

# **Analysis of poverty in Mozambique\***

Household poverty status, child malnutrition and other indicators 1997, 2003, 2009

by

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\* This is the second part of the desk review “Analysis of Poverty in Mozambique” a study for the group of bilateral donors (G19) conducted through an agreement with the Royal Dutch Embassy in Maputo. The terms of reference and the first part of the study are attached as Annex 3. The latter consisted of a quick assessment of the report “Poverty and Wellbeing in Mozambique: Third National Poverty Assessment” (MPD-DNEAP, 2010). This second part has the objective to provide an in-depth analysis of poverty pattern since 1997 based primarily on three large-scale household surveys that also form the backbone of the MPD-DNEAP report.

## **Acknowledgement**

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## Abstract

Three consecutive “National Poverty Assessments” for Mozambique have provided a wealth of information on the poverty patterns and the changes therein in the recent period 1997 to 2009. This report reviews the evidence, noting a marked incongruence of the poverty patterns over time as well as over the various population groups and provinces. For example, the assessments found that the poverty headcount has sharply declined in the period from 69% in 1997 to 54% in 2003 but remained practically the same in the recent period from 2003 to 2009 (from 54.1% to 54.7%). Yet, the economy showed sustained high growth rates and there is little evidence that the income distribution has changed dramatically. Also the position of Maputo appeared extraordinary in the sense that poverty in Maputo City was found to be about as high as in various other parts of the country and that Maputo Province ranked among the poorest provinces, while, more generally, the rural-urban dimension appeared far less manifest as one might expect. Moreover, the liaison between the household poverty status on the one hand –in terms of consumption deficiency– and the presence of malnourished children and the lack of assets on the other appeared rather weak. The report probes into the household poverty status and argues that the unexpected patterns can partly be attributed to the choice of a poverty line from a spectrum of theoretically admissible ones. Comparison of the dynamically adjusted context-specific poverty lines used in the assessments with a single national poverty line –a commonly used benchmark– shows that the latter leads to results that are more in line with expectations. The new estimates indicate a poverty reduction from 70% in 1997 to 61% in 2003 and a subsequent improvement at a lower pace to 57% in 2009; the poverty headcount is relatively low in Maputo, more consistent at the provincial level, a great deal higher in rural area and more in line with other dimensions of poverty.



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## 1 Introduction

In its recent history, Mozambique has been in a continual struggle for development. Soon after the country gained independence in 1975, a civil strife unfolded and led to a civil war that lasted for more than 15 years. It ended with the cease fire in 1992 and a subsequent transition to multi-party democracy in 1994.

Predictably, Mozambique's development path has been paved with true challenges, including the intricacies involved in post-conflict recovery, peace building and shared governance. Another major challenge of equal extent concerns the exceptionally low living standard of the majority of the population. The prevalence of poverty is high throughout the country, notably the inadequacy of consumption and of health and nutritional conditions. In addition, households are vulnerable to various risks, notably the risk that is associated with major floods of the Zambezi River destroying harvests, houses and infrastructures and the risk caused by the epidemic surge of HIV/AIDS which levies a high toll in terms of prime-age deaths and children orphaned.

Indeed, today still Mozambique is considered as one of the poorest and least developed countries. This is reflected by the fact that Mozambique is situated at the very bottom tail in the various lists of countries ranked by level of development. For example, Mozambique is number 197 out of 210 in the country ranking by per capita income level (World Bank, 2010). Likewise, in a World Bank list of countries that were ranked in terms of per capita wealth, Mozambique occupies the 139<sup>th</sup> position out of a total of 152, while its rank is 177 out of 195 in the United Nations list of countries by increasing under-five child mortality rate (UN, 2010). By the same token, in the list of African countries ranked by their Human Development Index, only Burundi, Niger, Congo and Zimbabwe have an even lower index.

The present study provides an analysis of the current poverty patterns in Mozambique. The point of departure will be the three consecutive large-scale household surveys which provide a wealth of information on the poverty patterns and the changes therein in the recent history (INE, 1998, 2004, 2010). Based on these very surveys, three "National Poverty Assessments" have confirmed that, though important improvements have been made, poverty is still widespread in the country (MPF/UEM/IFPRI, 1998; MPF/IFPRI/PU, 2004; MPD-DNEAP, 2010). The picture that emerges from these poverty assessments is however not univocal and in a sense unexpected. In particular, when looking at the main poverty measure –deficiency of per capita consumption– it appears that the national poverty dynamics and the rural-urban and provincial dimension of poverty are somewhat at odds with intuition, while the evidence further suggests that the

relationship between the poverty status of the household on the one hand and other commonly used living standard indicators on the other leaves much to be desired.

To address these issues and explore its implications, the report proceeds as follows. After summarizing the findings in the national poverty assessments and underscoring the picture that emerges from them (Section 2), we take a closer look at the reasons that might explain the relevant incongruence of the poverty patterns over time as well as over the various population groups, provinces and urban-rural localities (Section 3). Specifically, this section contains a brief review of the methodology to identify and compute poverty lines (Ravallion, 2010a). Following the practice in Mozambique, the focus will be on the Cost-of-Basic-Needs approach and on the assumptions about the group of households over which a certain empirically estimated cost applies. It may already be mentioned that the national poverty assessments use local prices (household unit values) and local and dynamic consumption patterns (“adjusted flexible bundles”), which brings about many context-specific poverty lines<sup>1</sup> (Tarp et al., 2002; Arndt and Simler, 2010). The resulting assessment is unique in Africa in the sense that the poverty line has an unusual specificity. Indeed, from a theoretical angle, context-specific poverty lines may help to determine the poverty status of households more accurately. For example supposing that a household in a high-cost economic environment (city) is at the edge of poverty at a certain expenditure level, a similar household at the same expenditure level can be non-poor in a low-cost environment (village). At the same time, specificity of poverty lines may also come at a cost, namely a certain loss of consistency and robustness. For example, it may happen that the available data grossly overestimate the urban-rural gap in the cost of living and in the living standard, which may lead to a situation that many households in the village are mistakenly classified as non-poor and many households in the city as poor. As shown by Ravallion and Bidani (1994) for the case of Indonesia, this can lead to a complete reversal of the urban-rural dimension of poverty.

In view of the unexpected poverty patterns (Section 2) and the possibility that the results are sensitive to the specificities of the poverty line and to relevant data limitations (Section 3), the significance of this sensitivity is investigated in Section 4. This is done by making a comparison between the poverty patterns resulting from the “adjusted flexible bundles” and patterns that

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<sup>1</sup> The first poverty assessment employs 13 different poverty lines, based on local prices and local consumption patterns observed in the IAF 1996/97 survey (Niassa and Cabo Delgado, rural&urban; Nampula, rural&urban; Sofala and Zambesia, rural&urban; Manica and Tete, rural&urban; Gaza and Inhambane, rural&urban, Maputo Province, rural&urban; Maputo City). For the second assessment, each of these lines is adjusted in accordance to the changes of local prices and local consumption patterns observed in the subsequent IAF 2002/03 survey, while the third assessment employs another set of 13 poverty lines estimated using the IOF 2008/09 survey.

emerge when using an approach at the other side of the specificity-spectrum. The latter is an approach common in many countries (Asra and Santos-Francisco 2001; Ravallion, 2010b) and will be referred to as the “fixed price fixed bundle” approach. It identifies one single national poverty line for each survey year, computed as the cost of a single bundle of basic needs evaluated at a single set of prices that prevailed in the particular year. The results of this robustness test are striking; using the “fixed price fixed bundle” approach to estimate poverty lines, the national poverty dynamics and its urban-rural and provincial disparities appear more in line with expectations, while the relationship between the household poverty status and other welfare indicators in the surveys appears much tighter. This higher distinctive power of the national poverty line is corroborated by evidence from other data sources.

Section 5 discusses these empirical findings in the light of the literature and the ongoing debate on poverty reduction strategies in Mozambique. It will be argued that certain caveats apply to the current practice of using various context-specific poverty lines rather than a single national one. The findings in this report suggest that, unless specific poverty lines are tested against more aggregated lines, the cure (i.e. adding specificities to the cost of living for groups of households) might be worse than the disease (i.e. applying the same cost of living for households whose actual cost of living are different). Markedly, in the case of Mozambique, the urban bias of the context-specific poverty lines could well lead to a gross overestimation of poverty in Maputo and a gross underestimation of the rural-urban gap (see also Maia and Van den Berg, 2010).

The final section, Section 6, concludes. It looks briefly into policy implications and into the research agenda that may strengthen the analysis of poverty in Mozambique. As the literature and the experience in many countries has shown, an in-depth analysis of poverty patterns and an understanding of the multi-dimensional complexity of poverty profiles can be of great help to monitor, target and decentralize poverty reduction efforts by the government and the donor community, to evaluate the effects that economic shocks and interventions have on the poorest, and, finally, to inform the public about the progress that has been made in the various poverty dimensions.

## 2 Poverty patterns emerging from the 3 national poverty assessments

### 2.1 *Wealth of information in consecutive household surveys*

Three consecutive “National Poverty Assessments” for Mozambique have provided a wealth of information on the poverty patterns and the changes therein in the recent history. The assessments employ as their primary data source the rich data from three large-scale household surveys –conducted in 1996/97, in 2002/03 and in 2008/09– and confirm that, though important improvements have been made, poverty is still widespread in the country.

The data encase a wide array of poverty indicators for some eight to ten thousand households throughout Mozambique and, because of the sampling frame and the inclusion of population weights taken from the Population Census (INE, 2010a), the figures can be scaled-up to figures that are representative at the national and at the provincial level<sup>2</sup>. The poverty indicators that are captured include the details of households’ consumption patterns – food purchases, home produced food and non-food expenditures– as well as of the characteristics of their housing, the education, the health and the employment of their members, and, last but not least, the height and the weight of children under five years of age (see INE, 1998a, 2004, 2010b for a detailed description of the surveys).

Because the consecutive surveys form the most comprehensive source of data on recent poverty patterns in Mozambique, this study will focus on this source, also considering the fact that this is the principal data source considered in the three national poverty assessments. Likewise, we follow the current practice in Mozambique to take a multi-dimensional perspective and try to test the validity of the poverty picture that emerges from the primary data source. For that purpose we will also briefly turn to other sources such as the Demographic-and-Health-Survey and the Multiple-Indicator-Cluster-Survey and the National-Child-Mortality-Study on the condition of mothers and children (INE, 1998b, 2004b; INE/UNICEF, 2009; INE/MdS 2010b).

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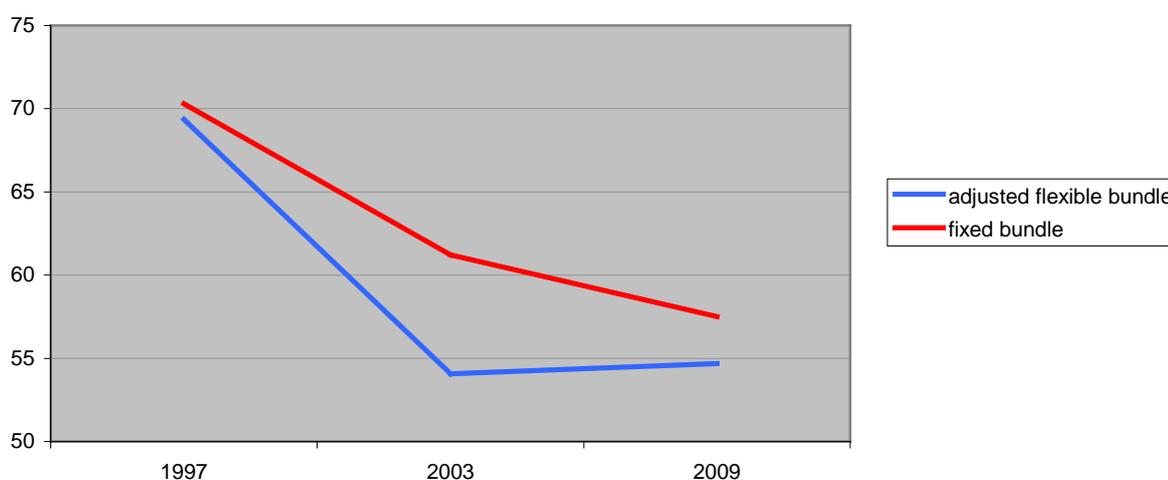
<sup>2</sup> The samples of the three surveys are large and geographically very well balanced (respectively some 42,700, 44,100 and 51,100 individuals in about 8,250, 8,700 and 10,800 households throughout the country). Only 1 out of 146 districts is missing in the 2009 sample, only 2 in 2003 and 18 in 1997. At the level of the 11 provinces, the population is decently represented in each sample, while sampling weight from the census have been applied to obtain results that are representative for the population at large. See Table A2.1 of Annex 2, which contains the tabulations of the data that underlie the figures presented in the main text.

## 2.2 Poverty dynamics and its urban-rural dimension

As a starting point let us summarize the main findings in three national poverty assessments. As already mentioned, the poverty patterns that emerge are in a sense unexpected. In particular, when looking at the main poverty measure – which is the deficiency of household consumption measured in terms of per capita consumption below a certain poverty line – it appears that certain findings are at odds with intuition, while other findings indicate that the relationship between the poverty status of the household and commonly used living standards indicators such as child nutritional status, ownership of assets and the food share in total consumption leaves much to be desired.

To illustrate this, consider one counterintuitive result concerning the evolution of poverty during the two six-year periods between two consecutive surveys.

**Figure1: Evolution of poverty in Mozambique, 1996/97, 2002/03 and 2008/09 (headcount, % of total population)**



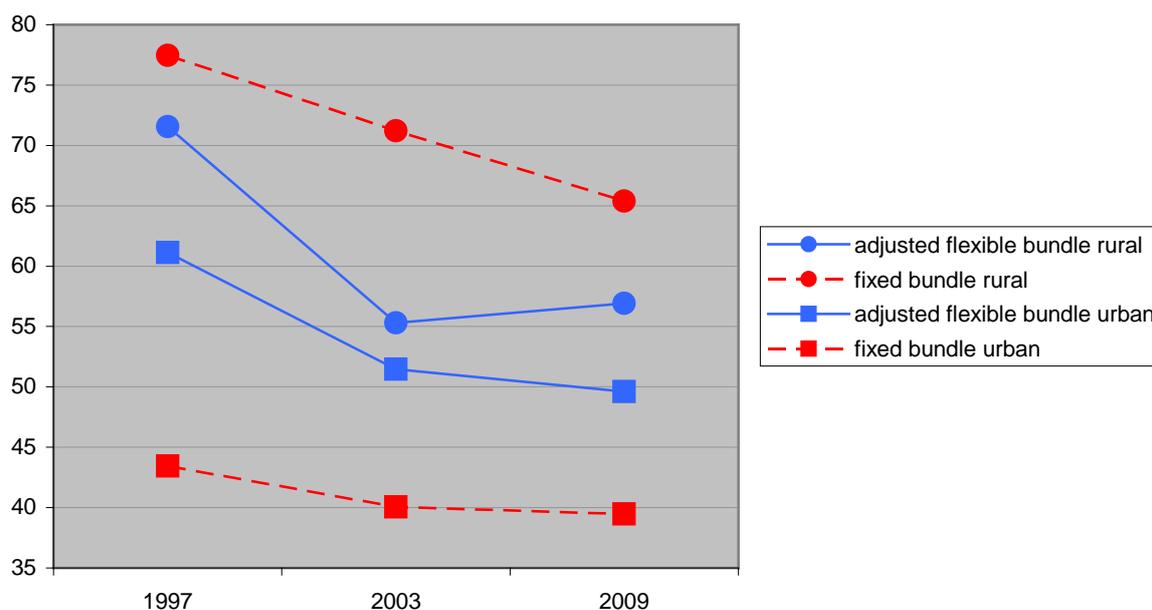
As indicated in Figure 1 by the blue line –the red line will be discussed in the Section 4 and can be overlooked at this point<sup>3</sup>– it was found that the prevalence of poverty in Mozambique declined sharply in the first period from 1997 to 2003 (from 69% to 54%), but remained practically the same in the recent period from 2003 to 2009, with even a slight increase (from 54.1% to 54.7%). Yet, over the past decade the economy showed a sustained annual economic growth as high as

<sup>3</sup> The blue lines and the blue bars in this figure and in all subsequent figures illustrate the results that accord to the poverty headcounts in the three national poverty assessments. The red lines and red bars in the same figures illustrate the results after replacing context-specific poverty lines by a national poverty line, see Section 3. The comparison between the two is postponed to Section 4.

8% (UNDP, 2009), while, in spite of a moderate increase of inequality, there is little evidence that the income distribution has changed dramatically (James et al., 2005).

The rural-urban dimension is another case where results seem out of the ordinary, see Figure 2 and again, consider the blue lines only.

**Figure2: Evolution of rural and urban poverty (headcount, % of total population)**



It was found that the incidence of poverty in rural Mozambique is not greatly higher in comparison to urban area, whereas in sub-Saharan African countries rural poverty is usually about two or three times higher. For example, in Ghana rural poverty is 39% as compared to 11% in urban area, in Uganda 34% compared to 14% and in Kenya 50% compared to 32%, see World Bank (2011). As can be seen from the figure, for Mozambique, the recent assessment classified some 50% of the urban population as poor as compared to 57% of the rural population, while in 2003 this difference is even smaller: 52% poverty in urban area and 55% in rural area. Moreover, the poverty reduction in the first period progressed at a slightly lower pace in the urban area (urban poverty from 61% to 51%; rural poverty from 72% to 55% in rural), while it continued to decline in the second period, albeit at a very low velocity (from 51.5% to 49.6%). The decrease of rural poverty in the first period is even more extraordinary, but, contrary to urban poverty, rural poverty was found to increase somewhat in the second period (from 55% to 57%).

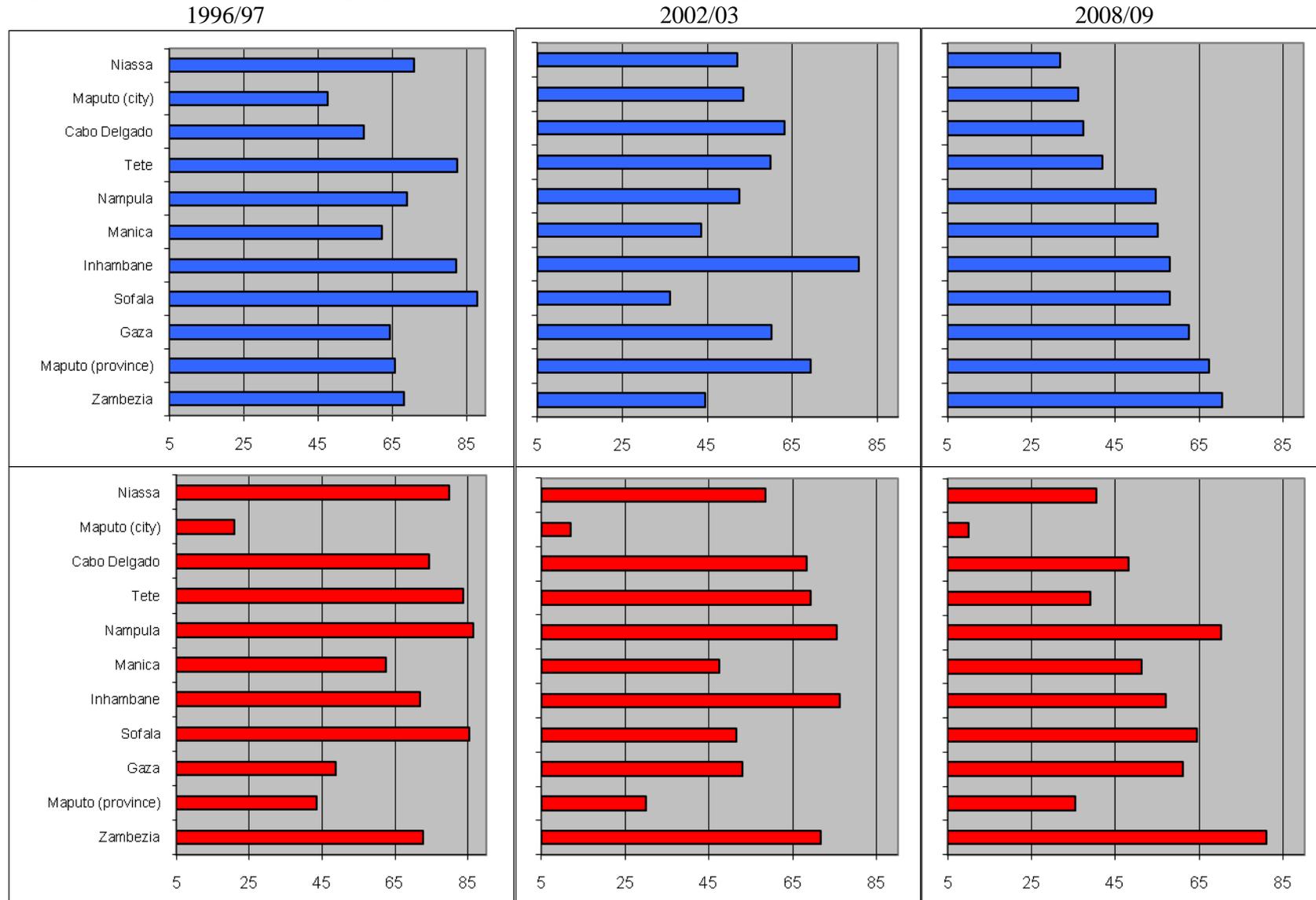
### 2.3 *Poverty incidence by province*

As shown in the three upper panels of Figure 3, the differences by province are equally surprising (bars in blue; recall that the red bars in the lower panels will be discussed in Section 4 and can be overlooked for now). In the recent survey, the poverty incidence is lowest in Niassa, Maputo City and Cabo Delgado (at 32, 36 and 37%, respectively), followed by Tete (42%) and Nampula (55%). The position of Maputo is notable in the sense that poverty is almost as high as in various other parts of the country. In other African countries, the relative position of the capital is consistently at the top.

Moreover, the comparison of provincial poverty figures and poverty rankings over time shows an unusual pattern, especially because the three samples have been designed to be representative at the provincial level. Over the two consecutive six-years periods 1997 to 2003 and 2003 to 2009, some provinces saw swings in poverty head counts of more than 20 per cent points up and down with a continuous re-ranking of provinces over the three surveys. For example, whereas Sofala appeared the poorest province in 1997 (poverty head count 88%) it became the least poor province in 2003 (36%) and was averagely poor in 2009 (58%). Another example is Niassa, where the figures show a remarkable success from a ranking among the poorest provinces in 1997 (71%) to a middle position in 2003 (52%) and a top position in the most recent 2009 survey (32%). Another salient figure concerns the impoverishment of Maputo City between 1997 and 2003 (from 47% to 54%) during a period in which poverty decreased significantly in all other provinces except Cabo Delgado.

In other African countries, the position of the capital and the ranking of provinces in terms of poverty incidence are usually much more robust. Even if provincial-specific external factors such as droughts, cyclones, crop diseases and price shocks are taken into account it would seem an intricate matter to explain the amplitudes of the provincial poverty rates in Mozambique.

**Figure 3: Evolution of poverty per province (headcount, % of total population)**



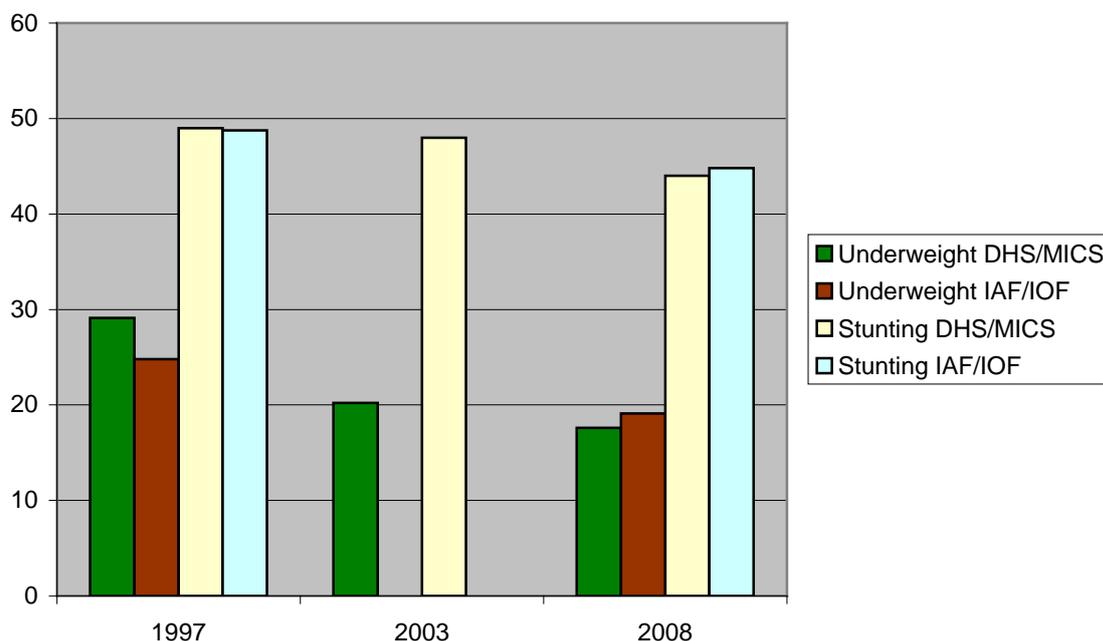
#### 2.4 *Nutritional status of children under five years of age*

The picture that emerges from the three poverty assessments is also remarkable when the (consumption) poverty figures are compared to other (non-monetary) MDG poverty indicators for which data have been collected in the consecutive survey rounds and in other surveys covering the same period. It appears that the poverty status of households is only weakly correlated with other indicators.

In this regard the nutritional status of children under five years of age is often used as an important monitor for the success of poverty reduction efforts. From the data on age, height and weight, we computed the usual measure for stunting, underweight and wasting using standard growth curves (WHO, 2007). Figure 4 shows the recent evolution of stunting and underweight. The figure shows the results from the child anthropometry collected as part of the 1997 and 2009 budget surveys (INE, 1998a; INE 2010a), while additional information is taken from the Demographic-and-Health-Survey and the Multiple-Indicator-Cluster-Survey (INE, 1998b, 2004b; INE/UNICEF, 2009). These latter three surveys are especially interesting for an evaluation of the nutritional status of children and poverty patterns in Mozambique, because the time frame more or less coincides with the budget surveys. Hence, we can put side by side the figures from the DHS1997 and the MICS2008 with those in the IAF1997 and IOF2009 figures, and, more interestingly, we can use the DHS2003 to see how the nutritional status of the children under five years of age evolved in between 1997 and 2008.

As the yellow and light blue bars indicate, some 45% of the under-fives are stunted in 2009 (i.e. have a height-for-age that is too low), an improvement as compared to 49% in 1997. These stunting rates are among the highest in the world. The figures for children with an impeded weight-for-age (underweight) show a more notable improvement from 25% in 1997 to 19% in 2009 (brown bars). The corresponding DHS/MICS figures are very close to these figures and the differences can be attributed to the differences in the time frame of the surveys (see Figure 3-12 in MPD-DNEAP, 2010).

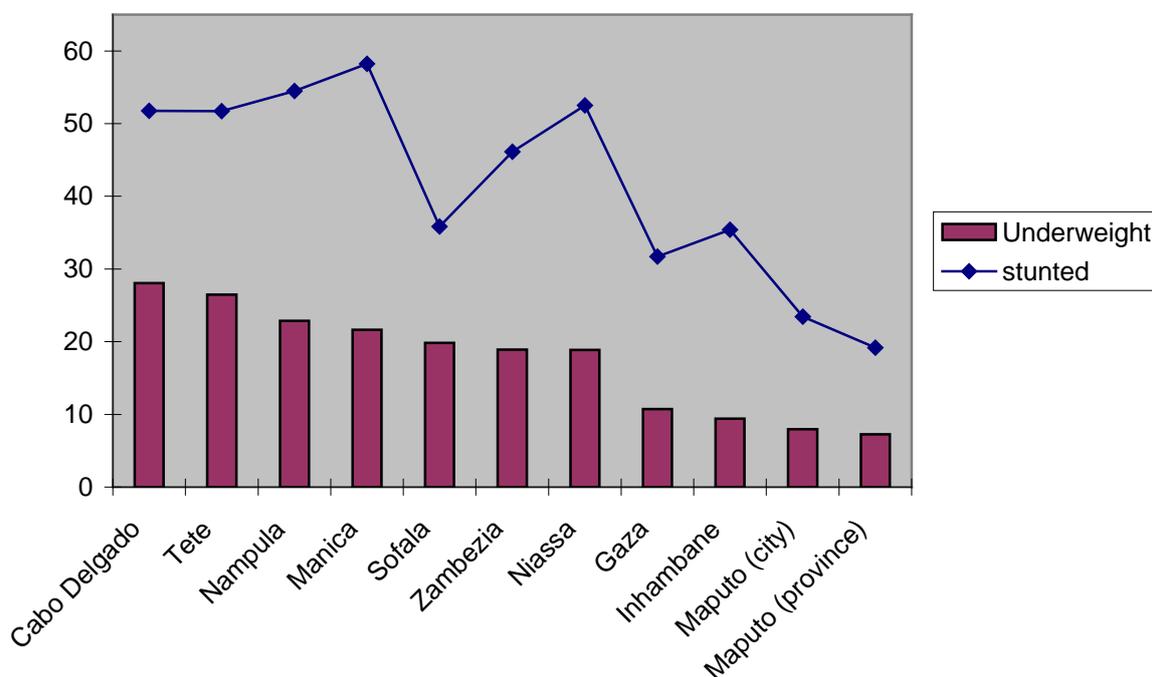
**Figure 4: Evolution of stunting and underweight in Mozambique**  
(headcount, % of children under five years of age with Z-score of  $-2$  and less)



The catchiest feature that comes out of Figure 4 is the evolution of stunting and underweight observed in the DHS/MICS figures which are available for all the three years. Looking at stunting (the three yellow bars) it would seem that the progress is slow, but also that the situation in the recent period shows a bit more progress. Looking at underweight (the dark green bars), it appears that during the first part of the period 1997 to 2009 the situation improved appreciably, while after 2003 the improvement continued at a slower pace. It is noteworthy to compare these trends with the poverty trend in Figure 1 (blue line). There is a sort of incongruence in the sense that the latter trend indicates that poverty reduction would have come to a standstill in recent years, while the malnutrition trends continue to show some improvements.

As a further illustration of this incongruence, in Figure 5 we computed the spatial patterns of child malnutrition as they appear from the most recent survey, with the gradient following the prevalence of underweight from the highest level in Cabo Delgado to the relatively low levels in Maputo. Given the poverty patterns in terms of consumption deficiency (Figures 1, 2 and 3) and in terms of child malnutrition (Figure 4 and 5) it comes as no surprise that the relationship between consumption poverty and malnutrition cannot be established at a high level of confidence. For example, whereas Cabo Delgado comes out as the province with the lowest poverty head count in terms of inadequate consumption (Figure 3) it appears to have the highest head count in terms of child underweight and is among the provinces where stunting is most prevalent (Figure 5).

**Figure 5: Provincial stunting and underweight in Mozambique**  
(headcount, % of children under five years of age with Z-score of  $-2$  and less)



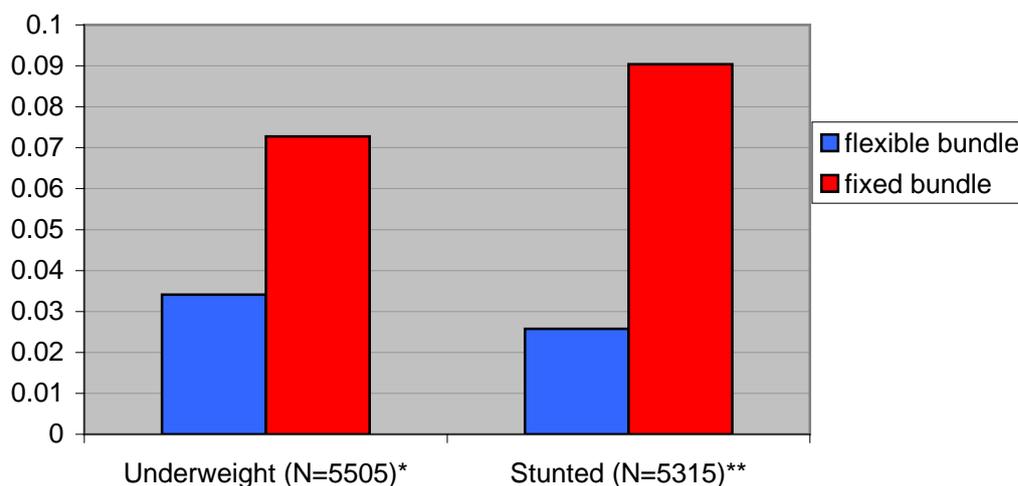
In general, at the household level, the relationship between the consumption poverty status and the presence of malnourished children can never be established at a very high level of confidence, essentially because consumption data are often imprecise and because the nutritional outcomes have causes of its own related to frequency of meals, waste, dietary diversity, feeding and childcare practices, intra-household food allocation food and access to health services. Nonetheless, at aggregate levels, per capita food consumption is strongly correlated with malnutrition, accounting for about half of the differences across countries (World Bank, 2011). Therefore, one may expect to find some correlation at the provincial level, also because of the sizeable samples. For example, for Ethiopia, Girma and Genebo (2002) found a high elasticity of the prevalence of stunting with respect to the economic status households with 54% stunting in the poorest households and 26% in the richest. By the same token, in a study on Bangladesh, Rahman et al. (2009) found that, other things being equal, mothers earning a wage were two-and-a-half times more probable of having healthy weighted children than mothers without cash income.

As illustrated by the blue bars of Figure 6 below (once again, a discussion of the red bars is postponed to Section 4), a similar correlation between poverty and child malnutrition cannot be found in the poverty assessments (see also Figure 3-10 in MPD-DNEAP, 2010, showing that

child malnutrition is practically unrelated to the poverty status). For those households with young children –about half of all households– the correlation coefficient between their poverty status and having children who are stunted is a meager 0.026. Statistically this correlation is insignificant at the 10% confidence interval which means that one might as well say that the relationship is null. Aggregating household information to the district level, the correlation between the incidence of poverty and the incidence of stunting appears similarly low and no longer of any statistical significance, while at the provincial level the relationship practically disappears.

The presence of children underweight has a somewhat higher correlation with the poverty status of the household (see the blue bar in the left part of Figure 6) and is statistically significant at the 5% level. The correlation coefficient equals 0.034 and becomes higher at 0.157 and 0.163 at the level of districts and provinces respectively. Yet, again, the relationship loses its significance at the aggregated levels and, thereby it is less tight than one might expect on the basis of evidence for other countries in Africa.

**Figure 6: Poverty status and malnutrition, 2009**  
(Pearson correlation coefficients)



\* within 5% confidence interval for the flexible bundle, within the 1% confidence level for the fixed bundle

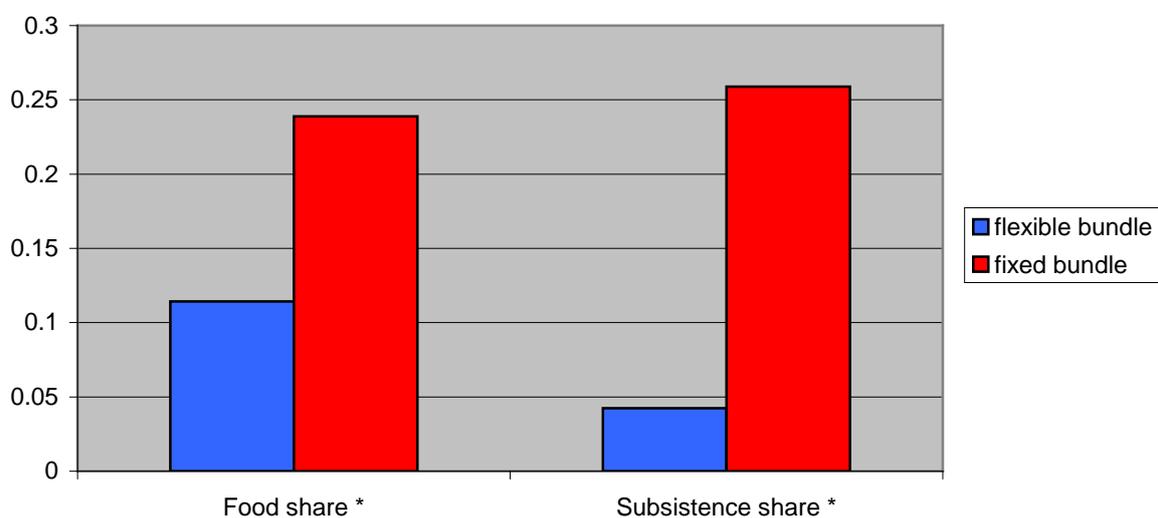
\*\* not within the 10% confidence interval for the flexible bundle, within the 1% confidence level for the fixed bundle

## 2.5 Food as a share in total consumption and other poverty correlates

The food share in total consumption gives an indication of the household's preoccupation with its basic needs, while the share of auto-consumption in total food shows the extent to which households are dependent on low productive subsistence farming. These two characteristics are often reflective of impoverished communities and can therefore be useful as an indicator of poverty (Schmidt, 2009). The blue bars in Figure 7 on the next page display these shares and their relation with the poverty status of the household (see Section 4 for a discussion of the red bars). On this score too, it would seem that the correlation is unexpectedly low.

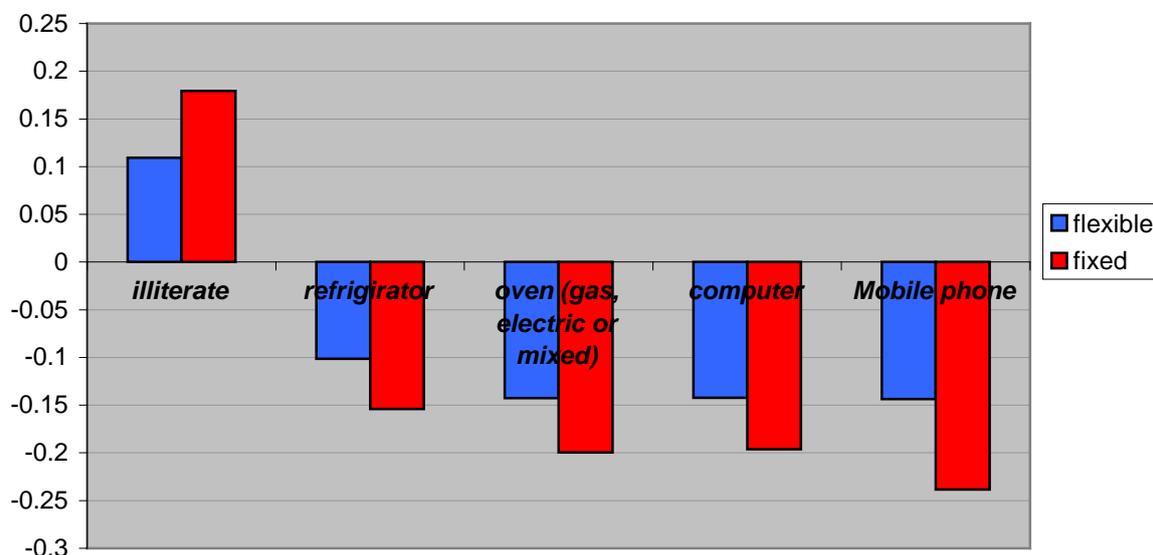
Given the analysis hitherto it comes as no surprise that relationship between (consumption) poverty status on the one hand and other remaining measures that are indicative of the household living standard is found to be equally weak. As a final illustration, analyzing the data from the last survey, the blue bars in Figure 8 show the low correlation with the literacy of the head of household and the ownership of selected household durables.

**Figure 7: Food share (% of total consumption), subsistence share (% of total food) and their relationship with poverty status (Pearson correlation coefficients)**



\* within the 1% confidence level

**Figure 8: Poverty status and selected welfare indicators**  
(Pearson correlation coefficients)



all values within a 1% confidence interval

### 3 Possible impact of poverty lines on poverty assessment in Mozambique

The (consumption) poverty patterns in Mozambique as they emerge from the three national poverty assessments appear rather unexpected in various instances illustrated in the previous section. Also, the relationships between the household poverty status and other welfare indicators seem rather weak. This warrants a further investigation into the factors that could explain this, especially given the role that poverty figures play in the monitoring, design and evaluation of development efforts.

#### 3.1 *The cost-of-basic-needs poverty line*

The poverty line is one of the factors that may impact on poverty patterns and, as we will argue below, this might indeed explain some of the relevant incongruence of the patterns over time as well as over the various population groups, provinces and urban-rural localities.

Following Ravallion (2010a), the poverty line is defined as the money-metric value that a particular household would need in order to reach a certain minimum living standard, at a

particular location and in a certain year. Despite the general consensus on this definition, in practice it can lead to very different values, ranging from the PPP-dollar-a-day on the one hand –perhaps the most credible proxy of the global minimum consumption level– to the local cost of a specific basket on the other –probably a better proxy to compare the cost of basic needs within a country–. The availability of detailed consumption data from recurring large-scale household surveys has triggered several applications of the latter type of poverty lines and this is the case in Mozambique.

Poverty comparisons are generally responsive to the definition of basic needs such as the food that is deemed necessary to attain a minimum dietary energy requirement plus a budget to cover for non-food items. Comparisons should also be receptive to data characteristics such as the measurement of consumption quantities and of unit values for home produced food. These aspects may challenge the robustness of poverty estimation. For example, in the case of Indonesia, Ravallion and Bidani (1994) discuss the implications of alternative poverty lines. They compare results from poverty lines based on local baskets for each province separately computed for rural and urban areas with results of a single poverty line based on the basket of those being in the lowest per capita expenditure bracket. The picture changes dramatically. Notably, under the rural-urban specific diets, urban poverty exceeds rural poverty, while the reverse is true under the national diet, the main reason being that the spatial variation of the poverty line is far less pronounced under the national diet.

For the case of Mozambique, the study by Tarp et al. (2002) addresses the same issue, namely the robustness of poverty patterns for the choice of the poverty line. Analyzing the data from the 1997 budget survey (INE, 1998a), the authors find that poverty patterns based on the Cost-of-Basic-Needs are sensitive to the food basket that is chosen. With a few exceptions, as an alternative to a single national basket, the poverty lines based on 13 local regional food baskets are associated with a significant shift to cheaper sources of calories in response to regional variation of prices (unit values). Because this could capture locally relevant demand behavior, regional food baskets could be preferable. At the same time, however, the provincial level incidence of poverty corresponding to the use of a single national basket appeared to be more robust in terms of a stronger association with other provincial-level welfare indicators like child malnutrition (Tarp, *op. cit.*, Table 9), albeit the association is not particularly strong. At the household level, the correlation between the poverty status and the presence of stunted children appears significant when using the national basket, but, surprisingly, it is zero when using the regional baskets (Tarp, *op. cit.*, Table 10).

Another issue concerns the use of average unit values observed in the budget surveys as an indicator of price differences in Mozambique. Here too the argument is that adding specificity to the poverty lines may help to determine the poverty status of households more accurately. For example supposing that a household in a high-cost economic environment (city) is at the edge of poverty at a certain expenditure level, a similar household at the same expenditure level can be non-poor in a low-cost environment (village). Nonetheless, price differences can also reflect measurement errors, and, more importantly, differences in quality. As a result, price differences are often undependable and large, and their use in spatial poverty lines can create a serious bias in the resulting poverty patterns. Indeed, a recent study for Mozambique finds that the large price differentials that are said to exist between Maputo city and the rest of the country is likely to be the source of a considerable bias, with a gross overestimation of poverty in Maputo city (Maia and van den Berg, 2010).

All this suggests that a certain specificity of the food component of the poverty line may be preferable from a theoretical angle, but, empirically, it may come at a cost, namely a certain loss of consistency and robustness. It can happen that the available data grossly overestimate the urban-rural gap in the cost of living and in the living standard. This may lead to a complete change of the urban-rural dimension, caused by the risk that many households in the village are mistakenly classified as non-poor and, contrariwise, many households in the city are mistakenly classified as poor. The evidence for Indonesia in Ravallion (1994) and for Mozambique in Tarp et al. (2002), amongst others, indicates that this urban bias is far from imaginary.

There are reasons to believe that, in the case of Mozambique, the use of locally observed consumption patterns and locally imputed prices (household unit values) is likely to lead to an underestimation of rural poverty lines and an overestimation of urban lines. Rural poverty lines may be too low as a result of the fact that the consumed items in the observed bundles are not homogeneous and sometimes consist of several goods (“other vegetables”, “meat” and “fresh, refrigerated or frozen fish”). Therefore, relatively low prices in rural area are likely to reflect not only market conditions, but also a relatively low quality. Contrariwise, to the extent that the higher prices in urban area reflect higher quality, the urban food poverty lines are probably too high.

The urban food poverty line might also be too high because the urban poor tend to consume more outdoor meals for which underreporting is more likely to happen, and which are not in the food basket. In the case of Mozambique such underreporting is indeed a major data issue and adjusting for this can have a large impact (see MPD-DNEAP, 2010, Section 10.6). For example, as shown in MPD-DNEAP (op. cit. Table 10-4) poverty headcounts change appreciably after a

proportional inflation of the expenditures of all households that live in a spatial domain with an apparent calorie deficit. Although this adjustment for the underreporting appears to have only a limited impact on the overall national poverty headcount –less than 3 per cent points– it has major consequences for the poverty headcount in Maputo City (in 2009: down from 36 to 22%) and in Maputo Province (in 2009: down from 63 to 31% in the urban part and down from 77 to 66% in the rural parts).

Another factor that comes into play is the nonfood component of the poverty line. In the poverty assessments, this component has been estimated as the average nonfood budget share of households whose total expenditure is close to the food poverty line. Because the nonfood budget shares appear to be much higher in urban area, this might amplify any initial urban bias in the food poverty lines. More importantly, the foremost element that could create a bias in the comparison between urban and rural poverty lines is probably the fact that items that are key to the household living standard are concealed and practically impossible to built-in into the consumption estimates. Examples are the availability and the use of public water taps, public transport, regulated markets and schools and health facilities of good quality. Such commodities are consumed much more by the urban poor and clearly increase their living standard, but are seldom included in their consumption aggregate. In case of non-market publicly provided goods, one major problem is that it is an intricate matter to impute a value for the households' access to certain physical and social services' infrastructures. Also the households' use of public goods is difficult to measure and difficult to price properly. In the case of Mozambique this “*consumption of commodities supplied by the public sector free of charge or the subsidized element in such commodities*” is recognized as a major omission from the consumption measure (MPF/IFPRI/PU, 2004, page 4). Clearly, this could create an additional bias and would warrant a mark-up of the consumption measure of the urban households or, equivalently, a lowering of the urban poverty line relative to the rural one.

### 3.2 *Two sides of the spectrum: national poverty line versus context-specific lines*

Following the discussion above and with reference to the current practice in Mozambique, one may conclude that the choice of poverty lines can be a tedious matter, especially when it comes to the identification of the specific groups of households over which a certain empirically estimated minimum cost-of-living is applied. In the case of Mozambique, the three national poverty assessments have used local prices (average household unit values) and local and dynamic consumption patterns (“adjusted flexible bundles”), which has led to various context-

specific different poverty lines (Arndt and Simler, 2010)<sup>5</sup>. The assessment is unique in Africa in the sense that the poverty line has an unusual specificity with a different basket of basic needs for each of the 13 spatial domains and for each year in accordance to relative price differentials.

To introduce some of the issues involved in identifying and computing poverty lines, we adapt the framework in Ravallion (2010) to the case of Mozambique. Consider an index  $r$  which indicates, say, the ten provinces divided into rural and urban area or, for that matter, the three consecutive years of the budget survey. In each domain  $r$ , all households are assumed to be similar and to have the same preferences over different bundles, represented by a certain level of welfare/utility/living-standard which will be denoted by  $u(q)$ , where  $q = (q_1, \dots, q_K)'$  is a bundle of quantities consumed consisting of  $k = 1, 2, \dots, K$  goods and services and  $u$  is a utility function with standard properties. Depending on where and when the household consumes its bundle  $q = (q_1, \dots, q_K)'$ , we assume that it can buy all items against prices  $p_r = (p_{1r}, \dots, p_{Kr})$ . Finally, let  $\underline{u}$  be some minimum living standard below which households are deemed to be poor, a level that should of course be kept fixed over all domains and all households. Then, if one would know  $\underline{u}$ , one could consider households in domain  $r$  and select those with this living standard and see their consumption  $q_r^*$  that yields  $u(q_r^*) = \underline{u}$ . This consumption can be interpreted as the basic needs bundle and, provided all goods can be bought on the market or, at least can be valued adequately, the corresponding poverty line would be defined as follows:

$$z_r = p_r q_r^* = \sum_k p_{kr} q_{kr}^* . \quad (1)$$

This is the ideal. Unfortunately, because  $\underline{u}$  is unobserved, it is impossible to actually observe the reference bundle  $q_r^*$  in each of the specified domains and, thereby the ideal poverty lines  $p_r q_r^*$  are unknown as well. This basic problem of the ideal that can never be directly observed, even if we assume for a moment that all prices  $p_r$  are observed or imputed accurately and that all consumed quantities  $q_i$  are known as well for a sample  $i = 1, 2, \dots, I$  of poor and non-poor households across all domains.

Hence, poverty lines have to be constructed in one way or another from a priori reasoning and therefore a certain level of arbitrariness is difficult to avoid. For food items, one obvious

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<sup>5</sup> The first poverty assessment employs 13 different poverty lines, based on local prices and local consumption patterns observed in the IAF 1996/97 survey (Niassa and Cabo Delgado, rural&urban; Nampula, rural&urban; Sofala and Zambesia, rural&urban; Manica and Tete, rural&urban; Gaza and Inhambane, rural&urban, Maputo Province, , rural&urban; Maputo City). For the second assessment, each of these lines is adjusted in accordance to the changes of local prices and local consumption patterns observed in the subsequent IAF 2002/03 survey, while the third assessment employs another set of 13 poverty lines estimated using the IOF 2008/09 survey.

candidate would be the bundle  $\underline{q}$  that is typically consumed in the poorest segments of the population and that is scaled to obtain a given calories requirement. This approach has been applied in most developing countries and leads to food poverty lines  $p_r \underline{q}$  which can capture the spatial prices differences as well as inflation over time. Specifically, when confining the analysis to price differentials over time and discarding regional price differences, this approach identifies one single national poverty line for each survey year, computed as the cost of a single bundle of basic needs evaluated at a single set of prices that prevailed in the particular year. In many countries, after applying a certain cost to cover for basic non-food expenditures, this has been a common way to define poverty lines (Ravallion, 2010). For the case of Mozambique this would mean:

$$z_t = (1 + \delta) p_t \underline{q}, \quad (2)$$

for  $t = 1997, 2003, 2009$  and a share  $\delta > 0$  to account for non-food consumption needs.

Alternatively, as is the current practice in Mozambique, one may opt for flexible diets that adjust to the particular domain where the household lives. This means that in each location and for each year the food bundle may have a different composition, while also the prices and the allocation for non-food may change with time and over space. For Mozambique, letting  $\underline{q}_{ts}$  denote the minimum food bundle for the poor in the specific spatial domain  $s = 1, 2, \dots, 13$ <sup>6</sup> at the time of the survey  $t = 1997, 2003, 2009$  and with corresponding prices  $p_{ts}$  and with non-food allocations  $\delta_{ts} > 0$ , the context-specific poverty lines read:

$$z_{ts} = (1 + \delta_{ts}) p_{ts} \underline{q}_{ts}. \quad (3)$$

In the case of Mozambique, these poverty lines have been computed in two stages. The initial stage is similar to (2), but now using local consumption bundles, local prices and local allocations for non-food. In a second round of computations, the composition of the bundle obtained during the first stage is adjusted to make sure that the household in year  $t$  and at location  $s$  actually prefers its own bundle over the bundle of any of the other households, provided that it would be able to buy that bundle. Technically this means that each bundle in equation (3) must satisfy the “revealed preference” conditions:  $p_{ts} \underline{q}_{\tilde{t}\tilde{s}} \geq p_{\tilde{t}\tilde{s}} \underline{q}_{ts}$ , where  $\tilde{t}$  and  $\tilde{s}$  range over all other years and all other provinces. These conditions must hold because, if it would be the case that

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<sup>6</sup> The 13 spatial domains defined in the national poverty assessments are: 1=Niassa and Cabo Delgado, rural; 2=Niassa and Cabo Delgado, urban; 3=Nampula, rural; 4=Nampula, urban; 5=Sofala and Zambesia, rural; 6=Sofala and Zambesia, urban; 7=Manica and Tete, rural; 8=Manica and Tete, urban; 9=Gaza and Inhambane, rural; 10=Gaza and Inhambane, urban; 11=Maputo Province, rural; 12= Maputo Province, urban; 13=Maputo City.

$p_{ts} \underline{q}_{\tilde{ts}} < p_{ts} \underline{q}_{ts}$  in one of the other years or one of the other provinces, the actually chosen bundle  $\underline{q}_{ts}$  is inconsistent with cost minimization. Clearly, if the household could change to the cheaper alternative  $\underline{q}_{\tilde{ts}}$  –which, by assumption, yields the same living standard  $u(\underline{q}_{\tilde{ts}}) = u(\underline{q}_{ts}) = \underline{u}$ –, then the chosen bundle cannot be the bundle that minimizes the cost to attain that living standard  $\underline{u}$ . We refer to Arndt and Simler (2010) for a description of the entropy-estimation which considers this adjustment for “revealed preferences” and has been applied to the data from Mozambique.

It must be noted that this second step –the adjustment for “revealed preference” – is a necessary one when using context specific basic needs bundles, in order to establish comparability of living standards among households over time and space. With the usage of a fixed bundle this comparability is obtained by construction, because everyone has the same bundle over time and over space, which presumably reflects the basic needs of everyone.

### 3.3 *Pros and cons of national poverty line versus context-specific lines*

As already indicated in the introduction, the poverty lines of equation (3) will be referred to as “adjusted flexible bundles” while the line of equation (2) will carry the label “fixed price fixed bundle”. The pros and cons of opting for either of these approaches derive directly from the advantages and disadvantages of specificity, see also the discussion in section 3.1 above. Simply rephrased, one could say that specificity might be able to capture relevant local consumption habits, local market conditions and local relational perspectives, but it might be unable to capture relevant data limitations such as the typical volatility of household unit values and the inevitable underreporting of consumption. On these scores, a national poverty line may perform better.

Because the “adjusted flexible bundles” are based on what the poorest segments in each province and each urban-rural locality actually consume, there is an issue of quality that is worth iterating. For example, over time, if due to a price increase of wheat, a household at the edge of poverty, initially consuming a mix of wheat and cassava, is forced to switch entirely to less nutritious cassava, one might want to conclude that it falls into poverty, even if the total amount of calories stays the same. When the fixed bundle of equation (2) is applied, such an increase in poverty will indeed be observed. However, the increase of poverty may go unnoticed when, like in equation (3), the new situation has its own subsistence consumption characterized by fewer calories from tastier and more nutritious foods. When the poor resort to cheap high-calorie low-quality food items, as is often the case, the use of context-specific poverty lines can thus result in a situation that poverty is unaffected by price increases of the best quality food that the poor consume, which would be a counterintuitive result.

By the same token, when the rural poor are given the means and discarding price differentials, they might well want to change their minimum basket with the basket of the urban poor because of the better quality. In these respects, it may be noted that the diversity and quality of a diet are not minor points. Recent literature has found that these factors are important predictors of micronutrient deficiency (Moursi et al., 2010) and child stunting (Rah et al., 2010).

Of course, the poverty line of equation (2) based on the “fixed price fixed bundle” has problems of its own, essentially because it is a rather coarse measure for poverty classifications. Since this approach is at the other side of the specificity-spectrum, it may well be that the converse holds, namely that the poverty line is too high in rural area and too low in urban area, where the cost of living is generally higher.

The construction of a poverty line is never a mean feat. Given the trade-off between specificity and consistency-robustness and in view of relevant data limitations that are related to unobserved and unobservable components of the living standard and the cost of living, it will always involve some careful judgment (see Asra and Santos-Francisco, 2001, amongst others). Nonetheless, in cases that supplementary data on various dimensions of poverty are available, the empirical probing into the potential benefits that the choice for context-specific poverty lines has apropos of the choice for a more generic poverty line can help to make the trade-off. In the next section we will address this issue for the case of Mozambique by comparing the poverty patterns that have been reviewed in some detail in Section 2 and that emerge from the local poverty lines (3) with the alternative patterns that will arise when using the national poverty line (2)<sup>7</sup>. We can already lift the veil by mentioning that all findings seem to point in the same direction, namely that the national poverty line seems to perform better than the local lines: the dynamics and the spatial patterns of poverty will be more as one might expect and the relationship with other dimensions of poverty will be tighter.

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<sup>7</sup> The national poverty line  $z_t = (1 + \delta) p_t \underline{q}$  is computed from the local poverty lines  $z_{ts} = (1 + \delta_{ts}) p_{ts} \underline{q}_{ts}$  by taking population weighted averages for the food basket  $\underline{q} = \sum_t \sum_s \frac{1}{N_{ts}} \underline{q}_{ts}$ , for the non-food share  $\delta = \sum_t \sum_s \frac{1}{N_{ts}} \delta_{ts}$  and for the prices  $p_t = \sum_s \frac{1}{N_{ts}} p_{ts}$ , where  $N_{ts}$  is the population in spatial domain  $s = 1, 2, \dots, 13$  at the time of the respective survey  $t = 1997, 2003, 2009$ .

## 4 Striking changes of poverty patterns

### 4.1 *The dynamics and urban-rural and provincial disparities are more as expected*

In view of the discussion on the possibility that the unexpected findings in Section 2 might be partly ascribed to the sensitivity of the poverty-line methodology to data limitations, we computed the national poverty line according to equation (2) and compared the concomitant poverty patterns with those that emerge from the use of the 39 local poverty lines (3).

The national poverty line proves to be a very useful benchmark, as is illustrated in the red lines and the red bars of the various Figures from Section 2. Actually, the use of the “fixed price fixed bundle” leads to striking changes in the poverty patterns in Mozambique, and most of these changes are comprehensible, adding confidence and consistency to the storyline. For example, considering the national trend in Figure 1 and the urban-rural trends in Figure 2, the dynamics of poverty reduction seems to be more consistent with other data sources, including macro-economic growth and rural-urban disparities. The poverty reduction in the first period from 1997 to 2003 is now less sharp (from 70% to 61%, as compared to a reduction from 69% to 54% for the “adjusted flexible bundles”), while in the recent period from 2003 to 2009 poverty continued to decline, though at a lower pace (from 61% to 57%, as compared to a standstill for the “adjusted flexible bundles”).

The rural-urban dimension of poverty also changes dramatically when replacing the local-prices “adjusted fixed bundles” by the “fixed price fixed bundle”. Poverty is now much more prevalent in the rural population (65% in 2009, previously 57%), while the urban population is less poor (39% in 2009, previously 50%). Here too, as Figure 2 illustrates, the dynamics show a different pattern. Urban poverty gradually falls from 43% in 1997 to 40% in 2003, as opposed to the sharp decline from 61% to 51% in that period, as reported in the national poverty assessments. By the same token, the rural poverty reduction from 77% in 1997 to 71% in 2003 is much less pronounced (previously from 72% to 55%) while, contrary to the subsequent increase mentioned in the poverty assessment report (from 55% to 57%), the new analysis suggests that rural poverty has continued to decline steadily from 71% in 2003 to 65% in 2009. It may be noted though that evidence from the TIA is much less positive about rural productivity increases, especially among small-scale farmers (INE/TIA, 2009). Some authors even claim that poverty is not being reduced at all (Cunguara and Hanlon, 2010).

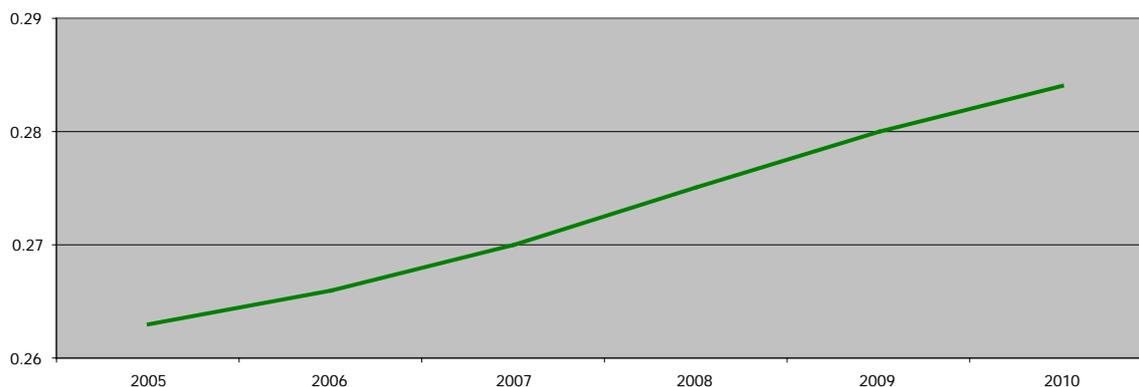
Looking at the dynamics at the provincial level, the consistency of the poverty patterns also seems to improve appreciably (see the lower panels of Figure 3 with the red bars.). For example, employing the “fixed price fixed bundle” poverty line, the amplitude of the excessive poverty

swings in the province of Sofala is halved, while, in Zambezia, the swing up and down by more than 20 per cent points now turns into a gradual deterioration. Also, the position of Maputo City and Maputo Province as the parts of the country where the incidence of poverty is relatively lowest is now consistent over the years. The size of the rural-urban gap and the position of Maputo as the area where development indicators are relatively favorable are confirmed by other studies such as Tvedten et al. (2009), who find child mortality rates in Maputo City to be less than half of those in rural area and female literacy rates to be almost quadruple.

#### *4.2 The relationship between poverty status, malnutrition and other indicators is stronger*

Following the “fixed price fixed bundle” methodology, it appears that the ranking of provinces in terms of consumption poverty (Figure 3, red bars) is more in line with the ranking in terms of child malnutrition (Figure 5). Furthermore, the poverty incidence is correlated more with child malnutrition than in the case of “adjusted flexible bundles” –correlation coefficients are more than two times higher–, see the red bars of Figure 6. This relationship now continues to be significant when considering population groups at the district and at the provincial level. A similar stronger relationship is found with respect to both food share in total consumption and with respect to own-consumption share in total calories, as shown by the red bars of Figure 7. Finally, the co-variation between household welfare and household assets appears to be more robust when the national poverty line is used, see Figure 8 (red bars).

Comparing Figure 1 with Figure 4, another very interesting finding emerges from applying the national poverty line. It appears that the poverty trends make a better match with the trends in child malnutrition. Notably, at the national level, the reduction of poverty and underweight has gone hand in hand, with a nod in 2003 that reflects a slowing down of the fast track in the period 1997 to 2003. The evolution along the two lines shows a similar pattern and it appears that the same congruence holds for several other poverty correlates. In that regard, it is noteworthy to look at Human Development Index that was already mentioned in the introduction. Like the prevalence of poverty under the national poverty line, the HDI shows minor but consistent improvements over time, as illustrated in Figure 9 (UNDP, 2010).

**Figure 9: Human Development Index in Mozambique, 2005 to 2010**

## 5 Discussion

### 5.1 Main finding

Because the poverty patterns in Mozambique appear to be very sensitive to the choice of poverty lines and because the change of results might have important policy implications, it is important to probe carefully into the potential benefits that specific poverty lines have apropos of a more generic poverty line. From a theoretical point of view specificity of poverty lines may be a desirable property. Empirically though, the construction of a poverty line cannot go without a trade-off with consistency and robustness (Lokshin and Ravallion, 2006). Moreover, in order to make a poverty line operational, it has to take into account data limitations that are typical for large-scale budget surveys, including the urban bias in measuring consumption, the unobservable components and the volatility of price unit values. To the extent possible, poverty comparisons should avoid that two households with actually the same level of welfare are treated differently. In other words their poverty status should be either the same, or, at least, any systematic bias in the misclassification should be reduced to the minimum.

Our empirical findings suggest that the current practice in Mozambique to use many and dynamically adjusted poverty lines is not without pitfalls in that respect. In general it is commendable to check for robustness by empirically testing the outcomes from specific poverty lines against more aggregated lines, a procedure that is common in many countries (Asra and Santos-Francisco, 2001). Unless such tests are in support of context-specific poverty lines, the cure (i.e. adding specificities to the cost of living for a household) might be worse than the

disease (i.e. applying the same cost of living for households whose actual cost of living are different). In other words, there is a possibility that context-specific poverty lines might augment the risk of misclassification.

A main finding in the report is that this is actually the case in Mozambique. As indicated in Section 3.3, the unexpected results from applying poverty lines that are based on “adjusted flexible bundles” might partly be due the susceptibility of the poverty lines to an inherent urban bias and to characteristics of the survey data. In particular, the use of locally observed consumption patterns of the poor and locally imputed prices (household unit values) are likely to lead to an underestimation of rural poverty lines and an overestimation of urban ones. Rural poverty lines may be too low as a result of the fact that the consumed items in the observed bundles are not homogeneous and sometimes consist of several goods (“other vegetables”, “meat” and “fresh, refrigerated or frozen fish”). Therefore, relatively low prices in rural area are likely to reflect not only market conditions, but also a relatively low quality. Contrariwise, to the extent that the higher prices in urban area reflect higher quality, the urban food poverty lines are probably too high. The urban food poverty line might also be too high because the urban poor tend to consume more outdoor meals for which underreporting is more likely to happen, and which are not in the food basket. Furthermore, the nonfood component of the poverty line is estimated as the average nonfood budget share of households whose total expenditure is close to the food poverty line and, because these nonfood budget shares appear to be much higher in urban areas, this amplifies the urban bias in the food poverty lines. A final element that could bias the comparison between urban and rural poverty are the missing items like public services, all of which are available and consumed more by the urban poor. This too could create a bias and would warrant a lowering of the urban poverty line.

Of course, the poverty line based on the “fixed price fixed bundle” may have problems of its own. Since this approach is at the other side of the specificity-spectrum, it may happen that the converse holds, namely that the poverty line is too high in rural area and too low in urban area, where the cost of living is generally higher. Nevertheless, the use of a national poverty line is customary in many countries (e.g. Al-Hasan and Diao, 2007 for Ghana) and in practically all countries it is used as a benchmark. At the international level, the World Bank recommends to use absolute poverty lines with a purchasing power parity of \$1.25 (PPP), while long before poverty reduction was officially set as the number one MDG, many international covenants and treaties established similar goals. For example, Article 25 of the Universal Declaration of Human Rights reads that *"Everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and*

*necessary social services.*" In this context, one might say that the search and the public discussion around the setting of a poverty line are closely related to the challenge of entitling the poor to income support and access to public services, in an operational and comprehensible way.

As a way forward, it would seem that the search for a poverty line that is most appropriate for Mozambique has to look somewhere between the context-specific poverty lines and the national poverty line. Nonetheless and notwithstanding the undeniable scope and need for advancement of the "fixed price fixed bundle" methodology, the empirical analysis of poverty patterns and poverty dynamics in this report suggests that the single national poverty line may be more suitable for poverty analysis in Mozambique than the thirteen specific lines. All findings seem to point in the same direction, namely that the use of a single poverty line performs better: the dynamics and the spatial patterns of poverty are more as one might expect and the relationship with malnutrition and other welfare indicators is much stronger. On this note, we may iterate the importance of child malnutrition as a dimension of poverty that can have devastating effects on welfare. For example, a study by Black et al. (2008) found that the odds ratio for mortality by weight-for-age increases by a factor 9 when comparing children with a normal weight (Z-score of -1 or above) with those severely underweight (Z-score of -3 and below).

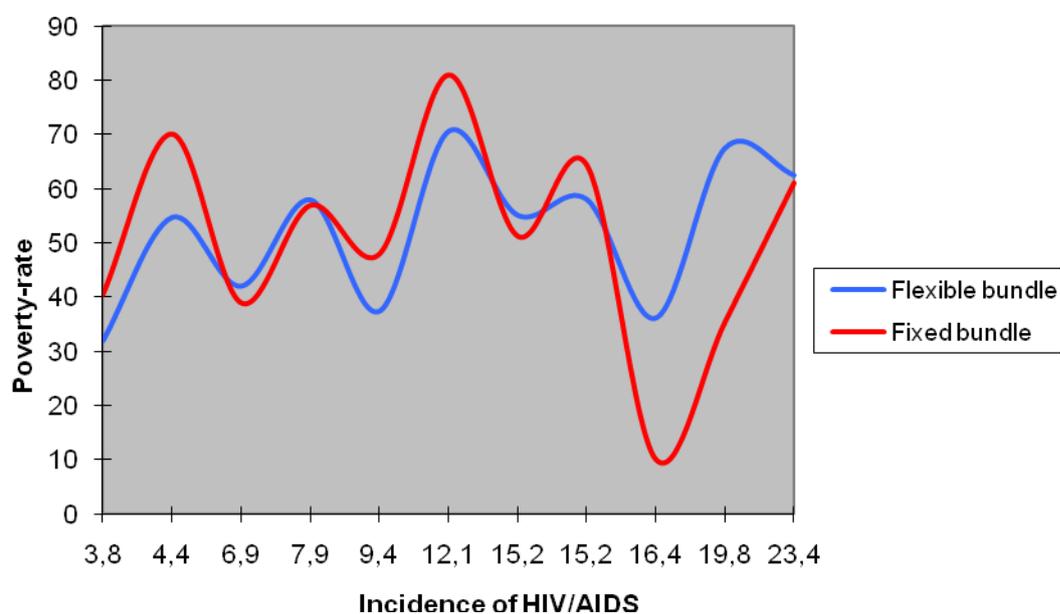
## 5.2 Poverty analysis

The third national poverty assessment report has embarked upon a research and capacity building agenda to investigate "*a detailed set of poverty profiles, including an analysis of the ultra-poor, a poverty mapping exercise, benefit incidence analysis and an extended analysis of infant nutrition*" (MPD-DNEAP, 2010: xv). This is an important agenda in view of the needs to monitor progress and to evaluate poverty reduction strategies. As illustrated in this report, the agenda is also quite challenging, notably when it comes to the policy implications of (in-) consistent poverty patterns, the concentration of poverty in rural area and the gross overestimation of poverty headcounts in Maputo.

Be this as it may, it is however unrealistic to expect that the comparisons of living standards among households in Mozambique and of poverty patterns over time can be analyzed by a single characteristic like a threshold on per capita consumption or on the nutritional status of children under five years of age. We already mentioned the well-known fact that the correlation between the various dimensions of household poverty is seldom as high as one might wish, essentially because each dimension has causes of its own and because the measurement can be are imprecise.

This can be further illustrated by looking at the prevalence of HIV/AIDS which was mentioned in the introduction as one of the major threats to development in Mozambique. Studies on the relationship between (consumption) poverty and HIV/AIDS are not conclusive. Indeed, using the above poverty patterns, there is no clear correlation with the incidence of HIV/AIDS. This is shown in Figure 10, using the provincial figures from the 2009 INSIDA survey (INE/MdS, 2010a). The picture is illustrative of the risk of using the consumption poverty status of the household as the guiding principle for poverty analysis. Apparently, the factors underlying the HIV infection are too complex to be captured by other poverty indicators and may therefore call for targeted interventions.

**Figure 10: Provincial HIV/AIDS occurrence and its relation to consumption poverty, 2009**



Fortunately, the wealth of information available in Mozambique opens the opportunities to analyze poverty on the basis of the ensemble of the characteristics of the households, not limited to the ones reviewed in this report. We have focused on the poverty status, child malnutrition, food and subsistence shares, literacy of the household head and a few selected household durables, leaving untapped the rich information about other dimensions of poverty. Amongst others, these dimensions include household composition and dependency rates, access to electricity, access to and quality of drinking water, health facilities and schools, sanitation, and sector of employment.

To start, one may expand the tabulation of poverty characteristics for selected years and plot them on a map to obtain a first impression of spatial patterns and dynamics, as has been done

for a few selected indicators in Annex 1. Next, using multivariate techniques, one may regress a particular poverty measure on its covariates. For example, in their analysis of the 1997 and the 2003 surveys for Mozambique, Fox et al. (2005) regressed (the logarithm of) per capita or per adult-equivalent expenditures on demographics, education and sector of employment along with district fixed-effects. These variables explained some 35% of the variance of expenditures and showed a consistent pattern of high returns to (post-) secondary education and to employment in the service sectors (op. cit., Table 15), a pattern which is confirmed in the recent poverty assessment by MPD-DNEAP (2010, Table 12-5). The latter concerns a similar regression for the 2003 and 2009 surveys using the “welfare ratio” as dependent variable –defined as the ratio of the household expenditure over its poverty line, see Blackorby and Donaldson (1987) and adding several variables concerning housing and household assets. The ensemble of variables explain some 50% of the variation of the “welfare ratio” around one and the estimates indicate that the returns to education in Mozambique seems to be falling across all education levels while those employed in the service sectors are gradually losing their relative advantage.

Using the full distribution of poverty characteristics over the population, further work could address several questions of interest in relation to the evaluation of development efforts. In that regard, the availability of software dedicated to multi-dimensional poverty analysis is worth mentioning (e.g. Keyzer and Pande, 2010). This will facilitate practical applications and capacity building in Mozambique to go hand in hand with advances in the literature. For example, combining survey data with data from the population census and building on experience gained in other African countries, a poverty map could be constructed that tones the poverty picture and can be used to identify pockets of poverty on the one hand and of relative wealth on the other (Jalan and Ravallion, 2002; Elbers et al, 2003). Also, the various cross-section surveys could be used to construct a pseudo-panel of households that can be used to address the likely impact of redistributive policies and the strengthening of safety nets and social protection (Molini et al. 2010). This point can be elaborated further by investigating a typology of households using combinations of poverty characteristics that are most prevalent and study how the poorest group might benefit from a combination of interventions, say in terms of their access to health care and education, their proximity to markets and the increases of the productivity of their crops (Arndt et al., 2010). By the same token, the poverty analysis on the basis of the various recurrent surveys in Mozambique could benefit appreciably from advancements in the treatment-effects literature and its application to policy evaluation questions (Heckman, 2008; Florens et al., 2010).

## 6 Conclusion

It is now well recognized that the phenomenon of poverty is multi-dimensional and touches upon practically every facet of human life of households in Mozambique. This is reflected well in the PARPA and PARPAII plans aiming at the abolishment of absolute poverty (GdM, 2001; GdM, 2006) and in the continual debate on improved strategies to reduce poverty in all its dimensions. As the literature and the experience in many developing countries has shown, an in-depth analysis and understanding of poverty and its multi-dimensional complexity can be of great help to target, decentralize and evaluate poverty reduction efforts by the government and the donor community, to evaluate the effects that economic shocks and interventions have on the poor, and, finally, to inform the public about the progress that has been made in the various poverty dimensions.

On this note, it is worth mentioning that that the local capacity for poverty analysis is often one key element in advancing the development strategy of a country. In the case of Mozambique, the rich data from the three rounds of the recurrent large-scale household surveys are a real asset. Together with data from the two Censuses and with various other survey data of good quality, this provides the ingredients for effective capacity building, especially by the active involvement of researchers and policy makers in training programmes and in co-authored papers.

The evidence indicates that poverty in Mozambique is still widespread in every dimension. The three national poverty assessments in 1998, in 2004 and, recently, in 2010 have clearly shown this. They have also highlighted that it is far from straightforward to identify poverty patterns based on whether or not a household can afford the cost of its basic needs, i.e. whether it is above or below the poverty line considered relevant. The subsequent national poverty assessments are increasingly elaborative on this point and propose the use of different prices and different minimum consumption bundles in each year and for each group of households (rural-urban and provincial), while adjusting the bundles further in response to changing relative prices. In principle, for sufficiently precise and comprehensive consumption and price data and for sufficient within-group similarity and between-group dissimilarity, this may lead to more precise estimates of the relevant poverty line and thereby of the poverty rankings of households.

However, the analysis in this report has suggested otherwise in the sense that poverty comparisons in Mozambique are less consistent when using context-specific poverty lines as compared to using a national poverty line as is the common practice. As a matter of fact, it purports that the inherent urban bias in computing context-specific lines might be the origin of the unexpected findings. This is signified by testing the poverty lines that are specific to population groups and to survey years against the alternative of one single poverty line for all Mozambicans. Though the alternative is admittedly a rather coarse poverty measure, it is a common benchmark

in other countries and, more importantly, in the case of Mozambique it appears to perform better in the sense that the national, the urban-rural and the provincial evolution of poverty patterns seems more plausible and also more in line with other poverty indicators like children malnutrition and lack of assets. We argued that this may have policy implications, most markedly regarding the consistency of the poverty trends, the concentration of poverty in rural area and the gross overestimation of poverty in Maputo.

Mozambique is in a quest for consistent poverty profiles that are suitable for the appraisal of its development strategy, in particular in relation to the targeting of poverty reduction efforts down from the national level to the level of the various population groups, provinces and districts. The poverty patterns analyzed in this study support the idea that Mozambique is gradually moving towards the MDG poverty reduction goals, although evidence also indicates that the pace at which this happens is slowing down.

Although this might be interpreted as support to Mozambique's current development model, there are also reasons to believe that poverty reduction has been too slow, especially because the economic growth has been high over the past decade. With the economy growing at some 8 percent each year during the period from 1997 to 2009, the average annual reduction of the poverty headcount of 1 percent point seems small. The low growth elasticity of poverty reduction is worrisome and has led to a certain controversy regarding the effectiveness of the sustained donor assistance and the accumulating loans from abroad that have helped Mozambique to implement its macro-economic stabilization and growth policies.

The reliance on foreign aid and foreign capital has various consequences. For example, in 1998 Mozambique became the 6th country eligible for debt relief under the Highly-Indebted-Poor-Countries initiative which now covers some 30 countries. Currently, the lion's share of the government budget is financed through donor assistance and the efforts of the government to reduce this dependency by broadening the tax base have largely remained void. By the same token, there are concerns about the effectiveness of investments in public goods (esp. electricity and rural infrastructure) and the implementation of redistributive social policies that are conducive to inclusive growth. The low growth elasticity of poverty might reflect a dual economy with little attention to growth in (small-scale) agriculture and a focus on (labor-extensive, subsidized) growth in large industrial projects.

If anything, the ongoing policy debates in Mozambique indicate that these concerns about the growth elasticity of poverty reduction, about the concessions given to large companies and about the sustainability of the government budget are high on the development agenda.

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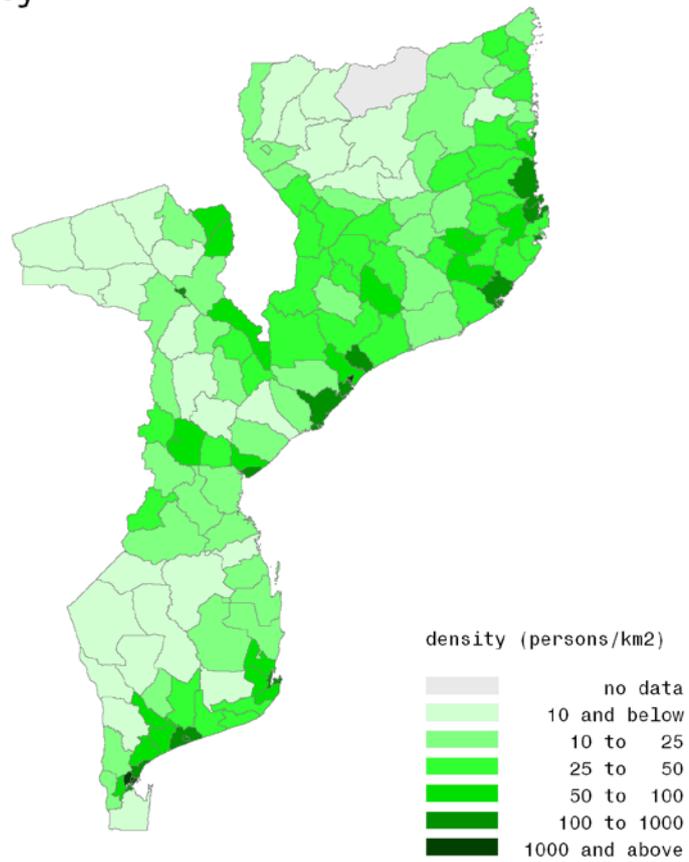
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## ANNEX 1: Maps

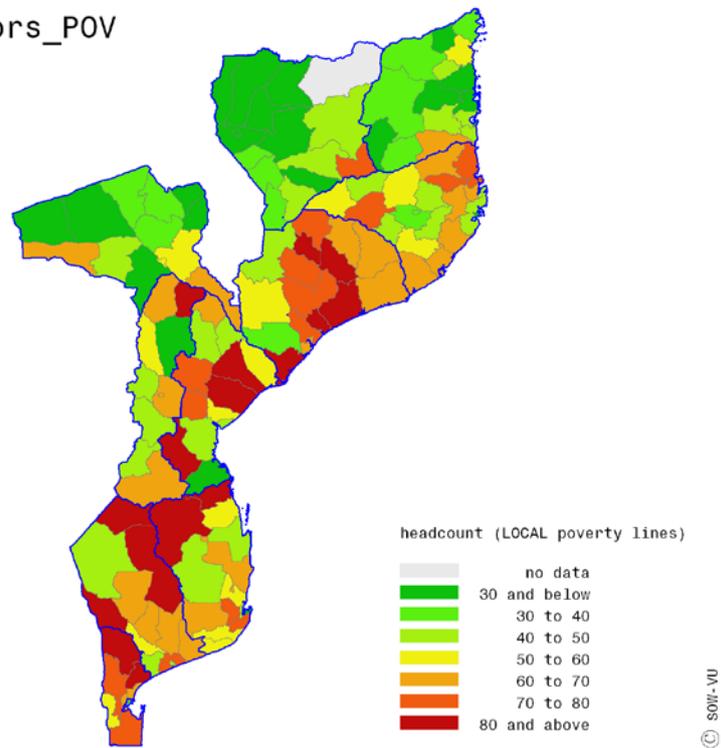
District population density, 2008/09

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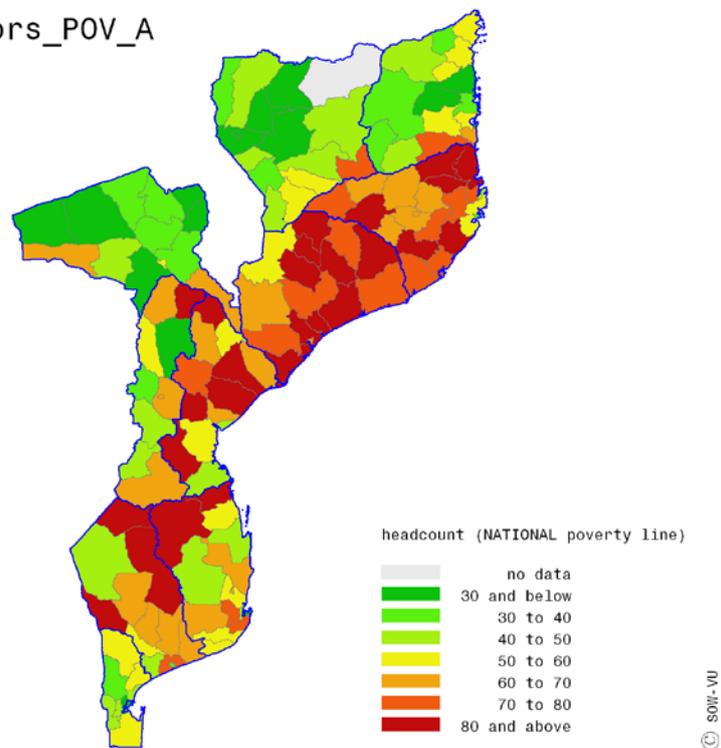
District poverty headcount, 2008/09 (“adjusted flexible bundles”)

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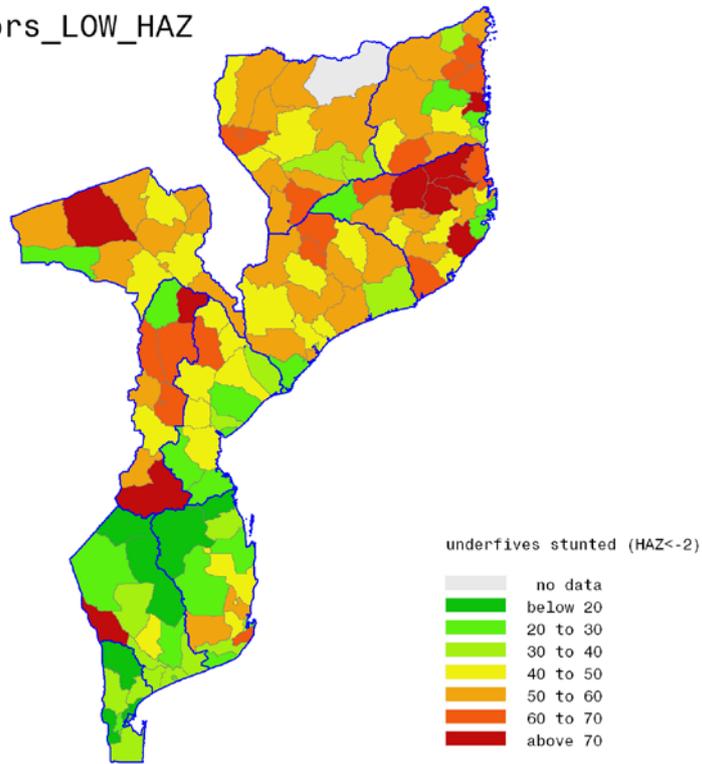
District poverty headcount, 2008/09 (“fixed price fixed bundle”)

CN\_indicators\_POV\_A



Prevalence of malnutrition, 2008/09: Stunted children under-five

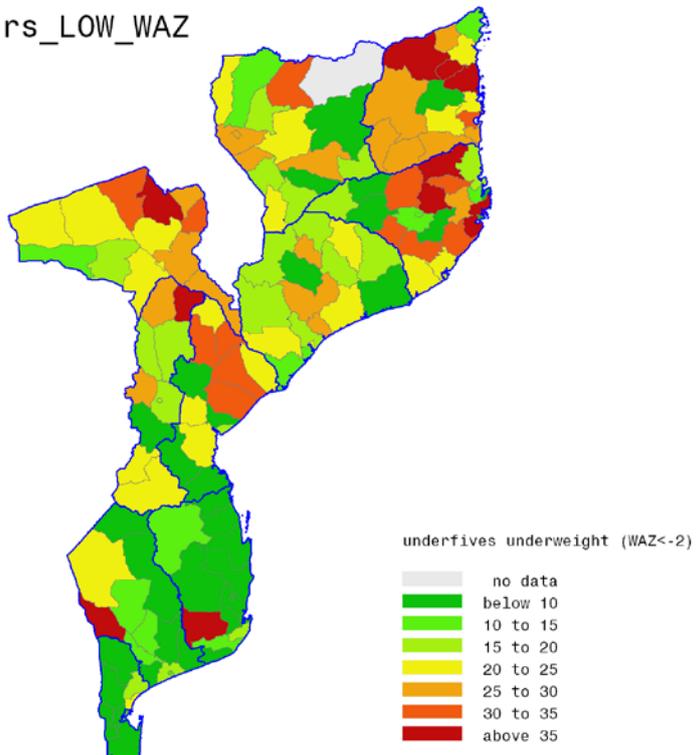
CN\_indicators\_LOW\_HAZ



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Prevalence of malnutrition, 2008/09: Underweight children under-five

CN\_indicators\_LOW\_WAZ



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## ANNEX 2: Tables

Table A2.1 Sample sizes and total population (in millions) for 1997/98, 2002/03 and 2008/09

	1997/1998			2002/2003			2008/2009		
	# HH's	HH size	Pop	# HH's	HH size	Pop	# HH's	HH size	Pop
National	8,250	6.2	17.484	8,700	6.2	18.302	10,832	6.0	21.537
Urban	2,439	7.0	3.681	4,005	6.6	5.871	5,223	6.3	6.548
Rural	5,811	6.0	13.803	4,695	6.0	12.431	5,609	5.8	14.989
Niassa	657	5.8	0.873	816	6.2	0.929	814	5.4	1.276
Cabo Delgado	743	5.2	1.342	738	4.9	1.541	780	5.2	1.687
Nampula	955	5.4	3.261	756	5.4	3.448	1,575	5.5	4.133
Zambezia	884	5.4	3.356	733	5.6	3.518	1,523	5.8	4.100
Tete	611	6.0	1.173	756	5.6	1.406	768	5.8	1.935
Manica	661	6.9	1.000	816	7.6	1.225	804	5.8	1.500
Sofala	762	6.8	1.766	795	7.3	1.532	851	6.9	1.750
Inhambane	729	7.3	1.281	753	6.5	1.345	803	6.5	1.319
Gaza	637	7.5	1.266	786	7.6	1.283	815	7.3	1.356
Maputo Province	718	7.1	0.999	828	6.4	1.022	900	6.1	1.358
Maputo City	893	7.6	1.1676	923	8.0	1.052	1,199	6.4	1.124

Table A2.2 Trends in poverty headcounts (%): national, urban-rural and per province

	1997/1998		2002/2003		2008/2009	
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	Adj. Flex.	Fixed
National	69.4	70.3	54.1	61.2	54.7	57.5
Urban	61.1	43.4	51.5	40.1	49.6	39.5
Rural	71.6	77.5	55.3	71.2	56.9	65.4
Niassa	70.7	79.9	52.1	58.6	31.9	40.6
Cabo Delgado	57.4	74.4	63.2	68.3	37.4	48.0
Nampula	68.9	86.5	52.6	75.4	54.7	70.2
Zambezia	68.0	72.8	44.6	71.8	70.5	81.1
Tete	82.2	83.7	59.8	69.2	42.0	39.0
Manica	62.2	62.6	43.6	47.5	55.1	51.4
Sofala	87.9	85.5	36.1	51.6	58.0	64.5
Inhambane	82.1	72.0	80.7	76.3	57.9	57.0
Gaza	64.2	48.8	60.1	52.9	62.5	61.2
Maputo Province	65.7	43.4	69.3	30.0	67.5	35.5
Maputo City	47.5	20.9	53.6	12.0	36.2	10.1

Table A2.3 Prevalence of underweight in 2009 by poverty status (%)

	Poor		Non-poor		All
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	
National	20.1	21.1	17.6	15.8	19.1
Urban	14.9	16.9	12.3	11.2	13.8
Rural	22.0	22.2	20.1	19.1	21.3
Niassa	18.6	17.2	19.0	20.2	18.9
Cabo Delgado	30.6	30.5	25.9	24.7	28.1
Nampula	23.0	24.1	22.6	18.9	22.9
Zambezia	20.1	19.8	15.2	13.1	18.9
Tete	27.8	27.7	25.4	25.5	26.5
Manica	25.3	25.6	16.4	16.7	21.7
Sofala	22.3	20.6	15.1	17.9	19.9
Inhambane	11.9	12.1	5.0	4.9	9.4
Gaza	11.4	11.6	9.5	9.2	10.7
Maputo Province	9.4	12.5	1.0	3.9	7.3
Maputo City	9.5	16.2	6.7	6.7	7.9

Table A2.4 Prevalence of stunting in 2009 by poverty status (%)

	Poor		Non-poor		All
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	
National	45.8	47.9	43.4	39.5	44.8
Urban	38.7	43.0	30.4	28.5	35.2
Rural	48.4	49.3	49.2	47.3	48.7
Niassa	50.6	50.3	53.7	54.3	52.5
Cabo Delgado	54.7	53.9	49.4	48.9	51.8
Nampula	57.6	57.4	49.1	44.3	54.5
Zambezia	45.5	46.3	48.0	45.2	46.1
Tete	54.9	55.9	49.0	48.6	51.7
Manica	63.7	63.0	50.2	52.3	58.3
Sofala	36.9	37.8	33.7	31.0	35.8
Inhambane	36.9	37.2	32.8	32.4	35.4
Gaza	29.9	30.3	35.2	34.3	31.7
Maputo Province	22.6	28.4	9.0	13.3	19.2
Maputo City	27.4	33.7	20.3	21.8	23.5

Table A2.5 Prevalence of wasting in 2009 by poverty status (%)

	Poor		Non-poor		All
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	
National	7.0	7.5	7.4	6.6	7.2
Urban	7.6	8.1	6.6	6.3	7.1
Rural	6.8	7.4	7.8	6.7	7.2
Niassa	2.9	4.4	8.5	8.0	6.4
Cabo Delgado	9.4	10.2	6.8	5.0	8.0
Nampula	8.3	8.8	8.8	7.5	8.5
Zambezia	7.3	7.5	6.0	3.9	7.0
Tete	6.7	6.7	11.4	11.2	9.2
Manica	5.8	5.7	4.4	4.7	5.2
Sofala	13.0	12.3	10.5	11.9	12.2
Inhambane	2.9	3.0	2.6	2.5	2.8
Gaza	4.6	4.5	2.9	3.0	4.0
Maputo Province	4.6	4.8	5.8	4.9	4.9
Maputo City	3.8	7.1	6.4	4.9	5.2

Table A2.6 Food as a share of total consumption in 2009 by poverty status (%)

	Poor		Non-poor		All
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	
National	65	67	61	58	63
Urban	57	60	44	45	51
Rural	68	69	70	69	69
Niassa	68	69	63	62	64
Cabo Delgado	67	67	69	69	68
Nampula	69	69	63	59	66
Zambezia	72	73	67	62	71
Tete	64	63	75	75	71
Manica	64	63	71	71	67
Sofala	64	66	61	57	63
Inhambane	59	59	55	55	58
Gaza	58	58	52	51	55
Maputo Province	52	54	37	43	47
Maputo City	43	48	29	32	34

Table A2.7 Subsistence as a share of total food consumption in 2009 by poverty status (%)

	Poor		Non-poor		All
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	
National	63	68	59	51	61
Urban	28	34	21	18	24
Rural	76	77	78	77	77
Niassa	59	63	68	67	65
Cabo Delgado	81	81	67	64	72
Nampula	67	69	62	55	65
Zambezia	79	80	73	69	77
Tete	73	73	86	85	81
Manica	55	56	67	65	60
Sofala	54	56	45	39	50
Inhambane	72	72	61	60	67
Gaza	48	59	58	47	54
Maputo Province	24	31	8	12	19
Maputo City	2	2	1	1	1

Table A2.8 Illiteracy of the head of household in 2009 by poverty status (%)

	Poor		Non-poor		All
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	
National	49.1	51.9	38.3	33.9	44.3
Urban	34.6	38.6	16.2	16.7	25.3
Rural	54.8	55.4	49.7	47.1	52.6
Niassa	57.9	56.7	48.7	48.2	51.6
Cabo Delgado	66.3	68.7	57.7	53.6	61.0
Nampula	54.2	54.2	42.1	35.8	48.7
Zambezia	49.9	50.6	40.2	31.4	47.0
Tete	44.0	45.4	41.3	40.6	42.5
Manica	46.4	47.0	34.1	34.4	40.9
Sofala	47.1	47.7	36.0	33.0	42.5
Inhambane	50.3	50.7	30.6	30.3	42.0
Gaza	55.3	55.9	38.0	37.7	48.8
Maputo Province	35.2	43.7	14.6	20.1	28.4
Maputo City	21.0	27.4	8.1	11.1	12.8

Table A2.9 Number of cell-phones in the household in 2009 by poverty status

	Poor		Non-poor		All
	Adj. Flex.	Fixed	Adj. Flex.	Fixed	
National	1.09	1.01	1.39	1.51	1.22
Urban	1.42	1.23	2.06	2.08	1.74
Rural	0.96	0.95	1.04	1.07	1.00
Niassa	0.98	0.97	1.11	1.14	1.07
Cabo Delgado	1.06	1.05	1.22	1.25	1.16
Nampula	0.85	0.86	1.10	1.21	0.97
Zambezia	1.03	1.04	1.20	1.26	1.08
Tete	0.86	0.83	1.00	1.01	0.94
Manica	1.06	1.04	1.21	1.22	1.13
Sofala	0.90	0.90	1.41	1.51	1.12
Inhambane	1.07	1.05	1.49	1.50	1.24
Gaza	1.28	1.28	1.77	1.77	1.47
Maputo Province	1.71	1.46	2.44	2.22	1.95
Maputo City	2.14	1.90	2.78	2.62	2.55

## ANNEX 3: Quick review of the 3<sup>rd</sup> national poverty assessment report (October 4<sup>th</sup>, 2010)

### “Poverty and wellbeing in Mozambique: Third national poverty assessment”

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#### 1 Main finding

Based on the estimated calorie content of the local food basket and the local prices paid for the food items, the survey indicates that the poverty head counts are generally very high and that the (national and provincial) poverty dynamics in the period 1997 to 2009 are sometimes surprising (Table 3-5). The dynamics, as will be indicated below, are somewhat controversial.

- a) Based on the three consecutive surveys IAF96, IAF02 and IOF08, the report finds that between 1996/97 and 2002/2003 the national poverty rate decreased from 70 to 54 %, while between 2002/2003 and 2008/2009 this rate remained practically unchanged, despite sustained economic growth
  - b) The report further indicated that the level of poverty varies widely by region, ranging from 48 to 88 % in 1996/97, from 36 to 81 % in 2002/03 and from 32 to 71 % in 2008/09
  - c) The change of poverty over time also shows huge regional variation, showing a sustained poverty reduction in 3 provinces (from 71 to 52 to 32% in Niassa; from 82 to 60 to 42% in Tete; from 83 to 81 to 58% in Inhambane), stagnation in 2 provinces (Gaza and Maputo Province around 65%) and a poverty rate that bounces up and down in the remaining 6 provinces (for example from 68 down to 45 up to 70 % in Zambezia and from 48 up to 54 down to 36 in Maputo city)
- a) The high *level of poverty* in Mozambique is well-documented and reflects the limited employment opportunities in the economy, especially due to the persistently low productivity in agriculture. Yet, the *change of poverty over time* is somewhat surprising. The question is why the national poverty rate has not declined in the recent period of sustained economic growth from 2002/03 to 2008/09. The report argues that there are three main reasons to explain this: i) the stand still of productivity growth on small-scale farms, ii) the unfavorable weather conditions in 2008, particularly in the central provinces, and, iii) the high prices for food and fuel.
- b) The large *regional variation of the level of poverty* comes as no surprise. In a poor country with a wide variety of agro-ecological conditions and an urbanization pattern that is biased to a few main cities, the magnitude of the observed regional differences in poverty rates is reasonable. The regional variation reflects that the general picture is not so bleak in some parts of the country, while in other parts the poverty situation is particularly alarming. As evidence in other developing countries indicates, the prevalence of poverty in the poorest region can be a factor two and more

as compared to the prevalence of poverty in the richest region. If one would further disaggregate the figures and focus on districts and communities, the poverty picture can even be toned further and identify pockets of poverty on the one hand and of relative wealth on the other.

c) The unexpected poverty dynamics at the national level are amplified at the regional level. Indeed, the *regional changes of poverty over time* are huge and, as the report admits, it would seem very challenging to explain the patterns that are presented. Indeed the report recommends further research that aims at “*a detailed set of poverty profiles*” and that includes “*a poverty mapping exercise*” (p xv). Clearly the identification of geographical areas of key concern would require a more consistent and more convincing picture over time.

## 2 Other results of particular interest for analysis of poverty

The report contains many more results that are pertinent to an understanding of poverty patterns and poverty dynamics in Mozambique. Most of the work concerns a further poverty analysis of the IOF08 survey data beyond the food consumption section and of a wide range of other survey data as well as price data and national accounts.

The study includes an analysis of poverty based on child malnutrition, access to health and education, quality of housing, ownership of household durables and of agricultural assets. In particular, the following comparisons are made:

- i) Child malnutrition (IAF96; DHS03, MICS08; IOF08)
- ii) Human capital and access to health and education (IAF02; IOF08)
- iii) Housing and household durables (IAF02; IOF08)
- iv) Farm size, livestock, agricultural production (TIA02; TIA08; IOF08)

Indeed these are all vital aspects of poverty. A detrimental outcome in each of these fields can be seen as both a cause of poverty (e.g. health and education are prerequisites for productive employment) and an effect of poverty (e.g. sufficient earnings are a prerequisite for buying household durables and expanding livestock).

The report shows that these various poverty indicators show mixed progress. For example, improvements in child malnutrition are observed, but are quite small (Figure 3-11). There is considerable progress in the access to education (Figure 3-2 and 3-3) though the falling rates of return indicate that there are also concerns about the quality (Table 12-5 to 12-8). In some parts of the country, the access to health facilities and to safe water has also improved (Figure 3-4 and 3-5), while housing quality and ownership of household durables has also improved, particularly in the South (Table 8-1 and 8-2). At the same time, the progress in agricultural is none with an increasing population pressure, very small farms, low fertilizer use and significant decreases of pesticides, irrigation and credits (Table 12-4).

A final distinct contribution of the report that should be mentioned concerns the macro-analysis (Chapter 7). For the purpose of simulating the economy, a CGE-model used. The model is briefly described in Section 7.1, with some additional assumptions given in Section 7.2.2. It features sector details (56 sectors) and three types of labour, while capital and agricultural land are the two additional factors of production. The CGE model has 2003 as its base year and, with a few exceptions, the simulation results are well in line with the assessment of poverty based on the IAF02 and IOF09.

### 3 Strengths of the report

The report looks at poverty from many angles, following the transition from the mere monetary concept that was used in PARPA I to a much more holistic concept used in PARPA II (p. 78 “*A key underlying theme of this report is that poverty is a multi-dimensional concept*”). The broader view defines poverty as “*the impossibility, due to incapacity or due to lack of opportunities of individuals, families and communities to attain minimum living conditions according to basic societal norms*” (p. 3). Clearly, this definition takes on board the various poverty measures briefly discussed above.

The report is particularly well articulated in this respect. IOF data are put side by side to a wide variety of other data sources that reflect various aspect of poverty. The technical work is outstanding and the cross-referencing between the text and the tables and figures is excellent.

The main outcome of the survey is clearly presented, namely that poverty reduction has stagnated in spite of sustained economic growth, while there is no clear evidence that inequality has increased. Efforts are made to explain this and the hypothesis that the stagnation is mainly due to external factors such as (idiosyncratic) weather and price shocks is brought to a test with a macro-economic simulation model. The test results in a baseline poverty rate of 45.7% in 2009 and “*This is essentially the same as the level targeted by PARPA II*” (p. 68). The various scenarios reconfirm the analysis of the IAF02 and IOF08 survey earlier in the report with large adverse effects of high fuel prices and low rainfall (Figure 7-2). The simulated poverty rate under price and weather shocks is remarkably close to the survey estimates, just a minor 0.4 per cent point lower. For sure, the underlying assumptions might play a role here, for example that “*growth rates of labour and land are exogenously imposed*” (p. 61) and that “*labour is fully employed and mobile across all activities*” (p. 63), an issue which goes beyond this quick appraisal.

### 4 Robustness of the main result and possible alternative explanations

After reading the report, one may be left with the impression that both the main outcome as well as its interpretation would require further analysis. Such additional analysis seems warranted in order to explain the observed poverty patterns and poverty dynamics in Mozambique with more confidence and more consistency. The research would need to look into two major aspects.

First, the outcome itself could be partly an artifact of the data collection and data processing.

- i) Severe underreporting of food consumption: How can the calorie content of the food be below 800 Kcal per capita per day for over 20% of the households?
- ii) Use of local food basket and local prices: Are we comparing apples and oranges? Do spatial prices reflect transport cost only or also quality aspects?
- iii) The use of an alternative poverty line based on a national consumption pattern and more modest spatial price variation could have major implications for the poverty head counts and the poverty dynamics. In particular, a re-estimation of per capita (food) consumption in IAF97, IAF02 and IOF08 that also takes account of the quality of the diet could result in a entirely different picture than the one appearing from Table 3-5 and Table 10-1. The observation that the northern and rural parts of the country do relatively well as compared to the southern and urban parts could well turn into the reverse.

To address these issues, the methodology outlined in Chapter 10 (especially in section 10.1, pp. 80-84) needs to be tested further and possibly adapted in order to improve the consistency of the poverty patterns over time as well as over the various population groups, provinces and districts.

Regarding data problems, the report on page (p. xiv) states that “*poverty levels are likely to be overestimated by approximately 3 percentage point*” and that the “*trends in poverty over time are broadly robust ...*”. At the same time and on the same page the report warns that “... *emphasis should not be placed on the precision of poverty estimates at the provincial level*” (see also the discussion in section 8.2 of the report). The report continues with saying: “*Nevertheless, the broad spatial pattern of changes (i.e., improvements in the North and South, worsening in the Centre) is confirmed by other data sources*”. This quick appraisal has found limited evidence to fully support these conclusions. To mention just a little example, consider the provincial figures on housing quality in Table 8-1. Taking population weights, see the Table in annex, it appears that electric lightening is highly concentrated in the South and practically all improvements between IAF02 and IOF08 took place in the South, where an additional 15 out of every 100 households got access to electricity, bringing the coverage to 33 per cent. Both in the Center and in the North only about 4% had electric lightening during IAF02 and the increase between the survey periods was only 3 per cent points.

Second, if one accepts the outcome as it stands, the proposed explanation can only be part of the storyline. The test of the hypothesis that the stalling poverty reduction is mainly caused by external factors (weather, international food and fuel prices) is not entirely convincing. Slow growth in food production is also mentioned, but the investigating of the underlying reasons receives little attention. Therefore, other hypotheses would need to be brought to a test, especially because the sustained productivity growth in the family agriculture sector is “*the principal missing element in the current development process*” (p xiv). For example:

- i) Could the outcome reflect a dual economy with a small group (who are not represented in the survey) that captures most of the income growth?
- ii) If the dual economy is part of the story, how would that relate to the capabilities of the government to make public investments and implement redistributive social policies that are conducive to pro-poor growth?
- iii) It would be worthwhile to investigate the reasons why the household survey appears to be a poor instrument to measure inequality in the country (section 6.3).

## 5 Recommendations

The report “Poverty and wellbeing in Mozambique: Third national poverty assessment” is a thorough investigation into poverty along many dimensions. Nonetheless Yet, as indicated in the report, additional research is called for (p xv: “*These include a detailed set of poverty profiles, including an analysis of the ultra-poor, a poverty mapping exercise, benefit incidence analysis and an extended analysis of infant nutrition.*”).

From this quick assessment two principal reasons stand out that warrant such a deepening of the analysis. First, the results presented are sometimes unexpected, especially regarding the depth of poverty in the various parts of the country and the extremely high volatility in the poverty rates at the level of provinces. The report admits that there is a need to investigate this issue further and this need for a consistent poverty assessment that is more specific than just the aggregate is particularly urgent in view of policy analysis and policy evaluation, down from the national level to the level of the various population groups, provinces and districts.

The aggregate outcomes might mask a certain controversy regarding the effectiveness of government policies and, more general, the appropriateness of Mozambique's development model. In that regard the sustained donor assistance and the accumulating loans from abroad are noteworthy. These have helped Mozambique to implement macro-economic stabilization and growth policies as well as poverty reduction programmes ever since the civil war that ended in 1992.

Yet, the reliance on foreign aid and foreign capital is not without cost. For example, in 1998 Mozambique became the 6<sup>th</sup> country eligible for debt relief under the Highly-Indebted-Poor-Countries initiative which now covers some 30 countries. Currently, the lion's share of the government budget is financed through donor assistance and the efforts of the government to reduce this dependency by broadening the tax base have largely remained void. By the same token, there are concerns about the capability of the government to effectively invest in public goods (esp. rural infrastructure) and to implement redistributive social policies that are conducive to pro-poor growth. As indicated, the result in the report might reflect a dual economy with little attention to growth in (small-scale) agriculture and a small part of the population in the South that benefits disproportionately from growth. In that model, the trickle down to the poorest is minimal and the risk of rent seeking by the elite is maximal. Finally, the level of foreign involvement in development may also limit the room for maneuver to develop policies that deviate from the (neo-classical) recipes of the donor community. For example, rural subsidy programs in Mozambique are rare, but as the recent experience with fertilizer subsidies in Malawi has shown, these can be a major source of agricultural growth.

This brings us to the second reason why the report's warrants additional research. The report's explanation of the standstill of the poverty reduction in the period 2003 to 2009 is not entirely convincing. Because it overemphasizes external factors such as idiosyncratic shocks of the weather and of world market prices. There is room for exploring alternatives and for putting more emphasis on the internal factors that may explain failures and successes in the various parts of the country. A case in point here is the productivity growth in the smallholder agriculture which is "*the principal missing element*" and could reflect certain biases in the current development process.

It goes without saying that a re-assessment of national and provincial poverty patterns along with an increased attention to political economy aspects could have important implications for the evaluation of poverty reduction strategies.