POVERTY MEASUREMENT:

Meanings, Methods and Requirements

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Dileni Gunewardena's interest in poverty measurement began in 1993 when she was involved in producing a poverty profile for the World Bank's Poverty Assessment of Sri Lanka using raw data from the *Household Income and Expenditure Surveys* conducted by Sri Lanka's Department of Census and Statistics. She has given lectures in the World Bank Institute's South Asia Region Workshops on Economic Growth and Poverty Reduction, and participated in the South Asia Regional Consultation on the World Development Report 2000/1. Together with co-author, Dominique van de Walle, she won the award for Best Research on 'Escaping Poverty' at the First Annual Awards Competition, Global Development Network in December 2000, for a paper on *Sources of Ethnic Inequality in Vietnam*. She has a Ph.D. in Economics from American University (Washington, D.C.) and received her B.A. (Honours) in Economics from the University of Peradeniya. She is now a Senior Lecturer in the Department of Economics and Statistics at the University of Peradeniya where she teaches Economic Development, Gender Economics and Labour Economics.

The **Centre for Poverty Analysis** (CEPA) was established in May 2001 as an independent institute providing professional services on poverty related development issues. CEPA provides services in the areas of Applied Research, Advisory Services, Training and Dialogue & Exchange to development organizations and professionals. These services are concentrated within core programme areas that currently include the following; Poverty Impact Monitoring, Poverty and Youth, Poverty and Conflict, Poverty Information Knowledge Management.

The study, *Poverty Measurement: Meanings, Methods and Requirements* by Dileni Gunewardena, is a product of the programme on Poverty Information and Knowledge Management. The study was sponsored by the Poverty Impact Monitoring Unit (PIMU) of the German Technical Coorporation (GTZ).

The CEPA Publication Series currently includes the following categories; Studies, Edited Volumes, Working Papers, Articles, Event Series, Manuals/Handbooks and Policy Briefs. CEPA also houses a Resource Centre containing a growing volume of literature and data on poverty in Sri Lanka.

For Lavanya Maureen de Mel,
with the hope that when she grows up she will find less poverty,
no matter how she decides to measure it

Background to the study

This technical study was commissioned by CEPA with financial sponsorship by the German Technical Coorporation (GTZ) to facilitate the setting up of a study programme on improving Sri Lanka's poverty measurement methodology and the poverty information system.

Poverty measurement and analysis is needed to identify the poor, the nature and extent of poverty and its determinants, and to assess the impact of policies (and non-policy shocks) and (poverty alleviation and other social welfare) programmes on the poor. Efficient and accurate poverty-monitoring enables a nation to evaluate its progress in raising the standard of living of its poor, and provides much needed evidence to guide social development policy formulation and to support policy reform. Strengthening a country's ability to track progress on poverty reduction is desirable from the donor community's point of view and this has obvious benefits for the recipient country. National measures of poverty (and other welfare indicators) also provide the basis for international estimates, which enable the international community to keep track of global poverty trends. This is especially relevant at this point in time, when the international community has agreed on the importance of achieving the eight Millennium Development Goals by the year 2015.[1]

The last two decades have witnessed considerable analytical efforts by research organizations, academics and practitioners worldwide, which are directed towards (a) deriving good practices in measuring poverty in all its dimensions, and (b) generating the data requirements and improving the statistical capacity necessary for measurement and monitoring.[2] This research has been fruitfully used to inform policy and guide economic reform in some countries.[3]

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[1] The responsibility for collecting national data on several core indicators lies with individual countries. See www.developmentgoals.org for a list of 48 indicators that will help monitor achievement in 18 specific targets under the eight broad Millennium Development Goals (MDGs).
[2] Poverty mapping initiatives (CGIAR, UNEP etc. etc), Paris 21, and so on.
[3] For example, see Mackinnon, John and Ritva Reinikka, "How Research Can Assist Policy: The Case of Economic Reforms in Uganda", World Bank Research Observer Vol 17, 2 (Fall) 2002.

Sri Lanka has had a long history of data collection and statistical capability and is, in many ways, a model that other countries could follow in the area of data generation.[4] However, while on the one hand, much of the data collected remains underutilised by researchers and policymakers, on the other hand, little revision of data surveys has been undertaken in order to make the data more useful to researchers. There are large potential gains from greater dialogue between data users (local and international academics, research institutions and practitioners) and data producers (primarily the Department of Census and Statistics and the Statistics Department of the Central Bank of Sri Lanka). This is never truer than in the area of poverty research and monitoring.

Poverty measurement exercises have been undertaken for Sri Lanka in at least the last twenty years.[5] These have been characterized by differences in the choice of welfare indicators (income, expenditure and dietary energy) as well as in the method of deriving a poverty line. An "official" poverty line does not exist, nor is there consensus on the methodology that should be used. Little effort has been directed at conceptualising and measuring non-income measures of poverty.

This study arises out of a need identified during a series of brainstorming sessions organised by the Centre for Poverty Analysis (CEPA) on these issues with experts in the field, including data producers and users. The issues discussed specifically included the need to reconsider the current definitions on poverty and methods of measuring poverty, on-going initiatives to improve the poverty data-base, methods of improving existing data, and the centralization and dissemination of data.

The objectives of this study, as identified by CEPA:
The study will provide an overview of the issues relevant to Sri Lanka's poverty measurement methodology and the poverty information sys-

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[4] Sri Lanka's Department of Census and Statistics was considered a possible venue for a study tour by the World Bank Institute in 2001.

[5] A list of estimates of the Headcount Index from studies conducted in the 1980s and 1990s based on survey data from 1969 until 1991 are given in Table 1 in Tudawe, Indra, Review of Data and Data Sources to Monitor Poverty in Sri Lanka, Report prepared for MIMAP-Sri Lanka, Phase I, Colombo, Institute of Policy Studies, June 1999.

tem, with a focus on the strengths and weaknesses of the current status.

In addition to focusing upon economic dimensions of poverty and quantitative methods of data collection and analysis, the study will reflect upon the role of non-economic measures and qualitative methodologies in defining, and measuring poverty.

The study will identify methods to address the issues discussed. It will propose a plan of action that will not be constrained by the existing institutional structure and availability of personnel.

Organisation of the study:

In keeping with the aforesaid objectives, the study, which comprises two parts, focuses on three main questions: *Where do we need to be? Where are we? How do we get to where we need to be?*

Part I: Poverty Measurement: Meanings, Methods and Requirements
Part I focuses on the question, *Where do we need to be?* and attempts to provide an overview of the consensus (and where there is no consensus, an outline of the areas and nature of disagreement) on international best practices in relation to poverty measurement methodology.

The international literature on poverty measurement is a vast area, and somewhat like the proverbial elephant. Typically, social scientists of different disciplines, and practitioners of different approaches, like the blind men in the fable, are familiar with their own methodology and only marginally aware of developments in other approaches to measuring poverty (and consequently apt to dismiss them out of hand). A new empirical debate has arisen as to whether poverty has increased or decreased in the developing world in this era of globalization.[7] Additionally, the area of poverty measurement is experiencing a new phase in conceptual advances, evident in the last few years, even months. All these factors provide the motivation for presenting a review that at-

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[7] Bhalla (2002), Chen and Ravallion (2001) and Reddy and Pogge (2003).

tempts to cover a wide variety of approaches, and does so at a somewhat detailed level. *This study is thus a combination of a non-technical review and a manual.*

This study comprises three main sections: (1) a review of conceptual approaches to poverty measurement, (2) a review of international best practice in relation to poverty measurement and (3) a review of data requirements (and typical sources) for poverty measurement.

Part II: Improving Poverty measurement in Sri Lanka
Part II is a policy paper that focuses on improving *Sri Lanka's* poverty measurement methodology in the light of the best practices identified in Part I. It summarizes the main issues outlined in Part I in response to the question *Where do we need to be* and asks the questions *Where are we?* and *How do we get where we need to be?* In response to these questions, it provides an overview of the current status of poverty measurement methodology in Sri Lanka, identifying areas in which Sri Lanka is lagging behind, and outlines a plan of action that identifies (a) priority areas for improvement, (b) key players in the improvement process and (c) steps that need to be taken by the key players.

CONTENTS

1. Conceptual issues in poverty measurement

In the introductory comments to a conference held at Cornell University in the spring of 2002, Ravi Kanbur stated that while the 1970s and early 1980s were characterised by conceptual ferment in the economic analysis of poverty and inequality, the last fifteen years have seen few advances conceptually in this area.[8] He suggested that there was both a need and an opening for a new phase of conceptual advances (Kanbur 2002). Scarcely one year after this statement was made, there is growing evidence of this new conceptual ferment and a resurgence in research.[9] Conducting a review of international research in poverty measurement methodology in this context is somewhat like hitting a moving target. While many of the conceptual issues and problems raised and discussed in this chapter are not new, the international community is a lot closer to finding new and better answers to these issues and problems than ever before. This is reflected in Chapters 2 and 3, which, draw largely from the last fifteen years of consolidation and application, but also include wherever possible, new methodological insights and developments in data generation.

Why (or for what) poverty is measured will determine to some extent what is measured and how it is measured. Therefore, in Chapter 1, I outline the typical uses of poverty data with a view to defining the scope of the study, and, subsequently, to be able to highlight the differences in data requirements for each of these uses. I then present the debates and consensus regarding concepts and definitions of poverty and identify those that will be used in this study, and that will form the basis for identifying data requirements.

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[8] Rather, they were characterised by consolidation, application and policy debate.
[9] If the themes of several international conferences held in 2003, and of special issues of international journals, are anything to go by, consider the following: in February, the University of Manchester held a Conference on "Staying Poor: Chronic Poverty and Development Policy" and the World Bank held a workshop on Measuring Empowerment, the WIDER conference on "Inequality, Poverty and Well-being" was held in May. In September, a Conference on the Capability Approach was held in Pavia, Italy. The March 2003 issue of *World Development* was devoted to the topic of Chronic Poverty and Development Policy. This is apart from the policy debates and academic research that have been taking place in the developed world, particularly in Europe, the U.S. and Australia. See also Thorbeck, 2003.

1.1 The uses of poverty measurement

Why poverty is measured to some extent determines what is measured and how it is measured. Coudouel, Hentschel and Wodon (2001) list four purposes of poverty measurement and analysis: (1) cognitive (to know what the situation is) (2) analytical (to understand the factors determining this situation) (3) policy making (to design interventions best adapted to the issues) and (4) monitoring and evaluation (to assess whether current policies are effective, and whether the situation is changing).

(1) Poverty measurement takes place at regular intervals so that a society is aware of the ground situation regarding poverty. This can take place at the sub-national, national and international levels. Poverty measurement for cognitive purposes typically involves (a) identifying a poverty line or threshold (which is sometimes called the referencing problem or the identification problem) and (b) deciding how to convey information about the poor in a single indicator or measure (known as the aggregation problem). These problems are addressed in section 2.1 below. Poverty measures thus constructed are used to make poverty comparisons within countries over time or across groups, or with other countries at the same point in time. For international poverty comparisons, a consensus on universally acceptable measures and indicators is needed, and to some extent exists (Ravallion 1994). Poverty comparisons between groups are used to construct a poverty profile. This will typically contain (a) poverty measures across geographical regions and other categories (for example, poverty rates by gender, age, ethnicity, occupation, educational status and labour force participation, etc.); (b) the contribution of these groups to poverty measures (for example, 80% of the poor live in rural areas) and (c) the relative risks of being poor for different groups (Coudouel *et al.* 2001). (See Appendix A for an example).

(2) Poverty analysis moves from describing poverty, to understanding its causes. Types of analysis vary from econometric analyses of the microeconomic determinants of poverty (the approach used in the last World Bank Bangladesh poverty profile)[10] to more qualitative and participatory approaches such as that used in the World Bank Voices of the Poor (Narayan *et al.* 2000). A variety of approaches and methods exist, and there is some consensus on the most appropriate approach for each need.[11] Whatever the approach used, the purpose of analysis is to identify the correlates of poverty and understand its causes. Poverty analysis, therefore, invariably requires information other than poverty indicators (gender, age, ethnicity, occupation, educational status and labour market information, asset ownership and access, infrastructure availability, health and nutritional status etc.)

(3) Probably the most important reason for measuring and analysing poverty is to inform policy to design interventions to alleviate poverty. One incentive for improving poverty measurement methodology and data has come from the need to better target interventions. Primary among interventions are income support schemes directed at the poor. Deciding on a poverty line or threshold is of paramount importance in this case (see section 2.1.3). In addition, poverty profiles of the type described above are useful to guide targeting to the poorest groups. However, the design of interventions is not the only policy application of poverty analysis. It is now explicitly recognised that the overall policy framework needs to incorporate a poverty focus, and mechanisms need to be put in place to measure or monitor the impacts of policy on poverty. In addition, poverty analysis that reveals the causes of poverty has immediate policy relevance.

(4) Monitoring is a continuous process that takes place more frequently than measuring, and its purpose is to provide an almost continuous report on poverty, and how policy makes an impact on pov-

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[10] Wodon, Quentin, 2000. "Micro Determinants of Consumption, Poverty, Growth and Inequality in Bangladesh", *Applied Economics,* 32:1337-1352.
[11] See the World Bank manual for policy makers. (Klugman, Jeni, (ed.), 2002. A *Sourcebook for Poverty Reduction Strategies*. Washington, D.C.: World Bank).

erty alleviation. Like poverty analysis, approaches to monitoring range from sophisticated computable general equilibrium models to more contextual evaluations that are based on the perceptions of the poor themselves. As with analysis, monitoring also requires information other than the information on chosen poverty indicators. These will include information on inputs and processes in addition to outputs, outcomes, and impacts. The distinction is made between poverty monitoring and poverty impact monitoring/evaluation (Klugman 2001). This paper focuses on poverty *measurement,* and the monitoring of poverty that complements measurement.

A slightly different categorisation of the purposes of measurement is often cited in the literature (Kanbur and Squire 2001, Asra and Santos-Francisco 1998). The distinction is made between poverty measurement for the purpose of comparison (similar to category (1) in the first typology) and poverty measurement for the purpose of designing specific poverty-reducing actions (one may argue that categories (2)–(4) above are variants of this purpose). Precision and robustness become more important when the objective of measurement is to help in the design of specific poverty-reducing actions because equal treatment of equals is a fundamental principle of public policy (Kanbur and Squire 2001).

A variant on the question "for what purpose" is the question "for whose purposes?" This question is posed and answered by Uphoff (2001) who asks "For academics, for whom precision and elegance bring professional and personal rewards? For bureaucrats or policy-makers who need to make decisions about resource allocation? For the poor themselves, so that they understand their situation better and can act more effectively on their own behalf?" This paper is based on the belief that the main purpose of poverty measurement is to reduce or eradicate poverty (and poverty measurement is for the poor in that sense), and

that policymakers and academics have a positive and important role to play in that process.

The focus of this paper as the title indicates will be on poverty measurement, rather than on monitoring or analysis. While the underlying concepts discussed in Chapter 1 are relevant to all the purposes and types of poverty "measurement", the differences in these purposes become more obvious when moving from concepts to measurement (Chapter 2) and finally to identifying data requirements (Chapter 3). Any attempt to include all measurement issues and data requirements will be beyond the scope of this study. On the other hand, there will be considerable overlap in the discussion, and where relevant, data and measurement issues relating to monitoring and analysis will also be discussed.[12]

1.2 Approaches to defining and measuring poverty:

Several distinct approaches to measuring poverty are evident in the social science literature. Some of these approaches are conceptually precise and distinct, while others have considerable overlap with each other. Any attempt to classify these approaches is unlikely to be definitive or exhaustive. The categorisation adopted in this study is from a recent set of studies from Queen Elizabeth House, which focuses on four distinct approaches to poverty definition and measurement (a) the monetary approach (b) the capabilities approach (c) social exclusion and (d) the participatory approach (Ruggeri-Laderchi *et al.* 2003).

Approaches to conceptualising, defining and measuring poverty are often loosely referred to as "quantitative" or "qualitative", yet there is often confusion as to just what these two terms mean.

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[12] One way to explain this is to say that this paper will focus mainly on the issues raised in Chapter 1 of the World Bank's *Sourcebook for Poverty Reduction Strategies* (Klugman *et al.* 2001) that deals with Well-being Measurement and Analysis (Coudouel *et al.* 2001) and less with those raised in Chapter 3 in the *Sourcebook* on Monitoring and Evaluation.

Table 1: Five dimensions of characterisation of the qualitative and quantitative traditions

Dimension	Qualitative	Quantitative
Information on Population	Non-Numeric	Numeric
Population Coverage	Specific	General
Population involvement (in design)	Active (subject-driven)	Passive (researcher-driven)
Inference Methodology	Inductive (Interpretivist, constructivist)	Deductive (Logical Positivism)
Disciplinary Framework	Broad Social Sciences	Economics

Source: Adapted from Kanbur 2001a.

Table 1 presents a typology by Kanbur (2001a) in his summary of the proceedings of a workshop on "Qualitative and Quantitative Poverty Appraisal: Complementarities, Tensions and the Way Forward" held at Cornell University in March 2001.[13]

For the purpose of this study, the "monetary" or "money-metric" approach is considered to be quantitative, and the other approaches, qualitative. A comparison of these approaches is given in Appendix B: Table B1.

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[13] Available online at http://www.people.cornell.edu/pages/sk145/qqz.pdf. Workshop participants who usually use a quantitative approach were asked to identify the strengths of the qualitative approach and those who usually use a qualitative approach were asked to identify the strengths of the quantitative approach. In terms of combining the two approaches, quantitative analysts agree on the usefulness of the qualitative approach in (a) suggesting causal connections to be econometrically tested (b) understanding statistical outliers ("it helps to have had tea with a statistical outlier") (c) finding appropriate "exclusion restrictions" in econometrics (d) appreciating the extent of measurement error (Rao 2002) and (e) suggesting (more subjective) questions (and participatory methods) for inclusion in standardised surveys (Kanbur 2001a). On the other hand, qualitative data needs to be put into "enough of a quantitative framework [so] that they can be meaningfully interpreted" (Uphoff, cited in Kanbur 2001a). Mixing of approaches could be "sequential", where each side does their best, and uses the results to triangulate and inform the next stage of design or "simultaneous" for the same population group, so that the participatory/ qualitative approach can improve the quantitative method (Kanbur 2001a). Qualitative data are also less expensive to collect than quantitative data (see table B2 in Appendix B), but are less representative and, therefore, less reliable.

1.2.1 Monetary approach

In this study the adjectives "monetary", "money-metric", "income" and "consumption" and "objective-quantitative" are often used interchangeably to refer to the predominant approach used in Economics to measure poverty that uses household (numeric/quantitative) data collected in (representative, quantitative) household surveys on either income or consumption to construct measures of poverty that relate to a country or region. [14]

This approach falls under the *welfarist (or utilitarian)* approach, where a preference ordering over goods, representable by a utility function is used (Ravallion 1994). The poverty line, in this approach, is the minimum cost of the poverty level of utility at prevailing prices and household characteristics (Ravallion 1998). This approach has also been called the income approach (UNDP 1997, p. 16) or monetary approach, because "in practice, the welfarist approach typically leads to measures based solely on the goods and services consumed by a household, and the household's size and demographic composition" which is a more narrow term than utility (Ravallion 1994).

This approach has dominated the poverty discourse, particularly in the area of measurement. Issues pertaining to measurement under this approach are discussed in section 2.1.

1.2.2 Capabilities approach

The *capabilities approach* was first presented by Amartya Sen in the essay "Equality of What?" delivered as the Tanner Lecture on Human Values in 1979.[15] It defines poverty as not being able to do certain things; lacking capabilities to function or lacking "the substantive freedoms [a person] enjoys to lead the kind of life he or she values" (Sen 1999). It has gained general acceptance in the last decade, and it has become the dominant approach used by the UNDP since the UNDP-

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[14] As well as the world! (Chen and Ravallion 2001, Bhalla 2002).
[15] This was initially published in McMurrin (1980).

based *Human Development Report* 1997 on poverty (UNDP 1997). The World Bank-based *World Development Report* 2000/2001 on poverty also accepts this approach as being a better characterisation of the experience of poverty and increasing our understanding of its causes (World Bank, 2001). The task of poverty analysis and measurement under this approach is to identify what these capabilities are in specific societies and who fails to reach them. However, operationalising this approach still has a long way to go (Ravallion 1994). Currently, the practice followed by the *Human Development Report* is to report on functionings, rather than capabilities.[16] These functionings include being well nourished, being adequately clothed and sheltered and avoiding preventable morbidity, being informed and knowledgeable, being capable of reproduction, enjoying personal security and being able to participate freely and actively in society (Falkingham and Namazie 2002). It has been pointed out that a *functionings*-based operationalisation of the capabilities approach is essentially no different from using *basic needs* measures.[17] Issues relating to measurement under this approach are discussed in section 2.6.

1.2.3 Social exclusion approach

Social exclusion has been described as occurring when a substantial part of the population are disadvantaged, disenfranchised and disaffected (Bradley *et al.* 2003). The EU defines social exclusion as the "process through which individuals or groups are wholly or partially excluded from full participation in the society in which they live" (cited in Ruggeri Laderchi *et al.* 2003) and "a progressive process of marginalization leading to economic deprivation and various forms of social and cultural

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[16] A functioning is an achievement, whereas a capability is an ability to achieve (Sen 1987, p.36).
[17] A *basic needs* approach also focuses on material deprivation, but may be regarded as broader than the monetary approach in that it includes needs that are not purely physiological. For example, the *Human Development Report 1997* (UNDP 1997) mentions the need for employment and "participation" as part of the basic needs approach. The basic needs approach emphasizes the importance of directly measuring poverty, using measures that are intrinsic, not instrumental. Basic needs indicators include access to food, shelter, schooling health services, potable water, and sanitation facilities, employment opportunities and opportunities for community participation.

disadvantage" (cited in Chakravarty and D'Ambrosio 2003).

The concept of social exclusion originated in France in the 1960s and 1970s to refer to those who were not protected by the welfare state and were considered misfits (Saith 2001b). It was extended in the 1980s as deregulation, privatisation and globalisation were accompanied by precariousness of employment to include long term and recurrent unemployment (Bhalla and Lapeyre 1999). It gained popularity in Europe, and was adopted by the European Community (and later the European Union), although attempts to introduce it into the U.S. debate are only very recent (Micklewright 2002).

It is not a substitute for the concept of poverty, but complements it (Haveman 2003). It is a multidimensional concept involving economic, social, political and cultural aspects of disadvantage and deprivation.

Berghman (1995) makes the distinction between concepts referring to situations and concepts referring to processes. Thus, social exclusion is a process, which leads to a situation of relative deprivation, just as impoverishment is a process that leads to a situation of income poverty or insecurity of subsistence (Berghman 1995).[18]

Atkinson (1998) has identified three main characteristics of social exclusion (a) *relativity* (exclusion relative to a specific society) (b) *agency* (excluded as a result of the action of an agent or agents) and (c) *dynamics* (future prospects are as or more important than current conditions). It is multidimensional, involves major discontinuities, and has a neighbourhood dimension (Room 1999). It involves the denial or non-realisation of rights of citizens (Room 1995, Klasen 1998), it emphasizes the lack of participation in social institutions, and includes the idea of distance or polarisation. It differs from the capability and utility approaches in that it is socially defined and is often a characteristic of groups (the aged, handicapped, racial or ethnic categories) rather than

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[18] Related approaches are the *resources* approach and the *relative deprivation* approach. According to the resources approach, poverty is not having certain things (necessities or basic needs), or not being able to afford certain things or activities that enable one to participate in the life of the society. Closely related is the relative deprivation approach and is often found in the developed country (sociological) literature where poverty is defined as the lack of choice or lack of resources (Townsend 1979) and which emphasizes relative deprivation rather than absolute deprivation.

pertaining to individuals (Ruggeri-Laderchi *et al.* 2003). The agency aspect of social exclusion also points to the existence of distributional conflict.[19]

Issues relating to measurement under this approach, and in a developing country context are discussed in section 2.7.

1.2.4 Participatory approach

The critical feature distinguishing the *participatory approach* from other approaches is that in this approach the people themselves participate in assessing their own poverty and are able to "share, enhance, and analyse their knowledge of life and conditions, to plan and to act." (Chambers 1994). Participatory poverty assessments (PPAs) are "designed to learn how individuals from various social groups assess their own poverty and existing poverty reduction strategies, how various survival strategies operate, which government poverty reduction strategies people prefer, and which they are prepared to support. The findings are meant to refocus, elaborate or validate conclusions from conventional poverty assessments" (Salmen 1995, cited in Kanbur and Squire 2001). "Participatory assessments pay special attention to process, with the aim of engaging a range of stakeholders, generating involvement, maximizing local ownership, and building commitment to change" (Kanbur and Squire 2001). Issues relating to measurement under this approach, in a developing country context, are discussed in section 2.8.

1.3 Issues in defining poverty

Any discussion about the measurement of poverty needs to begin with its definition. There is a general consensus that poverty is about **deprivation**, or lack of **well-being**. However, beyond this point there is much debate, some of which is still unresolved. Some of the issues that are discussed are:

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[19] Whereas the utility and capability approaches imply that poverty can be reduced through growth alone, this approach focuses on the importance of redistribution.

In what space is poverty best conceptualised?

Is poverty a uni-dimensional or multidimensional phenomenon?

Is poverty about absolute or relative deprivation?

Is poverty subjective or objective?

In what sense is poverty different from inequality?

Should poverty be measured directly or indirectly?

Does the time duration of poverty matter for measurement?

How is vulnerability related to (and different from) poverty?

There are many areas of overlap in the discussion of these issues, and frequently those that take one position in relation to a particular debate, will take a related position with respect to another debate. For example, Townsend adopts a needs or resources approach to poverty, which then leads him to assert the untenability of the idea of absolute needs (Townsend 1979, cited in Sen 1983). Similarly, a fully relativist position defines poverty in terms of inequality.

1.3.1 Poverty in what space?

In 1979, when Sen first introduced the capability approach, the prevailing theories offered by Moral Philosophy relating to equality were Utilitarianism and the Rawlsian theory of justice (Saith 2001a). Sen proposed capabilities as an alternative and more appropriate "space" to evaluate inequality than the space of utilities or that of primary goods.[20] Sen (1999) presents the claims in favour of the capability approach to poverty as follows: (1) the approach concentrates on deprivations that are intrinsically important, unlike income which is only instrumentally significant (2) income is not the only instrument generating capabilities (see Figure 1 below) and (3) the instrumental relation between low income and low capabilities is variable between different families and different individuals.

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[20] This approach was further developed by Sen in subsequent publications (Sen 1985; 1987; 1988; 1992; 1997; and 1999).

Muellbauer (1987) presents the links that Sen (1987) makes between goods, capabilities, functionings and utilities in Figure 1 below. Starting from the top right hand row, conventional market goods are first transformed into material characteristics (for example, aspects of nutrition such as calories and proteins). These characteristics are then transformed into capabilities and finally into actual functionings (achievements). Higher levels of achievement give higher levels of utility. At each step of transformation, other factors come into play (the lower row). Thus, it is not goods only, but a person's environment (for example, climate and public goods such as clean air) that determine the amounts of material characteristics that can be achieved. Conversion of these material characteristics into capabilities will vary according to personal characteristics, and the final achievements will depend also on the person's psychic state, which also influences the utility the person derives from his/her functionings.

If one were to include income in this figure it would be to the right of commodities, and a corresponding box in the lower row would include prices (income, together with prevailing prices, determine the amount of commodities that can be consumed). Sen (1992) argues that in income space, the relevant concept of poverty has to be inadequacy (for generating minimally acceptable capabilities) rather than lowness (independently of characteristics).

Figure 1: Utility, functionings, capabilities and their sources
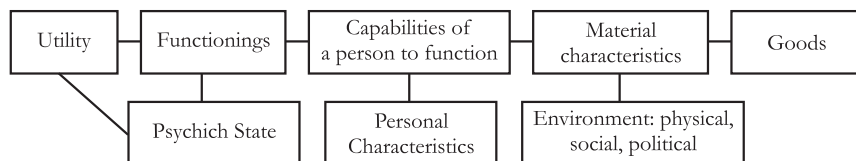
Source: Muellbauer 1987.

Although utility is depicted as the end of the chain, Sen argues against using utility to judge the standard of living because utility or the ability to be happy is (a) just another capability and (b) too subjective and quirky. The same argument can be raised against using functionings or actual achievements (The oft-quoted example of the person with means who is fasting out of choice as opposed to the person who is starving because of lack of means is relevant here). Sen argues that it is "the set of available capabilities of a person to function …[that is] what the standard of living ought to be about". This is a point on which there is consensus. However, when it comes to measurement, it is often easier to observe people's actual achievements or functioning, than their capabilities or what the set of achievements might have been.

Ravallion (1998) argues that focusing on capabilities for defining poverty does not require that we abandon monetary, utility-based, characterizations of welfare. The concept of capabilities, as an intermediate level between utility and commodities consumed is a way of dealing with the problem of referencing (determining the poverty line) and is not a substitute for utility as the welfare indicator, but complements it by providing additional information. He argues that presenting the two approaches as fundamentally different and debating their relative merits can be misleading.

Operationalisation of the social exclusion approach varies in terms of the space in which poverty is measured. Several attempts have been made to explicitly apply the capabilities approach to social exclusion (Poggi 2003). Other ways of measuring social exclusion explicitly refer to "resources" lacked (Mack and Lansley 1985) while a third category makes no explicit reference to the capabilities approach, yet tends to focus more on what people are excluded from *doing* or *being* rather than on *what they lack*.

While explicit mention of space is not evident in the participatory approach, the emphasis on the process and experience of poverty is closer to a capabilities approach than a resources or commodities approach.

1.3.2 Poverty is multidimensional

The notion that poverty is deprivation that is experienced in multiple dimensions is uncontroversial. Conceptions of *what* these dimensions might be have evolved over time from the purely *economic* to including *education* and *health* (*social* indicators, or indicators of *human poverty*) to much broader ideas that include *social inclusion*, empowerment of the powerless and voiceless *(political)* and *vulnerability*. The decennial World Bank *World Development Reports* on poverty illustrate the expanding conception of poverty. The *World Development Report 1990* included low achievements in education and health as part of the appropriate concept of poverty, while the *World Development Report 2000/ 2001* includes vulnerability and exposure to risk, as well as voicelessness and powerlessness. Measuring the latter aspects of poverty poses special challenges, but there is ongoing work in this area.[21]

Chambers (1992) suggests that at a minimum, there are three dimensions of poverty: *survival, security* and *self-respect*. Baulch (1996) expands this conceptualisation of poverty in a "pyramid of poverty concepts". Line 3 provides the conception of poverty as economic survival, which is broader than (private) income (or consumption) alone, including common property resources and state provided commodities.[22] The inclusion of assets recognises the role of assets in reducing vulnerability or increasing security, while dignity and autonomy, ingredients of self-respect, are important aspects of functioning, the lack of which is manifest in voicelessness and powerlessness. Thus, the last line is considerably expanded to a definition closer to Sen's understanding of poverty as capability deprivation.[23]

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[21] Conference on measuring empowerment held in Washington, D.C. (World Bank) in March 2003.
[22] A completely "economic" definition would also include time adjustments that enable the total value of home production to be incorporated (Douthitt 1994).
[23] Other "pyramids" of expanding poverty concepts define poverty in terms of four types of capability deprivation: economic, human, social, political and protective (Gsaenger 2003).

Figure 2: A pyramid of poverty concepts

PC
PC + CPR
PC + CPR + SPC
PC + CPR + SPC + Assets
PC + CPR + SPC + Assets + Dignity
PC + CPR + SPC + Assets + Dignity +Autonomy
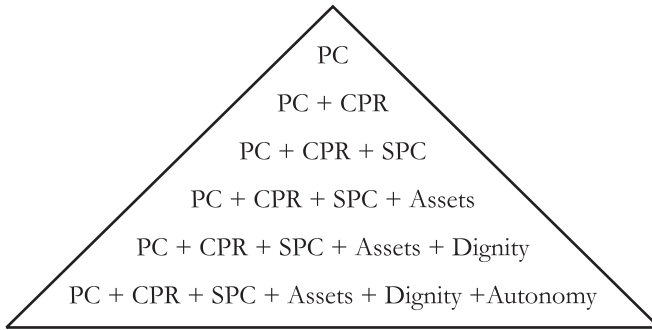
Source: Baulch, 1996

Note: PC=private consumption; CPR=common property resources; SPC= state provided commodities

It should be noted that measurement becomes increasingly more difficult as one moves further down the pyramid in Figure 2. The extent to which monetary poverty measures are good proxies of the broader concepts then becomes a crucial issue (Baulch 1996).

The capabilities, social exclusion and participatory approaches all explicitly refer to poverty as multidimensional. However, the difference in concepts leads to differences in the way these multiple dimensions are incorporated into the measurement of poverty. Chapter 2 reviews this in greater detail (Section 2.2).

1.3.3. Absolute vs. relative

The relativist approach sees an individual's or household's deprivation (or lack of well-being) determined by its position relative to others in society (Townsend 1979). Sen (1983) distinguishes between *fully relativised* and *primarily relativised* views of poverty.

A fully relativised view of poverty (where for example, the poor are

considered to be those in the bottom 10 or 20 percent of society) essentially means that poverty is viewed as an issue of inequality. One problem with viewing poverty in this way is that it will never be completely eradicated. Similarly, if the level of living in the entire society falls, with no change in the distribution, according to this approach, poverty would not have increased, although some people may even be starving. It also makes comparisons across countries or regions difficult, although one might argue that if the same relative definition was to be used by all countries, some type of comparison can be made. A primarily relativised view of poverty is less problematic. For example, the European Commission uses a relative poverty line of 60% of the median income, which replaced the previous threshold of half the mean income of the society.[24] The number below this poverty threshold can, in theory at least, be zero (Sen, 1983).

An absolute definition of poverty is based on the idea that "there is an irreducible core of absolute deprivation in our idea of poverty, which translates reports of starvation, malnutrition and visible hardship into a diagnosis of poverty, without having to ascertain first the relative picture" (Sen 1981). This irreducible core need not be time-invariant; people's absolute needs can vary over time. It is also probable that this core will vary from society to society: absolute deprivation in sub-Saharan Africa will be different from absolute deprivation in Alaska.

Sen (1983) explains this by pointing out that, "the absolute satisfaction of some … needs might depend on a person's relative position vis-à-vis others" which (Sen thinks) is well illustrated by Adam Smith's discussion of the concept of necessities in *The Wealth of Nations*:

"By necessaries I understand not only the commodities which are indispensably necessary for the support of life, but whatever the custom of the country renders it indecent for creditable people, even the lowest order, to be without … Custom … has rendered leather shoes a necessary of life in

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[24] The EC defines the poor as "persons, families or groups of persons whose resources (material, cultural and social) are so limited as to exclude them from the minimum acceptable way of life in the Member State in which they live" Hagenaars *et al.* 1994:2.

England. The poorest creditable person of either sex would be ashamed to appear in public without them."

(Smith 1776, pp. 351-2).

While many use this passage as an example of a relative conception of poverty, Sen points out that what is absolute here is the avoidance of shame, which Sen characterises as a capability. In order to escape poverty, what are needed are shoes (a commodity) and that is society-specific. Thus, Sen argues, "absolute deprivation in terms of a person's capabilities relates to relative deprivation in terms of commodities, incomes and resources" (1983).

In 1995, at the UN World Summit on Social Development, the governments of 117 countries agreed on the definitions of *absolute* and *overall* poverty.

"Poverty has various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion. It is also characterised by a lack of participation in decision-making and in civil, social and cultural life. It occurs in all countries: as mass poverty in many developing countries, pockets of poverty amid wealth in developed countries, loss of livelihoods as a result of economic recession, sudden poverty as a result of disaster or conflict, the poverty of low-wage workers, and the utter destitution of people who fall outside family support systems, social institutions and safety nets.

Women bear a disproportionate burden of poverty and children growing up in poverty are often permanently disadvantaged. Older people, people with disabilities, indigenous people, refugees and internally displaced persons are also particularly vulnerable to poverty. Furthermore, poverty in

its various forms represents a barrier to communication and access to ser-vices, as well as a major health risk, and people living in poverty are par-ticularly vulnerable to the consequences of disasters and conflicts. Absolute poverty is a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shel-ter, education and information. It depends not only on income but also on access to social services."

<div align="right">United Nations (1995)</div>

Do the different approaches to poverty view poverty as primarily absolute or relative? While the quantitative approach can incorporate both views, the tendency, at least in the case of measuring poverty in the developing world, is to use the concept of absolute deprivation. What comprises the minimum level of well-being below which a per-son or household can be said to be poor will vary in each society. How this translates into the determination of the (monetary) poverty line is discussed in section 2.1.

Poverty measurement in the capabilities-functionings approach tends to use absolute measures (or expert-defined thresholds), although the indicators used may be society-specific and change over time and across locations.

In the relative deprivation and social exclusion approaches, poverty, by definition, is relative. However, there is a tendency when applying this approach to developing countries to use measures of exclusion and deprivation defined in an absolute sense.

In the participatory approach, poverty definitions are local, and there-fore highly relative.

1.3.4. Subjective or objective?

Does poverty have an objective existence, where it is up to the researcher, or society to observe and describe it, or is it society or individuals in

society, that define(s) it? If so, who defines it?[25] Two other variants of this question are, is the definition of poverty ultimately a value judgement? (The parallel question is, whose value judgement?) Is it a policy definition?

Why some people may find it difficult to conceptualise poverty as absolute deprivation is the difficulty in determining what the core of poverty is, or where the poverty threshold lies. They would argue that any attempt to define a poverty threshold is normative and prescriptive. Piachaud (1981) claims that "the definition by an individual, or by society collectively, of what level represents poverty will always be a value judgement". Mollie Orshansky (1969), who was influential in determining the U.S. poverty line says "poverty, like beauty, lies in the eyes of the beholder."[26] Marx (1867) had no such problem: "in a given country, at a given period, the average quantity of the means of subsistence necessary for the labourer is practically known."[27] Commenting on this, Sen argues that "[while the] description of necessities may be very far from unambiguous ... the presence of ambiguity in a description does not make it a prescriptive act-only one of ambiguous description."

Interestingly, participants at the Cornell "Q-squared" Conference (who were mainly proponents of either the monetary approach or the participatory approach) did not seem to consider this to be overly important. Kanbur (2001a) says that context (the strength of the qualitative approach) was seen as important, but more as a better investigative method in revealing the unique "truth", than as a way of revealing multiple and possibly conflicting perspectives on reality.[28]

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[25] One typology distinguishes between "expert-based deprivation thresholds" and "people's views on what is necessary" (Boltvinik 1997)

[26] See Case Study C1 in Appendix C for more on the U.S. poverty line.

[27] Quoted in Sen, 1981.

[28] Summary of the proceedings of a workshop on "Qualitative and Quantitative Poverty Appraisal: Complementarities, Tensions and the Way Forward" held at Cornell University in March 2001, available online at http://www.people.cornell.edu/pages/sk145/qqz.pdf

Poverty is not a policy definition

Two types of poverty lines are found in practice: (1) a diagnostic or descriptive poverty line ("who are the poor?") and (2) a prescriptive or "immediately imperative" income-support line ("who are eligible to receive assistance?") (Foster and Sen 1997). In Britain, the poverty line is related to the Official Supplementary Benefit Scale (Sen 1983), and this is the case in China as well (Asra and Santos-Francisco 2001).[29] The tradition of identifying the poverty line with the level of benefits has been called the *policy definition* of poverty (U.S. President's Commission on Income Maintenance in 1969, cited in Sen, 1983). The definition of poverty does not depend on the feasibility set of a given society, although the latter will determine how much poverty is eradicated. The danger of linking the poverty line to the cut-off to be eligible for government support is obvious: a lower poverty line will imply that there is less poverty, whereas in reality, it will only mean that less poverty is being eradicated. As Sen (1983) succinctly states "Inescapable poverty is still poverty". Thus, when there is a link between the poverty line and the cut-off for eligibility for benefits, it is important that the poverty line is determined before and independently of the latter.

1.3.5. Poverty and inequality

Poverty and inequality are conceptually distinct. When measuring inequality, one is concerned with changes in the entire distribution of well-being. For example, "a transfer of income from a person in the top income group to one in the middle income range must *ceteris paribus* reduce inequality; but it may leave the perception of poverty quite unchanged" (Sen 1981). Even relative definitions of poverty line define poverty either in relation to a relative poverty line or concentrate on the levels of deprivation of the most disadvantaged, such as the bottom

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[29] In Hong Kong, although there is no official poverty line (because the government refuses to adopt one), the government claims that the rates of social assistance are adequate, and the prevailing level at which support through social assistance is given is taken to be the *de facto* poverty line (MacPherson 1998). See Tables C1 and C2 in Appendix C.

40% of the society, whereas inequality is concerned with changes in the relative position of anyone in the society.[30]

The concepts of poverty and inequality are strongly related, however, and there is a strong case for focusing on inequality among the poor. That is, it is important not to regard the poor as one homogenous group, but to differentiate between different levels (or degrees) of poverty. Many societies will agree, in theory at least, that improving the lot of the poorest of the poor (the Rawlsian criterion) ranks first on the poverty alleviation agenda.

While the conceptual distinctness of poverty and inequality is acceptable to any of the approaches to poverty discussed in this study, inequality is a key concept in both social exclusion and participatory approaches, where the relative nature of poverty is emphasized.

1.3.6. Direct and indirect definitions of poverty

A distinction that is often made in the literature is that between direct and indirect measures of poverty (Sen 1981). Sen (1999) also refers to the related difference between *intrinsic* and *instrumental* measures of poverty. A direct measure such as the Direct Calorie Intake Method (DCI) of defining poverty directly observes whether some measure of adequacy (enough calories so as not to be hungry) *has* been met or not, whereas an indirect measure such as income only conveys the information as to whether the level of adequacy *can* be attained (afforded) or not. Atkinson (1987) makes the distinction between the right to a minimum level of resources and the attainment of a minimum standard of living.[31] Indirect approaches tend to be used by the objective-quantitative approach, while the direct approach is favoured more by the subjective-qualitative approach. Table 2 provides a useful overview.

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[30] This focus only on those below the poverty line is known as the "focus axiom" of poverty.
[31] Note that Atkinson's distinction is more akin to the difference between capabilities (the ability to do or be certain things) and functionings (the actual achievement or attainment of them).

Table 2: Direct and indirect concepts

Definition or issue	Indirect concepts found in Objective-Quantitative or Monetary approach	Direct concepts found in Subjective-Qualitative or Social Exclusion approach
Definition of welfare	Resources, in particular income (that are *determinants* of a way of life)	Living conditions, way of life, quality of life
Definition of poverty	Lack of resources, in particular, income	Social exclusion, lack of social integration
Relevant concept in empirical poverty research	Subsistence minimum concept	Relative deprivation concept
Measuring devices	Poverty line, equivalence scales	Deprivation scale, index of deprivation
Social policy goals	Guaranteeing minimum income	Combating social exclusion

Source: Adapted from Kohl 1996

1.3.7. The dynamics of poverty

Chronic and transitory poverty are distinct phenomena, caused by different processes with different policy applications. For example, policies to alleviate chronic poverty demand increases in the physical and human capital of the poor or in the returns to their labour, while insurance schemes are more appropriate for transient poverty (Kanbur and Squire 2001).

Thus, the measurement of poverty should aim to shed light not just on the static observation of households' living standards at differing

points in time, but on the duration of poverty, and the processes that move households in and out of poverty. For example, how much of a reduction in poverty is due to better protection of those groups vulnerable to poverty (those who are just above the poverty line), versus better performance at promoting the poor (moving them out of poverty)? (Dreze and Sen 1989, cited in Ravallion 1996). People who are "at risk" may temporarily have low incomes, but those who have just emerged from poverty may temporarily be above the poverty line, but be still suffering from material deprivation from prolonged periods on low income (Bradshaw 1993, Gordon 2000).

How large are movements in and out of poverty? Several studies suggest they are large. For example, between 1975 and 1983 panel data from a survey of six Indian villages by the International Crops Research Institute for Semi-Arid Tropics (ICRISAT) showed that 50 percent of the population was poor in a typical year, but that only 19 percent was poor in every year (World Bank 1990). Jalan and Ravallion (1998) found that in China transient poverty accounted for 37 percent of total poverty for households that were below the poverty line, on average, and that this varied according to the overall level of the province (in better off provinces a higher proportion of poverty was transient). In Indonesia, the country hardest hit by the East Asian Crisis, incomes in urban areas fell by one third, whereas the decline in rural areas was less than 15 percent (Poppele, Sumarto and Pritchett 1999). Allocation of income support schemes according to the pre-crisis distribution of poverty would have missed many of the newly poor in urban areas (Kanbur and Squire 2001).

Hulme and Shepherd (2003) attempt a conceptualisation of *chronic poverty* that advocates (1) a durational definition that an individual is chronically poor if he experiences significant capability deprivation for a period of 5 years or more, (2) a multidimensional definition that in-

corporates non-monetary measures into the measurement of long-term poverty, (3) focusing on chronic deprivation experienced by *individuals* rather than households,[32]   (4) a relative, rather than absolute definition of chronic poverty.

The different approaches to understanding poverty differ in their approach to the time duration of poverty, and use different methods in analysing and measuring it. These are examined in detail in Chapter 2, section 2.3.

1.3.8. Poverty and vulnerability

Vulnerability is an aspect of poverty that relates to risks, shocks, stresses and internal defencelessness (Streeten 1994, cited in Lok-Desallien, 1997). World Bank (2002a) defines it as the expected welfare loss resulting from unexpected events and lack of insurance against them. The poor are vulnerable to external shocks,[33] the poor are less well insured against risk, and as a result fall deeper into poverty. Chambers (1995) describes vulnerability as having "two sides: the external side of exposure to shocks, stress, and risk; and the internal side of defencelessness, meaning a lack of means to cope without damaging loss". Outside sources of risk range from irregular rainfall and epidemics to crime and violence, the structural vulnerability of homes, and civil conflict. On the internal side, the poor lack the means to protect themselves adequately against risk: assets, insurance, and access to credit. Thus, vulnerability (or the other side of the coin, assets to protect against vulnerability) could well be used in Baulch's (1996) pyramid of expanding poverty concepts (Figure 2).

Participatory surveys reveal that economically marginalized groups tend to be socially marginalized as well, so that they are disadvantaged with respect to both resources and power (Salmen 1995). In Cameroon, the poor distinguished themselves from the non-poor on five main cri-

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[32] In some households, all members may not experience poverty "in similar ways over similar times".

[33] These could occur at the micro (household) level (for example, illness, death), sometimes called *idiosyncratic*, at the meso or community level (pollution, riots), and at the national or international level (national calamities, macroeconomic shocks), known as *aggregate risk*.

teria: hunger in their households, fewer meals a day and nutritionally inadequate diets; a higher percentage of their income spent on food; nonexistent or low sources of cash income, *and a feeling of powerlessness and inability to make themselves heard* (World Bank 1995a, cited in Kanbur and Squire 2001).

Kanbur and Squire (2001) identify at least two dimensions of the problem of risk: it keeps the poor in low-risk, low-return activities, and it endangers what they already have. Studies of credit and insurance highlight the difficulties involved in lending to and insuring the poor (Aleem 1990 and Hazell, Pomareda and Valdes 1986). This keeps them in low-risk low-return activities. For example, a study of Indian households found that households that are more vulnerable to income shocks devote a much smaller proportion of land to risky high-yielding varieties (Morduch 1990). Most credit networks are intra-village, and of little use in the face of aggregate shocks (like crop failure) that hit the entire village. A study of rural households in south-western China in the 1985-1990 period found that the loss of one year's income as a result of crop failure led to a manageable 10 percent decline in consumption for the following year for the richest third of households, but for the poorest 10 percent the comparable figure was a devastating 40 percent (Jalan and Ravallion 1999).

A summary of measurement issues relating to vulnerability is given in section 2.4 in Chapter 2.

1.4. Summary

Any measurement of poverty must begin with defining and conceptualising it. Why poverty is measured determines to some extent how it is measured, and the definitions that relate to the measurement of it. Kanbur and Squire (2001) argue that the way in which poverty is defined drives the strategy for dealing with it. Broadening the

definition enables a larger range of policy instruments to be used to reduce it. At the same time, the interactions among different aspects call for a careful integration of policies. The purpose of this chapter in highlighting the debates in poverty definition and measurement was to indicate the complexity of the issues involved, the diversity of the approaches to conceptualising and measuring poverty, and indicate the nature of disagreements.

The concept of poverty used in this study is not restricted to one approach, but draws from all of them, highlighting similarities and differences (see Appendix B, table B1).[34] It is based on a definition of poverty that is primarily absolute, albeit with an inescapable relative element, it holds that poverty is not a value judgement or a policy definition but rather has an objective existence, which is up to the researcher to identify, describe and analyse, that quantitative-objective and qualitative-subjective approaches complementarily assist in uncovering this objective existence, that it is distinct from inequality, though related, and that inequality among the poor is a factor that needs to be included in poverty measurement, that it is multidimensional, incorporating not only material deprivation but also vulnerability and powerlessness, and that capturing the dynamics of poverty is an important component of poverty measurement.

In the next chapter, I look at specific issues in measuring poverty. I begin by outlining best practice methods in poverty measurement within the monetary approach, and assess how it resolves the issues raised in Chapter 1. I then move on to the other approaches, and examine each in the context of the issues raised in this chapter.

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[34] "This study" refers to the present volume as well as to the accompanying policy paper *Improving Poverty Measurement in Sri Lanka*

2. Good practice in poverty measurement

Any exercise involving the measurement of poverty needs to address the problems of: (1) Identification (Who are the poor?), and (2) Aggregation (How can the phenomenon of poverty be described or summarised in a scalar index?). An additional problem that arises under the issue of identification is that of referencing (with reference to what are the poor considered poor?) Measurement choices that affect identification include (i) t*he choice of indicator*, and (ii) *the choice of a poverty line* or "threshold". Choices that affect aggregation include (iii) *the choice of unit* over which poverty is to be defined, (iv) *the choice of measure,* and (v) *the choice of weights* when multiple dimensions are combined.[35]   How these issues are addressed and choices made depend on the approach to understanding and measuring poverty that is used.

In this chapter, I attempt to describe how the different approaches to poverty address the aforesaid choices and deal with incorporating into measurement, the conceptual issues discussed in Chapter 1. A large section of this chapter (section 2.1) is devoted to the traditional objective-quantitative approach with its focus on monetary measures of poverty. The relative size of this section is primarily due to the volume of the literature on measurement within this approach. A secondary reason for the focus on this approach is to provide the Sri Lankan reader with a much-needed reference to best practices that have been developed in this approach over the last two decades or so.

In sections 2.2 and 2.3 I focus on two major aspects of poverty measurement that have either ostensibly, or in reality, been ignored in the objective-quantitative approach. Section 2.2 highlights the main issues involved in the incorporation of multidimensionality in poverty measurement. Section 2.3 focuses on measuring the dynamics of poverty.

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[35] The choice of weights is also implicit in converting household consumption into equivalised individual consumption.

Sections 2.4 and 2.5 on measurement of vulnerability and voicelessness and powerless, by contrast, are much smaller, reflecting either the size of the literature, or that these issues are addressed in other sections.[36]

From sections 2.6 to 2.8, I expand the review to include capabilities, social exclusion, and participatory approaches to measuring poverty. The literature on measurement within these approaches is considerably smaller than in the objective-quantitative approach, but is growing rapidly, and has much to contribute to the issues of incorporating multidimensionality and dynamics into the measurement of poverty. Section 2.9 discusses two related approaches (proxy measures of poverty, and subjective indices of deprivation). Section 2.10 summarises this section and highlights issues relevant to improving poverty measurement methodology.

2.1 Monetary approaches to poverty measurement

The monetary approach to measuring poverty can be traced back to Booth (1887) and Rowntree (1901) who studied poverty in London and York, in the late 19th and early 20th centuries. In the 20th century, poverty measurement within this approach made "basic conceptual advances" with the work of Atkinson (1970, 1987) and Sen (1973, 1976, 1981, 1987) in the 1970s and 1980s, culminating (at least according to one author) with the famous paper (Foster, Greer and Thorbecke 1984) that resulted in the FGT measures that are now the "workhorse of applied work on poverty the world over" (Kanbur 2002).

In this section, I begin with the four choices that any poverty measurement exercise must address, drawing on the well-known work of Ravallion (1994, 1996 and 1998) and others in outlining best practice within this work (Deaton 1997, Olsen Lanjouw 1997, Coudouel *et al.* 2001). I then briefly describe the uses of this method and end with an outline of the limitations of this approach.

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[36] Many of the issues relating to vulnerability are dealt with in the section on poverty dynamics (Section 2.3) as well as in the section on multidimensionality. Both vulnerability and voicelessness and powerlessness are dealt with in the capabilities, social exclusion and participatory approaches to poverty measurement as well (Sections 2.6 to 2.8).

2.1.1. Choice of indicator

The main contenders for measuring poverty in the "monetary" approach are income and consumption expenditure. Coudouel *et al.* (2001) present three arguments from the literature for using consumption rather than income.[37] (1) It is a better outcome indicator than income. Actual consumption gives a better idea of a person's well-being. Income may not translate easily into capabilities (access, availability etc. influence the correspondence of income to capabilities). (2) Consumption is a better indicator of a household's ability to maintain its standard of living even when income fluctuates (the ability to smooth consumption is an important aspect of well-being). These two factors have provided reasons for the consideration of the use of expenditure in the measurement of poverty in some developed countries (Travers and Richardson 1993 in the Australian poverty measurement debate; Slesnick 1993 referring to the U.S., both cited in Saunders 1997). The recent Eurostat poverty measurement project used expenditure as the indicator, compared to the Luxemburg Income Study (which focuses on income inequality). Atkinson (1989) distinguishes between a "standard of living approach" which sees poverty in terms of not actually meeting a minimum standard (consumption would be the appropriate indicator here), and a "minimum rights" approach, which focuses on the right to (being able to afford) a minimum level of resources (income is more appropriate in this instance). However, the overwhelming argument in favour of using consumption when measuring poverty in developing countries is (3) that it is usually better measured than income.

Measurement error and the choice of indicator

Typically, income data is unreliable because people do not like to reveal their income (especially if there is a perception that the information will be used against them-for tax purposes, or jeopardise their sta-

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[37] See also Deaton 1997 and Ravallion 1994.

tus as government benefit recipients). In the urban informal sector and in rural agrarian households, income flows will vary and recall error is highly likely. Net income needs to be calculated, which necessitates the recall of input costs and household's consumption of their own produce, which requires imputing prices.[38] Measuring consumption expenditure is also not without problems. Prices of households' own consumption need to be imputed and the relevant recall (reference) period for different sets of expenditures need to be determined such that measurement error is minimised.[39] Empirical work has shown that the more commodities listed on a recall sheet, the higher the measure of aggregated consumption that results (Pradhan 2000). This means that changes in the number of items included in the survey may bias intertemporal or cross-country comparisons (or comparisons of different regions within the same country based on different survey instruments). Omission of certain categories of expenditures may bias the profile of poverty if the effect of the omitted category is non-random. For example, if the use value of water is not included in a consumption measure, and the public provision of water is correlated with locality (urban/rural or geographically) the estimates of poverty will be biased. (Consumption of water-abundant urban areas is underestimated relative to water-scarce rural areas). However, expenditure modules in household surveys are typically designed well. (Some countries even go to the extreme of not collecting income data because it may influence the information that households supply on expenditure).[40]

Another problem with using consumption (expenditure) rather than income is that some items of expenditure are incurred due to a fall in well-being (for example, health expenditures are incurred when a per-

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[38] Parallel, developed country groups where consumption expenditure may be a better indicator than income are the self-employed and the aged (Saunders 1997).

[39] A well-known example involves the 50th round of India's National Sample Survey in 1993/94 where the standard (but unusual in data collection practice) 30-day recall period for all items was changed to the 7 days before for items of food, beverages, etc. and 365 days for items where expenditure was infrequent. Experimental surveys conducted following the 1993-94 survey confirmed that reported expenditure in food is significantly higher if the recall period is shortened, and average monthly expenditure on durables is lower if the recall period is lengthened (Deaton 2001b and Sen 2000, cited in Tarozzi 2003).

[40] India's National Sample Survey.

son falls sick, yet, following common practice a person who incurred such expenses would be considered less poor than a person who had zero health expenditure).

Valuing home production and imputing prices

In many agrarian economies cash income (expenditure) is only a small proportion of total income (consumption). The problem of what prices to impute arises whether the indicator being used is income or expenditure. If income is the chosen indicator, one needs to calculate the value of production. The appropriate measure is net returns (gross output minus purchased inputs and hired labour costs).[41] The question of how to value the output (or, if expenditure is the chosen indicator, how to value consumption of own produce) arises: what is the appropriate price? Is it farm-gate (the opportunity cost of not selling it), or market (what it would have cost to buy it), private or official marketing agency, local or regional? These issues are discussed further in Deaton (1997) and Deaton and Zaidi (1999)

Deriving the use value of other goods and services

Even the best measures of consumption expenditure are likely to run into problems when imputing, say, the rental value of owner-occupied housing in regions where the rental equivalent would be almost impossible to determine. While it is important to price basic services such as water, the process of doing so is complicated.[42] Similarly, while it is important to impute a value to in-kind benefits such as publicly provided health and education services, there are difficulties in doing so.

2.1.2. Choice of unit of analysis

Where consumption behaviour is concerned, the "family", not the individual is the natural unit (Sen, 1981; Atkinson, 1991). This may be

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[41] Family labour would enter into both sides of the equation (part of total income, but needs to be netted out of gross income from production), and therefore can be omitted.
[42] About 50 percent of households in Ecuador obtain water from the highly subsidized public network. The urban poor, who are not connected, have to pay high prices to obtain water from private bowsers. The survey only includes nominal expenditure which does not accurately indicate actual consumption by households (Hentschel and Lanjouw, 1996).

the household (unit of residence), the spending unit, a blood or marital relationship, dependence or inner family (those usually at home).[43] Why we focus on this larger unit, and not individuals, is because we do not assume that individuals with zero income are without resources. In practice this means that data is collected at the household level, and all members of the household are treated as having a common standard of living.[44]

However, it is difficult to think of households as repositories of well-being (Deaton, 1997) so one needs to convert family income into individual income. The easiest way to convert family income is to divide through by the number of family members. However, two important concepts to be considered are that of (a) economies of scale (two people living together must spend less to achieve a given living standard than two people living apart, for eg. housing costs and utilities expenditure are unlikely to double when family size increases[45]) and (b) need-based adult equivalence-households differ in their composition, and more specifically, children need less than adults.[46] Dividing household income (expenditure) equally among its members ignores the true dispersion, and therefore understates inequality and, in some instances, poverty. When there are economies of scale, using per capita income (expenditure) as the indicator will overstate poverty (understate welfare). Household consumption then needs to be scaled in some manner to derive equivalent consumption.[47]

Equation 1 is a useful way of depicting equivalent consumption.

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[43] In the UK, until 1985, official statistics were based on the family unit. This definition was subsequently changed to that of the household — characterised by common residence and commonspending.

[44] This can be a problem if there is great variation in the allocation of resources within households, for example, if women or the elderly are discriminated against within the household.

[45] However, in many developing countries, housing costs are a small percentage of expenditure, economies of scale are likely to be small.

[46] Some analyses also use a breakdown by gender. The notion that women need less than men is controversial.

[47] Alternatively, different poverty lines could be used for different household compositions. It is more common to convert the consumption indicator than to use several poverty lines, although these are equivalent. (See discussion below on adjusting for prices and consumption patterns).

Equation 1

Equivalent consumption = total household consumption / n^s

where n is household size and s is the elasticity of "family need" with respect to family size; which varies according to the age composition of household. When $s=0$ there is no adjustment for family size; when $s=1$ the measure is equal to per capita consumption (which amounts to ignoring economies of scale and equivalence scales). With $s=0.5$ (strong economies of scale), a household of four persons are assumed to have needs that are twice those of a one-person household, whereas with the per capita adjustment ($s=1$) their needs would be four times as high. Where there are moderate economies of scale ($s=0.75$) the assumption is that a four-person household has needs that are 2.8 times that of a one-person household.[48]

The question of how to adjust for economies of scale and adult equivalence is then the question of how to determine S. (1) One basis is to use the nutritional requirements of different types of people. It is common in developing countries to find nutrition-based scales based on age and gender. For example, in order to function normally, a child below the age of five may need one-third the calories of an adult male. If this is used as the basis for an equivalence scale, a household with one adult male and three children below the age of five will be considered equal to two (equivalent) adult males (Olson Lanjouw 1997). Nutritional requirements (while not uncontroversial) can only be used to determine equivalence in food requirements.[49] Children's non-food needs such as education, clothing and medicine could easily exceed those of adults. While several nutritional norms used in practice differentiate between adult males and females, this practice is debatable.

(2) A second way to deal with this is to base it on consumption practices; how do people regard the equivalence question themselves?

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[48] The example is from Falkingham and Namazie (2002). A study of poverty in Ireland used the following scales (1) Initial adult 1, additional adult 0.7, additional child 0.5 (2) Initial adult 1, additional adult 0.6 and additional child 0.4 (3) Initial adult 1, additional adult 0.66 and additional child 0.33 (Whelan and Nolan 1996).

[49] Even when determining nutritional norms, one needs to consider activity levels, degree of physical adaptation of persons to different nutritional intakes at given activity levels, and the importance of nutrients other than calories.

This can be done by (a) asking people themselves: for example, How much extra income would a larger family need to manage? "Subjective" perceptions of a poverty line may be useful to derive a poverty line in this manner (See section 2.9). It can also be done by (b) using household data to examine the actual consumption behaviour of families with differing sizes. The problem with deriving scales from observed consumption patterns is that families may not have the same concern for meeting the different needs of different groups (that is, female and elderly individuals may be discriminated against).

The methods described above to find equivalence scales by different types of people do not always solve the problem of economies of scale. Dreze and Srinivasan (1995) have argued that the share of public goods in total consumption can be interpreted as an upper bound of the degree of economies of scale in household consumption.

While there are theoretically many ways of establishing equivalence scales, there is little guidance on how to choose among the different methods available. Use of household per capita income (expenditure) assigned to individuals is still widely used, and in the absence of a widely accepted alternative to it (Olson Lanjouw 1997) is still "best practice" (Deaton 1997). An obvious exception is that the use of per capita consumption will lead to the erroneous conclusion that larger households are poorer.

Does it matter in practice? Empirical studies have shown that poverty rates are quite sensitive to the introduction of equivalence scales (and it is quite common to use sensitivity analysis with alternative equivalence scales), but a recent study of Ecuador (Hentschel and Lanjouw 1996) indicated that poverty *profiles* are much less sensitive (Olsen Lanjouw 1997). When there is insufficient basis for deciding on a particular equivalence scale, the best approach is to conduct a sensitivity analysis to see if poverty profiles are sensitive to the choice of equivalent scale.

2.1.3. Choice of poverty line

In this section I first examine the functions of poverty lines, then briefly examine measurement-related issues relating to absolute and relative poverty lines and finally focus on methods of constructing (absolute) poverty lines. I draw heavily on Olson Lanjouw (1997) and Ravallion (1994, 1996 and 1998).

Functions of poverty lines

As with the overall measurement of poverty, the use of a particular poverty line determines the factors that should be considered in constructing it. Olson Lanjouw (1997) identifies four functions of poverty lines (a) poverty monitoring (b) developing a poverty profile (c) a threshold for entitlements and (d) a focus for public debate.

Poverty monitoring

The poverty monitoring function of poverty lines is to allow the calculation of poverty rates which, in turn, allows for poverty comparisons, which can then be used to inform the targeting of transfers or determine the best locations for development expenditures, to track changes in poverty rates over time, and to evaluate the poverty impact of policy interventions.

Developing a poverty profile

Poverty lines can be used to construct poverty profiles, which identify the correlates of poverty and are helpful in identifying the determinants of poverty. The general location of a poverty line that is constructed for this purpose should have broad support and be in line with conventional intuition (Olson Lanjouw 1997).

A threshold for entitlements

In several countries the poverty line is (or is linked to) the reference income or expenditure level to which state transfers are linked. Poverty is then defined as a policy definition (see section 1.3.4.) of poverty referred to earlier, and this role is controversial because it provides governments with an incentive to define the poverty line according to the availability of government funds needed to alleviate it. Much of the public debate surrounding the new "experimental" poverty lines in the U.S. relate to this very issue.[50]

A focus for public debate

A poverty line can help to focus public attention on the issue of poverty. Atkinson (1993, cited in Olson Lanjouw 1997) claims that the existence of a well-defined poverty line in the U.S. has helped to increase public discussion of the situation of the poor and how it has changed over time. This is true for the new "experimental" poverty line in the U.S (Citro and Michael 1995). The $1-a-day poverty line which has come in for a lot of criticism, nevertheless has this feature of being useful for advocacy purposes: it is easy to visualise and can be understood by laymen as well as experts, and helps to keep the issue (of developing countries' poverty) alive in the developed world. An official national poverty line "provides a public benchmark for the level of living standards that are considered adequate in a country, and thus constitutes a key device for monitoring the progress of poverty reduction policies, whether by government of other parts of civil society" (Falkingham and Namazie 2002).

Absolute or relative

The conceptual issues underlying the choice between measuring absolute and relative poverty were discussed in section 1.3.3. Absolute pov-

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[50] See Fisher 1999 for an overview of developments since the 1995 report of the National Research Council Panel. Some of these are given in Case Study C1 in Appendix C.

erty lines attempt to set a standard of absolute deprivation, while relative poverty lines are defined in relation to the distribution of the population under consideration. An example of a relative poverty line that was commonly used in many developed countries (and all the European Union) is 50 percent of average (mean) income (adjusted for family size and composition using equivalence scales) (for example, Callan and Nolan 1998). This was proposed in the 1960s by the U.S. economist Victor Fuchs because it was a line that would automatically rise as living standards rose. The European Union adopted a different definition in 2002, that of 60% of the median (adjusted) income because the median is less sensitive to changes in income for groups of the population.[51]   Relative poverty lines of the type described above work well when living standards rise slowly and steadily; however, if they fall in a period of economic decline, the poverty line will also fall in real terms. This happened in New Zealand between 1983/84 and 1992/93 where despite a fall in real terms of the relative poverty line, measured poverty remained constant. If the absolute value of the 1983/84 relative poverty lines were used in 1992/93, measured poverty would have increased almost three-fold, from 4.3 to 11.3 percent (Waldegrave and Frater 1996). Had relative poverty lines been used in Africa during the 1980s, measured poverty would undoubtedly have been underestimated! Relative poverty lines also do not work well when incomes are rising very rapidly, as in Ireland in the last decade (where the distribution of income remained constant, so that low incomes also rose). The misleading impression that is given with a relative (moving) poverty line in this situation is that no progress has been made in reducing the extent of poverty. Thus, even in the developed world, there are situations when relative poverty lines should be complemented with absolute poverty lines. It has become common now to include both a time-variant relative poverty line, as well as a relative poverty line for a specific year

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[51] For example, if everyone in the population were given enough money to bring them up to half mean, then the mean itself would rise, whereas if the same were done with those below half the median income, the median would not change. Unlike the mean, the median is unaffected by changes in the incomes of the very rich.

that is fixed in real terms over time (Feres *et al.* 2003).

Although there are strong philosophical reasons for choosing a relative, rather than an absolute poverty line, ultimately the choice of cut-off for a relative poverty line is always arbitrary. Relative poverty lines make most sense in countries where absolute deprivation is not the social norm. In many low-income countries a poverty line of half the median will not suffice to meet even the most basic needs (Falkingham and Namazie 2002). A relative poverty line that has been used for Ghana by the World Bank is two-thirds of mean household expenditure per capita (World Bank 1995b). A similar approach used by Neef (2002) uses 40 percent of average incomes to denote the threshold for severe poverty and 60 percent of average incomes to denote the threshold for relative poverty in Romania. An accepted (though arbitrary) measure for the definition of destitution is "a quarter of median rural income" (Harriss-White 2003).

International and national

Poverty comparisons across countries can use national poverty lines or an internationally-comparable standard. For example, if one were comparing Sri Lanka and Bangladesh in a given year, one could say "x percent of the population in Sri Lanka was poor compared to x percent in Bangladesh, where we are using the definitions of poverty that each country uses to define its standard of minimum needs". Alternatively, one can try to arrive at some common standard and then find out how much poverty exists in Sri Lanka and Bangladesh relative to that standard. This latter approach is reflected in the now famous $1-a-day at purchasing power parity poverty line (Chen and Ravallion 2000). In practice, poverty measures using these different approaches rarely yield the same results. Comparisons of poverty rates in Asian countries based on national poverty lines with those based on PPP-adjusted $1-a-day

line showed higher poverty rates using the former (Gsaenger 2003). Atkinson (1991) reports that in Europe, poverty according to a line that is fixed at 50 percent of average national income is significantly different from (lower than) poverty according to a line fixed at 50 percent of the community average. Thus, the $1-a-day poverty line should be seen as a supplement to, rather than a replacement for, a national poverty line based on a minimum consumption basket that has been calculated and priced specifically for an individual country's circumstances (Falkingham and Namazie 2002).[52] The discussion below pertains to how this should be done.

Method of choosing an absolute poverty line

Once the choice of indicator, and the choice of unit of analysis have been made, the next steps in constructing a poverty line are deciding on (1) the food component of the poverty line and (2) how to include non-food items.[53]

Setting the food poverty line

This involves determining the minimum nutritional requirements per day for a reference person or household, which in practice, are typically defined in terms of energy requirements (Olson Lanjouw).[54] Two approaches are commonly used: (a) Least cost approach (b) Actual expenditure approach.

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[52] The value of the $1-a-day in local currency terms is obtained using purchasing power parity rates—whose construction is not entirely without problems.

[53] The Direct Calorie Intake (DCI) method (described below) of deriving a poverty line only computes a food poverty line, which is derived in terms of energy requirements that are given in terms of caloric intake. Several other methods exist which do not separate out the food and non-food component, such as (a) Lipton's (1983) definition of ultra-poverty which considers the poor to be those who spend more than 80 percent of their income on food while meeting less than 80 percent of their nutritional requirement (b) The Wolf Point or equilibrium point method which identifies the poverty line as that level of income where household savings are zero. Other methods use the income level where the Engel coefficient (proportion of income/expenditure) allocated to food reaches a maximum [(Edirisinghe 1987) uses this method].

[54] Some exceptions are the Philippines Food Poverty line which includes protein micro-nutrient intake as well (Asra and Santos-Francisco 2001), and food poverty line used in a World Bank Poverty Assessment for the Kyrgyz Republic where the food basket was determined to meet protein, carbohydrate and fat minimums as well (Olson Lanjouw 1997).

The least cost approach constructs a food basket that is consistent with prevailing tastes and satisfies the minimum calorie requirement at the lowest cost, given prevailing prices. Its main advantage is that it is not a highly data-intensive process. Its main disadvantage is that it is unlikely that people with food expenditure equal to this food poverty line will actually be meeting their minimum requirements (because tastes differ). In addition, when minimum requirements are defined in terms of several norms (calories, proteins, carbohydrates, vitamins, etc.), deriving the poverty line becomes a complicated linear programming exercise, which makes the result non-transparent (and non-intuitive) to the layman (Olson Lanjouw 1997).

Expenditure-based food poverty lines use actual data on household expenditure to derive the poverty line. A segment of the population (the lower deciles) is chosen as the reference population, and their food consumption patterns (in terms of actual quantities of a basket of main food items) are obtained from household survey data.[55] The contents and composition of the basket are derived entirely from actual consumption data. These quantities are converted (using national calorie conversion tables) into calories and total caloric intake is calculated.[56] Actual consumption can then be scaled up or down, depending on whether the total calorie intake is less or more than the minimum requirement. Once this is done, the cost of the basket is calculated according to prevailing prices to obtain the food poverty line.

Thus, the main difference between this method, and the method previously described, is that rather than prescribing a least-cost food basket, this method uses the actual consumption patterns of households in determining the food basket. Thus, the final basket is not nec-

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[55] Practice in determining this reference population varies across countries. The prescribed method is to choose the lowest 40% (or thereabouts) based on a national ranking of individuals. [56] Note that calorie conversion will differ by individuals, and any average conversion is only an approximation of actual conversion. The degree of disaggregation for conversion tables is a matter of controversy. Some would argue for separate urban and rural conversion rates, in addition to those by sex and age, while others would argue that the appropriate division might be by sector of occupation, rather than location (for example, manual workers expend more calories than those in sedentary occupations).

essarily (and is unlikely to be) a least-cost basket. This is more likely to ensure that minimum nutrition requirements are being met at the poverty line.

The disadvantage of this approach is that data requirements are heavy. Information is needed not only on expenditure on food but also on quantities consumed, and not just on food purchased, but food produced at home, and this then leads to issues of pricing (imputing values to) home-produced food.

However, this is the method most commonly used in constructing a food poverty line. The U.S. food poverty line, derived in the 1960s is one of the early examples based on a household survey of consumption.[57]

Both these approaches run into problems when food consumption patterns vary hugely by region or by a particular group in society. This issue is dealt with in the section on adjustments below.

Another approach that is sometimes used by governments is the Direct Calorie Intake (DCI) method. In this case, calories, rather than consumption or income, is the indicator, and the poverty line is itself denoted in calories, that is, it is related to the minimum calorie requirement.[58] The advantage of the DCI method is that it is just that-direct-one observes a capability (not being undernourished) being met directly (intrinsically, rather than instrumentally). Moreover, it is a "real" measure of consumption. If one uses this method, one does not have to calculate price indices to make comparisons over time and space (see below). Its main disadvantage is that it ignores the fact that food consumption is only one aspect of well being, that poverty denotes a lack of access to basic needs other than food, such as clothing, housing, education and health.

The once-popular definition of ultra-poverty (those who spend more than 80 percent of their income or consumption on food expenditure

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[57] The Department of Agriculture's 1955 household survey of food consumption.
[58] This measure is thus not a monetary indicator.

and meet less than 80 percent of their caloric requirement) is a variant of this method, which allows for non-food expenditure, but is also problematic. The Food and Agricultural Organisation (FAO)'s categorisation defines a household to be at minimum subsistence if its food share is 50-59 percent, and to be in absolute poverty if the food share was over 59 percent. Both these measures are based on the so-called Engel curve, the empirical observation that as income increases, the proportion of income used for food falls. The problem with this concept is that it has been observed (by Lipton 1983, among others) that at very low incomes (the poorest 5-15 percent, Lipton says), the Engel coefficient (the food share) first rises as incomes increase, before it falls. These households would not be meeting their minimum food requirements, and as their income increases, they allocate a greater proportion of the increased incomes to improve food intakes. According to the FAO and ultra-poor definitions, an increase in incomes would lead to an increase in measured poverty, which is counter-intuitive. Anand *et al.* (1993) use consumer finance data from Sri Lanka (CFS 1981/82) to test the criteria in the concept of ultra-poverty and find that (a) neither calorie intake nor food share, on their own, contain very much poverty information, that (b) together they perform better than separately, but that (c) even the double criterion is inferior to a poverty criterion based simply on total expenditure. Food share is also not a very useful concept in countries with high public service provision, such as China (where the public provision of health and education services obviates the need for private expenditure on them-and thereby reduces the non food component of expenditure).

Accounting for non-food expenditure in the poverty line.
Two approaches are possible: (a) a direct method where the non-food items are explicitly defined and priced and added to the food poverty

line (also known as a budget-standards approach) and (b) where the food poverty line is scaled up by some factor to determine the (total) poverty line.

The first approach is rarely used in practice (Olson Lanjouw 1997), although its use may be more widespread than is commonly believed. An example of its use is the Ministry of Labour's calculation of the poverty line for Uzbekistan (World Bank 1994 cited in Olson Lanjouw 1997). COPLAMAR (1983) uses the Mexican Basket of Essential Satisfiers, which includes "expert-based" standards for clothing and shoes. The difficulty in doing so is that unlike a minimum nutritional requirement, on which some consensus may be achieved, there are few "standards" that can be applied to basic non-food items, and any list is bound to be contentious. A criticism of the budget standard approach (that applies to both food and non-food components of it) is that it is "dominated by expert assessment of the normative dimensions of adequacy"(Saunders 1997).[59] These expert judgements can be misleading because they create the unwarranted impression of objectivity (Citro and Michael 1995, quoted in Saunders 1997).

The second method of scaling up the food poverty line to obtain the total poverty line is more common. This method looks at the actual non-food expenditure of some group. The question is which group? Two approaches are commonly used: (1) determining the average level of total expenditure of those people whose food expenditure is just equal to the food poverty line and (2) determining the non-food expenditure of people whose total expenditure is just equal to the poverty line and adding it to the food poverty line. Ravallion (1994) refers to the first as the typical non-food spending of those who just attain the food requirement, and the second as the typical non-food spending of those who can just afford the food requirement. The argument in favour of the latter is that if people whose consumption is just enough to af-

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[59] These experts would include nutritionists, housing experts, health care specialists and financial counsellors.

ford their food spending divert some of it to non-food spending, then that non-food spending could be termed basic. Ravallion (1994) suggests that the two approaches represent an upper (ZU) and lower (ZL) bound of the poverty line, respectively. This approach is known as the Cost-of-basic-needs method (CBN) (see Figure 3).

Figure 3: The Cost of Basic Needs Method for setting the non-food allowance

Food spending and total spending

Total Income or Expenditure
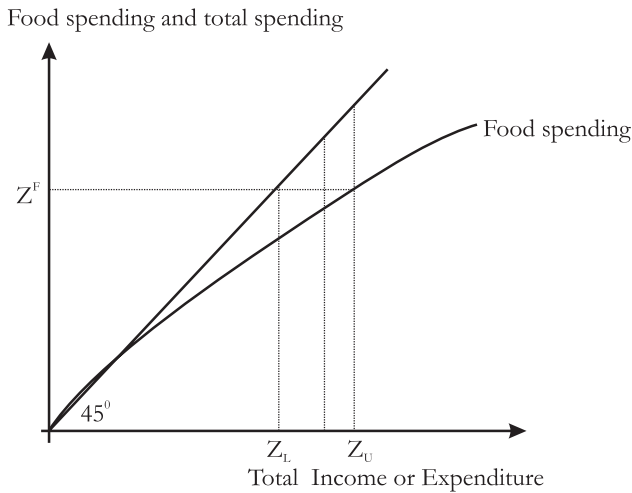
A practical difficulty exists if there is no "group" whose food or total expenditure is equal to the poverty line. One possibility is to choose households whose (per capita or adult equivalent) food expenditure is within a small interval around the poverty line and calculate their median total (per capita or adult equivalent) expenditure. Several groups of households could be chosen at successively larger intervals around the poverty line, and an average of their median total expenditure can be used as the final poverty line. Another possibility is to use a sub-sample of household survey data to estimate a model of food expendi-

tures as a function of total expenditures and other characteristics, such as household size and age composition, and to use the estimates to predict the nonfood expenditure of households at a given level of food expenditure (Ravallion 1994).

Adjustments for price differences and consumption patterns
Poverty lines are used among other things, for poverty comparisons. This must mean, for example, if poverty comparisons are made over time, that the poverty line must be adjusted to account for inflation. This can be done in one of two ways: if the poverty line is anchored in, for example, 1995 prices, current expenditure data (for example, in 2002) can be converted to real terms in 1995 prices. Alternatively, current expenditure data can be kept in nominal terms and the 1995 poverty line can be updated to 2002 real terms. Both these methods require a suitable price index.

The cost of living may also vary, at a given point in time, between regions, or urban and rural areas of the same country. Adjustment for regional price variation is then necessary (and possible, using household survey data). In a similar manner to that described for temporal adjustments, one of two methods may be used. A regional cost-of-living index may be constructed, and expenditures adjusted by this index and then compared against a single, national, poverty line. Alternatively, and equivalently, unadjusted expenditures can be compared against region-specific poverty lines. Note, however, that these region-specific poverty lines are region-specific only in terms of prices, and not consumption patterns. This is known as the principle of *consistency,* or treating individuals with the same living standards equally.

Price adjustments need to take into account differentials in quality. For example, Ravallion and van de Walle (1991) found that, although average dwelling rents were six times higher in urban Java than in rural Java, once quality differences were taken into account, the differential

was only about 10 percent.

When consumption patterns vary widely by region, should poverty lines be based on different (food) baskets? The question to be asked is whether the reason for different consumption habits is due to taste differences or differences in levels of wealth. Richer urban households may consume a more refined quality of rice than poorer rural households, because they can afford to do so. In this case it is difficult to justify different food baskets: a single consumption basket based on the consumption pattern of low-income households in the country as a whole is justified. However, if, in some region of the country, rice is not consumed at all, owing to some factor other than price, then there are problems with using a common basket as in the case of East Sumba in Indonesia (CEPA 2003). Some researchers argue for methods such as the food energy intake method (see below) on grounds of *specificity,* in that it reflects better the actual food consumption behaviour of individuals around the caloric threshold given their tastes and preferences, in addition to relative prices.[60]

One commonly used method that uses separate food baskets is the food energy intake method (FEI). This method aims to find the monetary value of the poverty line at which "basic needs" are met, implicitly acknowledging that total consumption of goods and services is a better welfare indicator than food-energy intake per se (Ravallion 1998). The exercise is described graphically in Figure 4.

The easiest way to calculate poverty lines according to the FEI method is to calculate mean consumption of a sub-sample of households that meet their required calorie intake (in whatever manner). Alternatively, one can regress-separately by sub-sample-food energy intake (not food expenditure) on total consumption, and calculate the poverty line as the inverse of the function. Like the DCI method, it avoids the need for price data. The problem with the FEI method is that it allows poverty lines to differ according to tastes, activity levels

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[60] Asra and Santos-Francisco (2001) explore the issues of consistency and specificity in a review of poverty lines in several Asian countries.

and relative prices, and other factors that may not be relevant to poverty comparisons (Ravallion 1998). For example, in the case of urban and rural areas, nonfood goods tend to have lower prices in urban areas, and their availability is greater. As a result, the demand for food and, therefore, food energy intake will be lower in urban areas than in rural areas at any given level of income. But this does not mean urban households are poorer. Activity levels in certain urban occupations will be less than in agricultural occupations, requiring fewer calories (for example, agricultural labour and factory work, WHO 1985 cited in Ravallion 1998) so food intakes may be lower at a given income. Urban areas may consume more expensive calories. Poverty lines calculated for Indonesia, using the FEI method, resulted in urban-rural cost of living differences far in excess of the reality, and calculated poverty rates that portrayed urban poverty incidence to be higher than rural poverty, when the reverse was the actual case (Ravallion and Bidani 1994).

Figure 4: The Food-Energy Intake Method

Food energy intake (Calories per day)

Total Income or Expenditure
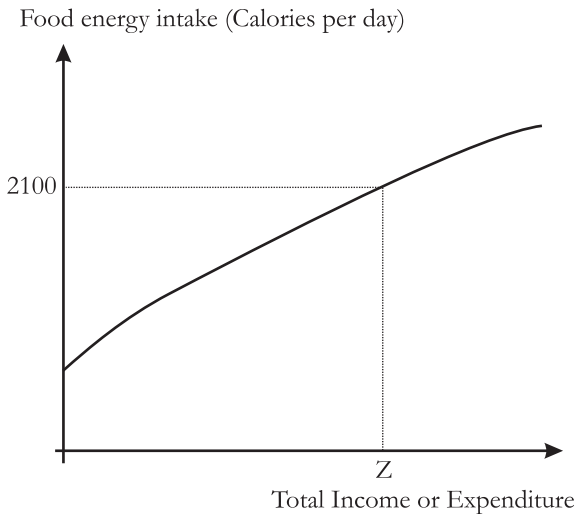
How can genuinely different consumption patterns be accounted for in constructing poverty lines? One possibility is to choose a reference group (for example, the bottom 40 percent of the population) nationally, and construct separate consumption baskets for the different regions.

Finally, cost-of-living adjustments, whether spatial or temporal, should be made using prices that are appropriate to the poor. Integrated surveys like the Living Standards Measurement Survey (LSMS) include a community-level module on prices, which (if obtained locally, and for items that the poor consume) can be used to construct price indices. Alternatively, unit values can be constructed (divide household expenditure on items by the quantity consumed of them) which, though not as good as using prices, are better than the alternative of not adjusting for cost-of-living differences.

Updating the poverty line between survey years requires the use of local consumer price indices. Consumer price indices are constructed from two sources: a set of prices, collected on a regular schedule from retail shops and markets around the country; and a set of weights, which typically come from a household expenditure survey. Problems can arise with both components (Deaton 2001). Prices may be difficult to collect in rural areas, resulting in urban bias, the markets chosen may not be representative, and enumerators may not observe the prices people actually pay. The main problem with weights is when they are too old. The Indian Consumer Price Index for Agricultural Labourers (CPIAL) had weights that were 35 years old, when it was revised in late 1995. When updating its poverty lines, the Indian Planning Commission re-weights the components of the CPIAL so as to match more closely the purchases of people near the poverty line, using weights from 1973-74, which are still dated (Deaton 2001a).

Table 3: Summary of approaches to setting an absolute poverty line

Component of the Final Poverty Line	Method	Advantages	Disadvantages
Food Poverty Line	Least-Cost (normative)	Identifies the lowest cost food bundle. Does not require detailed expenditure data.	Food bundle may not accord with actual eating habits. Complex-particularly with multiple nutritional minimum.
	Expenditure-based (normative)	Consistent with eating habits of low-income households. More likely that obtaining a caloric minimum implies balanced nutrition.	Requires detailed household-level quantity and expenditure data.
Non-Food Component (normative)	Choosing Non-Food Bundle Directly	Straightforward and transparent. Does not require expenditure data.	Arbitrary and paternalistic. Requires price data.
	Scaling Up Food Poverty Line (non-normative)	Reflects behaviour of low-income households.	Requires household-level expenditure data.

Source: Olson Lanjouw 1997.

Should poverty lines be increased in real terms over time? A well-known argument is that consumption patterns change over time, that there are goods today that were not known several years ago. While some would argue for maintaining the historic reference bundle on grounds of consistency, others would argue to change the reference bundle to reflect changing consumption patterns on the grounds of

specificity. The advantage of the relative poverty line approach is that it automatically updates the poverty line for inclusion of such changes, as well as changes in the overall level of well-being of the society. Another approach to incorporate changing consumption patterns is to broadly define groups of essential goods and services (for example, food, housing, health and education, transportation, personal care), but use household surveys, whenever they are available, to include consumption patterns and update poverty lines. This is the approach recommended by the National Research Council Panel on revising the U.S. poverty line (Citro and Michael 1995).

The dominance approach or poverty comparisons without poverty lines

Arguments about arbitrariness of the poverty line will persist, whatever the method chosen. An alternative to using a poverty line is to use the dominance approach, which can be used when the purpose of poverty measurement is to develop a poverty profile, or to make comparisons across groups and time. This method is graphical, and uses household data on the chosen indicator (for example, per adult equivalent consumption expenditure). Cumulative distribution functions for 1985-86, 1990-91 and 1995-96 for Sri Lanka are plotted in Figure 5.

Figure 5: Cumulative distribution functions in Sri Lanka, 1985-1996

O 1995-96   □ 1990-91
+ 1985-86
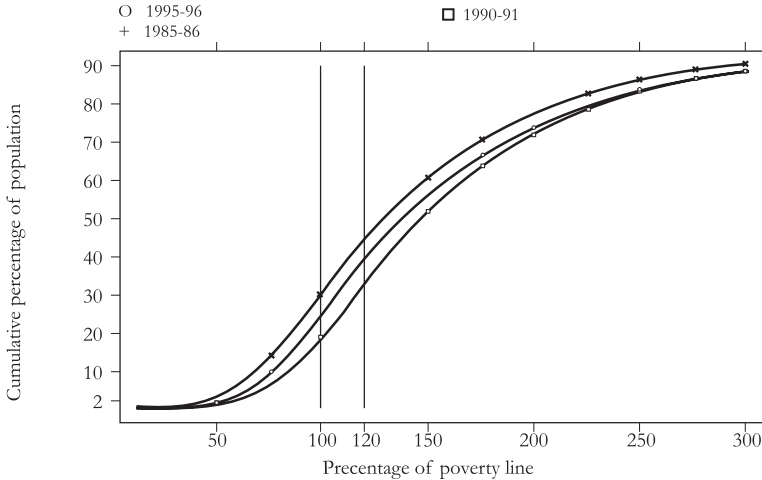
Cumulative Distribution Functions 1985-1996

Source: Gunewardena 2000.

The horizontal axis is given in percentages of the poverty line. Since the poverty line is denoted in per capita household consumption expenditure (Rs.791.67 per person per month in 1995-96 rupees), this is the underlying metric. For each level of per capita expenditure (expressed as a percentage of the poverty line) reading off the vertical axis for one of the curves indicates the incidence of poverty that would result if that level had been chosen. For example, at (100 percent of) the poverty line, the incidence of poverty in 1995-96 is close to 25 percent, in 1990-91 it is a little less than 20 percent and in 1985-86 it is close to 30 percent. Looking at the graph one can see that if the poverty line were to lie anywhere between 50 percent and 250 percent of its current posi-

tion (that is anywhere between Rs.396 and Rs.1979 per person per month) it would always be true that the incidence of poverty in 1985-86 was the highest and in 1990-91 the lowest, among the three time periods. This result is robust to a wide range of poverty lines (from about 50% to 250% of the reference poverty line).

This approach is useful only when the curves do not intersect. An intersection of the curves would imply that it mattered where the poverty line was located; a comparison of poverty incidence would not be robust anymore.

Underlying this approach is the notion that the usefulness of poverty measurement lies in the ability to make *poverty comparisons* based on *ranking* rather than cardinal comparisons. The latter are too "fragile to the specific assumptions that inevitably underlie a particular poverty line or poverty measure" (Olson Lanjouw 1997).

2.1.4. Choice of poverty measure

Two theoretical "requirements" of poverty measures are worth discussing before specific measures are discussed. One is the requirement of decomposability, the other is the requirement of continuity. A decomposable measure "allows the breakdown of total poverty into components, and tells us how much of the overall poverty may be attributed to various population subgroups respectively" (Foster and Sen 1997). An intuitive way of understanding this concept is to think of what would happen with measures that are not decomposable: it would be entirely possible for the poverty measure for the whole group (say, for Sri Lanka) to go up while the measure for each subgroup (urban, rural and estate) were to go down.

"Continuity" is also easier to understand in terms of its opposite: discontinuity or the existence of a "jump" at the poverty line. If we are confident that there really is a "jump" in welfare at the poverty line, and we are confident about the location of the poverty line, then pov-

erty measures that are not continuous are a good thing. On the other hand, if we do not believe the jump occurs at a particular poverty line, then continuity is to be desired. The property of continuity allows a measure of poverty to give highest priority to the "poorest". This concept is illustrated below with regard to the specific poverty measures.

The Headcount Index (H) is one of the best-known and most widely used measures of poverty. It measures the incidence of poverty, that is, the percentage of individuals in a given population whose standard of living lies below the poverty line. The problem with this measure is that it disregards inequality below the poverty line, that is, it contains no information on the degree of poverty (shortfall below the poverty line) of each individual. For example, if a transfer of income from a poorer person to a richer person (both of whom start off below the poverty line) enables that individual to "jump" the poverty line, according to the headcount index, poverty has decreased; but we disregard the effect on the individual who remained below the poverty line, and became poorer.[61] Another illustration is that if a poor person were to die, it would reduce the headcount index, not increase it! (Sen 1976). The advantage of this measure is that it is easy to understand, and it is also decomposable.

The Poverty Gap Index (PG) remedies the lack of information below the poverty line by measuring the depth of poverty. It is the average shortfall between an individual's level of consumption and the poverty line, where the shortfall for all individuals whose consumption falls above the poverty line is zero. It can be interpreted as a per capita measure of the total shortfall of individual welfare levels below the poverty line.

The income-gap ratio (I), which is the percentage average shortfall of the poor from the poverty line, is more intuitive than the poverty gap ratio, but it gives no information about the numbers in poverty (another way of saying this is that it only indicates the depth of pov-

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[61] In the language of social welfare and inequality axioms, it violates the principle of transfers.

erty, but not its extent). The poverty gap ratio does both, in that it is the product of the Headcount Index and the income-gap ratio (H x I).

However, in both these measures, if the transfer from a poorer person (poor) to a richer person (poor) leaves the richer person below the poverty line, the aggregate (and thus, the per capita) shortfall will not change, because the increase in the poorer person's shortfall is exactly offset by the decrease in the richer person's shortfall.

Sen (1976) attempted to remedy this by constructing a measure of poverty (S) that explicitly included inequality below the poverty line. The original formula for Sen's index is given by Equation 2:

Equation 2

$$S = H(G^P) - PG(1 - G^P)$$

where G^P is the gini coefficient among the poor. The equation above expresses poverty as a combination of the headcount index, and the poverty gap index, specifically as the average of the two, weighted by the gini coefficient. The problem with the gini coefficient is that it is not strictly decomposable, and as a result S is also not decomposable. It is also not a "continuous" measure of poverty.

The Squared Poverty Gap index (PG2) measures the severity of poverty. By squaring the shortfall between an individual's level of consumption and the poverty line, it places greater weight on poorer individuals. Thus, the squared poverty gap index is sensitive to relative deprivation among the poor. The headcount index, poverty gap index and poverty gap squared index are part of a family of measures of poverty known as the Foster-Greer-Thorbecke measures that can be defined as

Equation 3

$$P_\alpha = (1/n) \sum_{x<z} [(z-x_i)/z]^\alpha$$

where x_i is the consumption of the ith individual, z is the poverty line, n is the population size and α is a non-negative parameter. When α is 0, P=H; when α is 1, P=PG; and α is 2, P=PG^2 (Foster, Greer and Thorbecke, 1984).[62] Table 4 summarises the poverty measures described in this section.

Table 4: Choice of poverty measure

Poverty Measure	Description
P_0 Headcount Index (H) The incidence of poverty	The percentage of individuals in a given population whose standard of living lies below the poverty line Problem: violates the principle of transfers
I Income gap ratio	Percentage shortfall of the average income of the poor Problem: not sensitive to the number of poor people
P_1 Poverty Gap index (PG) The depth of poverty	The average shortfall between an individual's level of consumption and the poverty line, where the shortfall for all individuals whose consumption falls above the poverty line is zero. Sensitive to the number of poor people. Product of H and I. (HI) Problem: not sensitive to transfers among the poor which leave the richer individual still below the poverty line (the increase in the poorer person's shortfall is exactly offset by the decrease in the richer person's shortfall)
P_S Sen's measure of poverty	Expresses poverty as a weighted average of the poverty gap and the poverty gap index where the weight is the gini coefficient. H(Gp) - PG (1-Gp) Problem: the Gini coefficient is not additively decompos able, therefore neither is Sen's P.
P_2 Squared Poverty Gap index (PG2) The severity of poverty	By squaring the shortfall between an individual's level of consumption and the poverty line, it places greater weight on poorer individuals.

[62] Extensions of the FGT measures have been applied in a dynamic framework (Jalan and Ravallion 1998, Christiaensen and Boisvert 2003) as well as in poverty comparisons within a multidimensional framework (Duclos, Sahn and Younger 2003).

Shortcomings

While these measures are used extensively in both developing and developed country poverty measurement exercises, they suffer from several shortcomings. (1) It has already been stated that they would register a decrease, not an increase if a poor person were to die. Kanbur (2002) has pointed out that in situations where (large numbers of) poor people were to die (such as AIDS victims in Africa, who are mainly the rural poor) because of their poverty (inability to afford expensive treatment) the FGT measures (or any measures that focus on the currently living) are inadequate.[63]   (2) They are also not subgroup sensitive (Subramaniam 2003). The following example from Subramaniam (2003) illustrates this. If for example, one divides the population into two subgroups, A and B, where A is an historically disadvantaged group (like a depressed caste) and the headcount ratio of poverty for A is 0.7 and for B is 0.3, and the groups comprise half the population each, the total headcount ratio for the country would be 0.5 (0.7*0.5 + 0.3*0.5). If a pure redistribution from B to A were to decrease A's poverty to 0.6, while increase B's poverty to 0.4, we may be predisposed (says Subramaniam) to regard this as an improvement, while the headcount index registers none (0.6*0.5 + 0.4*0.5) = 0.5. This idea of incorporating what is sometimes termed horizontal equity into measures of poverty is somewhat controversial, although subgroup sensitivity is a standard property of measures of inequality. They are (3) not sensitive to inequality around (above) the poverty line. A new approach by Foster and Szekely (2000) attempts to derive a measure that is more sensitive to the state of income distribution, where the non-poor also receive a weight-which can be made as small as one wishes.

2.1.5 Uses and limitations of monetary measures

This section (2.1) has described standard practice in the measurement

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[63] Kanbur and Mukherjee (2003) attempt to modify the FGT measure so that it is not "perversely mortality sensitive." Further development of this measure would require confronting deep-rooted normative and philosophical questions such as placing a value on years of life lost (Thorbecke 2003).

of poverty within the monetary approach. I end this section with a brief discussion of the uses and limitations of these measures.

Poverty comparisons, analysis, informing policy and monitoring
The primary use of these measures is cognitive, in order to know how many people are poor, and how poor they are, as well as to be able to make comparisons over time. Monetary measures of poverty are used to construct poverty profiles, not just for developing countries by the World Bank, but also by other researchers and countries (for example, Callan and Nolan 1998 for Ireland). These profiles, in turn, are used for analysis, as they help to identify the correlates of poverty, and categories of people who are poor, and to monitor the movement of poverty over time. The indicator variable, or a poverty line based transformation of it (that is, consumption as a proportion of the poverty line, x_i/z) is typically used in both static and dynamic econometric analyses of poverty and well-being. These analyses in turn, provide guidance for formulating policy as well as providing feedback on the performance of policy.

Targeting and poverty monitoring
The use of these measures in targeting varies. In several developed countries, the poverty line, defined in income terms, is used as the basis for an income cut-off for government benefits. In developing countries, it makes little or no sense to do this, as comparing a poverty line that is based on a measure of *consumption*, that includes-in large measure-the imputed value of households' non-market consumption, with household's cash income is, to say the least, inconsistent. (See section 2.1.1 for more details). However, poverty analysis using monetary measures can point to broad categories for targeting. Similarly, monetary measures of poverty constructed from survey data can be com-

bined with census data to construct poverty maps that help with geographic targeting (see section 3.2.4). Apart from such contexts, however, since these measures require survey data that is available only intermittently, they are of limited value in continuous poverty monitoring. This has led to the search for suitable proxy measures (Section 2.9).

Limitations of monetary measures of poverty
The "limitations" of monetary measures of poverty include (1) its inability to adequately measure deprivation in multiple dimensions (2) its limitations in capturing more than "snap-shot" measures of poverty (3) its reliance on objective or expert-based determination of standards (4) its focus on absolute poverty and (5) its reliance on quantitative data collection methods. The rest of this chapter examines the ability of several alternative approaches to address these problems as well as recent efforts of economists within the quantitative approach to address some of these limitations and so improve the "objective-quantitative" approach. The aspects of *multidimensionality* and *dynamics* of poverty are given emphasis in this examination, and are discussed next, in sections 2.2 and 2.3.

2.2 Incorporating multidimensionality in poverty measurement
2.2.1 Introduction
In this section, I begin by describing the inability of monetary measures of poverty to adequately capture multiple dimensions of poverty. I then go on to describe general issues relating to the incorporation of multidimensionality in a measure of poverty. Sections 2.2.2 –2.2.4 deal with each of these issues individually.

Monetary measures and multidimensionality
Figure 1 and Figure 2 in Chapter 1 illustrate the point that even the best measure of monetary poverty leaves many dimensions of poverty unmeasured.

Figure 1 indicates that there are several sources of parametric variation in the conversion of income to functionings (that is, the various things we can do or be).[64] These include (1) *personal heterogeneities* (people have different physical characteristics connected with disability, illness, age, or gender, that make their needs diverse) (2) *environmental diversities* (for example, Climatic conditions, rainfall, flooding etc.) (3) *variations in social climate* (this includes public facilities such as health care and education, the prevalence or absence of crime and violence, and the nature of community relationships)[65] (4) *differences in rational perspective* (someone relatively poor in a rich community may need a higher level of income to "function" than an absolutely poor person in a poor community) and (5) *intra-household inequality*[66]

An "economic" conception of poverty would include common property resources and state-provided commodities, as well as private consumption (line 3 in Figure 2). However, the review in section 2.1 has shown that even the best measure of poverty within the monetary approach is at best a measure of private consumption. Yet, studies show common property resources and state-provided commodities to be important contributors to well-being among the poor and would-be poor.

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[64] See also Sen 1997.

[65] For example, in Indonesia in 1987 the implicit subsidy to the poorest decile of urban population through the use of hospitals and primary health centres was twice that received by the poorest decile of the rural population (van de Walle 1994). In Ghana, World Bank poverty assessment results which illustrated that income poverty had declined by three or four percentage points (good by African standards) during the period 1987-1991 were met with scepticism, and the underlying perception that poverty could not have declined was supported by the fact that this period coincided with the reduction of many government subsidies to the poor (Kanbur 2001).

[66] Work by Haddad and Kanbur (1990) cited in Coudouel *et al.* (2001) indicate that relying on household-level data alone could lead to an underestimation of inequality of more than 25 percent. Recent initiatives on measuring child poverty (Micklewright and Stewart 2001, White, Leavy and Masters 2002) also recognise the limitations of the income approach in measuring child poverty. Kabeer (1994) argues that the bias in intra-household welfare distribution suggests that women and children are likely to be disproportionately represented in the ranks of those below the poverty line.

Consider the following scenario: a country undergoes a period of fiscal discipline that leads to growth, which even trickles down to the poorest deciles, as measured by consumption. However, part of the fiscal discipline involved budget cuts that led to the closing down of publicly provided community-level health services. The overall rise in wealth increases the demand for land, and leads to privatising of the commons. What is the overall impact of these movements on a typical "poor" person? While her consumption increases, she will experience a fall in welfare because she either has further to walk in order to gather fuel, wood and collect water; or she has to depend on less safe sources of water. She may now visit the local private sector doctor when her child falls sick, whose services may actually be of a lower quality than of the base hospital she used to visit previously. Moreover, because her use of these services results in monetary expenditure that she did not incur before, this may actually register as an increase in her consumption, and thus may show her as being better off than she was before.

Jodha (1995) found that between 1950 and the early 1980s, common areas declined by 31 percent to 55 percent in study villages in the dry regions of India. It would be misleading to assume that even had measured income poverty decreased over the period, overall deprivation had also declined. In Britain, the welfare state multiplies the income of the bottom 20% four fold through welfare benefits, of which the value of services received by them (income in-kind) are twice as much as they earn (Gordon 2002).

Empirical evidence on the relationship between income and other dimensions of poverty is mixed. Where there is evidence from household survey data, it appears that the multiple dimensions of poverty do go together; for example, years of education increase with income, the poorer are sicker, and so on (Kanbur and Squire 2001). "Individuals with lower incomes on average also have lower welfare in other dimensions … However, it is also noticeable that the correlations are rather

modest-income usually explains very little of the variation in non-monetary welfare indicators (Appleton and Song 1999: 25).

A related question that recent research focuses on, is whether income growth will be sufficient to reduce non-monetary dimensions of poverty such as under-five mortality, and child malnutrition. The answer appears to be in the negative: publicly provided services and interventions still have a major role to play (Haddad *et al.* 2003, World Bank 2003).

Given the limitations of the standard income or monetary approach in measuring non-monetary dimensions of poverty, what possibilities exist for the incorporation of multidimensionality in the measurement of poverty? This question is addressed in the rest of section 2.2 as well as where appropriate in sections 2.4 -- 2.9.

Issues and approaches

Measurement issues in a multidimensional context may be (a) dimension specific, or (b) arise from the fact of multiple dimensions (Qizilbash 2003). As with the monetary approach to poverty measurement, any multidimensional measure of poverty must address the problems of *identification* and *aggregation*.

The identification problem relates to the familiar choices of units of analysis, indicators and thresholds. However, the *choice* of *indicator* is now also a question of choosing *dimensions* of well-being, and the choice of *poverty line* or *cut-off* now refers to identifying the appropriate level that determines adequacy in *each* of the multiple dimensions. In addition to this is the further question of how to identify someone as poor-whether one takes a *union* or *intersection* to this problem. A union or intersection approach regards someone as poor if he/she is poor in *any* dimension relating to poverty (Bourguignon and Chakravarty 2002, Brandolini and d'Alessio 2001) and an intersection approach identifies

someone as poor if he/she is poor in *all* the specified dimensions.

A third approach is to estimate multidimensional poverty lines, that is, classify the poor if they are poor in terms of some overall index or average of indices relating to poverty (Klasen 1997 and 2000). This has been termed the *intermediate approach* by Duclos, Sahn and Younger (2003) where an individual may be poor if he/she is below some poverty line that applies to all dimensions.[67]

The aggregation problem now refers, in addition to the problem of aggregating across individuals, of individual well-being status (and the related problem, dealt with in the choice of *poverty measure* of how to weigh the extent of deprivation in each dimension), to the problem of aggregating across individual indicators or dimensions, leading to the problem of the *choice of weights* to be given to each of the multiple dimensions to be aggregated.

These are discussed further in sections 2.2.2 – 2.2.4.

2.2.2 Choice of dimensions and indicators

There appears to be little disagreement regarding the dimensions that need to be included in a multidimensional measure of poverty. The pyramid in Figure 1, to a large extent, expresses the growing consensus as to what these dimensions should be. An alternative depiction of the multiple dimensions of poverty defined in terms of capability deprivations (see section 2.6) is given in Figure 6 below.

However, when it comes to operationalizing these dimensions in a vector of well-being indicators, there is wide variation in the indicators used, and few guidelines on the basis for inclusion.

Indicators may be chosen as direct measures of poverty (for example, using a capabilities, basic needs or social exclusion approach) or as proxies of consumption (poverty). In the latter case, the guiding principle is obvious, and statistical or econometric methods are used to identify the indicators that correlate best with (consumption) poverty (See Appendix D on asset-based indices for an example).

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[67] See section 2.2.3

Figure 6: Dimensions of capability deprivation
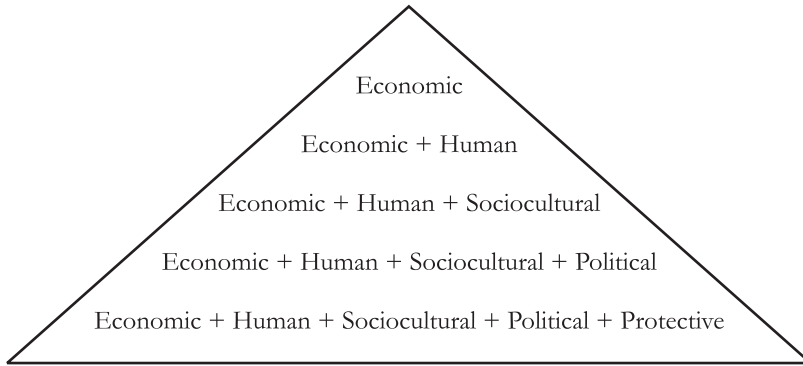
Source: DAC/OECD Guidelines on Poverty Reduction 2001, Paris, cited in Gsaenger 2003.

When the indicator is expected to be a direct measure of well-being or deprivation, the guidelines for choice are less clear.[68] However, policy-oriented studies in the last few years have generated several principles or criteria that should be applied to such indicators.

Atkinson *et al.* (2002) identified a set of six basic principles or properties that each indicator should satisfy: (1) *Clarity* and lack of ambiguity (2) *robustness* and *validation* (3) *policy responsiveness* (and lack of manipulation) (4) *Comparability* (across countries) and *consistency* (what is being measured is consistent across time and space) (5) *timeliness* (but subject to revision) and (6) avoidance of unnecessary *informational burden* on states, enterprises and citizens.[69]

Achibache *et al.* (2001) provide some general guidelines to identify a good impact/outcome indicator. It (a) provides a direct and unambiguous measure of progress-more (or less) is unmistakably better (b) is relevant-it measures goals or factors that have an impact on the goals (c)

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[68] One author refers to the underlying imprecision about the dimensions of well-being which are relevant to the poverty evaluation exercise as "horizontal vagueness" (Qizilbash 2003).
[69] In a report prepared for the Council of the European Union on indicators of social exclusion.

varies across areas, groups, over time, and is sensitive to changes in policies, programs, institutions (d) is not easily blown off course by unrelated developments and cannot be easily manipulated to show achievement where none exists (e) can be tracked (better if already available), is available frequently, and is not too costly to track.

Ravallion (1996) outlines the following list of what he calls "Ingredients for a Credible Approach to Poverty Measurement": (1) A sensible poverty measure based on the distribution of real expenditure per single adult covering all market goods and services (including those obtained from non-market sources), (2) Indicators of access to non-market goods for which meaningful prices cannot be assigned, such as access to non-market education and health services (3) Indicators of distribution within the household, measures of gender disparities and child nutritional status (4) Indicators of certain personal characteristics which entail unusual constraints on the ability to escape poverty, such as physical handicaps or impairments due to past chronic undernutrition.

The different approaches to measuring poverty provide additional guidelines to selecting indicators. For example, a typical list of indicators following the *capabilities* approach is suggested by Nussbaum (2000).

Table 5: Nussbaum's list of features essential to full human life

1. Life: normal length of life
2. Health: good health, adequate nutrition and shelter
3. Bodily integrity: movement; choice in reproduction
4. Senses: imagination and thought, informed by education
5. Emotions: attachments
6. Practical reason: critical reflection and planning life
7. Affiliation: social interaction, protection against discrimination
8. Other species: respect for and living with other species
9. Play
10. Control over one's environment, politicall (choice) and materially (property).

Source: Nussbaum 2000

However, this has been criticised as (a) being based on a very small sample of views and (b) representing a Western late-20th century conception of the "good life" (Ruggeri-Ladderchi *et al.* 2003). There is considerable overlap between this list and other lists of basic needs, social exclusion indicators and proxies for poverty. For example, indicators of social exclusion in developed countries include unemployment, access to housing, minimal income, citizenship, democratic rights and social contacts, households with children living in poverty, teenage mothers (see List E1 and Table E1 in Appendix E).

A list of components that correspond to the capability deprivation, outlined in Figure 6, and are more appropriate in a developing country context, is given in Table E2 in Appendix E.

A similar list of eight broad components of poverty that are identified in IFAD's rural poverty report for 1992 is given in Table 6.

Table 6: Eight broad components of poverty

Poverty Measure	Description
Material deprivation	Inadequate food supplies, poor nutritional status, poor health, poor education, lack of clothing and housing, fuel insecurity, and absence of provisions for emergencies.
Lack of assets	Material assets (land, agricultural inputs,etc.) and human capital (education, training, etc.)
Isolation	Social, political and geographic marginalisation (remote areas with limited access to transport, roads, markets and communication links).
Alienation	Isolation and exploitative social relations, includes people who lack identity and control, are unemployed or underemployed, lack marketable skills, and have limited access to training and education

Table 6: Eight broad components of poverty contd.

Poverty Measure	Description
Dependence	Skewed dependency relations such as between landlord and tenant, employer and employee, creditor and debtor, buyer and seller, or patron and bonded labourer
Lack of decision making power	Limited participation and freedom of choice
Vulnerability to external shocks	Nature (droughts, floods, cyclones, locusts), markets (collapse in commodity prices, labour supply and demand), demography (loss of bread winner, death, divorce), health (illness of bread winner) and war Insecurity Risk of being exposed to physical violence

IFAD 1992, cited in Sumner 2003

Sumner (2003) provides a list of indicators that are commonly used, which capture many of the dimensions and components outlined above. This list includes a list of indicators reflecting empowerment and participation, in addition to education, health and nutrition and environment indicators. Several of these are Millennium Development Indicators (indicators to monitor the achievement of targets relating to the Millennium Development Goals (MDGs) agreed upon by the international community).[70]

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[70] See www.paris21.org/betterworld

Table 7: Most commonly used non-economic well-being measures

Indicators

Education

Education enrolment rates*

Survival to the final primary or secondary school grade/completion of   primary or secondary school

Literacy rates

Health and nutrition

Malnutrition rates* /food or calorie consumption per capita/Body mass index

Mortality and morbidity rates*/life expectancy/not expected to survive forty years/infection rates*

Health service usage-skilled personnel at birth*/contraceptive prevalence rate*/immunisation rates*

Environment

Access to "improved" water sources

Access to "adequate"sanitation

Household infrastructure-permanent material used for walls of home   and electricity supply

Empowerment and participation

Participation in general and local election voting (decision making at various levels)

Extent of knowledge of local projects and district budgets (access to information)

Number, size and revenue of active NGOs (potential for civil society monitoring)

Note: * denotes the indicator is a Millennium Development Goal

Source: Sumner 2003.

The *subjective* approach provides a criterion for choosing among indicators, known as the "consensual" approach: to include indicators that more than 75% (or a similar percentage) of households considered to be absolutely necessary (Razafindrakoto and Roubaud 2003, also Dirven, et. al. 1998, Mack and Lansley 1985).

While indicators that measure non-monetary dimensions of poverty need to be universally applicable, they will also need to be somewhat location specific. *Participatory* studies can yield indicators, which are identified by the population that is being studied. A well-known list of "ill-being" indicators drawn from participatory studies is given in Table 8.

Table 8: Criteria of ill-being

Being disabled (for example, blind, crippled, mentally ill, chronically sick)	Suffering the effects of destructive behaviours (for example, alcoholism)
Lacking land, livestock, farm equipment, a grinding mill	Being "poor in people", lacking social support
Being unable to decently bury their dead	Having to put children in employment
Being unable to send their children to school	Being single parents
Having more mouths to feed, fewer hands to help	Having to accept demeaning or low-status work
Lacking able-bodied family members who can feed their families in a crisis	Having food security for only a few months each year
Having bad housing property resources	Being dependent on common

Source: Chambers 1995

A comprehensive set of indicators used in various contexts, and within various approaches is given in Appendix E. These expand on the lists given above and include education and occupation of household members, demographic composition and indicators of food security and vulnerability.

Ultimately, the choice of indicator may respond to *philosophical preconceptions* (beliefs that self chosen, participatory or basic needs indices are inherently better than economic indicators),[71] to *data limitations*, or to the results of *analysis* (ranging from *statistical techniques* to *participatory studies*). When choosing from among these indicators, a useful guiding principle is to explore the tradeoffs inherent in the choice of indicators. This will include (a) the assumptions that are made, the practical implications in terms of (b) costs, (c) technical requirements, (d) errors of inclusion and exclusion and (e) characteristics of the chosen population (Davis and Siano 2001).

2.2.3 Choice of thresholds

The choice of threshold in a multidimensional approach has to deal with the location of appropriate thresholds in each of the unitary dimensions that are components of the overall multidimensional index, as well as address the issue of identification in relation to the dimensions taken together.

The choice of threshold in a unidimensional setting for non-monetary indicators must address issues similar to those raised in relation to monetary measures, in section 2.1.3. While the discussion in that section indicated the problems of robustness that can plague the choice of a monetary poverty line, the same applies to many of the indicators that are used in composite indices of poverty. However, discussion of the problem of choosing thresholds in the dimensions is rare (compared to that in the monetary approach).

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[71] Or the opposite. See the note to Table E1 in Appendix E.

Several indices that have long been used in practice use such thresholds.[72]   For example, two of the component indicators of the HPI-1 percentage of children under 5 who are underweight, percentage of population with access to improved sources of water have explicit thresholds.[73] Many of these thresholds indicate some kind of natural or obvious cut-off that is often determined by expert knowledge (for example, as in the classification of water sources into safe and unsafe), sometimes with the aid of reference data (as in the case of the determination of the cut-off for measures of undernutrition).

However, more often, the location of such a threshold is less obvious, and is often arbitrary. This is less of a problem when the indicator is used separately, as the measure is transparent and evident. On the other hand, when an indicator that is based on a threshold, as for example, the longevity indicator in the HPI (probability at birth of living up to age 40), is combined with other indicators into a composite index, the implications of using that particular threshold become less evident.

One approach used to resolve the problem is the use of the so-called "consensual" or "consensus" approach, where surveys or participatory studies indicate not only which indicators are appropriate, but which thresholds apply as well.[74]

Recent methodological advances include the use of the Fuzzy Set Theory to determine thresholds. The Fuzzy Set Theory has been advocated where concepts are vague, that is, there is no definite criteria for discerning which elements do and do not belong to a particular set, but rather there is a continuum of grades of membership.[75]   For this reason

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[72] Except in the case of multidimensional indices constructed purely by ranking.
[73] That is, the cut-off that determines whether a child is underweight or not, and the demarcation between sources of water that are safe and unsafe.
[74] The application of the subject approach in the measurement of social exclusion in Britain is an example. See Table E1 and List E1 in Appendix E.
[75] Qizilbash (2003) refers to this as "vertical vagueness", as distinct from vagueness about the dimensions of well-being relevant to the poverty measurement exercise, or "horizontal vagueness".

it has been said to be particularly appropriate to the measurement of poverty (Miceli 1998).[76]

The recent application of the Fuzzy Set Theory provides methodologies to incorporate both "absolute" and "relativist" approaches to the measurement of multidimensional poverty (Cerioli and Zani 1990) as well as methodologies (totally fuzzy and relative method or TFR) that avoid the use of arbitrary threshold values (Cheli and Lemmi 1995).

Once the problem of appropriate thresholds in each of the component dimensions has been dealt with, one needs to deal with the problem of identification of the poor, taking into account *all* the dimensions, that is, derive *multidimensional poverty lines*. Since this involves aggregation across multiple dimensions, it is dealt with in section 2.2.4.

Duclos, Sahn and Younger (2003) provide a methodology for poverty comparisons in the spirit of the stochastic dominance literature, which is robust over a broad range of poverty lines (as in the unidimensional approach outlined in section 2.1.3) which applies equally well to "union", "intersection" and "intermediate" approaches to poverty identification in a multidimensional approach (see section 2.2.4).

2.2.4 Choice of weights, or how to aggregate?

There are two distinct positions in relation to the incorporation of non-income dimensions in the measurement of poverty. One has been called the radical multidimensional approach that advocates poverty comparisons within each dimension independently of each other without aggregation. The other is to aggregate the multiple dimensions using specific aggregation rules or aggregative strategies. These strategies are shown in from Brandolini and D'Alessio (2000).

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[76] If Y is a set of y individuals (i=1, ...,y) and A, a fuzzy subset of Y, the set of poor people. In the fuzzy approach $f_A(i)$ the membership function to the poor set is defined as :

$f_A(i) = 0$ if individual i is absolutely non-poor

$0 < f_A(i) < 1$ if individual i reveals a partial membership to the poor set.

$f_A(i) = 1$ if individual i completely belongs to the poor set

The entire problem in this approach consists in the formalisation of the membership function (Fusco 2003).

Figure 7: Strategies for multidimensional measurement
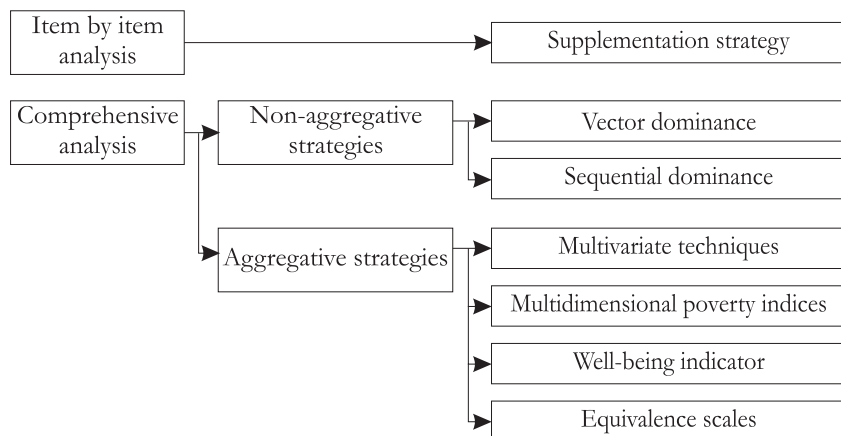
Source: adapted from Brandolini and D'Alessio (2000).

The radical multidimensional position

The extreme or radical multidimensional position is that a synthetic index is not essential or desirable, a view held by those who espouse the monetary approach, as well as by those who are among its strongest critics (Ravallion 1996, Kabeer 1989). Ravallion (1996) explicitly advises against

"adding up multiple indicators into a single scalar metric when there is no obvious basis for setting the trade-offs. It is not clear what meaning can be attached to the result and the aggregation also wastes information; it can be important to know that region A is doing well in the income space, but not in basic health and schooling, while in region B it is the reverse. Rather, what seems to be called for is a genuinely multi-dimensional approach in which expenditure on market goods sits side-by-side with "non-income" indicators of access to non-market goods and indicators of intra-household distribution."

Ravallion (1996)

This approach tends to be a supplementation strategy, where income poverty measures are supplemented with other measures. All indicators are considered one by one, by studying their univariate characteristics. The problem is that, as the number of dimensions grow, one cannot do justice to all the information that is contained therein.[77]

Aggregating multiple dimensions

In classifying approaches to aggregating multiple dimensions of poverty the World Development Report 2000/2001 (World Bank 2001) refers to three approaches: (1) Alternative aggregation rules (2) The welfare function approach and (3) Composite index approach.[78] One can attempt to fit these into the framework in Figure 7. Thus, "non-aggregative" strategies of the figure are described here as aggregation rules, while the welfare function approach cited here is the approach used in the multidimensional poverty indices of Bourguignon and Chakravarty (2002) referred to in the figure. Well-being indicators referred to in the figure are the composite indices described in this section.

Aggregation rules

Aggregating across multiple dimensions (as in aggregation across individuals of individual well-being statuses) requires specific aggregation rules. Two commonly used rules are those of *union* and *intersection.* The implicit requirement is that each dimension uses a threshold, below which the population is considered poor or deprived in that dimension, and there is a dichotomous division of the population for each division such that they fall into poor and non-poor categories (DANE 1989). Typically, one of the dimensions used is that of income poverty.

Duclos, Sahn and Younger (2003) illustrate the typical approaches in Figure 8. X and Y are two dimensions along which well-being is

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[77] The practical implication is that a donor who would like to know "which is the neediest district" in terms of X, Y and Z, cannot be given a direct answer with only one "neediest" candidate district.

[78] The discussion of partial ordering and complete orderings is found in section 2.6.4 under the capability approach.

measured (for example, health and consumption). Z_X and Z_Y are poverty lines in the X and Y dimensions respectively. An unknown poverty threshold separates the poor from the rich. This threshold can be thought of as a series of points at which overall well-being of the individual is equal to the "poverty level" of well-being, and below which individuals are in poverty. λ_1 (the thick dotted line in Figure 8) is a poverty threshold that uses the concept of *intersection*, that is, only if an individual is poor in both X and Y dimensions (health poor *and* consumption poor), is he is considered to be poor. The concept of *union*, where an individual is considered poor, if he is poor in *either (any)* of the dimensions (health poor or consumption poor) given by the finely dotted L-shaped line λ_2.

The poverty line λ_3 provides an *intermediate* approach, where even if an individual is not poor in one dimension, he/she would be considered poor if his/her well-being in other dimensions is sufficiently low. In other words, in this approach individuals are classified as poor if they are poor in terms of some overall index or average of indices relating to poverty.[79]

Figure 8: Union, intersection and intermediary poverty thresholds
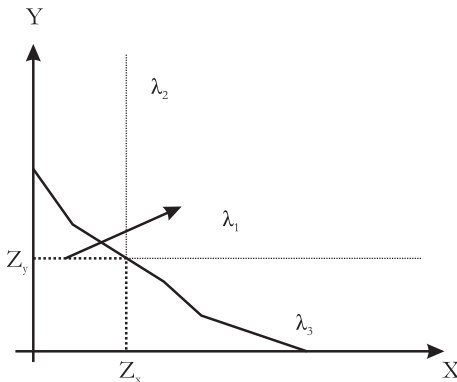
Source: Duclos, Sahn and Younger, 2003.

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[79] Note that this is equivalent to saying that the poverty line in one dimension is a function of well-being measured in another.

Welfare functions

A welfare function approach uses various dimensions of well-being, allows for trade-offs, and defines a threshold or minimum level of total welfare. It typically uses an intermediate approach in terms of aggregation rules. The welfare function approach attempts to make ethical and theoretical implications of different aggregation rules explicit. The difficulty lies in finding a suitable welfare function for comparisons between non-market elements of welfare. Recent attempts at multidimensional poverty measurement specify a poverty threshold for each functioning, look at the shortfalls of the functioning quantities of different individuals from the threshold levels, and aggregates these shortfalls into an overall magnitude of poverty (Bourguignon and Chakravarty 2002, cited in Chakravarty and D'Ambrosio 2003).

Composite indices and statistical methods

Composite indices, which impose weights rather than using weights estimated from peoples' choices, are useful for advocacy and cross-country comparisons (such as the Human Development Index and the Capability Poverty Measure and Human Poverty Index).

Composite indices are constructed by combining separate indices that are calculated in a relative way, or ranked (for example, the life expectancy component of the HDI calculates actual life expectancy relative to the minimum, as a proportion of the range of life expectancy, that is, the maximum minus the minimum). Other indices (for example, in Latin American statistical offices) combine ranks of variables, rather than actual values. Because rankings, or relative achievements are not necessarily highly correlated, combining them together can make them difficult to interpret. There is no objective basis for selecting the weighting or ranking schemes on which aggregation is based (Ravallion 1996). Thus, implicit trade-offs are included which were never intended. There is no explicit role for examining trade-offs within this approach. Appendix F describes the construction of some well-known composite indices.

The problem of weighting a composite index has at least six solutions in the literature. The first is (1) to use equal weights. This method is used because the alternative of assigning weights is considered arbitrary. However, this amounts to saying that the welfare value of owning a radio is the same as having access to a flush toilet which, in turn, is the same as having safe drinking water (Falkingham and Namazie 2002). This is, unfortunately, a very commonly used procedure (see review of demographic studies in developing countries by Montgomery *et al.*)[80] used by researchers in developed and developing countries. Filmer and Pritchett (1998) state that its only advantage is that it does not appear to be as arbitrary as it really is!

A second method is to (2) use weights determined by some form of "consultative" process. This may be from households themselves such as the weighting procedure described in Townsend's "subjective deprivation scale" above (see also Dirven 1998) or a group of experts and policy analysts [as in Bolivia, Navajas *et al.* (2000) or the weights used in the calculation of the Human Poverty Index chosen by Anand and Sen (1997)].

Another method is (3) which is used in constructing asset-based indices is to use information on assets together with price data to construct a household wealth index. The difficulty in doing this is that reliable price information is not always available.

The fourth solution, also from the asset index literature is (4) to use the asset variables as explanatory variables in a multivariate regression (say, if educational attainment were the dependent variable, household asset ownership variables are used on the right-hand side as explanatory variables).[81] However, because some of these assets are both outcomes and measures of wealth themselves, as well as being inputs into other outcomes (for example, electricity is an indicator of wealth, but

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[80] A list of these studies is given in Appendix G.
[81] This is the approach used and recommended by Montgomery *et al.* (2000).

it is also an input into studying, which affects schooling outcomes), the measured effect in these regressions is not a wealth effect. Thus, although the regression coefficients can be used as a linear "index" of the asset variable that best predicts the dependent variable (for example, educational attainment) the index cannot be interpreted as the effect of an increase in wealth on educational attainment.

Two more solutions (also from the asset index literature) in the form of (5) principal component analysis (used by Filmer and Pritchett 1998) and (6) factor analysis (used by Sahn and Stifel 2000) extract the combination of variables that best captures the common information from all the variables. The assumption used in both these methods is that there is a common factor "welfare" behind the ownership of these assets.

The statistical methods of factor analysis and principal components analysis define (in slightly different ways) that factor as a weighted sum of the individual assets. Sahn and Stifel (2000) found that the two methods yielded similar results: the Spearman rank correlation coefficient for the indices to be about 0.98, while Hewett and Montgomery (2001) in a study of developing-country cities found that living standards indexes derived from the two methods vary empirically with the education of household head and by city size. Sahn and Stifel (2000) argue that the factor analysis method is better because the model and assumptions are made explicit, and provide guidance on which assets should or should not be included in the index. Many recent studies have used the simpler principal components methods (Zeller 2001). Yet Hewett and Montgomery (2001) argue that factor analysis is better grounded in theory and more appropriate for the purpose.[82]

Another approach that has been recently applied to the analysis of well-being (DiTomaso 2003) is the multiple indicator multiple causes

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[82] Both of these methods may be unsatisfactory in the case of latent variables. Latent variables are metrical or categorical variables which underlie the observed binary (taking value 0 or 1) variable that is used in the construction of an index. In this case latent trait analysis or latent class analysis is more appropriate than either principal components or factor analysis (Bartholomew, *et. al.* 2002, cited in Falkingham and Namazie 2002).

(MIMIC) approach, which has been used extensively in psychometrics and more recently in econometrics and is founded upon the specification of a system of equations which specify the relationship between a set of unobservable latent variables, a set of observable endogenous indicators, and a set of observable exogenous variables.

2.3 Measuring the dynamics of poverty

It has long been accepted in the poverty literature that it is imperative to understand the dynamics of poverty. Dealing with the issue of dynamics in the measurement of poverty has a somewhat more recent history. Qualitative approaches that focus on processes have tended to pay more attention to the dynamics of poverty than quantitative approaches that are said to reveal only "snapshots" of poverty. However, there has been a recent increase in the emphasis on the dynamics of poverty. Within the capability approach, some have argued that "becoming" is as important a category of analysis as "being" and "doing" (Comim 2003). Within quantitative and qualitative approaches, methodological advances include (a) methods to distinguish between poverty that is transient, and poverty that is permanent or chronic, and movements in and out of poverty, as well more recent work that (b) attempts to understand the evolution of capabilities (D'Agata 2003) or the adaptive processes that influence subjective well-being (Burchardt 2003). It is the former literature, and in particular the identification of chronic poverty, that this chapter focuses on.

There is growing recognition that transitory and chronic poverty are caused by different processes and have different routes out of poverty, with important implications for policy. The different approaches to understanding poverty differ in their approach to the measurement of the time duration of poverty. These are reviewed in this section.[83]

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[83] This section draws primarily on two sources: (a) 14 articles in the March 2003 issue of *World Development* which used a variety of approaches to conceptualising and analysing chronic poverty, and (b) the section on measuring vulnerability in Coudouel *et al.* (2001).

Two main methods are used to measure chronic poverty (McKay and Lawson 2003). The first of these uses longitudinal or panel data, and typically, though not necessarily focuses on monetary measures of living standards. A variant of this approach uses non-monetary measures (for example, measures of malnutrition or illiteracy) with similar (panel) data and analysis. Panel data analyses will necessarily look at short-term fluctuations in poverty because the data being used will typically not be more than ten years in duration, and is usually less.[84]   Another approach is to use information that is obtained at one point in time but which offers evidence on chronic poverty. This may be obtained from retrospective questions or life histories, or one-time indicators that have implications for duration, such as illiteracy or stunting (McKay and Lawson 2003).

2.3.1 Measuring chronic poverty using panel data

The quantitative approach to poverty measurement typically uses panel data. The advantage of using panel data is that it allows the analyst to track the dynamics of poverty at the *most disaggregated level* possible—typically the level of the household. Panel data analysis uses two main approaches: *spells* and *components*. These are discussed below.

Poverty spells, survival, entry and exit rates

A poverty *spell* is defined as beginning when an individual moves into poverty (that is, to be poor in a particular period having not been poor in the previous period) and ending when the individual moves out of poverty (that is, not being poor in a particular period having been poor in the previous period). Exit rates and survival rates can be calculated for specific time periods.

A household is classified according to the frequency or duration of

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[84] Note that this is due to the recent availability of panel data in developing countries. However, because of attrition, even the best of long-term panel datasets will also be limited.

the spells of poverty they experience. Typically, criteria vary among studies. The most stringent one is that which defines a household as chronically poor only if it is poor in *all* the periods under examination. Another criterion is to consider a household chronically poor if it is poor in a consecutive number (say, three) of periods.

Table 9: Long term poverty according to the "poverty spells" indicator and two poverty lines: survival rate (%): 1985-90

Poverty spells (survival rate after n-years)	1	2	3	4
National Social Minimum Income (NSMI) Total population	28.7	13.9	2.5	0.0
Subjective Poverty Line (SPL) Total population	56.3	39.2	26.1	23.4

Dirven *et al.* (1998)

Alternatively, entry and exit probabilities can be computed.

Table 10: Entry and exit probabilities, rural Pakistan, 1986-91

	Probability of entering poverty for non-poor households	Probability of escaping poverty for poor households
1986/87-1990/91	24	49

Source: Baulch and McCulloch 1998

Transition matrices depict movements in and out of poverty. In the table below, the last row and last column give total percentages of the poor and non poor in the respective years. The first row and column indicate the percentage of those who were poor in both periods, while the second row and second column indicate the percentage of those who were not poor in both periods. The first row and second column

indicate those who escaped poverty in the second period, while the first column and second row indicated those who entered poverty in the second period.

Table 11: Movements in and out of poverty in rural Ethiopia

Cell percentage	Status in 1995		
Status in 1989	Poor	Non poor	Total
Poor	↔ 31	↑ 30	61
Non poor	↓ 15	↔ 24	39
Total	46	54	100

Source: Dercon 1999

These measures can be used to detect the correlates and determinants of vulnerability. For example, Duncan *et al.* (1993) found that poverty spells in the Netherlands were related to labour market events (losing work, reduced working hours) and household formation events (divorce or separation). Muller (1997) used transition matrices to distinguish between seasonal and non-seasonal poverty.

Components of poverty

In the components approach, an attempt is made to distinguish the permanent component of the welfare indicator (usually income or consumption) from transitory shifts. The permanent component is based either on the average over time, or a prediction of household consumption based on known household characteristics. In the example given in Table 12, households that are always below the poverty line are classified as persistently poor, while those who are always above it are classified as never poor. In between are those who, on average, are below the poverty line, but are sometimes above it (called the chroni-

cally poor) and those who are on average above the poverty line, but sometimes below it (called the transiently poor).

Table 12: Classification of households in rural China over 1985-1990 (Percentage)

	Persistently Poor	Chronically poor	Transiently poor	Never poor
Full Sample (Guangdon, Guangxi, Guizhou and Yunnan provinces)	6.2	14.4	33.4	46.0

Source: Jalan and Ravallion 1999

Nonmonetary dimensions of chronic and transitory deprivation

Although most existing empirical analyses of chronic poverty have been based on monetary measures of living standards, the methods described above can be used with indicators other than income or consumption. Such measures could include measures of health, education, and subjective measures of deprivation. Dirven *et al.* (1998) compared poverty spells based on income (using the European Commission's relative poverty line at the time of 50 percent of median standardised household income) and poverty spells based on responses (very difficultly or difficultly) to the question "How did you get along with your household income in the previous twelve months?" and found that survival rates according to the second (subjective) definition dropped drastically, while for income, the decrease was much slower.[85]

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[85] A description of the subjective approach is given in section 2.9.

Table 13: Long-term poverty according to the poverty spells indicator using below 50% of median standardised household income (1985-94) and having difficulties getting along (1985-95).

Poverty spells (Cumulative survival rates after n-years)	1	2	3	4	5
Below 50% of the median	44.2	32.7	26.7	20.9	20.9
Difficulties getting along	41.2	22.6	13.9	9.1	6.8

Dirven *et al.* 1998.

Baulch and Masset (2003) use panel data from the 1992-3 and 1997-98 Vietnam Living Standard Surveys (VLSS) to measure chronic poverty according to a number of indicators and dimensions (Consumption poverty, food consumption poverty, stunted children, malnourished adults and children never in primary school). The null hypothesis of independence between monetary poverty indicators and nonmonetary poverty indicators can always be rejected, but overlap between subcategories of chronic poverty was generally modest. For example, they found a low correlation between chronic monetary poverty and chronic stunting which, on further analysis, turned out to be due to the low correlation between monetary poverty and stunting in any one year. A similar pattern was observed for the correlation between adult malnutrition and monetary poverty. On the other hand, poverty profiles reveal that many, but not all, of the characteristics associated with chronic food poverty (which is also a measure of extreme consumption poverty) are shared by the chronically stunted and the never-educated (children).[86]

Some indicators are more likely than others to vary or fluctuate over the relatively short time horizons presented by the available panel

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[86] For example, children who are chronically stunted and have never attended primary school are, like the chronically food poor, most likely to come from a large, ethnic minority household living in a remote rural commune in the mountainous Northern Uplands or Central Highlands regions. This is not true of chronically malnourished adults, most of whom live in the Red River and Mekong Deltas, plus the Southeast, and come from the *Kinh-Hoa majority* (Baulch and Masset 2003, p. 451).

data. Height-for-age, for example, as a measure of chronic malnutrition, or literacy, cannot be used in the manner described above, but are in themselves measures of chronic deprivation.

Measurement issues

The accuracy with which the poverty line is estimated is important in the measurement of poverty, especially when a *spells* approach is used. If a household is just above the poverty line most of the time, it will not be considered chronically poor, according to some of the methods described. A measure that takes into account duration, rather than frequency of poverty spells is subject to similar sensitivity to the poverty line. Given that the data is truncated in time (one has no information for the period before and after the survey period, and in cases where the panel is non-consecutive, in between as well) a household maybe wrongly classified as transiently poor. Studies using both approaches have found that the components approach produces 5-25% more chronically poor people (Yaqub 2003).

The estimation of prices takes on special significance in the estimation of transitory poverty. The use of the consumer price index (CPI) may not be appropriate if prices in the reference bundle do not move parallel with the CPI (Thorbecke 2003). The use of the same real monetary poverty line (expressed as an annual average) may not be appropriate in the face of large seasonal fluctuations when one is tracking transitory poverty.

2.3.2 Measuring chronic poverty without panel data

All the examples cited above used panel data. When panel data is not available, *repeated cross-sections* may be used to track poverty dynamics for regions or clusters, though not for households (Wodon 1999). While this will not reveal information about poverty dynamics *within* these

broad areas, it is more likely that chronic poverty exists in areas that exhibit few changes in poverty levels over time.

When only a *single cross-sectional survey* is available, it is possible to build measures of vulnerability that rely on variation within communities or other subgroups or external information on the seasonality of prices and production. For example, Suryahadi and Sumarto (2001) regress the relationship between household consumption and its characteristics and term the predicted value an estimate of permanent consumption. Thus, the transient poor are those whose current consumption falls below the poverty line, but whose predicted consumption lies above it, while the chronically poor are those whose predicted *and* actual consumption lie below the poverty line.

Gordon (2002) uses data from *Britain's Poverty and Social Exclusion Survey* to classify the population into four groups-poor, rising out of poverty, vulnerability to poverty and not poor-based on households' income and "standard of living".[87] Those whose incomes were high, but whose standard of living was low were those who were rising out of poverty (the improvement in living standards lags behind the improvement in incomes) while those whose incomes were low, but whose standard of living was high were those who were vulnerable to, or falling into poverty, maintaining their standard of living by dissaving. A parallel exercise for developing countries could be carried out with existing household survey data using a broad consumption indicator to measure standard of living.[88]

The *severity of poverty* or *extreme poverty* is often considered a proxy for persistent poverty. Nevertheless, many studies that do use panel data analysis find that the chronically poor are not necessarily the poorest (Aliber 2001 for Kwa-Zulu Natal in South Africa, Gaiha 1989 for India), indicating that this is not a very good proxy.

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[87] Standard of living is measured using a relative deprivation approach.
[88] The difficulty arises if income is badly measured.

Those experiencing *multiple dimensions of deprivation* may also be considered to be chronically poor (Hulme *et al.* 2001). The usual difficulties in measuring multidimensionality apply in this case as well (see section 2.2).

Indicators that are observed at one point in time but that provide information on longer-term processes are useful measures or proxies of chronic poverty. For example, the average height of school children, illiteracy, and asset ownership are indicators that reveal information about the dynamics of poverty. Recent empirical work in labour economics shows that unskilled workers are trapped in a vicious circle of employment in the low-skilled sector, unemployment, and periods out of the labour force (Bradshaw *et al.* 2003). However, when using this approach, it is important to distinguish between deprivation and the causes of deprivation.

Bird and Shepherd (2003) use a "recovery index" which gives a subjective assessment of change in assets. This measures the degree of perceived improvement or decline over a period following a severe drought (5 years prior to the date of the survey, and is based on responses to 8 questions on change in food security related variables).

2.4 Measuring vulnerability

Vulnerability in the dimensions of income and health is the risk that a household will experience an episode of income or health poverty over time. However, vulnerability also means the probability of being exposed to several other risks (violence, crime, natural disasters, enforced premature school-leaving, etc.) (World Bank 2001).

Several ways in which vulnerability can be measured using consumption-related measures are well known. For example: (a) variability in consumption (the higher the coefficient of variation the more vulnerable the household (Morduch 1998) (b) whether an income shock is

passed onto current consumption or not (are households able to deplete savings or borrow in the face of a shock, and thereby smooth current consumption?) (Amin, Rai and Topa 1999, Jalan and Ravallion 1999) (c) how often a household is above or below the poverty line in a given period (Gaiha and Deolalikar 1993), and (d) as the proportion of non-poor households who became poor in a subsequent period (Sen 2003).

The limitations of using the coefficient of variation are well-known: It does not differentiate between (1) upward and downward fluctuations, whereas it is mainly the latter that affects the poor (2) fluctuations that are bunched together (worse for the poor) versus fluctuations that are spaced across time and (3) fluctuations that are varied in severity versus fluctuations that are moderate and equal (See box 1.3 in World Bank 2001). Vulnerability is sometimes group-specific in its impact, for example, on children's health and development, physical well-being, social capital, family sizes, and insecurity of old age (World Bank 2002).

For policy purposes, it is not sufficient to identify vulnerability after the fact. One needs indicators that can be used to identify at-risk households beforehand. There is some consensus that a single indicator cannot capture all the complexities of vulnerability. (World Bank 2001) and Moser (1998) identify the following indicators as useful in assessing a household's exposure to risk: (1) physical assets (housing, equipment and land) (2) human capital (health and education) (3) labour and (4) stocks (food, money or valuables) are a measure of the households' capacity to self-insure. (5) Income diversification is sometimes, but not always an indicator of the households' ability to spread risk. (6) Links to networks (family-based networks, occupation-based groups of mutual help, rotating savings and credit groups, and other groups or associations to which a household belongs) can be a source of transfers in

cash or kind in the event of a calamity. In addition, (7) participation in the formal safety net (social assistance, unemployment insurance, pensions and other publicly provided transfers) and (8) access to credit markets are other indicators of a household's ability to cope with shock.

Detailed qualitative surveys-or modules in quantitative surveys incorporating questions on these indicators-are required to capture all the dimensions of vulnerability. Measuring vulnerability requires panel data, because vulnerability is a dynamic concept. Households need to be obseved more than once in order to assess how they respond to shocks.

Another approach to measuring vulnerability is to measure the prevalence of risks or shocks (usually aggregate risks such as crime, natural disasters).[89]

2.5 Measuring voicelessness and powerlessness

Voicelessness and powerlessness (and the opposite, empowerment) can be measured using a combination of participatory methods and national surveys on qualitative variables such as the extent of civil and political liberties. Best practices in methodology and the associated data requirements are part of a new and ongoing research agenda which is still at a very early stage (World Bank 2001, World Bank 2003).[90]

2.6 Capability approaches to poverty measurement

The capabilities approach which was first introduced by Sen in 1979 (Sen 1980) has had a lot of appeal in the area of poverty measurement. Sen's persuasive arguments in favour of capabilities rather than utility or commodities as the space in which to measure well-being are well-known and widely accepted to be true. It is not merely a way to enlarge the evaluation of well-being to variables other than income, but it is a radically different way to conceive the meaning of well-being (Chiappero-Martinetti 2000).

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[89] See indicators relating to vulnerability in the tables in Appendix E .
[90] See indicators in Table E2 in Appendix E.

In this section, I focus on developments in operationalising the approach, drawing heavily from existing reviews, in particular, Saith (2001a).

Saith describes the main features of the capabilities approach, which will be familiar to the reader from Figure 1. A person may possess the following **commodity vector** [*sack of rice, bicycle*] which has a corresponding **commodity characteristics vector** [*nutrition, transport*][91] which enables this person to achieve various functionings, for example, (*moderately nourished*).[92] Although commodity characteristics do not vary by person, functionings do, so that another individual having a parasitic infection with the same commodity, may only achieve the functioning (*poorly nourished*). A **functioning vector** is a list of functionings that a person achieves, given the commodities at her disposal, her *personal characteristic*s, and other *environmental factors* that impinge on her situation, which gives a snapshot of the person's state of being.[93] A capability is the ability to be or do something.[94] An individual possessing a certain quantity of the commodity *rice* thus has *the capability to be moderately nourished*, although she may not choose to be so (Saith 2001a). A **capability set** is the set of all possible functioning vectors that a person can achieve. Thus, continuing to follow (Saith 2001), the capability set in this situation is {[*moderately nourished, transported*], [*well-nourished, stationary*]}. An individual can then select the functioning vector she prefers, which is then her "chosen state of being" which can be called her "well-being achievement". **Freedom** means having a capability set that offers plenty of opportunity for choice (Muellbauer 1987).[95] The appropriate criterion of poverty is *the lack of fundamental capabilities, that is, the lack of opportunity to attain basic functionings.*

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[91] Note that a commodity may have multiple characteristics, for example, *rice* has a *social* characteristic in that people meet to eat (Saith 2001a).

[92] A functioning is what a person succeeds in doing with the commodities (and their characteristics) in his possession, given his personal characteristics, as well as the existing external circumstances (including factors like physical environment, cultural factors, public goods provision etc.) depicted in Figure 1.

[93] In the example above, a person may use the bicycle and be [*moderately-nourished, transported*] or choose to save the energy on cycling, and be [*well-nourished, stationary*].

[94] If a dynamic aspect is incorporated, a capability is also the ability to *become* something.

[95] Sen (1985) refines the concept by making a distinction between "well-being" freedom and "agency freedom".

Within the capability approach, the problem of identification is dealt with in the literature, mainly in terms of the choice of indicator. The problem of aggregation is the dual problem posed by multidimensionality, of aggregating elementary indicators to obtain an overall evaluation for each single dimension (functioning/capability) and to add up all the dimensions to reach an overall evaluation of well-being.

2.6.1 Choice of indicator

The choice of indicator within the capability approach is thus two choices: (1) identifying the appropriate evaluative space and (2) identifying a list of capabilities or functionings and a set of indicators related to the selected dimensions of well-being with adequate criteria to measure and represent them (Chiappero Martinetti 2000).

Although ideally, interpersonal comparisons ought to involve evaluation and comparison of capability sets, in practice, many researchers have restricted themselves to the analysis of functionings. Three reasons for doing so are: (1) trying to measure capabilities involves enumerating the entire set of alternatives, which in theory, can be infinite (2) the time dimension can create problems and (3) capability measurement is highly demanding. In terms of information-statistical databases give information on what occurred, and not on what could have occurred (Brandolini and d'Alessio 1998).

Evaluative space

Saith (2001a) points out that evaluation (or measurement) within the capability approach takes three forms (1) within the space of "functionings" only (2) combining the space of "functionings" and income, and (3) within "income" space, but using the concept of adjusted income.

Evaluation within the functionings space

Irrespective of the level at which assessment of well-being is conducted, the number of capabilities of functionings that could be considered are enormous. However, if the purpose of well-being comparison is to identify the poor, a subset of capabilities/functionings may suffice. Sen (1993) argues that identifying a minimal combination of basic capabilities can be a good way of setting up the problem of diagnosing and measuring poverty. Basic capabilities here are defined, as in Sen (1980) to separate out the ability to satisfy certain crucially important functionings up to certain minimally adequate levels (below which people count as being scandalously "deprived").

Evaluation combining functionings and income

In this approach, traditional income-based approaches are combined with (a) information on functionings themselves, or (b) variables which are instrumental in the determination of the capability set, such as the prevalence of unemployment, availability and reach of health care, evidence of gender bias in family allocation (Foster and Sen 1997).[96] A range of possibilities exist within this approach, ranging from that suggested by Ravallion (1996) among others (see section 2.2) where no attempt is made to aggregate the different measures used, to approaches that use composite indices that include an income indicator such as the UNDP's Human Development Index (HDI) and Human Poverty Index for developed countries (HPI-2).[97]

Evaluation within (adjusted) income space

Operationalising the capabilities approach within the income space alone requires taking into account each individual's respective conversion ability and deriving individual specific poverty lines (Saith 2001a). This is similar to the second approach, where both income, and functionings

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[96] Foster and Sen (1997) point out that these extensions of income poverty do not aim at a precise "bottom line" but rather seek to enrich the overall understanding of poverty.
[97] HPI-1 does not use an income indicator.

are considered in the measurement. It differs in that the measures are developed entirely in income space.

An alternative way of looking at this is as an extension of the equivalence scale approach (used commonly within the monetary approach), where household income is converted into individual income taking into account economies of scale, and differences in individual characteristics (see section 2.1.2). In this relatively new approach to operationalising capabilities, individual incomes are adjusted for differences in functionings in order to get some sort of "functioning-equivalent incomes". Thus, according to Foster and Sen (1997) the income level of a family may be adjusted downwards by illiteracy and upwards by higher levels of education, to make them "equivalent" in terms of capability achievement. This approach has much to offer in terms of practical usefulness, and allows for more articulation and stricter metrics (Foster and Sen 1997) especially in relation to the problem of aggregation. Work in this area includes that explored by Angus Deaton, Anne Case and Christina Paxson,[98] Ballestrino (1995) and Desai (1995).[99]

However, when variations in the conversion of income into capability arise from handicaps that are not so easily compensated by higher personal income (such as living in an epidemiologically dangerous environment, or having an incurable or untreatable disease) then this approach is less satisfactory, and the need to look directly at capabilities/functionings (as described in the previous two approaches) may be inevitable (Foster and Sen 1997).

Indicators and dimensions

What these "basic capabilities" and "basic functionings" may be needs to be ascertained. Fusco (2003) suggests two ways (other than by hunch) of choosing indicators, one *a priori* and the other *a posteriori*. The *a priori* method is to rely on recommendations made by the *bon sens* of a

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[98] In a joint research project of Angus Deaton and Amartya Sen, supported by the MacArthur Foundation.
[99] Ballestrino makes some suggestions toward developing societal poverty lines, while Desai's methodology is resources required to guarantee a minimal list of capabilities (Saith 2001a).

philosopher or a school of long tradition.[100] The *a posteriori* method is to apply a multivariate technique of data analysis (such as principal component analysis, factor analysis, latent variable analysis) on a sample, but there is no guarantee that the list will be exhaustive.

Alkire (1998) provides a useful list of guidelines that functionings must satisfy in order to be considered as indicators of basic deprivation: (1) the functioning belongs to the capability set (is itself valuable) or the functioning is directly associated with the capability set (highly correlated, etc.) (2) the functioning pertains to a basic human need, that is, that without which one's life may be blighted (3) the functioning is not significantly dependent on any non-basic prior functioning (4) the functioning is not dependent on the presence of uncommon ability or interest (5) the level of achieved functioning, which is widely recognised as "basic" can be specified and empirically observed (6) provision of the functioning does not necessarily compromise freedom to pursue other significant functionings in the long term.

2.6.2 Choice of unit of analysis

Empirical operationalisations of the capabilities approach have typically used the individual (for example, numbers enrolled in school, mortality, literacy, undernutrition). Like poverty measures, some information is collected at the household (for example, access to safe water and sanitation) and the appropriate computations for individuals are made, assuming intra-household equality.

2.6.3 Choice of poverty line

The choice of poverty line in the capability approach has to address the problems of any multidimensional poverty measure. Poverty thresholds have to be determined for each elementary indicator, and a threshold (or aggregation rule) in multidimensional space also needs to be determined (see section 2.2.3 and 2.2.4).

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[100] Streeten (1981), Doyal and Gough (1991), Desai (1995) Qizilbash (1998) and Nussbaum (2000) provide several lists whose merits and demerits are discussed in the literature.

In some instances, these thresholds may be obvious, or natural. They may need to be determined by experts, and there is an inescapable element of arbitrariness in most cases (as for example in the HPI-1 and HPI-2 described in Appendix F).

Fuzzy Set Theory has been applied to determine poverty thresholds in capability measurement (see section 2.2.3). In this approach, following Chiappero Martinetti (2000) we let "F be the fuzzy subsets that define the position of each individual according to the degree of attainment of a given attainment (functionings), μF is the membership function. In this case, if

μ_F (x) = 0, there is complete failure in achieving the functioning represented by X

$0< \mu_F$ (x) < 1, there is a partial achievement of the functioning represented by X

μ_F (x) = 1, there is complete achievement of the functioning represented by X."

In the first application of fuzzy set theory to poverty measurement Cerioli and Zani (1990) presented a method of computing a multidimensional deprivation ratio and functioning indices for dichotomous variables (which are traditional sets; non-possession of a good implies a deprivation of the good, possession implies an achievement in the relevant functioning), categorical variables and continuous variables.

Let $D=[D_1,...,D_k]$ be the set of living standard indicators, chosen as outlined in section 2.6.1, and K_j be the subset of individuals deprived in D_j, so that k_{ij} is the value that denotes the degree of deprivation of variable j by individual i, and H_j is the subset indicating level of achievement in the functioning represented by D_j, hij is the value that denotes the degree of functioning in variable j by individual i.

The membership function in the case of *deprivation* in categorical variables is then

$$\mu_K (i) = 1 \qquad\qquad\qquad \text{if } 0 < c_{ij} \leq c_{inf, j}$$
$$\mu_K (i) = (c_{sup,j,} - c_{ij})/c_{sup,j} - c_{inf,j} \qquad \text{if } c_{inf, j} < c_{ij} < c_{sup, j}$$
$$\mu_K (i) = 0 \qquad\qquad\qquad \text{if } c_{ij} \geq c_{sup, j}$$

where $c_{inf,j}$ and $c_{sup,j}$ stand for two threshold values. $c_{inf,j}$ is the threshold under which the individual is certainly deprived in the jth dimension, while $c_{sup,j}$ is the threshold above which the individual is certainly not poor relative to the jth dimension. Achievement in functionings can be specified in a similar way.

$$\mu_H (i) = 0 \qquad\qquad\qquad \text{if } 0 < c_{ij} \leq c_{inf, j}$$
$$\mu_H (i) = (c_{ij} - c_{inf, j})/ (c_{sup,j} - c_{inf,j}) \qquad \text{if } c_{inf, j} < c_{ij} < c_{sup, j}$$
$$\mu_H (i) = 1 \qquad\qquad\qquad \text{if } c_{ij} \geq c_{sup, j}$$

Note that these specifications in the case of categorical variables assume that values are equally spaced.

The specifications of the membership functions are similar in the case of continuous variables. One obvious application of continuous variables is the use of income or consumption, but now instead of one poverty line or threshold (as in section 2.1.3), two thresholds are specified. Cerioli and Zani suggest that the lower threshold ($c_{inf,j}$) could be fixed at the level of subsistence poverty (absolute poverty) and the higher threshold (c_{ij}) at the level of the mean or median income (relative poverty).

2.6.4 Choice of poverty measure

Constructing poverty measures under the capabilities approach, like in

the monetary approach, requires both identification and some mechanism for aggregation. As discussed in section 2.2, this poses some problems when more than one functioning is considered. The discussion in section 2.2.3 and 2.2.4 applies to capability measures; in fact, many of them were derived under the capability measurement research agenda. In this section, I focus mainly on interpersonal comparison, specifically the distinction between partial ordering and complete ordering, drawing heavily on Saith (2001a).

Partial ordering
Two possible procedures may be followed.

Dominance partial ordering
An individual may be considered better than another if the value of one of the functionings in the functioning vector is higher than that of the other, provided the value of none of the remaining functionings is lower (similar to the Pareto criteria). This is also known as vector dominance.

Table 14: Dominance partial ordering

Individuals	"Being healthy" days well previous year (max. 365)	"Being educated" level of education (max. 12)	"Being nourished" mid-arm circumference (max. 8)
A	360	8	4
B	330	6	4
C	365	7	5

Source: Saith (2001a)

On the basis of dominance ranking, A ranks higher than B, and C

ranks higher than B, but A and C cannot be ranked against each other. All that can be said is that the well-being of A is higher than that of B, and the well-being of C is higher than that of B, but no relative ranking of A and C is possible.

Sequential dominance
This analysis technique is used for the comparison of income distributions when family needs differ, yet it could be used to obtain partial orderings within the capabilities framework (Brandolini and D'Alessio 2000).

Complete ordering
This implies that some decision has to be taken on the relative importance of each functioning. Some ways in which this is done are discussed in section 2. 2.4.

A commonly used technique to achieve this is Borda rule ranking. The rule provides a method of rank-order score where each unit (for example, country or region) is awarded a point equal to its rank in each criterion (dimension) of ranking (alternative with the least well-being scores 1, and that with the highest scores N), where all scores are added up into aggregate scores, and ranked according to aggregate scores (which is the Borda ranking). If two individuals tie they are given the same number, and the rank given to the next score is one higher to account for the replication. The advantage this has over dominance ranking is that it can give a complete ordering (see Table 15), and it is simple and easy to use and the fact that its strengths and weaknesses are transparent and well-known. A major weakness is that it only allows for ordinal comparisons. Thus, implicit in the rule is the principle of equal weighting (no weight is given for distance or depth of deprivation).

Table 15: Borda rank

Individuals	"Being healthy" days well previous year rank	"Being educated" level of education rank	"Being nourished" mid-arm circumference rank	Total Rank Value	Borda Rank
A	2	3	1	6	2
B	1	1	1	3	1
C	3	2	3	8	3

Source: Saith (2001a)

The problem of inability to rank A and C is now solved, with the well-being of C being declared the highest by the Borda score, followed by the well-being of A, and then of B. However, there is no way to know if the relative position of C to A is much better than that of A to B.

Composite index

Section 2.2.4 and Appendix F deal with most of the literature on composite indices. In this section, I continue with the illustration provided by Saith (2001a). The values here are "normalised" values of those in Table 14. The composite index is simply an arithmetic mean, which assigns equal weight to all dimensions. The ranking follows that of the Borda score. However, it is possible to compare the relative position of C to A, with that of A to B.

Table 16: Composite index

Individuals	"Being healthy" days well previous year normalised value	"Being educated" level of education normalised value	"Being nourished" mid-arm circumference normalised value	Composite index (arithmetic mean)
A	0.99	0.67	0.50	0.72
B	0.90	0.50	0.50	0.63
C	1.00	0.58	0.62	0.73

Source: Saith (2001a)

Application of fuzzy set theory to aggregation of multiple dimensions
Recent contributions that make use of fuzzy set theory provide ways in which to incorporate a system of weights (Cerioli and Zani 1990). Fusco (2003) following Brandolini and D'Alessio (1998) arrives at two ways of aggregating the values derived in section 2.6.3; one is a multidimensional ratio of deprivation/functionings for each individual (unit of analysis),[101] whereas the other is a unidimensional ratio indicating the average population in the membership of a deprivation/achievement in functioning.[102] Both these ratios are computed as averages. In the multidimensional aggregation, the weight w_{kj} used are the inverse function of the rate of individuals deprived in/achieving in the jth functioning, so that the greater the *frequency* of deprivation/achievement in an attribute, the greater its importance.[103] The weighting schemes used so far are inevitably arbitrary or debatable.

2.7 Social exclusion approaches to poverty measurement
Although there is far less consensus on methodologies for measuring social exclusion than there is in the measurement of monetary poverty, there are several pragmatic approaches that have been undertaken. For example, many publications of member states of the EU cross-tabulate monetary poverty with indicators of several domains that relate to social exclusion (EU Social Protection Committee 1998). In this section, I draw on some recent attempts to develop a scientifically/theoretically/conceptually-based methodology for measuring social exclusion.

A conceptually based measurement of social exclusion would allow the calculation of the level of social exclusion in a country, comparisons across countries or groups, and allow for subgroup decomposition.[104] As in a quantitative or monetary measure of poverty, it would

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[101] The unit of analysis used by Fusco (2003) is actually the country.
[102] This is analogous to the familiar percentage of people without access to safe water, except that the threshold for safe water is now fuzzy, rather than arbitrarily dichotomous.
[103] An alternative is to give equal weights to each dimension, as in the UNDP indices.
[104] That is, be capable of answering the question, given the level of social exclusion in a society, which subgroups of the population, partitioned according to ethnic, geographic, and any other socioeconomic characteristic, contribute more to aggregate social exclusion (Chakravarty and D'Ambrosio 2003).

need to address the problems of *identification* and *aggregation* and the related choices of *indicator, unit of analysis, poverty line* and *poverty measure*. Some of the defining features of social exclusion that determine how these choices are made are: (1) *multidimensionality* of the concept which includes political, cultural, and social as well as material aspects of exclusion,[105] (2) *relativity* (3) the focus on *dynamics* and (4) *social interaction* (Bossert *et al.* 2003). In this section I examine the implications of these properties for the measurement of social exclusion.

2.7.1 Choice of indicator(s)
Domains, dimensions and indicators
Social exclusion is by definition multidimensional, and implies deprivation in a wide range of indicators or functionings of living standards, which can be of a quantitative or qualitative type. As in a multidimensional measure of poverty, a measure of social exclusion needs to identify the domains and dimensions along which the deprivation or disadvantage occurs.

Typically, the social exclusion literature refers, first to the selection of domains (for example, health), then dimensions are chosen within these domains (for example, length of life in health) after which indicators that measure these dimensions are selected. Finally, composite measures or synthetic indices are constructed that combine the dimensions into a single measure (see section 2.7.4).[106]

The choice of domains, dimensions and indicators is somewhat *ad hoc*, as the examples that follow indicate. The Statistical Programme Committee of the EU (1998) recommended three domains (1) income (2) labour market and (3) social indicators.[107] Böhnke (2001), also in the context of social exclusion in the EU, argues for four "levels" of social exclusion: (1) the non-realisation of rights and the denial of access to social protection systems (for example, homelessness, illiteracy, under-

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[105] Many of the functionings that are considered are *qualitative*, or measured using a subjective or consensual approach to measurement. See more about this approach in section 2.7
[106] This is the procedure outlined in the construction of Social Indicators for the EU (Noll 2001).
[107] Fifteen indicators suggested by Eurostat (2000) fall into 7 domains: (1) Financial difficulties (2) Basic necessities (3) Housing conditions (4) Durables (5) Health (6) Social contact (7) Dissatisfaction.

nutrition) (2) disadvantages in several life domains that may interact and reinforce each other such as low income, bad housing conditions, precarious labour market attachment, unemployment (3) weak social networks and family ties, limited opportunities to take part in social, political and cultural life and (4) individual perception of opportunities and deprivation. Saunders (2003) defines three dimensions in the Australian context: lack of social interaction, domestic deprivation and extreme consumption hardship. Camara *et al.* (2003) mapping social exclusion in urban Brazil include four dimensions: (1) autonomy (2) life quality (3) human development and (4) equality.[108] Gordon *et al.* (2000) analysing social exclusion in Britain, argue for four dimensions to be included: (1) impoverishment or exclusion from adequate income or resources (2) labour market exclusion (3) service exclusion and (4) exclusion from social relations. I follow this last classification, as being both comprehensive and having a basis for justification.

Exclusion from adequate income or resources
Gordon (2002) defines poverty as the state of having *both* low incomes and low standards of living. Many studies of social exclusion go beyond the standard income or monetary approach in measuring poverty using, in addition, measures of items lacked, as in the relative deprivation approach (pioneered in Mack and Lansley 1985), and people's own perceptions of their situation, as in the subjective approach to poverty measurement (Dirven *et al.* 1998). For example, the project of measuring poverty and social exclusion in Britain in which Gordon was involved in used three separate measures: income poverty, necessities poverty, and subjective poverty (Bradshaw *et al.* 2000).

Exclusion from the labour market
A dominant theme in the social exclusion literature is labour market

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[108] Variables under autonomy include poverty and labour market related variables, quality of housing, and access to services are included under quality of life, literacy and education, mortality and violence are included under human development, and gender equality variables under equality. These variables are specific to the conditions in São Paulo.

access. Social exclusion is identified with non-participation in the labour market and long-term unemployment. There is justification for doing so within this approach: a job provides not merely an income, but is also an arena for social contact and social interaction (Bradshaw *et al.* 2000).

However, Gordon (2002) points out the danger of oversimplification-for example, being employed in a job with long working hours can lead to non-participation in social activities that people themselves consider to be necessary (such as weddings and funerals), while over half the population in many countries does not participate in the labour force from "choice", rather than exclusion, either because they are engaged in unpaid labour, or because they are too young or too old.[109]

Recent work in developed countries attempts to combine work on unemployment duration, and a larger set of labour market transitions with the concept of social exclusion-if some workers are "persistently" excluded, that is, trapped in a vicious circle of low skilled employment, unemployment and labour market withdrawal, the policy implications are more serious than if workers spend brief episodes of exclusion followed by inclusion (Bradley *et al.* 2003).

Exclusion from services
An aspect of social inclusion is lack of access to basic services, both inside the home (such as electricity, water supply and sanitation) and outside (transport, markets, financial and health services). The *Poverty and Social Exclusion Survey* in Britain allowed researchers to identify whether households lacked access to these services because they were unavailable, or because the households could not afford them, or because they did not want to. The *World Development Report 2004* shows how service provision is failing the poor (World Bank 2003).

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[109] However, a gender-analytic approach may point out the constrained nature of the choice that operates in unpaid labour which, in certain circumstances, can lead to social exclusion.

Exclusion from social relations
The social exclusion approach is specifically interested in social interaction. Involuntary non-participation in socially-perceived necessary activities, isolation, perceived lack of support, lack of civic engagement and confinement were dimensions in which social exclusion was measured in Britain, using data from the P*overty and Social Exclusion Survey* (Bradshaw *et al.* 2000).

Relevant domains in a developing country context
Saith (2001b) examines the feasibility of operationalizing the concept of social exclusion in developing countries. In the North, Saith (2001b) claims, patterns of social integration are institutionalised and clearly defined, and social exclusion, when applied to those outside accepted norms includes those excluded from the welfare state, social security, and in long-term unemployment. Given the differences between the North and South in terms of political history, the magnitude of insecurity, administrative resources and budget constraints in developing countries, applying the same criteria in the South as in the North does not appear practically feasible (Saith 2001b). An alternative route is explored by Saith (2001b) in the context of "social security schemes *as they have developed in developing countries*". Social security in developing countries, unlike in developed countries, includes the activism of the public, non-governmental organizations, social, political and humanitarian institutions as well as the activity of the state (Saith 2001b). It includes a protective dimension (such as the prevention of famines) as well as a promotive dimension (such as the alleviation of regular and persistent deprivation like endemic hunger or rampant morbidity). Saith (2001b) points out that while this latter dimension is similar to the concept of social security in developed countries, identifying individuals who do and do not benefit from the system would be very difficult. Identifica-

tion on the basis, of *outcomes*, rather than benefits is far more feasible. Thus, the excluded could be those "who do not achieve certain minimum standards of functionings related health, nutrition and education (Saith 2001b). However, defining exclusion in relation to employment status is problematic because the majority of the population would be engaged in activity outside the organised sector, and could not be considered "excluded".

Studies in developing countries range from those that are in fact studies of multidimensional poverty, concentrating on dimensions of health, education, housing, water supply, sanitation and social security (Appasamy *et al.* 1996 for India) or exclusion from land (Mearns and Sinha, 1999 for Orissa, in India), to those that include exclusion from rights and social networks as well as employment, credit and insurance (Figueroa, Altamirano, and Sulmont 1996 for Peru), and those that used a subjective approach to defining social exclusion (Bedoui and Gouia 1995 for Tunisia).[110] Saith (2001b) argues that many of these studies are simply revisiting old debates and discussions about the multidimensionality of poverty, under new terminology.

How to measure exclusion within these dimensions?

While most studies measuring exclusion state very clearly which dimensions and indicators they use, these indicators are used in a very *ad hoc.* manner. The issues relating to aggregation are those that arise in any multidimensional index, and are dealt with in section 2.2.4.

Identifying groups approach

Some studies of social exclusion attempt to identify whether an individual is socially excluded or not, based on whether the individual con-

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[110] These are all studies reviewed by Saith (2001).

cerned belongs to a group that is considered at risk of social exclusion. Sources of social exclusion include physical isolation, ethnicity, gender and religious discrimination, bureaucratic barriers, institutionalised road bias, corruption, intimidation and physical violence, and the nature of the local and national political elite.

The problem with this type of approach is that while it is pragmatic, it over-generalises, and is not very useful in helping to identify the socially excluded.[111]

Persistence and the dynamics of exclusion
The social exclusion literature refers to the importance of persistence, for example, one spell of unemployment does not make an individual socially excluded (Bradley *et al.* 2003, Klasen 1999). Another time-related feature of social exclusion is that disadvantage is often cumulative-poor educational attainment and poor educational achievement (as measured by literacy and numeracy tests) have strong impacts on unemployment rates. Exclusion - or adverse inclusion or incorporation-thus, may be the cause of chronic poverty (Bird and Shepherd 2003).

Geography and exclusion
Adverse geography may limit access to resources for participation (through lack of proximity, mobility, and networks) as well as generate exclusion through statistical discrimination (Klasen 1999).

2.7.2 Choice of unit of analysis
Although it is argued that social exclusion moves beyond the individual to include a neighbourhood dimension, in practice, this approach does not differ very much from conventional methods of poverty measurement (Bradshaw *et al.* 2000). Information is collected at the unit or

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[111] Gordon (2002) comments that the only person in Great Britain who was not excluded under a compilation of groups based on existing studies was Prince Phillip! The queen herself, being a pensioner and a woman, would have to be defined as socially excluded. Applying the "Lady Di" test (discarding any theory that would have included her as socially excluded because she was a single parent with mental health problems, because they took it as axiomatic that she was not) enabled Gordon and his colleagues at the Townsend Centre for International Poverty Research to discard most of the literature on social exclusion!

household level, but the unit of analysis is often the individual (Chakravarty and D'Ambrosio 2003).

2.7.3 Choice of poverty line

Haveman (2003) poses the following question: if inclusion is a continuum, how do we establish exclusion? Chakravarty and D'Ambrosio (2003) argue that social exclusion differs from multidimensional poverty in the sense that, although both multidimensional poverty and social exclusion relate to failure in functionings, (absolute) poverty does so in terms of shortfalls from a threshold, while social exclusion relates to the inability to participate. Thus, they do not use a poverty line. Functioning failure is then incorporated in their measure in a somewhat complex way: an individual is considered deprived whenever there are people who experience fewer functioning failures than him/her. In this manner, if no household in a society had access to safe water, any one of those households would not be considered deprived, or excluded. While this may be a fair interpretation of the concept of exclusion, it obviously does not fit with a concept of poverty, especially of absolute poverty.

An alternative way of conceptualising the poverty line in a social exclusion framework that emphasises neighbourhood effects is illustrated in Figure 9. The poverty thresholds would be optimal if it occurs at the position indicated, where the differences between the poor and the rich are maximised and the differences within the two groups are minimised.

Figure 9: Poverty and social exclusion
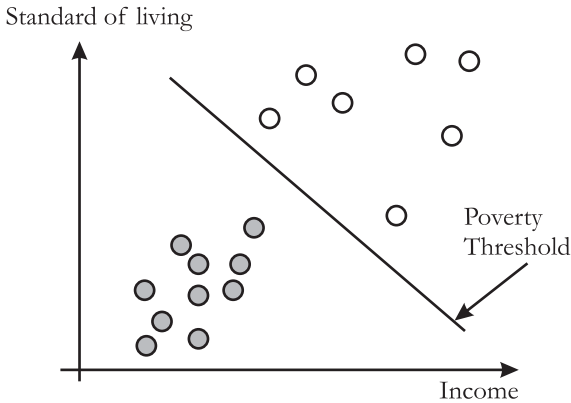
Source: Adapted from Gordon (2002)

Camara *et al.* 2003 use a method where reference values of zero are given to a *basic standard of inclusion* for each variable. Areas with values above this are mapped onto a positive scale, while areas below are assigned negative values. Each index has a range between-1 (total exclusion) and 1 (total inclusion).

The Statistical Programme Committee of the EU using a more pragmatic approach, notes that the use of the median rather than the mean as a reference for the poverty line is more in line with a social exclusion definition, because social exclusion implies distance from the standard income level, which is the income level in the middle of the distribution (EU 1998).

2.7.4 Choice of poverty measure
The debate on whether the multiple indicators in the measurement of social exclusion should be aggregated or not is still open, with several initiatives choosing not to do so (Bradshaw *et al.* 2000).

Unlike the well-known measures of poverty and inequality, measures of social exclusion are only just being developed. Some researchers follow a "pragmatic" approach to aggregation, including the ranking method adopted in the calculation of the Human Development and Human Poverty indices. Others like Chakravarty and D'Ambrosio (2003) and Bossert *et al.* (2003) characterise a family of measures of social exclusion using an axiomatic approach, in a way similar to the derivation of standard poverty and inequality measures. The measures satisfy the axioms of *normalization* (if nobody is socially excluded the measure is zero), *monotonicity* (if the deprivation score of a person increases, the measure increases), *subgroup decomposability* (for any partitioning of the population with respect to some socioeconomic or demographic characteristic, the overall social exclusion is the population weighted average of subgroup exclusion levels),[112] and *nondecreasing marginality* (when aggregating individual deprivation scores into an overall indicator of exclusion, a higher deprivation score does not get a lower weight than a lower score).

Chakravarty and D'Ambrosio (2003) and Bossert *et al.* (2003) incorporate the concept of social exclusion and functioning failure as occurring if an individual has more functioning failures relative to the rest of society. Similarly, they consider the dynamics of social exclusion to imply that exclusion occurs with persistence (this is similar to the idea of persistence in labour market exclusion in Bradley *et al.* 2003 cited in section 2.3.1).

2.7.5 The contribution of the social exclusion approach

What does the social exclusion approach add to the measurement of poverty? Despite its wide acceptance by policy makers in developed countries, others have been sceptical about its value added. Bradshaw *et al.* (2000) claim that "social exclusion has been contrasted with a parody of the concept of poverty." Haveman (2003) suggests that its contribu-

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[112] This property is useful in calculating a particular group's contribution to aggregate exclusion, and hence to identify the subgroups that are more afflicted by exclusion, and to implement anti-exclusion policy (Chakravarty and D'Ambrosio 2003).

tion is in adding the concept of "participation" (described as access to jobs, public services, social activities) which adds richness to the meaning of disadvantage and forces a search for policies other than income support. Klasen (1998) suggests that social exclusion can be seen as the denial of three important capabilities: the ability to be integrated into the community, participate in community and public life and enjoy social bases of self-respect (Sen 1992, Sen 1999). However, difficulties in incorporating these into measurement remain.

Measuring exclusion

The measurement of poverty in many developed countries includes several instruments to measure exclusion (see Annexe E). While these measures cannot be applied directly to developing countries, some guidelines for measurement can be derived from this literature. Ruggeri-Laderchi has three suggestions: (a) Take norms from outside the society, for example, from developed countries. This would fit in with an absolute approach, whereas to be completely relative may lead to accepting as the norm that which is an intrinsic aspect of deprivation, for example, the caste system is part of the social system. (b) Derive the characteristics through consultation in participatory approaches. This method has great potential for identifying what societies themselves consider aspects of social exclusion. Its disadvantages, described in section 2.6 include the point made above, that using a subjective approach may lead to accepting as normal, and therefore ignoring, what is essentially deprivation or exclusion. (c) A third approach, used commonly in the economics profession is to derive empirically structural characteristics of the population (race, caste, region, types of occupation) that are correlated with deprivation in other approaches.

Some excluded groups relevant to Asia have been identified by Deolalikar *et al.* (2002). In rural areas, these are the landless, small and marginal tenant cultivators, and indigenous peoples (often ethnic mi-

norities). In urban areas these are urban slum-dwellers who are usually recent migrants, women (widows and household heads) and children (street children, child workers and orphans). Regional exclusion (for example, Northeast Thailand and the Northern Uplands and Central Highlands in Vietnam) is also identified as a category of exclusion.

Specific measures of social exclusion (inclusion or integration) that are appropriate for developing countries may include indicators of "solidarity": (a) at least one member of the household has participated in mutual aid activities with neighbourhoods or in an association (b) at least one member of the household has found his job thanks to personal relations (c) the household has received (or given) gifts coming from (or to) other households at the time of festivities during the year, and indicators of "participation in social life" such as access to and keeping abreast of information, knowledge of institutions, participation in association activities (Razafindrakoto and Roubaud 2003).

2.8 Participatory approaches to poverty measurement
Participatory appraisals

Participatory poverty assessments (PPA), such as those used in the World Bank, evolved from participatory rural appraisal (PRA) defined as "a growing family of approaches and methods to enable local people to share, enhance, and analyse their knowledge of life and conditions, to plan and to act." (Chambers 1994).

Rapid appraisal and participatory appraisal are commonly used approaches in monitoring poverty and the participatory design of projects. Participatory appraisal has the specific objective of empowering the target group, while rapid appraisal methods are meant to provide evaluators data on the community in a very short time (usually a day visit) with a usually predetermined agenda (Zeller *et al.* 2001). They use simi-

lar methods. (See Appendix F for a list of methods). They are useful in identifying vulnerable groups in a community and, therefore, suited for targeting, as well as the participatory design of development projects and services.

Participatory wealth ranking

Participatory wealth ranking, a method used by both these approaches, asserts the primacy of local knowledge over externally determined measurement criteria. The ranking is based on the subjective view of the people in a community, who generate their own criteria with which to rank poverty or wealth. The ranking involves several stages: mapping, which takes place at a community meeting, where a village map is drawn and a list of households are generated from the map; initial ranking of household;[113] and analysis[114] (Falkingham and Namazie 2002).

2.8.1 Choice of indicator

The participatory approach uses local knowledge in the choice of indicator, and thus has a unique contribution to poverty measurement. Chambers' 1997 list of indicators from participatory assessments shows the importance of lacking assets, education, labour, and food security. These were typically important indicators.

The largest PPA conducted by the World Bank is *Voices of the Poor* which included 69,000 people and 78 PPAs in more than 47 countries (Narayan *et al.* 2000). *Voices of the poor* concluded that the poor define poverty as multi-dimensional and beyond material well-being (Sumner 2003). (1) Risk and vulnerability and (2) empowerment and participation were two aspects of well-being highlighted both in this study and the conjoint World Development Report 2000/2001. The study also identified food security and employment as important aspects of material well-being.

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[113] Each household is represented by a card. Three reference groups are set up for each section of the village that has been mapped, with three to five members of the community in each group. Each group meets separately and sorts the household cards according to wealth on a continuum from high to low.

[114] The results of the ranking of different groups are brought together and the piles are scored. The final score of each household is the average of the ranks it was given by three reference groups

The advantage of the participatory approach is that it can be used to identify location-specific poverty indicators and indicators of deprivation.

2.8.2 Choice of unit of analysis
The unit of analysis is typically the household (see section on Participatory Wealth Ranking above).

2.8.3 Choice of poverty line
Poverty thresholds are implicit in this approach, which does not construct well-defined poverty lines, but rather asks for participatory wealth ranking, which fits in more with a completely relative notion of poverty.

2.8.4 Choice of poverty measure
Aggregation of information on individuals in poverty into a measure is not addressed in the participatory approach. Baulch (1996b) characterises participatory approaches as being strong on identification, but weak on aggregation. This may be too simplistic an assessment.

Chung *et al.* (1997) list several reasons why the usefulness of these methods in assessing poverty for regional, national or international comparisons is limited. (1) The results stem from subjective ratings of community members and are difficult to verify (2) the method is consistent with finding the poorest third in one village, but it may not be consistent in finding in which communities the poorest third of an entire region reside (3) strategic responses or biases in anticipation of benefits from understating wealth, cannot be ruled out (4) the method requires skilful and experienced communicators, in comparison with structured surveys that only require enumerators.

On the one hand, identification of the poorest takes place at a micro (village) level, and does not provide a means of consistent comparison

across villages. On the other hand, methods are being devised that allow the application of these results beyond the village level. These are discussed below.

Participatory approaches can be extrapolated to other communities, as for example in Ravnborg (1999), where a well-being index is created and extrapolated by means of a questionnaire applied to a random sample of communities. The similarity with proxy means testing is evident: but rather than key variables being identified by multivariate regression, they are identified by local informants (Davis and Siano 2001). Leclerc *et al.* (2000) extrapolate their results to the whole country using neural nets and proxy indicators found in census data.

Christiaensen *et al.* (2000) were able to test if participatory wealth ranking and village mapping compared well with the more traditional household survey methodology by using both methods in a study of five villages in Northern Mali. They found that a sampling frame constructed from a population census and revised with local input suffered from undercoverage, while village mapping suffered from overcoverage. PWR resulted in higher estimates of household size and lower estimates of household wealth than the household survey. They interpret this to be the result of the dynamics of these different activities. They argue that rather than asserting the superiority of one method over another, it is important to carefully examine and acknowledge the biases that can result from a particular method being used. They reiterate the importance of triangulating, or cross-checking, information that is obtained.

In another comparison in Kenya, the findings of the 1995 participatory survey using "wealth ranking" were compared with those of a 1992 National Welfare Monitoring Survey based on an established poverty line. Where cluster sampling was carefully carried out and where drought did not seriously affect the district in the intervening years, the estimates of poverty from the participatory survey were virtually

identical to those from the national survey (Narayan and Nyamwaya 1996 cited in Kanbur and Squire 2001).

Another apparent "inconsistency" between qualitative and quantitative results is that households that are clearly below the poverty line in monetary terms may not consider themselves poor in a wealth ranking/participatory/subjective approach. The reason for this is usually that "perceptions" of poverty have a strong relative component. People "feel" poor relative to their neighbourhood (Thorbecke 2003).

Other criticisms of the approach are, that while communities are heterogeneous, the "voices" that are heard are likely to be those of the powerful. The public nature of the assessments may make it difficult to get honest assessments, and involve participants in some risk.

2.9 Other approaches to poverty measurement
2.9.1 Poverty monitoring

Poverty monitoring is distinct from poverty measurement in that the measurement takes place at regular intervals, while monitoring is a "continuous" process. While the focus of this paper is on measurement, it is necessary to refer to monitoring, however briefly, in the context of the poverty information system.

One approach that is sometimes (inappropriately) used is to update the existing national poverty line, and compare project beneficiary households' income (or expenditure) level with this poverty line. National poverty lines are usually laboriously constructed according to current best practice (as outlined in section 2.2), using data from well-designed expenditure modules of over 200 items from budget surveys conducted by national statistics offices. Conducting a similarly detailed and time-intensive expenditure survey in the project area is expensive and requires well-trained personnel. Instead, what is typically done is to compare the poverty line with an income or expenditure measure

that is based on a few questions in the survey and subject to a great deal of measurement error. This is compounded by the fact that cash incomes and expenditures form a very small fraction of (rural) developing country household income/expenditure.

Another alternative may be to use nationally gathered survey data for the project area. This may not be possible because of sampling design. Moreover, when there is a time lapse between the national survey and the assessment exercise, inflation and changes in relative prices need to be accounted for as well (Zeller *et al.* 2001). In addition, access to national data may be restricted, or the cost of the data (when governments sell it) may be prohibitive, and it may be poorly documented so that considerable time is needed for a skilled analyst to make the data comparable and to resolve the issues of inflation and changes in relative prices (Zeller *et al.* 2001).

Other approaches that are used are those of Rapid Appraisal and Participatory Appraisal. However, the use of these approaches is limited in the monitoring of poverty at the national or regional level (see section 2.8.).

As a result, several monitoring tools and techniques are being developed that attempt to fill this gap. They are described below.

Proxy means testing

Poverty indicators (or component indicators of composite indices of poverty) are either (a) unambiguous measures of poverty (such as measures of the incidence of hunger) or (b) proxies for consumption (or income) poverty (Zeller *et al.* 2001). Proxy means testing offers an example of indicators chosen on the latter basis.

Proxy means testing is used for the purpose of targeting. The indicator of poverty (welfare) is income or consumption (usually consumption, as defended in section 2.1). The purpose of the exercise is to iden-

tify good predictors/correlates of consumption, which are easily measurable and verifiable, and which may be used when information on consumption is unavailable.

Proxy means tests have been developed by the World Bank using LSMS data (Grosh and Baker 1996, Grosh and Glinskaya 1998) as well as by the International Food Policy Research Institute (IFPRI) (Ahmed and Bouis 2001) using the IFPRI-led 1997 Egypt Integrated Household Survey (EIHS). Grosh and Glinskaya (1998) use six classes of independent variables: (1) location (2) household composition (3) social categories (4) housing quality (5) ownership of assets and consumer durables and (6) employment and verifiable income-related variables. Ahmed and Bouis (2001) include an additional category: education. Comparing the model with estimates derived from the same survey, based on consumption expenditures results in an error of exclusion that is 28.2 percent and an error of inclusion of 16.3 percent.

Monitoring tools

The need to monitor poverty continuously has led to the development of new "tools" for the purpose. One of these, the CGAP Poverty Assessment Tool, is described below. Rapid monitoring surveys developed by the World Bank, UNDP and other organizations are also a response to this need. Some examples are described in the next chapter.

The CGAP poverty assessment tool

The Consultative Group to Assist the Poorest (CGAP) poverty assessment tool is a low-cost tool intended for use in project and policy assessment developed by the International Food Policy Research Institute (IFPRI) with technical and financial support of CGAP of the World Bank.[115] It was developed specifically to measure the poverty level of microfinance clients, but it can be applied to identify the poor in a

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[115] See Zeller *et al.* (2001) for a detailed description.

general sense as well.

Zeller (2001) describes the steps in developing the tool as (1) identifying a large number (over 300) of indicators which were tested in the field in four case-studies and subsequently reduced (2) designing a survey methodology that facilitated the collection of information on these indicators from households in the operational area of the programme (microfinance institution) and (3) applying a suitable statistical methodology for summarizing the information in the various indicators into a single summary index.

The indicators were divided into (a) those which express the means to achieve welfare, specifically the household's human capital (family size, education, occupation, etc.), physical capital (type and value of assets owned), and social capital and (b) those which are closer to the ends themselves (access to health services, food, electricity, energy, water, shelter and clothing, human security, and environmental quality). Over 300 indicators were pre-selected. The strategy followed in identifying reliable indicators was to choose indicators that were (a) obvious measures of a dimension of poverty, such as the incidence of hunger or (b) good proxies for household total expenditure. An eight-point list of criteria was used to evaluate indicator suitability: (1) suitability for urban-rural contexts (2) sensitivity of question (3) time and cost requirements to obtain answers (4) quality of the indicator in discriminating between different poverty levels (5) reliability[116] (6) simplicity and (7) universality in an international context.

The list of indicators that were rejected and the grounds for rejection is enlightening. They included (a) indicators using child-specific information (not all households have children, therefore, not a universal indicator) (b) indicators of social capital (still an evolving area of investigation and measurable and comparable indicators are not easily found) (c) subjective responses (responses on self-assessment of poverty

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[116] In the data collection sense, that the answer can be verified in a recheck.

were considered unreliable for comparisons) (d) health-related information (reliable health information requires longer recall periods and more intensive and specialized training of interviewers, which is expensive).

The questionnaire was field tested in four sites, one each in Central America, East Africa, Southern Africa and South Asia. The final list of indicators used in the questionnaire and the list of indicators used to construct the poverty index are given in Table E8 and List E3 in Appendix E.

The composite poverty index is then constructed using principal components analysis. Complete details describing each step in implementing the tool are available in manual form (Henry *et al.* 2000).

2.9.2 Poverty maps[117]

Poverty maps are data sets that provide information about the spatial distribution of poverty and inequality within a country, because they allow the visualization of the incidence and magnitude of poverty across space. Poverty maps are not limited to monetary measures. They can be used with a variety of non-income indicators, both separately as well as combined. These include infant mortality, chronic malnutrition, illiteracy, school-aged children not in school, overcrowded housing, inadequate roofing, and the proportion of the population without access to water, sewerage, and electricity (Schady 2002).

Poverty maps (a) capture heterogeneity within a country (b) identify geographic factors that influence poverty by enabling the researcher to investigate whether spatial disparities within living standards have been caused (and the nature of the causation) by geographically defined factors such as agro-ecological resource endowments, access to input and output markets, and availability of educational and health facilities (c) improve the targeting of resources and interventions by allowing the most needy groups to be identified, and thereby minimizing the

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[117] This section draws on several reviews of geographic targeting and data requirements for poverty mapping (Henninger 1998, Schady 2002 and Deichman 1999).

leakage of transfers to non-poor persons (type I error) and the risk of a poor person being missed by a programme (type II error)[118] (d) improve communication about poverty conditions by encouraging visual comparison and making it easier to look for spatial trends, clusters or other patterns, and provide local stakeholders with information required for local decision-making and for negotiation with government agencies, making them an important tool for local empowerment and decentralization (e) provide an alternative to aggregating multiple dimensions of poverty. The advantage of spatial maps is that these multiple dimensions can be described separately, but in a manner that enables them to be compared easily. Spatial maps can be used to overlap income-poverty, malnutrition, and access maps to assess joint correlations or disparities.

Maps that show indicators of well-being can help policy by indicating areas that need additional resources such as infrastructure. Poor areas may also be selected to receive some form of direct transfer payments, for example, in the form of subsidized credit, funds for public works, food-for-work programs, or direct local administrative budget subsidies.

Different forms of targeting can be distinguished: geographical targeting in which broad allocations of resources are made, individual assessment mechanisms in which households or individuals have to fulfil certain criteria to be able to participate in social programmes, and self-targeting where the programme is designed to appeal only to the poor.

Poverty mapping is best used for *geographical targeting* where resources are directed toward areas that are identified as poor. An advantage of geographical targeting is that it requires relatively low administrative costs. Indirect estimation of geographically referenced indicators or well-being tends to be less expensive than detailed surveys, monitoring systems or means testing. Furthermore, if an existing administrative structures such as county, district or municipal governments.

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[118] However, because poverty maps will have a certain error attached to them, they need to be validated and accompanied by independent sources of information.

Poverty mapping needs to make use of several data sources and indicators. For example, overlaying a poverty map with geographical information on access to health care will not only inform decisions in *where* to expand health services, but also *how* to do so; poorer areas with less access should be subsidized, while some form of cost-recovery can be used in less poor areas.

The important research question that can be addressed with small area data is why poor regions exist at all (Ravallion and Wodon 1997). Two explanations exist: *Individualistic explanations* that assume no barriers to mobility and *structural explanations* that argue that mobility is limited.

According to the first explanation, people remain in poor areas because of wage or price incentives, or because they believe they have a greater chance of making a living in a less competitive environment. Low rents, poor infrastructure, limited service and a lack of economic opportunities are the result of individual decisions by the poor to live in that area.

The essential feature of the structural explanation is that mobility is limited. People have little choice, and are, therefore, caught in a *spatial poverty trap* where poor resource endowments lead to limited access to educational, social and economic opportunities, thereby further increasing the differences between poor and better-off areas.

Empirical testing of structural theories requires quality information on poverty as well as on human and geographical capital variables. Other research uses of small area data include testing the influence of the level and inequality of personal income on health and/or educational outcomes or other community-level choice variables.

2.9.3 Subjective measures of poverty

The monetary approach is typically associated with the quantitative-

objective approach outlined in section 2.1 above. However, the subjective approach to poverty, which is described in this section, has both a monetary dimension where subjective assessments of the poverty line are elicited from respondents, as well as a non-monetary dimension where measures of "deprivation" are based directly on items that respondents consider important in the determination of well-being. In this section I focus primarily on the monetary dimension, but include discussion of resource-based deprivation.

The subjective approach to measuring poverty attempts to move the task of defining the poverty line away from experts to the poor or ordinary members of society. "Perceptions of poverty" can be elicited with regard to (a) the perceptions of the poor with regard to their own situation (b) a judgement (not necessarily by the poor themselves) about minimum standards and needs and (c) poverty rankings, sometimes called participatory wealth rankings ("which groups are most vulnerable in the village?"). While these are all "subjective" assessments the last category is better described under the term "participatory approach". This is partly because the methodology by which these perceptions are elicited are different for (a) and (b) (usually from small-scale surveys) than for (c). Hence in this section, I restrict the discussion to (a) and (b).

These perceptions can be used to (a) derive poverty lines, or provide a reality check on poverty lines derived in some other manner, (b) inform choices about equivalence scales, economies of scale, regional cost-of-living differences.

The limitations of this approach are that (a) they can reproduce existing patterns of discrimination or exclusion that are deeply embedded in social norms (b) They are not obtained using rigorous sampling methods and are therefore not representative, only indicative, and as such cannot be used to set public action priorities and (c) they are subject to time-horizon problems (the poor tend to focus on short-term

consequences, while technocrats and policymakers focus on the medium term) (Kanbur 2001b).

A segment of the developed country literature on poverty can be termed the subjective or consensus approach to poverty measurement.[119] This supports the notions that (a) poverty is about the lack of choices and (b) poverty is socially-specific and culturally relativistic, and that, wherever possible, the poverty line should be socially determined and socially endorsed (Saunders 1997).

Several variants of consensual approaches to poverty lines are used: (1) Some obtain views about hypothetical families while (2) others focus on respondents views about their own situation or how much income they need (Goedhart *et al.* 1977, Dirven *et al.* 1998) and (3) a third approach (which defines poverty as the "enforced lack of socially perceived necessities") asks which components of living standards are "necessary" (Mack and Lansley 1985). This information may be used to construct an (subjective) income poverty line, using price/cost information, or it may be used to construct a subjective deprivation poverty line based on scores (Dirven *et al.* 1998).

An example of the first approach is the Gallup poll question "what is the smallest amount of money a family of four needs to get along in your community?" (Danziger *et al.* 1984:501). It can also be used with houses of different compositions and thereby provide a basis for constructing equivalence scales (Rainwater 1974). The difficulty with this approach is that people are asked to put themselves in other peoples' shoes.

The second approach uses either a subjective poverty line (SPL) which asks respondents about the minimum income they need to make ends meet, or a Leyden poverty line (LPL) which is based on the concept of

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[119] This "subjective" approach is based largely on questions of a monetary nature, which is why this topic is included in this section.

the welfare function of income (MacPherson and Silburn 1998: 13). Poverty lines using the SPL approach are typically based on a minimum income question (MIQ) such as the following "What income level do you personally consider to be absolutely minimal? That is to say that with less you could not make ends meet" (Goedhart *et al.* 1977, Pradhan and Ravallion 2000).

How does one use this approach to construct a poverty line? Empirical studies have found that the answer to the MIQ is positively related with actual income (See Pradhan and Ravallion 2000 for a list of empirical studies). The relationship looks like that shown in Figure 1. Thus z* is a good candidate for a poverty line-below it, people feel their income is not enough, above it, people feel their income is enough. Common practice in the developed country literatures is to find z* using a regression of minimum income on actual income (Pradhan and Ravallion 2000).

Figure 10: The subjective poverty line (z*)
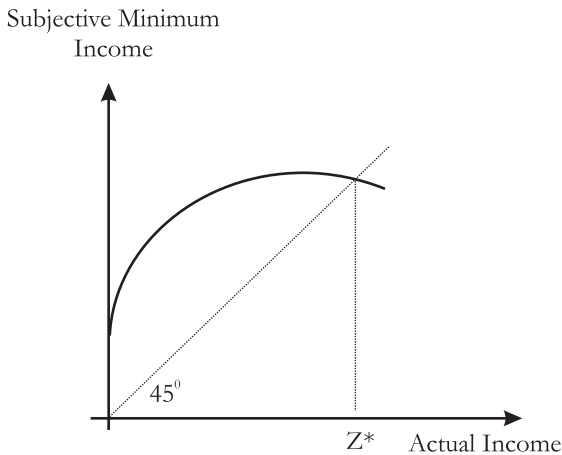
However, there are problems with this method. The regressions typically use the answer from the MIQ as the measure of income.[120] The standard practice in the MIQ assumes that the household that responds to that question already knows its income, when this may not be true-they may only include cash income (excluding imputed income from own housing or own production) which will be an underestimate, or they may include asset sales, or ignore production costs (an overestimate). These problems are particularly acute in developing countries, which have led some researchers to develop alternative means of identifying the subjective poverty line without an MIQ (Pradhan and Ravallion 2000). The alternative proposed by Pradhan and Ravallion (2000) is to ask several (qualitative) questions on consumption adequacy (of different categories) in a quantitative survey.

Table 17: Questions on consumption adequacy

I would like to ask your opinon of your family's standard of living	
It was less than adequate for your family's needs	1
It was just adequate for your family's needs	2
It was more than adequate for your family's need	3
Not applicable	4

*Adequate means no more nor less than what the respondent considers to be the minimum consumption needs of the family.

Concerning your family's food consumption over the past one month, which of the following is true?

Concerning your family's housing, which of the following is true?

Concerning your family's housing, which of the following is true?

Concerning your family's clothing, which of the following is true?

Concerning the health care your family gets, which of the following is true?

Concerning your children's schooling, which of the following is true?

Source: Pradhan and Ravallion, 2000

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[120] Pradhan and Ravallion make the point that this measure is obtained from just one question, whereas many pages of programming code are required to construct typical income and expenditure indicators used in standard (traditional, objective-quantitative) poverty measurement from survey responses.

The responses to these questions are then used, together with the responses to quantitative questions on actual expenditure, to construct a poverty line (See Pradhan and Ravallion, 2000 for a detailed description of the methods used to do so).

Analyses of this nature have recently been carried out on seven West African cities (Razafindrakoto and Roubaud 2003). Data were from recent surveys, which included consumption and living conditions of households as well as "subjective" perceptions on their standard of living. Sen (2003) also constructs subjective poverty lines (using a somewhat complicated definition of the SPL) and compares movements in and out of poverty as defined by objective and subjective poverty lines.

Research conducted by the Social Policy Research Centre (SPRC) in Australia found that when a sample of Australians were asked the MIQ, that is, what was the minimum income they needed in order to make ends meet, there was a great deal of variation, and only 30 percent of the variation could be explained by the actual income and family circumstances of the respondents (Saunders 1997). When the question is asked of a more homogenous sample of Department of Social Security (DSS) clients (those who actually receive income support) the MIQ response exceeds the actual income of those surveyed by between 30 and 80 percent. However, when asked to choose the statement that best described what being in poverty meant to them (see below) the responses indicated that few of them saw poverty in purely relative terms ("having less than others") and the vast majority saw it in terms closer to the concept of absolute deprivation (relating to not being able to afford "basics" and having to struggle to "survive").

Table 18: Perceptions of the meaning of poverty among DSS clients

	Percentages
Not having enough money to make ends meet	12.3
Having a lot less than everyone else	1.8
Not having enough to buy basics like food and clothing	41.9
Having to struggle to survive each and every day	26.4
Never having enough to be able to live decently	8.6
Never being able to afford any of the good things in life	6.7
Don't know	2.5

Source: SPRC Longitudinal Survey of DSS Clients, First Wave of Interviews (preliminary) quoted in Saunders, 1997

Other studies have found that dramatically different answers may be given in responses to only slight changes in the wording of questions (Walker 1987; Hagenaars and de Vos 1988; van den Bosch *et al.* 1993).

The other approach is to use household questionnaires to find out what respondents (as opposed to experts) consider to be necessities. Widely varying answers are given, because people's responses are based on their own situation, regardless how far they are from the poverty line (MacPherson and Silburn 1998). A study by Mack and Lansley (1985) claims to include items that are indicators of "not only the basic essentials for survival … but also access or otherwise, to participating in society and being able to play a social role". Most respondents classified 22 of these items as necessities and their absence was negatively correlated with income. Mack and Lansley anyone who could not afford three or more of these items was considered to be poor. Callan and Nolan (1998) also use "suitable" direct information on indicators of deprivation to construct a measure of exclusion due to lack of resources. Callan and Nolan (1998) use factor analysis and identify a set of eight items that cluster together in a factor analysis of a larger set of items. An "enforced lack" in any one of these eight items is treated as an

indicator of underlying generalised deprivation. A measure of poverty combining income and "deprivation" information is obtained by regarding a household as poor if it falls below 60 percent of average income and is experiencing deprivation (as defined above).

The *Poverty and Social Exclusion Survey* (PSE) conducted in Britain in June 1999 followed a similar approach. Just over 25% of the population was found to be poor, where poverty was defined as both low income and low standard of living or multiple deprivation (defined as lack of necessities as defined by respondents).

A recent study by Razafindrakoto and Roubaud (2003) presents measures and analysis of poverty in Antananarivo, Madagascar in terms of seven measures. These are (a) standard "objective-quantitative" monetary measures such as the $1 and $2-a-day measures, as well as *non-monetary objective poverty measures* in terms of (b) living conditions (c) human capital and (d) social exclusion and *subjective poverty measures* such as (e) a general perception of the standard of living, (f) non-satisfaction of needs seen as vital (consensus principle) and (g) financial poverty. They find that although *none of the seven categories defined as poor represents less than 32% of the population, only 2.4%combine all the criteria*. On the other hand *78% of the population show at least one form of poverty*. These results indicate that the multidimensionality of poverty is better described by a vector of well-being indicators, rather than a single indicator. Correlations between the indicators were higher between indicators of a single category (for example, objective or subjective) than between indicators across these categories. Monetary poverty measures had the highest correlation with any other indicator. Determinants of objective and subjective poverty also tended to be different.

Studies that have investigated the correlation between income and subjective well-being (both proxies for utility) have found positive but weak correlations (Burchardt 2003). The low correspondence between

income and subjective well-being may be due to (a) inaccurate measurement of income (b) the importance of non-income factors for subjective well-being (c) the disposition for happiness being a personal trait (d) the neighbourhood or reference group effect and (e) adaptation according previous income trajectory.[121] Conclusive evidence for or against adaptation requires longitudinal data. Using a two-wave panel for Russia, Ravallion and Lokshin (2001) find that household income is a strong independent predictor of change in subjective economic welfare, controlling for baseline income. Burchardt (2003) using ten years of data from the British Household Panel Survey found that subjective well-being is influenced not only by an individual's current situation, but by their previous situation as well. Those who have *become* poor are less satisfied than those who have been poor for a long time, while those who are upwardly mobile are no more satisfied than those who have experienced a higher income over a period. Therefore, income is a flawed proxy for satisfaction, and satisfaction is unsuitable for assessing current well-being.

2.10 Summary

In this section, I first outline areas in which there is consensus, areas in which there is disagreement, and areas that despite disagreement, provide definite routes to follow, and make some general conclusions on the state of poverty measurement.

Areas in which there is consensus

- The definition of poverty. The idea that poverty relates to the ability to participate in society is evident in the developed country literature as well as in the developing country literature. In the developed country literature the concept of social exclusion is used often. In the developing country literature the term capabilities, and

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[121] (c) is the Psychological explanation while (d) is the sociological explanation.

the related ability to function/participate is emphasized. The concept of capabilities is readily accepted as being "what the standard of living" is about.

- The monetary measurement of poverty and associated quantitative approach are inadequate.
- The multiple dimensions of poverty need to be included in poverty measurement.
- There is much to be gained by combining quantitative and qualitative approaches. There is scope for incorporating subjective approaches to determining the poverty line. Participatory approaches can provide context, explain outliers, help identify indicators, etc.

Areas in which there is disagreement
- On how to incorporate multidimensionality, specifically
- Whether the dimensions should be aggregated
- How they should be aggregated
- On whether to use relative or absolute poverty lines
- On whether poverty lines should be objective (expert-based) or subjective
- On what bases should be used for objective poverty lines (budget standard or least-cost)
- On how to construct adult equivalence scales

Areas in which there is no consensus, but there are several definite alternatives followed
- Aggregating multiple dimensions
- The selection of indicators or dimensions to be included

It is now clearly recognised that *any single indicator of poverty* will not adequately describe or measure the complex phenomenon that is

poverty. Multidimensionality of poverty is now firmly accepted, and we are much closer to measuring it than we were a decade ago.

It is also evident-although arguably-that any single *approach* to measuring poverty will not suffice. The contribution of the monetary approach to poverty measurement is well-known, just as its limitations are evident. The capability approach to poverty measurement by focusing on basic deprivation, has contributed much to the conceptual resurgence in this field, and thus provides a good theoretical and conceptual basis for improvements in poverty measurement. However, the social exclusion approach has a contribution to make by adding the element of participation or inclusion. Participatory approaches provide the local non-expert based knowledge that is insufficiently emphasized in the other approaches.

We are also much better at measuring the *dynamics* of poverty than we were several years ago. The availability of panel data has led to methodological improvement in distinguishing between the transiently and permanently poor and tracking movements in and out of poverty. This has also had important implications for the measurement of *vulnerability*. The measurement of empowerment, or its absence in voicelessness and powerlessness is still at a somewhat rudimentary stage, but with a growing research agenda.

Recent *empirical* work has focused on comparing results using different approaches (quantitative and qualitative, objective and subjective, monetary and non-monetary, etc.). This leads to the question of data requirements for the measurement methods advocated in this chapter, which is the subject of the next chapter.

3. DATA REQUIREMENTS FOR POVERTY MEASUREMENT

3.1 Introduction

The purpose of this chapter is to provide an overview of the data requirements for the poverty measurement exercises outlined in Chapter 2, give an indication of typical data sources for these requirements, highlight their strengths and weaknesses, and provide examples from other countries. In addition, this chapter raises issues pertaining to these data requirements in the context of the current international poverty measurement and monitoring agenda.

In the next section I provide a brief overview of data sources that are available in most countries worldwide. This section draws heavily from several excellent reviews of data sources (Lok-Desallien 1996, Coudouel *et al.* 2001 and Achikbache *et al.* 2001).

3.2 Sources of data

Achikbache *et al.* (2001) illustrate the statistical process in Figure 1, Appendix H. Various "statistical organizations" gather information from economic and social agents using a variety of data collection methods. These data are processed in varying degrees and the resulting statistical products, including poverty monitoring data, are used by a variety of data users. Our focus, in this chapter is on (raw) data sources (what Achikbache *et al.* call data collection methods), rather than on "statistical products".

Data sources are categorised into censuses and sample surveys, administrative or service records and qualitative and participatory surveys and appraisals.

A visually useful classification of data sources is given by Lok-Desallien (1996)[122] who presents the various data sources on two continuums (Figure 2, Appendix H). The vertical axis indicates differ-

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[122] Adapted from Marchant, 1994.

ences in data collection methodology that range from subjective assessment through a series of more structured approaches including quantitative and qualitative questionnaires to direct measurement (for example, anthropometric data). The horizontal axis provides a continuum in sample size from the case study to the census. Surveys of the quantitative type typically undertaken by National Statistical Organisations (NSOs) are bunched on the upper right of the diagram, reflecting their use of quantitative questionnaires and probability sampling, while rapid appraisals, ethnographic investigations and other intensive anthropological studies are bunched in the lower right hand side. Several "hybrid" surveys hover above the horizontal axis, which are based on structured interview but use a variety of sampling methods.

In this section I focus on these different types of data and their uses. I begin by focusing on censuses and sample surveys, I follow with an overview of qualitative data, and finally I focus on several important sources of data from administrative records.

3.2.1 Censuses and surveys
Censuses

Censuses of population and housing are held infrequently, even in developed countries, but provide an important role in poverty measurement. They are usually the main source of a national sampling frame, on which sample designs for subsequent surveys are based. In addition, recent work on small area estimation has highlighted the importance of censuses in providing estimates (for *all* households) of the probability of being poor. (See section 2.1.5 and section 3.2.4). Agricultural censuses are also important, especially in providing data on vulnerability of livelihoods and security of food supply in the rural sector. Some recent censuses have also provided sufficient information to be used in multidimensional poverty analysis (Qizilbash 2003).[123]

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[123] The 1996 South African census data have been the focus of some of the recent academic and policy-oriented literatures on South Africa (Qizilbash 2003).

The population census usually contains descriptive statistics of the housing stock, access to basic services such as water, electricity and sanitation, information on education and employment patterns and population statistics.

Multi-topic sample surveys

Surveys that are based on probability sampling and that collect information on a number of topics are extremely useful for poverty analysis, that is, understanding the *causes* of poverty.

Multi-topic surveys fall into two categories: (a) large-scale and in-depth surveys which are designed to provide a wide range of representative data on households, which are time-intensive, and (2) rapid or light surveys, which also collect information on several topics, which may be administered to large or small samples, but which can be administered quickly and over a short space of time.

The World Bank's Living Standards Measurement Survey and Integrated Surveys and RAND's Family Life Surveys in Malaysia and Indonesia (which include data on household income and consumption expenditures as well as measures of public services and demographic behaviour) are examples of the first category of multi-topic surveys. Priority Surveys and Core Welfare Indicators Questionnaire (CWIQ) fall into the latter category.

LSMS surveys

These comprise both a household survey and a community level module. The household survey collects information on household expenditures and income, health, fertility, anthropometrics, education, employment, agricultural and non-agricultural self-employment, the ownership of assets such as housing and land, access to services and social programmes, credit and savings information, migration, etc.

The community module collects information on community infrastructure and access to basic services, seasonal labour markets, wage rates and agricultural practices. It is usually administered to a village leader, except for the health and education sections, which are covered at the relevant facility with appropriate staff.

The price module focuses on the prices of the most important purchases and sales by low-income households, including consumer prices from local markets for food and nonfood items, and prices of the main products and consumption items of poor households.

LSMS surveys tend to be expensive, costing around $700,000 (depending on the sample size), and time intensive to administer (at least one hour, and depending on the modules included, repeated visits are required) and long in duration (19 months from sample and questionnaire design to completion of initial data analysis). If they are "piggy-backed" onto existing surveys they are somewhat less expensive (Lok Dessallien 1996).

Because of their time-intensive and expensive nature, LSMS and Integrated Surveys (IS) are administered at 4-6 year intervals. Repeat surveys include a core panel in order to be able to track the same households over time.

The LSMS project is conducted by the World Bank, and information on datasets, archives of studies based on LSMS surveys are available on the LSMS website: http://www.worldbank.org/html/prdph/lsms. See also Grosh and Munoz (1996) and Grosh and Glewwe (2000).

Core Welfare Indicators Survey (CWIQ)
The Core Welfare Indicators Survey is an example of a rapid monitoring survey that is quick and easy to implement. It is conducted annually, for the purpose of rapid monitoring of key indicators for different population subgroups, in particular indicators of access, utilisation and

satisfaction with core social and economic services (see List E2, Appendix E), and has the following features:

It is part of an overall monitoring package.

It has a short questionnaire with multiple-choice questions for easy and rapid data collection and is administered in a single visit.

It uses optical scanners to speed data entry to eliminate data entry bottlenecks and pre-programmed validation procedures to ensure high built in data quality levels.

It has "push-button" standardised outputs (tabulation plan).

It employs as large a sample as is feasible, given national statistical resource constraints, and the need for rapid results.

It is not designed to measure or monitor poverty, rather it is intended only to measure whether or not public services and development programmes are reaching and benefiting the poor, and to monitor selected indicators (those that contain advance warnings of future impacts of policies and events) and assess household living conditions, access to basic social services and infrastructure and satisfaction with these services.

Rapid nutrition monitoring in Bangladesh

A similar rapid monitoring survey is the Nutrition Surveillance Project in Bangladesh which has been conducted since 1990. It was spearheaded by Helen Keller International, actively involves local civil society organizations and the government, and is funded by UNICEF and USAID (UNDP 2000).

It collects household data across the country every two months to monitor people's food security and poverty.

A typical survey lasts six weeks.

It covers 41 subdistricts and 4 urban slum wards.

The purpose is to link malnutrition to its causes.

Information is collected on:

The socio-economic status of the household

Household agricultural production

Demographic characteristics

Food consumption and Nutrition of household members

Health and Vitamin A status of mothers and children

Village-level prices

Special modules are added to the basic questionnaire to address specific problems.

A brief report with summary findings quickly follows each survey round.

The project has been used to assess the effects of disasters and the impact of relief and rehabilitation efforts on household members, particularly nutrition and health of children.

Demographic and Health Surveys (DHS)

The DHS surveys have been carried out in over 50 countries, primarily with USAID sponsorship. They comprise two sections: a household questionnaire, and an individual questionnaire which is administered to all females between the age of 15 and 49.

The household questionnaire includes information on basic household data, survivorship and residence of parents, eligibility for individual interview, household amenities, time to get water, drinking water source, toilet facilities, housing conditions and ownership of consumer durables. They typically do not include income or expenditure modules, with one exception: the 1994 Indonesia DHS, which fielded an experimental module on household consumption expenditures in about half the surveyed households.

The individual questionnaire includes respondents background information including childhood residence, date of birth and age of women, education and literacy, religion and ethnicity, information on

reproduction, contraception, health of children including breastfeeding practices, immunization and health, marriage and fertility preferences, husband's background and woman's employment, anthropometric data (child height and weight) for children under 5.

These surveys are in-depth surveys that are time-intensive (they include weighing and measurement of children, and sometimes women) and costly, and therefore are held only every 6-7 years.

The DHS surveys are administered by Macro International, Inc. Datasets and documentation are available to researchers at their website http://www.macroint.com/dhs. Lok Dessallien (1996) estimates their cost to be approximately $500,000 and their duration 16-18 months.

Because these surveys are based on a somewhat uniform questionnaire across countries (and therefore allow for cross-country comparisons), are well-documented, and easily accessible, and contain information on assets and access to services, they have become an important source of data for developing asset-based proxy indices, and asset-poverty indices (see section 2.4).

In addition, they are a unique source of information (on nutrition, health and education) on individuals (women and children) allowing for some intrahousehold analysis.

Household Income and Expenditure Surveys (HIES)
Household Income and Expenditure surveys are the main vehicle for the collection of income and expenditure data in a country. Data from these surveys have been used to construct measures of income and expenditure inequality and poverty, to construct weights of average household consumption bundles for consumer price indices, estimation of savings, incidence of taxation, elasticity of demand for goods and services and nutritional analysis of food consumption.

HIES surveys are typically national in coverage, although in some countries (mainly in Latin America) they are confined to urban areas.

Information collected in the HIES includes household demographic information (including education and occupation of all household members), household income (individual and collective, in-cash and in-kind, paid and self-employment), household expenditures (individual and collective, for purchased goods and services as well as for consumption of self-production) and assets (family business stocks, owned housing).

Income poverty estimates rely heavily on consumption expenditure data. Thus, HIES are the main sources of data for the *measurement* of monetary poverty. Depending on the breadth of the survey, these surveys are also useful for poverty analysis, although typically not as useful as multi-topic surveys such as the LSMS.

A criticism of household survey data is that expenditure is often collected at the level of the household rather than the individual. Thus, little information is available on intra-household consumption and intra-household allocation of resources. In the case of household public goods it is not *possible* to allocate expenditures individually. In the case of private goods, the purchaser and the consumer may differ, and the purchaser may not be well informed about its use, and the consumer about its purchase. However, in the case of other goods, such as cigarettes, it is relatively easy to find out who consumes how much (Case and Deaton 2002). Field experience has shown that accurate information can be obtained only when there is both a "household" questionnaire, as well as a series of "individual" questionnaires where each adult is asked to report a subset of expenditures (Case and Deaton 2002).

HIES can be expensive and time-intensive. Many countries typically administer them only every five years or so. However, this varies, in both developing and developed country situations. India (see below) administers this survey annually, as does the UK (Family Budget Survey). On the other hand, in Ireland, the Central Statistical Office's (CSO) household budget survey (conducted since 1973) is conducted only once in seven years.

National Sample Survey (NSS)
Conducted by the National Sample Survey Organization practically every year since 1951. Since 1972/73, a quinquennial survey is included with a considerably larger sample size. Only expenditure data is collected (no income data). Recent debate involves the increasing discrepancy between consumption growth as measured by the NSS when compared with national accounts statistics (NAS).

Labour Force and Employment Surveys
Labour Force and Employment Surveys are traditionally used to obtain regular estimates of (un)employment and labour force participation. The survey sample is typically smaller than that of an HIES. The use of these surveys in (consumption) poverty measurement is limited because they only contain earnings data. Household information is limited to demographic and education and occupation data.

Lok-Dessallien (1996) indicates that some countries have developed a series of employment-related surveys, given the difficulty of capturing all aspects of the labour market in developing countries in one survey. These include (a) establishment surveys (to ascertain the size of formal sector employment) (b) household employment surveys (to obtain detailed information on the economically active and inactive populations) (c) informal sector surveys (to obtain detailed information on size and characteristics of the informal sector-usually urban only) and (d) household livelihood surveys (to better understand the broader range of livelihoods of the population, and the coping and adaptive strategies).

Food consumption and nutrition surveys[124]
These are based on a small sample size, but often include measurement of food consumption. They can provide detailed information on (a) Types and severity of nutritional deprivation (b) Consumption and

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[124] Based on UN 1984.

production of own produce (they may be the only source of information on crops such as cassava or yams whose production cannot be easily calculated through standard agricultural surveys) (c) Weights for cost-of-living indices and estimates of private consumption expenditure (d) The effects of food subsidy programmes, for example, the effects of food subsidies on food intake, nonmarket prices, income and the demand for food.

Agricultural surveys and censuses[125]

The census of agriculture provides basic information on the organization and structure of the sector and use of agricultural resources. It covers (a) Comprehensive statistics on agricultural land area, crops cultivated, irrigation and numbers and kinds of livestock (b) Benchmarks for improvement of current estimates of crop areas and production, and of livestock resources and production (c) Measures of the state of, and changes in, the structural attributes of agriculture, such as size and distribution of holdings, extent of various forms of tenancy, agricultural resources, production requisites, facilities and practices (d) Basic data on current use and changes in use of agricultural resources such as people, land, livestock and poultry, irrigation, agricultural machinery and implements (e) The coverage of these censuses make it possible to use the data for small areas (communities, administrative units, and agro-ecological zones) which can contribute significantly to poverty assessments, especially where the majority of the poor are involved in subsistence agriculture.

Table 19 relates some of the indicators of poverty identified in chapter 2 to the data sources among censuses and surveys.

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[125] Based on UN 1991.

Table 19: Variables related to poverty and human welfare, Census, LSMS and DHS

Indicator	Census	LSMS	DHS
Health			
Anthropometric measurements		●	●
Child mortality			●
Disability	(selected countries)		
Education			
Literacy	●		●
Educational attainment	●	●	●
School attendance	●	●	
Economics			
Economiccharacteristics of households	●		
Occupation	●		
Status in employment	●		
Total consumption		●	
Household income	(selected countries)	●	
Total household expenses		●	
Total food expenses		●	
Access to services			(selected countries)
Housing			
Type of buildings	●	●	●
Number of rooms, floor space	●	●	●
Water supply	●	●	●
Sanitation	●	●	●
Cooking facilities	●		
Number of occupants (crowding)	●	●	●

Source: Henninger 1998, Appendix 2.

Table 20 below highlights the advantages and limitations of some of the household surveys described above in relation to poverty measurement.

Table 20: Advantages and limitations of household survey types

Household Survey	Advantage	Limitations
Multi-topic surveys	Measurement and a nalysis of different poverty dimensions, their inter-relationships, and correlates	Time-intensive (colle-ction and evaluation)
Demographic and health surveys	Health-poverty measurement, health behaviour analyses, basic poverty diagnostics	Measurement of other dimensions of poverty limited, diagnostics limited
Employment surveys	Analysis of employment patterns, wage income analysis (link to education)	Limited use for poverty measurement and diagnostics
Single-topic surveys	Income-poverty measurement (or one other dimension)	Limited diagnostics possible
Rapid monitoring surveys and service satisfaction surveys	Monitoring of key welfare indicators	Income-poverty mea-surement not possible, limited diagnostics

Source: Coudouel, Hentschel and Wodon (2001)

3.2.2 Qualitative data

The importance of qualitative data and research in complementing existing quantitative techniques has been highlighted throughout this paper. In this section I describe some important data collection methods for qualitative and participatory assessment and highlight their uses in poverty measurement and monitoring.

Table 21: Data collection methods for qualitative and participatory assessments

Data Collection in:	Methods
Beneficiary Assessments	Participant observation and more systematic data collection methods like structured interview over a limited time span
Ethnographic Investigations	Anthropological research techniques, especially direct observation, to analyse the influence of ethnicity, gender and village stratification on the household and group well-being behavior.
Longitudinal Village Studies	Wide variety of methods ranging from direct observation and recording (tabulation), periodic semi-structured interviews with key informants (for example, health centre staff) and village population, to survey interviews in several different observation periods.
Participatory Assessments	Ranking, mapping, diagramming, and scoring methods are prominent besides open interviews and participant observation. The time horizon of participatory assessments is often short. They build on local populations describing and analysing their own reality surrounding poverty and well-being.

Source: Coudouel, Hentschel and Wodon (2001)

The advantages and disadvantages of participatory methods and qualitative data have been highlighted in the previous chapter. These methods are useful in providing context, or *identifying* the poor, their chief shortcomings are the lack of representativeness. This points to the advantages of triangulation: of combining quantitative and qualitative approaches.

Coudouel *et al.* (2001) provide a list of criteria for assessing the adequacy of qualitative data in the use of poverty measurement and monitoring.

Table 22: Criteria for assessing the adequacy of qualitative data

Criteria	Adequate requirement
1. Age of data	• Collected in the past five years
2. Methodologies	• Participatory methods (PRA), focus groups better
3. Coverage and scope:	• All major agro-ecological zones represented
• Geographical	
• Rural and urban	• Both
• Groups consulted	• Both sexes, youth and elderly, other vulnerable groups, major livelihood groups of the poor
4. Dimensions of poverty	• Dynamics (esp. seasonality), causality, gender, age, livelihood
	• Identification of vulnerable groups
5. Perceptions of services, infrastructure and governance	• Explored
6. Information flows	• Awareness and understanding of poverty-related policies and programs
7. Priorities of the poor	• Opportunities and constraints improving quality of life, priorities for poverty reduction

Source: Coudouel, A., J. Hentschel and Q. Wodon (2001)

3.2.3 Administrative data

Administrative data are collected (and statistical products produced) by line ministries and specialized agencies in their capacity as regulators or monitors of certain activities and functions of government. Interest in the use of administrative data has at least two sources: (a) increasing budgetary pressure to find less expensive ways of collecting

data, and (b) the use of geographic information systems in poverty mapping which can combine data from many sources spatially.

The *Ministry of Health* synthesizes data on health services provided through hospitals, clinics and health campaigns (for example, vaccinations), on such items as the status of child nutrition, disease incidence, inpatient and outpatient visits, etc.

The *Ministry of Education* collects information on enrolments, teacher and student profiles, educational attainment, repetition and dropout rates, etc. directly from schools.

In some countries, for example, Viet Nam and China, local records are maintained on the poverty status of households, and are synthesized by the *Ministry of Social Welfare*, or the National Statistical Office (NSO).

The *Ministry of Public Works* has information on water, sanitation and electricity distribution.

Agricultural service records are collected from local administrative units or *Ministry of Agriculture* extension workers. These include data on: area cultivated, area harvested, estimated yield and production, crop diseases and agricultural inputs, etc.

Table 3 compares administrative data with data collected by the National Statistical Office. The advantages of using administrative data are that (a) they are usually *relevant*, (b) collected frequently, (c) have complete data coverage, that is, is reached by the administrative process, (d) may include checks on data accuracy, (e) the cost of data collection is much less than for surveys and (f) the response rate is high, and the response burden is lessened.

The use of administrative data poses problems and challenges: (a) the NSO loses control over data quality (b) technical and legal problems of access (c) problems of comparability between datasets in relation to base years and geographical disaggregation (d) limited coverage of the administrative system.

Achikbache *et al.* (2001) highlight areas that are likely to be important for poverty monitoring: (a) health statistics derived from records

kept by health centres, clinics and hospitals, (b) education statistics collected from schools (c) records pertaining to the social safety net programme, (d) vital event registration (e) utilities (water and power distribution) and (f) business licensing.

Table 23: Administrative data compared with specific NSS data systems

Administrative data	Specific NSS data systems
+ No/minimal cost to NSO there are partner agencies-rare)	- Full cost borne by CSO (except where
+ Can be very secure in terms of longevity-eg. company taxation; customs; motor vehicle registrations	+ Longevity determined largely by NSO (but increasingly subject to funding support through the annual budget process)
- Can be vulnerable to changes in policy eg, abolition of certain controls	+ Changes to collection determined by NSO
+ May be associated with very strict editing and controls eg, revenue functions like tax and customs	+/- Editing under control of NSO, but this can be resource intensive
- Confidentiality-individual records may not be available to NSO for edit/query	+ All records available to NSO
+/- Sometimes very strict reporting requirements eg, tax-but others can be unreliable despite apparent strength (eg, building approvals)	+ Can impose compulsory response under statistics legislation-but does this affect data quality?
- Data items set up for non NSO purposes	+ Data items, definitions, scope determined by NSO
- Control by host agency, NSO cannot impose changes	+ NSO has control
+ Coverage-normally 100% of target population eg, tax, customs	+/- NSO can aim for 100% coverage, but costs often force use of samples
+/- Data accessibility-many are electronic, but some require extensive manual transfer	-/+ NSO can determine nature of system processing, but data processing is often burdensome

Table 23: Administrative data compared with specific NSS data systems contd.

Administrative data	Specific NSS data systems
- Flexibility-it can be difficult to persuade other agencies to change to meet NSO needs	+ NSO can vary items and procedures at its own discretion
+ Minimises respondent burden	- Absolute increase in respondent burden
+ Can lead to efficiencies in sharing specialist skills and training	
+ Can lead to efficiencies in sharing specialist skills and training	
+ Establishes NSO links to other agency-maximises chance of NSO involvement in future developments (can introduce changes at the margin)	

Source: Achikbache *et al*. 2001.

Table 24 below relates different types of poverty measurement and the data required to construct them to the data source that they are typically constructed from.

Table 24: Poverty measures, data requirements and data sources

Type of poverty measure	Data requirements	Typical Source
(Objective-quantitative type) FGT measures of poverty for use in a standard poverty profile	Consumption expenditure, correlates of poverty such as demographic variables, education, occupation, geographic location, price data	Household budget survey
Subjective	Respondents assessments on minimum incomes, items essential for well-being, etc.	Specialised small-scale surveys, participatory appraisals
Chronic and Transitory meaures of poverty	Consumption expenditure and income measures over time, and their correlates: education, occupation, etc.	Longitudinal household surveys

Table 24: Poverty measures, data requirements and data sources contd.

Type of poverty measure	Data requirements	Typical Source
Vulnerability	In addition to measures of the income aspect of vulnerability, data on food insecurity, natural disasters as well as household level vulnerability measures such as death or illness/loss of job of breadwinner.	Household surveys, demographic and health surveys, agricultural census and surveys, participatory data, information from famine early warning systems and auxiliary data from GIS.
Multidimensional measures	Indicators on health, education, access to facilities, assets,	Household surveys, demographic and health surveys, agricultural census and surveys, participatory data, information from famine early warning systems and auxiliary data from GIS, as well as administrative data.
Intra-household measures of poverty	Information on health, education and economic activities of women and children, health status of the elderly	Household surveys, demographic and health surveys, administrative data from the Ministry of Health.

3.2.4 Combining survey and census data

Small area estimation is a statistical technique, which combines survey and census data to estimate welfare or other indicators for disaggregated geographic units such as municipalities or rural communities (Davis and Siano 2001). The exercise involves predicting a model of consumption from household survey data using explanatory variables that are found in both the household survey and the census. This will include (a) demographic variables such as household size, age, sex composition (b) education and occupation of each family member (c) quality of housing (d) access to public services such as electricity and water and (e) principal language spoken in the house. The parameter estimates from the model are then applied to census data to predict probabilities of

each household in the census being poor (Hentschel *et al.* 2000). The models should be estimated by statistically-representative regions. Household-level results can then be aggregated by the geographical region of interest by taking the mean of the probabilities for the chosen geographical entities (Davis and Siano 2001). This permits the construction of poverty maps (disaggregated across geographic units). The optimal degree of disaggregation depends on (a) the purpose of the map (b) the level at which the household data is estimated and (c) tradeoffs between the size of the standard error and policy needs.

Others (Bigman *et al.* 1999) have estimated similar indicators using GIS derived indicators (such as climatic suitability, livestock per capita, distance to nearest health facility, number of water pumps per community) as explanatory variables.

Countries for which poverty maps have been constructed at the household level for targeting and policy making, include Ecuador and Nicaragua (Hentschel *et al.* 2000), Panama (World Bank 2000), and South Africa (Alderman *et al.* 2000).

Similar exercises can be done at the level of disaggregated geographical units, such as communities or small towns, and have been done for Vietnam (Minot 1998), Burkina Faso, India, Kenya and China (Bigman *et al.* 2000).

Sources of data for poverty maps

Geographic targeting needs *small area* data. For this reason, national statistical agencies should make census data available at the *lowest geographic aggregation that does not compromise data privacy*. Sample surveys should be designed with some consideration of geography to ensure sufficient spatial coverage as well as statistical significance of survey data at relatively low levels of geographic aggregations. This requires a combination of population-based sampling with a spatial sampling design.

Population and housing censuses

Census data can be compiled for small statistical or administrative areas or for communities, towns and villages and provide the basic information (on population and housing) for poverty maps.

Surveys

Surveys such as the World Bank's Living Standards Measurement Surveys (LSMS) and the USAID funded Demographic and Health Surveys (DHS) provide more comprehensive data resulting in several hundred indicators. However, they are *not* reliable sources of small area information because they are based on samples which are not meant to be statistically representative at a very disaggregated level.

Sample survey information on indicators (for example, health outcomes) can be used, together with information on the location of sample clusters by geographical information systems (GIS) to allow aggregation of survey data for regions other than administrative units (such as agroclimatic zones or regions classified according to access to infrastructure and services).

Information on the location of sample survey points also serve as an indexing system. They allow for the extraction of relevant auxiliary data (for example, distance to the nearest market town, agroclimatic conditions surrounding it, number of schools or health facilities etc.) that were not used in the survey instrument.

Geographical Information Systems (GIS)

GIS are database management systems that use geographic location as a reference for each database record. They

- Use location to integrate information from heterogeneous sources, for example, for each village in a region, the mean annual rainfall or soil quality information within a 20-kilometre radius.

- Can generate information to test hypotheses about neighbourhood relationships. For example, do neighbouring farmers share similar household characteristics which point to the existence of significant clusters caused by some other (exogenous?) factors, diffusion processes, or spatial spillovers.
- Provide powerful visualisation tools that facilitate the analysis of geographic data and improve communication of analysis results and policy recommendations.

Auxiliary data sources

GIS is used to develop monitoring systems to assess food security and coordinate drought relief operations for *food security and vulnerability mapping.* Two such initiatives are the USAID's Famine Early Warning System (FEWS) and the Food Insecurity and Vulnerability Information and Mapping System (FIVIMS) coordinated by FAO. These systems generate comprehensive, spatially-referenced databases on indicators that relate to the level of human well-being in the target regions.

GIS is also used for *measuring accessibility.* Accessibility to markets and services is partly determined by the quality of public infrastructure. Using high-resolution census data, information on transport networks, and the location of service centres, an analyst can estimate, for instance, the proportion of the population that lives within an acceptable distance or travel time from a school or health clinic. This is useful in determining gaps in service provision and in deciding on the location of new facilities.

3.3 Specific data issues
3.3.1 Collecting panel data: is it worth it?

Panel data are collected regularly in developed countries. For example, USA - PSID, Eurostat manages the European Community Household Panel, with more countries embarking on conducting panel surveys (for

example, Ireland).

The collection of panel data is difficult and expensive, which makes many developing countries reluctant to embark on such a project. In addition, substantial attrition is likely in areas where there is considerable mobility because of migration. This may bias the estimates from panel data, making the exercise worthless. Tests on three developing country samples (Bolivia, Kenya and South Africa) conducted by a team of economists from the World Bank, International Food Policy Research Institute, University of Pennsylvania, and the Max-Planck Institute for Demographic Research (Alderman *et al.* 2000) indicate that although (a) univariate comparisons of critical outcome and family background variables differ significantly between attritors and nonattritors, (b) multivariate estimates of behavioural relations of interest may not be biased due to attrition.

Several researchers decry the unavailability of panel data (Baulch 1996b, Appleton 1996), particularly in order to be able to quantify and analyse chronic poverty. While there are methodologies that could be used in place of panel data, these are usually second best or worse; several issues cannot be analysed without panel data.

An example of a good panel dataset is the ICRISAT panel survey of 211 households in six villages in Maharastra and Andra Pradesh, carried out over eight years. Another is by IFPRI (Adams and He 1995), a three-year panel of 727 households in rural Pakistan. Several of the LSMS surveys also have a panel component.

The National Urban Employment Survey (NUES) conducted by the Mexican National Institute of Statistics, Geography, and Information conducts extensive quarterly surveys and is structured so as to generate panels that allow tracking a fifth of the sample across five quarters. An offshoot of this survey is the Micro-Enterprises Survey (MES) which is also a panel created by identifying 11,000 owners of

micro-enterprises from the 1990:4 NUES and reinterviewing them in 1991:1 (Maloney 1998).

3.3.2 Non-compatible data

Measures of consumption are often available from surveys whose definition of consumption may vary. Problems of non-compatibility, though serious (Pradhan 2000) are surmountable, using the appropriate methodology (Lanjouw and Lanjouw 1997). This vastly increases the possibilities for using existing surveys.

3.4 Poverty information/monitoring systems

While many countries regularly collect and publish data on income poverty as well as other measures of poverty (human poverty, or basic needs indicators) several countries have now set up a formalised poverty monitoring system (UNDP 2000). Uganda, Benin, Thailand and the Philippines get special mention in the UNDP *Poverty Report* 2000 (UNDP 2000).

3.4.1 Assessing sources for a poverty monitoring system

Features of poverty monitoring systems include (a) large, comparable income and expenditure surveys at periodic intervals (typically 4-6 years) for example, Household Income and Expenditure Surveys carried out by National Statistical Agencies, and the Living Standards Measurement Survey (LSMS) of the World Bank (b) lighter surveys with shorter questionnaires, smaller sample sizes and information on human poverty indicators or proxy indicators for income poverty (for example, UNDP Rapid Poverty Monitoring Survey, CGAP's Poverty Assessment Tool and World Bank's Core Welfare Indicators Questionnaire) and (c) Participatory Poverty Assessments (UNDP 2000).

Table H2 in Appendix H indicates the type of poverty measure-

ment and analysis that can be undertaken, given the different types of data available. World Bank (2001) revealed that 85 percent of the world's population lives in countries that have at least 2 income and expenditure surveys. The implication is quite clear that much can be done by way of poverty measurement and analysis in many countries.

3.4.2 Maintaining international comparability

Standardization is important for international comparability. Thus, for example, the objective of a poverty mapping initiative is to produce subnational maps of poverty indicators that display a high degree of comparability from one country to another. This is made difficult by (a) variation in data availability and quality (b) synchronicity of data collection-internationally as well as between surveys and censuses within a country, which reduces the synergy effects that can be gained by combining the complete coverage of a census with the rich information of a survey, (c) and comparability of economic statistics. (Synthesis report on the international workshop on poverty mapping, Arendal, Norway, October 14-16, 1998).

Several initiatives are under way to coordinate data collection (and to build up statistical capacity as well) internationally. The Millenium Development Goals and associated targets and indicators are examples where international consensus was reached on the specific indicators to monitor progress on these goals. The PARIS21 consortium has the mandate to coordinate international efforts in statistical capacity building.

3.4.3 Rationalizing data collection nationally

Part of the trick in using a combination of censuses and sample surveys, light/rapid monitoring surveys, qualitative approaches and administrative data in deriving a poverty information system lies in the timing.

The time spacing of currently established sample surveys in order to obtain maximum use of the data is important. This may involve spacing out similar surveys conducted by different agencies, or different surveys that obtain similar data, conducted by the same agency (for example, many surveys collect asset data which can be used to construct measures of asset poverty. If the surveys are spaced out at regular intervals there will be an almost continuous flow of information on asset poverty).

It is also important to know which surveys to space *together*. For example, in order to use the synergy effects that can be gained by combining the complete coverage of a census with the rich information of a survey.

Rationalising data collection also involves making important prioritisations and trade-offs. Rather than conducting expensive multi-topic surveys separately, are there possibilities of adding either (a) a small expenditure module to a DHS type surveys or to ask (b) asset questions to a household budget survey which usually has information on ownership? (c) are there possibilities of including topic-specific modules in a regularly conducted survey?

3.4.4 Features of a poverty information strategy

Achikbache *et al.* (2001) outline the important aspects of a "sequenced" poverty information strategy:

A sequenced information strategy is meant as a management tool for governments and central statistical agencies to provide an enabling framework for meeting the information needs of poverty reduction strategies and economic development plans. A well-defined and cost-effective strategy ought to be implemented with secured financial and human resources, in accordance with a timeframe.

A strategy pursues by definition, a holistic scope - Poverty reduction, population well-being, takes into account all needs of policy-mak-

ers, aims to reach a realistic goal by tackling impediments, evaluating costs, and involving all partners, and identifies relevant monitorable objectives through measurable results; An Information Strategy is geared towards generating quantitative and qualitative information relevant to monitoring input, output, outcome and impact of pre-determined objectives, an information complying with high quality standards and generated in a timely fashion.

A *Sequenced Information Strategy* establishes information needs hierarchy, in terms of scope and in terms of content, which would meet all partners' expectations, identifies indigenous and exogenous funding capacities, and plans a series of actions sequenced in time - short-, medium- and long-term interventions - and stemmed on existing systems.

Some examples are given in Appendix H.

3.5 Summary

This chapter provided information on sources of data for poverty measurement that are typically collected within a country. Several new initiatives were described. These relate to "new" features of traditional data collection instruments such as surveys, as well as "new" types of surveys, "new" uses for administrative data and "new" ways of combining different types of data (for example, qualitative and quantitative, survey and census).

Several important features emerge from this chapter. Firstly, the demand for data is much greater than before. This is a demand for data (1) *more often* and for (2) *more types of data*. It is also a demand for data at a (3) *more disaggregated level* (that is, local is preferred to regional, and regional is preferred to national), with a degree of accuracy that enables it to be used for targeting purposes. The analysis of poverty in its multiple dimensions and the need to establish causality, has led to the demand for (4) *different types of information for the same households*

or individuals. Finally, analysis of the dynamics of poverty has led to the demand for (5) *longitudinal data.*

These different types of demand have had several impacts on the use of data in poverty measurement. The features (1) and (2) of the demand for data have led to the consideration of using routinely collected administratively data for poverty measurement purposes, as well as the use of data collected from qualitative approaches for triangulation, while (3) has led to a greater use of Geographical Information Systems, and combining of census data with a variety of other data, including survey data (4) has seen a change in survey content-moving away from single-topic to multi-topic because of analysis methods (for example, multivariate regression analysis needs a variety of information for same households (or individuals). This change in content is also evident in the questionnaire design of censuses. Finally (4) has led to the development of panel data sets, the most well-known of which is the LSMS.

A country that is seriously considering improving its poverty information system thus needs to take into account these different types of demand-and their implications for data collection. Priorities need to be established, and the relative cost-effectiveness of these data collection methods established.

4. CONCLUSIONS AND THE WAY FORWARD

The review of poverty measurement practices has made clear that poverty measurement has made incredible advances in recent times. These are both in terms of (1) consolidation and developing best practice, mainly in relation to monetary and quantitative methods, that took place in the fifteen years from the mid 1980s to the end of the last millennium, and (2) the recent conceptual and methodological advances that have taken place in the first few years of the new millennium.

Some important features of these developments are described below. (1) It is now clearly recognised that *any single indicator of poverty* will not adequately describe or measure the complex phenomenon that is poverty. Multidimensionality of poverty is now firmly accepted, and we are much closer to measuring it than we were a decade ago. (2) It is also evident-although arguably-that any single *approach* to measuring poverty will not suffice. The contribution of the monetary approach to poverty measurement is well-known, just as its limitations are evident. The capability approach to poverty measurement by focusing on basic deprivation, has contributed much to the conceptual resurgence in this field, and thus provides a good theoretical and conceptual basis for improvements in poverty measurement. However, the social exclusion approach has a contribution to make by adding the element of participation or inclusion. Participatory approaches provide the local non-expert based knowledge that is insufficiently emphasized in the other approaches.

(3) We are also much better at measuring the *dynamics* of poverty than we were several years ago. The availability of panel data has led to methodological improvement in distinguishing between the transiently and permanently poor and tracking movements in and out of poverty. (4) This has also had important implications for the measurement of *vulnerability*. (5) The measurement of empowerment, or its absence in voicelessness and powerlessness is still at a somewhat rudimentary stage, but with a growing research agenda. (6) Recent *empirical* work has focused on comparing results using different approaches (quantitative and

qualitative, objective and subjective, monetary and non-monetary, etc.). (7) This has been facilitated by the availability of non-traditional instruments of data collection. Mainly, the household survey design that is most useful is a multi-topic, panel survey, where questionnaires include both standard objective data collection questions, as well as the type of questions on subjective well-being that sociologists have been collecting for years. An example of such a survey is the British Household Panel Survey.[126]

The fundamental elements of the process of poverty measurement have not changed, however. The problems of identification and aggregation with the attendant choices of indicator, unit of analysis, poverty line and poverty measure are still the basic nuts and bolts of poverty measurement. A country that is looking to improve its poverty measurement methodology needs to pay attention these choices, and devise ways of making them. To a large extent, the process of improving a poverty measurement methodology would consist of (1) determining which dimensions and indicators of poverty are appropriate to that country, using a combination of local knowledge and expert knowledge, (2) assuming that income or monetary poverty measurement is retained as an important, though not exhaustive dimension of poverty, improving the measurement of income poverty using the well-established guidelines on which there is a great deal of consensus (3) determining methodologies for the aggregation of indicators into poverty measures. This may include easily constructed composite indices, even though their disadvantages are well-known, as well as more sophisticated methods of statistical analysis such as principal component or factor analysis, latent variable analysis, as well as developments in the use of Fuzzy Set Theory, etc. (4) Finally, this will include establishing priorities in the process of data collection that is required for the purpose of poverty measurement.

For future generations to "find less poverty no matter how (they) decide to measure it", poverty measurement and analysis has also to be integrating into the policy-making process. This may be the greatest challenge that lies ahead.

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[126] See Burchardt 2003 for analysis using this survey.

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APPENDICES

Appendix A: Components of a poverty profile for Bangladesh 1996 Poverty profiles based on the income method

One of the main uses of poverty measures calculated under the income approach is to construct a poverty profile which presents the poverty characteristics of various household groups. The categorisation into groups is driven by ex-ante knowledge of important dimensions (perhaps using information obtained by qualitative methods) or by dimensions which are relevant for policies (geographic location, age, gender, sector of employment).

Poverty profiles can present poverty measures in three ways: poverty rates by group, the contribution of each group to poverty and the relative risks of being poor for different groups.

The table below categorises the population by geographic region. The headcount index indicates that Rajshahi division had the highest incidence of poverty, where 62% of the population in Rajshahi were poor.

The share of all poor is a function of that group's population share and the incidence of poverty in that group. Thus, Rajshahi had a 28% share of all the poor, which is higher than its population share, given that the poverty incidence in Rajshahi is higher than the national poverty incidence (28=24*62/53).

The relative risk of living in a particular geographic region is defined relative to all other groups. Thus, urban households in Madagascar are 39% less likely to be poor than rural households (1-47/77).

Table A1: Poverty profile for Bangladesh and Madagascar by geographic region

Bangladesh 1996	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	National
Population Share	7	26	31	12	24	100
Headcount Index	60	45	52	52	62	53
Share of all poor	8	22	30	12	28	100
Relative risk	+14%	-20%	-3%	-3%	+24%	

Madagascar 1994	Total urban	Capital City	Major urban	Other urban	Rural	National
Population Share	21	10	5	7	79	100
Headcount Index	47	41	43	59	77	70
Share of all poor	14	6	3	6	86	100
Relative risk	-39%	-44%	-41%	-17%	+63%	

Source: Coudouel *et al.* 2001.

Appendix B: A comparison of four approaches to poverty

Table B1: A comparison of four approaches to poverty

	Monetary approach	Capability approach	Social Exclusion	Participatory approach
Unit of Analysis	Conceptually the individual, in practice, the household	Usually the individual, but for some indicators, the household, or more aggregated geographic areas.	Individuals (or households) or groups relative to others in their community/ society	Groups and individuals (or households) within them
Indicator	Income or consumption. Best practice in LDCs is consumption expenditure.	Many.	Many.	Many.
Definition of Thresholds	Central element is a minimum food requirement (defined externally, by "objective" criteria. Best practice methods use information from household consumption patterns to determine minimum level of non-food consumption	"Lists" of dimensions that are normally assumed to be objectively definable.	Reference to those prevailing in society and state obligations	Local people's own perceptions of well-being and illbeing

Appendix B: A comparison of four approaches to poverty
Table B1: A comparison of four approaches to poverty contd.

	Monetary approach	*Capability approach*	*Social Exclusion*	*Participatory approach*
Relative or absolute	Both relative and absolute poverty lines are used, although absolute is more typical in LDCs	Usually absolute	Relative, by definition, yet tendency to use absolute definitions in LDC context	Relative
Sensitivity to social institutions	Not intrinsic to measurement methodology-typically would be dealt with in analysis	Emphasis on adequacy rather than sufficiency leaves space for variations	Central element	Reflected in the way poor people analyse their own reality
Importance of processes	Not intrinsic to measurement methodology-typically would be dealt with in analysis	Not clear	One of the main thrusts of the approach	Critical for achievement of satisfactory methods
Major conceptual weaknesses	Utility is not an adequate measure of well-being, and poverty is not an economic category	Elements of arbitrariness in choice of basic capabilities, problems of adding up	Broad framework, susceptible to many interpretations, difficult to compare across countries	Whose perceptions are being elicited, and how representative and consistent are they? How does one deal with disagreements?

Appendix B: A comparison of four approaches to poverty
Table B1: A comparison of four approaches to poverty contd.

	Monetary approach	*Capability approach*	*Social Exclusion*	*Participatory approach*
Problems for cross-country comparisons	Comparability of surveys, price indices, and national poverty lines	Fewer problems if basic capabilities are defined externally ("objectively"); aggregating of different indicators leads to inconsistencies which can make comparisons meaningless	Lines of social exclusion are essentially society-specific, problems of aggregation of multiple dimensions similar to that in the case of capabilities	Cultural differences can make appropriate processes differ across societies, results may not be comparable
Manner of incorporating multi-dimensionality	Assumes that monetary indicator can appropriately proxy other aspects of poverty. Extensions of this approach include asset-based indicators?	Identifies indicators in many dimensions, either separately or aggregated into single index	Identifies indicators in many dimensions, either separately or aggregated into single index	Indentifies many dimensions of poverty. No attempt to combine into a single index.
Data availability	Household (income and expenditure) surveys conducted at intervals. HH surveys may overlook important sub-populations such as the	Data available from a variety of sources including demographic and health surveys, multi-topic surveys	Data intermittent, depends on individual researchers. If basic dimensions are agreed upon, data could be a collected regularly.	Generally only small purposive samples. Never available nation ally, methodology makes repre-sentative sampling and regular national data collection impos-sible.

Appendix B: A comparison of four approaches to poverty

Table B1: A comparison of four approaches to poverty contd.

	Monetary approach	*Capability approach*	*Social Exclusion*	*Participatory approach*
	institutionalised and the destitute. Controversial use of national income data to estimate in the interim-requires assumptions about distribution.	and administrative data from Ministries of Health, Education, and public service providers (water, electricity, telecommunications and other infrastructure). Problems of comparability of unit or sub-populations overlooked.		
Cost	Representative surveys with large samples are expensive, analytical costs heavy. However, several surveys are routinely conducted.	Much data routinely collected for administrative purposes. Additional data from multi-topic surveys would be expensive.	Cost will depend on survey instruments used.	Generally much cheaper than large sample surveys. However opportunity costs of participants are never included in cost calculations.

Appendix B: A comparison of four approaches to poverty
Table B1: A comparison of four approaches to poverty contd.

	Monetary approach	Capability approach	Social Exclusion	Participatory approach
Major weaknesses for measurement	"Arbitrariness" of "externally" determined thresholds and other elements.	Impossibility of set evaluation. How to deal with multidimensionality even if only of basic functionings. In practice, what is measured is functionings, not capabilities.	Problems with multi-dimensionality. Challenge of capturing processes.	How comparable? How representative?
Policy implications	Emphasis on growth and distribution of personal monetary income. Social income needs via monetary incomes and publicservices neglected.	Investment in extending basic capabilities/basic	Foster processes of inclusion, in markets and social process, with particular emphasis on formal labour market	Empowerment of the poor.

Source: Adapted by the author from Ruggeri Laderchi *et al.* 2003, Chart 1

Table B2: Poverty issues and qualitative methods contd.

Poverty Issues	Qualitative Methods Used
Perceptions and indicators of wealth, well-being,	● Wealth and well-being ranking or grouping criteria and indicators
Poverty, vulnerability, powerlessness, local terminology and correspondence with such concepts. Differences in perception by gender.	● Semi-structured interviews ● Social mapping
Perceptions of change over time in welfare in dicators, terms of trade	● Timelines (for migration, terms of trade, environment, and so on)
Access to (and use) services such as health, education, credit; preferences especially where choice between options is available; perceptions of services, including views (or awareness) of recent change; differing perceptions and values for men and women	● Institutional diagramming ● Semi-structured interviews ● Trend analysis of services, for example, health, education, agricultural extension, marketing
Assets of rural communities-access to services, common property resources, other natural resources	● Resource mapping ● Focus groups ● Institutional (Venn) diagramming
Assets of households	● Wealth ranking or grouping ● Social mapping ● Semi-structured interviews
Coping strategies and fallback strategies in times of crisis	● Livelihood analysis ● Semi-structured interviews ● Ranking exercises
Perception of consumption level in terms of food, clothing, and relation to well-being	● Focus groups Well-being grouping/ranking ● Focus groups Social mapping ● Focus groups Semi-structured interviews
Community-based support mechanisms for the rural poor (community safety nets)	

Table B2: Poverty issues and qualitative methods

Poverty Issues	Qualitative Methods Used
Local institutions of self-help and support for the urban poor (for example, market traders association, trade associations, churches, and so on)	● Semi-structured interviews ● Institutional mapping
Role of community institutions in service and infrastructure provision	● Institutional mapping ● Semi-structured interviews
Long-term environmental trends, for example, declining soil fertility, declining rainfall	● Historical transects ● Community timelines ● Resource mapping at different points in time ● Trend analysis
Responsibilities, obligations within house holds (support to children, provision of food, payment of school fees, and so on, by gender)	● Semi-structured interviews ● Decision-making matrix

Source: Klugman 2001

Appendix C: Poverty lines from around the world

Table C1: Poverty lines in eight Asian countries

Country	Source Of Data	Year	Living Standard Indicator	Calorie Norm	Method Used	Sources
Bangladesh	Bangladesh Bureau of Statistic (BBS) Household Expenditure Survey	1981/82, 1983/84, 1985/86, 1988/89, 1991/92 & 1995/96	Calorie intake	Absolute poverty -2122 calories per capita per day, Hardcore poverty- 1805 calories per capita per day	Direct calorie intake (DCI)	1) Ahmed, Faizuddin, "Poverty Incidence in Bangladesh 99: Regional and National Estimates", Regional Seminar on Poverty Monitoring Survey 99, Dhaka, 21 May 2000. 2) Wondon, Quentin T, Food Energy Intake and Cost of Basic Needs:
Bangladesh	Bangladesh Bureau of Statistic (BBS) Household Expenditure Survey	1981/82, 1983/84, 1985/86, 1988/89, 1991/92 & 1995/96	per capita expenditure	2112 calories per capita per day (urban), 2122 calories per capita per day (rural)	Food energy intake (FEI)	Measuring Poverty in Bangladesh. *The Journal of Development Studies*, Vol 34, No 2, December 1997, pp 66-101. 3) Wodon, Quentin T, Poverty in Bangladesh: Extent and Evolution. *The Bangladesh Development Studies* vol 23, Sept-Dec
Bangladesh	Bangladesh Bureau of Statistic (BBS) Household	1981/82, 1983/84, 1985/86,	Per capita expenditure	2122 calories per capita per day	Cost of basic needs (CBN)	1995, Nos 3 & 4. 4) World Bank, Bangladesh From Counting the Poor to Making the Poor Count. Poverty

Appendix C: Poverty lines from around the world
Table C1: Poverty lines in eight Asian countries contd.

Country	Source Of Data	Year	Living Standard Indicator	Calorie Norm	Method Used	Sources
	Expenditure Survey	1988/89, 1991/92 & 1995/96				Reduction and Economic Management Network, South Asia Region, 29 April 1998.
China	National Bureau of Statistics (NBS) Rural Household Survey	1984,1990.	Per capita income	2100 per capita per day-rural (In the absence of an official poverty line, past calculations were based on UNDP & WB studies)	Cost of basic needs (CBN)	1) Wang , Zingzui, et al. 2000. China Poverty Profile. A Report Submitted to the Asian Development Bank. FCPMC, Beijing, PRC.
India	National Sample Survey (NSS)	National Sample Survey Organisation (NSSO)	Per capita expenditure	2100 calories per capita per day (urban), 2400 calories per capita per day (rural)	Food energy intake (FEI)	1) Thomas, P.V. India Country Paper on Poverty Measurement. Seminar on Poverty Statistics, 21-23 June 1999, ESCAP, Bangkok. 2) Government of India, Report on the Expert Group on Estimation of

Appendix C: Poverty lines from around the world
Table C1: Poverty lines in eight Asian countries contd.

Country	Source Of Data	Year	Living Standard Indicator	Calorie Norm	Method Used	Sources
		continuously from 1950-1974. Thereafter, data was collected by an integrated survey quinquennially from 1972/73 - 1993/1994.				*Proportion and Number of Poor.* Perspective Planning Division, Planning Commission. New Delhi, July 1993. 3) *Government of India, Estimate of Poverty.* Press Information Bureau. New Delhi, 11 March 1997.

Appendix C: Poverty lines from around the world
Table C1: Poverty lines in eight Asian countries contd.

Country	Source Of Data	Year	Living Standard Indicator	Calorie Norm	Method Used	Sources
Indonesia	Central Bureau of Statistics National Household Socio-Economic Survey (SUSENAS)	1976, 1978, 1980, 1981, and every 3 years therea-fter	Per capita expenditure	2100 calories per capita per day (urban), 2400 calories per capita per day (rural)	Cost of basic needs (CBN)	1) Asra, Abuzar, I.P. David and R.A. Virola. 1997. "Poverty Assessment in the Philippines and Indonesia: A Methodological Comparison" *Journal of Philippine Development.* Number 44, Vol. XXIV, No. 2 Second Semester. 2) Sutanto, Agus, P.B. Irawan and A. Said. 1999. Poverty Measurement: Problems and Development. Paper Presented at International Conference on Methodologies of Poverty Calculations in Indonesia, Jakarta, 30 November 1999. 3) Badan Pusat Statstik, 2000. Pengukuran Tingkat Kemiskinan Indonesia 1976-1999: Metode BPS. Jakarta

Appendix C: Poverty lines from around the world
Table C1: Poverty lines in eight Asian countries contd.

Country	Source Of Data	Year	Living Standard Indicator	Calorie Norm	Method Used	Sources
Nepal	Central Bureau of Statistics (CBS) Nepal Living Standard Survey	1995/96	Per capita expenditure	2124 calories per capita per day	Cost of basic needs (CBN)	1) Prennushi, Giovanna. Nepal: Poverty at the Turn of the 21st Century Main Report and Background Studies, South Asia Region Internal Discussion Paper, Report No. IDP 174, the World Bank, May 1999. 2) Lanjouw, P., *et al.* 1986. "Building Blocks for a Consumption- Based Analysis of Poverty in Nepal", n.p.
Philippines	National Statistics office (NSO) Family Income and Expenditure Survey (FIES)	1957,1965, 1971,1985 and every 3 years thereafter.	Per capita income	2000 calories per capita per day and 100% of the recommended dietary allowances (RDA) for protein and 80% of the per capita RDA for vitamins	Cost of basic needs (CBN)	Francisco, V.S., Poverty in the Philippines. January 2000. Unpublished Report to ADB. National Statistics Coordination Board (NSCB), 1997 Philippine Poverty Statistics, Philippines.

Appendix C: Poverty lines from around the world
Table C1: Poverty lines in eight Asian countries contd.

Country	Source Of Data	Year	Living Standard Indicator	Calorie Norm	Method Used	Sources
Thailand	National Statistics Office (NSO) Socio-Economic Survey	1975-76, 1981, 1986 and every 2 years thereafter.	Per capita income	refer footnote 1	Cost of basic needs (CBN)	1) National Economic and Social Development Board (NESDB), New Poverty Thresholds for Thailand with Policy Application, " *Indicators of Well-Being and Policy Analysis*, Vol 2, No. 2, March 1998. 2) Kakwani, Nanak, *Poverty in Thailand*. School of Economics the University of New South Wales, Sydney, Australia. Undated. 3) Kakwani, Nanak and Medhi Krongkaew. 1998. "Poverty in Thailand: Defining, Measuring and Analysing. Working Paper No. 4. Development Evaluation Division. NESDB.

Appendix C: Poverty lines from around the world
Table C1: Poverty lines in eight Asian countries contd.

Country	Source Of Data	Year	Living Standard Indicator	Calorie Norm	Method Used		Sources
Vietnam	General Statistics Office (GSO) Vietnam Living Standards Survey (VLSS)	1992-1993, 1997-1998	Per capita income	2100 calories per capita per day	Cost of basic needs (CBN)		1) Government- Donor-NGO-Working Group, "Attacking Poverty", *Vietnam Development Report* 2000. Consultative Group Meeting for Vietnam, 14-15 December 1999. 2) Glewwe, Paul, *et al.* "Who Gained from Vietnam's Boom in the 1990s? An Analysis of Poverty and Inequality Trends, " Development Research Group, The World Bank, Undated.

Source: Abuzar Asra and Vivian Santos-Francisco (2001)

Table C2: Poverty lines in selected developed countries

Country	Official Poverty Line exists?	Description	Other poverty line and description	Source for other poverty line	Source
Australia	Henderson Poverty Line (the product of a Commission of Inquiry into Poverty, chaired by Prof. Ronald Henders on, reported in 1973	Poverty threshold is the minimum wage plus family benefits for a one-earner couple with two children Second poverty line, applied after housing costs were deducted from income Uses the 1954 New York Family Budgets Standard Equivalence scale.			Cox 1998.
Canada	1. Low income cutoff line (LICO) 2. 50 percent of median gross income adjusted only for family size	Statistics Canada (Federal Department responsible for collecting income data in Canada). LICO (began in 1959) determines a percentage of income at which individuals and families may be said to spend a disproportionate amount on essential food, clothing and shelter, leaving little or no income for transportation, health ersonal care, education, household operation, recreation or insurance.			

Table C2: Poverty lines in selected developed countries contd.

Country	Official Poverty Line exists?	Description	Other poverty line and description	Source for other poverty line	Source
Hong Kong	No. CSSA cut-off is de-facto poverty line	(Comprehensive Social Security Assistance) is a means tested programme, which has been proved to be insufficient.			MacPherson 1998
India	1962 Working Group of the Government of India recommended per capita total consumption expenditure (PCTE) of Rs. 20 per month in 1960/61 prices. Planning Commission Total consumption expenditure per capita Rs. 49.09 in rural areas and Rs. 56.64 in urban areas in 1973/74 prices	No records available to reveal the assumptions or calculations implicit in this figure. Average per capita expenditure level at which the average per capita daily [calorie] intake is 2,400 in rural areas and 2,100 in urban areas. Based on the age-sex-activity-calorie allowances recommended by a group of nutrition experts, daily requirements for urban and rural areas based on the age-sex-occupational structure of the population. Consumption expenditure using NSS 1973/74 data.			

Table C2: Poverty lines in selected developed countries contd.

Country	Official Poverty Line exists?	Description	Other poverty line and description	Source for other poverty line	Source
Ireland			Relative poverty lines of 40, 50 and 60 percent of the average income.		Callan and Nolan 1998
Korea	Ministry of Health and Social Affairs (1973 and 1978)	1973 and 1978 use the Engel method and 1978 uses the Leyden method.	Engel, Leyden, Rowntree, Expenditure and Perception methods	Bark 1994	Oyen, Miller and Samad 1996
Netherlands	No. General Assistance benefits are de facto.	Minimum income level necessary to live in subsistence. Depend on the composition of the recipient's household, his or her age, and whether or not he or she shares a home.	National Social Minimum Income Level (Not only general assistance benefits but also holiday allowances, incidental benefits,		Dirven et al. 1998

Table C2: Poverty lines in selected developed countries contd.

Country	Official Poverty Line exists?	Description	Other poverty line and description	Source for other poverty line	Source
			family allowances and student grants) Subjective Poverty Line (judgements of heads of households about the minimum income required for their household).	Goedhart et al 1977	
Philippines	1983 Social Development Committee (Cabinet Level body) 1991 Philippines National Statistical Coordination Board	Relative poverty line of the bottom 30 percent. Much criticised. last determined a national absolute poverty in 1991. P3,675 per month for a family of six. Officially determined minimum income			

Table C2: Poverty lines in selected developed countries contd.

Country	Official Poverty Line exists?	Description	Other poverty line and description	Source for other poverty line	Source
	(1991) Philippines Commission to Fight Poverty (PCFP) 1994	needed by a family to obtain a specific bundle of privately provided food and basic services (health care, a safe dwelling, clean water and sanitation and cloting). Food threshold is min. nutritional basic reqt. Of 2000 calories a day, with up to 90 percent of the calories derived from grains.			
United Kingdom	No. But the level of benefits was taken as an implicit poverty line. Post 1988 50% of av. Income	DHSS 1988 study on Low Income Families using annual Family Expenditure Survey. Household formation used for calculating means-tested benefit DSS used Households below average income (HBAI) together with rest of European Union (DSS 1995).			Silburn 1998

Table C2: Poverty lines in selected developed countries contd.

Country	Official Poverty Line exists?	Description	Other poverty line and description	Source for other poverty line	Source
United States	Orshansky poverty line (1963).	Poverty line of US$3000 a year for a family of four, based on the Dept. of Agriculture's food plan of 1961. One third of a typical family's expenditure was on food, so the food poverty line was scaled up by three. Poverty thresholds are updated annually (how) and adjusted for inflation.			
Zimbabwe	1995 Poverty Assessment		Income required to satisfy minim-um consumption needs of a family of given size and composition within a defined environment in a condition of basic physical health and social decency. Nine categories: Food, clothing, fuel and lighting, personal care and health,	Cubitt and Riddell (1974)	Midgley and Livermore 1998 Kaseke 1998

Table C2: Poverty lines in selected developed countries contd.

Country	Official Poverty Line exists?	Description	Other poverty line and description	Source for other poverty line	Source
			replacement of household goods, transport, accommodation, education and provision for post-employment consumption.		

Complied using Oyen 1996 and Dixon 1998.

Case Study C1: What can we learn from the U.S. Poverty Line?[127]
The U.S. poverty line was constructed in 1963 by Mollie Orshansky, a civil servant, in what is now known as the U.S. Department of Health and Human Services (DHHS). According to Orshansky, her calculations were solely for a survey of the aged, but were misappropriated by President Johnson, who was looking for a national poverty measure (Milbank, 1995) in order to measure progress on the "War on Poverty".

How the U.S. Poverty measure was constructed:
- Orshansky started with a set of minimally-adequate food budgets calculated for families of various sizes and composition by the U.S. Department of Agriculture (USDA) for 1961.
- Based on information from the U.S. Department of Agriculture's 1955 household survey of food consumption she determined that food represented about one-third of after-tax income for a typical family.
- The minimally adequate food budgets were scaled up by a factor of three to get the total poverty line.
- They were then adjusted for family size.
- She obtained 124 poverty thresholds that differed by family size, number of children, age and sex of head and farm and non-farm residence.
- In the 1960s, the poverty line was updated to account for inflation, using increases in the prices of food to inflate the minimal food budget, maintaining a multiplier of three.
- In 1969, the U.S. Bureau of the Budget (now the Office of Management and Budget) adopted the Orshansky measure as the standard government poverty measure, mandating that inflation be measured using the Consumer Price Index (CPI) published by the U.S. Bureau of Labour Statistics (BLS).

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[127] Based mainly on Weinberg *et al.* 1998.

- With only minor modifications (reducing the number of categories to 48) the Orshansky thresholds still form the basis for the official poverty statistics.
- It measures pre-tax income only, with no mention of in-kind benefits like food stamps, and credits like the Earned Income Tax Credit (EITC). Including these would decrease poverty significantly.
- It also makes no allowance for child-care and transport expenses, thus understating the number of working poor.
- It does not consider regional cost-of-living differences, therefore overstates rural poverty and understates urban poverty.
- It also mixes pre-tax income with after-tax spending requirements.

Beginning in 1992, a comprehensive examination of poverty measurement in the United States was conducted by the National Research Council (NRC)'s Panel on Poverty and Family Assistance of the National Academy of Sciences (NAS) commissioned by the 1988 Family Support Act. This panel published their findings a report in May 1995.[128]

Some recommendations on the revision of the official poverty measure, contained in Citro and Michael (1995):
- "The revised measure should comprise a set of poverty thresholds and a definition of family resources-for comparison with the thresholds to determine who is in or out of poverty-that are consistent with each other and otherwise statistically defensible. The concepts underlying both the thresholds and definition of family resources should be broadly acceptable and understandable and operationally feasible."
- The poverty measure should have the following characteristics:

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[128] Citro and Michael 1995, *Measuring Poverty: A New Approach.*

- It should represent a budget for food, clothing, shelter (including utilities) and a small additional amount to allow for other needs (for example, household supplies, personal care, non-work-related transportation).
- A threshold for a reference family type should be developed using actual consumer expenditure survey data and updated annually to reflect changes in expenditures in food, clothing and shelter over the previous 3 years (using data from the Consumer Expenditure Survey, converting data to the current period using the Consumer Price Index).
- A second set of updated thresholds should be used for evaluation purposes, which only updates for price changes (rather than consumption patterns).
- The reference family threshold should be adjusted to reflect the needs of different family types and to reflect geographical differences in housing costs.

- *Choice of indicator:* Family resources should be defined-consistent with the threshold concept-as the sum of money income from all sources together with the value of near-money benefits (for example, food stamps) that are available to buy these goods and services. Such expenses include income and payroll taxes, childcare, and other work-related expenses, child support payments to another household, and out-of-pocket medical care costs, including health insurance premium.
- *Unit of analysis:* Should continue to be Families and unrelated individuals. Definition of families should be extended to include cohabiting couples.
- *Recommended equivalence scales:* children under 18 are treated as consuming 70 percent as much as adults on average; economies of scale are computed by taking the number of adult equivalents in a

family (that is, the number of adults plus 0.7 times the number of children) and raising this number to a power of from 0.65 to 0.75.

- *Spatial cost of living:* A cost-of-housing index can be constructed from the decennial census, and should be applied to the housing component of the poverty line. Appropriate agencies should conduct research to determine how the geographic cost of living differences should be calculated between censuses.

- *Risk and vulnerability:* Appropriate agencies should work to develop one or more "medical-care-risk" indexes that measure the economic risk to families and individuals having no or inadequate health insurance coverage. However such indexes should be kept separate from the measure of economic poverty.

- *Choice of measures:* In addition to the basic poverty counts and ratios for the total population and groups, official poverty series should provide statistics on the average income and distribution of income for the poor, as well as on measures that exclude government taxes and transfers (that is, defines pre-tax income, excludes means-tested/ all government benefits) so that the effects of government taxes and transfers can be assessed.

- Federal and State agencies responsible for assistance programs that use poverty guidelines derived from the official poverty threshold (or a multiple) should consider using this proposed measure, and modifying it if necessary.

Data requirements and research priorities recommended by the panel
- The Survey of Income and Program Participation (SIPP) should become the basis of official U.S. income and poverty statistics in place of the March income supplement to the Current Population Survey (CPS)[129]. Priority should be accorded to methodological research for SIPP that is relevant for improved poverty measurement.

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[129] This recommendation was subsequently modified following a change in the design of the SIPP.

- The Census Bureau should routinely issue public-use files from both SIPP and CPS that include the Bureau's best estimate of disposable income and its components, so that researchers can obtain poverty rates consistent with the new threshold concept from either survey.

- *Research priorities:*
  - Methods to develop poverty estimates from household surveys with limited income information that are comparable to the estimates that would be obtained from a fully implemented disposable income definition of family resources.
  - Methods to construct small-area poverty estimated from the limited information in the decennial census that are comparable with the estimates that would be obtained under a fully implemented disposable income concept.
  - Consider adding one or two questions to the decennial census to assist in the development of comparable estimates.
  - The Bureau of Labour Statistics should undertake a comprehensive review of the Consumer Expenditure Survey to consider ways to improve the CES for the purpose of developing poverty thresholds, for making it possible at a future date to measure poverty on the basis of a consumption or expenditure concept of family resources, and for other analytical purposes related to the measurement of consumption, income and savings.
  - Official poverty measures should be derived annually. Other measures can be derived for periods that are shorter and longer than a year, for such purposes as program evaluation. Such measures may include the inclusion of asset values in the family resources definition.

- The extent of resource-sharing among roommates and other household and family members to determine if the unit of analysis for the poverty measure should be modified in the future.

The Census Bureau responded to the panel's proposal with a series of research projects (Weinberg 1998 and Fisher 1999), some of which are completed. Other organizations involved in research in these areas are the Bureau of Labour Statistics, General Accounting Office, Brookings Institution and Institute for Research on Poverty (IRP). These include

- Developing poverty thresholds using expenditure data
- Work-related expenditures (mainly child-care and transportation)
- Valuing housing subsidies
- Designing a Medical Care Risk Index
- Shifting Family Definitions
- Valuing home ownership to add to income
- Equivalence scales
- Corrected estimates using out-of-pocket medical care expenses

In 1997 the Office of Management and Budget convened a federal Interagency Technical Working Group (TWG) to improve the Measurement of Income and Poverty. The group formed various subgroups to deal with specific issues. They have compiled a list of research projects, and have provided comments on the Census Bureau's plans for a report on experimental poverty measures.

In 1999, the Census Bureau released its first report on experimental poverty measures which implemented most of the NAS Panel recommendations, as agreed upon by a technical working group on poverty measurement chaired by the Office of Management and Budget.

A second report was released *in 2001*.[130]

The current value of the U.S. poverty line is about $15.05 per person per day (Barrett 2003).

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[130] See Short *et al.* 2002 for a summary of these reports and current challenges.

Appendix D. Asset based indices

Composite indices typically fall into two categories: (a) those that aim to capture the non-income dimensions of poverty in a single measure, or alternatively, to capture a more complete measure of poverty than income measures, and (b) those that are used to identify the determinants of some other phenomenon, such as fertility or educational attainment. The asset-based indices that are reviewed generally fall into the latter category, although Sahn and Stifel (2001) attempt to construct an index of "asset poverty". In this section I review recent attempts to construct indices from asset indicators with a view to providing overall guidance in best practice in constructing composite indices, especially in the area of choosing weights.

Asset-based indices drawn from the Demographic and Health Surveys (DHS) have been used in recent research on the determinants of educational attainment (Filmer and Pritchett 1998 and 1999), examining fertility (Bollen *et al.* 2002), fertility, child mortality and children's schooling (Montgomery *et al.* 2000), and to construct "asset poverty rates" (Sahn and Stifel 2000). Filmer and Pritchett (1998) found that while there is a correspondence between the classification of households based on consumption expenditure and an asset index, the asset index was a better proxy for predicting school enrolments (due to possibly being a better predictor of long run welfare or "economic status") than consumption expenditure. Montgomery *et al.* (2000) found proxy variables to be weak predictors of consumption per adult, but to yield similar results to consumption per adult when used as explanatory variables.

Sahn and Stifel (2000) argue that using asset variables to create an index of asset poverty avoid problems of data collection typically associated with consumption poverty measures such as such as variable recall periods (Scott and Amenuvegbe 1990), differences in commodity lists (Pradhan 2000), and the difficulty of finding accurate deflators for intertemporal and spatial comparisons.

Data on assets

Questions on asset ownership collected in DHS and LSMS and other surveys usually take the form "Do you own … (such and such)?" This yields a binary variable taking the value 0 or 1 and gives no additional information on the quantity or quality of the assets. For example, does the household own one bicycle or many? Is the TV black and white or colour? How reliable is the supply of services such as electricity and water? Whether the lack of information on quantity and quality affects the outcome (ability to classify households as poor or non poor) is, to a large extent, an empirical question, which will only be definitively answered as more studies are conducted. The use of binary variables also poses special problems in constructing an index.

There are also methodological issues in including in a household-based indicator, assets and services that are shared or publicly owned such as well water or pit latrine or connection to electricity supply (Deaton 1997).

Differences in housing quality across regions (geographic, as well as urban and rural) generate problems similar to those posed by widely differing consumption patterns in creating a basket for income/expenditure based poverty lines. For example, urban slum dwellers often live in brick and concrete dwellings, but in far worse conditions (in terms of indoor pollution from a smoking fire, overstressed sewage and water supply systems) than rural families in mud or thatched houses. Ownership of household productive assets, such as holdings of land and animals are appropriate in rural areas, but inappropriate (and in the case of land, difficult to measure) in urban areas (Hewett and Montogomery 2001).

Does the choice of indicators matter?

Filmer and Pritchett (1998), constructing asset-based indices, found that reducing the number of variables used in the index does not re-classify households very much (some of the poorest 40 percent get reclassified

into the middle 40 percent, but none are classified as rich). Bollen *et al.* (2002) examined several proxies and concluded that the choice of proxy does matter if the focus is on economic status (as is the case when using a proxy to monitor poverty), but not if the variables are being used to proxy economic status as an explanatory variable in the determination of some other dependent variable (such as fertility or educational attainment). Other studies have found that at the subnational level different indicators can lead to alternative poverty or food insecurity rankings (Glewwe and van der Gaag 1990, Hentschel *et al.* 2000).

What can be done? In choosing indicators, rather than asserting that one variable-or approach to choosing variables-is better than another, the guiding principle should be to explore the tradeoffs inherent in the choice of indicators. This will include (a) the assumptions that are made, the practical implications in terms of (b) costs, (c) technical requirements, (d) errors of inclusion and exclusion and (e) characteristics of the chosen population (Davis and Siano 2001).

Limitations of asset indices as proxies for welfare

The indices constructed using these methods cannot be used to measure absolute deprivation or be interpreted in any absolute sense, partly because they cannot be used to determine a threshold of poverty.[131] They can only be used to rank households, and to group them into percentiles, that is, measure relative welfare.

Filmer and Pritchett (1998) use data from the Indian 1992/93 National Family Health Surveys (a survey modelled on the DHS survey) and the asset index thus constructed performs well in terms of internal coherence, robustness to the assets used, reasonable comparisons with poverty and output across states, but raise questions in terms of urban/rural comparisons. Rank correlations of this index with consumption poverty headcount indices and per capita net state domestic product reveal a high correlation between the three.

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[131] Sahn and Stifel (2000) implicitly use a threshold, only described as "a certain level in the asset index distribution."

Filmer and Pritchett (1998) point out that both the asset index and a measure of consumption expenditure are proxies for a household's long run "wealth" or economic status. Both these measures are limited. The problem with the asset index is not having appropriate weights for the assets, the problem with current expenditure as a proxy for long run wealth is that that would occur only under the unrealistic assumption of perfect foresight and perfect capital markets.

Although some authors have attempted it, asset indices cannot be used reliably to monitor changes in poverty over time, as there may be significant changes in household ownership of, or access to, some of the index components, which may not necessarily translate into a reduction in material poverty (Falkingham and Namazie 2002).

Asset indices are typically constructed from a generic list of indicators, although findings from qualitative studies indicate that measures need to be country/region/area-specific (Moser and Holland 1997; Moser 1998; Bond and Mukherjee 2001).

Appendix E: Selected lists of indicators for measuring and monitoring poverty
List E1: A list of poverty and social exclusion indicators used in developed countries
Income
1. Gap between low and median income
2. Individuals with low income (below 60% of median income)
   Intensity of low income (below 50% of median income)
3. In receipt of means-tested benefits (working age only)
4. Long-term recipients of benefits (all ages)
5. Periods of low income (at least two years in three on a low income)
6. The location of low income

Children
7. Living in workless households
8. Living in low income households (below 60% of median income)
9. Low birth-weight babies (%)
10. Accidental deaths
11. Low attainment at school: pupils gaining no grade above Grade D
12. Permanently excluded from school
13. Children whose parents divorce
14. Births to girls conceiving under age 16
15. In young offender institutions (age 10 to 16)

Young adults
16. Unemployed (16 to 24)
17. On low rates of pay (16 to 21)
18. Not in education, training or work (16 to 18)
19. Problem drug use (15 to 24)
20. Suicide (15 to 24)
21. Without a basic qualification (19 year olds)
22. With a criminal record (18 to 20)

Adults aged 25 to retirement
23. Individuals wanting paid work
24. Households wanting work for two years or more
25. On low rates of pay
26. Insecure at work
27. Without access to training
28. Premature death
29. Obesity
30. Limited long-standing illness or disability (45-64 year olds)
31. Mental health

Older people
32. No private income
33. Spending on "essentials"
34. Excess winter deaths
35. Limiting long-standing illness or deaths
36. Anxiety (feeling unsafe out at night)
37. Help from social services to live at home (%)
38. Without a telephone

Communities
39. Non-participation in civic organizations
40. Polarisation of work (%)
41. Spending on travel
42. Without a bank or building society account
43. Burglaries
44. Without household insurance
45. Dissatisfaction with local area (%)
46. Without central heating
47. Overcrowding
48. Households in temporary accommodation
49. Mortgage arrears

(Source: Monitoring Poverty and Social Exclusion 2002, Executive Summary. Available online at www.poverty.org.uk).

List E2: Core Welfare Indicator questionnaire indicators
Indicators of Living Standards:
- Percentage of households reporting diminishing/increasing land assets.
- Home ownership.
- Type of home construction.
- Percentage of households using wood, charcoal or crop residues for cooking fuel.
- Type of fuel used for lighting.
- Ownership of selected household goods.
- Mean number of household members.
- Percent of adults who are literate.
- Percent of persons sick or injured in the previous four weeks.
- Type of sickness or injury.
- Percent of children who are malnourished.

Access, Utilisation and Satisfaction Indicators:
- Access to clean water.
- Access to primary and secondary schools.
- Access to local market and public transport.
- Net primary and secondary enrolment rates (by gender).
- Satisfaction with school services.
- Percent of children who do not attend school.
- Reasons for not attending school.
- Primary and secondary drop out rates (by gender).
- Access to medical services.
- Use of medical services by persons sick or injured in previous four weeks.
- Satisfaction with local health service.
- Reason for non-use of medical services.
- Percent of women with a recent birth who received prenatal care.
- Percent of births delivered in a health facility.
- Percent of births supervised by a formally trained health worker.
- Percent of children who have participated in nutrition programs.

- Percent of children who have participated in weigh-in programs.
- Percent of persons currently employed.
- Percent of persons underemployed.
- Percent of persons unemployed during the previous week.

Source: Achikbache, B., M. Belkindas, M. Dinc, G. Eele and E. Swanson, "Strengthening Statistical Systems for Poverty Reduction Strategies: Technical; Notes and Case Studies" cited in J. Klugman (ed.), *2001, A Sourcebook for Poverty Reduction Strategies*, Washington D. C.

Table E1: Choosing dimensions and indicators for social exclusion

Area of activity	Consumption	Savings	Production	Political	Social
Exclusion defined by:	Low income	Low wealth	Lacking Production activity	Politically unengaged	Socially isolated
Indicators	Income under half mean equivalised household income	Not an owner-occupier, Not contributing to or receiving an occupational or personal pension, and no savings over £2000	Not in employment or self-employment, full time education or training, looking after children, or retired over pensionable age	Did not vote in the last general election and not a member of a political or campaigning organisation	In any one of five respects, lacks someone who will offer support (listen, help in a crisis, can relax with, really appreciates you, can count on to comfort).

Source: Tackling Social Exclusion in Families with Young Children, Summary of Stage 2, "Measuring Social Exclusion".

Note: Discussions with representatives of Government, voluntary organisations and families from across the UK reveal marked differences in acceptance of these dimensions and indicators. The first group considered income and unemployment as useful "hard" measures, the second group emphasized social activity and isolation, while the third group suggested the importance of perceptions (theirs and others toward them), to be as important as income. Immediate living conditions (including services) were more important than owning a home.

Table E2: Indicators for monitoring capability deprivation

Measuring "human" poverty	Socio-cultural capabilities	Political capabilities (Voicelessness/ Powerlessness)	Measuring vulnerability
Undernutrition	Analysis of local ranking of poverty/well-being	Self-assessed powerlessness (participatory poverty assessments)	Physical assets (housing, equipment, land)
Infant and child mortality	Evidence of social interaction patterns by gender, ethnicity and other social categories	Survey evidence of local power relations and their dynamics	Human capital (health and education)
Maternal mortality	Number and degree of activity of community-based organisations	Surveys of gender balance in decision-making at all levels	Labour, stocks (food, money, valuables)
HIV prevalence/AIDS mortality		Regulations for decentralised decision-making	Spread risk
Community based disease monitoring indicators			Income diversification

Table E2: Indicators for monitoring capability deprivation

Measuring "human" poverty	Socio-cultural capabilities	Political capabilities (Voicelessness/ Powerlessness)	Measuring vulnerability
TB, Malaria incidence Education Gender balance in education			Access to credit markets Links to networks Participation in the formal safety network Frequency and impact of conflicts and natural disasters Population movements Self-assessed well-being (participatory poverty assessments) Social surveys, sentinel reports, "social weather stations".

Source: Adapted from DAC/OECD Guidelines on Poverty Reduction 2001

Table E3: Indicators for poverty maps

Dimension	Sector	Example Indicators	
		Status	Outcomes/Consequences
Economics	Consumption and income	Head count index; poverty gap	Productive assets; housing
Social	Nutrition	Caloric intake to requirement	Children's weight-for-age
	Sanitation and water	Access to safe drinking water	Morbidity due to water-borne diseases
Energy	Access to electricity/	fuel wood	Nutritional or educational indicators.
	Health and family planning	Access to primary healthcare	Infant mortality rates
	Education	Primary school enrolment rate	Literacy rates
Enabling environment	Access to opportunities	Access to land, credit; participation in decision making	Productive assets; income from gricultural surplus or non-farm activities
	Natural endowment	Agro-climatic variables	Measures of agricultural productivity and food security
	Geographic infrastructure	Access to markets	Income from sales of agricultural surplus

Source: Uwe Deichmann (1999)

Table E4: Indicators of human well-being and poverty

Dimensions	Component	Means Examples of Indicators	Ends/Outcomes/Capabilities Examples of Indicators
Economic	Current consumption	• Number of people below poverty line	• Lack of wealth
(monetary measurement)	expenditures	• Head count index (proportion of people below poverty line • Poverty gap • Squared poverty gap • Other composite poverty indexes • Percentage of household budget spent on food (food ratio)	[-productive assets-land, livestock and equipment housing consumer goods savings
	Income	same as above	
Social (non- economic or non-monetary measurement)	Nutrition	• Calorie intake to requirement	• Low height-for-age • Low weight-for-age • Low weight-for height • Body mass index • Low birth weight
	Sanitation and water Energy	• Access to adequate sanitation • Access to portable water • Access to adequate energy supply • Access to electricity	• Morbidity-water borne diseases
	Health and family planning	• Access to primary healthcare • Immunization rates • Access to family planning • Births attended by trained healthcare personnel	• Mortality-infant • Mortality-children under the age of 5 • Mortality-maternal • Morbidity of certain diseases • Contraceptive prevalence rate • Percentage of pregnant women who are anaemic • life expectancy

Table E4: Indicators of human well-being and poverty contd.

Dimensions	Component	Means Examples of Indicators	Ends/Outcomes/Capabilities Examples of Indicators
	Education	● Net primary enrolment rate	● Literacy rate-female/male/adult ● Primary school completion rate
Enabling environment (tries to capture structural inequities, and processes and systematic disadvantages)	Access to means of production	● Limited or no participation in decision making ● Limited or no social capital ● Limited or no access to productive assets ● Limited or no access to employment ● Limited or no access to land ● Limited or no access to credit ● Limited or no access to technology ● Limited or no access to information	
	Vulnerability	● Poor agricultural endowment ● High environmental hazard (droughts, floods, etc) ● Great insecurity (crime, i ntimidation etc)	
	Peripheral areas	● Poor access to markets ● Poor access to infrastructure ● Poor access to public transportation	

Source: Henninger (1998)

Table E5: Examples of intermediate and outcome indicators

Goal	Intermediate indicator	(input and output) Outcome/impact indicator
Reduce extreme poverty and expand economic opportunities for the poor.	• Expenditure on employment programs for the poor • Number of beneficiaries of employment programs for the poor	• Incidence of extreme poverty: percentage of population whose consumption falls below the poverty line • Poverty gap ratio • Income/expenditure of the poorest 20% of the population as a share of the total income/ expenditure of the whole population
Enhance the capabilities of poor men and women	• Expenditure on primary education as a share of total expenditure in education • Expenditure on primary health care as a share of total expenditure on health • Number of new schools built • Number of primary school teachers trained • Percentage of population below the poverty line with access to health care facilities • Number of doctors per 100,100 inhabitants	• Literacy rates • Learning achievement • Gross/net enrollment rate in primary/secondary education • Dropout and repetition rates • Infant, child, and under five mortality rate • Maternal mortality rate • Malnutrition rate
Reduce the number of Vulnerable poor.	• Expenditure on safety net programs • Number of households/individuals receiving transfers from the government • Number of households receiving food aid as a percentage of drought- affected households	• Number of households made food secure • Percentage of vulnerable group (for example AIDS or orphans) protected • Additional income provided through safety net programs

Source: Achikbache *et al.* in Jen Klugman, (ed.), 2001 *A Sourcebook for Poverty Reduction Strategies"*, Washington, D.C.

Table E6: Revised list of monitoring indicators

Indicators	Intended level of disaggregation
Income Poverty	
Proportion of people below the poverty line	National, regional, district
Number of people in absolute poverty	National, regional
Household percentage share of food expenditure	National, regional
Proportion of population living under thatched houses	National, regional
Dependency ratio	National, regional, district
Gini coefficient	National, rural/urban
Consumption per capita of poorest 20%	National, regional, district
Per capita GDP	National
Savings/DGP ratio	National
Revenue per capita per district	District
Security and Vulnerability	
Proportion of households affected by theft or civil disturbances	National, regional
Number of people internally displaced	National, regional
Number of civilian deaths due to insurgency	National, regional
Number of criminal cases reported	National, regional
Proportion of households experiencing major income shocks last year	National, regional
Refugee and displaced as proportion of district population	District
Proportion of households under economic distress selling assets	National
Road Network	
Road length opened	National
Road length up-graded	National
Proportion of districts with more than 50% of roads in poor condition	National, district
Proportion of area not serviced by roads	National, district

Table E6: Revised list of monitoring indicators contd.

Indicators	Intended level of disaggregation
Land	
Incidence of poverty by land ownership and tenure	National, district
Agriculture	
Adoption rate of modern farming methods	National, district
Yield rates	National, district
Percentage of farmers growing food security crops	National, district
Markets	
Availability of markets by type	National, district
Accessibility of markets	National, district
Volume of goods and services handled at a given market	National, district
Proportion of households where the sale price of the main agricultural product is less than 50% of the urban market price	National, district
Labor Productivity and Employment	
Unemployment rate	National, district
Vocational training enrollment	National, district
Average hours worked per day	National, district
Rural Credit	
Growth of micro-finance portfolio	National, district
Proportion of population accessing micro-credit	National, district
Growth in savings	National, district
Credit management (effective use)	National, district
Availability of micro-finance services	National, urban/rural

Source: Prennushi, G., G. Rubio and K. Subbarao, "Monitoring and Evaluation: Technical Notes" cited in Jeni Klugman, (ed.), 2001, *A Sourcebook for Poverty Reduction Strategies,* Washington, D.C.

Table E7: Proposed indicators for monitoring the PRSP in Tanzania

Objectives	Final Indicators	Intermediate Indicators
1. *Reducing income poverty*	- Poverty incidence Proxy Indicators - Ownership of household assets - Type of construction materials of dwelling units (floors, walls and roofing)	- Real GDP growth - Investment (physical and human) - Investment productivity - Growth in value-added of agriculture - Development of private sector - Seasonal production of hey food and cash crop - Kilometres of rehabilitated rural roads - Actual and budgetary allocation for rural roads - Actual and budgetary allocation for agricultural extension
2. *Improving Quality of life and social well being* A. Health, survival and nutrition	- Infant and under 5mortality rates - Percentage of children under 2 years immunized against measles and DPT - Seropositive rate in pregnant women - Maternal mortality - Life expectancy - Malaria-related fatality rate for children under 5 - Burden of disease/morbidity - Proportion of households with access to safe drinking water - Stunting prevalence - Wasting prevalence	- Proportion of districts with active HIV/AIDS awareness campaigns - Percentage of births attended by trained personnel - Child feeding practices - Implementation of malaria control program - Actual and budgetary allocation for primary health care - Actual and budgetary allocation for HIV/AIDS - Actual and budgetary allocation for water and sanitation

Table E7: Proposed indicators for monitoring the PRSP in Tanzania contd.

Objectives	Final Indicators	Intermediate Indicators
B. Education	- Literacy rate - Gender equality in primary and secondary education - Proportion of school age children successfully completing primary education - Net primary school enrollment rate - Gross enrollment rate - Drop out rate - Transition rate from primary to secondary - Proportion of students in grade seven passing at specified mark in standard examination	- Actual and budgetary allocation for basic education
C. Vulnerability	- Built capacity to all communities needing safety nets programs	- Established database for the vulnerable groups - Promoted the production of drought resistant crops in all drought prone areas - Promoted community managed irrigation schemes in all potential irrigation areas
D. Social well-being	- Fully implemented poverty reduction strategy	- Fully implemented local government - Ratio of decided to filed court cases - Average time taken to settle commercial disputes - Ratio of actual court appeal sessions to planned sessions - Number of PRS workshops held and composition of committees

Table E7: Proposed indicators for monitoring the PRSP in Tanzania contd.

Objectives	Final Indicators	Intermediate Indicators
3. Achieving and sustaining a conducive development environment		
A. Macroeconomic stability	- Inflation rate	- Fiscal balance - Gross official international reserves - Exchange rate - Current account balance
B. Governance	- Number of budgetary votes managed through IFMs - Expenditure commitments and arrears recorded through IFMs - Spread and magnitude of corruption - Integrity and transparency in the accounting system - A governance system that us efficiently and effectively decentralized - Strengthened professional and cost effectiveness of the public service system. - Improved public service capacity, motivation and performance - Improved budget management at central and lower levels	-Rolled out integrated financial management information system (IFM) to all ministries and sub treasuries - Developed and approved specific anti-corruption action plans for the ministries of agriculture and cooperatives, education and culture, health, and water; and the CSD based on the national anti-corruption strategy - Developed and approved performance improvement modules for priority sectors - Timely prepared budgets at all levels. - Institutional pluralism in the delivery of public services

Source: Prennushi, G., G. Rubio and K. Subbarao, "Monitoring and Evaluation: Technical Notes" in Jeni Klugman, (ed.), 2001, *A Sourcebook for Poverty Reduction Strategies,* Washington, D.C.

Table E8: Indicators in the final recommended questionnaire

Human resources	Dwellings	Food security and vulnerability	Assets	Others
• Age and sex of adult household members	• Number of rooms	• Number of meals served in last two days	• Area and value of land owned	• Non-client's assessment of poverty outreach of MFI
• Level of education of adult household members	• Type of roofing	• Serving frequency (weekly) of three luxury foods	• Number and value of selected livestock resources	
• Occupation of adult household members	• Type of exterior walls	• Serving frequency (weekly) of inferior food		
• Number of Children below 15 years of age in the household	• Type of flooring	• Hunger episodes in last one	• Value of transportation related assets	
• Annual clothing/ footwear expenditure for all household members	• Observed structuralone condition of dwelling	• Hunger episodes in last twelve Months	• Value of electric appliances	
	• Type of electric connection	• Frequency of purchase of staple goods		
	• Type of cooking fuel used	• Size of stock of local staple in dwelling		
	• Source of drinking water			
	• Type of latrine			

Source: Zeller, M., M. Sharma, C. Henery and C. Lapenu, 2001, "An operational tool for evaluating poverty outreach of development policies and projects", IFPRI *Discussion Paper No. 111*, Washington, D.C.: IFPRI.

List E3: Indicators selected to represent the poverty index

Human resources
1. Maximum level of education in household
2. Percent of adults who are wage labourers
3. Education level of household head
4. Percent of literate adults in household

Dwelling
1. Value of dwelling
2. Roof made of permanent material
3. Walls made of permanent material
4. Quality of flooring material
5. Electric connection
6. Source of cooking fuel
7. Latrines in the household
8. Number of rooms per person
9. Access to water
10. Structure of house

Assets
1. Irrigated land owned
2. Number of TV's
3. Number of radios
4. Number of fans
5. Number of VCR's
6. Value of radio
7. Value of electronic devises
8. Value of vehicles
9. Value of assets per person/adult

Food security and vulnerability
1. Number of meals served in the last two days
2. Episodes of hunger during the last 30 days
3. Episodes of hunger during the last 12 months
4. Number of days with luxury food 1
5. Number of days with luxury food 2
6. Number of days with inferior food
7. Frequency of purchase of basic good
8. Food stock in house
9. Use of cooking oil

Miscellaneous indicator
1. Per person expenditure on clothing

Source: Zeller, M., M. Sharma, C. Henery and C. Lapenu, 2001

Appendix F : Some well-known composite indices
The UNDP's Indices

Although the capability poverty measure (CPM) introduced in UNDP (1996) and the Human Poverty Index (HPI) introduced in UNDP 1997 are the only measures that specifically include the word poverty in their title, even the UNDP's well established Human Development Index (HDI) may be considered a poverty index, focusing as it does on health and education, two very important dimensions in which deprivation must be considered poverty.[132,133]

The HDI is constructed by taking indicators of achievement in these three dimensions: life expectancy at birth, adult literacy rate, gross enrolment ratio (both indicators of achievement in knowledge) and GDP per capita (at adjusted US$ PPP rates), converting them into indices that convey information about the relative position of a country (relative to the minimum and maximum) and combining them together using equal weights. Anand and Sen (2000) explain that GDP is being used in the HDI as a proxy for all the other variables that go into a measure of human development. Education and health are explicitly included because studies have shown that income is not a very good proxy for achievement in these dimensions.

The HPI-1 (calculated for developing countries) uses indicators of deprivation in the same three dimensions as the HDI: probability at birth of not surviving to age 40, adult illiteracy rate and two (non-income) indicators of not being able to achieve a decent standard of living (percentage of population not using improved water sources, and percent of children under five who are underweight).

The HPI-2 (calculated for developed countries) uses indicators of deprivation in these dimensions as well as an indicator of social exclusion. The indicator of deprivation in longevity is the probability at

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[132] The HDI was introduced in 1990 by Mahbub ul Haq, amidst much criticism (including from Amartya Sen and Ravi Kanbur, among others) that the conceptual foundations for it were weak. Haq's response was that the HDI would raise issues of health and education on par with income in a way that no other measure could, and Sen, and Kanbur have acknowledge that he was right (Kanbur 2002).

[133] In fact, in the explanation of their derivation in technical note 1 (UNDP 2001) the dimensions portrayed in the HDI and the HPI-1 are the same: a long and healthy life, knowledge and a decent standard of living.

birth of not surviving to age 60 (reflecting a relatively higher overall achievement in longevity in these countries). Deprivation in knowledge is measured by the percentage of adults lacking functional literacy skills, and deprivation in a decent standard of living is measured by the percentage of people living below the poverty line. The long-term unemployment rate is used as an indicator of social deprivation.

Each component used in the HPIs is either a headcount index or an average of headcount indices (Qizilbash 2003), and each term is a "shortfall" so that the overall index is the shortfall in terms of each component, for n dimensions (3 in the case of HPI-1, 4 in the case of HPI-2).

Equation 4

$$\text{HPI-1} = [1/3 \ (P_1^{\alpha} \ + \ P_2^{\alpha} \ + \ P_3^{\alpha})]^{1/\alpha}$$
$$\text{HPI-2} = [1/4 \ (P_1^{\alpha} + P_2^{\alpha} + P_3^{\alpha} + P_4^{\alpha})]^{1/\alpha}$$

The weighting rule developed for the Human Poverty Index by Anand and Sen (1997) is to use the formulae given in Equation 4 which differs from an unweighted average when ? is not equal to one. The larger is ?, the greater the weight given to the dimension in which there is most deprivation. As ? increases, the relative impact of the dimension with the most deprivation rises very fast. $\alpha=3$ is chosen because it gives an elasticity of ½, and the relative impact is not unreasonably large. Anand and Sen (1997) admit that there is an "inescapable arbitrariness" in the choice of ?, and that the best way to deal with this issue is to explain clearly what is being assumed, so that public criticism of this assumption is possible.

While the annual Human Development Reports calculate HPIs at the national level, there is nothing intrinsic in the measure that prevents it from being calculated at the sub-national level. In fact, many of the National Human Development Reports (NHDRs) that have been published since the late 1990s report these measures at the sub-national level.[134] NHDRs also develop their own versions of the HPI, selecting indicators that are best suited to the country.

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[134] Including the National Human Development Report 1998 for Sri Lanka.

IFAD's composite indices

The International Fund for Agricultural Development (IFAD) calculates five composite indicators: (1) the Food Security Index (FSI) which focuses on food production and consumption (2) the integrated poverty index (IPI) which is a composite of the headcount ratio, the poverty gap and poverty severity and the rate of growth of GNP per capita (3) the basic needs index (BNI) which is a composite of adult literacy and primary school enrolment, population per doctor, infant mortality rate, access to health care, safe water and sanitation, (4) the women's status index (WSI) which is made up of the maternal mortality rate, the percentage of birth age women using contraception, the adult literacy of females, the female gross primary and secondary enrolments, male and female wage ratios in agriculture and male and female ratio of labour force participation, and finally the (5) relative welfare index (RWI) which is a composite of FSI, IPI and BNI (Sumner 2003).

WHO Quality of Life indices

The World Health Organization's (WHO) indicators consider six "quality of life" domains: physical, psychological, independence, social relationships, environment and spiritual. The data for these are collected in a survey instrument (QOL100 or QOLBREF) where respondents rate their perceptions of their quality of life on a scale from 1 to 5 (WHO 1995, 1999 cited in Sumner 2003).

Unsatisfied basic needs

Many Latin American countries have used what is known as Unsatisfied Basic Needs indices (COPLAMAR 1983, Boltvinik 1997) or the converse, an Index of Fulfilment of Basic Needs (see Navajas *et al.* 2000) which comprises about 10 indicators capturing housing quality, access to public services, education, and access to formal and informal health services. *The weights are determined by a form of consultative process among national poverty experts and policy analysts.*

One example is the index produced by FONCODES (the Peruvian Social Fund) which is used to target its projects. It is based on eight indicators—infant mortality, chronic malnutrition, illiteracy, school-aged children not in school, overcrowded housing, inadequate roofing,

and the proportion of the population without access to water, sewerage, and electricity. Each indicator was standardized by dividing by its minimum value, chronic malnutrition was multiplied by seven and then all indicators were aggregated. This had the unintended consequence that the greatest weight was given to those indicators with the greatest variance (Schady 2002).

Deprivation indices and subjective deprivation scales

First introduced by Townsend (1979) the index measures a household's capacity to participate in a wide range of customary social activities. Townsend demonstrated that as family income diminished, so did social participation.

The subjective deprivation scale consists of a list of items reflecting people's living conditions. The extent of deprivation is calculated as a weighted sum of the score on each item that the individual considers absolutely necessary to have. If an item is lacked, it adds one to the deprivation score, if it is possessed, it subtracts one from the deprivation score (weighted by the extent to which the item is possessed or lacked by a reference group). The subjective deprivation poverty line is found by asking the so-called life-resources evaluation question (Dirven *et al.* 1998) which asks households to give a self-assessment of their situation from very poor (a score of 1) to very rich (score of 10). The poverty line is considered to be 5.5.

Appendix G: Selected research using proxy measures of economic welfare

Author (s)	Title	Data Source	Proxy measure of economic welfare
A.Razzaque, N. Alum, L.Wai and A. Foster (1990)	'Sustained effects of the 1974-75 famine on infant and child mortality in a rural area of Bangladesh', Population Studies, 44 (1): 145-54	Matlab Demographic and Surveillance System	Additive index of durables, including quilts, hurricane lamps, radio, watches and the receipt of cash remittances.
M. Brockerhoff (1990)	'Rural to urban migration and child survival in Senegal', Demography, 27(4): 601-16	Senegal DHS 1986	Type of toilet facilities and source of drinking water (model also included region, mother's marital status and occupation, and spouses occupation).
J. Knodel and M. Wongsith (1991)	'Family size and children's education in Thailand: evidence from a national sample' Demography, 28(1): 119-31	Thailand DHS 1987	Wealth index derived from types of vehicles owned, flooring, and toilet facility.
G.Guo and L.Grunmmer-Strawn (1993)	'Child mortality among twins is less developed countries', Population Studies, 47(3): 495-510	Demographic and Health Surveys for 26 countries	Owns car or TV (model also included urban/rural residence, mother's and spouse's education, husband's occupation (agricultural or manual).
K.Bollen, D. Guilkey and T.Morz (1995)	'Binary outcomes and endogenous explanatory variables: tests and solutions with an application to the demand for contraceptive use in		

Appendix G: Selected research using proxy measures of economic welfare contd.

Author (s)	Title	Data Source	Proxy measure of economic welfare
P.Sandiford, J.Cassel, M.Montenegro and G.Sanchez (1995)	Tunisia', Demography, 32(1): 111-31 access to health services', Population Studies, 49:5-17	Tunisia DHS 1988	Sum of household assets. 'The impact of women's literacy on child health and it's interaction with Enters number of socio-economic variables separately.
I.Speizer (1995)	'A marriage trichotomy and its applications', Demography, 32(4): 533-42	Cameroon DHS 1991	Index containing type of flooring, ownership of durables (radio, bicycle, TV, motorcycle, car, stove, refrigerator), access to electricity.
E. Jensen (1996)	'The fertility impact of alternative family planning distribution channels in Indonesia', Demography, 33(2): 153-65	Indonesia DHS 1991	Index of ownership of durables and quality of housing with equal weighting.
P.Muhuri (1996)	'Estimating seasonality effects on child mortality in Bangladesh', Demography, 33(1): 98-110	Matlab Demographic and Surveillance System	Whether the household owns at least one of five durable goods or receives remittances.

Appendix G: Selected research using proxy measures of economic welfare contd.

Author (s)	Title	Data Source	Proxy measure of economic welfare
D.Guiley and S.Jayne (1997)	'Fertility transition in Zimbabwe: determinants of contraceptive use and method choice', Population Studies, 51(2): 173-90	Zimbabwe DHS	Sum of the number of consumer durables as well as indicator variables for land ownership, good drinking water and good sanitation facilities.
D.Filmer and l.Pritchett (1999)	'The effect of household wealth on educational attainment: evidence from 35 countries', Population and Development Review, 25 (1, March): 85-120	DHS surveys from the 1990's for 35 countries	Index from (1) a set of six dummy variables, each of which is equal to one if a member owns a radio, television, refrigerator, bicycle, motorcycle, or car (2) a set of three dummy variables, one of which is equal to one if the household's drinking water is from a piped source, a well or surface source, or another source (3) a set of three dummy variables one of which is equal to one if the household has a flush toilet, a pit toilet latrine, or no/other toilet facilities (4) a dummy variable equal to one if the house has electricity (5) the number of rooms for sleeping in the dwelling (6) a dummy variable equal to one if the dwelling's floors are made of finished materials such as cement. Weights are derived using principal component analysis

Appendix G: Selected research using proxy measures of economic welfare contd.

Author (s)	Title	Data Source	Proxy measure of economic welfare
D.Sahn and D. Stifel (2000)	'Poverty comparisons over and across countries in Africa', World Development, 28 (12): 2123-55	DHS data for 12 African countries	Asset index using (1) Household durables consisting ownership of a radio, TV, refrigerator, bicycle, and motorized transport, and (2) household characteristics including source of drinking water (piped or surface water relative to well water), toilet facilities (flush or no facilities relative to pit or latrine facilities), and floor material (low quality relative to high quality) and (3) years of education of household head. Weights derived using factor analysis.
M.Montogomery, M.Gragnolati, K.Burke and E.Paredes (2000)	'Measuring living standards with proxy variables', Demography, 37(2): 155-74	LSMS from five countries (Ghana, Jamaica, Pakistan, Peru and Tanzania)	Uses a series of separate indicator variables for durable goods (radio, TV, refrigerator, bicycle, motorcycle, car) and housing quality (access to clean water and electricity, type of toilet and flooring).
K.Bollen, J.Glanville and G.Stecklov (2001)	'Economic status proxies in studies of fertility in developing countries: does the measure matter?' MEASURE Evaluation Working Paper, No.0138	LSMS from Ghana and Peru	Compares two alternative measures: principal component score of various consumer durable goods; index constructed by summing ownership of same set of goods.

Source: Jane Falkingham and Ceema Namazie (2002), "Measuring health and poverty: a review of approaches to identifying the poor", HSRC, London.

Appendix H: Data sources

Economic and Social Agents

- Households and individuals
- Enterprises
- Public agencies and service providers
- Community and other organizations and groups

Data Collection Methods

- Census and sample surveys
- Administrative records and management information systems
- Non quantitative and participatory surveys and appraisals

Statistical Organizations

- National statistical agency
- Central Bank
- Ministry of finance
- Other Ministries and state agencies
- Local government agencies
- Other organizations eg; research bodies, NGO's, businesses etc

Statistical Products

- Real sector national accounts, production data, price statistics
- Balance of payments
- Government finance statistics
- Money and banking statistics
- Poverty monitoring data
- Education statistics
- Health statistics
- Population and demographic data
- Other statistics

Data Users

- Legislators
- Government planners, analytics etc.
- Lobbyists etc
- Researchers
- Media
- General Public
- Domestic and international markets
- Donors, International agencies
- Regional and sub-regional bodies

Figure H1: The Statitical Process

Figure H2: Data collection methods for poverty assessments
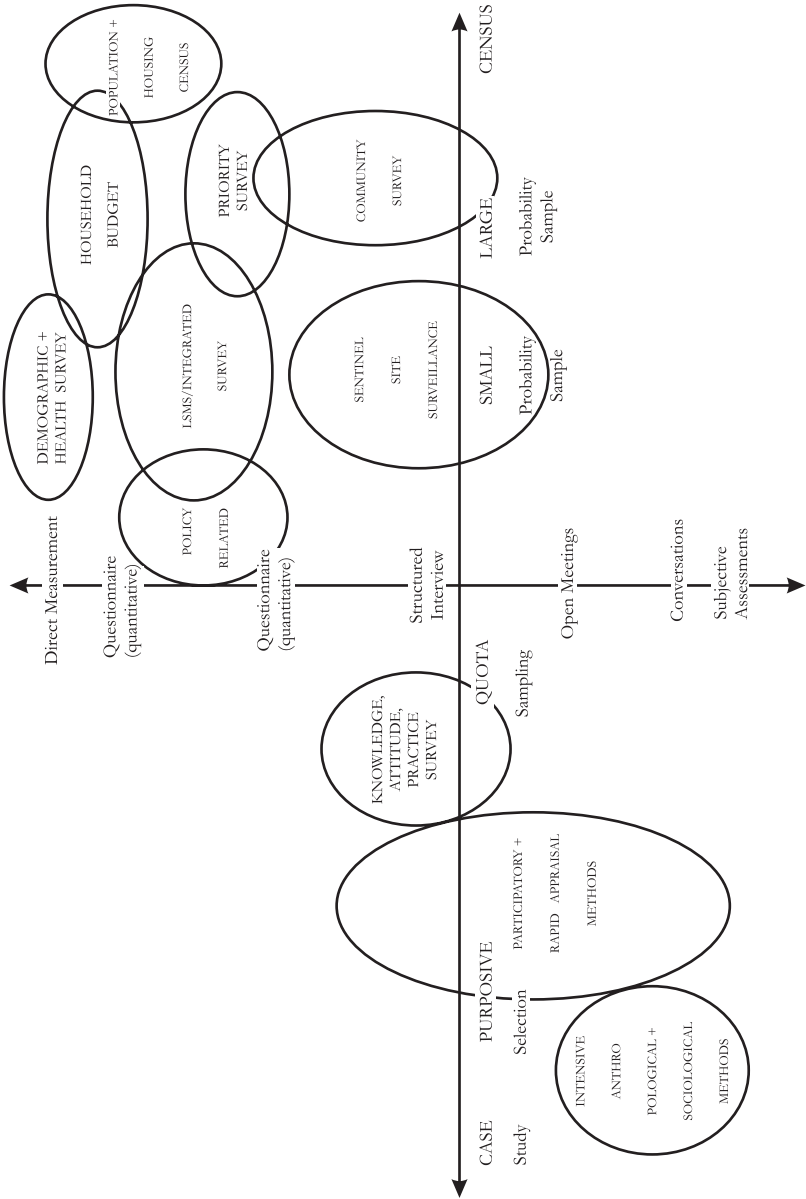
Source: Lok Dessallien 1996

Table H1:Data types and agencies

Data	Agency	Source	Frequency
National-level data			
National accounts: GDP, consumption, investment, exports, imports, and so on	Central statistical agency	System of national accounts, trade statistics	Monthly or quarterly where possible-trade statistics, for example; at least yearly
Public finance data: revenues, spending by category	Ministry of finance, central statistical agency, sectoral ministries	Budgets and actuals	Monthly or quarterly where possible-trade statistics, for example; at least yearly
Consumer and producer prices	Central statistical agency, central bank	Price surveys	Monthly; CPI basket updated at least every five years
Local-level data			
Consumer and producer prices, climatic data, national accounts at regional level	Central statistical agency, central bank	Price surveys, systems of national accounts	Monthly; CPI basket updated at least every five years
Availability of services	Local administration, sectoral ministries	Multi-topic household surveys; qualitative studies	Yearly
Use of services	Local service providers	Rapid monitoring and satisfaction surveys	Yearly
Individual and household-level data			
Household consumption and income; living conditions, social indicators	Central statistical agency, Ministry of labor/employment	Household budget expenditure, income surveys, multi-topic household surveys, demographic and health surveys	Every three to five years

Table H1:Data types and agencies contd.

Data	Agency	Source	Frequency
Population statistics, access to services-no consumption or income; literacy	Central statistical agency	Population census	Every five to ten years
Household living standards-no detailed consumption or income; illness patterns, malnutrition, education profile	Central statistical agency, Ministry of labor/employment, others	Rapid monitoring and satisfaction surveys, demographic and health surveys	Yearly
Household priorities, perceptions of well-being, user satisfaction	Central statistical agency, sectoral ministries, others	Qualitative studies; rapid monitoring surveys	Every one to three years

Source: Coudouel, Hentschel and Wodon, "Well-being measurement and analysis" cited in Jeni Klugman, (ed.), 2001 *A sourcebook of poverty reduction strategies*, Washington D.C

Table H2: Income poverty: data availability and analyses tools

Case	Data Availability	Income-Poverty Measurement (IPM)	Analytical Tools
1)	No surveys (multi- or single topic) exists. Only census data or administrative data available	IPM not possible	- Geographic maps: access to services, housing deficit, literacy, GDP per capita but not income poverty - Geographical incidence: spending or enrolment in relation to access maps
2)	One round of rapid monitoring surveys exist (CWIQ), priority survey	IPM not possible. Wealth index can be calculated as proxy for income (but no absolute line applied).	By wealth quintile: - Geographic maps (depends on size of survey) using poorest 20% or 40% of wealth indicator - Risk of being in bottom 20% of wealth quintile (by group, characteristics) - Profile of wealth relationships with education, enrolment, access and satisfaction with services, basic service access, basic labor market statistics - Incidence analysis (distribution of health, education, specific program spending by area and wealth quintile)
3)	One cross-section demographic and health survey	IPM not possible. Wealth index can be calculated as proxy for income (but no absolute line applied).	By wealth quintile: - Geographic maps (depends on the size of survey) using wealth indicator (20% or 40% poorest) - Risk of being bottom 20% wealth quintile (by group, characteristics) - Profile of wealth relationship by quintile with education, enrolment, health outcome indicators, basic services access, basic labor market statistics - Incidence analysis(distribution of health, education, specific program spending by area and wealth quintile)

Table H2: Income poverty: data availability and analyses tools contd.

Case Data Availability	Income-Poverty Measurement (IPM)	Analytical Tools
4) Repeated cross-section demographic and health survey	IPM not possible. Wealth index can be calculated as proxy for income (but no absolute line applied).	As above plus: - Change in risks, profile, incidence (by wealth quintile)
5) One cross-section with single-topic survey (with income/consumption variable)	IPM possible-one time period	By poor/non-poor groups or by using income variable: - Geographic maps (depends on size of survey) - Profile (limited) of poverty group and quintile to labor market, education - Risk analysis - Incidence (limited) - Statistic decomposition - correlates (limited)
6) Repeated cross-section with single-topic survey (with income/consumption variable)	IPM possible-several time periods	As above plus: - Dynamic decomposition analysis (inequality and growth) - Risk, profile, correlates, incidence, welfare changes over time (limited)
7) One cross-section of multi-topic survey	IPM possible-one time period	By poor/non-poor groups or by using income variable: - Geographic maps (depends on size of survey) - Profile - Risk analysis - Correlates - Static decomposition (inequality) - Incidence

Table H2: Income poverty: data availability and analyses tools contd.

Case Data Availability	Income-Poverty Measurement (IPM)	Analytical Tools
8) Repeated cross-section of multi topic survey	IPM possible-several time periods	As above plus: - Dynamic decomposition of poverty changes - Repeated cross-section regression - Map, profile, risk, incidence, welfare changes in time
9) Repeated multi-topic survey with panel component	IPM possible-several time periods	As case 7) plus case 8) plus: - Panel growth regressions (determinants) - Mobility vulnerability analyses, entry/exit modeling, duration analysis

Source: Coudouel, Hentschel and Wodon (2001)

Examples of poverty monitoring systems

Uganda:

The monitoring strategy of the Poverty Eradication Action Plan (PEAP) is designed for two main purposes. First, it is essential to monitor progress in order to continually inform key agents involved in the process. Encouraging a two-way flow of information between beneficiaries, service providers, and policy makers is an essential component of the PEAP. In this way, the design and implementation strategies can be continually modified to build on what works, and to avoid repeating mistakes. Second, the monitoring strategy will help to build accountability. Where targets are set, the Government will expect to account for its successes or failures in achieving them, though it is understood that these successes and failure sometimes depend on factors outside Government's control.

Poverty monitoring involves a large number of institutions including the Poverty Monitoring Unit, the Uganda Bureau of Statistics, and the Uganda Participatory Poverty Assessment Project.

Five aspects of the system are worth noting.
- Household surveys are being used to prepare high-quality estimates of trends in poverty and the published reports provide much useful information.
- Participatory work has shed light on numerous aspects of poverty in Uganda and has immediately influenced budgetary allocations on water supply and the priority given to improving security.
- There is a need to develop indicators for performance in all sectors. This is being done by sectoral ministries, and the Poverty Monitoring Unit has also developed a list of indicators in cooperation with the districts.
- The institutional provision for monitoring the PEAP is found in the preparation of the *Poverty Status Report*. It synthesizes information on recent poverty trends, and makes recommendations on the poverty eradication strategy, to be incorporated in future PEAP revisions. The PEAP will also be revised every two years.

- Finally, there is a proposal for a Geographical Information System which would link existing sources of data and allow the spatial distribution of poverty to be studied in more detail.

Monitoring is structured at three main levels.

First, the monitoring of PEAP *outcomes*. This will focus on progress in reducing income poverty, improving health, raising educational achievement and enhancing the voice and participation of the poor. Most of the information for such outcome monitoring will be drawn from household surveys and repeated exercises under the UPPAP.

Second, the strategy will entail monitoring actions or *outputs* intended to achieve these outcomes. Data sources will include both sample surveys and data from management information systems.

Third, there will be regular monitoring of the *inputs* required for action against poverty. This consists mainly in tracking public expenditures on poverty reducing activities.

Tanzania

"The Poverty monitoring system coordinates/implements collection, analysis and dissemination of: (a) National and sub-national surveys and the census (b) Routine administrative data provided by local government and sector ministries (c) In-depth contextual research." [135]

"Information from the Poverty Monitoring System's different branches are assembled in the Tanzania Socio-economic Database" which is on the web and available on CD-ROM. An Annual Poverty and Human Development Report is produced, and this is the annual output of the poverty monitoring system.

The overall responsibility lies with a "Poverty Reduction Strategy Technical Committee" and activities are directed by four small technical working groups, on (a) Surveys and the Census (b) Routine Data Systems (c) Research and Analysis (d) Dissemination, Sensitization and Advocacy.

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[135] Booth *et al.* (1998) distinguish between *contextual research* which "attempts to capture a social phenomenon within its social, economic and cultural context" and *non-contextual research,* is designed to "collect information untainted by the peculiarities in which it is collected".

The Vice-President's Office (VPO) will have the overall responsibility for monitoring the implementation and impact of the poverty reduction strategy. Monitoring and evaluation (M&E) of the poverty reduction strategy will require indicators or qualitative assessments pitched at different levels.

- **First,** M&E will require impact and outcome indicators. Impact indicators will describe progress towards overall poverty eradication objectives, while outcome indicators will refer to results of interventions (inputs) directed at poverty reduction. The government has already coordinated a consultative process to draw up a list of poverty and welfare monitoring indicators (PMI), which contains many of the required impact and outcome indicators. These indicators have been incorporated into the Tanzania Socio-Economic Database (TSED), which contains a wider set of indicators.
- **Second,** proxy indicators will be developed to substitute for impact and outcome indicators that are more difficult to measure, or are available only at infrequent intervals.
- **Third,** intermediate indicators will be used to provide supplementary information for assessment of progress under the poverty reduction strategy.
- **Fourth,** resource allocation for, and expenditure on, priority poverty reduction initiatives will be monitored under the PER and MTEF framework.
- **Fifth,** M&E will also seek to assess the extent of participatory involvement by the poor, as well as other shareholders, in subsequent revisions of the PRSP and in the implementation, monitoring and evaluation of related programs and projects.
- **Sixth,** M&E, supported by well-targeted research, will assess the impact on the poor of policies that transcend the immediate agenda of the poverty reduction strategy.

- **Seventh,** A set of gender-oriented indicators will be developed as an integral part of the M&E.
- **Finally,** given financial and technical constraints, the M&E system will be limited to "core" strategic indicators that can be used readily by policy makers and other stakeholders.

Moreover, a special effort will be made to include indicators with at least two observations during the three-year horizon of the poverty reduction strategy.

Source: Adapted from Achikbache, B., M. Belkindas, M. Dinc, G. Eele and E. Swanson, "Strengthening Statistical Systems for Poverty Reduction Strategies: Technical Notes and Case Studies" in Jeni Klugman, (ed), 2001. *A Sourcebook for Poverty Reduction Strategies,* Washington, D.C.

Philippines [136]

This is part of the CBMS network of MIMAP-PEP (Poverty and Economic Policy) ongoing initiative of IDRC, Canada.

The Philippines CBMS identified a core set of 14 "basic needs" indicators, some of which are a subset of the MDG target indicators, where the list is an abbreviation of previous lists.

Data collection takes place at a disaggregated level (Barangay or village)

Data uses are expected to be local and national government.

Enumerators are chosen from within the village/Barangay.

Collected information is disaggregated into functional groups.

Data collected is reported to higher geopolitical level, and databanks

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[136] From Reyes, Celia M. and Lani E. Valencia, "Poverty Monitoring Systems in the Philippines", Paper presented at the Regional Conference of Poverty Monitoring in Asia, Feb 24-27, 2003, Sri Lanka.

are created and maintained at each geopolitical level.

The information generated by existing monitoring systems is utilized as a support indicator system.

Linked to the provincial government: they have mandated the use of the data as a basis for planning, synchronised time frame of planning activities and allocated 20 percent of development fund of local government units to CBMS based plans, and used CBMS in their first HDR.

INDEX

261

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