

## Poverty and poverty measurement in Africa

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### Abstract

Africa is still the poorest continent in world. Poverty measurement is improving in the continent. Some sub-Saharan Africa (SSA) countries developed poverty reduction strategy papers through household surveys the last ten years. The surveys and analyses provide rich information to document the poverty reduction papers and allow undertaking deep studies on growth, financial crisis, shocks and its impacts on the household vulnerability, risk management and resilience. Household surveys in SSA are diversified and allow poverty measurement following different methodologies and approaches derived from international research and applications. The paper presents the amount of data available to analyze poverty trends in Africa and go ahead with specific applications and study on poverty measurement and analysis by the World Bank.

Keywords: Poverty measurement, surveys, consumption poverty line, poverty mapping

### 1. Introduction

Poverty analysis has taken increasing importance the past twenty years in the developing world, particularly in SSA. This evolution is led by the necessity for both governmental authorities, partners in development, donors and civil society to inform development agenda, poverty reduction policies and international commitments by reliable figures and indicators. Hence, to complete the poverty reduction strategy papers-lately called growth and poverty reduction strategy, in order to achieve among others the Millennium Development Goals (MDG), developing countries need to realize series of household surveys, including: budget and consumption, demographic and health surveys, labor force, education, food consumption, life standard surveys, etc.

The development of Information and Communication Technology, such as powerful computers, sophisticated statistical software and database management and archiving tools, added to key research key works by academia and international institutions such as "The World Bank Group" has also helped the need for policy maker and government to collect household data in order to better inform developments policies or measure their impact on the poor populations (cf. Ravallion, Chen, Sachs, Collier, Deaton, etc.). The World Bank elaborated the poverty profile in 1993, to set up an information and analysis system on income sources, consumption behaviors, economic activities and living conditions of poor people. The different data collection sources mentioned above, allow to complete the poverty profile and to help the conception of poverty alleviation socioeconomic policies. This paper presents data production and availability in SSA, poverty measurement approaches used and go further in the recent developments in poverty analysis by the World Bank.

### 2. Poverty data collection in SSA: series of increasing surveys, but still insufficient

The necessary datasets to achieve poverty analysis works can be classified as following:  
- Data of administrative sources, which are mainly produced by line ministries or independent organizations ; the data come mainly from the sectors of health, water and sanitation, agriculture, education, labor and social protection, environment, etc. In some of

the countries, which are well organized, the civil register is used to complete data collection for poverty measurement and analysis.

- Surveys on budget and consumption at the households level; they allow further information on households consumptions and expenditures as well as in some cases on their income. These surveys are huge, time consuming (one year at least), require complex sampling methodology and are expensive. They also need detailed information on prices, quantities, seasonal trends.

- The living standard measurement studies or LSMS surveys, elaborated thanks to the support of the World Bank progressively replace the budget consumption surveys. They are less complex and easier to implement.

- Derived from the LSMS, and developed jointly by the World Bank with UNDP and UNICEF the Core Welfare Indicators Questionnaire (CWIQ) is designed to monitor social indicators in Africa on an annual basis. The CWIQ is developed to show who is, and who is not, benefiting from actions designed to improve social and economic conditions. The CWIQ collects indicators of household well-being; and, indicators of access, usage and satisfaction with community and other basic services. The CWIQ is designed to complement rather than replace other surveys. It is implemented as an annual “core” questionnaire in what the social dimension of the structural adjustment is measured.

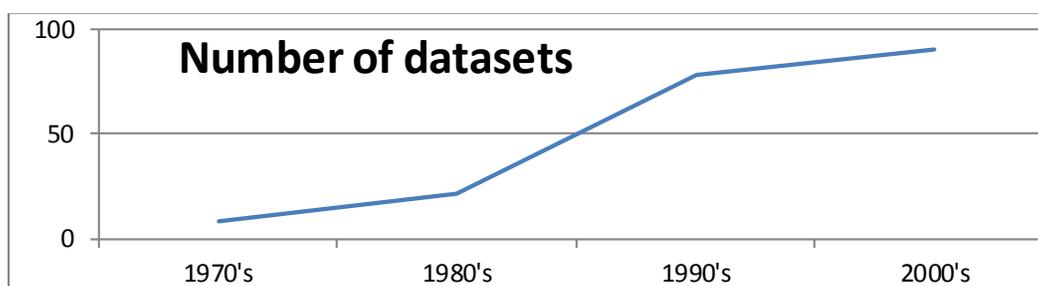
- Other data collection surveys based on the LSMS have been set up in developing countries. These surveys target smaller samples of households, and aim to get results faster by identifying the socio-economic trends in terms of economic activity, occupation, participation in the labor market, consumption spending, access to basic social facilities and services, etc. In addition, these surveys cover short period of observation, one month to six months. Data is collected in a single passage by successive rounds. For example, the so called 1.2.3 surveys have been developed in francophone sub-Saharan Africa’s countries from 1993 to 2005, and targeted households in the main urban area of these countries. Scheduled in three phases, they collected information on employment, informal sector and consumption. In addition to each main module was joined a specific qualitative module on governance, subjective poverty, democracy, etc.

Special survey systems are implemented in some countries. In Benin, the National Statistical Office developed a particular household data collection program called the “Integrated Modular Surveys on Household Living Standards” (EMICoV). This a very huge and expensive survey covering all the country, representative at the lowest administrative level, constructed on the LSMS models, and requiring four passages (quarterly survey) in one year. The basic module is on household consumption and expenditures. This module is administrated at each passage and is coupled with specific module such as employment, land access, water and sanitation, governance and democracy, access and use of information and communication Technologies. At the end of the one year period, the EMICoV allows to build a comprehensive poverty profile (monetary and non-monetary, including subjective and living conditions poverty). Another basic survey is scheduled 5 years later to up-date the poverty profile. Meanwhile, between the two main surveys, each year, one survey is realized in only one passage. The EMICoV follows since 2006 the same panel of 18-20 thousands households, and allows to prepare the government’s strategy for growth and poverty reduction, among others. But unfortunately, the panel was renewed in 2011, due to considerations regarding the use of a same panel with the demographic and Health Survey (DHS).

In the countries, data are also available, but not on a regular basis, on several other household living conditions such as the DHS, The international household survey initiative the Multiple Indicator Cluster Surveys (MICS), the population and housing censuses, and the latter’s help to empower analysis of poverty profiles, and provide with appropriate methodology in-depth data at the lowest administrative levels.

Although the availability of these data bases in SSA, there are several key issues for poverty analysis. The first one is quality of data. In several countries, due to lack of human resources and financial means, the quality of data and the level of precision are weak, and lead to a bias in the outcomes. These same reasons explain the low number of data in SSA, compared to other developing countries. For example, it has been identified only 1.7 LSMS in the SSA against 5.6 in the Latin America Countries. The difficulties to have access to data in several countries are other issues. This implies a huge limitation in the possible studies and analysis, and a bottleneck in the assessment of data and also in the improvement of the statistical systems.

Nonetheless, in the francophone countries of the Economic and Statistical Observatory of Sub-Saharan Africa (AFRISTAT), there are some efforts to produce regular data, through a harmonized minimum common statistical program (PROSMIC), and with the support of international partners. In these countries, almost 200 surveys/censuses have been realized through a period of 30 years, let 10 datasets by country in average.



Source: form author's estimation

## 2. Poverty measurement in Africa

The welfare indicator used in poverty analysis in SSA is the per capita expenditure. This latter is preferred to household revenue or income because it is more reliable. In fact, not only consumption is naturally linked to people's wellbeing, it tends to be more stable over time than income. In addition, consumption is more easily measurable than income (informal sector's income is volatile, and declarations are less accurate) and it can summarize the household's ability to meet basic needs.

Most of the different categories of consumptions require specific treatment before aggregation. They include durable goods, imputed rents, cash transfers, food consumption, spending in holidays and ceremonies, health care, education and other special expenditures.

For instance, there are three treatment approaches on durable goods. The first one, based on the concept of acquisition, ignore the problem of the distribution of the initial cost of the durable good on its useful life and charge the entire cost to the period of purchase. The second retain the concept of equivalent rent that is charged to the durable good. That is the case of the rent rate applied to those who live in their own houses. The third considers a concept of user cost that reflects the estimated usage of services provided by the property during the period cost. In practice some countries consider the depreciation cost of the good. This concept refers to all expenditures of current consumption by households, in terms of their value in use. Therefore is retained as net consumption of durable goods in the reference period (usually year).

Self-consumption and other categories of consumptions are also treated accordingly to the countries choices. The total consumption is therefore calculated and the per capita expenditure is derived by divided the total consumption of the household size. Several research works provide scales of equivalence to take into account the structure of the household composition in terms of gender, age and size.

Finally the poverty line is calculated, and the poor are those whose per capita expenditure stays under this line. The countries use two types of poverty lines: the absolute line and the relative line. The majority of SSA countries use the absolute poverty threshold by considering the cost of basic needs; the nutritional energy; or the one dollar a day method (for his latter, the World Bank propose nowadays 1.25 dollars in Purchased Parity Power, which represents the extreme poverty line as well as the food poverty line). Those who use relative poverty line consider a share of the average annual household expenditure, the median for instance. Several poverty indicators have been proposed by the literature, but the Foster, Greer and Thorbecke (FGT) family is the most used.

$$FGT_{\alpha}(x,z) = \frac{1}{N} \sum_{i=1}^N \left( \frac{z-x_i}{z} \right)^{\alpha} = \frac{1}{N} \sum_{i=1}^N (g_i)^{\alpha}, (\alpha \geq 0)$$

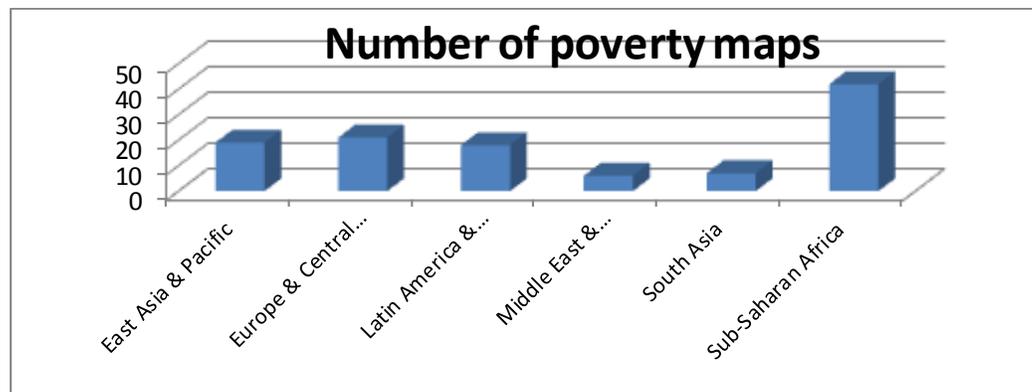
Analysis generally focuses only on three values of  $\alpha$ : 0, 1 and 2.

- When  $\alpha = 0$ ,  $FGT_0 = P_0$ : is the Headcount ratio or the proportion of people living below the poverty line,  $p$  is the number of poor.
- When  $\alpha = 1$ ,  $FGT_1 = P_1$ , is the Per capita Poverty Gap/ Depth
- When  $\alpha = 2$ ,  $FGT_2 = P_2$ , is the Per capita Squared Poverty Gap/Severity

### 3. Recent development in poverty research at the World Bank: Poverty mapping

The poverty mapping exercise is based on the standard methodology of Small Area Estimation (SAE) developed by Elbers, Lanjouw and Lajouw (2000; 2003), henceforth called ELL. The basic idea of ELL is to use detailed survey data to project welfare indicators into census records. The motivation for achieving this goal is to generate these at geographical levels not allowed by household surveys and not available in census data. The stages suggested by ELL (2003) are: Comparability between census and survey variables; Modelling of the welfare indicator of interest using the survey; and c) Computation of welfare indicators on census records (head count ratio, inequality, among others) based on parameters derived from the survey.

Once comparable variables between census and survey are identified, ELL models the welfare indicator using the survey. The coefficients of the estimations are used in the census to produce the poverty maps at lower geographic levels. Since 2003, 113 poverty maps are produced by the World Bank or are under production, including 37.2% in SSA.



Source: Author's graph from World Bank Poverty team data

### 4. What can it take to drop poverty rate to 3% by 2030

The new President of The World Bank Group decides to set up in 2013 an objective of poverty reduction to 3% by 2030. West Africa poverty economists simulate this goal with the poverty elasticity to per capita growth concept. The poverty elasticity is defined as the percentage of poverty reduction following 1% increase of population average income

when the poverty line remains constant. Indeed, this definition excludes an economic growth which generates poverty. Two approaches are used concerning the elasticity concept: the econometric regression (Ravallion, 2001) and the arithmetic approach (Heltberg 2002 and Bourguignon 2002).

The team works on the relation between poverty and economic growth for 13 SSA countries. The approach is based on a simple elasticity concept. It does not have to do neither with the econometric regression nor with the arithmetic approach mentioned above. It doesn't integrate inequality and development level effects, but considers international poverty line with \$ US 1.25 (in 2005 constant Purchased power parity). Hence, the poverty elasticity is calculated by the ratio between the variation of poverty incidence in percentage and the variation of GDP per capita at constant price in percentage (\$US of 2000).

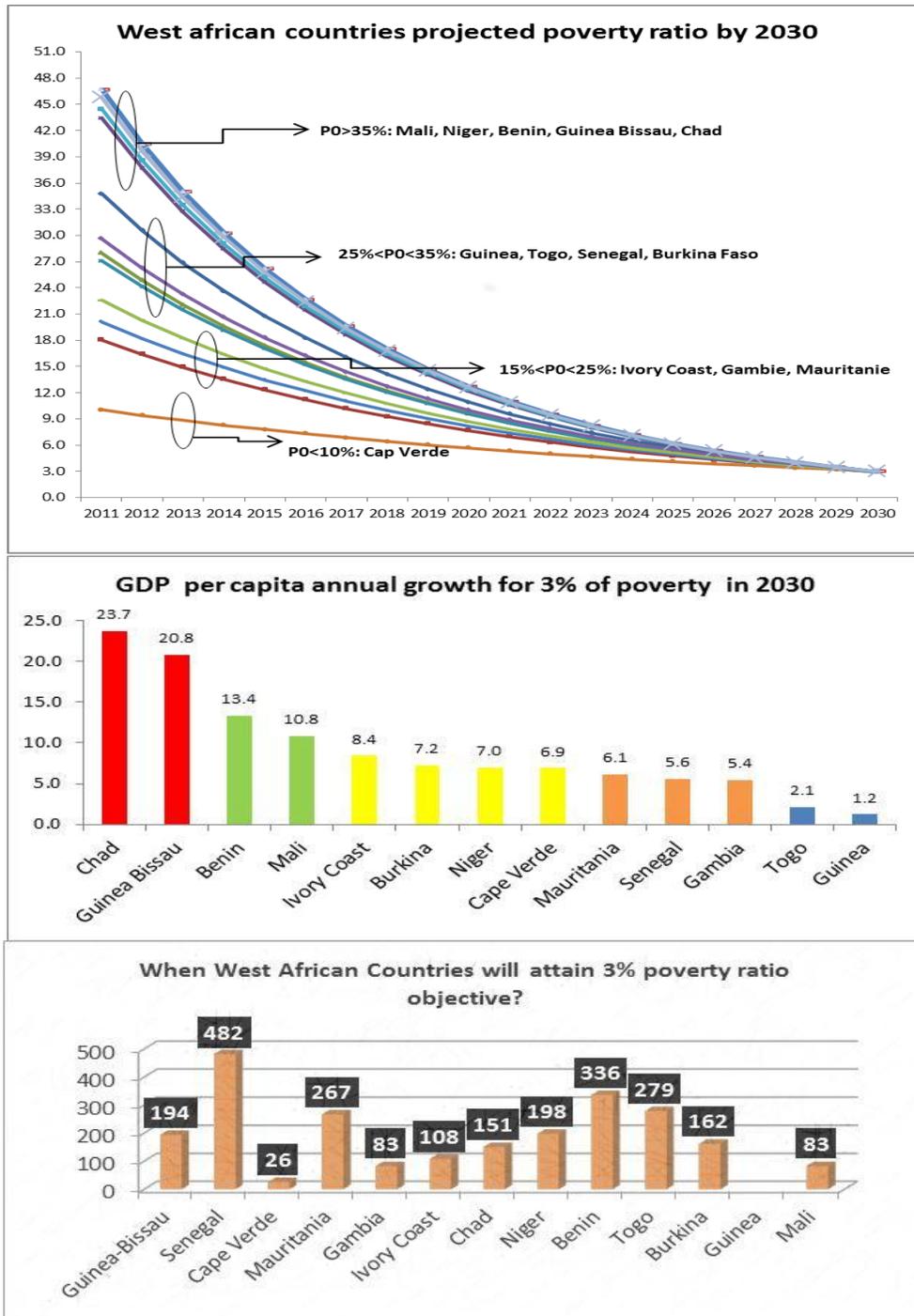
Three elements are required to calculate the annual economic growth necessary to reach 3% poverty rate in 2030: reference year from which projections are done, constant elasticity and annual poverty headcount ratio reduction. For all the countries, the 2011 year is the reference year since the most updated data on GDP are available for this year. Before the projection between 2011 and 2030, the team estimates the 2011 poverty incidence for each country by combining the GDP per capita growth with the constant elasticity (countries like Senegal, don't require this estimation because the 2011 survey has already produced the poverty number). Without this adjustment, the projections results may be inconsistent. Then, the annual poverty headcount ratio reduction between 2011 and 2030 is derived. Finally, the division of the annual poverty ratio reduction by the elasticity provides the constant annual GDP per capita growth. The constant annual GDP growth is obtained by adding the annual population growth. Most of the data are collected from the World Bank website <http://ddp.worldbank.org/ddp>. They are completed by datasets from national statistical offices website (national poverty incidence).

This exercise put in on the table the distressing issue of the coherence between macro and micro data in developing countries. In fact, some countries obtain mistrusted results. For example, it seems unrealistic for the Gambia to reduce its poverty incidence of about the half in only 5 years (from 66% in 2007 to 34% in 2012). While Guinea Bissau sees an augmentation of poverty its annual GDP per capita growth is positive (Is it a kind of immiserizing growth?). With the international poverty line, the elasticity of Senegal of -2 seems high compared to the economic performance during the (2005-2011) period. Togo and Guinea get very high elasticity equal respectively to -5.3 and -9.1.

The future episode of economic growth that is necessary to achieve the 3% objective in 2030 varies from one country to another. It depends on the elasticity, the level of poverty at the reference period (year 2011) and especially the poverty line. In consequence, the comparison between countries becomes difficult. This corresponds to Fields and Ravallion's conclusion that suggests to "take into account each country's diversity and specificity, and to focus on individual experiences in the analysis" (DIAL. 2003).

The table below shows that one more generation of 25 years from 2030 is required for Cape Verde to attain the 3 % objective with actual real GDP per capita growth. The situation is more complicated for the Guinea Bissau, Mauritania and Senegal which respectively need 2, 2.5 and 5 centuries.

However, the figure below offers an interesting classification of these countries according to their long journey to meet the 3% poverty rate objective in 2030: i. the very high poverty incidence group (Mali, Niger, Benin, Guinea Bissau, Chad); ii. the high poverty incidence group (Guinea, Togo, Senegal, Burkina Faso); iii. the medium poverty incidence group (Ivory Coast, Gambia, Mauritania); iv. And the low poverty incidence group (Cape Verde).



Source: World Bank AFTP4/PREM poverty economist team.

### 5. Conclusion

With available data, poverty researchers are able to produce a huge quantity of instruments and figure to help policy maker to best design and implement poverty reduction frameworks. The simulation on the WBG new goal to reduce poverty to 3% by 2030 is inspiring in west SSA. These countries have to change radically the cap if not extreme poverty fighting will continue to be an obsession during the five coming centuries.