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# Poverty profiles

## A methodological note on measuring poverty

Working Paper

By

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**M**illennium Development Goal (MDG) number 1 calls for halving poverty by 2015. But poverty is not distributed uniformly across countries, regions, age, and gender, mentioning only a few dimensions. For example, there exist remote areas where poverty is substantially higher than the national average, a phenomena known as poverty pockets. This is not only true at the country level, but also at the regional level. Poverty is concentrated in city neighbourhoods, isolated villages, and inaccessible regions of a country.

Poverty Reduction Strategy Papers have become a key policy instrument for addressing poverty in the continent. In Africa there are 33 countries that are potential PRSP candidates. Out of those 33, 21 countries had completed the formulation of full PRSPs by September 2004. In total, 30 countries have committed to the process through interim or full PRSPs and some are already preparing second generation PRSPs (AU 2005).

## 1. Introduction

There is an extensive literature that provides guidance on the conceptual issues surrounding poverty measurement. The classic studies are Ravallion (1992a), Lipton and Ravallion (1995) and a large number of journal articles that appeared in the 1990s which addressed most of the concerns regarding the measurement of poverty in developing countries.

For policy-makers the fundamental question is how can poverty be measured, analysed, and represented in order to efficiently target poverty reduction measures. Decision-makers often find themselves with a choice of different means of analysing poverty. It is important to understand how the different types of measures and analytical methods work in order to use the information appropriately for policy design. This paper focuses on methodological issues. It looks at the different methods of measuring poverty and at their advantages and drawbacks. It concludes with recommendations on how and when to use the different measures.

The companion paper<sup>1</sup> “Poverty maps of selected African Countries” gives a general overview on the topic of representations of spatial poverty through maps. It deals with some of the issues addressed in this paper with a particular focus on the use of maps as a relevant policy tool. Further, it provides examples of maps of African countries on poverty, market access, and other spatially distributed determinants of poverty.

## 2. Methodology

The high levels of poverty in Africa constitute one of the primary development challenges the continent is facing today. One concept of poverty is based on income or consumption measures of welfare. The Millennium Development Goal 1 (MDG 1) states that by 2015 extreme poverty should decline by half in all countries, where extreme poverty is defined as an income level below US\$ 1 per person and per day. However, well-being is broader than the income

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<sup>1</sup> Three papers “Poverty profiles: A methodological note on measuring poverty”, “Special Maps: Targeting and mapping poverty”, and “Poverty Maps: A useful tool for policy design to reduce poverty” were distributed on a CD at the ODI/ESPD conference on “Addressing inequalities: policies for inclusive development” that took place in Addis Ababa, Ethiopia from the 11th to the 12th of July 2005. The two latter papers were merged to “Poverty maps of selected African Countries”.

dimensions; it encompasses the environment that people need to have in order to lead a fulfilling life (UNDP 2004). This environment includes education, health, freedom, and social participation as well as income and consumption. The MDGs as a whole, therefore, not only target poverty in its income dimension but in its broader sense.

## 2.1 Consumption or income based measures of poverty

The literature on the measurement of poverty, particularly consumption or income based poverty, owes Sen (1976) a great deal. Before, poverty issues were treated under the concept of income inequality. The measurement of poverty since then focused on the development of properties that satisfy certain ethical criteria, and on that basis, to derive an index that can capture the notion of poverty. This approach made good use of the well-known concept of social welfare functions, which are in turn functions of the indirect utility functions of individual households. In the literature, this method is better known as the welfarist approach to the measurement of poverty.

Three different measures of consumption or income poverty are generally employed to assess poverty, highlighting its different aspects. They are the headcount index, the poverty gap index, and the severity of poverty index. They all refer to a certain amount of income that is considered the threshold between being poor and not being poor, the so-called poverty line.

The first and simplest measure of poverty is the headcount index. It is the ratio of people living below the poverty line compared to the total population. The headcount index gives a quick and simple-to-understand first look at the incidence of poverty in a particular area. Being a discrete measure, it does not indicate anything about how poor the poor are and how income is distributed inside the group living below the poverty line. In particular, the headcount index will remain stable if all the poor get richer without anyone crossing the poverty line (Ravallion 1992b).

The headcount index increased slightly at high levels in Sub-Saharan Africa (SSA) between 1990 and 2003 while it declined in all other parts of the world (see Table 2.1). In 2003 about 46 per cent in SSA lived on less than US\$ 1 per day, a proportion slightly above the ones that prevailed in 1980 and in 1990. At the global level, however, the share living at US\$ 1 per day declined from 40 per cent in 1980 to 20 per cent in 2003. The US\$ 1 headcount index in SSA currently exceeds the next poorest region, South Asia, by about 17 percentage points (ILO 2004a). As a result, Eastern Asia, South-Eastern Asia, South Asia and Northern Africa are broadly on track to meet the MDG1 of halving poverty by 2015, whereas there has been no progress in Sub-Saharan Africa in achieving this goal (UN 2004).

Table 2.1

Proportion of the population living on or on less than US\$1 and US\$2 a day

	US\$ 1 a day poverty			US\$ 2 a day poverty		
	1980	1990	2003	1980	1990	2003
East Asia	61.6	31.2	14.9	85.3	68.8	43.2
South-East Asia	31.4	16.6	9.3	69.2	59.3	47.8
South Asia	52.3	40.9	28.4	89.0	85.4	75.7
Middle East & North Africa	3.2	2.5	2.0	26.5	21.8	20.8
Sub-Saharan Africa	42.6	44.1	45.7	73.0	75.8	76.4
World	39.7	27.0	19.5	65.7	59.8	51.2

**Source:** ILO 2004a

The second measure is the poverty gap index, which measures the magnitude of poverty. It is obtained by multiplying the poverty headcount index by the ratio of the difference between the poverty line and the average income of the population living under the poverty line expressed as fraction of the poverty line. The poverty gap index in sub-Saharan Africa is almost three times as big as in Southern Asia, the next most impoverished region (see Table 2.2).

Table 2.2

Poverty gap index in selected regions (mean shortfall from poverty line, %)

	1990	1999	2001
East Asia	8.9	4.2	3.9
South-East Asia	3.8	2.0	1.7
South Asia	10.3	7.1	7.1
North Africa	0.5	0.3	0.3
Sub-Saharan Africa	19.5	18.6	20.5

**Source:** UN 2004

The third measure, the severity of poverty index, does not only measure poverty and the depth of poverty, but also includes the distributional effects of the group of people living below the poverty line. If income is redistributed from the poorer to the less poor (without anybody being lifted above the poverty line), neither the headcount index nor the poverty gap index will reflect this change. The severity of poverty index, however, will increase indicating that poverty for the poorest has become more severe. The severity of poverty index is more sensitive to the income changes of the poorest and less sensitive to the income changes of those living close to the poverty line. This mitigates the discrete nature of the poverty measures, especially of the headcount index (Ravallion 1992).

The pioneering work by Sen (1976) in the measurement of poverty was the formulation of axioms that are deemed to hold similar to the measurement of income inequality. Sen offered a critique of the headcount index and the poverty gap index, two measures which are discussed above.

Sen (1976) has shown that these two popular measures of poverty violate one or both of the following appealing axioms:

- a) The monotonicity axiom: all other things being equal, a reduction in the income of a person below the poverty line must increase the poverty index;
- b) The transfer axiom: all other things being equal, a pure transfer from a person below the poverty line to someone who is richer, but may still be poor, must increase the poverty index.

It can be seen quite easily that the headcount index violates both monotonicity and transfer axioms while the poverty gap index violates the transfer axiom. In the words of Sen (1976, 1983) “any poverty index worthy of consideration should be able to provide three basic information on poverty: it should be able to identify who the poor are; capture their average deprivation; and thirdly, their relative deprivation among themselves”. As a result, the headcount index captures only who the poor are, or measures the prevalence of poverty, the poverty gap index measures the average deprivation.

If the income of the poor in a population is equal, Sen (1976, 1983) argued that complete information on poverty can be obtained from the poverty gap index, which according to Sen represent both the identity of the poor and their average deprivation.

We note that the distinction in the type of poverty being measured rests on the way the poverty line is defined. If the poverty line is meant to represent a level of income barely sufficient to meet basic needs and nothing more, then the underlying poverty measured is known as absolute poverty, whereas if the poverty line is defined as a proportion of mean (or median) income of the income distribution, it designates relative poverty.

The literature following Sen focused on the refinement of poverty indices by introducing a number of other desirable properties that can fully represent a range of ethical considerations by offering room for flexibility.

Thon's extension (1979, 1981), and later a number of others, (Takayama (1979), Kakwani (1980a, 1980b)) made an attempt at constructing indices that meet a number of desirable properties. Another strand of research also pursued the construction of poverty indices on the basis of social welfare functions employing the underlying ethical properties. Notable among these are the works of Blackorby and Donaldson (1980), Clark et al. (1981) and Chakarvarty (1983) who truncated the underlying income distribution of a population to the relevant segment and defined poverty as a deviation from an "equally distributed income" among the poor.

The list of requirements that has to be satisfied by a poverty index has grown longer with the literature on the measurement of poverty. The issue that whether the poverty indices suggested in the literature meet all these requirements has been a subject of inquiry. Kundu (1983) demonstrated that if the fixed population axiom is violated, no single poverty index could meet all desirable properties. Hagenars (1987) showed succinctly that no poverty index can meet all the desirable properties simultaneously and that a choice of a poverty index always implies the preference of some normative judgements over another. It is important for policy makers to draw their selection of a poverty index based on properties consistent with their policy objectives since the same scenario is judged differently by different poverty indices.

## 2.2 The capability approach to poverty

Sen (1983, 1986) and others (e.g., Streeten (1989, 1994)) argued that the welfarist approach to the measurement of poverty considers material goods and services as an end to the attainment of well-being, while in fact they are also a means towards achieving well-being by allowing the individual to function well. It is usually denoted as Sen’s capabilities approach or the non-welfarist approach, which motivated the publication of Human Development Indices (HDI) by UNDP.

The core of the distinction in the two approaches in poverty analysis is the fact that the welfarist approach imposes a priori utility maximisation by an individual, which in itself leads to well-being, while the non-welfarist approach argues that commodities availed to an individual are vehicles for a better life and activities. Thus, a mere increase in income of an individual may not result in an improvement in his well-being because of a number of factors, environmental as well as personal ones<sup>2</sup>.

The second criticism of the welfarist approach is that it focuses on ‘primary social good’ with emphasis on commodities and their distribution, by neglecting the commodities-persons relationships. The argument made is that possession of a commodity by itself will not lead necessarily to higher welfare for an individual and even if it does, the amount of welfare obtained varies considerably from one individual to another.

To counter the limitations of the welfarist approach, Sen (1983, 1986) proposed the capabilities approach to well being. The implication of this shift in the conceptualisation of individual welfare to the measurement of poverty has been an area of active research in recent years (see for example, Saith (2001), Laderchi (1998, 1997)).

The capabilities approach creates a link across vectors of commodities and their characteristics, functioning, and capabilities. For example, a basket of food items represent a sub-set of a commodity vector, and has the characteristics of providing nutrition. The functioning resulting from the vector of characteristics of the commodities is the state of being well or poorly nourished. The capability refers to the realisation of all these processes offering the individual the ability to be nourished. Operationalisation of the capabilities approach in empirical literature was never easy (see Sati (2001) for a review). Most researchers so far use an expanded set of indices representing well-being like UNDP’s HDI in order to capture capabilities.

Table 2.3  
Human development index for selected regions

	Life expectancy index	Education index	GDP index	Human development index, value 2002
Sub-Saharan Africa	0.35	0.56	0.48	0.465
South Asia	0.64	0.57	0.55	0.584
Arab States	0.69	0.61	0.65	0.651
World	0.70	0.76	0.73	0.729
East Asia and the Pacific	0.75	0.83	0.64	0.740
Latin America and the Caribbean	0.76	0.86	0.72	0.777

**Source:** UNDP 2004

<sup>2</sup> See Lipton and Ravallion (1995) for details

Table 2.3 illustrates the Human Development Index for different regions. Sub-Saharan Africa has with 0.465 the lowest HDI of all regions and below the world average of 0.729. Life expectancy in SSA is 46.3 years compared to 66.9 years as the world average which is reflected in its life expectancy index well below the world average. The Education and GDP indices are considerably lower than the world average, as well.

## 2.3 Asset based measures of poverty

Section 2.1 reviewed the conceptual underpinnings of a poverty index based on a well-defined welfare indicator, such as income. In practice, there are a number of difficulties associated with the use of a given welfare indicator. One is the lack of completeness. No welfare indicator, so far, is capable of capturing individual welfare in its fullness, for welfare is a multidimensional concept. In addition, individual income excludes publicly provided goods and non-marketable goods.

Another problem is that of referencing. This has to do with the choice of the unit of analysis and structure of preferences. At the conceptual level, poverty measurement is concerned with an individual. In practice, individuals are in most cases members of a household, which raises the whole subject of intra-household distribution. In addition, the same amount of income is regarded differently by two individuals due to variations in preferences and thus welfare (see Ravallion (1998), and Lipton and Ravallion (1995) for details). Further, individuals might underreport their income for various reasons, creating additional bias.

A particularly troublesome problem is that of poverty comparison across countries. Variations in survey methodologies, inaccuracies in the construction of consumer price indices and related problems prompted researchers to seek for alternative measures of individual welfare. Current research focuses on ownership of household assets as a key indicator of welfare. Given a list of assets owned by households, the task is to construct a composite index that more or less reflects the relative importance of each asset in total welfare. The usual assumption is to establish a linear relationship between the asset index and the relative weights of each asset, which have to be estimated econometrically from the data itself in a situation where there are no records of prices of the assets or their quality. The common method is to use the variance-covariance structure arising out of the correlation across the assets households own and other socio-economic characteristics of the households. Usually principal components or factor analysis is used to generate the variance-covariance structure of the assets and other relevant factors.

Sahn and Stifel (2000) estimated a covariance between an unobserved common factor (wealth) across all households and each asset owned, along with the assumption of orthogonality of the common factor and the error terms. The idea is that the weight of each asset in the total asset index depends on how strong the relationship is between the asset and the common wealth factor. Once the asset index is estimated for each household, Shan and Stifel rank households according to the value of the asset index in ascending order. Thus, the study obtains the distribution of welfare on the basis of asset.

The method of principal components analysis (PCA) for the asset based method is not undisputed. An alternative to the principal component analysis is the multiple correspondence analysis (MCA). PCA assumes a normal distribution and hence continuous variables. This is, however, not the case for all asset variables. For example, a variable capturing TV ownership will be either 0 (does not own a TV) or 1 (owns a TV), i.e. discrete of nature. MCA on the other

hand makes fewer assumptions on the nature of the distribution of individual variables and seems more appropriate in the context of discrete and categorical variable (Burger et al. 2005).

## 2.4 Appraisal of different methods

The money-metric approach is by its conception an easy-to-read and easy-to-compare method. If budget surveys are available, the approach provides a clearly understood measure of welfare and its determinants. It provides a well-defined unit of analysis that is comparable across households living in different localities. That is the underlying distribution is in terms of monetary units, which has its own merits for comparing poverty and inequality. The money-metric approach provides a quite accurate measure of the current standard of living and exhibits continuity in the welfare indicator. Common indices such as the headcount index, the poverty gap index and the severity of poverty index provide a measure of poverty that are directly applicable to policy issues such as targeting, monitoring growth episodes, and evaluating resource requirements to fight poverty.

Other alternative methods of constructing poverty profiles, such as the asset based approach, are correlates of current income. Thus, except for data limitations, it is preferable to use money-metric approach for catching the latest trends. It has a theoretical construct, which makes empirical results easy to interpret in the context of risk analysis, poverty traps, and vulnerability. Furthermore, it is convenient to link poverty analysis with issues of economic growth and income inequality. Money-metric poverty measures have easily understandable time paths and alternative scenarios can be simulated without failing to understand the implications.

A drawback of the money-metric approach is that it defines poverty in a narrow sense. In practice, there are also several statistical problems such as variations in prices, individual preferences, inconsistency in survey designs, underreporting, and other non-sampling errors.

Sen's capabilities approach provides a fresh look at the whole concept of poverty from the perspective of the end use of goods and services. It is appropriate in the context of very poor countries where the notion of poverty is tantamount to survival and other life-threatening hazards as income is only a mean to achieve certain functionings. It uses quite fruitfully survey data along with qualitative data. This provides a broader perspective on the dimensions of poverty and is particularly very relevant for targeting purposes. Sen, however, does not mention on which capabilities to focus on. He insists that this choice must be the result of a political process.

On the other hand, the capabilities approach is data intensive in the sense that it uses information from survey data as well as from qualitative data. The underlying distribution is unit free, making the interpretation of most of the results difficult.

For the asset based approach the data requirement is quite modest. In fact, it can be measured from routinely available and standardized data sets such as Demographic and Health Surveys (DHS)<sup>3</sup>. It avoids the common problems of price inaccuracies and associated valuations faced in the money-metric approach to poverty. It retains most of the properties of a poverty index based on income. However, it measures relative poverty, depicting at the same time inequality. This is

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<sup>3</sup> Demographic and Health Surveys (DHS) collect data linked to the health endowments of households. The data surveyed includes asset ownership. DHS are supported by USAID and are available for a number of African countries.

conceptually as well as empirically different from the notion of absolute poverty. The asset index is unit free and thus making the structure of the distribution difficult to understand.

The asset based index does not measure current standard of living, an issue of great concern to policy makers, but rather the long run status of a household. Changes in income are only reflected after a certain amount of time. Except for the headcount index, other higher order measures of poverty (e.g. poverty gap index) are so small that they appear nonsensical. Largely the variables used for analysis are close correlates of consumption expenditure. From a methodological point of view the asset based approach lacks a theoretical construct.

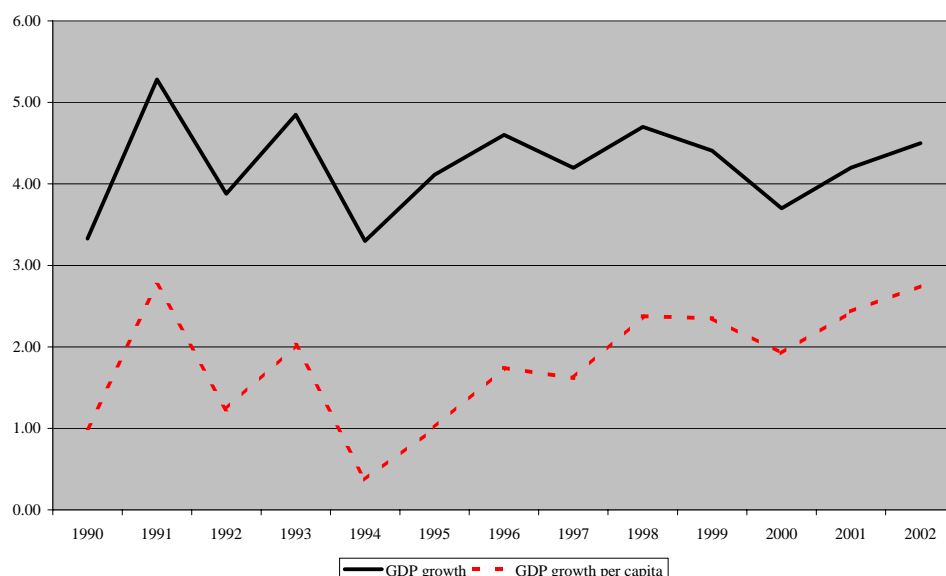
### 3. Country examples

This section examines the examples of Ghana and Zambia. It intends to illustrate the above-mentioned concepts and selected aspects of poverty profiles from a more practical point of view for the two countries in the period examined. However, it does not intend to give an account of the most recent developments nor a policy appraisal of the countries. We will start with a short description of the countries economic background before we exemplify the different poverty measures.

#### 3.1 Ghana

Ghana had its first structural adjustment programme in the early 1980s under the military regime of Mr Rawlings. The World Bank and the IMF assisted the economic recovery programme. Ghana established fiscal and monetary discipline, liberalized the financial sector, and the exchange rate. After the 2000 election power was handed over peacefully to a new government. Since the mid-1980s Ghana has been politically stable with sustained economic growth. Between 1990 and 1999 real GDP growth averaged 4.3 per cent per annum (see Figure 3.1). In recent years policies with a focus on poverty reduction and improvement of the conditions of the poor have been introduced (EIU (2004a), Word Bank (2004)).

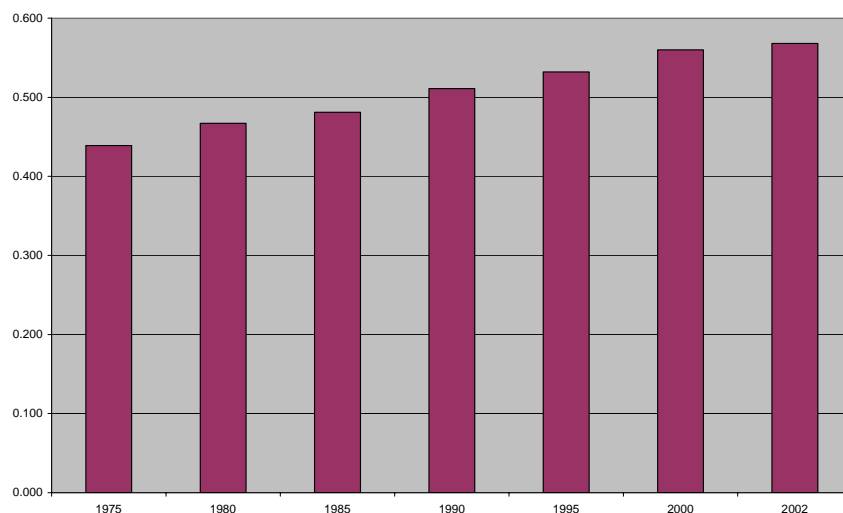
Figure 3.1: Real GDP and GDP per capita growth in Ghana, 1990 - 2002



**Source:** World Bank 2004

Using the national poverty line, Ghana's poverty headcount decreased from 50 per cent in 1992 to 39.5 per cent in 1998. The problem with the money metric consumption based approach, as mentioned in section 2.1, is strong sensitivity to the quality of and changes in definitions, price deflators, and design of the survey, among others. The 10 percentage point decrease in Ghana's poverty seems to be, however, plausible. GDP per capita grew from 1992 to 1998 by 11 per cent (World Bank 2004). UNDP's Human Development Index progressed from 1990 to 2000 about 9.5 per cent from 0.511 to 0.560 (see Figure 3.2). Sustained GDP growth over the same period increased GDP per capita by 20 per cent.

Figure 3.2: Human Development Index for Ghana

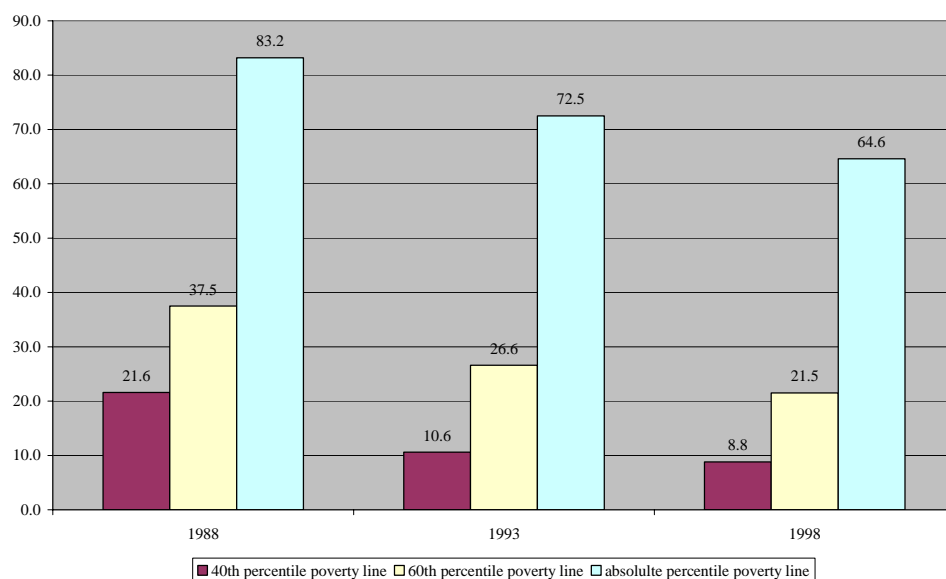


**Source:** UNDP 2004

In 1998 the US\$ 1 a day poverty gap index was estimated to be 17.3 per cent in Ghana. In all of Sub-Saharan Africa the poverty gap was 18.6 per cent in 1999. Poverty headcount index in Ghana was also lower with 39.5 per cent in 1998 compared to 45.7 per cent for SSA in 2003. The HDI reflects this picture of above average performance. The HDI of Ghana was 0.568 whereas the average in SSA was 0.465 in 2002.

For the asset based method the estimations of Burger et al. (2005) are reported here. They have estimated poverty headcount index using DHS data. Contrary to the usual approach using principal components analysis, they employed the multiple correspondence analysis to construct their asset index. Their results are in line with the results presented above, finding a steady decrease of poverty in Ghana (see Figure 3.3). The asset based index is a relative measure of poverty and cannot be compared to results obtained from other methods. The index constructed by Burger et al., however, allows us to conduct inter temporal analysis within particular countries and to compare poverty across countries.

Figure 3.3: Headcount poverty rates computed by the asset based method



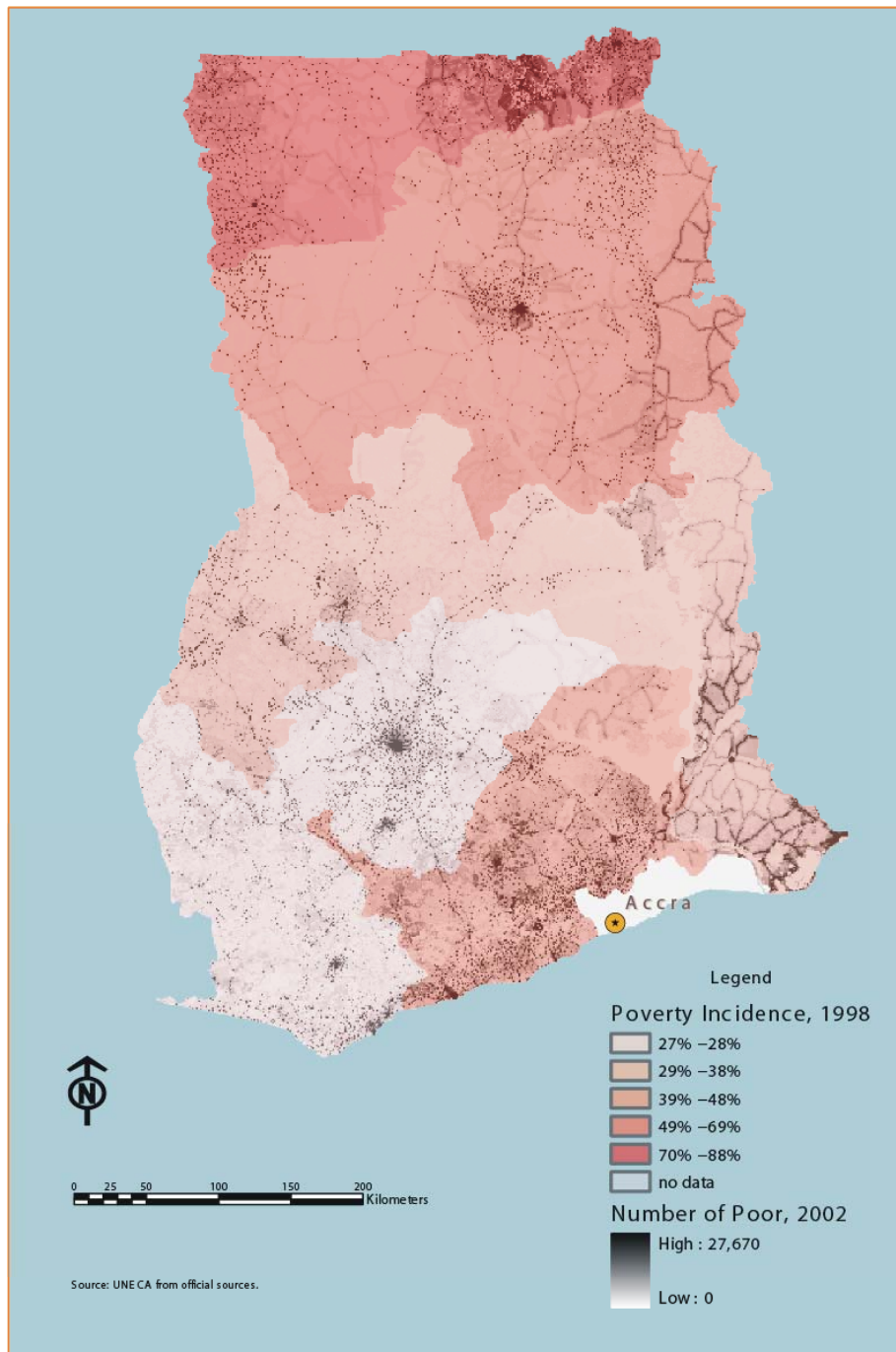
**Source:** Burger et al. 2005

Given the relative nature of the asset based index, there is not any direct correspondence to other poverty lines such as the US\$ 1 a day or national ones. The definitions used by Burger et al. (2005) are two relative ones and an absolute one. The relative definitions of the poverty line assume 40 and 60 percent of population over the whole sample of 7 Sub-Saharan African<sup>4</sup> counties as poor. The absolute poverty line defines a standard of minimum asset holdings that allows a decent living. Burger et al. (2005) considered the following set as minimal requirement: radio, bicycle, cement floor, public water and a pit latrine.

Maps depicting poverty incidence are a good way to capture the spatial dimension of poverty. Important for policy makers are on the one hand the headcount indices for different regions but as well where most poor live. The first is important to identify disadvantaged regions where poverty is high. The second is helpful in spotting the regions where interventions might be cost effective due to the strong concentration of poor. Maps can be used as an efficient tool for evaluating the impact of geographically targeted poverty alleviation measures. Their drawback is that their production is quite resource intensive (see also section 4).

<sup>4</sup> Those are: Ghana, Kenya, Mali, Senegal, Tanzania, Zambia, and Zimbabwe

## Ghana —Poverty Distribution



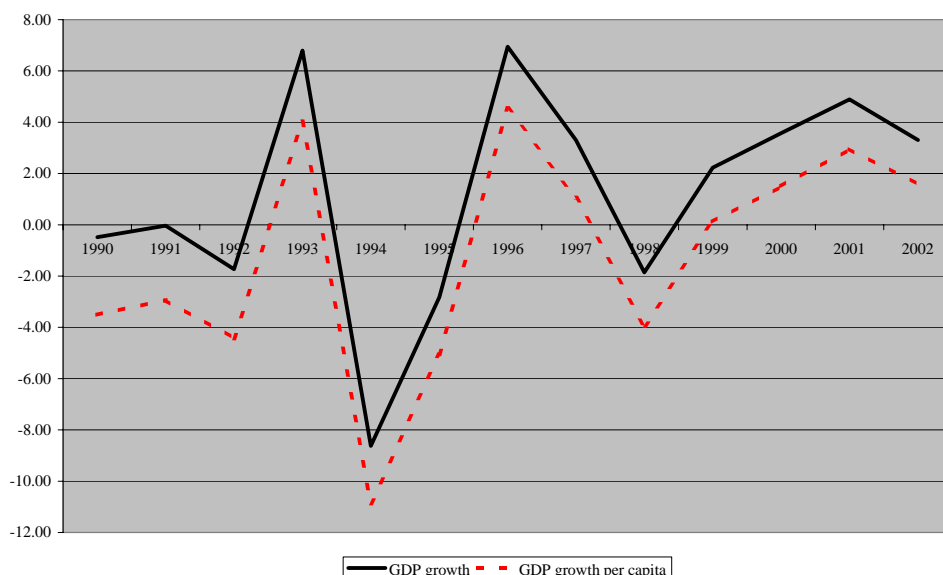
The map of Ghana shows a distinctive spatial pattern of poverty: the more remote a region is, the more probable it has a higher poverty incidence. But the map shows as well that the biggest number of poor people quite often live concentrated in small areas where poverty incidence is rather low. Poverty overall coincides with geographical remoteness, limited market access, low level of infrastructure, and other factors (for more examples see, also “Special Maps: Targeting and mapping poverty”). By using maps, such correlations are more easily apprehended and communicated to the larger public. Superposing poverty-maps with maps showing access to electricity, water, roads, education, and other dimensions of the capability approach is a possible

way to gain a more holistic image of poverty and deprivation. The paper “Poverty Maps: A useful tool for policy design to reduce poverty” gives an overlook of this topics and explores those correlations more extensively.

### 3.2 Zambia

After the deterioration of the economic situation in the early 1980s the government of Zambia sought assistance from the IMF. The structural reform programme – which included among other things the removal of producer subsidies for agricultural goods – however, led to political unrest. The government broke with the IMF but the economic situation did not improve. After power was handed over peacefully in 1991, the new government embraced a donor-advised structural adjustment programme. Public sector firms were privatised, exchange rate controls were eliminated, and a positive real interest rate was maintained. In recent years privatisation has slowed down as a high-profile anti-corruption campaign has commenced (EIU (2004b)).

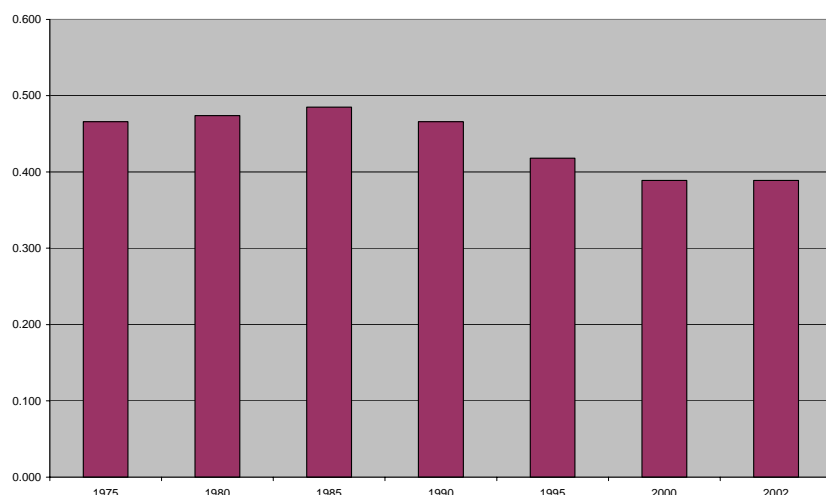
Figure 3.5: Real GDP and GDP per capita growth in Zambia, 1990 - 2002



**Source:** World Bank 2004

Growth during the 1990 was quite volatile. In more recent years it has become more stable albeit at a rather low level (see Figure 3.5). Poverty in 1996 was 69.2 per cent and increased to 72.9 per cent in 1998. During the same time period, real GDP expanded by 8.4 per cent and per capita real GDP by 1.5 per cent. However, over the period from 1990 to 1999 on average real GDP only grew at 0.4 per cent per annum and real per capita GDP contracted by 2.1 per cent per year. The low growth is reflected by the HDI (see Figure 3.6) where during all of the 1990s the index decreased only to stabilize in 2002. Between 1995 and 2000 the index declined by 6.9 per cent (Ghana’s HDI increased by 5.3 per cent over the same period). In 1998 the poverty gap was 32.7 per cent almost two times as high as in Ghana.

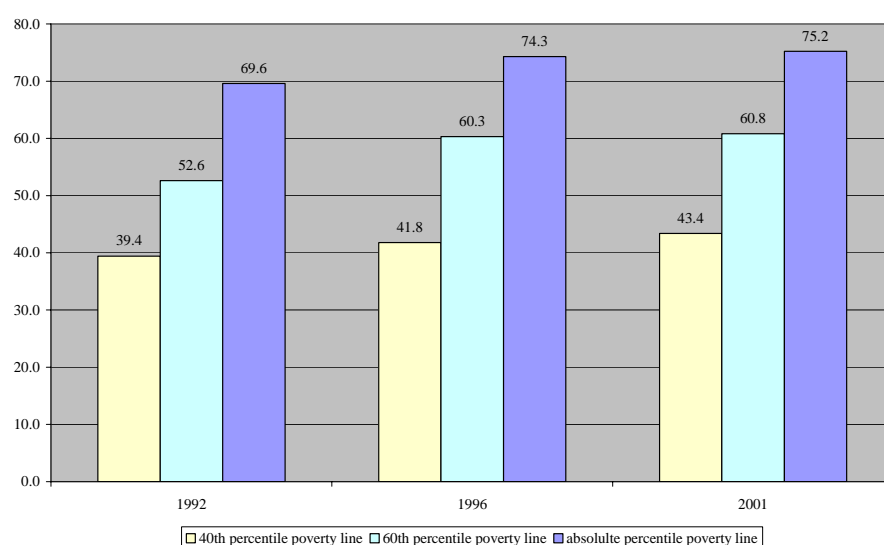
Figure 3.6: Human Development Index for Zambia



**Source:** UNDP 2004

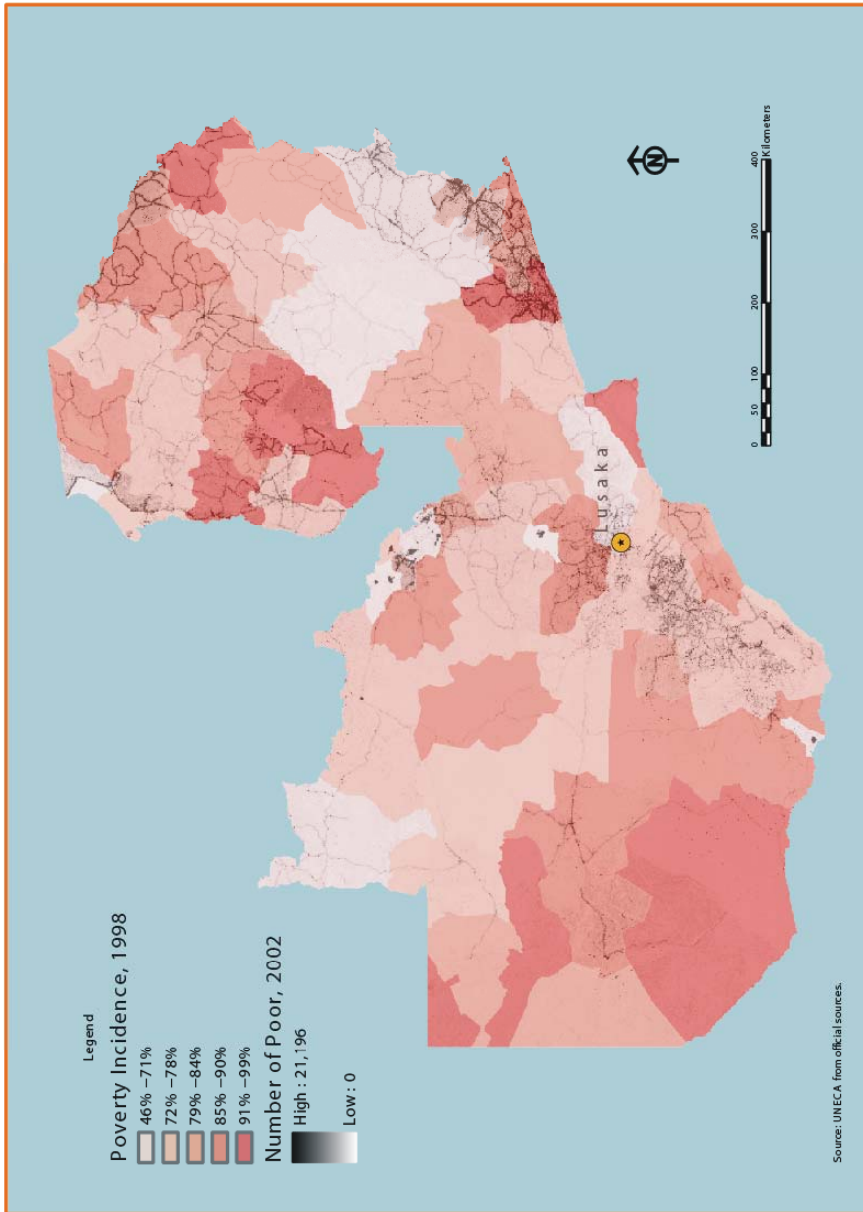
The asset based approach depicts a quite similar picture. Poverty rose over all three periods and poverty lines. The rise was more pronounced between 1992 and 1996. Between 1996 and 2001 the increase seemed to be weaker (see Figure 3.7).

Figure 3.7: Headcount poverty rates computed by the asset based method



**Source:** Burger et al. 2005

The examples of Ghana and Zambia are interesting in a couple of ways. Ghana saw its poverty reduced during the 1990s accompanied by sustained growth. On the other hand, Zambia saw poverty rise with volatile growth patterns. In 1998 - 1999 the headcount index of poverty is 84.6 per cent higher in Zambia than in Ghana, whereas the poverty gap is 89.0 per cent higher. The spatial distribution of poverty also shows interesting differences. Whereas in Ghana there is a quite clear pattern of increased poverty in the north, the pattern in Zambia is more complex. One of the reasons for the clearer patterns in Ghana is access to seaports. Zambia as a landlocked country is much more dependent on the political and economical situation in the countries surrounding it. With changes in the situation in transient countries, the transportation routes and cost may vary widely.



## Zambia —Distribution of Poverty

## 4. Conclusions and policy recommendations

The range of possible poverty measures is vast. Different methodological approaches have different advantages and drawbacks. There is no method that is preferable under all circumstances. Much depends on the purpose poverty measures are be used for. Policy-makers must carefully choose which measures and which indicators they use. Further, poverty reduction and reaching the MDGs should always stay faithful to its initial goal of improving the livelihoods of the most deprived. To strive for reducing poverty for those close to the US\$1 a day poverty line only in order to reach the MDGs, is forgetting the ultimate objective of the MDGs.

### Consumption or income based headcount indices of poverty

Headcount indices can give a first informative glance at the size of the problem for an area. However, to design poverty reduction measures just on the basis of this information is insufficient. A sparsely populated desert area might have the same poverty incidence as a densely populated urban area. But the construction of a road or a well might benefit far more (poor) people in the urban area than in the desert. Hence, the information about poverty incidence must be complemented by information about the population density. Only the combination of the two will make an effective targeting and spending policy possible.

### Asset based headcount indices of poverty

Consumption or income based headcount indices of poverty suffer from a number of problems as described above. They give valuable and timely information on the impact of a policy action or other changes in the structure of the economy. However, they are biased towards private consumption. A host of services consumed are not included in those measures. Access to education, health services, clean environment, and others are not reflected, especially when those services are provided for free by the public sector.

The non-monetary components of poverty, however, are likely to change in an environment of structural adjustment programmes and fiscal austerity. Asset based headcount indices might constitute a valuable complement reflecting a broader definition of well-being and poverty. Burger et al. (2005) found that much of the improvement in poverty in SSA in the 1990s was due to an increased asset ownership while public services deteriorated. Public services have a range of positive externalities well-known, and others that still are to be explored. For example, access to electricity reduces child mortality significantly. One possible explanation might be the access to cooling and more convenient cooking reduces the danger of adverse health effects of not properly stored and prepared food (Wang 2002).

Asset based measures of poverty provide a less volatile perspective on poverty. Shocks to the economy affect asset ownership less than current income. Permanent changes in the economic environment (positive or negative ones) take longer to be recorded by the asset based poverty measures. Because of these characteristics the asset based poverty indices rather reflect a general trend in welfare than short-term changes. The advantage of this is that singular shocks are not recorded and the measurement is somewhat more robust. On the other hand, permanent improvement or degradation of the situation of the poor is only recorded with a time lag.

## The poverty gap

Poverty gaps give a more informative picture about how deep poverty is than the headcount index. Poverty alleviation policies should ideally lift the income level of all poor people, lifting the richest of the poor out of poverty. The poverty gap index can serve as complementary information to the headcount index to monitor, albeit imperfectly, the impact of policies on the poor not lifted out of poverty.

Unfortunately, asset based poverty data cannot be used for the construction of poverty gap or severity of poverty indices. Its power to discern is not strong enough. Households are classified by the ownership of a limited number of assets, regrouping large numbers of households into the same group with an identical asset holding pattern. The poverty gap or severity of poverty indices of different regions or countries would lie too close together to have any informative value.

For an in-depth monitoring the severity of poverty index should be observed simultaneously. It allows for a more complete comprehension of income poverty synthesising who the poor are, how poor they are, and how unequal poverty is distributed among the poor. However, data requirements, computing, and interpretation become more complicated. It might be advisable to concentrate on the headcount index and the poverty gap index leaving aside the severity of poverty index when resources are limited.

## Maps

Poverty maps are a powerful tool to apprehend the spatial dimension of poverty. If they are used together with maps of infrastructure provision, market access, water basins, etc. they might point to possible interventions for poverty reduction. Their big advantage is that they are easily understood and communicated. Explaining and justifying policy action with the help of maps increases the understanding of the topic and acceptance by the general public at large and concerned stakeholders in particular.

The disadvantage of maps is that their production needs much data and know-how. They have to be frequently updated in order to be employable for policy design and evaluation. Poverty data should be reflected at an adequate geographical level. Too small units might exacerbate the cost of production of maps. Too big units on the other hand might mislead targeting as pockets of poverty might "hide" in relatively rich environments. If poverty maps are produced correctly and frequently, they are of great assistance to policy-makers and the general public.

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