



**'Capabilitizing' the Poverty Challenge:
*the case of Mozambique***

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Abstract

This paper deploys Amartya Sen's Capabilities Approach (CA) to evaluate and re-estimate multidimensional poverty in Mozambique. Sen's conceptual notion of poverty as unfreedom is applied in two ways: firstly, to critique the official unidimensional consumption based poverty measure adopted in PARP III, Mozambique's Poverty Reduction Action Plan 2011-2014. And secondly, to re-estimate multidimensional poverty quantitatively, by utilising Sabina Alkire's and James Foster's "Counting Approach", the methodology utilised for the Oxford Poverty & Human Development Initiative/United Nations Development Programme's Multidimensional Poverty Index (MPI), re-adopted and tailored for the country case Mozambique.

Aside from the point that poverty is unidimensionally measured in terms of consumption whilst defined as a multidimensional phenomenon, the paper challenges the 'food poverty' measure on three fronts from a capabilities point of view: 1. the measure neglects accounting for consumption of commodities supplied by public sector; 2. the measure confuses caloric intake with nutrition (inter-individual conversion factors); 3. the measure conceals rather than discloses areas for policy action (inter-societal conversion factors).

Following the re-estimation of multidimensional poverty with Alkire's and Foster's "Counting Approach", the main finding of the paper is that the official Mozambican poverty headcount ratio of 54.7% - the estimation of the percentage of the population living in poverty used as the headline figure to direct legislative policy - is one that is set to low. The "counting approach" reveals that 98.1% of Mozambicans have to be considered of being multidimensionally poor (which is even approx. 20% above the MPI result for Mozambique (79.3%)). The measurement operates with data from the Core Welfare Indicators Questionnaire QUIBB, and uses information from the Poverty Observatory for the selection of poverty dimensions and indicators.

Keywords: Poverty measurement, Capability Approach, Multidimensional Poverty, Multidimensional Poverty Index

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Introduction

Mozambique is a country that – despite a stable annual GDP real growth rate of approx 7.2% over the last decade - is riddled with poverty, measured both in GDP per capita and human development terms (with US\$1100 in 2011, Mozambique is ranked 212/226 countries worldwide in GDP per capita terms and 184/187 on the 2011 Human Development Index). On the other hand is it a country that has been hailed by the World Bank for its vehement reduction in poverty levels: “poverty declined rapidly in Mozambique over the 96/97-02/03 period” (Fox et.al, 2005: 2), or “poverty fell significantly between 1997 and 2003” (Fox et al., 2008: 4), reports stated. How is this possible? This chapter sets out to meaningfully critique the way poverty is measured in Mozambique, by analysing the measurements usefulness against the capabilities framework of Amartya Sen, which is implicitly the philosophical base of the country’s poverty definition used in the government’s Poverty Reduction Strategy Paper (PRSP). Considering the influence measurement techniques have gained on directing policies, and to judge progress’ made on reducing levels of absolute poverty, it concludes with a call to – at a minimum - complement the current unidimensional poverty measure with a *multidimensional* measurement application, one that shall allow the better crafting of policy responses to fight poverty defined as “capabilities deprivation”¹.

1 Measuring poverty in Mozambique: A critique

In Mozambique’s current and previous Poverty Reduction Strategy Paper PARP III 2011 - 2014 and PARPA II 2006-2009 (*Plano de Acção para a Redução da Proeza (Absoluta)*)², poverty is defined as a “multidimensional phenomenon”, as the lack of “capacity or (...) opportunity [for individuals, families, and communities] to gain access to minimum living conditions according to the basic standards of society” (GdM, 2011: 4; see also GdM, 2006: 8)).

This definition follows *implicitly* the logic of Amartya Sen’s capabilities concept, one which perceives poverty as a multidimensional phenomenon: poverty understood as the absence of some *basic capabilities*; which is a minimum set of “real opportunities”, people need to live the life they value (Sen, 1987: 36).

Sen famously argued that seeking equality of income or consumption, the traditional proxies of development within welfare economics and utilitarianism, is a misleading

¹ The paper is based on my PhD thesis “‘Capabilitizing’ the Poverty Challenge: The Case of Mozambique”, defended in January 2012 at the Interuniversity Institute of Social Development and Peace of the University Jaume I, Spain. Chapter 1 is derived from Vollmer (2010).

² The PARP 2011-2014 is the continuation of PARPA II 2006-2009 (which was extended to 2010) (GdM, 2011: 4). Subsequently the paper refers to PARP(A) or PARP(A) II(I).

informational base to judge development and poverty. Various “inter-individual” and “inter-societal” conversion factors, such as personal heterogeneities, social norms, customs and conventions, as well as environmental diversities, *inter alia*, can prevent the successful translation of commodities (or means, such as income and consumption), into functionings (or ends, such as being well-nourished). Functionings are defined as plural achievements (beings and doings) of value, e.g. being well-nourished, employed, clothed or literate. To ensure this, policy makers and their partners in development (public and private institutions) ought to focus on enhancing and equalising people’s capabilities (real opportunities or instrumental freedoms), by improving the provision of, among others, economic facilities, social opportunities, political rights, transparency guarantees and protective securities. If this is ensured, a person can live out their full agency freedom (Sen, 1999: 19, 38-40).

Post hoc, with poverty being acknowledged in PARPA II as “a multidimensional phenomenon, there is no single indicator that can capture all its manifestations” (GdM, 2006: 8).

Against this assertion it comes as a surprise that the same and subsequent PRSP operates with very “traditional” ways to measure poverty. What is used is the unidimensional headcount ratio, the poverty gap and the squared poverty gap, measuring consumption levels within the family unit. Of particular relevance for policy guidance is the headcount ratio, which reports the percentage of the population that falls below a poverty line, one that is usually related to income and is conventionally measured by total household consumption (Fox et. al, 2005: 1).

The National Directorate of Planning and Budget (DNPO) of the Ministry of Planning and Development (MPD), the government’s key institution for poverty measurement, appraisal and monitoring, has chosen to base PARP(A) II(I) on a consumption-based assessment of poverty, one in which

the basic minimum conditions were identified on the basis of an absolute poverty line measured in monetary terms that permits the family unit to obtain a basket of goods corresponding to a basic standard of living (GdM, 2006: 10).

With this measurement approach applied, the headcount ratio fell from 69% to 54.1%³, based on the comparison of the two family consumption surveys IAF (*Inquérito aos Argados Familiares*) from 1996-97 and 2002-03, in both rural and urban areas of Mozambique (the data was collected by the National Statistics Institute (INE). These household surveys contain information on expenditure for a random sample of 8700

³ The national poverty threshold in Mozambique is 18 meticaís, approx. US\$0.65.

households (DNPO, 2004: 2). This figure is used to guide policy action, and as a headline to judge joint governmental and international community efforts regarding their poverty reduction strategies and policies. It resulted in the World Bank stating that “poverty declined rapidly in Mozambique over the 96/97-02/03 period” (Fox et.al, 2005: 2; in adapted formulation also in Fox et al., 2008); it allowed the IMF to conclude in their PRSP Annual Progress Report and Review of the GdM’s Economic and Social Plan for 2003 that: “After all, it can be said that the PARPA central objective of reducing poverty incidence to less than 60% of the population by 2005 had already been met” (IMF, 2004: 22); it allures researchers to believe that “absolute poverty has fallen rapidly” in Mozambique (Virtanen and Ehrenpreis, 2007: 1); and it puts the international community on the fallacious path to believe that Mozambique is on track to meet the MGD on poverty and hunger (MDG 1):

Significant achievements have been recorded in Mozambique, particularly within the context of poverty reduction; with incidence rates dropping from 69 percent in 1997 to 54 percent in 2003. PARPA II sets out clearly the government’s commitment to reduce the incidence of poverty from 54 percent in 2003 to 45 percent by 2009. This path puts the country on track to reach the MDG on poverty and hunger (MDG 1) (United Nations, 2008).

PARPA II’s self-set target to further reduce the poverty headcount from 54% to 45% by 2009 (GdM, 2006: 1), has not been met according to the third poverty assessment which reports basically a stagnation/slight increase of the headcount at 54.7%⁴ (MPD and DNEAP, 2010: xi – xii)⁵.

In the analysis to follow I aim to highlight the discrepancy between the definition of poverty used in PARP(A) II(I), against the chosen way to measure poverty. It will be argued that the discrepancy results in the drafting of policies that are not as useful as they could be in alleviating poverty defined as the deprivation of some basic capabilities.

1.1 Poverty as a lack of consumption: Measuring around the problem

PARP(A)’s consumption-based assessment of poverty operates with poverty lines that were defined in a way that attempts to reflect the wide variations in prices and consumption patterns throughout the country (Hanlon and Smart, 2008: 61).

⁴ The third poverty assessment relied on data of the 2008/09 household budget survey IOF (*Inquérito ao Orçamento Familiar 2008/09*), which, despite “some small differences in the designs of the questionnaires”, is basically “very similar to the two earlier household surveys” with “their main objective, which is to measure consumption poverty at a given point in time” (MPD and DNEAP, 2010: 2). With regard to the methodology used to measure poverty, the third poverty assessment used essentially the same approach to measure poverty than the first and the second (MPD and DNEAP, 2010: 80).

⁵ PARP III sets out “to reduce the incidence of food poverty from the current level of 54.7 percent to 42 percent by 2014” (GdM, 2011: 4).

Yet, what counts as consumption and what is *actually* measured is determined by definition. Contained in the measurement is the “the total value of consumption of food and nonfood items (including purchases, home-produced items, and gifts received), as well as imputed use values for owner-occupied housing and household durable goods” (DNPO, 2004: 4).

The valuation of the different components of consumption (and income respectively) is done at *market prices*. What’s problematic here is that monetary values could have, in fact, been imputed into the measurement for items and services as well that are not valued through the market, e.g. subsistence production and public goods (Glewwe and Grosh, 2000 in Ruggeri Laderchi et.al, 2003: 6). This can be done through approximation of expenditure data, at times with adjustments for the use of services from durables (Ruggeri Laderchi et.al, 2003: 8). Due to claims by the DNPO of econometric-quantitative limitations however, two important components of consumption, at least from a capabilities perspective, were omitted from the measurement in Mozambique: the “consumption of commodities supplied by the public sector free of charge (or the subsidized element in such commodities) and consumption of home produced services” (DNPO, 2004: 4, fn. 4; MPD and DNEAP, 2010: 81).

In other words, the provision of public goods, defined as goods that are non-excludable and non-rival (as in opposition to private goods whose ownership can be transferred and contested (that is, a good consumed by an individual cannot be consumed by somebody else)), are not included in the consumption measure, as the IAF data do not permit quantification of these benefits. Examples would include streets, schools, public markets or water taps, the environment (including clear water, clear air, *inter alia*), defence and law enforcement, among others.

Thus, even though these goods will most likely enhance the well-being of an individual who is using those facilities, it is not accounted for in the measurement. Additionally, home produced services, such as cooking and cleaning, also add to a person’s welfare; yet, the IAF data permits neither quantification of those benefits. They are excluded from the consumption measure as well (DNPO, 2004: 4).

From a capability perspective, this is problematic in several ways: firstly, policy-makers will lack incentive to invest in and protect public goods, which is crucial for the enhancement of several “instrumental freedoms” (such as the creation of economic and social opportunities, i.e. through investments in public infrastructure, schools and health systems, *inter alia* (Sen, 1999: 38-40). That is, because their impact will not be felt in *numerical*

terms⁶. Secondly, the identification of the poor for “evidence-based” targeting may favour those lacking *private* resources. This will favour a market and private sector driven development model, against one that rather follows support-led processes and opportunities expansions, the latter the more appropriate choice within the capabilities framework for low human development countries (Sen, 1999: 35-36; 46). Hence, the measure tends, on the grand scale, to set incentives for policy actions that are based on a competitive market ideology “in favour of the generation of private income as against public goods provision, and similarly, a bias in the identification of the poor for targeting purposes towards those lacking private income” (Ruggeri Laderchi et.al, 2003: 8 -9).

1.2 Applying the “Basic Needs Approach” to set poverty lines: Confusing caloric intake with nutrition

To determine region-specific poverty rates for each of the 13 areas of the country, Mozambique’s first, second and third national poverty assessment (MPF et.al, 1998; DNPO, 2004; MPD and DNEAP, 2010) chose the cost of basic needs approach (CBN). The CBN differs to other models used within the consumption-based approach for the determination of poverty lines, such as the food energy intake, in the sense that it “does not suffer from the problem of inconsistent poverty comparisons”, as claimed by the DNPO (2004: fn. 6). Poverty lines within the CBN approach were constructed

as the sum of a food and non-food poverty line. Once the poverty line has been constructed, households that spend less on a per capita basis than the poverty line are deemed poor (...). They are set in terms of a level of per capita consumption expenditure that is deemed consistent with meeting these basic needs (DNPO, 2004: 4-5).

Hence, each poverty line was set

as the sum of the nutritional poverty line established by nutritional standards of approximately 2,150⁷ calories per person per day, plus a modest portion for non-food expenditures, determined on the basis of the portion of the budget spent on non-foods by families whose total consumption is approximately equal to the food-related poverty line. The poverty analysis in 2002-03 was

⁶ In his analysis of the way poverty is measured and assessed in Mozambique van den Boom uses the same line of argumentation to highlight that the current ‘food’ measure creates an urban poverty bias: “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” (2011: 17).

⁷ In the 2008/09 IOF, the average is 2,144 kilocalories daily per capita (MPD and DNEAP, 2010: 82)

done to facilitate a comparison of the results from that period with the results from 1996-97 (GdM, 2006: 10).

For each of the 13 areas a “food basket” was defined, that aimed to reflect actual consumption of people close to the poverty line. The bundle for the 1996/97 survey covered 151 food commodities, the bundle for the 2002/03 survey only 20 to 30 items, which, nevertheless, accounted for 95% of the value of food consumption in 1996-97 (DNPO, 2004: 8). The food poverty line was then expressed in region specific monetary costs per person per day for meeting the minimum *caloric* requirements when consuming this food bundle (DNPO, 2004: 6)⁸.

The non-food poverty line was derived by examining the non-food consumption among those households whose total expenditure is equal or close (80% to 120%) to the food poverty line (DNPO, 2004: 14-15; MPD and DNEAP, 2010: 82). Spending on non-food items such as clothing ranged between 18% of the total budget in rural Mozambique to 32% in some urban areas in 1996/97 (Hanlon and Smart, 2008: 61). For the 2002/03 survey the non-food spending was not specified in the DNPO.

By combining both poverty lines into one for each area, 69% of the population (11.7 million people) were classified “poor” based on the first IAF for 1996/97, and 54% (10 million) for the 2002/03 survey (Hanlon and Smart, 2008: 61).

The results of the DNPO are contested in the sense that the high fall of 15% in the headcount ratio is based on the use of a “flexible food bundle”, one that takes the substantial relative price changes that occurred between 1996/97 and 2002/03 in all spatial domains into account. As of these price changes, low-income households have incentives to change their consumption choices to take advantage of goods with relatively low prices and avoid goods with relatively high prices (DNPO, 2004: 9). The stark increase of maize prices for instance forced the poorest sections of Mozambique to switch to the cheaper *cassava*, which is problematic because cassava is less nutritious than maize (Hanlon and Smart, 2008: 62).

As this consumption-based measurement does not take nutrients other than calories into account (such as iron, proteins, vitamin A, B, C, among others), the change in the type of food remains non-accounted for as long as the *caloric* intake remains the same. Critics have identified this measurement weakness (Hanlon and Smart, 2008), which is indeed acknowledged in the DNPO report as an econometric problematic limitation (2004: fn. 9).

⁸ In the 2008/09 IOF, “food items are identified that account for 90% of food expenditure among the poorest 60% of the population. These bundles represent about 95% of the calorie requirement” (MPD and DNEAP, 2010: 82)

It can be named as the main reason why officially the poverty headcount in Mozambique can decline between 1997 and 2003 (defined by caloric intake), while chronic (child) *malnutrition* was on the rise for the same time period (Hanlon and Smart, 2008: 60, 62). Indices of chronic malnutrition in children under the age of five are still extremely high in Mozambique, at approx. 44% in 2010. Between 2001 and 2003, child malnutrition declined by 3.6% in rural areas, with a small increase in urban areas (0.4%). Overall though, the number of chronically malnourished children rose from 36% in 1997 to 41% in 2003, turning Mozambique into a country with the highest rates of child malnutrition in Africa. It is estimated that approx. 1.3 million children are chronically undernourished (DARA, 2009: 2). UNICEF argues that chronic child malnutrition can act as a well suited reference indicator for the general well-being of a population (Dupraz et.al, 2007: 94).

Based on the comparison of caloric vs. energy intake, Hanlon and Smart criticise the DNPO measurement procedure, stating that “though the flexible food bundle reflects what the poor are buying, it is not of the same nutritional quality; it is not the same poverty line but a lower one” (2008: 62).

Instead, a “fixed food bundle” should have been used in order to establish consistency in (absolute) poverty comparisons. If this is done, the reduction of the headcount ratio between the surveys is only at approx. 6 % (69% to 63%), which would mean a net increase of people living in poverty from 11.2 million to 11.7 million (the increase in total figures is due to a population rise between the two surveys from 16,099,246 in 1997 to 19,607,519 in 2002) (CIA, 2003)).

The DNPO defends the switch by stating that “fixed food bundles tend to overstate the cost of attaining that standard of living, as alternative bundles that yield the same utility are available at a lower cost” (2004: 9). And further,

if the relative prices of food vary regionally, the comparability of welfare levels across regions is only an illusion, and the use of a single consumption bundle for all regions can generate inconsistent poverty comparisons (2004: 7).

Following this reasoning the poverty line would have been set too high with a “fixed food bundle”. As outlined above though, this reasoning excludes the type of diet poor people are dependent on, and thus overstates the importance of caloric intake. Hanlon and Smart’s criticism has thus a valid core; however, as shall be seen, the operation with “flexible food bundles” satisfies Amartya Sen’s demand to operate with “differences in relational perspectives” (to be outlined in the next sub point), which relativizes this argument.

In sum nevertheless, whether the measurement operates with “flexible” or “fixed” food bundles⁹, the core weakness of any consumption-based measure, defined either by caloric intake or based on food energy, is its inability to account for the physical condition of individuals to convert available food into a well-nourished diet (or to use the capabilities terminology, to convert commodities as means (caloric intake) into functionings as ends (being well nourished)).

1.3 Main limitations of PARP(A)’s unidimensional measure: Disclosure vis-à-vis concealment

Any quantitative measurement presents “an integrated view of situations” (OPHI, n.d.: 1) and is operating with value judgements and arbitrariness’ to define some fundamental issues in a comprehensive manner. By nature, they reduce the complexities of poverty in order to produce econometric and statistically sound results. Thus, each measurement needs to be critically examined in two ways: it requires analysing the information it actually provides, to be triangulated with the search of information it (deliberately or non-deliberately) obscures.

For instance, if poverty is defined in absolute terms in relation to consumption, as happened with the IAF/IOF surveys, it is likely to some extent that poverty is

relative in income terms, since in richer societies people generally need more money to acquire the same nutrition – as cheaper foods are not available, transport is needed to shop, and so on (Ruggeri Laderchi et al., 2003: 5).

This has been identified by Amartya Sen as a conversion factor in the translation of commodities into achieved levels of functionings, and refers to the “differences in relational perspectives” (1999: 71). In other words, by using “flexible food bundles”, the ‘food’ poverty measure is indeed sensitive to “inter-societal” variations with regards to commodity translations; yet it is insensitive to “inter-individual” variations, as of the non-accounting for of other nutrients needed (other than caloric intake) to achieve a healthy diet.

⁹ Van den Boom highlighted correctly that, on the pro side of the use of the flexible bundle, it is indeed problematic to assume that the same expenditure level would not result in either more or less consumption depending on whether the person lives in an urban or rural area. Yet, the detriment of the flexible bundle is the loss of consistency and robustness in the poverty findings. With the use of the flexible bundle it occurred that the province Sofala, for instance, appeared to be the poorest province in 1997 (poverty headcount 88%), the least poor province in 2003 (36%) and an averagely poor province in 2009 (58%). These results are highly counterintuitive (2011: 7; 16). Van den Boom concludes that “[t]he 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 (...). 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” (2011: 43).

Having said this, the “inter-societal variation” is only partly accounted for, as other important information in relation to relative resources in the socio-economic/ political environment are not incorporated. For instance, according to the reliable online source *NationMaster*, historical data from between 1996 and 2008 (which constitutes at the same time latest data available) shows that out of Mozambique’s total 30,400 km roads network, only 5,685 km are paved, which severely limits the capacity to transport road goods. A total of only 110 million tonnes/km were transported in 1996, thereby ranking Mozambique 69/76 in worldwide country comparison (*NationMaster*, nd.).

Additionally, Mozambique’s total railway network amounted to 4,787 km in 2008 (ranking it 36/149 worldwide), allowing goods to be transported in the realm of 695 million tonnes/km (ranking it 80/108 worldwide). This correlates to a capacity utilisation of 0.033 million tonnes/km per 1000 people, which was severely below the weighted average of 1.2 million tonnes/km per 1000 people of 107 countries ranked. Per capita (expressed per 1,000 population), this places Mozambique 83/107 in worldwide comparison (*NationMaster*, nd.).

Thus, goods which cannot reach most of rural Mozambique, where 70% and hence the majority of the country’s poor live, are goods not available for consumption. Also problematic is the lack of suitable infrastructure in rural areas, which adds to the costs of farming. As outlined in a report by Mole, who conducted a Micro study on Smallholder Agricultural Intensification in Mozambique, transportation costs “increase transaction costs to market for both inputs and produce. High transaction costs result mainly due to poor links between production areas and consumption markets” (2006: 11).

Another important aspect to consider when consumption is used as an indicator for poverty is to assess technological achievements. These are suitable signifiers for judging governmental and private sector efforts in the R+D of (and actual distribution or real access to) new agriculture technologies, such as fertilisers and seeds, indispensable for the increase in food production. Here, UNDP’s 2001 “Technology Achievement Index” (TAI) is useful, which measured

how well a country is creating and diffusing technology and building a human skill base, reflecting capacity to participate in the technological innovations of the network age. The TAI focuses on four dimensions of technological capacity: creation of technology, diffusion of recent innovations, diffusion of old innovations, human skills (*INSME*, nd.).

Out of 72 countries ranked in the TAI (for which relevant data was available and of acceptable quality), Mozambique achieved a score of 0.066, and was placed last. The authors

of the study state that scores below 0.20 indicate a marginalisation of the country, indicating that “technology diffusion and skill building have a long way to go in these countries. Large parts of the population have not benefited from the diffusion of old technology” (Desai et al., 2002: 112).

This assessment has been somewhat verified by the aforementioned study conducted by Mole, whose survey of 398 households across Mozambique revealed that approx. 74% “had no cash outlay on seed in the year preceding the survey. The majority of the households in rural areas exchange seed from past harvest among themselves” (2006: 12). The survey revealed further that only 4% of smallholder farmers obtain seed via the market, that land preparation services by tractor or animal traction are in most parts of the study non-existent, and that only a few farmers have the ability to use fertilisers and pesticides (2006: 11-12).

Thus, one of the main problems of increasing agricultural production in Mozambique is the lack of inputs in the form of seeds and fertilizers, and poor market access. As a result, “the likelihood for increased incomes to improve access to food and reduce poverty is low” (Mole, 2006: 52)¹⁰.

These “inter-societal” conversion factors, or “real unfreedoms” in the terminology of Sen, are important types of information if poverty is understood as “capabilities deprivation”. That is, because they are barriers in people's “agency freedom” which need to be removed, strictly speaking. Yet, PARP(A)’s measurement does not help in revealing these areas of necessary policy action; on the contrary, it conceals them with its narrow and unidimensional focus on caloric intake as a proxy for consumption. Hence, what is undoubtedly needed is a meaningful multidimensional measurement that better captures PARP(A)’s multidimensional poverty definition.

1.4 Matching measurement with definition - A call for revision

This chapter has highlighted the problem that the applied measurement of poverty in Mozambique conceals, rather than discloses necessary areas of policy action. Researchers and analysts should aim to find and successfully apply a multidimensional measurement that actually helps to analyse *real opportunity provisions* for impoverished Mozambicans, in order

¹⁰ The 2008 rural income survey TIA (*Trabalho de Inquérito Agrícola*, implemented by the Department of Statistics of the Ministry of Agriculture) confirms this observation. According to the third national poverty assessment, the TIA reveals that “all indicators concerning access to and use of productivity-enhancing inputs, such as pesticides and fertilizers, show no unambiguously positive trends. From 2002 to 2008 the share of farming households receiving extension information appears to have declined from 13.5% to 8.3%. Similarly, use of pesticides fell from 6.8% to 3.8%. Even ignoring these trends, the absolute levels of these indicators are very low and point out that the vast majority of farming households continue to use almost no modern inputs or irrigation technologies to support production. Consequently these households are extremely exposed to the vagaries of climatic variation” (MPD and DNEAP, 2010: 47).

to better guide policy makers and development actors with regard to Sen's capability approach, which is engaged with the attempt to *explicitly* achieve individual well-being, context-specific defined, by switching the focus from means (such as consumption in form of caloric intake) to ends (such as being well-nourished, which remains one functioning among others nonetheless).

Measuring poverty is certainly meaningful; but only if it helps guiding policies to achieve self-set standards. The official unidimensional poverty measurement is of minimal help in alleviating the kind of poverty in Mozambique as correctly defined in PARP(A) II(I)¹¹. And indeed, a close scrutiny of PARP(A) II(I) reveals a policy orientation that remains neo-liberal, monetarist and supply leaning, as it seeks macroeconomic stability through fiscal discipline, the creation of a free market and favourable market conditions for Foreign Direct Investments (FDIs) and the private sector (GdM, 2011: 29; GdM, 2006: 118-119)¹². Certainly, causation between poverty measurement and policy response cannot be claimed; but neither can be a correlation denied¹³.

Because of this rationale, a measure is needed that – at a minimum – complements the official 'food poverty' measure, a measure that sets incentives more directly to create the pro-

¹¹ In analyzing poverty in Mozambique, van den Boom describes his unease with the food poverty measure the following: "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. (...). [By looking at HIV/AIDS in Mozambique], [t]he picture is illustrative of the risk of using the consumption poverty status of the household as the guiding principle for poverty analysis. Indeed, using the above poverty patterns, there is no clear correlation [of consumption poverty] with the incidence of HIV/AIDS" (2011, 26).

¹² The MPD explains the stagnation in the poverty reduction between 2003 and 2008 predominantly with reference to external factors, such as weather and price shocks (of food and fuel in particular). However, some commentators, such as Canguera and Hanlon (2010) or van den Boom (2011) also point out that endogenous factors are likely to be blamed, such as the current neo-liberal development policy and – despite the rhetoric applied in PARP III - the inadequate emphasis on smallholder agricultural production and job creation (see also Paulo, et al., 2011).

¹³ Van de Boom hints towards such a correlation as well in his assessment of the food poverty measure (or at least he hints towards the apparent mismatch of how poverty is measured in Mozambique and the government's policy responses to alleviate poverty). He concludes that "the aggregate outcomes [of the food poverty measure] 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. (...) 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 [the third national poverty assessment] 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. (...) 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." (2011: 45)

poor possibilities people need to live out their full potential as active agents capable of improving living realities for themselves. Possible actions include, among others, prudent *public expenditure policies* that focuses on the development of “public infrastructure in the field of transport, communication and energy”, and a *proactive tax and incentive policy*, in order to mobilize investments for formal job and commercial agribusiness creation (Cornia, 2006: 20-21); far-reaching direct cash transfers to stimulate market demand, and a sharp expansion of labour-intensive public work projects, such as road and irrigation system building (Hanlon and Smart, 2008: 155-157); the “reintroduction of some type of marketing boards” to ensure fair prices of produced goods and guaranteed markets (Tvedten et al., 2009: 4); and continuous investments in education and health systems, housing and sanitation. PARP III certainly goes further than PARPA II to initiate some of these measures, e.g. subsidies to urban public transportation and productive public works programmes are – even if only vaguely outlined - now an integral part of PARP’s programme to stimulate the creation of employment, as is the promotion of “special lines of credit and guarantee funds to support small producers and economic agents” (GdM, 2011: 17; 19)). Yet, a poverty measurement that sets incentives for such useful pro-poor policy measures more directly would be certainly important to strengthen such policy action.

Finding an appropriate multidimensional measure certainly requires a very thorough debate in Mozambique; however, this paper will do its part by applying Sabina Alkire’s and James Foster’s *Counting Approach* onto the case study of Mozambique, to offer some food for thought on how the discrepancy between poverty definition and measurement in Mozambique might be tackled. Whilst Mozambique has been ranked high on the new Multidimensional Poverty Index (MPI) put forward by the Oxford Poverty & Human Development Initiative (OPHI) for the 20th Anniversary edition of the Human Development Report 2010 (the index is methodologically based on the “Counting Approach”), namely as the 11th most multidimensional poor of 104 countries ranked¹⁴, it has not been individually analysed¹⁵. Applying the measurement individually onto country cases is a crucial task though. In the words of Sabina Alkire:

¹⁴ The MPI uses ten indicators in three dimensions of poverty to determine who is multidimensional poor, namely education (years of schooling, child enrolment), health (child mortality, nutrition), and standard of living (electricity, drinking water, sanitation, flooring, cooking fuel, assets), and applies an equal weighting system for each dimension, and also applies an equal weighting system for the indicators within the dimensions. An interesting finding of the MPI is that half of the world’s MPI poor people live in South Asia (51%), and just over a quarter in Sub-Saharan Africa (28%) (Alkire and Santos, 2010).

¹⁵ So far, the measurement has only been applied individually in a few selected case studies (in a comparative study for fourteen Sub-Saharan Africa countries (excluding Mozambique), India, Bhutan, China, Latin America, such as Mexico and Colombia)

The MPI fixes weights between countries to enable cross-national comparisons; alongside this we strongly encourage countries to develop national measures having richer dimensions, and indicators and weights that reflect their context as Mexico did and Colombia is doing (see Green, 2010a).

2 Re-estimation of multidimensional poverty: Identification

For the re-measurement of poverty, to be conducted in the upcoming two chapters, it will be prudent to select meaningful dimensions and indicators of poverty, as well as a meaningful weighting system. The Counting Approach requires the conduct of two steps: an identification step (which answers the question *who* is poor) and an aggregation step (which brings together data into one indicator of poverty). The identification step requires the choice of:

1. The Unit of Analysis
2. Dimensions of poverty
3. Variables/Indicator(s) for dimensions
4. Poverty Cutoffs for each indicator/dimension
5. Weights within and across dimensions

As for the unit of analysis, this will be the household. Whilst this is certainly a divergence from Sen's individualistic CA, it was considered a necessary trade-off in the light of available data.

In the upcoming subpoints the selection process for the identification choices 2-5 will be explained. Prior to this it should be highlighted though that for the estimation of (multidimensional) poverty one distinguishes commonly between "paper-based exercises", which can be more experimental and might be bound more to normative reasoning, and "policy-based exercises". The MPI is certainly a "policy-based exercise", one which aims to influence and direct policy, and for which the selection of dimensions and variables has been rather conservative (for instance, indicators in relation to employment or political indicators are omitted from the measure. In contrast, my estimation will be more "experimental").

Hence, results of the estimation should be understood only *indicatively*, not face value. In doing so, the upcoming chapters follow what can be described as "good practice", that is to follow the necessary steps given by the OPHI to apply the "Counting Approach" (Alkire and Foster, 2008, 2009; OPHI, 2010a, 2010b), and to orientate at those steps conducted in the MPI 2010 (Alkire and Santos, 2010).

2.1 Selection of dimensions, variables, poverty cutoffs and weights

Amartya Sen's CA requires researchers to select domains of poverty depending on the socio-cultural context. To this end, Ingrid Robeyns (2003) has proposed to follow a two stage process: By applying various epistemological approaches, ranging from participatory studies to expert questionnaires (among others), an *ideal* list of poverty dimensions should be drawn and put in contrast to a pragmatic *feasible* list. This means "that only from the second stage onwards constraints and limitations related to the measurement design and data collection, or to political or socio-economic feasibility in the case of policy-oriented applications, are taken into account" (Robeyns, 2003).

The selection process requires the triangulation of existing research findings, such as those participatory ones of the Poverty Observatory (PO)¹⁶, QUIBB 2000-2001 results (*Questionário de Indicadores Básicos de Bem-estar 2000-2001* (INE, 2008)), with own reasoning. To this end, I conducted an online survey between February 2010 and April 2010, which is listed as Appendix 1. Following an introductory enquiry about their opinion about what "are the biggest challenge(s) in Mozambique's current poverty reduction efforts? Which aspects of *ill-being* do you consider the most neglected or overlooked in the public and political discourse? What do you think are the main *drivers* for poverty to arise and persist?" (Step I), the questionnaire followed Robeyns rationale of inquiring *directly* for an ideal *vis-à-vis* feasible list (Step II and III). As part of Step I it gave the respondents also the opportunity to rank what "kinds of programmes and activities they consider most important to reduce the level of absolute poverty in Mozambique" (from most important 11 to least important 1)¹⁷. The questionnaire was send out to 100 country experts using the technique of "snowball sampling". A message was placed on the 11 February 2010 on the "Humanities and Social Science Online Network" group "H-Luso-Africa" (2010). Whilst I had a response rate to my initial query in the realm of 25%, only ten responses were able to fill out the questionnaire in the end. Of these ten responses, none was able to fill out the questionnaire in its entirety. Therefore, the responses are used as anecdotal evidence only (some of the responses were followed up with a telephone interview).

¹⁶ The poverty observatory (PO), set up in 2002 to facilitate dialogue between the government and Mozambique's active civil society, deployed various participatory research methods to capture opinions of eight thousand people in Mozambique's 102/146 rural and urban districts, on their perceptions of the causes of poverty.

¹⁷ Agriculture, Education, Labour, Food Security, Health, Water, Sanitation and Hygiene, Nutrition, Gender, Emergency shelter, Social Safety and Protection, Livelihoods, Other

2.2 Ideal List of Mozambique's poverty domains

In the following an ideal list of poverty domains for Mozambique will be named. The results of the questionnaire, particularly the answers given by the participants in Step I, highlight the importance to link ill-being directly to the dimensions labour/ livelihoods, education and health. "Good governance", or the absence of small and grant corruption, nepotism and favouritism, which was directly linked to the rule of the country's predominant Democratic Party FRELIMO¹⁸, was singled out as another reason for the ill-being of many Mozambicans. In the following individual answers of the respondents will be discussed (which are kept anonymous upon mutual agreement).

According to one respondent, who conducted field research in the district *Massinga* in the province *Inhambane* shortly before participating in this research, one driver for poverty to arise and persist is "corruption" which heavily manifests peoples ill-being: "Those with some money who would like to invest in small business find the way closed by the inefficient bureaucracy and the hunger of bribe of the civil servants". The problem with civil servants (police, teachers and health workers) is that they "are very badly paid and generally treat the common citizen in a very disrespectful way". He places this in relation to the one-party rule of FRELIMO and its use of the state "to prevent other parties to grow and do their work". One major problem is the government's occupation

to show to the donor community the increase of figures without checking if they are working well. There are more schools and health units nowadays than 5 years ago, but the system works worse than 5 years ago because there has been an increase of the population and a decrease of % of teachers and doctors per person of the population.

These factors, in sum, lead to a "lack of confidence in political institutions". The money that is actually earned by the people is invested in "construction and transport", and to buy mobile phones. Buying "small technology to increase agricultural productivity" is not really done. Of further problematic is the quality of education in Mozambique: "Those young people who finish secondary level have a lot of problems to find a job". Neither does the education system prepare them well enough to be hired by private companies. Hence, "education has a very low profile in the society". In sum therefore, poverty is directly linked to high corruption levels, the (poor state of the) educational system and a lack of formal labour creation.

¹⁸ Front for the Liberation of Mozambique (*Frente de Libertação de Moçambique*).

Another respondent linked poverty in Mozambique mostly to economic determinants. With barely 10% of the workforce formally employed, mostly even under precarious contract situations, all other life dimensions are affected in the wake. In this “living reality” the question of “capital” or “assets owned” (cattle, trees, machines, offices, etc.) is crucial: “Who does not have capital is a poor man”. This includes social capital as well. How well somebody is entrenched in society determines outcomes in health, education and economic transactions. Therefore, looking at labour and assets owned is important to assess a person’s standing in society.

A “lack of employment that inhibits people to have an income, especially in urban areas” has been singled out by another respondent as well.

One interviewee named the dimensions employment (access to multiple sources of monetary income from formal and informal labour, such as agriculture and fishing, industry and mining), education (which is important but not as important as employment, as there are entrepreneurs in the country who are “street smart”), and access to health services as *the* drivers of poverty.

An interesting response was given by one interviewee who highlighted the relativity of poverty and the resulting necessity to define poverty “under some specific circumstances”. People living below the official poverty line may feel subjectively not poor because they have a big field or other assets that they consider crucial as livelihood insurance. What was considered certain though is that more positive progress would be observable in the reduction of poverty if the level of “corruption” in society was lowered, and the status of the “woman” in Mozambique were strengthened.

For another respondent the poverty dimensions of most importance are employment (30%), citizen power (20%), health (10%) and schooling (10%). For him, “citizen participation in decision making, starting from municipality level” is the way forward to increase “political freedoms”.

For one interviewee, poverty is explicitly a multidimensional phenomenon:

Various dimensions interrelate in that it is difficult to reduce one dimension of poverty without making progress in others. Development requires progress in all of these areas. Ranking them is misleading in that it indicates that one area is now and forever more important than the other in the Mozambican context.

Against this general observation however, the respondent highlighted the necessity to achieve an increase in agricultural productivity amongst smallholders: “Agricultural productivity has not really been neglected in the public and political discourse. The problem is

that efforts to enhance agricultural productivity have been ineffective”. Having access to education, on the other hand, is clearly improving. However, “this does not mean that agriculture ranks above education”. In other words, this respondent advocates for a holistic development model.

What he considers rather more overlooked in Mozambique’s poverty discourse “is the very high level of vulnerability that the large majority of Mozambican households are exposed to”. In terms of the presence or persistence of poverty, the presence is no surprise to him:

The country was poor before the civil war. It emerged in 1994 completely smashed with something like 80% of the population living in absolute poverty. Even under the most optimistic scenarios, it was going to take decades to bring poverty levels (almost regardless of how they are measured) down even to averages for Sub-Saharan Africa. Households are mired in low productivity and high risk subsistence agriculture, for which reasons they are likely to remain poor for some time.

To conclude thereby, important elements to monitor include (in no particular order):

- consumption
- assets
- employment growth in the formal sector
- vulnerability
- child malnutrition
- access to and quality of social services, particularly health and education
- agricultural productivity
- quality of institutions
- gradual maturation of the political/democratic process
- economic infrastructure.

For another respondent the question of poverty in Mozambique is complex. “Before, poverty was conceptualised in terms of a lack of income necessary to purchase basics products for survival. But now, social aspects such as social exclusion, vulnerability, lack of opportunity, etc. are important as well”. As the greatest challenge for Mozambique she considers rural-urban migration and the resulting *urbanisation of poverty*:

Many times these people live in deplorable conditions, without decent housing, water supply or energy. They face a lack of employment or activity which provides an income, precarious hygiene conditions and an unbalanced diet with little proteins. These people are the most vulnerable in terms of hunger and malnutrition.

Hence, the reduction of “urban poverty in the principal cities, such as Maputo” should be a priority.

“Corruption is the major challenge” was the answer of another participant. The absence of a strong opposition party to FRELIMO, the lack of formal employment outside of the capital Maputo, and the large divide between rural-urban settings are all “serious drivers for poverty”. This necessitates pushing forward with judicial reforms, to increase access to credit for small-scale agri-business entrepreneurs, and to improve access to markets for farmers and producers (which includes an increase in local markets build, and an improved infrastructure, particularly the building of paved roads).

The large dependence of most Mozambicans on subsistence agriculture let another interviewee to conclude that access to land and improved cultivation is utterly crucial to reduce levels of absolute and extreme economic poverty. This goes along with access to resources and infrastructure. Access to health and education, as well as fighting favouritism within FRELIMO has to be addressed in order to reduce poverty in the social and political spheres.

Aside of the answers of the participants in the questionnaire and interviews, possible poverty dimensions to choose from are also listed in the QUIBB (INE, 2008). These “Core Welfare Indicators” were taken by the INE between October 2000 and May 2001 and covered almost 14,500 households nationally, of which 13,790 were finally interviewed (in comparison the 2003 DHS for Mozambique had a sample size of 12,315 households, the IOF 08 one of 10,832 and the IAF one of 8700. Therefore, the QUIBB is considered statistically representative for Mozambique). It captured basic indicators on household composition, employment or labour allocation by sector, education, and, from a capability perspective very importantly, “access to” indicators, such as access to hospital clinics, to water and schools (Donovan, 2008). The Data files are aggregated into data on children, on households, and individuals. The dataset will be used to conduct the Counting Approach, and as base to draw the feasible list of poverty domains and variables.

Certainly, the nature of the survey inquiry, with its focus on “well-being”, outweighs the detriment fact that it was taken nearly nine years ago prior to the conduct of this study. However, this does not have a major effect on the overall estimation, for two main reasons: firstly, the dataset was published in June 2008, wherefore it should be still considered as (relatively) new and should be used; secondly, datasets up to ten years of age remain to be used in studies to estimate poverty. The authors of the MPI for instance used in absence of

newer data datasets from the years 2000-2002 for their analysis of 6 of the 109 countries studied (Alkire and Santos, 2010).

To conclude thereby and by taking into consideration the responses to the online questionnaire, the analysis of available datasets and participatory studies (QUIBB and PO), and own value judgements based on my knowledge of the country case, I would choose as an *ideal list of Poverty dimensions* the following five:

- Formal Employment/ Sufficient Livelihood
- Good Governance
- Education
- Health
- Social relations

These domains relate to the four dimensions of poverty as highlighted by the PO, namely economic, political, human and social poverty (G20, 2004), and can be singled out as the main drivers for poverty to arise and persist in Mozambique. As they interlink and complement each other, an equal weighting system appears justified (although this remains open for debate). Unfortunately, indicators/variables for these dimensions weren't successfully singled out by respondents to the questionnaire. In absence of a tailor-made dataset that directly relates to these dimensions, the "Counting Approach" has to operate with available datasets, hence has to be *opportunistic*, of which the QUIBB appears to have the greatest intersection with the ideal list of poverty domains as listed here. Therefore, the feasible list is oriented at domains and indicators as captured in the QUIBB.

2.3 Feasible List of Mozambique's poverty domains

In this section a *feasible list* of dimensions and indicators of poverty will be presented. As the study is applied at the macro level for the whole of Mozambique's eleven provinces, in order to compare poverty across the country, it is important to select dimensions, indicators and weightings which are adequate for the population as a whole (that is, for rural and urban Mozambique). To this end, the QUIBB dataset is a suitable information base as it equally covered all provinces and districts in Mozambique (the only district omitted was the *Mecula* District in the *Niassa* province). Having said this though, results of the measure will be decomposed into rural and urban areas (*Área de residência*).

The unit of analysis will be the household. Whilst this is certainly a divergence from Sen's individualistic CA, it was considered a worthwhile and necessary trade-off. The QUIBB contains useful variables on households *and* individuals, however, indicators of the household

dataset are considered more relevant in order to highlight deprivations in the selected dimensions of poverty, particularly in relation to employment and livelihoods. In addition, only the household datafile is decomposed by region and area (urban-rural), which allows for the aforementioned decomposition of measurement results. This being said though, the adoption of a simple multiplication, to be outlined in subpoint 3.2, will allow the calculation of the percentage of people living in poverty (not the percentage of households living in poverty). This is particularly important for the comparison of the measurement results with the official poverty headcount in Mozambique of 54%, which reports individual poverty.

Due to the holistic nature of the CA, as well as the usual non-specification of weights from participants to the questionnaire, an equal weighting system between dimensions as well as between indicators will be used. This results in a “nested weighting system” (to be outlined in subpoint 3.1) which shall allow that multidimensional poverty across Mozambique’s socio-ethnic levels is compared in a balanced and non-patronage way.

As the dataset does not contain any meaningful indicators on social networks and relations, *feasibly* only four dimensions of poverty are to be incorporated in the actual measurement. Together with the corresponding indicators and individual poverty cutoffs (z), these are listed in Table 1. They are placed next to the corresponding instrumental freedom(s) put forward by Sen in *Development as Freedom* (1999). As both dimensions of human poverty, namely health and education, relate primarily to the same instrumental freedoms, namely social opportunities and protective security, I chose to mould them into one dimension of poverty. This shall also ensure that their weight in a nested weighting system will not contort the finding that, as dimensions of poverty, they are not more but equally important to the political and economic dimensions of poverty in Mozambique. Hence, the Counting Approach will operate with the following three dimensions of poverty.

Table 1: Feasible List of Poverty Domains, Indicators, weightings and poverty cutoffs

Sen's 5 instrumental freedoms	Dimension	Indicators/Variables	Equal/nested weighting scale (%)	Poverty Cutoff z: Poor if
Political Freedoms/ Transparency Guarantees	Good Governance	F14	33.3 (10/3)	If ≥ 3
Economic Facilities	Employment/ Livelihood	H2 H3 F10	11.1 (10/9) 11.1 (10/9) 11.1 (10/9)	Yes/ NO YES/ NO If ≤ 2
Social Opportunities/ Protective Security	Health Education	G3 G4 G7f Heduc G7d	6.66 (2/3) 6.66 (2/3) 6.66 (2/3) 6.66 (2/3) 6.66 (2/3)	If \neq piped water inside the house If = None or unimproved latrine If ≥ 30 minutes If HH < primary degree If ≥ 30 minutes

The QUIBB (INE, 2008) will be used as data source for indicators in relation to employment/livelihoods, education and health. As it does not contain any meaningful “direct” data in relation to “political poverty”, I chose to use an indirect approach to measure “good governance”. By using the variable F14 (How often had the household problems meeting the food demand of its members in the last 12 months? *Quantas vezes teve problemas de satisfazer o AF en alimentação*)), in which households are considered poor if they had been exposed to food insecurity¹⁹, it is argued that this “food” variable hints towards the level of political freedoms in the country²⁰. This rationale relates to Sen’s writings on famines and poverty, in which he argues that famines, hunger, malnourishment and food insecurity are directly linked to “bad governance”²¹. Certainly, “food”, or “nutrition” more generally, is

¹⁹ Households are exposed to food insecurity if they had been categorized as 3 (sometimes (*algumas vezes*)) 4 (many times (*muitas vezes*)) or 5 (always (*sempre*)) having problems to meet the food demand of the household members in the last 12 months

²⁰ Initially I aimed to combine malnourishment of children under the age of five (through the Height for age ratio (or “stunting”)) combined with the BMI<18.5 of adults to assess this dimension, taken from the DHS 2003. Unfortunately, with the Counting Approach it is statistically not possible to merge two datasets, in this case the DHS and the QUIBB, for the same reasons as put forward by the Director of the World Bank’s research department Martin Ravallion in his criticism of the MPI: “The precise indicators used in the MPI were not in fact chosen because they are the best available data on each dimension of poverty. Rather they were chosen because the methodology used by the MPI requires that the analyst has all the indicators for exactly the same sampled household. So they must all come from one survey. There is much better data available on virtually all of the components of the MPI, but these better data can’t be used in the MPI since they are only available from different surveys” (Italics added for emphasis, see Green, 2010b)).

²¹ Linking food insecurity to “bad governance” has appeared more frequently in past years. Letémayer for instance constructs this link in an article which is based on findings of the Global Hunger Index 2010 for Pakistan: “The Pakistani people are increasingly vulnerable to food insecurity because of the government’s bad governance and its lack of political will to tackle hunger” (2010).

usually used to measure consumption and hence used as indicator on economic poverty or health (as done, for instance, in the MPI²²). However, in this paper F14 will pose as a reference indicator on “good governance”, or “the exercise of economic, political, and administrative authority to manage a country’s affairs at all levels”, which includes “participation, accountability, transparency, consensus, sustainability, the rule of law, and the inclusion of the poorest and most vulnerable people in making decisions about allocating development resources” (Birner, 2007: 1). In other words, an improvement in this variable will indicate an improved political climate, a more equal resource distribution, and an improvement in the agricultural sector. Ultimately, it follows Kofi Annan’s assessment that “Good governance is perhaps the single most important factor in eradicating poverty and promoting development” (former secretary-general of the United Nations in 1998, quoted in Birner, 2007: 1).

The selection of the other indicators from the QUIBB was guided by the innate criteria that each dimension should bring together, where possible, indicators that highlight real opportunity freedoms (capabilities) as well as achieved functioning levels (which are treated though as “indirect indicators of the freedom to choose” (Kerstenetzky and Santos, 2009: 192)). Hence, “access to” indicators have been selected alongside pure “functionings” indicators. For example, the education indicators Heduc (highest education level of Household Head (HH) (*Nível de educação mais alto do chefe do agregado*)) and G7d (Time to reach primary school (*Tempo em minutos para chegar á escola primária*)) aim to highlight both, achieved levels of functionings and the opportunity (or the lack thereof) to function. The poverty cutoff for Heduc was set when the HH does not have primary education, and for G7d if the time to reach primary school (with whatever means of transport) exceeds 30 minutes (here I follow the international recognised timely standard also applied in the MPI for *water* (dimension “standard of living”, variable on water: “clean water is more than 30 minutes walking from home” (Alkire and Santos, 2010: 7)).

The rationale for choosing H2, H3 and F10 for the poverty dimension employment and livelihoods was their potential to highlight, firstly, shortcomings in the creation of labour

²² The MPI considers a nutrition indicator, comprised of the Body Mass Index of adults and child malnourishment (weight-for-age ratio for children under 5), suitable to measure the dimension “health”. What is highlighted though is the weakness that neither the BMI nor child malnourishment takes into account “micronutrient deficiencies” (Alkire and Santos, 2010: 14). This is an important note with regards to my criticism of the official consumption-based poverty measure in Mozambique, and its non-accounting for of other information on nutrients than caloric intake (chapter 1.2). Neither the MPI nor my application of the “Counting Approach” will counter this problem directly. However, what I consider important and logically in line with my criticism is the deduction that I don’t link food insecurity directly to health or consumption, but to political freedoms in Mozambique as only one dimension among others.

opportunities, particularly in the agricultural sector²³ (H2: Any member of the household was employed as seasonal or casual farm worker in the last season? (*Algum membro do agregado familiar esteve empregue como trabalhador sazonal ou eventual na última campanha agrícola?*)); H3: The household receives remittances from a member who regularly works away from home? (*O agregado familiar recebe remessas regularmente de um membro que trabalha fora?*)), and secondly, the necessity to increase assets for an ensured livelihood, which is particularly important for the vast amount of Mozambicans living from subsistence farming (F10: How many sheep and goats and other midsize animals belong to the household? (*Quantas ovelhas e cabritos e outros animais de médio porte que pertencem ao agregado familiar?*)). Simply speaking, economic poor are considered those households who solely rely on self-employment and tenuous subsistence farming to live from, without having any income (cash or in kind) generated from seasonal agricultural or other regular wage labour of a household member in the past 12 month (which was the time between October 1999 and September 2000)²⁴, and whose livestock base is considered precarious (which is set at ≤ 2 midsize animals owned).

Health indicators were chosen that directly link a person's/household's well-being to water, sanitation and access to hospital clinics. G3 looks at the source of drinking water (*Qual é a principal fonte de água para beber?*), and poor are considered those whose source is putting households at risk for consuming contaminated water (if \neq piped water inside the house (*Água canalizada dentro da casa*)²⁵). G4 assesses the sanitation system of households

²³ The dimension employment/livelihoods is particularly important. The MPD acknowledges that the sustained productivity growth in the family agriculture sector is “perhaps the principal missing element in the current development process”. After all, “[a]ccording to IOF08, for example, 70% of households are located in rural areas and virtually all of these (96%) are engaged in agriculture in some way” (2010, xiv; 46). Therefore, having an active focus on the agricultural sector is crucial to make progress in Mozambique’s development process. This acknowledgment should then also be reflected in the poverty measure for this country.

²⁴ There is a link here to the results of the *Trabalho de Inquérito Agrícola* (Rural Income Survey TIA, implemented by the Department of Statistics of the Ministry of Agriculture) 2008, which looked at the mean and medium cash income of rural Mozambique (which found that rural Mozambicans earn only US\$1,43 per person per day, and the income poorest quintile only US\$1 per week (Hanlon, 2010)). The low level of cash income stands in close relation to the lack of formal employment created, primarily in the agricultural sector. This stands in close relation to the minimal state in Mozambique and its neglect to take a crafting hand in the productive sectors of the economy. The “Counting Approach” aims to contribute to the necessary policy swift. Within its power, the measurement has the potential to help pushing unemployment levels down, because statistically, this will have an effect on the counted people living in multidimensional poverty. Certainly, this selection for income poverty (agricultural labour and livestock) may result in the underestimation of poverty for urban areas. Unfortunately, the QUIBB does not contain employment information decomposed by urban vs. rural areas, neither does it contain information on labour decomposed by economic sector beyond agriculture. However, since most impoverished Mozambicans live in rural areas from subsistence farming and work in the agricultural sector indeed, and the measurement aims to highlight identified areas of necessary policy action, this is a statistical detriment which can be coped with from this normative standpoint, and in light of the available data situation.

²⁵ Please note that this indicator attempts to relate to the demand of Mozambicans captured by the PO to get provided with “training so that the people themselves could construct improved wells, instead of waiting for them to be built by contractors at the State’s expense” (G20, 2004: 19). Hence, this indicator attempts to react to and highlight one identified real opportunity deprivation in the human poverty domain in an indirect way.

(*Que tipo de sistema de saneamento usa o agregado familiar?*), and considers those to be poor without latrine or whose latrine is unimproved (*Latrina não melhorada*). G7f is an “access to” indicator that measures the time it takes in minutes, with whatever means of transport, to reach the next hospital clinic (*Tempo em minutos para chegar á hospital o clinica*). Poor are considered those households who need ≥ 30 minutes (chosen based on the same rationale as with G7d²⁶).

Following the rationale put forward by the OPHI, the chosen indicators aimed to represent accurately the chosen dimensions of poverty, whilst aiming for that parsimony is ensured (that is, “using as few indicators as possible to ensure ease of analysis for policy purposes and transparency” (OPHI, 2010a)). Additionally, and with the exception of indicators H2 and H3, indicators were chosen that “are not highly correlated”²⁷ (OPHI, 2010a).

Ultimately, a household is considered *multidimensional poor* if, and only if, it is deprived in some combination of indicators whose weighted sum exceeds 33.3% of deprivations (the poverty cutoff k). This follows the rationale put forward by Alkire and Santos in the calculation of the MPI (2010: 19-20).

3 Re-estimation of multidimensional poverty: Aggregation – The Alkire-Foster method

The Multidimensional poverty methodology proposed by Alkire and Foster (2008, 2009) requires the conduct of two distinct steps: firstly, an identification step ρ_k (‘who is poor’), that considers the range of deprivations people have to suffer from in order to be considered multidimensional poor, and secondly, an aggregation step, by which data on poor persons are brought together into an decomposable class of various poverty measures (M_α) (OPHI, n.d.: 1).

Technically speaking the “Counting Approach” can produce four related kinds of measures in the class M_α , which employs the Foster-Greer-Thorbecke (FGT) metric from 1984²⁸, adjusted to account for multidimensionality (Alkire and Foster, 2008: 1). These are the headcount ratio (H), which reports the percentage (or incidence) of people who are

²⁶ Please note that the choice of both “access to” indicators is particularly open for debate. Despite its possible disadvantages their choice is based on the ground that they logically corresponded so well with Sen’s CA logic to remove “unfreedoms”. Also, they have clear and simple policy implications: reduce poverty by improving access to hospitals and primary schools (focus on and improve Mozambique’s infrastructure for instance, a problem in the country as highlighted in chapter 1.3. Hence, their incorporation has been considered logically coherent as a response to my criticism. Particularly indicator G7d reacts to the demand of Mozambicans captured by the PO to aim “at children who do not have the opportunity to attend school” (G20, 2004: 19).

²⁷ That is thematically (e.g. by taking sanitation, source of drinking water and access to hospitals as indicators for the dimension health, and not three homogenous indicators to assess a dimension, for instance all related to sanitation only for dimension health).

²⁸ The FGT measure was originally developed to calculate income poverty.

multidimensional poor; the breadth-adjusted headcount ratio M_0 , which adds into H the (weighted) number of dimensions in which each household is deprived, hence it calculates into H the intensity of poverty, A . M_0 is thus “calculated by multiplying the proportion of people who are poor by the average number of their deprivations ($M_0 = H \times A$)”; the poverty gap measure M_1 , which “reflects the incidence, intensity and depth of poverty. The depth of poverty is the ‘gap’ (G) between poverty and the poverty line ($M_1 = H \times A \times G$)”; and the squared poverty gap measure M_2 , that reflects the incidence, intensity, depth of poverty and inequality among the poor (the squared gap, S) ($M_2 = H \times A \times S$)” (OPHI, 2010b).

In regards to the data type which is necessary to use, it requires cardinal data to calculate M_1 and M_2 , whereas H and M_0 can be calculated with ordinal *and* cardinal data. As most capabilities (and functionings) can only be represented in ordinal data, that is data whose values don’t have any other meaning than their ordering (hence, data without cardinal meaning), and the feasible list for Mozambique is mostly ordinal indeed²⁹, this measurement will calculate H and M_0 only. This is a necessary concession when the measure is applied to translate the CA (e.g. the MPI is a pure M_0 measure as well³⁰). At the same time are these measures the most important ones in the M_α class, as the Headcount ratio H is indeed the headline figure used in Mozambique (and in most other cases) to judge progress made on the country’s poverty reduction efforts. Hence, recalculating H is a logical consequence of the criticism I raised in chapter 1 of this paper, and calculating M_0 is considered crucial to analyse in detail the breadth of multidimensional poverty (to be explicated in subpoint 3.1).

Ultimately, the intuition of the “Counting Approach” is that “it can distinguish between, for example, a group of poor people who suffer only one deprivation on average and a group of poor people who suffer three deprivations on average at the same time” (OPHI, 2010b). In other words, one household (or individual respectively) that is deprived in all dimensions of poverty at the same time is poorer than a household which is only deprived in one or less than all possible poverty dimensions.

In the next subpoint the notation of the “Counting Approach” will be presented as used for in this particular case study. The notation is derived and adopted accordantly following the

²⁹ Four indicators are of cardinal character, namely F10, F14, G7f and G7d. Technically speaking, this would allow the calculation of M_1 . However, for simplicity reasons, this measurement will calculate solely H and M_0 . Hence, distinguishing between absolute and relative poverty, although theoretically possible with the calculation of M_1 and M_2 , won’t feature in this application of the “Counting Approach”. In addition, as the QUIBB survey has no panel character, distinguishing between chronic and transitory forms of poverty will not be possible as well.

³⁰ Alkire and Foster actually argue that their proposed dimension-adjusted headcount ratio M_0 can be viewed as a direct measure of ‘unfreedom’, which makes it particularly useful from a capabilities perspective: “Now suppose that our matrix y has been normatively constructed so that each dimension represents an equally valued functioning. Then deprivation in a given dimension is suggestive of capability deprivation, and since M_0 counts these deprivations, it can be viewed as a measure of ‘unfreedom’” (Alkire and Foster, 2009: 26).

detailed explications of it in Alkire and Foster (2008: 5-7), Alkire and Santos (2010: 9-11), and the OPHI webpage (OPHI, 2010a, 2010b and related materials provided on the webpage). Note that the notation of the “Counting Approach” in the available literature considers the individual as the unit of analysis.

3.1 Notation

M_0 measures multidimensional poverty in a matrix y with d dimensions³¹ across a population of n individuals. Let $y = [y_{ij}]$ denote the $n \times d$ matrix of achievements for i persons across j dimensions. The typical entry in the achievement $y_{ij} \geq 0$ represents individual i 's achievement ($i = 1, 2, \dots, n$) in dimension j ($j = 1, 2, \dots, d$). Each row vector $y_i = (y_{i1}, y_{i2}, \dots, y_{id})$ gives individual i 's achievements in the different dimensions, whereas each column vector $y_{*j} = (y_{1j}, y_{2j}, \dots, y_{nj})$ gives the distribution of achievements in dimension j across individuals.

The measure applies a “nested weighting structure”, which partitions the dimensions into equal weighted classes (Good Governance, Employment & Livelihood, Health & Education), then applies equal weighting within the members of the class. For that, the weighting vector w_j represents the weight that is applied to dimension j , for which $\sum_{j=1}^d w_j = d$ notates that the dimensional weights sum up to the total number of dimensions ($d = 9$).

To identify who is poor among Mozambique's population, a two-step procedure is applied using two different kinds of poverty cutoffs (or lines): one within each dimension to determine whether a person is deprived in that dimension (the *within dimension* cutoff z_j), and a second across dimensions that ultimately identifies those “multidimensional poor” by *counting* the dimensions in which a person is deprived (the *cross-dimensional* cutoff k) (Alkire and Foster, 2008: 1; Alkire and Santos, 2010: 10).

For poverty cutoff z , “let $z_j > 0$ denote the poverty line below which a person is considered to be deprived in dimension j , and let z be the row vector of dimension specific cutoffs” (Alkire and Foster, 2008: 5). The next step is to apply the poverty lines, in that a person's achievement is replaced with his or her status with respect to each cutoff z (OPHI, 2010a). In other words, replace all non-deprived entries with zero, and all deprived entries ij with the dimensional weight w_j . For that, define a matrix of deprivations $g^0 = [g_{ij}^0]$ in which g_{ij}^0 is defined by $g_{ij}^0 = w_j$ when $y_{ij} < z_j$, and $g_{ij}^0 = 0$ when $y_{ij} \geq z_j$. The i^{th} row vector of

³¹ To avoid confusion: Alkire and Foster's term “dimensions” is what has been labeled “indicators/variables” in this paper (2008: 5). In order to leave the notation unaltered, the original term has been adopted.

g^0 , denoted g_i^0 is person i 's *deprivation vector*. In the next step it is necessary to count vertically down each column, using g^0 , to construct a column vector c of *deprivation counts* that denotes the total number of weighted deprivations each person i experiences. Doing so results in $c_j = \sum_{i=1}^d g_{ij}^0$.

To define who is multidimensional poor, Alkire and Foster proposes to set a second poverty cutoff k , which is the poverty line that defines the minimum number of dimensions a person must be deprived in to be identified as multidimensional poor. In the usual literature on multidimensional poverty, two methods of identification have been commonly applied: in the *union approach* a person i is said to be multidimensional poor if she is deprived in at least one dimension of poverty, regardless of the weights assigned to the dimensions. This is usually considered as too inclusive though, in that entire populations of impoverished countries such as Mozambique will most likely suffer in at least one of the identified dimensions of poverty. Hence, the *union approach* tends to overestimate poverty.

The second is the *intersection approach*, in which a person i must be deprived in all dimensions of poverty to be labeled multidimensional poor. This, however, is considered as too stern, and poverty will be underestimated. In both approaches setting k is unnecessary.

Alkire and Foster proposes now to take a *dual cutoff* approach to ultimately define who is multidimensional poor, by defining in addition to z a second cutoff k , which is to be set somewhere in between those two extremes $k = 1$ or $k = d$. As this study operates with a “nested weighting system”, as opposed to an “equal weighting system”, k has to be reported in a percentage range, rather than a stringent variable range. To that end, a person is considered multidimensional poor in Mozambique if the weighted indicators in which s/he is deprived sum up to 33.3%. As in an equalled weighting system every variable would get a weight of 11.1% (9 variables * 11.1% = 99.9%), k is set at 3 in this application, which means that a person has to be deprived in at least the equivalent of 33.3% of the weighted indicators in order to be labelled multidimensional poor.

To set the poverty line at this percentage, which corresponds to a range of *one to five indicators*, has two reasons: firstly it follows “good practice” as it is within the same weight range as used in the MPI, in which the measurement operates with 10 indicators and a percentage setting of k at 30%, corresponding to two to six indicators (Alkire and Santos, 2010: 19-20). Since varying k will result in poverty going up or down, in that k increases, poverty decreases and vice versa, setting k is a highly *subjective* or *normative* exercise in what ought to be an *objective* scientific application. Hence, following “good practice” appears

to be a reasonable selection criterion (having said that, please see further analysis of results for different settings of k in subpoint “3.2 Results”).

The second reason to set k at this range is to take account of the current poverty situation in Mozambique, and the feasibility to have “good governance” incorporated in the measurement. Technically speaking, any person deprived in variable F14 is labelled “multidimensional poor”, even if it is only this one dimension she must be deprived in. However, it is almost unthinkable that a food deprived person would *not* be deprived in one or more of the other eight variables of multidimensional poverty (which is certainly an assumption based on Sen’s analysis for the reasons and effects of famines and food insecurities). Therefore, having only one variable in the dimension “good governance” is certainly suboptimal from a semantic point of view (a point Alkire and Santos were apparently eager to avoid by assigning ≥ 2 variables to each dimension of poverty), though justifiable concerning that political indicators didn’t feature in the QUIBB, and in light of the relevance of food security on a person’s ill-being and hence poverty status. Hence, the difference of this applied dual cutoff method to the union approach rests upon the weights assigned to the dimensions.

To place this theoretical discourse into a formula, in $\rho: R_+^d \times R_{++}^d \rightarrow \{0,1\}$, let ρ_k be the *identification function* and apply $k > 0$ across the column vector c to obtain the set of poor persons. Censor all nonpoor data from a person i ’s achievement vector $y_i \in R_+^d$ and cutoff vector z in R_{++}^d . To do so, give ρ_k the value of 1 for $c_i \geq k$, and $\rho_k(y_i, z) = 0$ when $c_i < k$. In other words, if a person i ’s weighted deprivation count is equal to or greater than $k=33.3\%$, she gets the value 1 as she’d be considered multidimensional poor. The data is subsequently censored from people who are deprived but non-poor given k , by constructing a second matrix $g^0(k)$ which contains “the weighted deprivations of all persons who have been identified as poor and excludes deprivations of the non-poor” (Alkire and Santos, 2010: 10). $g^0(k)$ is obtained from g^0 by replacing its i^{th} row of g_i^0 with a vector of zeros whenever $\rho_k = 0$. From $g^0(k)$ a *censored vector of deprivation counts* $c(k)$ is constructed, which denotes the total number of weighted deprivations each multidimensional poor person i experiences. In notation: $g_{ij}^0(k) = g_{ij}^0 \rho(y_j, z)$ and $c_j(k) = c_j \rho(y_i, z)$.

Following the identification of “who is poor” and the censoring of the data, the second step of the “Counting Approach” is to aggregate the data into the (multidimensional) headcount ratio H , which depicts the percentage of persons who are multidimensional poor, and the dimension adjusted headcount ratio M_0 , which shows the prevalence (or breadth) of

poverty. This is done by multiplying H with the “average” number of dimensions in which all poor people are deprived (A)³².

To calculate H , divide the number of poor people q by the total number of people n ($H = \frac{q}{n}$). H is certainly useful to depict the *incidence* of poverty, but “it does not increase if poor people become more deprived, nor can it be broken down by dimension to analyse how poverty differs among groups” (OPHI, 2010a). As this violates what has been labelled *dimensional monotonicity*, that is if a poor person becomes deprived in an additional dimension the measure should depict this through an increase in overall poverty, M_0 needs to be calculated (which respects this particular property).

To do so, the *average deprivation share* among the poor A needs to be calculated (in the literature also referred to as the *average poverty gap*). This is done by adding up the proportion of total deprivations each person suffers divided by the total number of poor persons (OPHI, 2010a). With $\frac{c_j(k)}{d}$ indicating the “fraction of weighted indicators in which the poor person i is deprived” (Alkire and Santos, 2010: 10), and the average of that fraction among those identified as poor q is A , the *intensity* of multidimensional poverty is captured. In notation: $A = \sum_{i=1}^n c_j(k)/dq$.

M_0 then is calculated by multiplying incidence and intensity of multidimensional poverty, hence $M_0=HA$ ³³. This satisfies *dimensional monotonicity*, which follows the logic that in two societies with the same incidence of poverty that society is poorer in which the intensity of poverty is greater. In the words of Alkire and Santos:

a society that has 30 percent of its population in poverty where – on average – the poor are deprived on average in six out of ten dimensions seems poorer than a society that although also having 30 percent of its population in poverty, the poor are deprived on average in three out of ten dimensions (2010: 10-11).

In addition M_0 also satisfies the desirable property *decomposability*³⁴, which allows decomposing poverty by dimension and population subgroups. Dimensional decomposability is possible by taking $M_0 = \sum_{j=1}^d \mu(g_{*j}^0(k))/d$, in which $g_{*j}^0(k)$ is the j^{th} column of the

32 Note that M_0 is the “weighted sum of the deprivations the poor experience divided by the total number of people times the total number of dimensions considered” (Alkire and Santos, 2010: 10). In notation:

$$M_0 = \sum_{i=1}^n \sum_{j=1}^d g_{ij}^0 / nd$$

33 Alternatively, M_0 can be calculated by looking at the *arithmetic mean operator* μ of the matrix $g^0(k)$. In notation: $M_0 = \mu(g^0(k))$.

34 In addition to *dimensional monotonicity* and *decomposability* M_0 satisfies the following properties as well: replication invariance, symmetry, poverty focus, deprivation focus, weak monotonicity, non-triviality, normalisation, and weak re-arrangement (Alkire and Santos, 2010: 11 (fn. 11)). A detailed explication of these can be found in Alkire and Foster (2008: 13-19).

censored matrix $g^0(k)$. Dimension j 's contribution to multidimensional poverty is expressed as $Contr_j = \left(\frac{\mu(g_{*j}^0(k))}{a}\right)/M_0$.

Subgroup decomposability is also satisfied for which overall poverty equals the weighted average of subgroup poverty, where weights are subgroup population shares (Alkire and Foster, 2008: 13). This can be calculated by taking, for instance, two distributions x and y for two population subgroups $n(x)$ and $n(y)$ (such as urban and rural Mozambique), for which the weighted sum of the subgroup poverty levels (in that weights refer to population shares) equals the overall poverty level obtained when the two subgroups are merged. In the following notation the total populations is noted as $n(x, y)$ (Alkire and Santos, 2010: 11):

$$M_0(x, y; z) = \frac{n(x)}{n(x, y)} M_0(x, z) + \frac{n(y)}{n(x, y)} M_0(y, z).$$

Decomposing poverty is certainly useful for specific pro-poor targeting. However, it has to be beared in mind that the measure operates with nested weights, wherefore interpreting the results should be seen as part of the measurements' exercise. For instance, the measure could reveal that the impact of health on poverty is relatively low, but on the ground it can have strong implications on the other variables of poverty indeed. Hence, data results should be seen as a mere guide for policy makers that requires further qualitative work, a point strongly emphasized by Sabina Alkire during an OPHI 2009 Summer School on Multidimensional Poverty Measurement at the Pontifical Catholic University of Peru in Lima (27 August 2009 – 08 September 2009) (which was attended by the author of this paper). In the next subpoint results of the measure will be presented.

3.2 Results

Appendix 2 presents the STATA log-file for the "Counting Approach". The calculation of multidimensional poverty reveals a situation for Mozambique which has to be described as dire. Whereas the official measurement of the headcount ratio H in Mozambique assumes the percentage of people living in poverty at 54.7%, my measurement found that 98.1% of Mozambicans live in poverty.

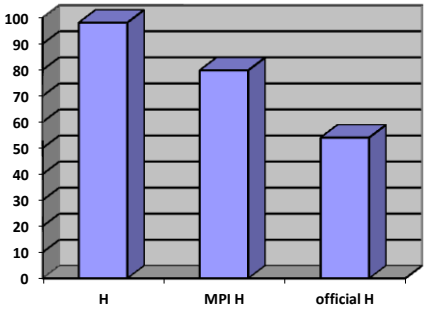
What is interesting to observe is that with $k=1$ (that is 11.1% in an equal weighting system = two health or education variables or one employment/livelihood variable in the adopted nested weighting system), poverty is certainly overestimated, as with this *union approach* 100% of Mozambicans would live in poverty H . With $k=3$ (or 33.3%), H lowers to 98.1%. Certainly, one may argue that this is too much as well; however, concerning that even with $k=4$ (44.4%) 92.7% would still be reported poor in the headcount ratio, it would need a

lowering to $k=5$ (55.5%) to finally achieve a substantial decrease in H , namely down to 77%. Even then, H would be substantially higher than the official headcount ratio, although lower than the H results of the MPI (in which Mozambique's H is 79.8% for $k=30\%$). The following Table 2 will present H , A and M_o of my measurement application, and in Chart 1 H will be compared to the results of the MPI and the official poverty headcount H in Mozambique.

Table 2: Multidimensional Poverty in Mozambique (with results for equal weights between variables presented in brackets)

H	A	M_o
98.1% (99.4%)	77.7% (81.2%)	76.2% (80.7%)

Chart 1: Multidimensional Poverty in Mozambique compared to MPI results and official H for Mozambique



What is particularly interesting to compare is the result of the MPI and my measurement results. The MPI finds that 79.8% of Mozambicans live in poverty (H). The reasons for the difference between the MPI result and mine can be found in the selection of variables (particularly its incorporation of Standard of Living indicators), as well as the dimensions' respective weightings, which gives education and health individually a weight of 33.4%.

Certainly, one might argue that $H=98.1\%$ still overrepresents poverty in Mozambique. I leave this point open for debate. In defense of the figure I'd like to highlight this papers' attempt to evaluate and measure poverty in Mozambique in a way that represents as closely as possible the actual situation on the ground. Hence, I consider the selection of variables and their individual cutoffs z reasonable concerning my empirical research on the country case. Applying $k=3$ appeared sensible as well, concerning that its setting followed good practice and in light of its subjective nature (as its placement has to be determined by the author of the study, any placement can be contested). If the then calculated results turn out to

report an incidence of poverty close to 100%, it seems unfair to alter the selection process in order to achieve lower results that may seem less dramatic and controversial. Certainly, it comes with a shock that poverty shall befall 98.1% of Mozambicans; yet, shockingly high is the MPI 2010 result for Mali, Ethiopia and Niger as well, for which H was respectively calculated as 87.1%, 90% and 92.7%. And further, shockingly low is the median cash income for rural Mozambique, as captured by the TIA 2008, which found that the lowest section of rural Mozambicans have to live off a cash income of less than US\$1 *per week*; and the incidence of income poor who fall below the US\$2 a day threshold, which for Mozambique is 81.8%, is shockingly high as well. Hence, I consider $H=98.1\%$ a reasonable result once one is overcoming the initial shock (please also note that with the application of an equal weighting system among indicators poverty would be even higher in the three measures of the M_α class).

Certainly, further robustness tests are needed, that vary indicators, individual cutoffs z , the cross-dimensional cutoff k and the weighting. The only robustness test conducted for this study has been a basic *dominance* analysis for poverty decomposed by area, which found that measurement results are robust to changes in k values (please see results embedded in the analysis of results of Table 3 below). Additionally, robustness was selectively tested by comparing measurement results with an equal weighting system between variables, which found that the adopted nested weighting structure appears more sensible to translate the *ideal list* of poverty domains than its alternative. This will become particularly obvious for the analysis of the dimensional contribution to M_0 (please see the analysis of results of Table 4 below).

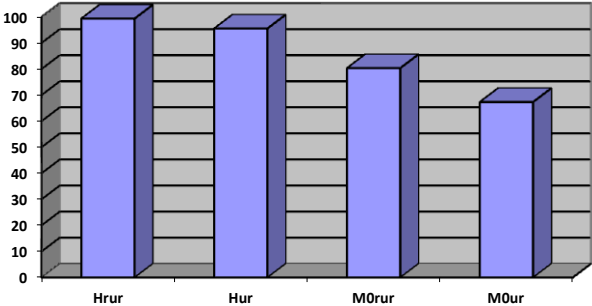
Also, what neither the MPI nor my measure is telling us is the depth of poverty M_1 and the inequality among the poor M_2 . Hence, it will be very interesting to conduct more robustness tests and calculations of other measures of the M_α class.

What is calculated though is the breadth-adjusted headcount $M_0=76.2\%$, which represents the proportion of the poor ($H=98.1\%$) and the average intensity ($A=77.7\%$) of their deprivation (in other words, the average deprivation share of those identified as poor is 77.7%). Please note that M_0 will always be lower than H , as it adjusts the percentage of the multidimensional poor by the average deprivation share among the poor. M_0 is a very useful measure particularly for the analysis of subgroup contribution to overall poverty (please see Table 3). In the following Table 3 H and M_0 are decomposed by rural and urban areas, and Chart 2 presents graphically the results.

Table 3: H and M₀ decomposed by area (with results for equal weights between variables presented in brackets)

H _{ur}	H _{ur}	M ₀ _{ur}	M ₀ _{ur}
99.3% (99.9%)	95.5% (98.2%)	80.3% (86.2%)	67.3% (68.9%)

Chart 2: H and M₀ decomposed by area

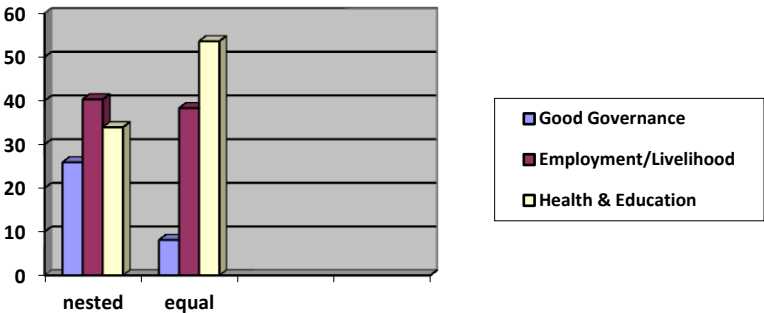


What is interesting to observe is the difference between H and M_0 decomposed by rural and urban areas. Whereas the measure reports 99.3% for H in rural Mozambique (for $k=3$), and 95.5% for urban areas, this alters quite intensively in M_0 , which reports 67.2% for urban Mozambique ($A=70.5\%$), in comparison to 80.3% for rural Mozambique ($A=80.9\%$). In other words, while the difference between the incidence of poverty across Mozambique is marginal at best, the intensity of deprivations suffered among the poor is higher in rural Mozambique, resulting in a higher prevalence of poverty in rural Mozambique (even more so with an equal weighting system among variables). As this satisfies *dimensional monotonicity*, rural Mozambique needs to be considered poorer than urban Mozambique (this rationale has been outlined in subpoint 3.1). Additionally, the proportion of poor people is higher in rural areas independently of the number of dimensions considered. This *dominance* gives k a certain robustness and adds to the confidence levels of the measurement results, in that independently of changes in k rural poverty will always be equal to or higher than urban poverty (or that rural poverty dominates urban poverty for all k values). Finally, to see results of the decomposition of M_0 by variable and by dimension, please have a look at Table 4 and Chart 3.

Table 4: M_0 decomposed by variable (with results for equal weights between variables presented in brackets)

F14	H2	H3	F10	G3	G4	G7f	HEDUC	Gfd
25.9%	13.5%	13.7%	13.1%	9%	8.4%	6.9%	6.3%	3.3%
(8.1%)	(12.9%)	(12.9%)	(12.5%)	(14.3%)	(13.3%)	(11%)	(9.9%)	(5.1%)

Chart 3: M_0 decomposed by poverty dimension (presented for the nested and equal weighting system)



The most important contributor to M_0 is the variable f14 (food) of dimension “good governance” (25.9%). Within dimension “employment/livelihood”, all variables under concern are equally important among themselves, with values around 13.5%. The greatest differences emerge in dimension “health & education”, in which the health variables g3 and g4 are slightly more contributing to poverty than the chosen education indicators. This is an interesting observation, as within this dimension an equal weighting system has been applied, which reflects the slightly greater importance of health (particularly water and sanitation) as a driver of poverty than education. By comparing the two “access to” indicators g7f and g7d it appears as well that access to hospitals (6.9%) is more troublesome than access to primary schools (3.3%) (which is not a surprise since there are usually more schools than hospitals). Ultimately, dimension “employment/livelihood” is the biggest contributor to M_0 with 40.3%, followed by “education & health” with 33.9% and “good governance” with 25.9% (the contribution of each dimension is calculated as the sum of the contribution of each indicator (Alkire and Santos, 2010: 36)).

Yet, as previously stated, due to the nested weighting structure, the individual impact of the variables in dimension “education & health” on M_0 is naturally below the impact of the variable f14 of dimension “good governance”. Choosing a nested weighting structure aimed to highlight the current situation in Mozambique and the assessment of the author that in the contemporary poverty discourse the dimensions “good governance” and “employment/livelihood” are equally in need of getting addressed than the other dimension

“education & health”, which certainly has a strong normative importance from a capabilities perspective. That in the subsequent calculation based on QUIBB results the dimension “good governance” ends up contributing the least to M_0 should be seen as the result of the absence of suitable political indicators in QUIBB and the necessity to work solely with one variable in this dimension. Hence, the results, although statistically accurate, shouldn't be taken face value to design pro-poor targeting based on the decomposition by variables.

This is particularly worth noting when placed in comparison to dimensional poverty contribution following the application of an equal weighting system among variables. By doing so, variable g3 (source of drinking water) is with 14.3% the greatest driver of poverty in Mozambique, followed by g4 (sanitation system) with 13.3% and the three employment/livelihood variables with approx. 12.8% each. F14, the most important variable in the nested weighting structure, loses in importance and contributes only 8.1% to M_0 , the second lowest contributor altogether (only beaten by g7d (access to primary schools), which remains even within an equal weighting system among variables the lowest contributor to poverty). This results in dimension “health & education” being the biggest contributor to poverty with 53.6%, followed by “employment/livelihood” with 38.3%, and “good governance” with 8.1%.

Certainly, applying an equal weighting system would have made sense if indicator f14 had been used to represent economic poverty or a lack of consumption. However, by using it to represent “good governance”, a concession in light of the absence of political indicators in QUIBB, the nested weighting structure was considered necessary to highlight the importance of the political poverty dimension for Mozambicans. This shall ensure that data limitations and statistical constraints do not interfere or alter the normative strength of the qualitative analysis of poverty in Mozambique, which found “bad governance” to be among the worst drivers for poverty to arise and persist in the country. This is a point I explicitly wish to make also in light of the MPI, which features none suitable indicator to capture political and/or economic poverty. This omission is suboptimal from my point of view.

Conclusion

In this paper I critiqued the unidimensional food poverty measure in Mozambique on the grounds that it does not match the multidimensional understanding of poverty in the country. Subsequently, I re-estimated poverty for Mozambique, by using the multidimensional poverty methodology proposed by Alkire and Foster (2008, 2009). It found that with the selected feasible list of poverty dimensions, indicators, individual cutoffs z , the

cross-dimensional cutoff k and a nested weighting structure for Mozambique, 98.1% of its population has to be considered poor. This stands in stark contrast to the official poverty headcount H of 54.7%, and is even more dramatic than the resulted H of the MPI for Mozambique (79.8%).

Whereas urban and rural Mozambicans are nearly equally affected by poverty ($H_{rur}=99.3\%$; $H_{ur}=95.5\%$), the intensity of deprivations (or average deprivation share) of those living in poverty is greater in rural areas than in urban areas ($A_{rur}=80.9\%$; $A_{ur}=70.5\%$). This means that rural Mozambicans have to be considered “poorer” than urban Mozambicans, in that rural poverty has a higher “prevalence” ($M_{0rur}=80.3\%$; $M_{0ur}=67.3\%$). Therefore, it is recommended to place a special policy attention onto rural Mozambique.

On average, it was found that the breath-adjusted headcount ratio is $M_0=76.2\%$, which means that poverty has a greater prevalence than found with the measure of the MPI for Mozambique ($M_0=48.1\%$). Both measures should be seen though as complementing each other and in comparison to the reductionist unidimensional headcount calculation for Mozambique adopted in PARP(A) II(I), rather than suitable to compare results between the two of them, as they have operated with very different poverty dimensions and indicators.

Concerning the individual contribution by dimension to M_0 it was found that within a nested weighting system, which was adopted to ensure that the selected poverty dimensions are equally treated within the measure, the biggest contributor to poverty was dimension “employment/livelihood” with 40.3%, followed by “education & health” with 33.9% and “good governance” with 25.9%. Although it was highlighted that the adopted weighting structure has an effect on the interpretation of results, it can be recommended to focus policy attention on the creation of formal labour in the agricultural sector, tackle issues of accountability and good governance to increase food security, and to invest in human dimensions of poverty, particularly into water and sanitation. Education is the least contributor to poverty.

Yet, concerning the *intrinsic value* of education to live a life one values (Sen’s CA logic), one shall not consider education not worth strengthening from a policy perspective. In addition, the measurement is not suitable to make judgments in regards to the quality of education in Mozambique, which is an important point to stress, as it leads to a crucial point of this recapitulation, which is that the results and given recommendations are based on a quantitative analysis, and hence need to be treated with caution. The measurement didn’t capture the plethora of well-being indicators of QUIBB; neither can it be considered informative on dimensions of poverty highlighted as important in an *ideal list* of poverty

domains, though omitted in the measure due to statistical constraints and data limitations, namely the dimension social poverty. So even though the measure is more comprehensive and inclusive than the official unidimensional measure adopted in PARP(A) II(I), it ultimately remains reductionist as well, an *indicative estimation* in need for further robustness tests and triangulations with qualitative research techniques.

Ultimately though, what should be achieved, from the point of view of this author, is that this “paper-based exercise”, within its confines of influence, is not only thought-provoking and discussion-sparking, but that it may also contribute to a policy shift as advocated for in this paper, as a deduction in H and M_0 will require Mozambican policy makers and their partners in development to focus their attention *actively* on the improvement of people’s well-being.

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Appendix 1: Questionnaire

Please provide some general information about yourself and your research experience with poverty in Mozambique

Name:

Sex:

Email:

Institution:

Position within Institution:

Area of competence:

Relevant work expertise:

Years of experience working with the country case Mozambique:

Years of experience working with poverty related research:

How familiar are you with the country's Action Plan for the Reduction of Absolute Poverty 2006-2009 (or *Plano de Acção para a Redução da Pobreza Absoluta* (PARPA II)), and the *Agenda 25*, the national Strategy of the Committee of Counsellors?

Very familiar

Somewhat familiar

Not familiar

How familiar are you with Amartya Sen's Capabilities Approach:

Very familiar

Somewhat familiar

Not familiar

Step I: Poverty in Mozambique at a glance

Q.: In your professional opinion and based on your research for this country case, what would you consider the biggest challenge(s) in Mozambique's current poverty reduction efforts? Which aspects of *ill-being* do you consider the most neglected or overlooked in the public and political discourse? What do you think are the main *drivers* for poverty to arise and persist?

A.:

Q.: What kinds of programmes and activities would you consider most important to reduce the level of absolute poverty in Mozambique? Please rank from most important 11 to least important 1 (please provide any specific information if considered helpful)

Agriculture:

Education:

Labour:

Food Security:

Health:

Water, Sanitation and Hygiene:

Nutrition:

Gender:

Emergency shelter:

Social Safety and Protection:

Livelihoods:

Other:

Step II: Ideal List of Mozambique's poverty domains

Sen's 5 instrumental freedoms	Dimension: Functioning of value	Indicators/Variables	Equal Weighting (%)	Different Weighting (%)	Poverty Cutoff
Political Freedoms					
Economic Facilities					
Social Opportunities					
Transparency Guarantees					
Protective Security					
Other					

Step III: Feasible List of Mozambique's poverty domains

Sen's 5 instrumental freedoms	Dimension: Functioning of value	Indicators/Variables	Equal Weighting (%)	Different Weighting (%)	Poverty Cutoff
Political Freedoms					
Economic Facilities					
Social Opportunities					
Transparency Guarantees					
Protective Security					
Other					

Step IV: Final comments and recommendations

Please provide (if any) final comments or recommendations on the selection of poverty domains and related variables for this study.

Appendix 2: STATA Log file “Counting Approach”

```

. *****
. ***** To see the results *****
. *****

. matrix list aggre_results //It's the matrix of aggregate results of H, M0//

aggre_results[9,3]
      c1      c2      c3
r1      1      1      .76697441
r2      2 .99882561 .76678868
r3      3 .98144568 .76176153
r4      4 .92699715 .740821
r5      5 .76956078 .66156243
r6      6 .58702924 .54651065
r7      7 .488031 .47321597
r8      8 .40536903 .40471475
r9      9 .1827944 .19509339

. matrix list H_rur_ur //It's the matrix of the Multidimensional H and its decomposition into urban and rural
areas //

H_rur_ur[9,6]
      c1      c2      c3      c4      c5      c6
r1      1      1      1      .31647784      1      .68352216
r2      2 .99882561 .99690857 .31587042 .99971323 .68412958
r3      3 .98144568 .95542567 .3080874 .99349322 .6919126
r4      4 .92699715 .86020547 .29367508 .95792239 .70632492
r5      5 .76956078 .63363085 .26057737 .83249774 .73942264
r6      6 .58702924 .4684816 .25256671 .64191802 .74743329
r7      7 .488031 .39264547 .25462232 .53219549 .74537768
r8      8 .40536903 .30726433 .23988599 .45079251 .76011401
r9      9 .1827944 .08606211 .1490021 .22758245 .85099791

. matrix list M0_rur_ur //It's the matrix of the M0 and its decomposition into urban and rural areas //

M0_rur_ur[9,6]
      c1      c2      c3      c4      c5      c6
r1      1 .76697441 .68547405 .28284822 .80470992 .71715179
r2      2 .76678868 .68497896 .28271238 .80466743 .71728762
r3      3 .76176153 .67284595 .27953739 .80293037 .72046261
r4      4 .740821 .63665766 .27197938 .78904971 .72802062
r5      5 .66156243 .5252329 .2512606 .72468442 .74873941
r6      6 .54651065 .423623 .24531506 .6034089 .75468495
r7      7 .47321597 .3675883 .24583606 .52212267 .75416394
r8      8 .40471475 .29688302 .23215584 .45464196 .76784416
r9      9 .19509339 .09080526 .14730305 .24337987 .85269695

. matrix list M0_dim //It's the matrix of the M0 and its break-down by dimension //

M0_dim[9,11]
      c1      c2      c3      c4      c5      c6      c7      c8      c9      c10      c11
r1      1 .76697441 .25695185 .13641111 .13630722 .13196339 .09047137 .08386933 .06919889 .06241248 .03241437
r2      2 .76678868 .25701409 .1363538 .13633491 .13195854 .09042111 .08387025 .06920098 .06242437 .03242194
r3      3 .76176153 .25871022 .13501819 .13657083 .13111931 .09010425 .08404188 .06933946 .06255374 .03254212
r4      4 .740821 .26602309 .13184904 .13515692 .12938899 .08915316 .08360682 .0692755 .06263332 .03291315
r5      5 .66156243 .2978176 .12292614 .12737327 .12403519 .08359616 .08041491 .06715767 .0625586 .03412047
r6      6 .54651065 .35583008 .10988755 .11553833 .11446368 .07679886 .07397141 .06136775 .05878456 .03335779
r7      7 .47321597 .38196559 .1043693 .11264226 .10910227 .07442741 .07237392 .05985289 .0567136 .02855278
r8      8 .40471475 .37096911 .10837173 .11575865 .11171372 .07304121 .07159608 .06114591 .05711151 .03029208
r9      9 .19509339 .34702164 .11567389 .11567389 .11567389 .06923199 .06894843 .06835485 .06213677 .03728465

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