data obsolete and defective because of the continuous entry and exit from poverty, the lack and limited knowledge in the composition and quantity of the minimum food and non-food requirements, the arbitrariness in setting up the poverty line. Moreover, the lack of monitoring mechanism for assessing and evaluating poverty situation on a periodic basis have posed problems in the analysis:

Despite these limitations, the following conclusions can be drawn from the analysis.

1. About 1.3 million people have been identified as poor, and these constitute 63 percent of the total population of the city. Those affected by primary poverty are 35 percent of the population.
2. The magnitude and level of poverty as evidenced in the last three years exhibit an increase from 45 percent to 63 percent.
3. The rate of unemployment increased from 22 percent to 27 percent and may have reached a level of 35 percent. In absolute terms, the number of unemployed increased from 147 thousand to 203 thousand in the 1990s.
4. Rate of population growth, partly fuelled by rural poverty, is in the range of 4 to 5 percent of which 48 percent of the growth accrues to rural-urban migration.
5. Formal employment opportunities in the city remain scarce. Small-scale enterprises are few and have limited labour-absorptive capacity. The economy is incapable of absorbing the annual increase of labour supply and the backlog of unemployment.
6. Despite increase of average household income from Birr 170 per month in 1979 to Birr 251 per month in 1984, increase in prices has eroded real income.
7. Economic growth is not compatible with population growth. Evidence indicate that GDP growth rate is low; and external debt as percent of GNP is as high as 58 percent, whereas the debt service as percent of exports is in the range of 30 percent, indicating poor macroeconomic performance.
8. Roughly 6 percent of the population (84 thousand people) lack access to clean water and roughly more than 29 percent (406 thousand) remain without toilet facilities.
9. Estimated average consumption of water per household is as low as 28 litres per day and as high as 40 litres per day.
10. The economic and social infrastructures have deteriorated as a result of low investment.

11. Social problems such as unemployment, prostitution, street children and others have become rampant and highly visible in the city.

The above findings support the fact that the incidence and magnitude of poverty is high and increasing. Poverty is both a political and a social issue. It warrants policy interventions as an integral part of a national and regional macroeconomic programme.

The trickle-down effect of economic growth alone cannot redress the problem. It is precisely for this reason that the Federal Democratic Republic of Ethiopia has incorporated alleviation of the problem of poverty as one of its fundamental goals in its economic development policy and programmes.

What is currently being done?

The government has identified the number of poor and has designed programmes targeted on the already poor and the new poor that emerged as a result of adopting the structural adjustment programme. These programmes and projects include:

1. flexible urban labour intensive public work programmes;
2. severance payments to retrenched workers of public enterprises;
3. the creation of a pool of a revolving fund for provision of interest free credit to the retrenched in order to start small-scale enterprises or business; and
4. food/kerosene voucher programme is also envisaged to cover the poorest of the urban poor.

So far, a number of poverty targeted programmes have been implemented. The World Bank and other international agencies have provided credit for the city of Addis Ababa (in the range of Birr 40 million) for poverty focused programmes. Other ongoing food-for-work projects by the World Food Programme and programmes of self-help, slum-upgrading, labour-intensive construction projects with a total cost of Birr 6 million are under way. Projects under the Ethiopian Social Rehabilitation Fund include programmes of providing social infrastructure, i.e. primary school, communal latrine, drainage

and income-generating projects for ex-soldiers and displaced civilians for 1993 (MOPED, 1994) with a cost of Birr 4 million.

The drawbacks of the above targeted programmes

1. The fund is limited and therefore the number of beneficiaries is limited.
2. The programmes have little sustainable impact since they are of limited duration.
3. There may be problems of wrong identification of beneficiaries, abuse of resources, and exaggeration of the number of man days of employment the projects generate.
4. The projects need to be regularly evaluated in terms of the income effect on beneficiaries.

In spite of limited benefits and coverage, the above programmes are still strongly recommended. However, the programmes should be broadened and evaluated periodically in terms of their impacts and attaining objectives.

What more should be done?

Poverty should not be conceptualised as a separate and independent issue from the broad development objectives. Different programmes need to be integrated into a comprehensive development strategy. The programmes should entail the following objectives and measures:

1. **Employment creation:** The most effective way of promoting employment expansion is the one that strikes a balance between public and private sector development. Private sector investments must be encouraged through credit facilities and other incentives to contribute towards poverty reduction through employment creation.
2. **Wage and salary adjustment policy:** Wages and salaries must be adjusted consistently with the rise in the standard of living. There is a need for monitoring producer and consumer prices to track the decline of real wages and salaries.
3. **Reducing population growth:** This is important for poverty reduction. Population projects should be incorporated in social development

programmes as part of the overall poverty reduction development objectives. Broadly targeted family planning has maximum effect in reducing population growth and channelling resources from social expenditures to capital investments in the long-run.

4. Educational reform: Evidence indicate that coverage and quality of education is low. Enrolment, particularly for the female population, is low. Educational qualification and salary structure of teachers is dismal and facilities are poor, which essentially are responsible for the poor quality of education. There is a need to improve the coverage and quality in light of human capital building as a means in poverty alleviation. Emphasis must be placed on primary education and technical education which give immediate results. Moreover, repetition and drop-out rates are also high. Thus, improving the quality and coverage of education requires strengthening management, reallocating educational resources, increasing funding, and involving parents in educational management.
5. Investment in infrastructure: (mainly housing, health facilities, water and sanitation):

Policy makers must have a clear appreciation of the potential of infrastructure in contributing to poverty alleviation. The linkage between infrastructure services and poverty both as a means to high income and as an end in themselves must be realised and underlined. To this end, efforts must be made to reduce housing shortage, ease overcrowding and make rents affordable relative to income. Moreover, slum upgrading must be addressed, sanitation facilities must be improved. Health coverage need to be improved by reallocating and increasing fund in health expenditure. Provision of these services will have strong impact on economic growth.

Faster economic growth in turn could lead to an improvement in living standards and a decline in the number of the poor. The simultaneous goals of economic growth and poverty reduction reinforce each other and need to be tackled. Finally it can be noted that the above measures could serve as broad policy framework from which details could be worked out to include quantitative targets, financial, and institutional manpower needs and monitoring mechanisms.

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Abdulhamid Bedri Kello

1. Introduction

There are various studies looking at the determinants of nutritional status of children (see for instance Khan, 1985; Alderman, 1990; and Tesfaye Teklu, 1994). Some of these studies are directly concerned with the relationship between income (or poverty) and nutritional status (see Ravallion, 1990; Ravallion and Huppi, 1989; Behrman, 1988; and Behrman and Deolkakir, 1986 for a review of other earlier works). It is argued in the literature that there may not be an immediate relationship between income and nutritional status. However in the long run, income and nutritional status are related as malnutrition, which is usually associated with poor sanitation and lack of primary health care, is a problem of the poor (Pinstrup-Andersen, 1989).

Most of the methods used to assess poverty in developing countries are based on consumption expenditures, particularly expenditures on food items (Ravallion and Bidani, 1994; Ravallion, 1996), which complicates matters when one tries to establish the relationship between poverty and nutritional status as the two seem to be directly related. However, the issue of intra-household distribution of food could lead to differing nutritional status measurements among the individuals in the household. If such is the case, then measuring poverty based on household food consumption (or even total consumption expenditures, which is heavily influenced by food consumption in countries such as Ethiopia) most probably may have little to do with nutritional status of children. There is the additional complication of the distribution of disease and the capability of the individual in utilising the food consumed. The distribution of disease in an area, the general health status of the people and the genetic inheritance of the persons concerned all influence the outcome of the available food (Behrman and Deolkakir, 1986). Therefore, looking at the relationship between poverty and nutritional status may not establish a direct and immediate link between income levels and nutritional status of children. However, it has been argued that poverty analysis based on consumption expenditures could produce dependable estimate of income and therefore poverty levels (see Ravallion, 1996).

The main objective of this paper is to investigate the relationship between the poverty status of households and the nutritional status of children to see if there are long-term effects at work in the different towns in Ethiopia. It is hypothesised that poverty and nutritional status do not have a significant relationship. To test this hypothesis two staged analysis is conducted. The first one is a chi-square analysis and the second is a regression analysis where poverty is included as an explanatory variable of nutritional status of children.

The data used is based on the Ethiopia Urban Socio-economic Survey conducted in 1994 in seven towns (Addis Ababa, Awasa, Bahr Dar, Dessie, Dire Dawa, Jimma and Mekele) by the Departments of Economics of Addis Ababa and Gothenburg Universities. The most important variables considered, poverty and nutritional status of children, are derived as follows. Poverty is defined based on household food consumption levels (for details see Mekonen Tadesse, 1996) and worked as an average for the seven towns (POV1) and for each specific town (POV2). Nutritional status is based on height-for-age z-scores (HAZ), weight-for-age z-scores (WAZ), and weight-for-height z-scores (WHZ) for children less than or equal to 6 years of age. The data analysed concerns only the households with such children.

The paper has two more sections. The first section presents the results of the analysis of the relationship between poverty and nutritional status and the second discusses these results. The paper is intended to present the preliminary findings for discussion.

2. Nutritional Status and Poverty Analysis: Results

A basic investigation to see if there is a relationship between poverty and nutritional status could be the construction of a table showing poverty by nutritional status. In addition to the cross-tabulation a chi-square test was carried out. The results of this stage of work is given in terms of height-for-age z-scores (HAZ) (the results obtained for weight-for-age z-scores (WAZ) and weight-for-height z-scores (WHZ) are not given as these gave very similar results). Tables 1 and 2 give the results of the test using a single poverty line for all towns (see Mekonen Tadesse, 1996) and for poverty lines drawn for each specific town, respectively. Following this a detailed town-by-town analysis was carried out but since this gave similar results, it is not reported.

The results show that, in both cases, the HAZ cannot be said to have a significant relationship with poverty levels (both the chi-square and correlation coefficient are very low and insignificant). As seen in the results (not reported here), it is not possible to say that nutritional status as measured in HAZ has any relationship to the status of poverty of the household, except in the case of Mekele where a significant result for the town-specific poverty is obtained. But, even in this case, it was not possible to obtain a high correlation coefficient between the two variables.

Table 1: Distribution of poverty by height-for-age z-scores (single poverty line for all towns)

Z-score	Non-poor	Poor	Total
-2.00	145	187	332(41.0)
-1.00	58	73	131(16.2)
1.00	166	181	347(42.8)
Total	369(45.6)	441(54.4)	810(100.)

Table 2: Distribution of poverty by height-for-age z-scores (separate poverty lines)

Z-score	Non-poor	Poor	Total
-2.00	158	174	332(41.0)
-1.00	58	73	131(16.2)
1.00	166	181	347(42.8)
Total	382(47.2)	428(52.8)	810(100.0)

The next step concerned the investigation of the relationship of poverty to nutritional status as conditioned by other variables (as is suggested in the literature, for instance Ravallion, 1990). For this purpose logistic regression was adopted. In the model, the dependent variable is height-for-age (represented by a dummy with 1 for those with no malnutrition and 0 for those who were malnourished) and the independent variables are:

CITY

Addis Ababa

1

Awassa

2

Bahir Dar

3

Dessie	4
Dire Dawa	5
Jimma	6
Mekele	7
MAZSCHO	Highest level of schooling of mother
HHDSEX	Gender of the household head
AGE	Age
GENDER	Sex
POV2	Non-poor 0 Poor 1
INT_1	MAZSCHO * POV2 (interaction of mother's education and poverty status)
HHSZ	Household size
HHDH	Height of household head
LNEDFA	Natural log of the educational level attained by the father of the child
INT_2	GENDER * MAZSCHO (interaction of gender of the child and mother's education)

Table 3: Regression results

Variable	B	S.E.	Sig.	R	Exp(B)
CITY			.3555	.0000	
CITY(1)	.2329	.1301	.0735*	.0336	1.2622
CITY(2)	.2707	.2513	.2814	.0000	1.3108
CITY(3)	-.1891	.2305	.4119	.0000	.8277
CITY(4)	-.0753	.2880	.7938	.0000	.9275
CITY(5)	.0742	.2453	.7621	.0000	1.0771
CITY(6)	.0508	.2312	.8262	.0000	1.0521
MAZSCHO	-.0460	.0271	.0892*	-.0289	.9551
HHDSEX(1)	.0716	.1149	.5330	.0000	1.0743
AGE	.1578	.0484	.0011**	.0900	1.1709
GENDER(1)	-.0388	.0760	.6098	.0000	.9620
POV2(1)	.0033	.0810	.9672	.0000	1.0033
INT_1	-.0383	.0266	.1491	-.0087	.9624
HHSZ	.0812	.0304	.0076**	.0693	1.0845
HHDH	.0114	.0089	.1987	.0000	1.0115
LNEDFA	.1588	.0920	.0842*	.0303	1.1721
INT_2	.0099	.0155	.5234	.0000	1.0099
Constant	-3.6643	1.5072	.0150		

Note: * and ** indicate significance at 10 and 1 percent levels, respectively.

The results, presented in Table 3, indicate that age of the child and the size of the household contribute significantly (while the schooling level of the mother and the father of the child are seen to have significant effect on the nutritional status of the child at a lower level of significance). Contrary to expectations, the results show that poverty status, as measured here, does not have a significant effect on the nutritional status of children.

3. Discussion of Results and Concluding Remarks

The results obtained indicate that it is not possible to establish a significant link between poverty and nutritional status. It seems plausible to associate poverty with the nutritional status of the children in the households. However, it was impossible to establish a significant direct link between the two. Using both definitions of poverty line (as computed by Mekonen Tadesse, 1996), it was not possible to establish a significant relationship between the two. Even the data disaggregated by town failed to register a significant chi-square test result to indicate a possible relationship, except for Mekele. The same held true in the results of the regression analysis as seen in the chi-square analysis. More importantly they also indicate that most of the hypothesised determinants of poverty fail to be significant contributors to the nutritional status of the children of the households covered in this study. A result that was unexpected was the negative relationship between the educational level of the mother and child nutritional status. A plausible possible explanation could be that mothers with more education have better chance of getting employment and thus have less time in the home to supervise the nutrition of their children. To either account for or eliminate this factor, regression analysis was run with the variable determining the employment status of the mother. The results indicated that the inclusion of this variables did not change results significantly and the variable did not have a significant relationship with the dependent variable.

Faced with such results, a possible explanation that comes to mind is that the specified model may not have properly accounted for the relationship that exists between nutritional status and the variables included in the regression, or that there are more important variables that are left out in the analysis. Other variables left out such as the availability of health care services, access to clean drinking water and so on may have to be included. The dummy variable (for

urban centre) was assumed to take care of such variations. However, it may be possible to introduce more sensitive dummy variables, for instance, disaggregating the data at the *kebele* level, which could help us not to classify the whole Addis Ababa as a homogeneous entity. However, similar results were obtained in other studies that concluded that a direct and immediate link between poverty and nutritional status may not hold as income losses and gains in the short run could be absorbed in shifting the composition of household consumption baskets (Ravallion, 1990). Furthermore, it is argued that other variables, particularly the environmental endowments (that affect disease distribution) could also influence the nutritional status of children in addition to the availability of food (Pinstrup-Andersen, 1989; Behrman and Deolmakir, 1986). It is also possible that other considerations in the allocation of family income could influence nutritional outcomes (Bouis and Haddad, 1990).

The problem in data reporting as a result of rounding off the age of children to the nearest year or half a year has been observed. This too could be a problem. As there is a follow up to the urban household survey, verifying this has become very important. The only solution to this is trying to convince the respondents to respond in terms of years and months or more preferably if the parents could give the year and month of birth of the child. Such a step could result in better information. It is also important to check documents such as birth certificates or vaccination cards of children. It may not be possible to exactly determine the age of a child if such documents are not there and the parents do not remember the date of birth of the child. This is further complicated by the usual underreporting of age of children in urban areas and more seriously by the belief that telling the age of a child is harmful as is the case in some traditions in Ethiopia.

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City	Value	Fred	(1)	(2)	(3)	(4)	(5)
Addis Ababa	1	407	1.000	.000	.000	.000	.000
Awassa	2	57	.000	1.000	.000	.000	.000
Bahir Dar	3	77	.000	.000	1.000	.000	.000
Dessie	4	47	.000	.000	.000	.000	.000
Dire Dawa	5	60	.000	.000	1.000	.000	.000
Gimma	6	69	.000	.000	.000	.000	1.000
Mekale	7	68	-1.000	-1.000	-1.000	-1.000	-1.000
POV							
Non-poor	.00	397	1.000				
Poor	1.00	398	-1.000				
GENDER							
Male	1	395	1.000				
Female	2	399	-1.000				
HHSEX							
Male	1	576	1.000				
Female	2	209	-1.000				

Note: Category variable(s) with 0-1 values have been recoded using the above coding scheme. Parameter estimates are not the same as for indicator (0-1) variables.

Annex 1

Details of regression results

Total number of cases: 870 (Unweighted)
 Number of selected cases: 870
 Number of unselected cases: 0
 Number of selected cases: 870
 Number rejected because of missing data: 85
 Number of cases included in the analysis: 785

Dependent Variable Encoding:

Original Value	Internal Value
.00	0
1.00	1

City	Value	Freq	Parameter coding					
			(1)	(2)	(3)	(4)	(5)	(6)
Addis Ababa	1	407	1.000	.000	.000	.000	.000	.000
Awassa	2	57	.000	1.000	.000	.000	.000	.000
Bahir Dar	3	77	.000	.000	1.000	.000	.000	.000
Dessie	4	47	.000	.000	.000	.000	.000	.000
Dire Dawa	5	60	.000	.000	.000	1.000	1.000	.000
Jimma	6	69	.000	.000	.000	.000	.000	1.000
Mekele	7	68	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
POV2								
Non-poor	.00	387	1.000					
Poor	1.00	398	-1.000					
GENDER								
Male	1	395	1.000					
Female	2	390	-1.000					
HHDSEX								
Male	1	576	1.000					
Female	2	209	-1.000					

Note: Category variable(s) with 0,1-values have been recoded using the above coding scheme. Parameter estimates are not the same as for indicator (0,1) variables.

Annex 1

Details of regression results

Total number of cases: 870 (Unweighted)
 Number of selected cases: 870
 Number of unselected cases: 0
 Number of selected cases: 870
 Number rejected because of missing data: 85
 Number of cases included in the analysis: 785

Dependent Variable Encoding:

Original Value	Internal Value
.00	0
1.00	1

City	Value	Freq	Parameter coding					
			(1)	(2)	(3)	(4)	(5)	(6)
Addis Ababa	1	407	1.000	.000	.000	.000	.000	.000
Awassa	2	57	.000	1.000	.000	.000	.000	.000
Bahir Dar	3	77	.000	.000	1.000	.000	.000	.000
Dessie	4	47	.000	.000	.000	.000	.000	.000
Dire Dawa	5	60	.000	.000	.000	1.000	1.000	.000
Jimma	6	69	.000	.000	.000	.000	.000	1.000
Mekele	7	68	-1.000	-1.000	-1.000	-1.000	-1.000	-1.000
POV2								
Non-poor	.00	387	1.000					
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Male	1	576	1.000					
Female	2	209	-1.000					

Note: Category variable(s) with 0,1-values have been recoded using the above coding scheme. Parameter estimates are not the same as for indicator (0,1) variables.

The Ethiopian Economy: Poverty and Poverty Alleviation

Classification Table for HAZZ

Observed	Predicted		Percent Correct
	0	1	
0	377	80	82.49%
1	225	103	31.40%
Overall			61.15%

Variables in the Equation

Variable	B	S.E.	Wald	df	Sig.	R	Exp(B)
CITY			6.6389	6	.3555	.0000	
City(1)	.2329	.1301	3.2035	1	.0735	.0336	1.2622
City(2)	.2707	.2513	1.1603	1	.2814	.0000	1.3108
City(3)	-.1891	.2305	.6732	1	.4119	.0000	.8277
City(4)	-.0753	.2880	.0683	1	.7938	.0000	
City(5)	.0742	.2453	.0916	1	.7621	.0000	1.0771
City(6)	.0508	.2312	.0482	1	.8262	.0000	1.0521
MAZSCHO	-.0460	.0271	2.8882	1	.0892	-.0289	.9551
HHDSEX(1)	.0716	.1149	.3886	1	.5330	.0000	1.0743
Age	.1578	.0484	10.6343	1	.0011	.0900	1.1709
Gender(1)	-.0388	.0760	.2604	1	.6098	.0000	.9620
POV2(1)	.0033	.0810	.0017	1	.9672	.0000	1.0033
INT_1	-.0383	.0266	2.0815	1	.1491	-.0087	.9624
HHSZ	.0812	.0304	7.1313	1	.0076	.0693	1.0845
HHDH	-.0114	.0089	1.6521	1	.1987	.0000	1.0115
LNEDFA	.1588	.0920	2.9815	1	.0842	.0303	1.1721
INT_2	.0099	.0155	.4073	1	.5234	.0000	1.0099
Constant	-3.6643	1.5072	5.9107	1	.0150		

Classification Table for HAZZ

Observed	Predicted
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10
11	11
12	12
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14	14
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86	86
87	87
88	88
89	89
90	90
91	91
92	92
93	93
94	94
95	95
96	96
97	97
98	98
99	99
100	100

* Constant is included in the model.

Variables in the Equation

Variable	B	S.E.	Wald
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YTIC

Estimation terminated at iteration number 4 because Log Likelihood decreased by less than .01 percent.

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Safety-nets, Credit and Market Reform

Adjustment and the Poor in Ethiopia: Lessons on Targeting and Design of Social Support Programmes

Abbi Mamo

1. Adjustment and Poverty

Structural adjustment programmes bring changes in welfare and income distribution. Some measures with such effects are elimination of subsidies, tight fiscal policies bringing cuts in social services and employment and increases in the prices of essential goods.

Assuming constant pattern of income and applying macroeconomic trends in income, adjustment may be followed by a decline in per capita household income and an increase in poverty incidence. This has been shown by Kanbur (1988) using the 1985 Living Standards Measurement Study of Cote d'Ivoire (see Kanbur, 1990, for details).

The negative impacts of adjustment are believed to be short-run effects. Improved efficiency and output growth is expected to prevail in the medium to long term. The expenditure switching component of adjustment favours tradables especially exports. But the benefit or the rise in rural incomes due to such a move largely depends on the proportion of households producing tradeables. On the other hand, some non-tradeables such as construction and government services are labour-intensive and a switch to tradeables may reduce employment and income of the poor especially in the urban centres.

Structural Adjustment Programmes bring changes in welfare and income distribution. Some measures include the elimination of subsidies, tight fiscal policies bringing cuts in social services and employment and price increases for essential goods.

Exchange rate devaluation will help the poor if they produce tradeable goods and will hurt them if they consume the same, such as imported necessities. The removal of ceilings on agricultural prices will benefit the rural poor who are net producers of food but hurt the urban poor who are net consumers of food.

Establishing causality between specific adjustment measures and the evolution of the standards of living of different socio-economic groups is difficult especially when this evolution may partly stem from past policies which militated against growth rather than from the adjustment policies [Grootaert and Kanbur; 1990:6]. In fact, different groups (urban and rural) and different sectors (formal and informal) are affected differently by adjustment programmes.

2. Social Support Programmes

2.1 Background

In Ethiopia, like in many other developing nations, well-developed pensions, public transfer and social assistance (safety-net) schemes are lacking. There is a lack of national integrated government transfer and social assistance programmes for the population. The population instead has to rely on traditional practices. Within and across family and community transfers are the basis for the traditional social insurance systems. Family members are taken care of by other family members in times of old age, sickness and unemployment. However, such traditional mechanisms are strongly undermined in times of general economic decline and other shocks. This may require increased government responsibility in providing some social security.

Moreover, in the short run, the contractionary impacts of reform programmes could outweigh the positive responses anticipated. This will call for the protection of societal groups affected by the expenditure-reducing policies.

Support programmes can be designed to address the most immediate needs of target groups. They protect/compensate victims of reform measures and enhance their productive capacity. Protection/compensation measures can be provided through current income transfers and long term investments.

Due to the heterogeneity of the poor, different kinds of social action interventions are required. The socio-economic argument for support programmes is that they can be seen as responses to alleviate the social costs of prolonged economic dysfunction, often called the 'social costs of non-

adjustment.' They are believed to offset increasing short-term unemployment and ease the transition to more sustainable employment creation. The poor generally have little access to social and economic services or productive assets and are marginal to the economic mainstream. Specific targeted programmes will be needed to increase access by the poor to markets, social services and opportunities [Marc et al., 1995:18].

The political argument says that if the problems of vulnerable groups are unaddressed, this will generate considerable opposition to reforms and put the whole adjustment process at risk (Marc et al., 1995:19).

The institutional argument states that social support programmes are effective since they involve beneficiary community members, NGOs, the private sector and the government.

There are some arguments against support programmes. The most important proponent of tighter rules in the early 19th century was Malthus. He agreed that society had an obligation to support the most needy especially the old; but he believed that by supporting large families, poor relief encouraged population growth and thus depressed wages.

2.2 Conceptual Issues

The design of social support programmes must be a policy measure that responds to prevailing poverty. According to Ravallion, public action should aim at expanding human capabilities rather than entitlements. A person's capability is a set of functioning bundles, representing the various beings and doings that a person can achieve with his or her economic, social and personal characteristics. 'A person's entitlements over some time period are the various consumption bundles that are legally attainable from that person's initial endowment, given prevailing prices (Ravallion, 1991:4). The provision of basic education, health services, clean drinking water and adequate nourishment are required to build capability. Social action programmes expand one's capabilities.

The term social action programmes embraces concepts such as social safety nets, Social Action Programmes (SAPs) and Social Funds (SFs). Both SAPs and

SFs can be considered as social safety nets. A social safety net addresses the needs of vulnerable groups and keeps them from falling into absolute poverty. SAPs and SFs aim to reduce poverty and reintegrate destitute groups into the economy (Marc et al., 1995:1).

Safety-nets are defined as resources provided by the family, the community or the state that support individuals during times of economic crisis. In this paper, a social support programme is taken to include all kinds of support schemes through social action programmes and social funds provided to the poor (those who have become poor by reform measures as well as before adjustment).

2.3 Budget and Sustainability

The major problems emerging in the design of support programmes are securing funds and making the programmes sustainable. In addition, reconciling government expenditure with the need to protect social expenditures for target groups is a key challenge. Even if countries manage to secure the funds to finance welfare, the problem of making the programmes sustainable is still a problem.

Compressing imports, in an attempt to correct external imbalance, brings two problems that erode the capacity to finance social support programmes:

- i. The fall in economic activity cuts the domestic revenue base and thus public resources for the programmes.
- ii. Excise duties are important sources of revenue and these fall along with import compression.

On the other hand, easing foreign exchange constraints increases government revenue through its long-run impact of increasing economic growth and taxable economic base.

From the public finance perspective, it is recommended to curb unproductive expenditures. But how? Adjusting countries are adopting what is called core public expenditure budgeting procedures to protect the poor. The idea is that once a government has defined the kinds of socially oriented services it wants to protect (such as preventive health services, primary education and targeted

subsidies for poor farmers), specific budgeting procedures are introduced to clarify and systematise the translation of these priorities into public expenditure decisions. Social spending can be reduced without a serious harm to the poor by carefully manipulating the composition of the expenditure in favour of the poor. But if we go for expenditure efficiency, it brings both technical complication and political difficulty.

In many instances, administrative feasibility becomes a limit. Sometimes, administrative costs constitute 2.5-3.5 percent of the benefits transferred. The more precisely targeted a programme, the higher the cost of administering it. One way to reduce the cost of administration while still achieving some degree of targeting is to target by indicators. Another approach might be to subsidise food prices which is important in the diet of the poor, but which does not figure prominently in the diet of the better-off.

There are also other important questions for which there is no single answer.

- a. Should the budget be part of an existing institutional framework of the government or should it be part of an independent body within the government ?
- b. Should the fund be provided to the community as grants or loans or both?

External assistance is the major source of finance. Almost all countries with poverty alleviation programmes have fund support from donors. One issue is the coordination of various donors in a programme. External finance cannot be a guarantee over the longer term. The government's domestic resource base need to be expanded and most of the social support programmes can be initiated using revolving funds.

More importantly, the budgetary implementation process is lengthy. The process is slow and uncertain in many developing countries which delays the release of allocated funds. For example, a study of disbursement mechanism in Cote d'Ivoire discovered twelve steps between the time an invoice is presented to a ministry and final disbursement against the invoice. A recent informal review of social sector programmes aimed at providing immediate support to poor and vulnerable groups in Ghana, Uganda and Zambia found that a key

impediment to success in all cases was delay in the disbursement of funds (Marc et al., 1995:44).

Implementation capacity (administrative, technical, financial and participatory) need to be considered for sustainability. In Ethiopia, a pilot phase has been initiated to test the capacity of implementing agencies. During this phase, the government has to provide training and technical assistance to institutions. Mobilising NGOs or local organisations, such as municipalities, are likely to require strengthening.

In the past, resources for maintaining programmes and covering recurrent costs in the medium to the long term were advanced from ministerial budget outlays. However, it is increasingly evident that, as government resources shrink, ministerial pledges are not enough to ensure recurrent costs and rehabilitate facilities. Alternative strategies to secure resources for sustaining programmes are to develop cost-recovery systems and to secure external resources. If programmes have delays in implementation, cost recovery will also be delayed. For continued donor support, encouraging the participation of the private sector in programmes is important. In fact, this is only a short-run solution. Thus, supporting projects that may strengthen municipal governments may be a better strategy.

2.4 Support Instruments

Governments can use social support programmes as channels that augment either primary or secondary incomes or both. Primary incomes are generated through the production of goods and services. The structure of output and the distribution of primary incomes have been affected by reform measures (World Bank, 1988:5).

a. Approaches to increase primary claims

- i. It is possible to increase the rates of return on the assets the poor hold (e.g. labour). As instruments, output prices (e.g. prices of cereals such as *teff* which is quite important in the consumption basket of households in Ethiopia), input costs, infrastructure, agricultural extension services, etc., can be improved in favour of the poor particularly in the rural areas.

- ii. Access to productive assets is a basic guarantee against poverty. In rural areas, land and credit can be significant inputs. Since landless households are relatively few in rural Ethiopia (4.9 percent) (see Table 1), they can easily be made accessible to credit. In urban centres, the informal sector embraces many of the disadvantaged groups. Ex-soldiers, refugees/returnees, retrenched employees are concentrating in informal-sector activities and support in the form of granting repayable loans to set up small enterprises can do a lot.
- iii. Employment opportunities can be encouraged in line with the expansion of tradable sector production. Work programmes can be designed focusing on tradable-oriented activities or on non-tradable activities which are essential to the expansion of tradables (e.g. constructing roads that serve regions that produce for export). To minimise employment problems of adjustment, occupational and geographical mobility can also be encouraged. Credit and training create self-employment. Governments face defaults in extending loans to poorest sections of the population due to lack of collateral. Attaining the objectives of zero defaults and helping the poor simultaneously is next to impossible and governments will be forced to accept some margin of defaults as a necessary evil.
With the progress of reforms, employment programmes need to provide on-the-job training to enable participants easily sell their labour services.
- iv. Labour is the major asset of the poor. To build their capabilities and increase present and future income, the poor should get basic services.
- v. Finally, income and consumption transfers need to be increased to compensate for the welfare losses due to adjustment.

b. Secondary incomes

These are directly transferred benefits to households (e.g. government transfers). They are often designed to integrate the poor in the long-run growth process through nutrition, health and education programmes. Governments aim at increasing productive assets of households, wage employment especially for urban and non-farm rural workers in the tradable sectors, helping those in the non-tradable sector to shift to other sectors, reducing labour market

distortions, encouraging community-based projects, etc., to increase secondary incomes of the poor.

c. Specific instruments

Vouchers (food/kerosene/agricultural input vouchers) can entitle the poor to choose from a specified list of consumer goods and inputs upto the face value of the voucher. Although they were not targeted, vouchers were in use in Ethiopia (a kerosene voucher). Eligibility to own the vouchers was based on *kebele* membership; not on income level or any other poverty indicator.

For fine targeting, charges are required during voucher programmes. But societal groups such as the disabled, orphans, the elderly should be exempted from payment of charges. The number of vouchers to be distributed can also be determined by assessing the need of each household.

Should vouchers be denominated in terms of entitlement to a given value or to a given physical quantity of commodities? In answering this question different arguments, which support either the poor or the suppliers are forwarded. Quantity denomination is preferred since it isolates the recipient from inflation (protective of the poor). Under value denomination, traders need not be resupplied with a corresponding amount and quality of the commodity plus an amount of money which covers the cost of marketing (protective of suppliers).

Food price adjustment is one way of safeguarding government employees. And retrenched workers can be given compensation. Governments can mobilise many unemployed individuals for road construction, sanitation, rehabilitation of schools, health centres, afforestation, water well drilling, etc. (i.e., urban and rural public works). The wages in the public works should be carefully planned not to dislocate labour from the formal sector. These labour-intensive works can be used to target the poor on the ground that only the poor choose to participate in such hard physical labour in return for a bare survival wage.

In rural areas, off-farm employment opportunities provide a better support for the non-farming community while provision of input vouchers become appropriate for the farming community.

The necessity of labour-intensive public works in the Ethiopian setting is unquestionable. After the recent exchange rate reform, the financial costs of improving rural roads by labour-based methods are significantly less than by equipment-based methods. Labour-intensive public works create employment, augment rural household income and lead to food security in the case of food-for-work projects.

3. Targeting the Poor

Lack of insurance leads to increased incidence of poverty. In the absence of insurance, persons who are poor take loans from neighbours and relatives for consumption smoothing and other purposes. But such self-protective mechanisms provide imperfect insurance warranting an effective government intervention for protection.

The major issue is to identify the poor that deserve policy attention (targeting). In fact, targeting is inherently political and therefore not always popular with governments. There can be numerous targeting options. But considerations such as estimates of administrative costs, leakage and undercoverage should be made to determine which targeting option is the most appropriate.

Targeting is difficult in the absence of household level data. Different indicators identify different sets of individuals/households as poor. Therefore in designing social support programmes the first area of concern should be the choice of welfare indicator(s). Then caution must be exercised in comparing poverty estimates of different regions (interregional) and of different periods (intertemporal).

In estimating poverty, a measure of standard of living has to be identified. Once this is done, the next logical move is to choose a cut-off point (the poverty line) that separates the poor from the non-poor. Neither of the tasks is simple. The standard of living of an individual or a household is a multi-dimensional concept involving, in principle, every aspect of consumption (food and non-food, services or basic needs such as health and education) as well as non-consumption activities and services (see Sen, 1987). The poverty line involves conceptual as well as measurement problems.

3.1 Targeting Indicators

There are some suggestions for a single measurement of standard of living: food expenditure (Anand and Harris, 1985); total expenditure or share of food expenditure in total expenditure (Deaton, 1981; Glewee 1986). Household income per capita, total expenditure per capita, food expenditure per capita, calorie intake per capita, and household inverse food share (defined as a ratio of total expenditure to food expenditure) are also identified as indicators of well-being.

In addition, there have been many attempts at specifying a poverty line, for example, based on critical minimum nutritional intake. But there is a considerable debate on whether nutritional analysis can specify such a critical threshold; and added to this is the problem of how such a threshold in nutrition space could be translated into a threshold in the space of per capita expenditure. Given these uncertainties, the choice of a particular poverty line is bound to be controversial, and the appropriate response should be to do sensitivity analysis using different poverty lines at any given point in time [Srinivasan, 1981; Sukhatome, 1982; Dasgupta and Ray, 1987; Kanbur, 1987].

In an attempt to measure poverty in Ethiopia, Dercon and Krishnan (1995), constructed a poverty line for rural areas for 1989 and 1994 based on survey data for 15 sites. Household consumption data (including purchased food, own harvest, food gifts and non-food expenditure) are used to construct the poverty line for each site by costing a representative diet giving 2,200 kcal in each area and including an allowance for non-food consumption. The absolute poverty line suggests that 30 percent of the sampled households fall below it. In addition, they used a poverty line put at two-third of mean consumption in the sample. The result is that 48 percent of households in the 15 sites fall below the poverty line.

Comparison of poverty in 1989 and 1994 showed that education, land quality, adult labour force size, the relative specialisation in agriculture and assets increased the chances of a household to move out of poverty. Thus programmes that are designed to provide education, improve capabilities and augment asset-holding capacity of households could make a big difference in the welfare of the rural poor in Ethiopia. The structural factors affecting poverty are found to be

female-headedness of households and limited access to land and other assets such as livestock, credit, etc.

The command over consumption is not the final objective of personal well-being. Income is not also the sole determinant of well-being. In using income and consumption as indicators of well-being, the assumption used is that individuals are the same in all respects once they consume identical items and earn the same level of income. Other factors such as types of goods consumed, time allocation for various activities, personal characteristics which affect consumption patterns are important.

Basic needs achievement, access to essential facilities such as health, education and housing, household composition, availability of employment opportunities, access to inputs, etc., can be used as general targeting indicators.

Table 1 summarises information on some of the structural factors affecting poverty based on Ethiopian Urban and Rural Household Surveys. These surveys were undertaken by the Department of Economics, Addis Ababa University in collaboration with the Centre for the Study of African Economics, Oxford University and Department of Economics, Gothenburg University of Sweden. The urban survey was undertaken in November, 1994 covering 1,500 households in seven cities/towns while the rural survey was conducted in three rounds in 1994/95 also covering 1,500 households in 15 different sites. The figures indicate average values for all sites.

The results presented in the table indicate that there are serious shortages of basic facilities, the dependency ratio for both rural and urban Ethiopia is quite high (more than 65 percent) and education and health service coverages are still small.

Support programmes for female-headed households should largely be concentrated in urban centres since they are more significant in urban areas than in rural areas. Obviously, such indicators are quite useful for policy makers in designing national poverty alleviation schemes in the long-run. Under such circumstances direct targeting simply identifies the structural factors of a target group. But in a country where poverty is widespread, it is not easy to make a divide between households that need public assistance and those that do not.

Table 1: Structural factors explaining poverty in Ethiopia

Characteristics	% of household	
	Rural ¹	Urban ²
Female headed	14.3	54.0
Landless	4.9	-
Took Credit	51.0	32.6
No Kitchen	-	14.0
No Toilet	-	18.6
No Bathing facility	-	84.0
Young (0-14)	43.4	31.6
Old (55+)	7.6	8.6
Off-farm Employment	38.2	-
Disability	2.0	1.6
Tertiary (education)	1.2	7.7

Note: 1. Indicates an average figure for eight of the sites covered.

2. Indicates an average figure for the seven towns surveyed

(Addis Ababa, Awassa, Bahr Dar, Dessie, Dire Dawa, Jimma, Mekele).

3.2 Targeting Groups that are Adversely Affected by Reform Programmes

So far general characteristics of households have been taken as indicators of the well-being of individuals and households. Poverty alleviation programmes based on such characteristics are long run in nature and will try to change the structural factors affecting well-being.

Adjustment policies affect many segments of the rural and urban population and call for the protection of at least the adversely affected ones. Women, smallholders, retrenched public enterprise employees and civil servants, unemployed graduates and other societal groups which have been directly and indirectly affected by the expenditure switching and reducing policies need explicit attention.

Identification of target groups is usually county-specific. Based on the household level data such as the Ethiopian Urban and Rural Household Surveys mentioned above, analysis of the evolution of income, consumption and basic needs fulfilment overtime can be undertaken. Then a relationship can be established between this evolution and the policy environment. Households can

be classified into different socio-economic groups. These groups must be as homogeneous as possible from the point of view of the impact of adjustment on their welfare through production and income generation mechanisms. Assets or sources of income are clearly the prime classifying variables if economic homogeneity is sought, since this is the main mechanism through which adjustment affects household welfare. In rural areas, the classification can be made according to whether the household owns a farm (and the size of it) and its major crop or type of crops (export versus subsistence crops). In some cases, the institutional arrangement under which the farm operates can be part of the classification (e.g. sharecropping). In urban areas the work status of the household head and/or the sector providing the household's main source of income can be used.

The above socio-economic criteria enables us to identify target groups. The groups can be defined along various economic and non-economic criteria. To identify the poor, one might look at location, lack of assets, selected activities and so on. Target groups can be quite heterogeneous and need not necessarily be defined at the household level. Three types of relations can be established between target and socio-economic groups:

- i. an entire socio-economic group may constitute a target group because, for example, it comprises both the chronic and the new poor, or a particularly vulnerable group;
- ii. target groups may comprise a subset of a socio-economic group; and
- iii. a target group may cut across several socio-economic groups (e.g. female-headed households).

3.3 Other Targeting Approaches

For fine targeting, direct targeting based on general household characteristics will no more be useful. The choice of the targeting criteria involves many issues. Below we will look at additional approaches to targeting.

i. Geographic targeting

It is undertaken based on average welfare level of specific areas. It misses to capture the poor living in the non-poor areas and may benefit the non-poor in the poor areas.

If regions identified as priority are too large and not homogeneous, targeting becomes more difficult. Simulations of the accuracy of geographic targeting show that both leakage and undercoverage diminish as the size of the unit used in decision making gets smaller (Marc et al., 1995:57)

Such targeting needs a reliable disaggregated data at the local level. In Ethiopia, the Ethiopian Social Rehabilitation Fund (ESRF) has conducted a rapid assessment to identify priority areas covering Addis Ababa, Tigray and Southern Ethiopia.

ii. Self-targeting

Self-targeted programmes ostensibly make services available to all but are designed in such a way as to discourage the non-poor from using them. Paying workers below the market wage rate, requiring people to stand in line (time costs), and subsidising a low quality product are examples of self-targeting; they are designed to induce the non-poor to self-select out of the programme. Although self-targeting may have lower administrative costs of identifying the poor, the costs of participation must also be factored in, such as forgoing other employment. Also in the case of public works programmes, contractor bias in recruiting workers can interfere, especially if the demand for unskilled labour is high.

iii. Targeting through choice of implementing agencies

Working with organisations that have extensive knowledge of local conditions and experience working with the poor, for example NGOs, can effectively enhance the benefits of these programmes. But the problem of incompatibility between the objectives of NGOs and the social support programmes might arise.

3.4 Ways to Improve Targeting

a. Beneficiary assessment

This includes direct observation, incorporates simple counting, and is expressed in quantitative terms. It helps to identify and select projects to understand needy groups, to clarify the approach for the promotion of support programmes.

b. Rapid assessment (participatory rural assessment)

The technique helps identify programmes and beneficiaries for targeting purposes and monitor programmes.

c. Use of household surveys

Surveys designed to capture information on household composition, income, expenditure, living conditions, employment, etc., can help to classify households according to socio-economic characteristics. This will improve targeting.

4. Review of Experiences

The purpose of this section is to present a review of some country experiences in the design of social support programmes, targeting beneficiaries and the strategies or mechanisms that sustain the benefits of interventions. Finally, an attempt is made to draw some lessons for Ethiopia.

The review is based on Marc et al. (1995), a study that outlines the basic issues and lessons in the design of SAPs/SFs in sub-Saharan Africa (SSA). Two broad categories of support schemes have been used to present the experiences gained in a number of African countries, viz. experience in employment generating components and experience in the provision of basic social services.

4.1 Experience in Employment Generating Components

4.1.1 Labour-intensive works

If political interference is reduced, support schemes succeed (Senegal). Conversely, Ghana's Priority Works Project faced implementation delays since it was integrated into government ministries. The autonomy promised on paper need to be translated into practice unlike the experience of Sao Tome and Principe.

The public works have often been located in remote areas. Experience gained so far in SSA suggests that creating incentives for firms to work in those areas is needed. Low wage is one way of targeting the poor in a public works programme, but experience gained elsewhere in Africa suggests that low wages alone may not be sufficient in attracting the poor. In Kenya's Minor Roads Programme, workers were attracted as much by a particular wage as by the prospect of securing continuous wage employment that offered a regular cash flow and saved them time in searching for casual work.

The common criticisms on public works are focused on two points. First, they are urban-biased and second, they suffer from inadequate targeting.

4.1.2 Support to microenterprises

Low-income enterprises were assisted through SAP/SFs in Chad, Ghana, Sao Tome and Principe, Somalia and Uganda. Two types of supports are common: financial and technical.

Credit programmes are difficult to implement in Africa for several key reasons: the reluctance of commercial banks to get involved, poor history of loan repayment and geographical dispersion. Commercial banks fear the huge transaction costs. Alternative financial intermediaries are needed. For instance, NGOs operated successfully in Chad. Intermediaries should be given incentives. For improved repayment, monitoring borrower activities is essential.

Programmes providing training and technical assistance should be related with day-to-day operations. Wrong orientation of training led to failure in

Madagascar. In Chad, the programme was over-extended so costly. Experience gained thus far cautions that microenterprises support is an expensive undertaking in all cases. Resources and staff that work with intermediaries (private groups, government institutions, NGOs, cooperatives, etc.) should be ready. Using private sector executives as trainers to ensure that what is taught is practical and current has contributed to the successful programmes in Senegal and Mexico.

A successful microenterprise programme has greater potential to generate employment for the medium-to-long-term while public works programme produces mainly temporary employment. Furthermore, women, under represented in labour-intensive works programme, are well represented in microenterprises.

4.1.3 Helping laid-off workers and unemployed graduates

Cameroon, Guinea-Bissau, Madagascar and Senegal have components to support the placement of laid-off public-sector employees and unemployed graduates. The support programmes consist of compensatory assistance, advice, training, placement services or credit for self-employment.

It is difficult to evaluate in concrete terms the achievements of these programmes because their objectives are often political in nature. The programmes bring gains in down-sizing future government payroll.

Senegal's Natural Employment Fund failed in the first year because it was conceived as a programme for emergency hand-outs aimed at responding rapidly to immediate needs with little attention to building durable delivery systems. It had serious institutional problems and the selection of eligible groups was based on personal criteria. There was no mechanism of accounting for expenditures or following up on loan results. Only 5 percent of those eligible were reached.

Similarly, the Cameroon programme failed mainly due to donor suspension and lack of counterpart funds. Guinea-Bissau's Reorientation Unit was successful; it reached 85 percent of the eligible groups. The basic reason for the achievement is its focus on screening workers for training in job placement. Its training curricula was based on assessment of labour market demands. The

programme also benefited from providing trainees a small stipend to enable them to dedicate their time exclusively to training and reducing the number of drop-outs.

4.2 Experience on the Provision of Basic Social Services

Zambia, Guinea, Sao Tome and Principe and Uganda have devoted the greater proportion of their projects to the provision of social services: health, education, sanitation and nutrition.

Community participation in cost-sharing, consultation and decision-making helped to improve sustainability of works, to ensure that the sub-project is relevant to the needs of beneficiaries and to build confidence as to the ownership of projects by the community (Uganda).

Ghana's participatory approach was undermined since the community could not contribute to the financial requirements and strong political pressure prevented the community from applying for projects. Zambia's case is different from Ghana, in that community contributions were dropped temporarily and the selection process was highly apolitical. Zambia's experience illustrates that projects used by the majority on a regular basis, such as schools, attract better community participation than those used by individuals from outside the community, such as roads and bridges.

Social indicators have been found useful in Cote d'Ivoire for macro-policy formulation. In the case of public housing subsidies, a misallocation of resources happened, thus benefiting middle- and upper-income groups.

Finally, whatever is the type of the support scheme, monitoring and beneficiary assessment have helped to improve targeting and ensure sustainability. Monitoring involves physical monitoring (consisting of follow-up of physical implementation in the field); financial monitoring (a follow-up of all disbursements and transfers of funds under the operation) and impact monitoring (which reviews the programmes impact on its beneficiaries in detail). The development of management information system contributed to improved physical and financial monitoring in Chad. The success in Senegal is

also attributed to the follow-up of sub-projects. Beneficiary assessment improved targeting in Bolivia and Zambia.

4.3 Lessons for Ethiopia

Both quick social action programmes and social funds ranging from the short to the long run are essential to alleviate the widespread poverty existing in the country. Ethiopia initiated a social fund (ESRF) which conducted a rapid assessment to identify priority areas. Pilot activities have been planned to take place in Addis Ababa, Tigray and Awassa (Hosaina area). Upto 31st March 1993, a total of 257 micro-project proposals were submitted to the Fund's three sub-units. Out of these proposals, 156 or 61 percent were income-generating, while the remaining 86 and 15 were social and economic infrastructure micro-projects, respectively (TGE, 1993:12).

From the review in Sections 4.1 and 4.2 we can draw some important lessons especially in protecting societal groups that are adversely affected by reform measures, some of which are applicable in the long run.

Before initiating support programmes for laid-off workers and unemployed graduates, data on manpower requirements of various economic sectors should be gathered. In addition, training programmes for redeployees need to be tied to current labour market demands.

For the sustainability of such schemes, the institutional aspect (e.g. coordination) should not be neglected, political interference should be minimised and the government should accept the communal ownership of infrastructural assets such as village water supply schemes.

Lack of collateral is one of the major problems in Ethiopia inhibiting poor groups to have access to credit. In such a situation, the country may need to consider to give credit at subsidised rates and avoid the traditional collateral requirements. The calculation of the rate of profitability of credit schemes should not be limited to economic variables but should take into account opportunity costs by weighting security risks against economic optimisation.

To provide basic services, information on social indicators is useful for targeting. Monitoring the implementation of projects improves the targeting process although it is costly. To guarantee the relevance of projects to the needs of the target groups, there should be participation in cost-sharing and decision-making by the target groups themselves. This contributes greatly to sustainability of the schemes.

Different projects address the needs of different target groups. For instance, public works do quite well for vulnerable men while microenterprise support is more important for women. In addition, projects need to be more multi-sectoral in nature to reach more social groups.

The government has to be careful not to make the budgetary implementation process too lengthy. Otherwise, the delay in the release of allocated funds leads to the failure of many projects. This will have effects worse than the reform measures (Cote d'Ivoire, Ghana, Uganda and Zambia).

Generally, the government must be less political while targeting, stronger in strengthening institutional capacity of projects for sustainability and more active in mobilising funds (domestic and external) for project funding.

5. Conclusions

In Ethiopia, support programmes should focus on urban centres during the reform period since the direct victims of the policy changes are likely to be dominantly concentrated in the urban centres (e.g. retrenched public enterprise employees and civil servants, unemployed graduate, etc.).

During adjustment, demand- and supply-side measures affect different groups of society. The effect might be adverse on the welfare of some of these groups. These need to be targeted using different approaches. However, estimates of probable administrative costs, leakage, undercoverage and excessive attention to a given area should be considered in selecting the most appropriate targeting approach.

Targeting measures which involve political choice (e.g. geographic targeting) need to be avoided. Though lacking in many developing countries, household-specific characteristics serve as a basis for targeting. The Ethiopian government can make use of the existing data stock on households which has been collected by different educational and research institutes.

In the short run, poverty-reduction strategies should be targeted given the limited implementation (administrative, financial, etc.) capacity of the nation. In the long run, efforts to reduce poverty should be found on improving the economy-wide structure of incentives and sectoral policies and on the widespread provision of physical structure and basic social services.

Support programmes should attempt to help those most in need not those easiest to reach. This is to avoid the concentration of the schemes (e.g. urban-bias). In fact, if the aim is to assist only those affected by the reform measures, individuals affected directly by the reform are largely concentrated in urban centres.

Mobilising local communities, municipalities, NGOs and cooperatives is important to share the administrative tasks of the central government.

Labour-intensive works can provide some temporary relief, but other methods to provide employment to the bulk of the unemployed and underemployed must be taken (e.g. microenterprise support). In fact, experience suggests that public works are less costly than microenterprise support. Therefore, based on cost consideration public works can be given emphasis in Ethiopia. On the ground of sustainability, microenterprise support programmes are preferable.

Programme benefits should be communicated to beneficiaries and communities should be encouraged to participate for sustainability. More importantly, resources to run the schemes should be secured. For instance, land required for many of the microprojects approved by ESRF has not been obtained. Donor support is quite important for the financial aspect of the schemes.

Compensatory measures that improve consumption in the short run cannot be taken as the sole solutions to rectify the negative effects of adjustment.

Therefore, the well-being of most of the poor should be linked to improvements in their production and economic activity.

Though demand-side measures bring public expenditure cuts, the government can play around by changing the composition of expenditure in a way to benefit the poor. The largest budget share may focus on preventive medicare instead of big allocations for hospitals that usually serve the middle and the upper class. Finally, whether or not the poor are protected during and beyond adjustment depends on political will.

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for Poverty Alleviation

Bekele Tilahun

1. Introduction

Poverty is a result of many factors. Among them is the lack of financial resources for capital formation. The informal sector has no access to formal credit and it lacks the necessary resources for its operations. It cannot easily obtain credit for the acquisition of investment items and to meet working capital requirements. Lending to the informal sector is one of the challenges facing financial institutions and this is very much related to poverty alleviation.

In a country like Ethiopia where the majority of the population is poor, greater emphasis should be exerted towards poverty and poverty reduction in order to achieve growth and improvement in the living standard of the population. However, no sufficient study has been done with regard to the informal sector credit. This calls for research in the area providing for an appropriate forum in which issues and concepts can be debated systematically with a view of reaching a common understanding in the policies and strategies to be adopted.

Against this background, the objectives of this paper are to:

- assess the informal sector in Ethiopia;
- identify problems and constraints to credit access by the informal sector;
- draw lessons from the experiences of Ethiopia and other countries that have attempted in the past financing the informal sector;
- finally, to suggest possible approaches to financing the informal sector and propose strategies and policies to be adopted for successful informal sector credit programme.

The study is based on reviewing the existing literature and mainly on data collected from branches of the Development Bank of Ethiopia (DBE) and Grameen Bank of Bangladesh. Few of the credit beneficiaries, all DBE branch

managers involved in informal sector credit and few promoters from the Ministry of Trade and Industry have been also interviewed.

The paper is organised in eight sections. Sections 2 and 3 provide a brief review of poverty and the informal sector including the state of poverty in the informal sector. Section 4 discusses the conceptual framework of credit for poverty alleviation, followed by Section 5 which identifies problems and constraints of the informal sector related to the availability of credit facilities. Section 6 examines experiences and strategies adopted in delivery of credit for poverty reduction by credit programmes of three countries. Finally, Section 7 draws lessons from experiences of successful programmes and suggest strategies and policies to be considered in Ethiopia and Section 8 provides conclusions.

2. Poverty and the Informal Sector

It might be difficult to give a specific definition of the informal sector. However, it could be broadly defined on the basis of the characteristics and business activities of firms. Thus, the informal sector consists of those enterprises engaged in various business activities of which the majority are without having license for their business operations.

2.1 Characteristics of Informal Sector and their Economic Condition

The informal sector is constituted of business operations outside government regulations. They are not officially recognised and registered by the government and do not operate under various regulations such as income tax regulations.

The majority of enterprises in the informal sector neither have sufficient capital nor have undergone any training. Most of the informal sector entrepreneurs are with low income and incapable of covering basic their requirements.

2.2 Areas of Activities

Informal activities are productive and income generating enabling the people involved to feed their families. Generally the role of women is significant. Studies have indicated that world-wide, one third of all businesses in the informal

sector are operated by women, although, participation rates vary from country to country (Holt and Helena, 1991:6).

In Ethiopia most of the informal micro-enterprises are small scale and operated by one man or assisted by family members. They involve highly labour-intensive, traditional technology requiring relatively little capital. The business activities of the informal sector could be categorised into four major areas of operation:

- a. Agricultural sector informal enterprises: These are small farm operations or off-farm activities performed in the rural areas. Included in this category are rearing milk cows, fattening (ox, sheep, goat), poultry raising, bee-keeping, marketing of crops and draught animals such as oxen, asses, smallholder horticultural crop production, etc.
- b. Manufacturing, handicraft and cottage industry: Several surveys have been conducted on such enterprises during the past years. A survey conducted in 1988 by ILO in Addis Ababa, Harrar and Dire Dawa revealed that the activities performed in this sector are weaving, spinning, embroidery, shoe-making, local-drink making, knitwear production, pottery, tanning, arts and crafts, wood and metal works, basketwork, *injera* making, bread making, food processing, etc. (ILO, 1990:39).
- c. Service sector informal enterprises: Included in this category are shoe repair, shoe shinning, electrical equipment repair, watch and clock repair, automechanics, tyre mending, tapestry, photography, hair-dressing, tailoring, entertainment, garage, brick laying and so on.
- d. Informal enterprises in petty-trade: This category includes grain and spices trade, selling of food, beverages, fruits and vegetables, second-hand clothes, lottery tickets, newspaper and magazines as well as operating, garment shops and small restaurants.

3. The State of Poverty in the Informal Sector in Ethiopia

3.1 Who are the Major Components of Ethiopia's Poor

No one can deny that the majority of Ethiopia's poor are those people living in the rural areas engaged in subsistence peasant agriculture. The second major

category of the poor are those individuals and households in the informal sector whose incomes are insufficient to provide their basic needs. Although, we do not intend to indicate the poverty line to separate the poor from the non-poor in this study, the World Bank adopted a global poverty line of US \$370 per annum to determine the number of poor people in the world (World Bank, 1990:28). Ethiopia's annual per capita income is estimated at US \$120. This indicates that the majority of the population lives in extreme poverty.

3.2 Size of Informal Sector

According to the World Bank Report, 1992, in the year 1990 about 27 million people were living under chronic poverty in Ethiopia. Although, there is no information on how much of these participate in the informal sector, it is commonly understood that most of the poor particularly in the urban areas are in this sector. A study conducted by ADB-Consult for the establishment of a specialised financial and promotional institution for microentrepreneurs in Ethiopia has tried to indicate the size of the informal sector by estimating rural micro-enterprise operators at 414,100 and urban micro-enterprise operators at 1,419,099 (ADB, 1995:30-31). This sums up to 1,833,199 for 1995. This estimate is based on 1972 CSO findings and making adjustment to current situation by applying population growth rate. The estimated figure is entirely the number of owner operators and doesn't include employees.

4. Conceptual Framework

Getting out of the poverty trap is difficult for the poor without outside intervention. Credit is usually viewed in terms of its ability to help people break away from this trap. Credit is a liquid asset through which the poor can acquire productive capital to improve their capacity to generate income, savings and investment. The increase in income and the possession of assets will enable the poor to fulfil their basic needs. The following are the most important roles of credit in reducing poverty:

- a. Increasing the poor's ownership of or access to physical assets: The income-earning capacity of the entrepreneurs in the informal sector is low because they lack income earning assets. Financial credit is the most flexible form of transferring economic resources to the poor. A poor person can buy

anything helpful for generating income with the cash obtained through credit.

- b. Raising productivity and net income: Credit has great potentialities to remove many of the associated constraints faced by the poor. Credit can assist in raising the productivity and income of small and micro-entrepreneurs. The majority of the population in this sector need credit either for start-up of small businesses or for the expansion of the existing ones. They must wait for proceeds to accumulate before they purchase material inputs for their businesses. This commonly results in inefficiency and discontinuity in business operations and incomes of individuals.

Added to this, small and micro-entrepreneurs are rarely capable of taking advantages of market prices of their products and raw material inputs. They have to obtain cash to meet their daily living expenses so that they must sell their goods immediately whether market prices are favourable or not. On the other hand, due to their subsistence position and shortage of cash, they rather buy raw materials when they obtain cash for they are unable to buy sufficiently at times of lower prices.

Some of the entrepreneurs are using traditional and labour-intensive equipment in their business operations. As a result of this poor and inefficient operation, productivity is low. The income to be generated from such activity could not meet the daily basic expenses of the family. The need may arise for changing of traditional technology to improved ones.

Thus, the operational constraints described above could be alleviated through credit and an increase in income-generating capacity of poor people through increased operational profits attained.

- c. Credit creates an employment opportunities: A World Bank study has indicated that the number of poor people in the sub-Saharan Africa has increased from 184 to 216 million during the period 1985 to 1990 (Deng, 1995:8). The largest segment of this population is unemployed or self-employed. In such a situation, credit provides viable and sustainable employment opportunities at all levels of skill through establishment of income generating activities.
- d. Credit is a means for provision of technical and promotional services: The most valuable asset that the poor have is their labour. Hence, skill development is an important element of poverty reduction. To this effect

development credit to the poor usually consists of promotional and technical support services. Training and organising of targeted groups usually are undertaken with the credit programme. In this way, the unskilled poor could be empowered sufficiently to participate in the economy through self-employment.

5. Problems and Constraints of the Informal Sector vis-a-vis the Availability of Credit Facilities

5.1 Problems Related to Informal Sector Enterprises

- a. Shortage of funds: Informal sector entrepreneurs face shortage of start-up capital for small businesses or to run activities under operation at manageable capacity and efficiency.
- b. Lack of shelter and insecure business site: The majority of the informal sector entrepreneurs are poor and they do not own work premises for their businesses. They do not have the security to work permanently in the site selected. They run high chances of eviction by municipal authorities, particularly in the centre of cities, street-sides and open-market areas without creating any favourable conducive environment for them.
- c. Policy issues: Micro-entrepreneurs are usually rejected by policy-makers. Most economic policies are not in favour of this sector. They are rather considered as outlaws.
- d. Marketing constraint: Goods produced and services provided by the micro-entrepreneurs face competition against products of large enterprises and imported goods. As a result of this competition, the demand and prices of products and services could fall below expectation.

5.2 Major Constraints in the Availability of Credit Facilities

The informal sector entrepreneurs face the problem of access to credit. Formal credit is virtually inaccessible to them because they cannot provide adequate collateral. Similarly, in the informal financial markets accessibility to money lenders is limited and often available only at exorbitant interest rates as compared

to the borrowing rate of the formal financial institutions. As a result, the profitability of the businesses carried out on borrowed fund is affected.

The major constraints which limit the access of informal sector entrepreneurs to credit services emanated both from the side of lenders and borrowers.

a. Lack of appropriate institutions for promoting and financing the informal sector: The existing conventional banks have limited experience in financing the poor. It is only recently that the DBE has started financing poor micro-entrepreneurs. It is a fact that banks are suspicious of loosing the public's money if credit is extended to the poor without any tangible collateral. They are not encouraged to participate in such activity in order to avoid losses by minimising their involvement for reasons indicated below:

- Higher transactions cost: The primary objective of conventional banks is to make profit. Providing credit to the poor is staff-intensive and small amount of loans to individuals makes supervision difficult. This entails high transaction costs and risks which must be covered by interest earnings from lending and service charges. The lending interest rate ceiling is fixed by the central bank, which is 15 percent per annum in the Ethiopian case. Banks are allowed to charge on the basis of this rate and this may not enable them to make sufficient profit; it may not even be sufficient to cover costs.

- Shortage of financial resources: Banks are facing shortage of funds for undertaking such risky ventures. They are not refinanced or provided with risk fund.

- Collateral requirements: Poor people do not have sufficient tangible fixed assets for meeting requirement to cover risks of loans. Thus they have been denied of this service.

b. Limited education and familiarity with loan procedures: Poor people have limited education or are totally illiterate making it difficult for them to cope with loan procedures and the banks' bureaucracy. They could be at a disadvantage in approaching banks for a loan. On the other hand, the capability to use credit productively may require some skill and know-how in

the field of the business to be undertaken. This may disqualify them from obtaining credit.

- c. Organisational problems: Informal sector entrepreneurs are not well organised to qualify for credit. None of the institutions in the country is responsible for organising and promoting them. The Ministry of Trade and Industry has been participating only in IDA micro-enterprise credit scheme of selected towns. After completion of the credit programme there is a fear that this operation will cease.

There could be informal organisations such as *iqub* in which the poor in the informal sector are participating. However, such organisations work only as depository and are not created specifically for obtaining credit. Such groups could be re-organised and strengthened to provide credit services.

6. Credit for Poverty Alleviation: Instructive Experiences of a Domestic Case and Some Foreign Countries

Some valuable experiences of selected successful urban and rural credit programmes for the poor are highlighted in this section. The discussion covers a background of each programme, credit delivery mechanisms, criteria adopted and their operational results. One case is based on domestic and the other two on experiences of other developing countries. It is believed that these experiences would help individuals and agencies to better understand the strength and weakness associated with poverty-oriented credit programmes. The assessments and discussions on these selected cases could enable those involved in the credit programme for poverty alleviation to consider some of the successful elements and programmes for further replication.

6.1 The Case of Development Bank of Ethiopia (DBE): Informal Micro-enterprises Lending Programme

6.1.1 Objectives

This credit programme was launched in 1993 under market towns project of the IDA line of credit. The purpose of the programme was to assist the poor in the informal sector from selected 16 towns listed in Table 1. Its main objective was to provide sufficient and efficient financial services to meet credit demand by micro-

entrepreneurs engaged in small income-generating activities. It was aimed to improve the productivity and income of the poor as well as to generate employment opportunities in the selected urban areas.

The programme has been under implementation by joint effort of DBE and the Ministry of Trade and Industry (MOTI). DBE is responsible for the provision of credit and services and MOTI for promotional and technical services. Training of officers engaged in the provision of credit and promotional activities was given high consideration. Over thirty staff members from both institutions were sent to Israel, Grameen Bank of Bangladesh and Egypt to acquire experiences in financing micro-enterprises.

6.1.2 Design of credit delivery system

- a. **Targeting:** The target beneficiaries of the credit scheme in the selected towns comprise females and males whose monthly income is less than Birr 50. At least 50 percent of the credit beneficiaries should constitute women and unemployed school leavers. The credit beneficiaries should be residents in or around the selected project towns.
- b. **Grass-roots organisations:** Information dissemination about the project is carried out by agents of the MOTI in targeted areas. Then registration takes place. Later on, the beneficiaries themselves form their own peer groups consisting of five to six members. Again five to six groups are organised in cooperatives. The number of a cooperative membership should not exceed thirty. Cooperatives are organised on voluntarily basis and each member is required to pay a registration fee of Birr 5 for membership.
Agents of MOTI carryout intensive promotional and follow-up activities and certify that cooperatives are qualified for credit.

Prior to extension of loans to beneficiaries cooperatives should have their own bylaws and submit their business plans prepared for them by the promoters.

- c. **Loan sanctioning procedures, terms and conditions:** Individual loan requests are endorsed at the general meetings of cooperatives and submitted to the Bank through the promoter. The Bank then approves the loans without involving too much paper work and lengthy procedures. The three executive committee members elected by the general assembly consisting of

the chairperson, deputy chairperson and the secretary enter into loan agreement with the Bank on behalf of the other members of the cooperatives. The total amount of approved loan is deposited in the cooperatives' account held with either DBE or the Commercial Bank of Ethiopia (CBE) whichever is convenient for them.

In turn, the executive committee members jointly withdraw the money from their account at the presence of the organiser from MOTI and distribute the share of each member upon signing a sub-agreement with the cooperative.

An obligatory deduction of 10 percent of the loan amount is made outright. This fund is deposited in the savings account of the cooperative to serve as a guarantee for loan default.

Upon settlement of all loans they can withdraw and distribute to each member or keep it in the savings account for building up their financial strength.

The minimum and maximum credit ceilings for each borrower were Birr 200 and Birr 500 respectively at the start of the project. However, the maximum ceiling was raised to Birr 1,000 and latter to Birr 2,000 and currently to Birr 5,000. This improvement has taken place due to the complaints of the beneficiaries about the inadequacy of loans to meet their financial requirements.

The interest rate charged on the loan is based on the market rate which is currently 15 percent per annum. No collateral or own contribution to the loan is required. However, all members are collectively responsible for repayment of the loan in case individuals fail to meet obligations. This helps to ensure careful scrutiny of members and their loan requests by the general assembly of the cooperative and in particular by peer group members.

Loan repayments are made weekly at equal instalments. It has to be settled within a period of fifty-two weeks or one year. The group leader is responsible for weekly loan collection against signature on each member's passbook for confirmation of receipts. The passbook contains individual's loan disbursements and repayments. Collections are deposited in the lending bank account on the same day.

6.1.3 Performance

Since the start of the credit programme in 1993 and until June 1995, the credit activity has grown rapidly providing a total amount of Birr 6.6 million to 7,827 poor people of which about 77 percent are women as shown in Table 1. The credit has been extended to them to undertake various activities as listed in Table 2. The major activities are food preparation and making of local drinks which account for 73 percent of the loan, followed by tailoring and embroidery (9 percent). The food and local drinks preparation and processing activities are commonly left for women.

The credit programme has succeeded in maintaining a high repayment rate with an average rate of 86 percent as shown in Table 1. This has contributed to the viability of the programme as can be observed from its two years healthy operation. The repayment rate seems on the high side as compared to the conventional credit operation. The programme has been able to mobilise about Birr 460,000 in the form of savings deposits from participating poor beneficiaries.

As regards the impact of the credit programme, it is too early, if not impossible to determine. However, it is expected that employment and income generated from these activities have increased. Freeing the poor from the exploitative practices of money-lenders could also be seen as one of the positive results.

These and other bits of evidence indicate that the impact of the credit scheme on the borrower's income is significant. Based on the success achieved so far, proposal is now being forwarded for expansion of similar credit programmes to other eight towns outside the existing project areas.

6.1.4 Strengths and weakness of the programme

The factors contributing to the success of the programme are summarised below:

- a. Targeting the very poor clients earning a monthly income of less than Birr 50.
- b. Provision of promotional services by MOTI.
- c. Credit is used only for productive income-generating activities.

Table 1: Development Bank of Ethiopia micro-enterprises lending for the year ending June 30, 1995

Project towns	No. of co-operatives	No. of beneficiaries			Loans granted ('000 Birr)	Total outstanding ('000 Birr)	Loans in arrears ('000 Birr)	Loan recovery rate (%)	Savings ('000 Birr)
		M	F	Total					
1. Debre Berhan	31	151	890	1041	1006	317	31	96	64
2. Bahr Dar ¹	70	508	1808	2316	1565	852	119	89	16
3. Goba	22	183	341	524	473	414	75	51	46
4. Asebe Teferi	6	69	91	160	143	120	33	48	14
5. Mizan Teferi	16	120	264	348	385	83	42	87	58
6. Wolliso	17	38	317	355	317	210	68	78	32
7. Woldia	24	275	305	480	366	219	5	97	37
8. Ambo	19	141	289	430	619	163	16	94	37
9. Zeway ²	20	117	333	450	370	168	14	94	37
10. Bedele	14	106	314	420	281	272	37	83	26
11. Assela	16	105	260	365	287	73	73	70	NA
12. Awassa ³	39	115	787	902	828	339	133	80	85
Total		1828	5999	7827	6641	3230	646	86%	460
	294								

Note: 1/ Includes the project town of Debre Tabor.
 2/ Includes major towns, Arsi Negelle and Shashamene.
 3/ Includes the major town of Arba Mich.

Source: Compiled from data collected from DBE Branches.

- d. Discussions are made by the group collectively.
- e. Credit is demand-driven not supply-driven.
- f. Lending procedures are simplified.
- g. Using the group to encourage mutual responsibility and joint liability to serve as a substitute for physical collateral.
- h. Savings — establishing deposit facilities through mandatory deduction of loan to serve as partial collateral for the loans.

Table 2: Development Bank of Ethiopia lending to micro-enterprises by type of economic activity and gender of beneficiaries

Economic Activity	No. of Beneficiaries				Loans Granted	
	M	F	Total	Share of females (%)	Amount ('000 Birr)	Share of total (%)
1. Local drink	20	3866	3886	99	3008	45.2
2. Food processing*	241	1809	2050	88	1890	28.45
3. Blacksmith	35	-	573	-	31	0.47
4. Tailoring/embroidery	476	97	369	17	4	8.95
5. Spinning/weaving	260	109	468	29	276	4.21
6. Woodwork	464	4	407	-	348	5.24
7. Shoe repair	50	-	50	-	53	0.79
8. Carpet/mattress making	10	3	13	23	16	0.24
9. <i>Sifet</i>	1	55	56	98	32	0.48
10. Sweater making	4	5	9	55	16	0.25
11. Radio/tape repair	10	-	10	-	17	0.2
12. Basketwork	18	-	18	-	22	0.33
13. Cement product	2	-	2	-	4	0.06
14. Jewellery	2	-	2	-	6	0.09
15. Candle (<i>twaf</i>)	15	19	34	56	10	0.15
16. Dairy/fattening	70	-	70	-	118	1.8
17. Metal work	40	3	43	11	16	0.69
18. Tannery	56	-	56	-	85	1.3
19. Pottery	2	15	17	88	8	0.12
20. Cart	2	-	2	-	20	0.3
21. Electric oven & stove	5	-	5	-	6	0.09
22. Garage	7	-	7	-	8	0.11
23. Others	38	14	52	27	30	0.45
Total	1828	5999	7827	77	6641	100

Note: * Food processing includes: *injera*, bread, snack bar, pulses and cereal and spice processing.

Source: Compiled from data collected from DBE Branches.

There are some shortcomings associated with delivery of credit that should be addressed and could be helpful for designers of similar programmes for the poor. Few complaints have been informally gathered from the beneficiaries of credit. These are listed below:

- a. delay in disbursement of loans due to lengthy process for providing legal certificate;
- b. shortened repayment period;
- c. weak leadership in some areas;
- d. weak organisation, supervision and selection in some areas like Goba, Robe and Aseba Teferi;
- e. inadequate savings promotion and strategies (no voluntary savings is tied with credit);
- f. absence of technical support particularly training and skill up grading.

6.2 The Grameen Bank of Bangladesh

6.2.1 Background

The Grameen Bank (GB) is a specialised bank for the poor. The Grameen Bank was first started as a research project on rural economic programme to help poor farmers under the Chiffagong University in 1978. Later on this project extended its field of operations in five districts under the sponsorship of the State Bank of Bangladesh and with financial assistance from IFAD in 1979. In 1983 the Bank was formally established with a share capital of US\$ 3 million contributed by the government and by the member loanees contributing 40 percent each. The remaining 20 percent was subscribed by other banks. Currently, the capital shareholdings of the government has been reduced to 25 percent and that of the borrowers raised to 75 percent.

The major objectives of the Bank are to extend banking facilities to poor men and women, to create opportunities for the underutilised manpower resources and to raise the income-earning capacity of the poor, both in urban and rural areas. The Bank is engaged both in the provision of credit services and promotional activities.

6.2.2 Credit delivery mechanism

- a. **Targeting:** The target beneficiaries of this Bank are those poor men and women owning no land or having less than 0.5 acres of land or whose total family assets do not exceed the market value of one acre of cultivable land.
- b. **Grass-roots organisation:** Bank workers go around the village and explain to the villagers informally the availability of credit facilities as well as rules and procedures of GB. Credit is provided to a group encouraging mutual responsibility. The lending activities are managed effectively through peer monitoring and joint liability. The size of the group is small and self-selected. The number of members are five and only one person from a household is allowed to join the group. Male and female form separate groups. However, relatives cannot be a member of the same group. Members of the group must be from a centre. A centre is the weekly meeting place. The groups and centres elect their leader. The group leaders consist of a chairperson and a secretary. From among the six group leaders a centre chief and deputy centre chief are elected and hold position for a period of one year turn by turn. Contact between the group members and the Bank worker is ensured through weekly centre meetings. Centre members discuss their activities and endorse members' loan requests and approvals. At the same time the Bank officer conducts most of the banking transactions such as collection of loans from repayments made by members at the centre meeting.
- c. **Loan processing, terms and conditions:** Individual loan requests are submitted to weekly centre meetings. The request could be rejected or endorsed at the meeting. Accepted loan applications are submitted to the Bank officer at the site for approval by the Bank. There is no need to travel long distance to get the loan. The most deserving two of the five members of the group receive the initial loans for productive income-generating activities. If their performance is found to be satisfactory the other two members receive successive loans. The chairperson is the last to receive the loan. Subsequent loans would be effected after settlement of the previous loans. Repayment of loans is on weekly basis at an equal instalment of fifty weeks. However, the repayment for housing loan which is part of the credit programme of GB could be extended to about ten years.

- d. Credit is provided for agriculture and forestry, livestock and fishery and micro-enterprises including trading, shop-keeping, transport and other services. The maximum ceiling of credit to an individual is TK 5,000 (US \$133). The first loan cannot exceed TK 1,000 (US \$26). Subsequent loans are allowed to reach the maximum ceilings. However, housing loans can reach TK 18,000. GB charges interest at the rate of 20 percent on loans, which is slightly higher than the rate of other commercial banks taking into account the significant transaction costs involved in financing and promoting activities of the credit scheme (Bekele Tilahun, 1992:8). To enable the poor to get access to credit the loan requires no tangible collateral.
- e. Savings mobilisation: A special feature of the Grameen Bank is that credit is linked with savings. Various types of savings are undertaken by beneficiaries of GB one of which is compulsory savings involving an automatic deduction of 5 percent of the loan amount at the time of disbursement. Thereafter, each member is required to contribute TK 1 weekly. These contributions are deposited in the group fund account. This fund is intended for lending to the needy members free of interest charges for consumption or investment purposes on the consent of the remaining group members.
- f. There are also other types of savings such as emergency fund, disaster fund, and special fund. The emergency fund savings were initially created to serve as insurance coverage against emergency situations such as default, death, disability and other accidents. Each borrower used to pay a sum equivalent to 50 percent of the amount of interest charged by the Bank on borrowed loan (this was latter reduced to 25 percent). Currently, the mode of contribution has been amended in which beneficiaries receiving loans below TK 100. Borrowers receiving credit exceeding TK 100 pay TK 5 to TK 10 depending on the size of the loans. This fund covers only risks of accident against death.
The disaster fund is another form of saving used for insurance coverage against flood and other accidents. Special fund savings are contributed by all centre members in connection with the establishment of joint enterprises for common use by the villagers.
The systems indicated above not only assist in developing the discipline of savings but also enhances the asset ownership situation of the poor.

6.2.3 Performance

Until July 1992, a total of 1.2 million poor people have benefited from GB's credit of which 93 percent were female. A total of TK 12,666 million (US \$333 million) was disbursed. The loan recovery rate during this period was about 98 percent. The accumulated group savings was about TK 1093 million of which TK 662 million or 61 percent of total was lent to members for meeting their immediate cash needs. The emergency fund savings reached to a tune of TK 186 million.

An impact study conducted by the World Bank on 800 borrowers of GB has revealed that their income has increased by 28 percent as a result of the credit scheme (Remmy, 1991).

6.2.4 Lessons learned

The experience of GB indicates that, for a successful credit programme, the following should be achieved:

- Effective targeting
- Suitable credit delivery system for poverty alleviation
- Organising borrowers into groups
- Charging market interest rates, although, it is not sufficient
- Financing productive income-generating activities
- Effective savings mobilisation
- Providing adequate and appropriate promotional services and close supervision.

One of the shortcomings is that GB is involved in both promotional and financial services and more emphasis is given to sustainability of the clients' enterprises. This cost the Bank 16-25 percent of the total loan portfolio. As a result of its high administration cost and lower lending interest rates it hardly keeps the bank self-sustaining.

6.3 Bedan Kredit Kecamatan (BKK) of Indonesia

6.3.1 Background

Indonesia is one of the developing countries which has succeeded in reducing poverty through the adoption of appropriate policies that spur growth and enable the poor to participate in economic activities. The poverty situation in this country has declined from 60 percent to 19 percent over the period 1970-1987 (World Bank, 1990:40). One of the strategies adopted in this country was the provision of credit to the poor for productive purposes. Among the poverty-oriented development programmes is the BKK. BKK is owned by the provincial government of Indonesia. It is locally administered and financially autonomous. Its initial capital was raised by provincial authorities and the rest came from mandatory savings and revenues.

BKK's target beneficiaries have been village residents of disadvantaged groups especially women. The Bank does not organise groups but does work with local municipalities to get references and to identify poorer members of the community.

6.3.2 Credit delivery mechanism, terms and conditions

One page loan application form is received by a bank worker at a community centre. Loan is processed and disbursed in less than a week. Loans are provided on the basis of character references from local officials. First a small disbursement not exceeding five dollars is extended and this increases in subsequent loans as borrowers establish strong repayment record. They use mobile banking units and make visits to village community centres weekly to distribute loans and collect savings. The maturity of the loan cannot exceed one year. Collateral is not required for the loan but they rely on social pressure and references. The lending interest rate is 3.6 percent a month or approximately 43 percent per annum.

Borrowers are required to save 3.3 percent of the face value of the loan every month. This savings deposit not only helps the poor to accumulate assets but also serves as insurance against default.

6.3.3 Performance

BKK has given an opportunity for self-employment in productive businesses. It has managed to reach about 2.7 million poor people in 1982 of which about 60 percent were women. Repayments of loans was satisfactory (only about 19 percent was in arrears). The Bank is charging interest rates to cover operating expenses including the cost of funds. Thus, it managed to earn a profit of US \$1.4 million in 1987 (Holt and Helena, 1991:24-29). According to BKK's principle it distributes 10 percent of its profit among its staff members as incentives. The success of BKK has encouraged the establishment of KUPEDES, a specialised credit programme for the rural poor, under the Bank Rakyat of Indonesia. This programme had the advantage of learning from BKK and has managed to reach 1.4 million rural people in a period of five years with repayment record over 95 percent in 1989.

Factors contributing to the success of BKK and which were replicated to KUPEDES are:

- targeting at the poor including the poorest;
- charging interest rate that covers transactions cost to ensure financial sustainability;
- assurance of bigger subsequent loan upon complete repayment of the previous one;
- frequent and small repayments;
- providing the loan in cash;
- lending for a wide range of borrower-selected, fast turnover and mostly non-agricultural income generating activities;
- absence of provision in other support services like extension, training, market information, etc., which tend to raise transaction costs;
- no collateral.

However, the shortcomings observed in the programme is that BKK is lending on an individual basis and consequently the loan recovery performance is not high as compared to other credit programmes.

7. Suggested Approaches and Policies for Alleviation of Poverty of the Informal Sector Through Credit in Ethiopia

A review of poverty-oriented development credit programmes of domestic and some selected countries has indicated that their success are influenced by their policy objectives and the accompanying policy instruments. These are:

- effective targeting
- an appropriate credit policy
- promotion of savings mobilisation
- establishing an appropriate programme or a financial institution for the poor
- appropriate credit delivery system
- effective control and supervision

In light of the experiences of poverty-oriented credit programmes reviewed in this paper, one could draw lessons and develop an appropriate credit model for poverty alleviation. A suitable credit policy and an appropriate delivery mechanism may alleviate poverty by making easy access to formal credit. The design of a credit policy in the Ethiopian context must consider the following:

7.1 Creating or Strengthening Self-Sustaining Specialised Institutions for the Poor

To improve the poor's accessible to credit the following options must be considered.

- a. Creation of specialised credit programme with in the existing banks: Poverty-oriented programmes could be executed by the existing financial institutions. The conventional banking procedures may not fit the poor as they are designed for the better-off class of society. For this reason, parallel poverty-oriented development programmes focusing on the poor outside the conventional credit services should be developed. DBE's and BKK's programmes on the poor could be cited as examples. Such credit services through the existing banks have an advantage over others in cost

minimisation for they have already well established branch networks, trained manpower and other facilities.

- b. Creation of a new poverty-oriented specialised financial and promotional institution: This would be possible only if the lending interest rates are allowed to sufficiently cover costs of operation of the institution to maintain its sustainability.
- c. Creation of intermediaries: Intermediaries like NGOs and self-help groups could be created to link the informal sector beneficiaries with formal lending institutions. The bank administers the credit using the intermediaries for minimising the transaction costs associated with lending to the poor. On the other hand, the intermediary will have sufficient familiarity with the borrowers at grass-roots level that could enable them to control and supervise the credit efficiently more than the Bank's personnel.

7.2 Develop an Appropriate Credit Delivery Mechanism

- a. Targeting: Setting eligibility criteria for poor clients to ensure that only the poor can participate in the programme.
- b. Individual or group credit approach: An appropriate choice of credit delivery system whether an individual or group approach should be determined. Both types have their own strengths and weaknesses. In the group approach, experiences have shown that repayment of loan is excellent and savings mobilisations through group is enhanced. On the other hand, the individual lendings approach enables to minimise segregation of poor individual who might not be allowed to join by group members. Cost of organising and promoting of groups could be reduced. However, the default rate is high in some programmes but BKK has experienced high loan recovery rate as compared to many programmes.
- c. Choice of minimalist or credit-plus approach: The minimalist credit approach confines its activities only to provision of credit services. It doesn't involve in the provision of promotional and technical support services to clients. The merits of such approach, it is claimed, is that it minimises the burden of organisation and costs.

The credit-plus approach is involved in both credit and promotional aspects. The merits claimed for such approach is high loan recovery and lesser loan

losses. However, the choice of approach depends on the advantages of minimising costs in providing additional support services. That is, the weight against reduction in transaction costs on loans and the incidence of loan defaults and losses resulting from poor loan recovery performances.

- d. Incentive and penalty system: Provision of incentives for timely repayment of loans and penalty for delays. Incentive for staff involved in the credit programme is also believed to enhance efficiency and its effectiveness.

7.3 Develop an Appropriate Credit Policy

- a. Linking credit with savings: Credit without savings may not be effective. Savings are essential to economic growth, help poor people accumulate assets, provide capital for financial institutions and can also substitute collateral for poor borrowers. All successful credit programmes for the poor have been designed to promote savings using various instruments. Savings and credit ratio of self-help groups in Indonesia, Thailand, Philippines and India are in the range of 1:4 to 1:2 (Kropp, 1992:20).
- b. Financing productive business and income-generating activities: Formal credit could be only for income-generating activities enabling the borrower to earn income to cover costs of his daily needs and to repay back the loan from the proceeds.
- c. Charging interest rate to cover costs: The lending interest rate should be able to cover administration costs. The costs involved in promotion, are quite substantial and it might be difficult to build into the lending interest rate. The question is: who could bear these costs and for how long? Can the Bank finance these costs by charging market rates of interest or even rates greater than the market like the Bank Rakyat Indonesia (BRI) which charges 30-60 percent or Bancosol in Bolivia an average interest rate of 54 percent which is about 20 percent higher than those of commercial market interest rates (Thillairafah:81). The other alternatives are, can costs be covered by interest subsidy or can a donor be found who is able to cover the costs through a technical assistance or grant? All these questions have to be answered before starting the credit programme. All are possible as far as there is understanding among the implementing institutions and borrowers in advance.

d. Reducing risks: Develop complementary risk reduction mechanisms. This could either be through design of savings instruments and insurance coverage against risk or through bigger subsequent loans to borrowers. Many successful credit programmes for the poor adopted the following which could serve as lessons for Ethiopia:

- Life/health insurance
- Credit insurance
- Mutual funds
- Deposit insurance

Successful programmes have reduced risks by starting with small loans to individuals and increasing subsequently as borrowers establish a strong repayment record.

7.4 Policy Measures at Macro-Level

Emphasis should be exerted towards poverty alleviation of the poor in the informal sector. A conducive environment under which lending to the poor becomes attractive must be created. This includes:

- provision of an appropriate legislative support for informal sector lending;
- ensuring legal guarantee through registration;
- provision of selective guarantee fund for lending institutions against loan defaults.

7.5 Creating a Favourable Working Atmosphere for NGOS

The participation of NGOs in poverty-oriented development programmes should be encouraged. The assistance of NGOs could be through donation of fund for start-up of relevant institutions helping the poor in the informal sector or they may provide a revolving fund to be utilised by the poor through bank loan administration specialised in this activity. NGOs can assist in providing the necessary promotional and technical services to the poor to make them viable and creditworthy.

7.6 Effective Control and Supervision

Strict and timely follow-up and supervision by the staff of the institution responsible for promotion and lending must be practiced. Attendance of the staff member at their weekly or monthly meetings is a must.

8. Conclusions

The only productive resource many of the poor in the informal sector possess is their labour. To a large extent, many of them are underemployed or employed in activities with low return or are unprofitable.

These people can be more productive by use of their labour through credit by allowing them access to income producing assets. Credit can promote the productive capabilities of the informal sector poor and enable them to satisfy better their needs through participation in their own activities. In the process of carrying out their business, they will be able to progressively increase their income, savings and investments through self-employment and thus cross the poverty line over time.

However, extending credit alone will not reduce poverty and improve productivity and income. To be effective, credit programmes for the poor in the informal sector must be backed up by the availability of secure work-place and markets for their products and services.

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Credit to Poor Households: The Case of Financing Micro-enterprises in the Debre Berhan Town, North Shoa, Ethiopia

Solomon Damte

1. Introduction

Despite pledges to improve the standard of living poverty continues to afflict large sections of the populations of developing countries. All indications are that the prospects of alleviating poverty in these countries in the immediate future do not seem bright.

As in most developing countries, the bulk of the poor in Ethiopia live in rural areas. Urban poverty has also been on the rise. In attempts to pull households from poverty it is believed that provision of credits, particularly to poor urban households, could play an important role. If such households have capital to start or expand small business, they can create additional self-employment almost immediately and experience vital increases in income.

Poor households pursuing micro-enterprises are denied access to institutional credit due to the high collateral and antiquated lending practices of the formal banks. An alternative and innovative approach to provide credit to the poor has been designed and successfully tried in many developing countries. The new approach, the best example of which is the Grameen Bank of Bangladesh, focuses its credit schemes on poor households, especially poor women, and offers credit on the basis of group collateral. This approach was introduced in Ethiopia in 1993 under the Market Towns Development Programme. The main targets of the scheme are the bottom poor living in the urban centres who are engaged in or wish to pursue micro-activities. The scheme was launched in 16 selected urban centres, one of which is the town of Debre Berhan.

The main purpose of this study is to evaluate the Market Towns Development Programme with a particular reference to the Debre Berhan project. The specific objectives are to: (a) assess the impact of the scheme on economic conditions of borrowers; (b) analyse the performance of loan repayment under

group liability of borrowers; and (c) examine the implications of financing micro-enterprises for banking institutions in Ethiopia.

The principal source of data is a sample survey consisting of 65 beneficiaries of the scheme in Debre Berhan. Secondary data, mainly from the Development Bank of Ethiopia (DBE), Debre Berhan Branch office are also incorporated.

The rest of the paper is organised as follows. Section 2 presents an overview of the literature. Section 3 deals with operational modalities of the scheme in the study area. Evaluation of the scheme is discussed in Section 4. Section 5 focuses on the major issues identified in the overall assessment of the scheme. Section 6 is devoted to conclusions and policy implications.

2. An Overview of Available Literature

Lack of finance is among the main obstacles facing poor households who run or wish to pursue small businesses on a part-time or full-time basis. One way of overcoming this problem is to go for credit. However, access to institutional as well as non-institutional credit is extremely limited for the majority of these households. Below we will present a brief review of how the different financial sectors in developing countries operate in terms of extending credit to low-income households.

2.1 The Formal Financial Sector

The formal banking services in many developing countries are largely urban-based. Formal financial institutions do not deliver credit as and when needed without elaborate paper work, bureaucratic lending procedures, and stringent collateral requirements. They also operate at high transaction costs. Consequently, the contribution of these banking institutions to the national economic development has remained grossly inadequate.

In many developing countries, commercial banks often accumulate excess liquidity while latent demand for credit by small borrowers remains unsatisfied. It was also noted that "the commercial banks in many African countries prefer to deploy excess liquidity in treasury bills and government bonds where risks are marginal" (Abebe Adera, 1995). The activities of these banks are heavily

concentrated in the hands of a few beneficiaries of the relatively well-to-do. They do not regard poor people as bankable, and this has impeded the emergence of vigorous entrepreneurship.

The record of the development banks has equally been disappointing. Development banks of many African countries finance the agricultural and industrial projects of state-owned enterprises at very high operating costs and low loan recovery. They have not yet had an appreciable impact on small-scale enterprises. In many cases development banks have become retailers of foreign loans and government funds even though many were empowered to mobilise resources. The performance of specialised agricultural credit banks in many African countries has been disappointing; they all have been or are being considered for restructuring (Mittendorf and Kropp, 1991, cited in Abebe Adera, 1995).

In Ethiopia, the formal financial institutions that are actively involved in financial resource mobilisation and allocation are the Commercial Bank of Ethiopia (CBE) and the Development Bank of Ethiopia (DBE). The CBE is currently faced with problem of excess liquidity while conceivable demand for credit by poor households remains unsatisfied. The DBE has been directing the bulk of its loans to government-owned agricultural and industrial projects, state farms and state-created co-operatives. The operation of the DBE has been constrained by very low loan recovery and huge losses for the last two decades.

Both the CBE and DBE are characterised by high collateral requirements, elaborate paper work, and high transaction costs. For the most part, the banks serve big businessmen and do not regard poor households as bankable. Many, small credit-worthy businessmen, with their viable investment ventures, are denied access to institutional credit because they could not afford the required collateral.

Overall, the prevailing operation of the formal financial institutions in many low-income countries such as Ethiopia is inefficient in providing sustainable credit facilities to the poor. The broad spectrum of poor households in these countries regard banks as services created for the well-being of rich people. In fact, the rules and regulations of the formal financial institutions have created the myth that the poor are not creditworthy.

2.2 The Informal Financial Sector

Compared with the formal financial institutions, informal lending is by far the most important source of finance for the urban as well as the rural population. In recent years, the informal sector has continued to assume increased prominence mainly due to the excessive rules and regulations of the formal financial sector. The operations of the informal sector derive their rules and regulations from the country's culture and customs. Informal sector transactions are conducted on the basis of trust and intimate knowledge of customers. The common cultural background and the mutual obligations and fervent bonds of family and kinship, all operate to promote the trust, accountability and moral responsibility that is lacking in the official banking system.

Besides, informal lenders have easy access to local information (at reasonable cost) on their borrowers with whom they have social relations. This permits credit contracts to play a more direct role in enforcing repayment. Also, the fact that collateral is rarely used in the informal sector and that the sector is almost totally free from central bank and government controls enables it to flexibly satisfy financial needs that cannot be met by the formal financial institutions.

Nonetheless, the informal sector is not without limitations, despite its flexibility, rapidity and transparency of procedures. Not only is there scarcity of loanable funds for investment, but the interest rate charged on these loans is often exorbitant.

2.3 The New Approach

An alternative and innovative approach undertaken in some Asian countries has refuted the myth that the poor are not creditworthy. The Grameen Bank¹ of Bangladesh is one (and perhaps the best example) designed to offer institutional credit to the very poor so as to develop entrepreneurial activities and address rural poverty. The essential elements of Grameen Bank are: exclusive focus on poor households, priority for poor rural women, collective borrowers' responsibility or group/peer pressure for loan repayment, suitable loan conditions and procedures, individuals self-chosen loan activities, mutual

support through compulsory group savings, and individual savings to promote self-reliance.

The Bank is involved in organising borrowers into groups and centres (which serve as intermediaries for credit delivery to their members), training borrowers on how to use banking services and graduate and/or diversify their activities, making marketing arrangements (where possible), supervising the enterprises and facilitating loan collection activities (Rahman, 1986).

Evaluation studies of the Bank's activities have confirmed that borrowers have succeeded in raising their real income, asset ownership, using their idle hours for productive purposes (through generation of self-employment), and improving their living conditions in terms of food (calorie) intake, education, health and meeting social obligation (Yunus, 1988; Gibbons, 1991).

Among the countries that have adopted the Grameen Bank financial system are: Malaysia (Projek Ikhair), Indonesia (Kredit Kecamatan Programme), Nigeria (People's Bank of Nigeria), Thailand, India, Philippines and Burkina Faso (Gibbons, 1991; Abebe Adera, 1995). These ongoing efforts have also experienced a consistently high repayment record which can be taken as an indication that the very poor have benefited from the group-lending scheme.

In general, the new banking system has been able to meet the objective of serving the poor and is proving to become self-sustaining. The key to the success of such banks lies on their efficient credit delivery mechanisms, no loan security requirements and unbureaucratic lending procedures.

The new credit system (designed along the Grameen Bank) was introduced in Ethiopia in 1993 under Market Towns Development Project. The project is financed by the World Bank. The prime objective of the programme is to provide credit assistance to the poor for the purpose of improving their economic condition and creating opportunities for self-employment. The pilot scheme was first launched in two small urban centres, Debre Berhan and Ambo, then expanded to other 14 towns². In the course of implementing the scheme, eight additional urban centres were included.

3. Operational Modalities of the Scheme in the Study Area

3.1 Brief Description of the Study Area

Debre Berhan town is located 130km north of Addis Ababa on the main road from Addis to Asmara. The town is a centre of social, political, economic and administrative activities of Northern Shoa Administrative Zone. According to the CSA estimate of 1984, the population size of the town was 25, 650 while local officials estimate the current population at about 75,000.

Economic activities in the town include: trade, hotel services, medium- and small-scale industries, livestock husbandry, handicrafts and other household income-generating activities. There is one government-owned sheep-rearing station in the town. Small-scale dairy is pursued by many of the inhabitants in the town as a side-line income-generating activity. Among the medium- and small-scale industrial activities are the Debre Berhan Wool Factory (a prominent blanket factory in the country), stone crushing plant, bakeries, and grain mills. A large number of dwellers in the town are engaged in handicrafts activities such as weaving, hides and skin processing, *bana* and carpet making and metal works.

3.2 Group Formation

Individuals who want to benefit from the project are required to form a group of their own choosing. Members of a group often have similar social and economic status, live in the same village or locality and perform similar activities. Each group consists of five members and 4-6 groups form a centre or micro-enterprise. Each micro-enterprise elects a committee of three members: a chairman, a vice-chairman and a secretary.

Nearly all the activities of the scheme, including organising borrowers into groups and centres, conducting feasibility assessments, giving legal entity to the micro-enterprises and supervising and facilitating loan repayments are carried out by the Northern Shoa Industry and Handicrafts Department (NSIHD). The role of the DBE branch at Debre Berhan is limited to loan disbursement and receiving repayment collected through the NSIHD. The NSIHD, once it makes sure that the process of group formation is complete, gives legal entity to

each micro-enterprise. This entitles the enterprises to receive credit from the Bank.

3.3 Target Beneficiaries and Activities Financed

The main targets of the scheme are the extremely poor living in the town and engaged in or wish to pursue micro-activities. A total of 574 beneficiaries are covered by the scheme. Of these, women borrowers comprise by far the majority (90 percent) while men account for the remaining 10 percent. For most of the beneficiaries, it was not their first time to join associations. Many were members of informal financial institutions (*iqub*, *idir* and *mehaber*).

The scheme incorporates various micro-enterprise activities including: petty trading, weaving, tailoring, carpet making, traditional jewellery, pottery, knitting, hides and skin tanning, *injera* and bread making. Food processing and spices preparation, brewing and distilling local drinks (e.g. *tela*, *araki*), small-scale dairy, sheep and cattle fattening, vegetable production, shoe making and repairing, wood work, carpentry and hair-dressing. Almost all micro-enterprises in the selected towns are owned and operated by the head of the household (of which female-headed households constitute the majority) and involve other family members as workers. On certain occasions non-family members are employed.

In the study area, the micro-enterprises financed are mainly food and drinks preparation and handicrafts. Borrowers carry out the activities within their home. Each borrower has financed the start-up of his/her small enterprise from personal savings or those of close relatives. The loan is mainly targeted to meet the working capital requirements of these activities.

The sectoral distribution of loans shows that disbursement is highly concentrated to a single activity, *araki* preparation. As indicated in Table 1, of the total loan amount of Birr 344,540 about 74 percent is allotted to *araki* preparation. *Injera* and bread making and butter and cheese preparation, ranking second and third, constitute 9.74 percent 7.84 percent of the total loan amount, respectively. The amount of loan granted to the re-emerging nine activities is only about 8 percent of the total (Table 1).

Table 1: Type of activity and beneficiaries

Type of activity	Amount of loan (Birr)	Percent	Number of beneficiaries			Percent
			Male	Female	Total	
Araki preparation	254,260	73.80	-	445	445	77.5
Butter & cheese preparation	27,000	7.84	25	5	30	5.6
Weaving	13,100	3.80	20	-	20	3.5
Injera & bread preparation	33,550	9.74	-	53	53	9.2
Other	25,630	4.82	12	14	26	4.7
Total	353,540	100	57(10)	517(90)	574	100

Note: Figures in parentheses are percentages.

Source: Development Bank of Ethiopia (DBE), Debre Berhan Branch.

3.4 Terms and Conditions of Loan

The loans are extended to self-chosen income-generating activities under special terms and conditions. Borrowers are not required to bring collateral in the form of tangible assets. Instead, social collateral, i.e. joint liability of borrowers and group/peer pressure, is taken as a means to secure the loan. Compulsory group saving to make loan repayment sustainable is also one necessary condition for disbursement. Each borrower is obliged to keep 10 percent of the loan amount in his/her enterprise's bank account. The maximum ceiling of loan amount that an individual can borrow was initially set at Birr 1,000 but, after one year of implementation of the project, it was raised to Birr 5,000 each. Loan repayment schedule was first decided to be weekly then changed to a bi-weekly arrangement. The loan is a short-term one year (12 months), with a two month grace period. Interest rate was initially set at 13 percent, increased to 14 percent (September 1994) and to 15 percent (December, 1994).

4. Evaluation of Performance

4.1 Response of Beneficiaries to the Terms and Conditions of the Loan

The bulk (83 percent) of the sample cases claimed that the loan amount (maximum Birr 1,000) is small. Borrowers' response on the bi-weekly repayment schedule varies largely depending on the nature of marketing of their

output. Sampled borrowers engaged in activities such as the sale of *araki* (69 percent) are satisfied with the bi-weekly arrangement. About 25 percent of the cases demanded for a monthly repayment and this group refers to those running activities with relatively longer period of production process (e.g. small-scale dairy). The rest (6 percent) preferred a weekly arrangement. Activities with daily sales (e.g. *injera*) belong to this group (Table 2).

For 91 percent of the sampled cases the interest rate is reasonable compared with the rate charged by the money-lenders (Table 2). This result is consistent with the universal consensus that borrowers attach more importance to the availability of credit rather than its cost, and hence demand for credit is insensitive to the cost of credit. Many of the beneficiaries had been borrowing from the informal financial sector at exorbitant interest charges ranging from 120 percent to 720 percent per annum.

Table 2: Response of borrowers to questions on loan amount, repayment schedule, rate of interest, *iqub* Vs bank service and future plans

Response	No. of borrowers (N=65)	Percentage
Loan Amount		
- high	-	0.0
- low	54	83.0
- satisfactory	11	17.0
Repayment Schedule		
- weekly	4	6.0
- bi-weekly	45	69.0
- monthly	16	25.0
Interest Rate		
- high	6	9.0
- low	19	29.0
- satisfactory	40	62.0
Future Plans		
- diversify	26	40.0
- expand existing activity	22	34.0
- shift to other activity	17	26.0
<i>Iqub</i> Vs. Bank Service		
- <i>iqub</i>	65	100.0
- bank		

Source: Own survey.

About 40 percent of the sample borrowers have plans to diversify their income sources, while about one-third (34 percent) want to expand existing activities. For many, lack of capital is the prime impeding factor to diversify and/or expand their income sources. The rest (26 percent) said that they will shift to other activities. The bulk of this group are those engaged in *araki* preparation, an activity whose production is laborious and hazardous to health and having a relatively reliable market.

With regard to preference between joining an *iqub* and taking bank loan to start a new business or expand an existing one, all the sampled borrowers favoured bank loan (Table 2). The possibility of liquidation and need for a personal guarantee (which many fail to offer) were stressed as the major drawbacks of *iqub*.

A particularly interesting case regarding this issue is that of Ato Haile (not his real name). Haile, 45, married and head of a family of 10 members, has borrowed Birr 1,000 to expand his small-scale dairy project. His main activity is preparation and sales of butter and cheese. He needed the loan to buy heifers and has utilised the loan accordingly.

Before the loan, he had joined no less than half a dozen *iqubs*. Haile's main objective for joining an *iqub* was to expand and/or diversify his income sources. However, he has never been able to realise his objectives. When asked about the reason for his failure, Haile responded: "The moment/day I won the lot in the *iqub*, I spent a considerable amount of money on 'Yedesdes' (a sort of generous invitation by an *iqub* winner for fellow members to express his happiness). Besides, my wife and children expect me to buy new cloths and expensive food and other consumption items and I spent a certain proportion for this purpose. In addition, since winning an *iqub* cannot be kept secret, neighbours, friends and relatives come over asking for loans. These are social obligations that I must respect. As a result, I am left with no money to attain my initial objective of buying heifers."

Haile explained that bank loan is often kept secret and is not subject to such obligations. Many poor households consider the money they get from *iqub* as a windfall income. Also, joining an *iqub* is viewed by the society as prestigious, while visiting a bank for loan is taken to imply that the person is in weak financial position.

4.2 Loan Recovery

The success of a credit operation depends on the rate of recovery. Out of Birr 346,940 disbursed during the one-year period of operation of the project, Birr 322,374.85 (93 percent) was recovered leaving an outstanding balance of Birr 24,565.15. It was evidenced that, out of the 22 micro-enterprises, 12 have fully repaid their loans with the interest before the scheduled maturity date. Some settled their debts 3-4 months in advance. The repayment rate of the micro-enterprises ranged from 78 percent to 100 percent.

Overall, the average recovery rate of the micro-enterprises is 93 percent. This rate is quite remarkable even when compared with the experience of the Malaysian Projek Ikatiar (78 percent), Nigeria (86 percent), India (90-95 percent) and the Grameen Bank (98 percent) (Gibbons and Kasim, 1993). Borrowers' eagerness to take the higher loan on the second round, and the peer pressure are among the main reasons behind this good repayment performance.

More importantly, the experience at Debre Berhan has shown that the poor have a better repayment record than the relatively wealthier individual borrowers. Out of the total individual loan amount that matured as at June 30, 1995, only 35 percent was recovered.

4.3 Impact on Income

The prime objective of the scheme is to improve income levels and create employment opportunities for the target group. During the 12 months operation of the scheme, the income of the significant proportion of the borrowers increased substantially. Preliminary impact evaluation of the randomly taken 65 borrowers show that about half (49 percent) of the sample households have experienced an increase in income levels due to the loan. Among the main reasons for the rise in income levels are: (i) the loan enabled a revival of an activity that used to be performed previously; (ii) it enabled to expand and/or diversify income sources; and (iii) it was secured at relatively low interest rate. Previously borrowers used to rely on informal lenders which charge exorbitant interest rates.

For about 32 percent of the sample cases there is no change in income levels. The remaining (19 percent) experienced a decline in income mainly due to a rise

in cost of production. Furthermore, virtually for all the sample borrowers, delays in the delivery of the loan adversely affected their operations. Most complained that they get the loan at times when input prices, especially those of grain, were relatively high.

An interesting case of a successful borrower in terms increasing income is Mrs. Belaynesh aged 48, married and mother of six children. Before the loan, she operated her business of *injera* making by taking credit from informal money-lenders (wholesale grain traders). She used to borrow at a very high interest rate from a grain trader and had no chance to choose the quality of *teff* she bought. Besides, she often mortgaged her jewellery with a condition that, if she failed to repay on time, the jewellery would not be returned.

She used to repay Birr 250 to the grain trader per week for a quintal of *teff* with an average market price of Birr 220. This means a 13.6 percent interest charge per week, 54.4 percent month or 652.8 percent per annum. She had been producing 1,800 pieces of *injera* utilising 3 quintals of *teff* per month. One piece of *injera* costs Birr 0.60. She had been getting a gross income of Birr 1,080 per month. Birr 750 goes to the trader to cover the cost of *teff* (Birr 660) with the interest (Birr 90). After deducting Birr 100 for fuel and other costs she was left with a net profit of Birr 230. For a family of eight members with no other source of income, this amount hardly covers basic consumption requirements.

After she borrowed Birr 1,000.00 at an interest rate of 15 percent per annum or 1.25 percent per month from the scheme, Belaynesh expanded her activity and started to produce 2,400 pieces of *injera* utilising 4 quintals of *teff*. With no significant change in average prices of *teff*, *injera* and fuel wood, she earns a gross income of Birr 1,440.00. After deducting all costs including a Birr 12.50 monthly interest charge and Birr 130.00 for the cost of fuel wood, her net monthly income has increased to Birr 417.50. Belaynesh is now in a better position to meet not only basic consumption needs but also the costs of schooling, health and other social services³.

5. Major Issues Identified in Financing Micro-Enterprises

- i. **Credit delivery mechanism:** Delivery mechanisms are as important as financial policies for a successful credit programme to the poor. The

current handling of financing micro-enterprises by fragmented functional government organisations (DBE and NSHID) seems inappropriate. Specifically, giving the greater part of the financing process (organising borrowers, conducting feasibility assessments, monitoring loan utilisation and collecting loans) to the NSIHD, an organisation alien to banking operations, is improper. The moderately good achievements of the scheme, with the prevailing institutional set-up, could be mainly ascribed to its limited coverage in terms of number of borrowers. Thus, without major modification of the credit delivery system, the scheme is unlikely to be sustainable and render adequate banking services to the poor.

- ii. Training: Many of the beneficiaries have had no formal schooling and can barely read and write. They can't understand complicated loan application forms and procedures. Educating borrowers on how to promote, expand and/or diversify their income sources is important. On the other hand, the NSHID has no adequate and skilled manpower. In addition, the available manpower lacks information regarding the objectives and implementation processes of the scheme. Due to these problems regular centre meetings⁴ are not properly conducted.
- iii. Default: There is no special procedure in case borrowers fail to pay back the loans. The fairly good repayment record is partly achieved through legal enforcement and strong supervision and follow-up by the NSIHD staff. The office has insisted on taking borrowers in arrears to the court so as to force them repay their loans. This, though induced some to reduce arrears, has imposed more burden on borrowers. Further, in reorganising borrowers for the second round, the office has made the ownership of some valuable assets a condition for credit eligibility. This is inconsistent with the main objective of the scheme, i.e. giving priority to the assetless, the extremely poor. Defaulters usually had misused all, or a substantial part of the loan to settle other pressing debts and/or for consumption. As a result, they were not receiving much, if any, additional income and this made repayment difficult.

Overall, a number of factors have contributed for the default problem. These include risks associated with the activities themselves, poor project design and management, lack of discipline among some borrowers, inadequate loan utilisation checks by the NSIHD, and the absence of regular centre meetings. For instance, the experiences of some countries (e.g. Bangladesh, Malaysia) suggest that poor attendance at centre meetings

was an 'early indicator' of subsequent repayment problems. This, coupled with limited understanding of the purpose of the scheme by field agents, led the office to make serious mistakes.

- iv. Investment capital: The low productivity of micro-enterprises can often be ascribed to lack of capital. Survey results reveal that borrowers have all the motivation, the time and labour except the capital to expand and/or diversify their income sources. Nearly three-fourth (74 percent) of the sample cases were unable to diversify and/or expand their activities due to shortage of investment capital (see Table 2). For most of the beneficiaries, the amount of loan obtained was not sufficient even to meet the required working capital, which constitutes the bulk of the total investment cost of many micro-projects.
- v. Technology: Most of the micro-enterprises are being carried out using traditional means of production. The tools and implements used are very primitive and need frequent repair, maintenance or replacement. Borrowers do not have the capital and the knowledge to renovate these tools and implements. As a result, many of the activities are highly cumbersome, time-consuming and in some instances hazardous to health. For example, those engaged in *araki* preparation, *injera* making and metal works often use fuelwood as a power source, primitive tools and implements and improper production practices. This has made the production process costly in terms of labour requirements, leading to low productivity.
- vi. Infrastructure: Inadequate infrastructure is also one of the major deterring elements in the effort to expand and/or diversify micro-enterprises. Marketing services regarding the timely information on prices, quantity and quality of their produce is lacking. Very poor road network and meagre transport facilities have limited market outlets and made it difficult to purchase, transport and use input and output products.

There is little that credit can, on its own, do to assist poor households to uplift their living conditions. This point was succinctly described by Bouman (1977) and was echoed by Abebe Adera as follows:

The mere provision of finance without prior removal of the structural impediments that influence its outcome is like 'using a straw for a

battering ram. The gate will not yield, but the straw gets broken' (Bouman, 1977: 202; Abebe Adera, 1994: 18).

- vii. Policy issues: So far no economic policy has been issued in favour of small and micro-entrepreneurs. Major government controls over business and commerce still persist, limiting small businessmen in taking their produce to either terminal or local/district markets. Sampled borrowers engaged in *araki* preparation, for instance, informed us that transporting their product to other market places was hampered by the local government taxes which ranged between Birr 3.00 and Birr 5.00 at a *kella* (check-point) for 20 litres of *araki*. The charge constitutes a considerable share of the net earning from such micro-activities.

6. Conclusions and Policy Implications

In Ethiopia, poor households engaged in small-scale but legitimate and viable investment ventures are denied access to institutional credit due to the high collateral and antiquated lending procedures of the formal banks. This has forced many to 'seek refuge' in the informal financial sector.

In order to address this major concern, a new view of providing adequate financial and promotional services to the poor, successfully tried in some Asian countries, was introduced in Ethiopia (1993) under the Market Towns Development Programme. The pilot phase was first launched in 16 selected small urban centres. This study, conducted in one of the selected urban centres, has demonstrated the possibility of reduction of poverty under such schemes. The scheme has succeeded in improving the income and asset ownership of the beneficiaries. It has created self-employment opportunities and built-up borrowers' confidence to help themselves. Also, a remarkable loan repayment performance of 93 percent was recorded.

Despite this impressive performance, however, the current handling of financing micro-enterprises by fragmented functional government organisations (DBE and NSHID) seems inappropriate. Specifically, giving the greater part of the financing process (organising borrowers, conducting feasibility assessments, monitoring loan utilisation and collecting loans) to the NSIHD, an organisation alien to banking operations, is improper. The expansion of the scheme into

additional urban centres will magnify the problem of coordination and monitoring. Thus, an efficient delivery mechanism should be devised to provide adequate, sustainable support services to micro-enterprises.

Equally vital is an in-depth understanding by the concerned institutions of the target group (their living conditions, income sources and the constraints they face) as well as the scheme and its implementation processes. Training and technical assistance for both bank staff and borrowers can be immensely helpful. Training to beneficiaries include: new and improved technical skills applicable to particular goods and services, management skills covering business planning and record-keeping, sales methods, knowledge of government services and regulations and the use of credit. Field agents' training should orient them towards the needs and priorities of smallholders and enhance their ability to communicate with beneficiaries.

The evidences with regard to default seem to suggest that many borrowers with repayment problems deserve a second chance, especially those borrowers who had lost their capital largely through no fault of their own. However, any measure to assist borrowers with arrears (such as additional loans, rescheduling repayment, etc.), unless taken with great caution, could further aggravate the repayment problem. Motivating defaulters to pay what they could and qualifying them for supplementary loans through close supervision could help more in the effort to address the default problem.

A more effective loan-recovery strategy should be evolved. Survey results suggest that care should be taken to ensure that borrowers are not induced to promise making repayments which they cannot keep. The use of flexible schemes for repayment should be employed. Repayment schedule should correspond to the speed of income generation. It is expedient to recover loans at frequent intervals from the relatively quicker income-generating activities, compared with the slower ones. Interest rebates for timely repayment and a penalty on overdue loans may also be considered to improve loan recovery. The two successful Indonesian financial institutions, for instance, offer a monthly interest rebate of 0.5 percent (Unit Desa) and 1 percent (Badan Kredit) of the original loan value as an incentive for prompt repayment (Yaron, 1994).

The adequacy and timing of loan delivery is crucial to enable borrowers make the best use of their productive capacity. While loans should not be so small so

as to be ineffective, amounts in excess of requirements are counter-productive because they may lead to waste and default.

Loan use also entails careful assessment of the modes of credit delivery, in cash or in kind. Loans in kind can be effective in ensuring that funds are not diverted to other uses. In the case of loans for equipment or other assets, the credit institution may liaise with importers or producers and arrange delivery. On the other hand, where the loan is for working capital and there are multiple channels of input supply, borrowers can receive credit in cash and choose their own source of supply.

Nonetheless, there is little that finance can, on its own, do to assist poor household to uplift their living conditions. Access to credit cannot compensate for inadequate non-financial infrastructure. Credit should be accompanied by adequate non-financial infrastructure and coordinated complementary services to make it more productive. The Government and any non-government organisation that is committed to combat the chronic poverty prevalent in the country should devote attention to the development of non-financial infrastructure. Consequently, the availability of market information and communication links with terminal and local/district markets, adequate transport facilities, improved technology, extension services including training, conducive price policies, input supply, storage facilities and removal of taxes at check-points (*kellas*) are vital if credit is to play its full role in reducing poverty.

NOTES

1. Grameen Bank had started as an action research project in 1976 and has become a formal bank in 1983. By March 1991, it had 854 branches serving 910, 842 (832, 782 of them women) borrowers in 21, 114 villages of Bangladesh. Group savings have reached 698 million taka (approximately US\$23 million). Currently, Grameen borrowers are the primary owners (holding over 75% of the shares) of the Bank (Yunus, 1988; Jazairy, Alamgir and Panuccio, 1992).
2. Asela, Zeway, Shashemane, Arsi Negele, Goba, Robi, Wolliso, Mizan Teferi, Woldia, Debre Tabor, Bahir Dar, Asebe Teferi, Bedele, Awassa and Arba Minch are the other towns covered by the project.
3. Belaynesh has more ideas/plans for the future. In the short run, by taking more loans, she wants to further expand the existing activity by replacing the traditional fuelwood baking stove with a modern one employing electric power. She also needs to prepare traditional

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bread (*ambasha*) as a side-line business. In the long run, when she gets economically strengthened, and if there is a conducive investment environment, she craves to establish a modern bakery project.

4. Regular centre meetings help to insure that funds are used quickly and for the purpose approved, that borrowers repay regularly the amount required and to strengthen group discipline and cooperation among members.

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Market Reform and Welfare in Ethiopia: Food-grain Prices, The Poor and the State

Bekele Sinkie

1. Introduction

Smallholder-dominated farming is a sector directly or indirectly providing livelihood for the majority of the Ethiopian population (e.g., 80% of total employment). It is also the major pool for the foreign exchange earnings of the nation. Despite its paramount role, however, it did not receive the required attention and was subjected to politically loaded policies, both direct (sector-specific) and indirect (economy-wide).

Contrary to the widely acknowledged importance of a relatively free marketing system in economic development, the food grain and export crop marketing sub-sectors in Ethiopia were severely affected by heavy-handed government intervention during 1974-91, in particular. During the pre-1974 period, weak state intervention in marketing obliged the system to wallow in constraints ranging from structural ones which are lent by nature to distorted prices caused mainly by scarcity of price information (see Bekele Sinkie, 1995). Since the mid-1970s, an important role in food-grain marketing was played by the state parastatal, the Agricultural Marketing Corporation (AMC). Established in 1976, AMC until 1978/79, obtained its grain procurement from peasant producers by competing with private traders in local markets. Afar 1979, however, AMC was assisted by policies which included control of private grain trade, quota assignments and low pan-territorial and pan-seasonal fixed prices. The implementation of these policies, at the regional and local levels adversely affected production, marketing and consumption (Alemayehu Lirenso, 1987).

In addition to these direct policies, indirect (macroeconomic) policies, such as those in the foreign exchange and financial markets, impinged considerable effect on the performance of the agricultural sector as a whole. Overvaluation of the birr through a fixed rate regime implicitly taxed agriculture. Credit policies that rendered privileged access to the public sector had also negative bearings on production, marketing and even consumption.

The severity of these problems, coupled with the global political environment, forced the then government to reform its (grain) market policies. The reform began with an upward price adjustment in January 1988 and was followed by a more comprehensive package in March 1990. The March 1990 reform announced that food-grain trade would be conducted on the basis of free-market pricing. It also abolished grain trade control and the quota system; AMC entered the free market and started operating as a state trade enterprise.

The Transitional Government of Ethiopia (TGE) also pursued the same policy stance as that of the March 1990 reform, especially reform in the grain-trade sub-sector. But it renamed AMC as the Ethiopian Grain Trading Enterprise (EGTE) in 1992. The Enterprise is given a textbook social and economic role of a marketing parastatal in a liberalised economy: protecting producers from depressed prices during glut (through flooring prices) and protecting consumers from price hikes during dearth (through ceiling prices) (see TGE, 1992:182). The TGE reform attempt seems to have two objectives: (i) altering the role of marketing parastatals and cooperatives; and (ii) increasing private sector participation in order to enhance the performance of the food-grain marketing system which includes both economic efficiency and other performance objectives (Scarborough and Kydd, 1992: 10).

Moreover, there are efforts to open up the economy by the TGE through loosening controls in the foreign exchange market (by devaluing the birr and through the auction), in the financial market (by giving easy access to private and public sectors to credit on market determined basis), in the industrial sector (by reducing protection) and so forth.

In light of the above discussion on the dynamics of the Ethiopian economy in general and the marketing sub-sector in particular, studies conducted on the functioning of the food-grain marketing system could be grouped into two: those in the pre- and those in the post-March 1990 reform periods. Before March 1990, the operation of the state parastatal and the performance of the food-grain marketing system has been studied through different approaches in several studies. These studies include: Alemayehu Lirenso (1987); Amare Getahun (1977); Befekadu Degefe and Tesfaye Tafese (1990); Cohen and Isaksson (1988); Estifanos Zeray (1984); Holmberge (1977); ICPE (1990); Merkie (1975); PSPI (1991); and Singh (1987). None of these studies has, however, tried to employ sound methodological framework that captures the combined effect of direct (sector-specific) and indirect (economy-wide) policies on the performance of the system.

Some of the studies conducted on the marketing system of the country after March 1990 are: Abebe Tefera (1992); Alemayehu Lirenso (1992,1994); Pickett (1991); Tewodros Feseha (1994); Dercon (1994); Wolday Amha (1992, 1994); Gezahegn Ayele and Metselal Abraha (1994); Bekele Sinkie (1995) and Bekele Sinkie and Mulat Demeke (1995). Nonetheless all these studies, except Bekele and Mulat (1995), in addition to the limitation of the studies conducted before 1990 cited above, focused either on the evaluation of the operation of the state prastatal and/or on assessing only the economic efficiency (i.e., technical, operational and allocative) objectives of market performance. This could mean that both the pre- and post-reform studies entirely neglected systematic treatment of other performance objectives of the marketing system: innovation, inter-sectoral resource transfers, equity, employment, food security and coordination efficiency (Scarborough and Kydd, 1992:10).

There are, therefore, several interesting and important questions that could be posed as research problems. This study focuses on two: (i) what is the welfare effect of the reform attempt? and (ii) what is the role of the state in influencing this effect? In the assessment of the welfare effect the study uses household level survey data and distinguishes between rural and urban households. The role of the state is investigated by examining how it affects the marketing channel based on a case study.

2. Methodology and Data

2.1 Method

The basic framework to be pursued in data analysis will be the Structure-Conduct-Performance (S-C-P) paradigm. Emphasis will be given to the welfare aspect of market performance. The Dethier (1989) model will be employed to estimate the impact of price-policy-related intervention on welfare. This could be outlined by dividing it into two main sections: treating the income effect of price intervention for rural and for urban households, respectively. In addition, the role of the state in ameliorating the distributional effect will be reviewed briefly by making use of the marketing channel.

2.1.1 Income effects for rural households

Price changes have an effect on the real income of rural households through their impact on volume of output and value added.

The nominal income of a typical farm household in income group k (Y_k) may be defined as:

$$Y_k = (\sum_i VA_i Q_i) + (VAQ)^{OA} + W_F L_F + W_{NF} L_{NF} + rK \quad (1)$$

where $\sum_i VA_i Q_i$ is income (value added) from crop production; $(VAQ)^{OA}$ is income (value added) from other agricultural (OA) activities; $W_F L_F$ is wage income from on-farm employment; $W_{NF} L_{NF}$ is wage income from non-farm employment; and rK is income from productive assets.

The real income of the same household in group k can then be written as:

$$Y_k = Y_k / CPI_k \quad (2)$$

where CPI_k is an income group-specific price deflator.

Given the above, for a typical household, the effect on real farm (R) income of direct price intervention (y_D) is given by:

$$y_D = (y - y') / y' \quad (3)$$

and the effect on real farm income of the total intervention (y_T) is given by:

$$y_T = (y - y^*) / y^* \quad (4)$$

where $y'(y^*)$ is real income without direct (total) intervention. And, $y' = Y' / CPI_R'$ and $y^* = Y^* / CPI_R^{*2}$

Landless rural households derive their income mainly from wage labour. Their nominal income therefore is not affected by price intervention at a given point in time, and the only change in real income that would result from changes in price policy comes from changes in the price deflator (CPI_R = rural consumer price index). So, for landless households, one has:

$$Y_D = (CPI_R' / CPI_R) - 1 \quad (5)$$

$$Y_T = (CPI_R^* / CPI_R) - 1 \quad (6)$$

2.1.2 Income-effects for urban households

Real income of urban households is affected by agricultural price intervention in the short-run through changes in their Consumer Price Index (CPI_U). Hence, the direct effect (Y_D) and the total effect (Y_T) of intervention can be computed as:

$$Y_D = (CPI_U' / CPI_U) - 1 \quad (7)$$

$$Y_T = (CPI^*_U / CPI_U) - 1 \quad (8)$$

where CPI_U is an urban consumer price index at prevailing prices; CPI_U' is an urban consumer price index correcting for the effect of direct price intervention on agricultural commodities; and CPI^*_U is an urban consumer price index correcting for the effect of total price intervention.

2.1.3 The state and price stabilization

Here attempt is made to evaluate whether the state is meeting its stated price stabilisation objectives or not, given the results to be obtained following the above method. This involves reviewing the activity of the state enterprise, EGTE, in the marketing channel.

2.2 Data

The preliminary results of Rural Household Survey carried out by the Departments of Economics of the Addis Ababa University and the Centre for the Study of African Economies of Oxford University, the EGTE, the Ministry of Planning and Economic Development (MOPED), and the Central Statistical Authority (CSA) are the major sources of data on household economic variables, producers' prices, the Consumer Price Index (CPI) (both rural and urban, the latter proxied by the Addis Ababa CPI) and other related variables. The estimate of the degree of direct and indirect price policy related interventions are from Bekele and Mulat (1995).

3. Income Effects of Agricultural Pricing Policies and the State

Three issues will be dealt with under this topic. The discussion on the degree of the effects of policy on real income of rural households will be presented first. This encompasses both farm-owners and the landless. This will be followed by similar discussions on the effects on the income of the urban households. The third issue will be the role of the state in ameliorating these effects.

Data on producers' prices could not be obtained for the period before 1980. Hence, this study is limited to the 15-years period from 1980 up to 1994. To allow for a proper understanding of the income effects of the different policies pursued in the country, the entire period was divided into three sub-periods. These are: 1980-88, 1989-91, and 1992-94.

The first and the second sub-periods fall entirely in the Mengistu regime. The difference between the two, however, is that during 1980-88, there was tight state control in the food-grain trade. Where as the 1989-91 sub-period exhibited price relaxation including the January 1988 upward adjustment of procurement prices and the March 1990 economic reform that announced liberalised grain trade. The last (1992-94) is the period of transition whereby the state attempted to open up the whole economy.

3.1 Income Effects

3.1.1 The rural land holding households

Price intervention had a depressive impact on real income of farmers almost throughout the period under consideration. The exception is the period 1989-91 where the Mengistu Government attempted to adjust upwards its low and fixed pan-seasonal and pan-territorial procurement prices.⁴ The results presented in Table 1, Columns 2 and 3, indicated that there was a strong bias against agriculture implicit in the price policies of the Government toward the producers of major food crops.

The general conclusion of a bias against agriculture must be qualified by reviewing the limitations of the approach pursued in this study. First, the results include only the effects of policies related to grain prices. Crops such as vegetables and fruits for which there are no price controls for producers, would have reduced total producers' losses if they have been included. Nor are such

counteract the effect on crops that had no state intervention included.

A second limitation of the data is that, in computing the effects of removing price intervention on real incomes, no allowance has been made for changes in wage income resulting from the changes in derived demand for labour consequent upon the output changes engendered by the non-interventionist price policy. No allowance has been made either, in computing cumulative effects, for income changes resulting from a reallocation of factors that are fixed in the short-run but mobile over longer periods. In other words, the endogenous changes in the other components of income in equation (1) resulting from price changes have not been taken into account.

Table 1: Effect of agricultural pricing policies on real incomes of rural landholding (col. 2&3) and landless (col. 4&5) and urban (col. 6&7) households—short-run, 1980-94

Year	Farmer		Landless		Urban	
	y_D	y_T	y_D	y_T	y_D	y_T
80	-0.25	-0.35	0.0025	0.11	0.0011	0.11
81	-0.07	-0.22	0.0005	0.11	0.0002	0.11
82	-0.22	-0.35	0.0018	0.15	0.0008	0.15
83	-0.16	-0.31	0.0013	0.19	0.0006	0.18
84	-0.20	-0.35	0.0019	0.18	0.0009	0.18
85	-0.06	-0.25	0.0004	0.17	0.0002	0.17
86	-0.13	-0.29	0.0010	0.16	0.0004	0.16
87	-0.08	-0.26	0.0006	0.15	0.0003	0.15
88	-0.04	-0.27	0.0003	0.17	0.0001	0.16
89	0.41	0.17	-0.0056	0.15	-0.0025	0.15
90	0.54	0.16	-0.0055	0.18	-0.0025	0.18
91	0.23	0.32	-0.0093	0.17	-0.0042	0.17
92	-0.30	-0.38	0.0068	0.18	0.0030	0.17
93	-0.29	-0.34	0.0069	0.17	0.0031	0.16
94	-0.38	-0.40	0.0110	0.16	0.0049	0.15
Period Averages						
1980-88	-0.14	-0.29	0.001	0.15	0.0005	0.15
1989-91	0.39	0.22	-0.007	0.16	-0.0030	0.17
1992-94	-0.32	-0.37	0.008	0.17	0.0037	0.16

Note: $y_D(y_T)$ = direct (total) effects price intervention on welfare.

The figures are to be interpreted in the following way: A value of, say, 10% (i.e., 0.10) indicates that with intervention on price of grain real incomes are 10% higher than what they would have been if prices had been at their border price equivalent with the exchange rate measured at the official (direct effect) or at equilibrium (total effect). A value of -10% (-0.10) indicates that real incomes would be 10% lower.

Despite these limitations, the approach in this study reveals important insights into the income effects of policy. It shows differences in the effects as examined by period and across the different households (even though not for various size of holdings due to data constraints).

As shown by the period averages in the table, the negative impact of price policy on farm incomes was significant during the 1980s (about 14 percent for the direct and 29 percent for total interventions). This could be ascribed to the grain procurement policy of the state that kept producers' prices low and fixed over seasons and over area. Exchange rate overvaluation and discriminatory trade policies against agriculture reinforced the effect of direct intervention. During the period 1989-91, because of relatively lower world prices, upward price adjustment in January 1988 upward price adjustment and the March 1990 reform, there were welfare gains by farmers. But, farmers were adversely affected by indirect policies related to the 1980s that resulted in total gains of 22 percent reducing them from 39 percent rendered by direct intervention.

Finally, during the period 1992-94, welfare losses again grew up at a total of 37 percent, 32 percent being a direct effect. This is of course contrary to expectations in view of the fact that the TGE attempted to open up the entire economy by devaluing the birr, by lowering industrial protection and so on. However, the indirect effect is relatively weaker while the direct effect is stronger. The reason for the latter could be the inefficiency that prevails in the grain marketing system in the country including repeated *kella* (check-point) taxation, imperfect market information and integration. It could also be attributed to high world prices brought about by crop (particularly wheat) failure in major wheat producing countries such as Australia.

In assessing the effects, this study did not classify households by size of holdings. The reason lies in the limitation of the approach pursued as outlined at the beginning of the paper. Above all, for instance, since the crops covered are limited, it might be misleading to give explanations in terms of variations in cropping patterns for the different results that could possibly be obtained across farms of different size — the specialisation of farmers owning small and large farms is different.

Nevertheless, for the purpose of commenting on the welfare effects of policy on low-income (smallholder) households and hence the poor, the results obtained could be considered as a minimum effect that is applicable to all farm sizes. This could be substantiated by the fact that it is only the short-run (static) effect that is considered but not the long-run which actually increases the impact of

intervention. Furthermore, crops such as *teff* that are widely produced and are affected by policy, are not taken into account.

With these limitations and understanding in mind, it could be said that small farmers (poor households) have encountered considerable welfare losses over the period of analysis both in the pre- and post-reform periods. These losses could be expected to highly affect the net-buyer rural households in that the sales in the immediate post-harvest period are taxed significantly.

3.1.2 The rural landless households

Overall, landless households have benefited from price intervention. This is clearly shown in Table 1, Columns 4 and 5.

Except in 1989-91, their real income was higher than what it would have been if there had been no direct government price intervention. In 1989-91, domestic (producers') prices were adjusted upward by the January 1988 price adjustment policy and was allowed to move freely by the March 1990 market reform, while world prices (measured at the official exchange rate) were lower during this period. The combined effect of this situation is very little welfare losses of landless rural households who are buyers of grain by the wage income they earn.

In the transition period, i.e. 1992-94, the gains revived for two reasons: inefficiency of the marketing system that suppressed producers' prices and the higher world prices.

In general, therefore, during most of the periods, agricultural price intervention led to welfare gains for the landless that were highest in the period of sharp increases of world prices and when there was lag in the adjustment of domestic prices by the Government as occurred in the period before 1988.

- For landless rural households, exchange rate and trade policies have accentuated the welfare gains, or dampened the losses obtained or incurred through direct price intervention. As can be seen from the results, the greater proportion of welfare gains is from the indirect intervention.

Consequently, still assuming the effect to be the lower bound that is shared by all income classes of households, the conclusion could be that the direct welfare protection given to both the poor and better-off landless households is insignificant. A shift from normal circumstance hampers the living of the rural

poor landless. In addition, if the long-run effects were considered, the direct welfare gains would have been washed away, resulting in losses from direct price-related policy interventions.

3.1.3 Income effects for urban households

Real incomes of urban households are affected by agricultural price intervention in the short-run through a change in the consumer price index they face. The results of the estimated effect on an average urban household is indicated in Table 1, Columns 6 and 7 for the direct and total impact, respectively.

The results show that urban households benefited from price intervention. With the exception of 1989-91, real urban incomes have been higher throughout the period than they would have been if there had been no direct government intervention on determination of grain prices. If there had been trade liberalisation jointly with price liberalisation, urban consumers would have gained during the entire period as shown by the results for the total effect (Column 7). Gains are highest in periods of sharp increases in world prices especially in 1992-94. This emanated from the fact that the Government did not prepare grounds for the improvement of producers' prices of food items in proportion to the increase in the world prices.

Similar to the rural landless households, though the welfare gains from policy is high, the contribution of direct intervention is insignificant. This holds true in both the pre- and post-reform periods. The implication for the poor, particularly following the adjustment in the country that increased the population in this category through retrenchment, demobilisation and so on, is lack of attention to access of these households to food.

3.2 The State in the Grain Marketing Channel: The Case of Arsi⁵

3.2.1 Location and the choice of the region

Arsi region is located in central Ethiopia. It is bounded by East Shoa in the west and north. In the east and south, it is bounded by East Harargehe and Bale, respectively.

The region is selected for this study based on the following three criteria. First and foremost, Arsi is one of the four major surplus-producing regions in the country (which include Arsi, Gojam, Shoa, and Wellega).⁶ The region was also one of the package project (Chilalo Agricultural Development Unit) areas in the

pre-1974 period. The choice of the region for the project was also based on the fact that it is a surplus-producing area.

Second, Arsi was one of the two surplus-producing regions (Gojam being the other) for which grain-trade licensing was prohibited by state regulation in the 1980s. This measure was taken in order to halt competition from private traders and to exercise state monopoly on grain purchases from these regions.

Furthermore, the region is conducive to investigate the structure and performance of the food-grain marketing system (as well as to identify its constraints) given the presence of regional markets (such as Assela) and a central market, Addis Ababa. It is worth noting that Arsi is the major source of wheat and barley for these urban centres (Ministry of Domestic Trade, 1994).

And, not the least, the familiarity of the present author to the area is also another factor.

3.2.2 Marketing channels and the state in Arsi catchment

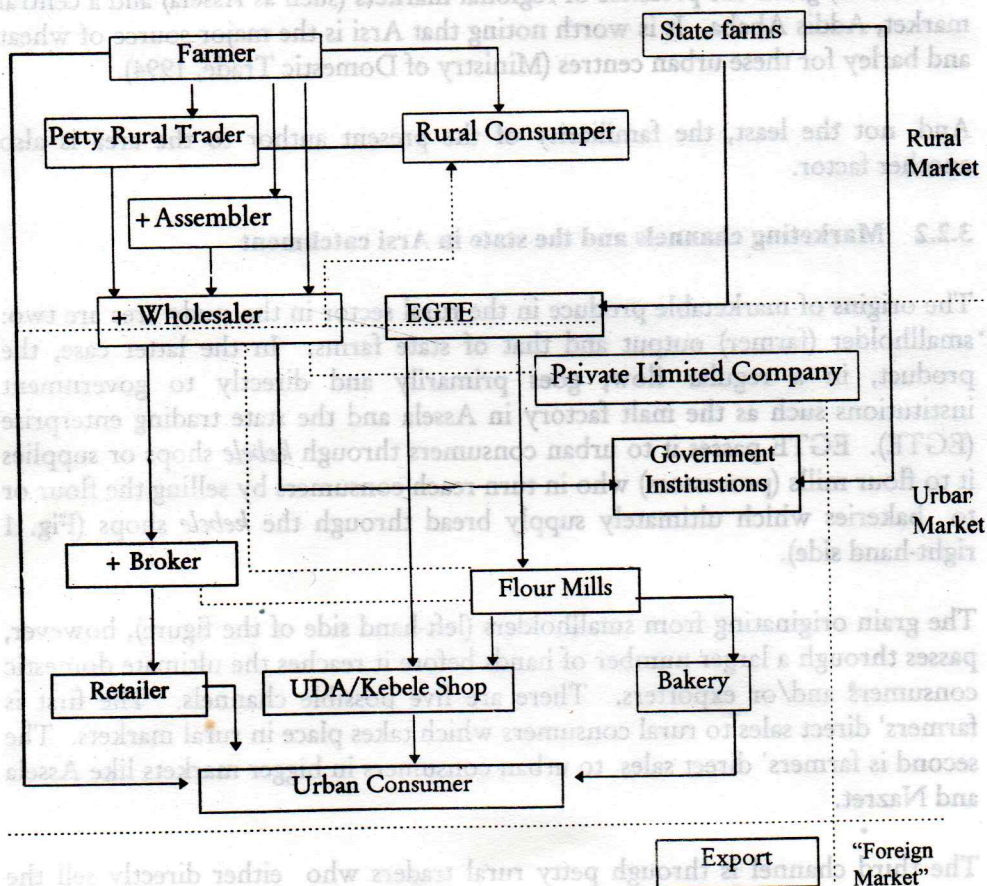
The origins of marketable produce in the rural sector in the study area are two: smallholder (farmer) output and that of state farms. In the latter case, the product, in a regular flow, goes primarily and directly to government institutions such as the malt factory in Assela and the state trading enterprise (EGTE). EGTE passes it to urban consumers through *kebele* shops or supplies it to flour mills (processors) who in turn reach consumers by selling the flour or to bakeries which ultimately supply bread through the *kebele* shops (Fig. 1 right-hand side).

The grain originating from smallholders (left-hand side of the figure), however, passes through a larger number of hands before it reaches the ultimate domestic consumers and/or exporters. There are five possible channels. The first is farmers' direct sales to rural consumers which takes place in rural markets. The second is farmers' direct sales to urban consumers in bigger markets like Assela and Nazret.

The third channel is through petty rural traders who either directly sell the grain to rural consumers and/or who pass it to primary/secondary wholesalers. The fourth are assemblers (primary/secondary) who pass the grain to wholesalers. The fifth and the most significant channel in terms of volume of flow is the case where farmers sell their produce to wholesalers. On regular basis, wholesalers after having absorbed the above (last) three flows, sell to

government institutions; or they reach urban consumers through (primary/secondary) brokers who temporarily connect to flour mills and then retailers. In the temporary flows, wholesalers pass the produce to flour mills in urban centres and/or to rural consumers; or they sell to private limited companies which pass the grain either to flour mills to reach consumers through *kebele* shops (in the form of flour and/or bread produced by bakeries) domestically and/or which export abroad. In a temporary channel wholesalers also sell to EGTE.

Fig. 1 Grain marketing channels in Arsi catchment



Note: += Redundancy
 → = Regular flow
 = Temporary flow
 Source: Field survey, 1994.

This shows that during the survey, there was no contact between EGTE and the channels originating from smallholders but temporarily still mediated by wholesalers. According to the local branch, for not less than 10 months EGTE did not purchase grain from Arsi region. The reason was said to be profit forecasts which the enterprise found to be low.

Recent field visit by the author (1995) also reinforces the same observation. Overall, in addition, even though the primary objective of the state, as written in its document, is price stabilisation it seems to have no clear target in practice.

4. Summary and Conclusions

This study attempted to measure the welfare effects of price-policy related interventions by presenting it in two parts: effects on the rural and urban households, respectively. Under the S-C-P paradigm, the Dethier (1989) model is employed for this purpose. A simple evaluation of the role of the state in ameliorating the distributional effect is also made with the help of the grain marketing channel in Arsi catchment, one of the major surplus-producing regions in the country and a region where private grain trade was banned by state legislation in the 1980s.

The period considered for analysis is the 15-years period from 1980 to 1994, limited to this by the inavailability of mainly producers' price data prior to 1980. In order to allow for a clearer understanding of the effects of the different policies pursued towards agriculture, the period is further split into three sub-periods; namely, 1980-88, 1989-91 and 1992-94. The first two sub-periods lie in the Mengistu era but differ in that the first exhibited excessive state intervention in grain trade while the second showed relaxation of policy in the sub-sector through adjustment of procurement prices in January 1988 and broader reform in March 1990. The third is the transition period during which the TGE attempted to open up the entire economy.

The study of household welfare and state intervention during these periods has some limitations resulting from data scarcity.² These are: coverage of limited crops, failure to include non-farm income while estimating total income of the households covered and inability to breakdown households into different income categories. In spite of these shortcomings, the approach in this study reveals important insights into the income effects across the different

households (rural versus urban) and over time (sub-periods) and into the role of the state in ameliorating this effects as an integral part of its stated objectives.

It is found, in general, that there is a bias against agriculture and failure of the state to ameliorate these effects over the entire period considered. Although the existence of such a bias in LDCs in general and Ethiopia in particular is widely acknowledged, the contribution of this study is the quantification of the welfare effect of intervention. Due to tight direct state intervention in grain pricing through assigning quota to peasants and setting fixed and low prices over seasons and regions in the 1980s, rural farm households' incomes were lower by 14 percent. During 1980-88, exchange rate overvaluation and discriminatory trade policies against agriculture reinforced the effect of direct intervention resulting in suppression of household incomes by 29 percent. However, the rural landless and urban households gained during this period in that their incomes were higher by 15 percent as a result of total state intervention, the greater proportion contributed by indirect effects while direct intervention had insignificant effect.

But, in 1989-91, there was a welfare gain of about 39 percent by rural households emanating from state procurement price adjustment (1988) and market reform (1990). However, overvaluation and discriminatory trade policy against agriculture washed away the gain ultimately reducing it to 22 percent. The landless and urban households lost a little due to direct intervention though the indirect effect counteracted to yield 16 and 17 percent welfare gains, respectively. Of course, these gains are also ascribed to low world prices during this period.

Since 1992, the TGE is striving to liberalise the whole economy. Nevertheless, the results in this study reveal a total welfare loss of about 37 percent of which 32 percent is accountable to direct and the balance to indirect effects. In this period, the rural landless and urban households gained welfare at 17 and 16 percent, respectively although the contribution of direct intervention is still insignificant. These results could be explained by two factors: internal and external.

Internally, the marketing system in the country revealed inefficiency emanating from excessive and repeated *kella* taxation and imperfect market information and integration (see also Bekele Sinkie, 1995; Bekele Sinkie and Mulat Demeke, 1995; and Wolday Amha, 1994). Externally, due to the failure of tradable food crops particularly wheat in major producing countries such as Australia, world prices have been higher.

Furthermore, the welfare losses for the rural poor households are high. The direct protection for the rural landless and urban households is insignificant despite the increase in poor households due to retrenchment and demobilisation. Though the state seems to have clear objectives it is found to focus on profit rather than trying to manage the distributional effect.

In light of the above, the following are suggested as measures that could redistribute income, at least to some extent, to vulnerable (poor) households and hence improve agricultural performance generally speaking. These are: improving the efficiency of the marketing system through reduction of taxes, accessing market participants (particularly producers) to up-to-date and reliable (price) information, provision of infrastructure and related services that will improve integration. Devising mechanisms to access the poor to food is also required particularly in this post-adjustment period. All of these require making the objectives of the state clear and well-defined.

NOTES

1. CPI_k could be defined as:

$$CPI_k = CPI_k = \sum_i a_i P_i + a_2 P_A + a_3 P_{NA}$$

where P_i is the consumer price of the crop, P_A is the CPI of other agricultural products, and P_{NA} is the non-agricultural price index. The weights are consumer budget shares, with $\sum_i a_i = a_1$, equal to the share of crop i in the rural household CPI, and with $a_1 + a_2 + a_3 = 1$.

2. For this purpose, the impact of the removal of direct interventions on the CPI (CPI') and of total interventions (CPI^*) could be estimated. CPI , CPI' and CPI^* are defined as follows:

$$CPI = \sum \beta_i P_i + (1 - \sum \beta_i) P_{NA}$$

where $\beta_i(1 - \sum \beta_i)$ = share of agricultural product i (non-agricultural goods and services) in the rural CPI.

$$CPI' = \sum \beta_i P'_i + (1 - \sum \beta_i) P_{NA}$$

where CPI' reflects the cost of the consumer basket in the absence of intervention.

$$CPI^* = \sum \beta_i \left(\frac{E_i}{E_0} \right) P_i + (1 - \sum \beta_i) P_{NA}$$

where CPI^* reflects the cost of the consumer basket in the absence of total intervention.

3. The distributional impact of government intervention is to be estimated by comparing the differences in real income of various rural household groups with and without intervention. The hypothetical effects of removing both direct and total intervention on prices of agricultural inputs and outputs also needs to be considered.
4. However, it should be noted that whether there is welfare loss depends on whether one considers the immediate, the short-term, or the long-term impact of price policies. The magnitude of the loss increases considerably if the long-term effects are included, although due to data constraints the latter is not considered in the analysis.
5. This is an excerpt from Bekele Sinkie (1995).
6. Arsi is known for its surplus production of mainly wheat and barley. The former crop is the focus for estimating welfare in this study. The latter attracted the installation of a state-owned malt factory, near Assela, the capital of the region.

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