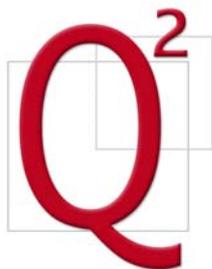# SQUARING THE 'Q's? METHODOLOGICAL REFLECTIONS ON A STUDY OF DESTITUTION IN ETHIOPIA

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Acknowledgements

1. INTRODUCTION

In 2001, Save the Children (SC)-UK commissioned a policy-oriented study of destitution in the Wollo area of Ethiopia's North-Eastern Highlands.[1] For several years, qualitative monitoring and research by SC-UK and other NGOs had found that the incidence and depth of poverty in this drought-prone farming area were worsening. Annual food aid needs were rising. A growing proportion of households were apparently unable to make a viable living without aid, even in relatively good harvest years. Yet official statistics showed that the percentage of rural people living below the national poverty line was falling for Ethiopia as a whole, and for the Amhara Region in which Wollo lies.

A number of explanations were possible for these apparently conflicting narratives. Firstly, the difference could be one of aggregation: Wollo might represent a spatial pocket of worsening poverty, masked by an average improvement in the large and diverse Amhara Region.[2] Conversely, case-studies in NGO operational areas could represent untypically poor communities (a criticism refuted by SC-UK in this case, but a common perception). A second explanation could be that the two approaches were simply measuring different, and non-commensurate, aspects of poverty: evidence from India (Jodha 1988) and Uganda (McGee 2004) demonstrates the possibility of income-poverty and other, more qualitative, indicators moving in opposite directions. Whatever the reasons, there were fears that policy-makers, convinced by the official narrative of falling rural poverty, were in danger of overlooking significant negative trends in the poorest areas. In part, this communication gap was attributed to a perception that the qualitative methods and purposive sampling employed in most of the NGO studies did not produce reliable evidence of the magnitude and distribution of the problems described.

In this context, the study's Terms of Reference specified a combination of qualitative and quantitative methods, in order to bridge the discourse gap and to quantify some of the non-income dimensions of poverty already well understood through SC-UK's three decades of work in the highlands. Building on this work and on a modified livelihoods framework, destitution was operationally defined as:

   "a state of extreme poverty that results from the pursuit of "unsustainable livelihoods", meaning

   that a series of livelihood shocks and/or negative trends or processes erodes the asset base of

already poor and vulnerable households until they are no longer able to meet their *minimum subsistence needs*, they lack access to the *key productive assets* needed to escape from poverty, and they become *dependent* on public and/or private transfers" (Devereux 2003:11).[3]

The pre-set research questions were: 1) What is destitution? 2) How do people become destitute? 3) How many people are destitute? and 4) Is destitution increasing? Clearly, this combination of questions could not be addressed by either qualitative or quantitative research alone.

Given the imperative of quantifying the scale and spread of destitution, priority was given to achieving a representative geographical coverage of Wollo. This was a considerable challenge, given the extent of the area, the mountainous terrain and poor roads, and the rural population of approximately four million. To meet it, the field teams co-opted most of SC-UK's regional vehicle fleet, and travelled on foot and by mule to remote sites. For this breadth of coverage, there was a trade-off in depth. The questionnaire survey teams were able to visit each site only once, conducting a brief one-off interview with the sampled households, while the qualitative team spent only a week in each village.

A quick turn-around of results was also required, so that the research findings could contribute to discussions around the national PRSP process and to SC-UK's programming. Although it is unfashionable to describe some of the methods employed as "rapid", the necessary speed of data collection and analysis was a factor in the methodology design. The Interim Report, including the major statistical findings, was presented to stakeholders in Ethiopia within seven months of the completion of fieldwork. Thus, the methodological choices discussed below were driven by the research questions, by the policy context, and (as always) by time and resource constraints.

This paper does not attempt to summarise all the findings of the study, nor to detail all aspects of its methodology: these can be found in the full project report (Sharp *et al.* 2003 or Devereux *et al.* 2003). Instead, it highlights points which seemed interesting, innovative or problematic in the context of the "Q-Squared in practice" debate.

The paper is structured as follows. Section 2 gives a brief overview of interlinked qualitative and quantitative elements at each stage of the research process, from design to report-writing. Section 3

examines in more detail three "qualitative" elements embedded in the mainly "quantitative" household questionnaire survey. The final section draws some conclusions about the strengths and weaknesses of the study's mixed-method approach, reflecting on synergies and trade-offs.

2. OVERVIEW OF THE RESEARCH PROCESS

"Q-Squared" elements at different stages

"Qualitative" and "quantitative" are used here in the same rather capacious sense as in Carvalho and White's (1997:1) definition:

> "The quantitative approach to poverty measurement and analysis … typically uses random sample surveys and structured interviews to collect the data - mainly, quantifiable data - and analyzes it using statistical techniques. By contrast, the qualitative approach … typically uses purposive sampling and semi-structured or interactive interviews to collect the data - mainly, data relating to people's judgment, preferences, priorities, and/or perceptions about a subject - and analyzes it usually through sociological or anthropological research techniques."

A detailed discussion of methods, however, divides more easily into the four research components contained within this definition than into the broad (discipline-based) categories of "qualitative" and "quantitative". The paper therefore looks separately at the "Q-Squared" factor in *sampling* (which in Carvalho and White's terms may be random or purposive); *data collection methods* (structured or interactive); *data types* (quantifiable or perceptual); and *analytical techniques* (statistical or sociological / anthropological). The Destitution Study aimed to maximize the potential synergies from combining qualitative and quantitative elements at each of these stages.

Design of data collection tools

Two parallel strands of data collection were designed, one quantitative (a standardised household questionnaire) and one qualitative (a flexible tool-box of participatory[4] and open-ended methods, applicable at individual, household, group[5] and community levels). The major purpose of the questionnaire survey was to estimate the scale of destitution, while the qualitative work focused on understanding causes and processes.

The instruments evolved symbiotically during a month of exploratory fieldwork, with the same field team working on both qualitative and quantitative tools. Modules of the draft questionnaire were refined or rejected according to insights from participatory discussions as well as their effectiveness in test interviews. Some questions and techniques moved from the qualitative work into the household questionnaire, or *vice versa*, as the team discussed which pieces of the jigsaw could best be explored through participatory and case-study methods, and which could usefully be standardised across a large household sample. An important function of this iterative process was "ruling in important factors, ruling out impossible ones" (Maxwell 1998:16).

Sampling

Interlinked random and purposive samples were used. The primary sampling frame was a computerised map of all *kebeles* (sub-districts) in the study area, geographically stratified by the nine Food Economy Zones (FEZs) previously mapped by SC-UK for their household food economy (HFE) analysis.[6] A sample of 27 *kebeles* (three in each FEZ) was selected by random number generation. For the survey, two further stages of random sampling were carried out during fieldwork, using a lottery system with the participation of key informants.[7] Four *gotts* (villages) were selected in each *kebele* and then 20 households in each *gott*, giving a total sample of 2,160 households (of which 2,127 were successfully interviewed). This sample size was simply the largest feasible, given the constraints of time, resources and geography.

For the qualitative fieldwork, a sub-sample of nine *gotts* (one in each FEZ) was purposively selected from among the survey sites. Selection factors included agro-ecology and altitude (so that the villages were, as far as possible, typical of the FEZ); logistics; size (very small communities were eliminated because it would have been burdensome and difficult for villagers to convene the number of discussion groups and case study volunteers needed); and the need for co-ordination with the survey teams.

This approach to integrating probability and purposive sampling is similar to Wilson's (2002:9) "table-top" design, in which a small number of in-depth qualitative case-study sites are visualised as the legs

supporting the extensive random sample for a questionnaire-based survey. He comments, "this provides some 'breadth' which can justify the selection of the in-depth study sites as being somewhat representative with respect to survey findings, rather than being 'just case studies'", adding that "there is an element of 'read-through' of data" between the extensive sample and the qualitative studies".

Fieldwork

Fieldwork was conducted between November 2001 and March 2002. The qualitative tool-box, from which methods were selected and adapted in each of the nine village study sites, drew on participatory rural appraisal (PRA) and anthropological traditions. It included semi-structured and unstructured interviews; focus groups of various kinds; life-histories; and visual techniques such as time-lines, mapping, wealth ranking and matrix scoring. Given space constraints and the selective focus of this paper, the qualitative methods are not discussed in detail: interested readers can find a fuller description in the project report (Sharp *et al.* 2003: 45-46 and Annex 4).

The household questionnaire, somewhat unusually, was designed to be conducted as a group interview with all available household members.[8] Interviewers were particularly encouraged to include women and younger adults in the discussions. One reason for this was that household heads may not know, or may under-emphasise, the activities of other members of the household. In particular, male respondents may underestimate the income contribution from women's livelihood activities, while women (in the particular farming culture of Wollo) may not know details of land and oxen contracts unless they are household heads themselves. A further reason for the group interview style is that it allows discussion of, and therefore more considered responses to, the more complex questions discussed in Section 3. This style of questioning requires skills more usually associated with semi-structured interviewing, such as talking around the question, cross-checking, probing, eliciting the respondent's analysis or opinion, and facilitating (without directing) discussion. Most of the interviewers had some prior experience of qualitative or participatory field research.

Unlike the design described by Wilson (above), in which the extensive survey and intensive case-study work are sequential phases, the Destitution Study conducted the qualitative and quantitative fieldwork simultaneously. This had both advantages and disadvantages. On the plus side, it enabled

continuous cross-checking of facts and interpretations, and exchange of thoughts and observations, between the methods and the teams. Often a questionnaire interview raised issues or identified potential case-studies, which could then be followed up by the qualitative team. Conversely, insights from the qualitative work sometimes identified mis-translations, gaps, or other problems with the questionnaire which could either be corrected or noted for the analysis. Implementing the two strands separately would have lost some of these synergies. However, there would also have been gains: analysing the questionnaire data before following up with qualitative fieldwork might have allowed more in-depth triangulation of findings and a sharper prioritisation of issues. Alternatively (and perhaps preferably), qualitative fieldwork and analysis could have preceded the survey: some sections of the questionnaire would have been rewritten, removed or added if time and resources had allowed such a sequencing.

Analysis and write-up

The two strands of field data were to some extent analysed separately, using the methods typical of each approach (statistical analysis for the survey data, and narrative or content-analysis techniques for the various elements of the village studies). However, they were also interwoven during the analysis (with qualitative information informing key judgments during statistical analysis, and statistical findings helping to formulate questions which were then applied to the qualitative fieldnotes), and combined in various ways during the report writing. As with the fieldwork, analysis of the two strands was simultaneous, allowing for iterative discussion and exchange between the methods and the analysts.

An example of qualitative findings influencing statistical analysis is the construction of a household destitution index (discussed below). Qualitative analysis and judgments made during fieldwork determined the selection of locally-meaningful indicators of subsistence needs and livelihood resources, and the setting of appropriate threshold values for scaling.[9] In the other direction, for example, the statistical result that destitute households were much smaller than average sent us back to our qualitative field-notes to revisit what people had said about household size and poverty (Devereux *et al.* 2003:92-97).

Comparing qualitative and quantitative findings on the same issue (one level of triangulation - see below) was another way in which the methods were combined. For example, aggregate household perceptions of trends were compared with community time-line and wealth-ranking discussions: here the qualitative findings supported the overall plausibility of the survey analysis, while adding nuance and highlighting local variability. On other themes, qualitative and quantitative information were juxtaposed, not to directly confirm or refute each other but simply to present different dimensions of an issue: for example, a statistical table on labour migration destinations was placed next to an extract from an individual migrant's narrative of his own experience.

There was a disciplinary divide in the team about the acceptability of using examples and extracts from the qualitative work to illustrate, or provide depth and voice to, the quantitative findings. The lead anthropologist was uncomfortable with this, while the other two researchers (both economists with experience of the more "rapid" forms of qualitative assessment) found it essential. This was probably, at base, an epistemological disagreement. A compromise was reached in which the primarily quantitative chapters of the report did include boxes and quotations drawing on the qualitative work, while a separate chapter also presented the case-study analysis as a narrative typology of household-level causes and processes of destitution. This analysis was also published as a separate paper (Yared 2003).

A different set of issues concerned what Wilson (ibid.) calls the "read-through" of data between the extensive (random) and intensive (purposive) samples. The village studies highlighted the heterogeneity of conditions and livelihoods even within each FEZ, and the crucial importance of local context in determining people's fortunes. It was therefore an unresolved question how far the cases and examples from the nine selected communities were truly illustrative of the broader survey results (which covered 107 villages). Some locational factors (such as distance from roads and towns) had been anticipated and incorporated into the household survey. Others (such as the presence of a permanent spring or an NGO project) had not, and therefore were not included in the quantitative analysis. Much of the local detail of the village studies was lost in the sense that it was not included in the final report, although the understandings generated by the qualitative fieldwork pervaded the quantitative analysis and the interpretation of findings.

Three degrees of triangulation

In the recent literature on combining qualitative and quantitative methods in poverty appraisal, the term "triangulation" has been used mainly to mean cross-checking data and interpretations between the two broad approaches. For example, Booth *et al.* (1998:5-6) argue that "the principle of triangulation provides support for the deployment of a strong combination of methods… This argument … remains a general point about the vulnerability of all single-stranded methods and the gains to be had from a robust eclecticism."

In social science research more broadly, triangulation has a longer history and a wider range of meanings. Miles and Huberman (1994: 266-7) note that the metaphor was first borrowed from surveying by Webb *et al.* in 1965, but that the practice predates the term. Denzin's (1978) classification of four basic types of triangulation (by data source, investigator, theory and method) is still widely used, with additions such as "inter-disciplinary triangulation" (Janesick 1994:215) and triangulation by "data type" (Miles and Huberman 1994: 267). Triangulation of various kinds is, in fact, intrinsic to qualitative research, not only in analysis but also in the generation of data during field work. As Huberman and Miles (1994:438) put it, "triangulation is less a tactic than a mode of inquiry… By self-consciously setting out to collect and double-check findings, using multiple sources and modes of evidence, the researcher will build the triangulation process into ongoing data collection".[10]

Denzin (1978: 301-302) draws a further distinction between "within-method" and "between (or across) methods" triangulation. Building on this, the following discussion refers to three levels of triangulation: two levels internal to the study (within-method and between-method), and a third level of external triangulation (using secondary information to cross-check the plausibility of findings).

3. "QUALITATIVE" METHODS AND DATA TYPES WITHIN THE QUESTIONNAIRE

This section discusses three "qualitative" methods used within the household questionnaire survey. The first is a holistic self-assessment of the household's (in)dependence and livelihood viability, elicited through an adapted form of wealth-ranking. The second is an extension of the same question

through a ten-year recall period, for the purpose of estimating trends in destitution and vulnerability. The third is an application of proportional piling (a quantification technique commonly used in PRA and related approaches) to investigating household livelihood and income diversification. For each of these, the sub-sections below consider the rationale for the choice of method; the data collection techniques; the type of data generated; and their analytical applications. Cross-checks of data quality and plausibility, using internal and external triangulation, are also discussed.

Self-assessment of household (in)dependence

In order to address the third research question *(How many people are destitute?)*, it was necessary to quantify the three key elements in our operational definition of destitution: subsistence outcomes, access to livelihood resources, and dependence on transfers. This section discusses the third element, dependence (i.e. the inability of the household, given their resources and opportunities, to make an independent living).

Loss of self-reliance, and consequently having to depend on public or private assistance, is central to the common understanding of destitution. In focus groups and wealth-ranking discussions, it was frequently mentioned as a characteristic of the poorest households. However, this dimension of poverty has been neglected in quantitative research. An exception is the work of Haveman and Bershadker (2001:335), who develop a concept of "self-reliant poverty … based on the ability of a family, using its own resources, to support a level of consumption in excess of needs". Using data from the USA, they measure this "self-reliant poverty" by comparing the combined earning potential of household members (given their age, educational level, etc.) with a threshold income level needed for self-reliance. The key difference between self-reliant poverty and consumption poverty is its focus on a household's potential or capacity, rather than its current income: this is conceptually similar to "dependence" as used in the Destitution Study. However, the method of quantification relies on a highly developed and integrated labour market where formal employment is the norm, wage levels are similar from place to place, and potential earnings are systematically linked to measurable individual attributes. Unfortunately, these conditions do not hold in Wollo: very few people have access to regular waged employment, and the majority of households survive on a portfolio of semi-subsistence agriculture supplemented by largely opportunistic engagement in low-return self-employment or

casual labour. Luck, location and resource endowments probably play a greater part than human capital in determining potential earnings from such activities: therefore, the labour-market approach to measuring self-reliance would not be feasible in this context.

Access to and receipt of transfers were also considered as potential indicators of dependence. Formal transfers in rural Wollo consist primarily of food aid (either distributed free or in exchange for work on community projects). More rarely they may include emergency cash payments, seed and tool distributions, or army compensation payments. Informal transfers were defined, on the basis of the exploratory fieldwork, to include gifts or interest-free loans of money, food, or seed; free use of farm or pack animals; and unpaid (non-reciprocal) labour. There were a number of obvious difficulties in quantifying and valuing such transfers. More fundamentally, however, there was a logical fallacy in taking *receipt* of transfers as an indicator of *dependence* on them: it is not necessarily the neediest who receive transfers.[11] For example, targeting of food aid in Ethiopia is known to be imperfect at household and district levels (see Clay *et al.* 1999): therefore, receipt of formal transfers cannot be taken as a reliable proxy for need or dependence. The same is true of informal assistance: indeed, the very poorest may well be characterised by a lack of the social or political capital needed to gain access to such assistance. Accordingly, access to social support was not used as an indicator of dependence but was, on the contrary, included as a positive asset in the destitution index described below. Receipt of food aid was similarly eliminated as a potential identifying characteristic of destitution, but was analysed as an independent variable.

Instead of these rejected options, the primary indicator of dependence used in the analysis was a self-assessment of household livelihood viability. Table 1 explains the four-category scale on which respondents were asked to place themselves, and shows the results. Households in the bottom category (unable to support themselves without assistance) were categorised as dependent or "self-assessed destitute".

Table 1: Results of household self-assessment

Category (extracts from household questionnaire)	Label	Number and % of households (2001/02) n = 2,127	
"Doing well: able to meet household needs by your own efforts, and making some extra for stores, savings and investments."	Sustainable	65	(3.1%)
"Doing just okay/ breaking even: able to meet household needs but with nothing extra to save or invest."	Viable	585	(27.5%)
"Struggling: managing to meet household needs, but by depleting productive assets and / or sometimes receiving support."	Vulnerable	1,167	(54.9%)
"Unable to meet household needs by your own efforts: dependent on support from community or government (could not survive without it)."	Destitute	310	(14.6%)

The data collection tool employed here is an adaptation of wealth-ranking, a method with a long history and a correspondingly large literature in the RRA and PRA traditions (see, for example, Grandin 1988 and IIED 1992). In its commonest form, wealth-ranking is conducted with a group of community representatives or key informants who define their own criteria for assigning households to different categories of poverty or well-being. This produces a *relative* ranking within the given population. Rankings using locally-generated criteria and thresholds cannot be aggregated across sites, and care must be exercised in generalising the characteristics of wealth groups.

In the adaptation used here, individual households ranked themselves; the categories were pre-defined and standardised; and they were worded so as to be, as far as possible, comparable across sites rather than a relative ranking within the community. This is not revolutionary: there are precedents for including a household wealth-ranking question in a questionnaire survey (see Bevan and Joireman 1997, who compare poverty estimates derived from a "personal wealth ranking", a consumption-based P_0 measure and a wealth index, all from the same questionnaire survey); and for standardising ranking categories and criteria to enable multi-site comparison (see Barahona & Levy 2003:14-15). Questions on subjective poverty are also increasingly included in standard income/expenditure surveys.

The ranking question in fact migrated from the village studies into the household questionnaire during the exploratory fieldwork. In doing so, it necessarily evolved into something much less open-ended than it could be in a focus group or case-study context. The question was placed at the end of the interview, so that it could be posed as a summing-up of all the factors previously discussed. Given the context of a collective household interview (see section 2 above), respondents were also encouraged to discuss and reach consensus on the self-assessment.

The type of data generated by this self-ranking question could be described as "qualitative", "non-numerical", "subjective" information, collected through a "qualitative" style of enquiry – but within a randomly-sampled questionnaire survey, for the purpose of statistical analysis. Perhaps a more important property of the question is that it asks for a considered, holistic assessment on the part of the interviewees: in other words, it requires the respondents to participate in the analysis.

Triangulation of this subjective self-assessment involved an objective index representing the other two elements of our definition: ability to meet subsistence needs, and access to livelihood resources. The index combined 15 variables from the household questionnaire (see Table 2), using weights mathematically generated by principal components analysis (PCA).[12] In this method, previously used to construct asset indices (e.g. Filmer and Pritchett 1998), PCA is used to extract from a given set of variables those linear combinations which best capture the common information. It is a purely statistical procedure, with no econometric content: key assumptions are that the underlying common information does represent the phenomenon of interest, and that the right variables have been included. Space does not allow a full discussion here of the advantages and limitations of this technique: details of the method can be found in Sharp (2003), together with the specifics of how each indicator was selected and defined, and a consideration of alternative (more qualitative) methods of constructing indices. In the context of the current paper's "Q-Squared" focus, perhaps the most interesting point is that the selection and scaling of the component indicators relied crucially on information and judgments from the qualitative fieldwork.

Table 2: Components of the objective destitution index

	Classification of indicators		Score (weight) by 1st Principal Component	Rank by score
SUBSISTENCE NEEDS	Food	Meals per day during hungry season	0.106	9
		Months of seasonal food shortage	0.100	10
	Non-food	Clothing purchases	0.100	11
		Housing quality	0.091	13
		Basic expenditure items	0.112	8
LIVELIHOOD RESOURCES	Human capital	Total household labor capacity	0.144	4
		Male adult labor	0.133	6
		Access to hired labor	0.122	7
	Natural capital	Farmland owned	0.096	12
		Land cultivated	0.157	3
	Physical capital	Oxen owned	0.161	2
		Total livestock owned	0.170	1
	Financial capital	Receipt of credit and/or cash gifts	0.026	15
	Social capital	Access to social support networks	0.050	14
		Participation in social institutions	0.144	5

The "objective" and "subjective" measures were found to be strongly correlated, as illustrated in Figure 1: 65% of the self-assessed destitute fell in the bottom 14.6% of the destitution index; 76% in the bottom two deciles; and 95% in the bottom 40%. A chi-square (χ^2) test between the 310 self-assessed destitute households and the bottom 14.6%, 20%, 30%, 40% and 50% of the index confirmed a significant association (p-value <0.01) in all cases.

Figure 1: Correlation between 'subjective' and 'objective' measures of destitution
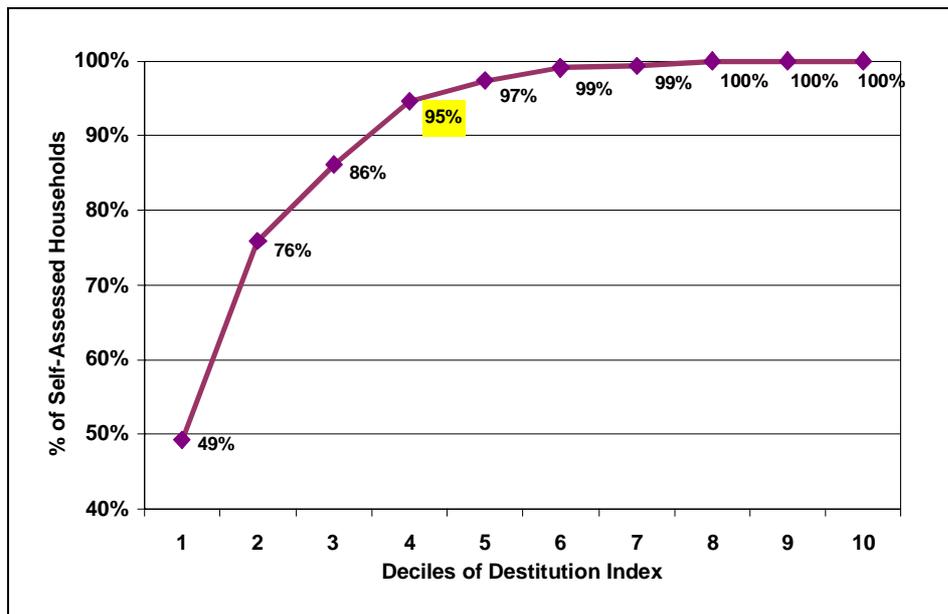
To reach a final "bottom-line" estimate, the two measures were combined: households were counted as destitute if they self-assessed as dependent and also fell in the bottom 40% of the index. One reason for triangulating the two measures in this way was to exclude relatively wealthy households who had misreported themselves as destitute. In fact, the combined rule eliminated only 17 households, reducing the estimated destitution rate from 14.6% to 13.8%.[13]

External triangulation of these exact numbers was not possible, since the definition and measurement of destitution were endogenous to the study. However, the approximate proportions of the categories (particularly the very high percentage of vulnerable or "struggling" households) were broadly consistent with secondary information such as SC-UK's HFE reports, as well as with the results of wealth-ranking and focus group discussions in the Destitution Study's qualitative fieldwork (between-methods triangulation). Internally, the data appear consistent and plausible. People did not overwhelmingly class themselves as destitute: approximately 30% of households considered themselves to be either "doing well" or "doing just okay". Nor, in the recall question discussed in the following section, did they automatically claim that their situation was worsening.

Can recall data give a reliable indication of trends?

The fourth research question *(Is destitution increasing?)* posed perhaps the greatest methodological challenge. Given the resource and time constraints, establishing a panel or multi-round survey was not an option (although it would in principle be possible to conduct future survey rounds based on the same sample). For policy purposes, it was nevertheless crucial to obtain some understanding of whether or not destitution was increasing.

Given the absence of longitudinal data on our indicators, all the methods employed to investigate trends in destitution and livelihoods (both in the village studies and the household survey) necessarily relied on participants' recall of the past. Clearly, there are caveats about the reliability of memory and the general human tendency to believe that things were better in the past. However, economists' rather sweeping bias against long recall periods is perhaps due to the dominance of income, consumption and expenditure surveys in quantitative poverty analysis: for these types of data, memory is short (Deaton 1997:24ff). By contrast, qualitative researchers in the sociological, anthropological and participatory traditions have always been more comfortable tapping into people's memories, and have developed a range of methods for doing so (see, for example, McGee 2004; da Corta and Venkateshwarlu 1992). It is well-established that the quality of recall data is enhanced by using memorable events or periods (Deaton 1997:19), and by making questions as factual as possible rather than asking for perceptions or feelings about the past.

Within the household questionnaire, the trend issue was addressed by extending the self-assessment question discussed above through three recall periods: one year before the survey (in the same month); two years before; and ten years before. The reference point of "ten years ago" (1991/92) was a memorable time, when the overthrow of Mengistu's Derg government ended a long civil war, conscription, and various constraints on people's movements and livelihoods. In parts of Wollo it also coincided with the most recent land redistribution. Neither the year of the survey nor the reference year were considered exceptionally good or bad for rainfall and agricultural production.

The data generated by this recall question are graphed in Figure 2, which plots the percentage of households placing themselves in each category, in each year. (The sample size differs because

some households were formed more recently than the reference years). Taking these percentages at face value, the graph shows that the incidence of self-assessed destitution trebled during the 1990s, from a low of 5.5% ten years before the survey to a peak of 16.4% two years before, dropping back a little to 14.6 per cent in 2000/01.[14] Over the same period, the proportion of "sustainable" households appears to have collapsed from 32% to 3%, and that of 'viable' households from 45% to 28%. Perhaps most importantly for policy-makers and humanitarian agencies, the proportion of "vulnerable" households (defined above as those depleting productive assets in order to make a living) rose from 17% in the early 1990s to over half the population (55%) in 2001/02.

Figure 2: Trends in destitution (from household recall / self-assessment)
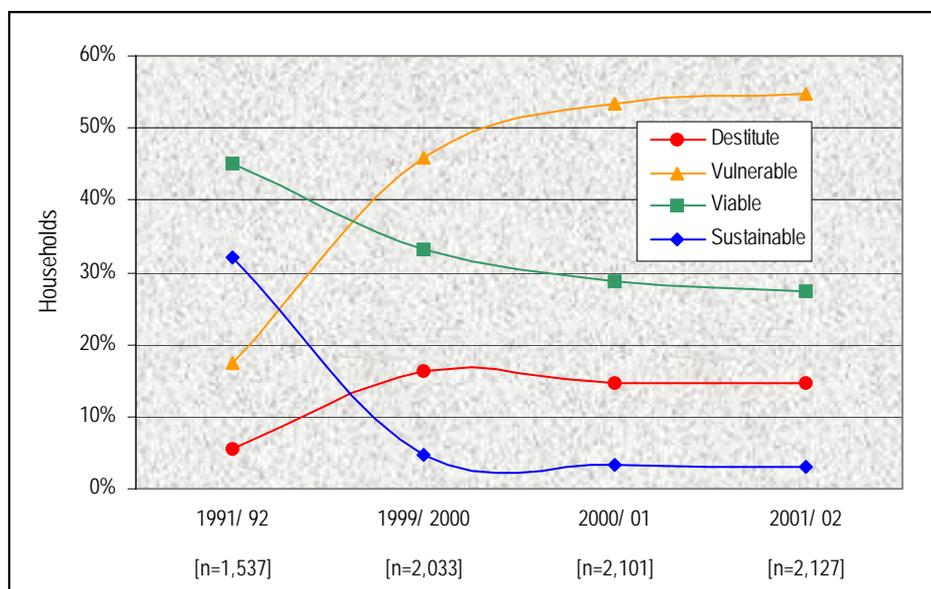
How accurate or reliable are these apparent trends? Their consistency and plausibility were tested in several ways, using within-method, between-method and external triangulation. Within the survey method, the internal consistency of the data was investigated by looking more closely at the poverty dynamics and household trajectories underlying the aggregate group proportions shown in Figure 2. For example, Table 3 shows the transition probabilities for households in each category ten years ago. As one might expect from the literature on poverty dynamics (e.g. Baulch and Hoddinott 2000; Block and Webb 2001), there is considerable movement of households between the categories, both up and down the scale. About 65% of those who described themselves as destitute ten years before had managed to move out of this category since then - nearly five percent of them attaining the

"sustainable" category (i.e. managing to accumulate assets or savings). Overall, 68% of households reported that they were worse off than ten years before, nine percent were better off, and 23% reported no change.

Table 3: Transition probabilities (self-assessed household situation)

'Now' (2001/02) ▶ Ten years ago (1991/92) ▼	Doing well ('Sustainable')	Breaking even ('Viable')	Struggling ('Vulnerable')	Dependent ('Destitute')	Total	[n]
Doing well ('Sustainable')	7.1%	43.9%	41.3%	7.7%	*100%*	*[494]*
Breaking even ('Viable')	1.2%	22.7%	64.4%	11.7%	*100%*	*[691]*
Struggling ('Vulnerable')	1.9%	23.6%	49.8%	24.7%	*100%*	*[267]*
Dependent ('Destitute')	4.7%	15.3%	44.7%	35.3%	*100%*	*[85]*
Total	*3.4%*	*29.3%*	*53.4%*	*14.0%*	*100%*	*[1,537]*
[n]	*[52]*	*[450]*	*[820]*	*[215]*		

Percentages within self-assessed category ten years ago

Over the shorter term, unsurprisingly, the proportional changes are less dramatic. The same analysis applied to the two-year recall data shows that 59% of households placed themselves in the same category in 2001/02 as in 1999/00. Twenty-four percent had moved down the scale, and 17% had moved up. 47% of those who were destitute two years before had managed to move out of destitution – most of them (35% of the category) into the "struggling" or "vulnerable" group, although two households (0.6% of the category) had moved from "destitute" to "sustainable" within the two years.

These transition matrices show that there is considerable "churning" of households moving in and out of the destitute category, and that they are more likely to move down the scale than up. Both these observations correspond with information from the village studies, and suggest that respondents' answers to the recall questions were more considered and complex than sceptics might expect.

Household trajectories were further investigated by plotting survival functions – a statistical technique adapted from epidemiology – for the risk of households becoming destitute over time.[15] The sample for this analysis consists of all households that were *not* destitute ten years ago (n=1,452). In Figure

3, the vertical axes show the cumulative probability of these households "surviving" (i.e. not falling into destitution) over the three recall periods until 2001/02: thus, the inverse of the axis value is the probability of becoming destitute. All households start at the same point ten years ago (at cumulative survival probability = 1). The analysis does not take account of households *recovering* from destitution during the ten-year period, although (as shown above) households do frequently move out of, as well as into, destitution. In this regard, it is a simplification of the dynamics actually reported by the survey respondents.

Figure 3: 'Survival' functions using self-assessment recall data
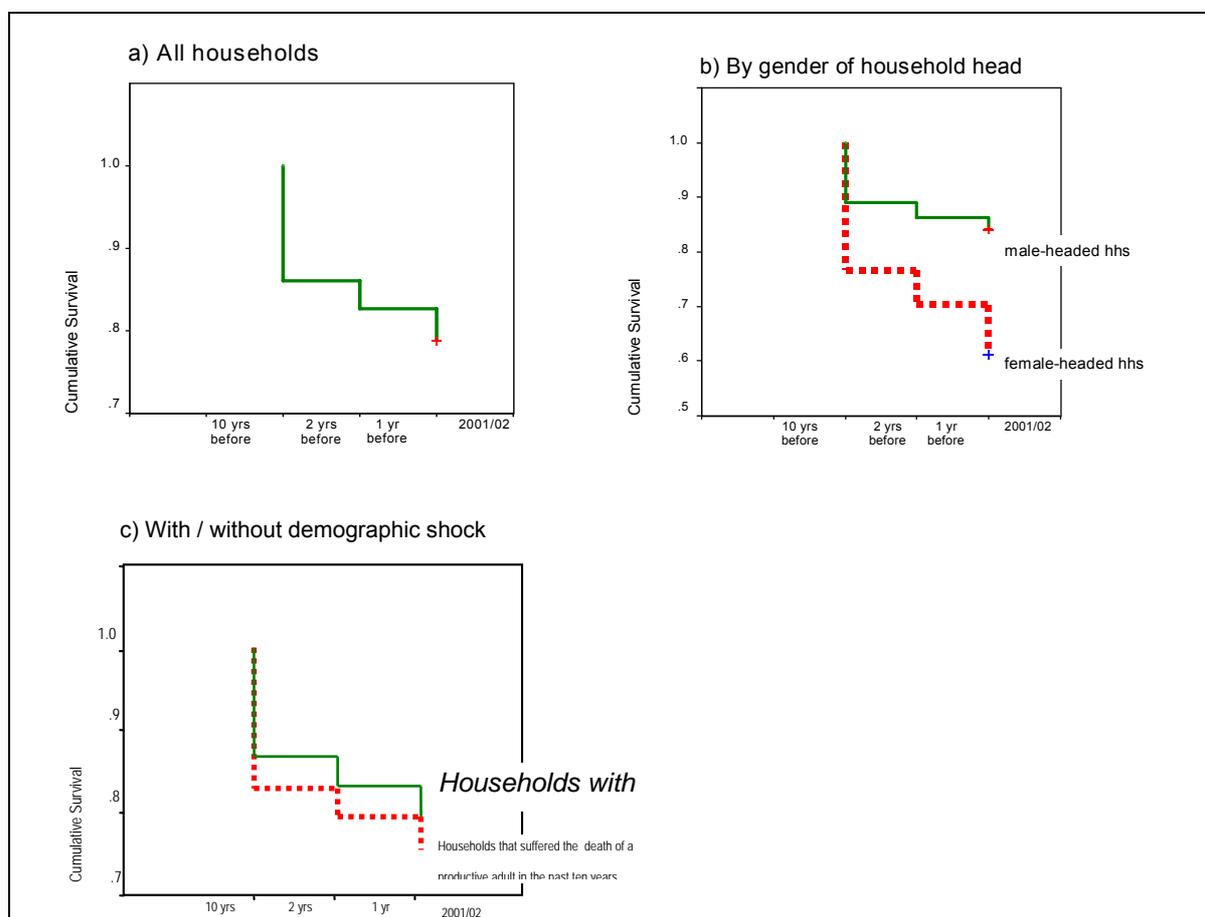
Graph a) in Figure 3 shows that, for all households, the cumulative survival probability over the ten years was 0.8 (or inversely, a non-destitute household faced a 20% risk of becoming destitute at some point during this period). More interestingly, graph b) disaggregates the sample by gender: it

18

shows that the probability of destitution for female-headed households was 40% (double the average), compared to approximately 15% for male-headed households. Graph c) separates out households that suffered a "demographic shock" (defined as the death of an able-bodied working adult) during the ten years: as expected, these households had an above-average probability of destitution (approximately 25%). This is a useful cross-check on the consistency and plausibility of the trends emerging from the recall data, although it is likely to be a significant underestimate of the impact of adult deaths on household livelihoods because, as we learned from the qualitative methods, a common result of such shocks is the break-up of the household itself. Our sample of households living in the village sites at the time of the survey obviously did not include households who had moved away or dissolved.

Between-methods triangulation with the village studies tended to support the reliability of the questionnaire respondents' answers, and the trends identified by the survey data. The greater vulnerability of female-headed households, and the impact of adult deaths on livelihood viability, were borne out by case-study, focus-group and wealth-ranking discussions. The simultaneous fieldwork enabled the qualitative research team to conduct a small number of follow-up interviews with questionnaire respondents, who generally gave convincing explanations for reporting that their livelihood status had improved (e.g. inheritance of assets, or children coming of age) or deteriorated (e.g. divorce, illness, loss of livestock, or debt). Similar causal factors were identified in group discussions of how people fall into and escape from destitution. In historical wealth-ranking discussions, participants in six of the nine sites reported that the proportion of poor households had risen over the previous ten years and that a new category of the very poorest had emerged. In seven sites, the proportion of "better-off" households had fallen.

All the methods converge on the twin findings that the incidence and severity of destitution have worsened, while (more unusually) the proportion and resources of better-off households have collapsed. Rather than stratification, the trend appears to be a general impoverishment of whole communities and economic areas (Sharp and Devereux 2004). External triangulation of these findings was limited by the scarcity of secondary data: however, the few sources of information available are consistent with them. Data collected for the national Early Warning System's Chronic Vulnerability

Index (CVI) show that livestock holdings and agricultural productivity have fallen since 1994, while overall vulnerability has risen.[16] Food aid needs, though fluctuating annually, are on a rising trend: 31% of Wollo's rural population needed aid in 2001, compared to 21% in 1994.[17] SC-UK monitoring data (from periodic assessments, not recall) similarly show a rising proportion of the poorest, accompanied by the decline of better-off households. A more detailed discussion of secondary information on poverty and well-being trends in Wollo will be found in Devereux and Sharp (forthcoming).

In short, while the precise slope of the lines in Figure 2 may be uncertain, the general directions of change – the increasing proportion of the destitute and vulnerable, accompanied by the collapse in numbers and resources of the better-off strata - are only too plausible. They appear robust when triangulated within the survey data (by exploring household dynamics and trajectories), between methods (by cross-checking the risk of destitution for different household categories in the survey sample with risk factors identified through the qualitative fieldwork, and by comparing community narratives of changing wealth-group proportions and characteristics with the aggregate survey findings), and externally (by comparing the survey findings with secondary information).

Estimating income diversification through proportional piling

Addressing the first and second research questions (*What is destitution?*, and *How do people become destitute?*) required an investigation of household and community livelihoods, encompassing assets, activities and incomes. Initial questions included whether the livelihoods of the destitute, and their degree of dependence on aid and other transfers, differed identifiably from those of the non-destitute.

In the village studies, these questions were explored through case study interviews, and through focus groups constituted on the basis of age, gender, and livelihood strategy, employing tools such as matrix scoring and inter-generational comparison. Various types of wealth-ranking discussions also deepened the researchers' understanding of the livelihood characteristics, constraints and aspirations of households in different circumstances and wealth groups.

In the household questionnaire survey, in addition to identifying all the household's livelihood activities and quantifying their resources (see Table 2 above for resource types covered), an attempt was made to estimate the proportion of income obtained from each activity. Income data, especially net income from self-employment, are notoriously difficult to collect in the best of circumstances (Deaton 1997: 29ff). In rural Wollo, a semi-subsistence economy where people engage sporadically in many self-employment activities with low and erratic returns (or losses), and where employment tends to be paid in a combination of cash and kind, the challenge of accurately quantifying income from different sources for a large household sample would be daunting. Early in the exploratory fieldwork it was decided that to do so would take disproportionate amounts of time, and would probably require several repeat visits to the sample households.[18] This was not feasible given the geographical breadth and overall time-constraints of the study. Therefore, while it would have been undeniably useful to have absolute (rather than proportional) income figures by activity and household, these data were not obtainable. As an alternative, we took the rather unconventional approach of using proportional piling within the household questionnaire.

Proportional piling is a quantification technique widely used in RRA and PRA-derived fieldwork. As the name implies, the method involves participants making piles (of stones, beans, dung pellets or whatever else is handy for counting) proportional in size to the relative number or importance of the items under discussion. Its numerous applications include wealth-ranking (to assess proportions of wealth-groups, rather than ranking named households); problem-prioritisation (Mariner 2000); and, as here, estimating the proportions of income obtained from different sources (Seaman *et al.* 2000; Watson 1994; Jones 1996). It is an interactive method employing "visuals and tangibles" (Chambers 2002:1) to generate discussion, disagreement and eventually consensus. It does not require participants to be numerate.

In the Destitution Study questionnaire, proportional piling followed on from a listing of all household members' livelihood activities[19], using a checklist derived from the exploratory fieldwork. A twelve-month recall period was used to capture seasonal activities. For the proportional piling exercise, transfers (food aid, gifts and remittances) were added to the list; a circle was drawn (or an area indicated on the floor or mat) for each income source; 100 beans were placed in the middle to

represent "all the food, cash or other income produced or received by the household" in the past twelve months; and the respondents were asked to distribute the beans among the different income sources according to their relative contribution.

The exact number of 100 beans (pre-counted by the interviewer) was used to facilitate the checking and recording of numbers in the field, and subsequent data entry: calculation errors were thus eliminated, since the number of beans could be read directly as estimated percentages. However, the respondents themselves were not required to think in percentages or fractions. A few people counted the beans, but most estimated the income proportions by first roughly allocating smaller or larger handfuls to each circle, then visually comparing the size of the piles, and moving beans around according to discussion and spontaneous pair-wise comparison (e.g. "didn't we get more from firewood than from eggs?").

In the first draft of the questionnaire, respondents were asked simply to rank their five main income sources. However, it was found that asking for estimated proportions through this piling technique took very little more time than ranking, prompted respondents to consider their answers more carefully, and produced much more detailed and complete information. As Mariner (2000) comments, proportional piling is inherently "….more quantitative than simple ranking because it allows great graduation of emphasis."

The data generated by this method are both numerical and subjective. Clearly, they are not the same thing as, nor direct substitutes for, standard income data. They are proportions only, not absolute figures: thus, they give no information about the value of a household's total income, and cannot be aggregated across households (as in the conventional method of calculating income portfolios). Nevertheless, they do allow household-level analysis of the relative importance of different income sources, the degree of diversification, and reliance on transfers. They also provide insights which might not emerge from standard income enumeration. For example, households had frequently engaged in livelihood activities (e.g. livestock keeping, trading and labour migration) which had produced no income during the past year. This finding, confirmed and contextualised by the

qualitative fieldwork, highlights the distinction between "income diversification" and "livelihood diversification".

Fifty-one separate livelihood activities were recorded: their analysis is work in progress. As an example of the data generated by proportional piling, Table 4 shows the percentage of households receiving income from the most frequently-reported sources - agriculture and food aid - and the average income shares derived from them. These figures confirm alarmingly high proportions of income from free food aid (35% of the previous year's income for the average destitute household, and 15% for non-destitute) and from public works (28% and 17% respectively). Destitute households' lower participation in public works is consistent with secondary and qualitative information, and can be attributed to their limited labour. Crop production remains the largest single income source for both categories of household, despite the very low resource and productivity levels, and the high risks, of farming in Wollo. This corroborates the observation from the qualitative fieldwork that livelihoods are dangerously undiversified.

Table 4: Income proportions from agriculture and food aid

	% HOUSEHOLDS [a]			% INCOME (median) [b]		
INCOME SOURCE	All households [N=2,127]	Destitute [n=293]	Non-destitute [n=1,834]	All households [N=2,127]	Destitute [n=293]	Non-destitute [n=1,834]
Crop production	87%	49%	94%	44%	33%	44%
Livestock	84%	41%	91%	20%	7%	20%
Public works	63%	46%	65%	18%	28%	17%
Free food aid	37%	62%	33%	18%	35%	15%

Notes:
[a] *Percentage of households reporting engagement in this activity, or receipt of this kind of transfer, in the past year.*

[b] *Income percentages are averages of household proportions, not percentage of aggregate income. Columns cannot be totalled.*

The proportional piling data also allow quantification of household income diversification, for example through the construction of a Herfindahl concentration index (defined as $HI_i = 1 - \sum_j (y_{ij})^2$, where **$y_{ij}$** is the share of activity or sector **j** in the total income of household **i**). Preliminary analysis along these lines suggests that destitute households, and households in remote sites (more than half a

day's walk from an all-weather road) have less diversified incomes. These findings, again, are consistent with qualitative information from the village studies.

Opportunities to triangulate the income-proportions data were limited. The relative proportions for different household categories appear to "make sense" in relation to the more purely qualitative information from the village studies: however, it is difficult to judge how reliable or accurate the actual numbers are. A very small number of qualitative follow-up interviews with questionnaire respondents suggested that the within-household rankings of income sources were relatively robust, but that the actual percentages varied when the piling was repeated. (This may also be the case with direct monetary estimates of income, especially net income from self-employment). Another issue identified in the follow-up interviews was potential gender bias, or more generally individuals' different perceptions of their own and others' contribution to total household income. In short, it made a difference which household members participated in the interview (again, this might equally apply to more orthodox income-enumeration methods). How accurate the percentages may be, and how far the data can be interpreted as "income", are therefore debatable points. What is certain is that the proportional piling technique produces, at the very least, a complete and finely nuanced ranking of household income sources.

There is some evidence that people's own estimation of income proportions can be as accurate as the much more time-consuming standard enumeration approach, just as farmers' estimates of their own production can be as accurate as crop-cutting surveys (Verma *et al.* 1988). For example, Da Corta and Venkateshwarlu (1992) describe a method of participatory estimation of income proportions through a series of interactive household interviews. Although they did not use proportional piling, their approach entails a broadly similar process of estimation on the respondent's part. Listing and ranking of income sources were followed by estimating and then refining income proportions. In the final step, respondents were asked to imagine that their total income was 100 Rupees (thus converting the proportions into estimated percentages). To test the reliability of the method Venkateshwarlu compared it with the more conventional approach, collecting detailed income and expenditure data and then calculating proportions, for a small control sample of households. He found "no statistically significant difference in the results" (ibid.:117).

4. CONCLUSION

This paper has focused on selected methodological features of a large mixed-method study. Overall, the combination of methods was successful in generating both qualitative insights into the causes and processes of destitution, and quantitative estimates of the scale of the problem. The "contextual" qualitative information was indispensable in making the many judgements and decisions involved in the statistical analysis of the survey data. As Kandiyoti (1999:521) states, "survey data is valuable only to the extent that it builds upon a solid bedrock of in-depth, qualitative information about the processes under investigation". At the same time, the quantitative research process and findings frequently prompted new investigations or changes of focus in the qualitative work, helping to identify which pieces of information were of central importance and which were local anomalies. It is, in fact, difficult to imagine how this research could have been conducted *without* integrating qualitative and quantitative approaches.

There were also, undoubtedly, trade-offs. Embedding the "qualitative" tools of self-assessment, recall, and proportional piling within the household questionnaire meant compromising some of the strengths of these methods: their open-endedness, and the richness of unanticipated detail that can emerge from talking around rankings and visuals ("interviewing the matrix", etc.). Trade-offs between depth and breadth were made at many levels. However, this is also a dilemma within each methodological strand, and not only at the interface between them: for example, in the household survey design it would have been possible either to apply a very detailed questionnaire to a small sample (and risk it being dismissed as non-representative), or, as we did, to prioritise random geographical coverage (breadth) and sacrifice some of the scope and detail of the questionnaire (depth).

Finally, the paper has considered the "Q-Squared" effect not only in the sense that combining methods produces more than the sum of parts, but also in the alternative meaning of "squaring": reconciling or making consistent the different insights contributed by each approach, through iterative triangulation.[20] Differences within the team about the integration of qualitative and quantitative findings in the final stages of the research process prompt us to ask whether it is possible for the two

approaches to have equal weight within one study, or whether one will necessarily dominate. Is the role of qualitative research to provide context, depth and grounding to a primarily quantitative study, or, as Jick (1979:609) suggests, do "qualitative data and analysis function as the glue that cements the interpretation of multimethod results"? It may be, as with many aspects of the Q-Squared debate, that the choice between these two perspectives depends mainly on the disciplinary ground one stands on.

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END NOTES

[1] The study area comprised the Zones of North Wollo, South Wollo and Wag Hamra, corresponding approximately to the former Province of Wollo.

[2] Trends in standard money-metric poverty indicators for Wollo are uncertain, since the relevant national survey data have only been collected since 1996/97 and cannot reliably be disaggregated to Zonal level.

[3] A full discussion of the conceptual framework, and of destitution in relation to other concepts in the poverty literature, can be found in Devereux 2003.

[4] 'Participatory' here denotes an approach to fieldwork, and a set of methods, which have evolved from the traditions of 'rapid' and 'participatory' rural appraisal. A key characteristic is that informants participate in the analysis, rather than merely providing discrete items of data which are later put together by an analyst. The study does not pretend to be participatory in the broader and more political senses.

[5] A group in this context could be an age-group, an interest-group (e.g. people wanting to discuss credit provision), a women's or men's group, or a livelihood group (e.g. traders or labour migrants).

[6] This approach systematically generates quantitative estimates from qualitative research methods. It uses key informant interviews to build a model of the "food economy" of a typical household in each locally-defined wealth rank (Boudreau, 1998; Seaman, 2000; Seaman *et al.*, 2000). Generalisation is based on the purposive sampling of research sites to represent a "Food Economy Zone" (FEZ), an economic area "defined on the basis of common characteristics in agro-ecology, cropping patterns and production, trade interactions, population density, and market options" (Haile Kiros *et al.*, 2000:1).

[7] The key informants, in discussion with the survey staff, constructed the sampling frame and selected the sample. At the *kebele*, a group of official and unofficial leaders was asked to compile a list of all villages in the sub-district. The agreed list was numbered, each number written on a slip of paper, and the folded slips shaken up and passed around in a hat or basket to be drawn by each informant in turn. In the villages, the same procedure was followed except that the sampling frame consisted of a village map showing all resident households (see Sharp *et al.* 2003: 36-38 for details). In addition to circumventing the problem of non-existent, incomplete or out-of-date sampling frames at these levels, this process of participatory random sampling was transparent to local people and facilitated explanations of what the teams were doing and why.

[8] The average household size in rural Wollo is 4.5. Collective interviews would not be possible with much larger households.

31

[9] See Sharp (2003) for details of how these decisions were made, together with a broader discussion of the fungibility of the five resource categories under the livelihoods framework.

[10] The full quotation, from which the title of this paper borrows, continues: "It will be the way he or she got to the finding in the first place – by seeing or hearing multiple instances of it from different sources, using different methods, and by *squaring the finding with others with which it should coincide*" (italics added).

[11] See Lensink and White 1999 for a similar argument regarding aid dependence at the national level.

[12] Weights were derived from the first principal component, which explained 31% of the total variance. The index was calculated as

$$D_j = \sum_{l=1}^{k} [w_i(a_{ji} - m_i)]/s_i,$$

where D_j is the standardised 'destitution index' for household j; w_i represents the weights (scores) assigned to the (k=15) variables on the first principal component; a_{ji} represents the observation for the jth household on the ith variable; m_i is the mean of the ith variable; and s_i is the standard deviation of the ith variable.

[13] Setting a cut-off on the continuous destitution index was essentially an arbitrary judgment: several different thresholds were considered. In the end, we should beware of fixing on 13.8 or any other percentage as the "right answer": tightening the criteria for destitution merely raises the number of people classed as "vulnerable". Whether 597,000 people (14.8%) are considered destitute, or 564,000 (13.8%), or "only" 400,000 (9.5%) is a relatively minor question compared to the less exact, but still quantitative, outcome of establishing that destitution is a widespread phenomenon affecting hundreds of thousands.

[14] This dip in destitution corresponds to a relatively good harvest year, which tends to support the reliability of the recall data.

[15] This section on survival functions draws on unpublished analytical notes by Edoardo Masset.

[16] Kerren Hedlund, WFP Ethiopia, pers.comm.

[17] Data from Ethiopia's Disaster Prevention and Preparedness Commission, compiled in Sharp and Devereux (2004:231).

[18] A standard LSMS (Living Standards Measurement Survey), for example, takes two to four visits per household, each visit lasting up to two hours. The Destitution Study questionnaire was administered in a single interview, averaging about one hour. The proportional piling discussion took between ten and twenty minutes.

[19] 'Livelihood activities' was explained as any type of work or activity (including renting and lending) which the household members engaged in for the purpose of earning cash, food or other income.

[20] Compare the quotation from Huberman and Miles (1994:438) in endnote 10.