

# **“Strong but not Broadly Shared Growth”**

## **Mozambique —Poverty Assessment—**

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## Executive Summary

*Mozambique has experienced strong growth in the last two decades. Its GDP expanded at an annual average rate of 7.2 percent between 2000 and 2016, and was among the fastest growing in Sub-Saharan Africa. While growth and poverty were not strongly linked for most of the 2000s –poverty fell from 60.3 to 58.7 percent between 2002 and 2009, the pace of poverty reduction accelerated afterwards, bringing poverty down to 48.4 percent by 2015. Mozambique has also made strides in non-monetary dimensions of wellbeing. The average household now has higher access to basic services such as education and health and owns more assets such as improved housing, cellphones and transportation devices.*

*But this progress is not without its challenges. Growth became less inclusive in recent years, with many low-income households missing out on the benefits: poverty would have fallen by twice as much since 2002 had growth been more equally shared. The weaker inclusiveness of growth is undermining Mozambique's progress in achieving shared prosperity and reducing inequality.*

*Strengthening the linkages between growth and poverty reduction requires a mix of policies aimed at achieving three overarching objectives. The first objective is to continue expanding the availability of basic services while addressing the remaining large inequalities in terms of access and quality to improve and equalize opportunities for all citizens. Enabling the poor with the skills and assess to participate in the growth process and share in its proceeds will bolster growth and economic progress. The second objective is to foster economic diversification, job growth in productive, labor-intensive production, and agglomeration of firms and markets. The private sector is typically the main engine for broad-based growth through job creation. The third objective is to raise productivity in agriculture – a sector that still supports the livelihoods of most rural households and the poor – by addressing the limited linkages of farmers with input and output markets, and the weak resilience to weather risk. Cutting across these strategies is the need to protect the gains achieved so far to avoid letting the one in four Mozambicans that have high economic insecurity slide back into poverty.*

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### ***Mozambique has experienced strong and sustained economic growth in the last two decades.***

Mozambique enjoyed remarkable recovery after decades of war. Growth of its Gross Domestic Product (GDP) expanded at an annual average rate of 7.2 percent between 2000 and 2016, making it one of the fastest-growing countries in Sub-Saharan Africa (SSA). The economic expansion has boosted incomes and living standards. GDP per capita, for instance, grew annually on average by 4 percent over the same period, climbing from \$561 to \$1,128 (2011 PPP). Growth has been supported by a rebounding agricultural sector, particularly in the first phase of the post-war period, increased productivity in trade, transport and communications and financial services, sound macroeconomic management, large-scale foreign investments projects and significant donor support. More recently, however, growth has slowed down due mainly to macroeconomic factors and severe natural disasters.

### ***High and stable growth has led to poverty reduction, especially after the late 2000s.***

Poverty has been on a declining trend following sustained strong growth in the 2000s. Poverty numbers based on the official methodology show that the poverty headcount fell from 52.8 percent in 2002/03 to 46 percent in 2014/15. This study, which examines the evolution of poverty using a different poverty measurement methodology, also finds a downward trend. As of 2014/15, the share of Mozambicans living beneath the poverty line is 48.4 percent, below the levels of poverty recorded in 2002/03 and 2008/09, 60.3 and 58.7 percent, respectively. This is equivalent to an average reduction

in poverty of 1 percentage point per year, yet the speed of poverty reduction is not even across the period analyzed (2002/03-2014/15). Poverty fell markedly faster between 2008/09 and 2014/15 (10.3 percentage points in total or on average 1.8 percentage points annually) than in the period 2002/02-2008/09, where the poverty rate barely dropped (1.6 percentage points in total or on average 0.26 percentage points annually). In absolute numbers, however, the total number of poor has increased – owing largely to the rapid growth in population, from 11 million in 2002/03 to 12.3 million in 2014/15.

***Over the long term, poverty has fallen more slowly than expected considering the strong growth performance, yet growth has become more poverty reducing in recent years.***

The fall in poverty in Mozambique is consistent with the trend seen in many other countries in the region. Yet, looking at the last two decades as a whole, economic growth and poverty reduction are not as strongly linked in Mozambique as in other countries. Estimates of the growth elasticity of poverty reduction for a group of selected countries in Eastern Africa with two poverty measurements in the last decade show that the responsiveness of monetary poverty to raising levels of income per capita in Mozambique is moderate. For instance, a one percentage increase in GDP per capita in Uganda is associated with a fall in poverty of 0.95 percent. An equivalent change in GDP per capita reduced poverty by 0.3 percent in Mozambique, less than a third than in Uganda. However, the latest numbers indicate that the country may be gradually becoming better at leveraging strong growth for poverty reduction. The elasticity rose from 0.08 (2002/03-2008/09) to 0.68 (2008/09-2014/15).

***While household consumption growth has accelerated after 2008, it became less inclusive.***

Who benefitted the most from economic progress in Mozambique? The answer depends on what period is analyzed. Most of the 2000s (the period 2002/03-2008/09) recorded a small reduction in poverty because of meagre consumption growth (0.11 percent). However, this slow growth was “pro-poor”, namely it benefitted disproportionately low-income households more, amongst all those located in rural areas. Nevertheless, while growth accelerated at the end of the 2000s, its distributional pattern reversed, turning into “pro-rich”. Annual growth in consumption per capita picked up, averaging 4.3 percent (2008/09 and 2014/15). Stronger growth for everyone resulted in faster poverty reduction, yet it benefitted chiefly the upper parts of the distribution. Annual consumption growth for the top quintile was 7.5 percent, three times faster than the rate exhibited by the bottom 40. The average gains in consumption relative to the value of the poverty line illustrate the weaker inclusiveness: 15.5 percent for the bottom 40 and 7 times for the top 20. The “pro-richness” of growth is limiting Mozambique’s progress in achieving shared prosperity and reducing inequality. The Gini coefficient increased from 0.47 to 0.56 between 2008/09 and 2014/15 –largely an urban phenomenon, placing Mozambique among the most unequal countries in SSA.

***Had growth been more equally shared Mozambique would have achieved twice as much poverty reduction after 2000***

The weaker inclusiveness means that many low-income Mozambicans are missing out on the benefits of progress. Changes in poverty can be decomposed into “growth” and “redistribution” effects. The analysis shows that consumption growth (“growth effect”) has been the main force behind the fall in poverty. In contrast, the increase in inequality in the distribution of consumption (“redistribution effect”) has offset part of the gains. More specifically, the “growth effect” alone would have reduced poverty by 23.1 percentage points between 2002 and 2014 – bringing the poverty headcount down to 37.2 percent rather than 48.4 percent – had that growth been more inclusive. Instead, inequality in the distribution of consumption growth increased poverty by 11.2 percentage points.



***Faster poverty reduction in some of the areas of the country where poverty was lowest a decade and half ago has limited the convergence in welfare levels between regions.***

The evolution of poverty displays noticeable regional differences. The share of households living in poverty has fallen in both rural and urban areas, from 69 percent to 56.0 percent in the former, and from 41.1 percent to 32 percent in the latter. However, rural areas continue to lag behind urban areas: since the early 2000s, nearly 8 out of 10 poor people have been in rural areas. There are also disparities across provinces. Despite the generalized decline in poverty, welfare levels remain low in the Northern and the Center Regions of the country relative to the South. Poverty continues to be high in Zambezia, Nampula and Niassa, historically the provinces with the highest poverty rates. In contrast, Maputo Province and Maputo City recorded the largest decline even though they had the lowest poverty levels back in 2002/03.

***In addition to robust growth, the increasing role of services in the economy and favorable macroeconomic conditions contributed to faster consumption growth after the late 2000s.***

Mozambique is undergoing a process of structural change whereby the sources of growth have gradually shifted away from agriculture. The GDP share of agriculture fell from 38.1 to 25.5 percent between 1996 and 2014. While the emergence of manufacturing is characterized by capital intensive activities (largely “megaprojects” in extractive, export-oriented industries) with higher value added but low job creation, the increasing role of services in the economy has offered a path to jobs outside agriculture. Between 2008 and 2014, the jobs share of services increased fast, moving from 15 to 24 percent. The GDP share of services also increased remarkably by almost 6 percentage points, reaching 55.7 percent. After 2008, labor productivity growth – the main engine of economic growth in the last two decades – has been largely driven by the redeployment of labor away from agriculture and into sectors with higher productivity growth, chiefly in services, where productivity is over six times larger despite high levels of informality. Moreover, the macroeconomic framework provided the conditions for faster private consumption growth. Public expenditures as a proportion of the GDP increased steadily between 2008 and 2014, raising from 24 to 39 percent. Annual credit growth to the private sector averaged 23 percent between 2009 and 2015. Foreign direct investments into Mozambique increased notably, reaching almost 40 percent of GDP in 2013, up from 5 percent in 2008.

***Economic progress also translated into improvements in non-monetary dimensions of well-being ...***

The average household has better standards of living today than at the turn of the century. Progress in closing consumption deficits, albeit at a moderate pace, has been accompanied by improvements in multiple nonmonetary dimensions of well-being. School enrollment and attendance show continued improvement since the early 2000s. Like other people in the region, Mozambicans are living longer. Individuals ages 20 to 65 have on average 5.1 years of schooling, compared to 2.4 in 2002/03. Life expectancy increased by nearly 9 years since 2001, from 48.8 to 57.6. Infant mortality, expressed as the number deaths per thousand live births, fell from 99.1 in 2003 to 68.1 in 2011. Other key health indicators as maternal mortality and morbidity are also moving in the right direction. These changes are coupled with improvements in the quality of housing and increased ownership of traditional and modern assets.

***But large inequalities of opportunities remain across the population, limiting the degree in which the poor participate in the growth process and share in its proceeds***

First, while multidimensional poverty has fallen, it remains high. Improvement in several dimensions occurred from low levels, which means that the remaining gaps are not trivial. Second, indicators such as access to electricity, food security and stunting, among others, showed little or no improvement during the period with the strongest economic growth on record. Third, progress has not been even neither across income groups nor across areas. The Human Opportunity Index, a measure that summarizes the level of basic opportunities in a society and how equitable they are distributed, reveals that the chances of Mozambican children later in life are largely influenced by their location and family background, chiefly household income and school attainment of the household head.

***Nearly one in two Mozambicans are trapped in chronic poverty and close to 25 percent of the population is highly vulnerable to fall into poverty***

Almost half of the population (46.3 percent) continues to be poor in monetary and non-monetary sense, most of whom (84.9 percent) are in rural areas. This segment of the population is likely to continue trapped into chronic poverty unless they break the cycle of physical deprivation and accumulate human, physical and financial capital to enter a path of stable income growth. Another 25 percent of the population is not monetarily poor but faces a high risk of sliding back into poverty because of the high economic insecurity brought about by its multiple non-monetary deprivations.

***Is Mozambique on a path to end extreme poverty by 2030? It is unlikely but poverty will fall significantly if growth is high and the gains are more broadly shared.***

Projections under an optimistic (high growth), pro-poor (inclusive) scenario show that poverty is unlikely to be eradicated by 2030 but it can be reduced to 21.8 percent, a remarkable achievement. However, if growth remains strong but pro-rich, as in recent years, the projections indicate that poverty will fall at most to 32.1 percent by 2030. If consumption growth is equally distributed across the population but below past performance, reflecting the slower economic growth experienced in recent years, around 36 percent of the Mozambicans will still be poor by 2030. The results of the simulations underscores that achieving robust, inclusive growth is the right mix to maximize poverty reduction moving forward.

***Strengthening the linkages between growth and poverty reduction requires a mix of policies aimed at achieving three overarching objectives.***

The first objective is to continue expanding the availability of basic services while addressing the remaining large inequalities in terms of access and quality to improve and equalize opportunities for all citizens. Enabling the poor with the skills and access to participate in the growth process and share in its proceeds will bolster growth and economic progress. The second objective is to foster economic diversification, job growth in productive, labor-intensive production, and agglomeration of firms and markets. The private sector is typically the main engine for broad-based growth through job creation. The government can play a critical role by implementing policies and regulations aimed at promoting an environment conducive to achieving high private investment rates and strong firm growth. The third objective is to raise productivity in agriculture – a sector that still supports the livelihoods of most rural households and the poor – by addressing the limited linkages of farmers with input and output markets, and the weak resilience to weather risk. Cutting across these three overarching objectives is the need to protect the significant gains in poverty reduction achieved so far to avoid letting the one in four Mozambicans that have high economic insecurity slide back into poverty and deprivation.

## Introduction

1. Mozambique has witnessed remarkably recovery after 1992, a year that marked the end of a 15-year civil war. Economic growth and household incomes rebounded on the back of reconstruction investments, the strengthening of a market-based economy, macroeconomic stability, policy reforms and government and donor expenditures in basic services. Productivity in agriculture picked up, improving the livelihoods for most poor households. These developments translated into strong and sustained economic growth over this period. Mozambique's Gross Domestic Product (GDP) grew at an annual average rate of 7.2% between 2000 and 2016, making it one of the fastest-growing countries in Sub-Saharan Africa. This economic expansion boosted the incomes of the population. GDP per capita grew annually on average by 4% over the same period, climbing from \$561 to \$1,128 (2011 PPP).

2. This Poverty Assessment documents Mozambique's progress in reducing poverty from 2002 to 2015, with a focus on the period covered by the last two household budget surveys, 2008/09-2014/15. Overall, this study finds that the life of most Mozambicans has improved considerably after the turn of the century. The poverty rate has been on a downward trend, falling from 60.3 percent in 2002/03 to 48.4 percent in 2015/15. The average household in Mozambique has now higher access to basic services such as education, health, safe water, sanitation and electricity, and owns more and better assets. However, this progress is not without its challenges. While growth in household consumption accelerated after 2008, lifting more people out of poverty, it is becoming progressively less inclusive, benefiting disproportionately more the better off. As a result, inequality not only remains high but is also increasing, above all in urban areas. Faster poverty reduction in some of the regions where poverty has historically been the lowest has contributed to increased inter-regional inequality. The equity losses of increasingly weakly inclusive growth are not trivial. Had growth been more equally shared, Mozambique would have achieved twice as much poverty reduction after 2000.

3. Two structural factors are at the root of the increasing lack of inclusiveness. First, Mozambique is undergoing a slow structural transformation as the economy transitions out of agriculture. But the new sources of growth are increasingly concentrated in large, capital intensive public and private investment projects with limited links to the broader economy. Consequently, growth in productivity and output in the most dynamic sectors (industry and services) has not been matched by strong job creation. The second barrier to more equitable growth lies in the persistently large gaps in endowments and returns between the poor and the non-poor. Opportunities for the few, high-quality jobs available are skewed towards urban, male and skilled workers. This inequality of opportunities limits the degree in which the poor participate in the growth process and share in its proceeds. This study concludes that strengthening the link between growth and poverty reduction requires addressing these two structural constraints while raising productivity and resilience to shocks in agriculture, the main source of livelihood for most of the poor in the years to come.

4. The starting point for the analysis is Chapter 1, which synthesizes progress in reducing monetary poverty between 2002/03 and 2014/15. This chapter also looks at the changes in the responsiveness of poverty to accelerating growth, discusses the implications of high fertility rates for poverty, undertakes sensitivity analysis of the poverty estimates to changes in the design of the latest household survey and the seasonality of consumption, and simulates future poverty trends. Chapter 2 examines the drivers of poverty reduction and the increasing lack of inclusiveness, focusing on the roles of growth and redistribution, the sectoral composition of output and jobs across the economy, rural to urban migration and the gaps in endowments and returns between the poor and non-poor. Chapter 3 takes as its focus

the progress in non-monetary dimensions of wellbeing, including analysis of the degree in which households experience multiple deprivations and the implications of overlapping deprivations for economic mobility. Chapter 4 reviews the extent to which aspects such as gender, place of birth or household income, among other variables beyond the control of children, determine the allocation of economic opportunities across the population. The two following chapters zoom in on two areas that are critical to further poverty reduction in Mozambique. Chapter 5 examines factors that are related with low productivity and weak market development in agriculture, and how they undermine the opportunities for rural households to grow out of poverty. Finally, Chapter 6 analyzes the main labor market outcomes from the perspective of workers and firms to illustrate the weak linkages between output growth, job creation and household consumption.

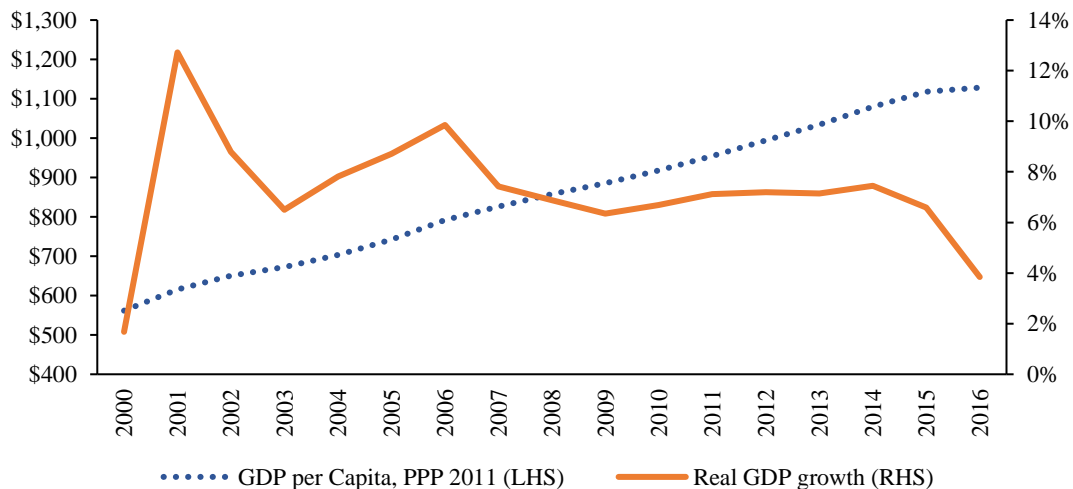
# 1. Progress in Reducing Poverty

## 1.1 An Overview of Economic Growth in the 2000s

5. **Mozambique has experienced strong and sustained economic growth in the last two decades.** Growth of its Gross Domestic Product (GDP) picked up remarkably following the end of the civil war in 1992, expanding at an annual average rate of 7.2% between 2000 and 2016, making it one of the fastest-growing countries in Sub-Saharan Africa (SSA). During this period, economic growth has been largely supported by a rebounding agricultural sector (particularly in the first phase of the post-war period), increased productivity in trade, transport and communications and financial services, sound macroeconomic management, large-scale foreign investments projects and significant donor support. This economic expansion has boosted incomes and living standards. GDP per capita, for instance, grew annually on average by 4% over the same period, climbing from \$561 to \$1,128 (2011 PPP) (Figure 1.1). Accordingly, Mozambique has been slowly closing the income gap with other SSA countries.

6. **Political and macroeconomic stability have provided the foundation for robust growth during this period.** Improvements in macroeconomic management and structural reforms contributed to a steady decline in the inflation and created a more suitable environment for businesses. Tax reforms led to a rapid increase in domestic revenues, reaching levels around 23% of GDP for the period 2010-2016, in line with top performing countries in Africa. Foreign direct investment increased rapidly, especially since the early/middle 2000s, boosting the financing of megaprojects. These large-scale capital-intensive projects focused mostly on commodity exploration and exports in the extractive industry. Sound economic management and stability also helped to attract large donor support. Foreign-aid inflows have been chiefly financing investments in education, health and infrastructure.

**Figure 1.1. Mozambique has enjoyed robust growth that has led to a sustained rise in GDP per capita**

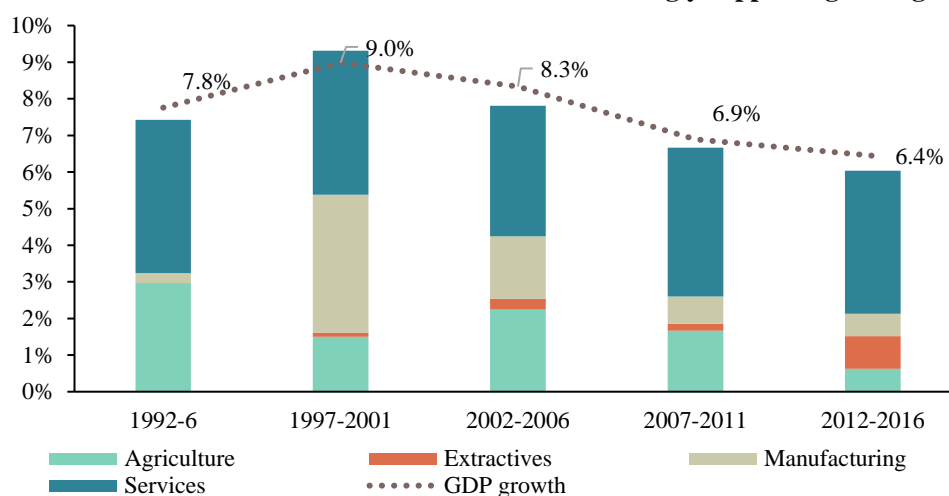


Source: National Institute of Statistics of Mozambique (INE) and World Bank using WDI

7. **Post-war reconstruction and agriculture pushed growth during most of the 1990s, yet the services sector and investments in mega-projects have increasingly driven growth since the early 2000s.** The leading sources of growth in Mozambique have evolved after the civil war. Investments in reconstruction and the incorporation of new workers into the labor force, particularly in agriculture, led growth in the early postwar period. These trends began to change at the end of the 1990s. A

significant expansion of the services sector and investments in megaprojects contributed to rapid accumulation of physical capital and an increase in total factor productivity. Figure 1.2 shows that agriculture's contribution to GDP growth fell from an average of 6 percentage points in the middle of the 1990s to 1.1 percentage points in the early 2000s, and then recovered slightly to around 1.5 percentage points. In contrast, the services sector has successively increased its role in the economy, from contributing an average 0.9 to 2.8 percentage points to overall growth between the mid-1990s and the middle of the 2010s. The manufacturing sector was a large contributor to GDP growth in the late 1990s and early 2000s (at an average 3.3 percentage points) but its share in the economy has fallen since around 2005. Yet, the raising prominence of megaprojects fueled by international investors increased the contribution of the extractive industries to GDP growth since the early 2000s.

**Figure 1.2. The services and extractive sectors are increasingly supporting GDP growth**

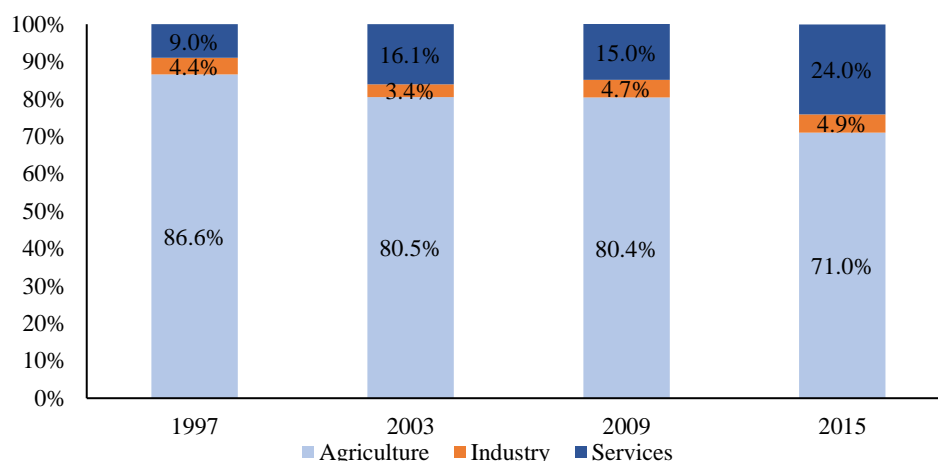


Source: National Institute of Statistics of Mozambique (INE)

8. **The sectoral composition of employment reflects to some extent the structure of the economy but the sectors driving growth in the last 10-15 years have had a limited contribution to job creation.** Notwithstanding the falling share of agriculture in total employment, most people continue to work in this sector. Almost 3 in 4 workers are engaged in agriculture, where labor productivity is low even by regional standards<sup>1</sup>. As expected from the modest structural transformation of the economy, a growing proportion of workers is employed in the service sector – the share increased from 9% in 1997 to 24% in 2015. In contrast, the contribution of the industry sector to employment is rather limited, oscillating between 3.4% and 4.9% in the last two decades despite its larger impact on growth (Figure 1.3). This is largely explained by the concentration of investments in large-scale capital-intensive projects that are characterized by weak backward and forward linkages with other parts of the economy.

<sup>1</sup> Chapter 6 and 7 provide additional discussion on productivity levels, trends and drivers in agriculture.

**Figure 1.3. For most workers their primary job is still in agriculture**  
(Employment by economic sectors, selected years)



Source: National Institute of Statistics of Mozambique (INE)

9. **Recent economic developments have highlighted Mozambique’s exposure to various shocks.** An ongoing economic downturn, brought about in 2015 by low commodity prices, drought and conflict, was compounded by the revelation of USD 1.4 billion in previously undisclosed commercial loans. Together, these events contributed to a sharp pace of currency depreciation and soaring inflation<sup>2</sup>. The weakened currency and constrained supply in agricultural goods drove food inflation to 41%, hitting vulnerable households the hardest as food products account for a dominant share of their consumption basket. Confidence in the economy also faltered, derailing Mozambique’s track record for high growth and economic stability. Whilst policy response picked up pace in the second half of 2016, the monetary-fiscal mix has been unbalanced with inflation reducing measures through monetary policy tightening coming at a cost to the private sector<sup>3</sup>.

## 1.2 Recent Progress in Poverty Reduction

### *Poverty headcount*

10. **The measurement of poverty in Mozambique is based on the value of a “minimum” level of consumption necessary for short- and long-term physical well-being.** Under this method, households not deemed poor have consumption levels that are enough to meet their basic food needs and other non-food essential expenditures. The official methodology defines this “minimum” level using 13 different values (poverty lines) for an equal number of regions, ranging from 19.6 Meticals in rural Zambezia and Nampula to 41.7 Meticals in urban Maputo Province. The methodology employed in this poverty assessment also follows the “basic needs” approach but defines only one absolute minimum level of necessary resources for the entire country (25.85 Meticals). In addition, this methodology adjusts household consumption to reflect regional differences in prices across the

<sup>2</sup> Inflation reached record highs in 2016, peaking at 26.4% in November 2016.

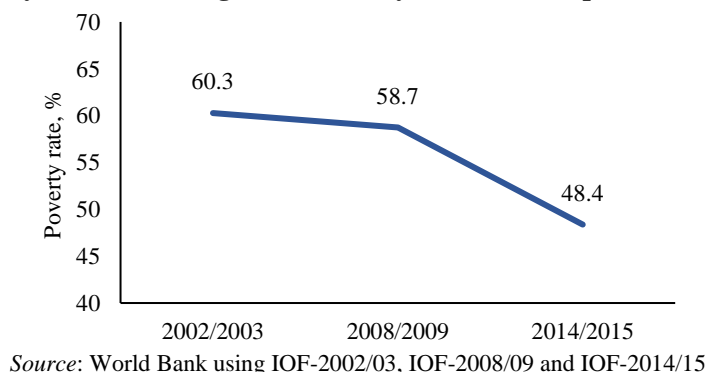
<sup>3</sup> Interest rates have picked up to almost 30%, causing credit levels to contract by an average 13% in real terms in the 12 months to October 2017.

country and temporal differences in prices over the course of the data fieldwork (more details are available in Box 2, Annex 1 and Annex 2).

**11. The data for the estimation of poverty indicators comes from household budget surveys collected nearly every 5 or 6 years.** The first survey, known as *Inquérito aos Agregados Familiares* (IAF) (household survey of living conditions) was collected by National Statistics Office of Mozambique (*Instituto Nacional de Estatística*, INE) between February-1996 and April-1997. The 1996/97 survey interviewed 8,274 households and, like the subsequent ones, was representative at the national, rural-urban, and provincial levels. The following surveys –also conducted by INE– took place between July-2002 and June-2003 and between September-2008 and August-2009 (*Inquérito aos Orçamentos Familiares* (IOF-2002/03 and IOF-2008/09). The fourth and latest survey available to date was collected between August-2014 and July-2015 (IOF-214/15). Contrary to the three previous surveys, which collected cross-sectional data, the IOF-214/15 was implemented as a panel survey (Annex 1). However, for poverty measurement purposes, the three waves of the IOF-214/15 have been appended to use the data as a pooled cross section.<sup>4</sup> Due to better comparability of the data, this report is based on the last three waves of the household budget survey (2002/03, 2008/09 and 2014/15).

**12. Poverty has been on a declining trend following sustained strong economic growth in the 2000s.** Based on data from the 2014/15 household budget survey, the proportion of Mozambicans living beneath the poverty line is 48.4 percent, below the levels of poverty recorded in 2002/03 and 2008/09, 60.3 and 58.7 percent, respectively (Figure 1.4). Overall, this is equivalent to an annual reduction in poverty, on average, of 1 percentage point. Yet, poverty fell markedly faster in the period 2008/09-2014/15 (on average 1.8 percentage points annually) than in the period 2002/02-2008/09, where the poverty rate barely dropped (on average 0.26 percentage points annually). The official numbers, reported in the Fourth National Poverty Assessment conducted by the Government of Mozambique (2016), also reflect the downward trend in poverty –from 52.8 percent in 2002/03 to 46.1 percent in 2014/15, driven almost entirely by the poverty reduction that took place between 2008/09 and 2014/15 (Figure 1.5).

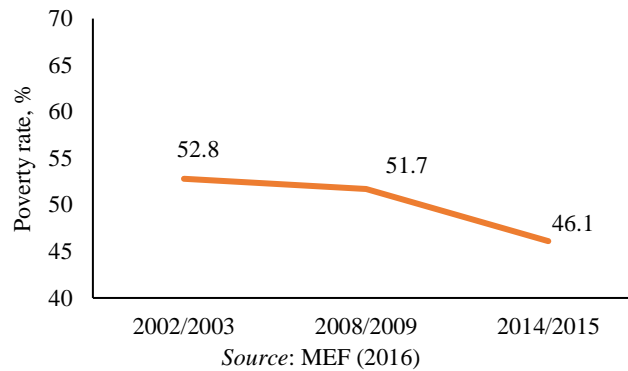
**Figure 1.4. Poverty has been falling since the early 2000s but the pace accelerated after 2008**



<sup>4</sup> This decision was made by the Mozambican Ministry of Economy and Finance (MEF) to capture the seasonality of consumption and avoid using the longitudinal nature of the data that was affected by high attrition rates. More details about these issues are discussed in the next section.

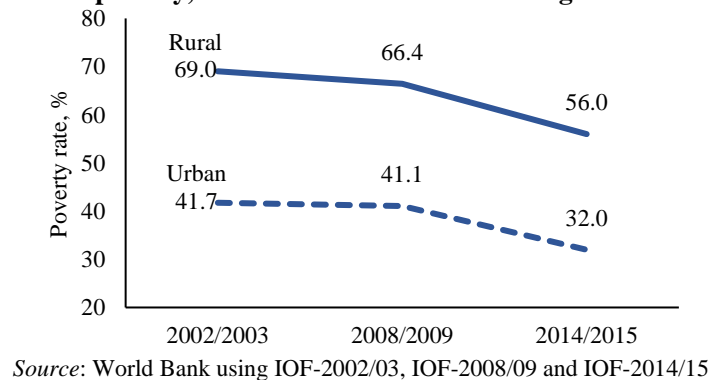


**Figure 1.5. Poverty rates based on the official methodology also show a downward trend**



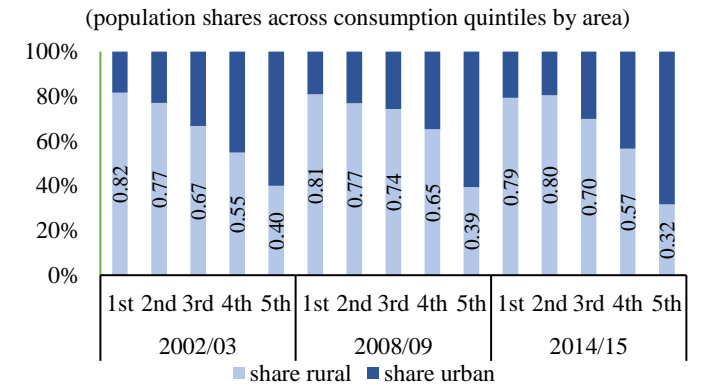
**13. The proportion of households living in poverty has fallen in both rural and urban areas, but poverty remains significantly higher in the former.** Poverty in rural areas declined from 69 percent in 2002/03 to 66.4 percent in 2008/09 and to 56.0 percent in 2014/15. Urban poverty shows a similar trend, however the decline for this part of the country occurred mostly between 2008/09 and 2014/15, dropping from 41.1 percent to 32 percent—urban poverty hovered around 41% in the preceding period (Figure 1.6). In relative terms, poverty has declined faster in urban centers (23.2%) than in rural villages (18.8%). Moreover, the gap in the prevalence of poverty between the rural and urban parts of the country remains almost unchanged: today a Mozambican from a rural area is 24 percentage points more likely to be poor than an urban Mozambican, down from 27 percentage points in 2002/03. Rural households have been concentrated in the bottom part of the distribution, systematically representing 80% of the bottom 40 (Figure 1.7). As noted in Figure 1.8, the rural and urban divide in poverty is also evident in the official numbers (Government of Mozambique, 2016).<sup>5</sup> Irrespective of the methodology used, the trends indicate that the overall decline in poverty did not contribute to a convergence in welfare levels between urban and rural areas.

**Figure 1.6. Despite the fall in poverty, welfare levels have not converged between urban and rural areas**



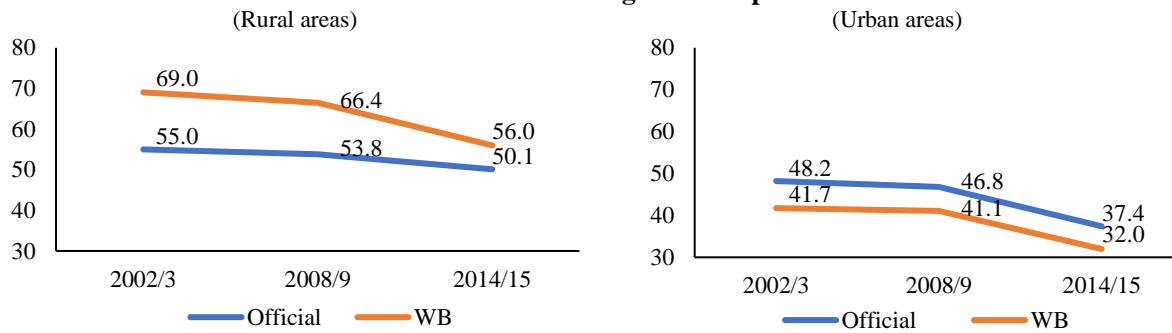
<sup>5</sup> However, the composition of poverty across areas is different: urban poverty is higher and rural poverty is lower in the official estimates relative to the methodology followed in this study (more details about these methodological differences can be found in Annex 1).

**Figure 1.7. Rural households have been systematically concentrated at the bottom of the distribution whereas the urban ones are largely clustered at the top**



Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

**Figure 1.8. Different poverty methodologies confirm the decline in poverty across urban and rural areas but show a different regional composition**



Source: MEF and World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

### **Box 1.1. Measuring poverty in Mozambique**

#### *Official poverty measurement methodology*

The official methodology to estimate poverty in Mozambique was developed by the Mozambican Ministry of Economy and Finance with technical assistance from UN-Wider. As most countries in Sub-Saharan Africa (SSA), the poverty estimates are based on aggregate household consumption as the key welfare indicator. The consumption aggregate comprises food consumption, including food produced by households themselves, as well as expenditures on a range of nonfood goods (including durables such as car, TVs, computers, etc.) and services (e.g., housing, clothing, utilities, transportation, communication, health, education, etc.). Price deflators are used to adjust the consumption aggregate for differences in prices across geographic areas as well as differences across time over the course of the IOF fieldwork. The poverty lines are based on the cost-of-basic-needs (CBN) approach. The methodology defines food poverty lines for 13 geographic regions anchored in the cost of region-specific food baskets that provide 2,150 calories per person per day. These lines are augmented to include an allowance for basic non-food needs. The regional poverty lines are re-estimated every time there is a new household budget survey. The poverty rate measures the proportion of people whose monthly price-adjusted total household consumption per capita is below the poverty line in the corresponding year and region. The values of the poverty lines used in the estimation of poverty with the IOF-2014/15 are found in Annex 2.

#### *Poverty measurement methodology followed in this study*

This Poverty Assessment followed a methodology that is close to the methods used in most countries within and outside SSA. This methodology is also based on the CBN approach and, for that reason, most of the concepts underlying it are analogous to those underpinning the official methodology. There are, however, some important differences. Regarding the consumption aggregate, the difference lies chiefly in the assumptions adopted to impute the value of services delivered by durable goods. Another difference is the use of a single poverty line. The food poverty line was calculated using the average food basket and price per calorie of households between the percentiles 40th and 60th in the IOF 2014/15. The reference food basket obtained corresponds to 1,460 calories. This value is below the calorie requirement of a typical Mozambican for adequate nutrition – usually around 2,100 calories per person per day. Yet, a decision was made to not scale up the value of the food basket to ensure consistency with the issue of systematic underestimation of calorie consumption in the IAF and IOF surveys and to reflect the behavior of households as depicted in the actual data. Like the official methodology, the non-food poverty line adds the cost of other essentials observed in the reference group. The 2014/15 poverty line was deflated to 2002/03 and 2008/09 values using the official Consumer Price Index (CPI). Finally, the consumption aggregate was adjusted to account for geographic food price variation using a Paasche index for each household. Annex 1 provides more details.

#### *The World Bank \$1.9 International Poverty Line*

The World Bank uses a global poverty line set at \$1.9 per person per day using 2011 prices to measure and track the evolution of poverty line worldwide. This line is not a substitute of the official poverty line, which is defined based on each country's specific economic and social circumstances. The value is derived from the national poverty lines of the 15 countries (including Mozambique) with the highest levels of poverty in 2005. To ensure that the same quantity of goods and services are priced equivalently across countries, the 15 poverty lines are converted to a common currency using 2011 purchasing power parity (PPP) exchange rates. The average of these 15 lines in PPP terms was \$1.9 per person per day. The international line is above the average of the 13 poverty official lines in Mozambique for 2014/15 (\$1.54 2011 PPP) and the WB poverty line estimated for this report (\$1.49 2011 PPP).

**14. Poverty has also declined when assessed against an international poverty line.** The global poverty line of US\$1.90 PPP can also be used to examine the level and evolution of poverty in

Mozambique. This line is not a substitute of the official poverty line but rather an international threshold that is used to measure and track poverty trends worldwide (see Box 1.1). Mozambique also shows poverty reduction when this poverty line is used as the threshold of reference. The poverty headcount ratio fell from 78.5 percent in 2002/03 to 67.9 percent in 2008/09 and to 62.9 percent in 2014/15 (Table 1.1).

**Table 1.1. Poverty headcount ratio for national poverty line and the US\$1.9 PPP poverty line**

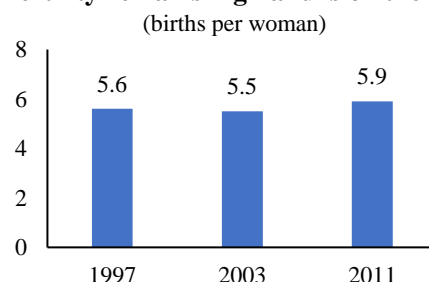
	2002/03	2008/09	2014/2015
National	60.3%	58.7%	48.4%
Urban	41.7%	41.1%	32.0%
Rural	69.0%	66.4%	56.0%
US \$1.9 PPP Poverty Line	78.5%	67.9%	62.9%

Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15 and Povcalnet.

### *Demographic trends and poverty*

**15. Long-term demographic trends, particularly high and stagnant fertility rates, have slowed down the pace of poverty reduction.** Mozambique lags behind other countries in SSA in kicking off a demographic transition. The average total fertility rate is estimated at 5.9 children per woman, nearly one child more than the average for countries in the region. The latest numbers available indicate that fertility levels are not only high but could have even increased relative to estimates for the late 1990s (Figure 1.9). This is particularly true among sociodemographic groups that are more likely to be poor such as households that are in rural areas (particularly in Northern and Central regions), headed by less educated parents and that own fewer assets (World Bank, 2016a) (Box 1.2). A rapidly growing population with a persistent young age structure will continue to place extra pressure on economic growth and poverty reduction in Mozambique.

**Figure 1.9. Total fertility remains high and is on the rise in Mozambique**



Source: World Bank using DHS-1997, DHS-2003 and DHS-2011

**16. Owing largely to the rapid growth in population, the absolute number of poor people in Mozambique has increased over time despite the decline in the overall poverty rate.** The population of Mozambique increased from 18 million in 2000 to a projected 28.8 million in 2017, which means that the total population has been growing over this period at an annual average rate of 3 percent. This rapid increase in population is making it more difficult to reduce the number of poor people even though the poverty rates have been falling. Indeed, as of 2014/15, the country has 12.3 million people living below the poverty line, 1.3 million more than in 2002/03 (Table 1.2). Poverty dynamics show that rural areas continue to account for most of the poor. Indeed, data from 2014/15 shows that nearly 8 out of 10 poor people are in rural parts of the country, fairly similar to the urban-rural composition seen in the early and late 2000s (Figure 1.11).

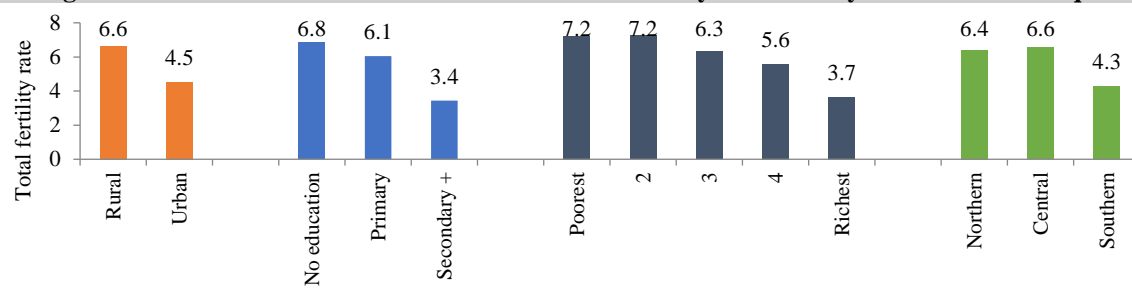
### Box 1.2. The impact of demographic trends on poverty in Mozambique

Demographic characteristics are closely linked to economic activity and progress. For example, a sustained decrease in the fertility rate can lead to an increase in the share of working age people. If productively employed, this larger cohort of workers can increase aggregate income, savings and investments, ultimately, raising income per capita – the so-called “demographic dividend”. At the household level, lower dependency ratios can also free up resources that can be invested on human capital and private consumption.

Countries often experience different demographic trends (demographic transitions) across different stages of development. Typically, low income countries exhibit high fertility rates but they start to fall as countries grow and achieve higher levels of development, moving from high to low fertility and mortality rates. There are differences in fertility rates within countries too. Some socio-economic groups, often poor and rural households, tend to have more children per woman than other segments of the population.

Several countries in Sub-Saharan Africa have recorded steady fertility declines in the last couple of decades whereas in others, such as Mozambique, fertility has been stagnant or even rising. At 83 deaths per 1,000 live births, infant mortality is high. The total fertility rate (TFR) in the early 2010's is estimated at 5.9 children per woman on average, up from 5.3 during the early 2000s and almost one child higher than the regional average. As in other high-fertility countries, the TFR is higher among the most vulnerable households – from the lowest quintiles, with no education and living in rural or other isolated areas. The TFR of a representative household from the lowest wealth quintile (7.2) is nearly twice the TFR of a household in the highest quintile (3.7). On average 2.1 more children are born per rural women than urban women (Figure 1.10).

**Figure 1.10. Socioeconomic characteristics correlate closely with fertility rates in Mozambique**



Source: World Bank using DHS-2011

High fertility has obvious negative implications for poverty reduction in Mozambique. An instantaneous reduction of one child in the TFR, keeping everything else constant, could lead to a 31% increase in real GDP per capita by 2050 and accelerate the pace of poverty reduction by around 60% (World Bank, 2017). However, transforming the demographic challenge into a demographic opportunity requires advancing multi-sectoral policies to empower families to make informed reproductive decisions through family planning, educating the young population, and promoting productive employment among the emerging working-age population.

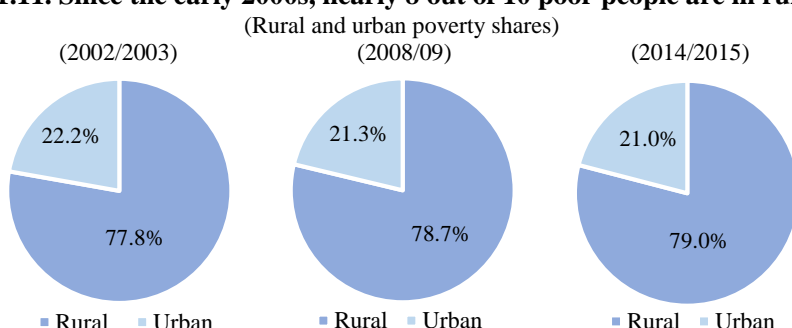
Source: World Bank. 2016. “Searching for the demographic dividend in Mozambique: an urgent agenda”. Washington, D.C: World Bank Group.

**Table 1.2. The total number of poor has increased, mostly in rural areas**  
(in thousands)

	National	Rural	Urban
2002/03	11,032	8,582	2,450
2008/09	12,647	9,959	2,688
2014/15	12,336	9,752	2,584

Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

**Figure 1.11. Since the early 2000s, nearly 8 out of 10 poor people are in rural areas**



Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

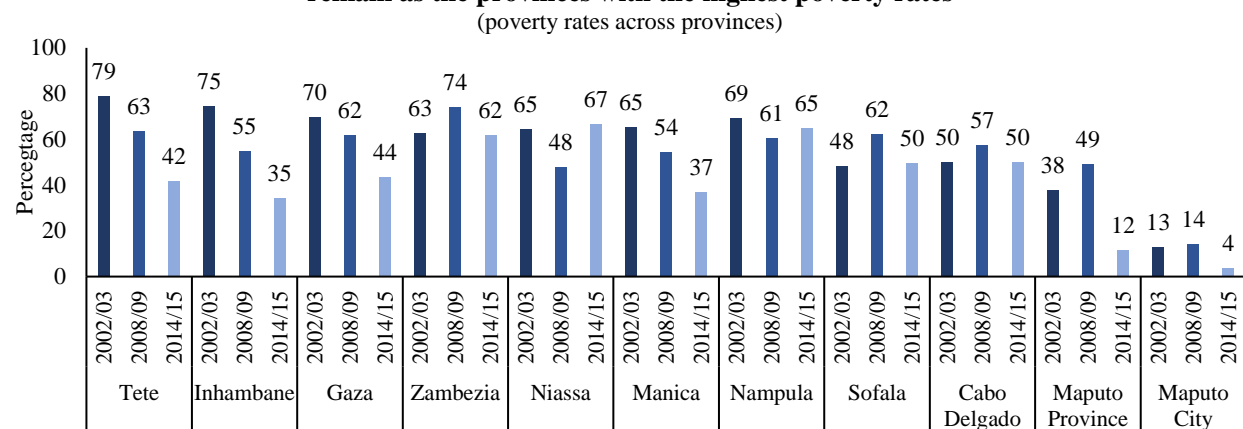
### *Regional distribution of poverty*

**17. There are large spatial differences in poverty levels and changes across provinces in the country.** Mozambique is administratively divided into 10 provinces and one capital city (Maputo) with provincial status. The household budget surveys used in this report are statistically representative at this level and thus allow tracking the evolution of poverty –and other socioeconomic indicators– across regions. For almost half of the provinces the trends signal a continued decline in poverty rates. The gains (measured in percentage points) for this group of provinces are not trivial: 37 in Tete, 30 in Inhambane, 28 in Manica, 26 in Gaza and 9 in Maputo City. A different pattern emerges for provinces such as Zambezia, Sofala, Cabo Delgado and Maputo Province, where poverty experienced an increase in the period 2002/03-2008/09 and a decline afterwards. Yet, as of 2014/2015, the incidence of poverty in these provinces –except Maputo City– is almost identical to the levels of poverty recorded in the early 2000s. Finally, there are two provinces (Nampula and Niassa) where the estimates show the opposite trend, namely a reduction between 2002/03-2008-09 and an increase in the subsequent period that brought poverty back to the baseline levels (Figure 1.12) (Annex 3).

**18. Despite the generalized decline in poverty, welfare levels remain low in the Northern and the Center Regions of the country relative to the South.** Poverty continues to be high in Zambezia, Nampula and Niassa, in contrast to Maputo Province and Maputo City, which recorded the largest decline. By 2014/15, poverty rates in these three provinces are well above the national average (48.4 percent): Niassa (67 percent), Nampula (65 percent) and Zambezia (62 percent). Official numbers also show these three provinces as the ones with the highest poverty rates across the country (Annex 3). Back in 2002/03 the provincial rankings differed strongly, with Tete, Gaza and Inhambane exhibiting poverty rates above 70 percent. Since then poverty reduction has been faster in these provinces, falling by around 40-50 percent. Likewise, Maputo Province and Maputo City recorded the largest improvements in poverty indicators, with a decline of 70 percent. This is in stark contrast to the marginal reduction of poverty seen in Niassa, Zambezia and Nampula. As noted by the Government's

Fourth National Poverty Assessment (2016), the capital city and the surrounding administrative area have pulled ahead of other parts of the country even though they had significantly lower poverty than other areas of the country in 2002/03.

**Figure 1.12. Poverty reduction has been uneven across regions whereas Niassa, Nampula and Zambezia remain as the provinces with the highest poverty rates**



Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

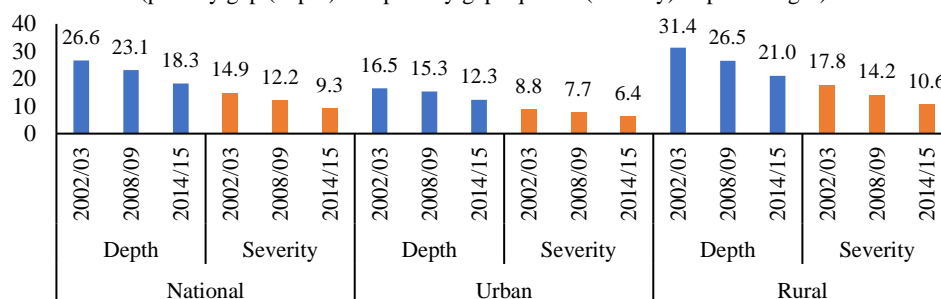
### *The depth and severity of poverty*

19. **Alternative measures such as the poverty gap and the poverty gap squared can shed light on the intensity of poverty and the level of inequality among the poor.** The most traditional indicator of poverty is the headcount ratio. It measures the share of a population below the poverty line but ignores the depth of poverty and the inequality in the distribution of income or consumption among the poor. The *poverty gap* (also known as the depth of poverty) adds up the extent to which individuals fall below the poverty line, namely how far, on average, poor households are from the poverty line. It is expressed as a percentage of the poverty line, equivalent to the average amount of resources that are necessary to bring the incomes or expenditures of the poor up to the poverty line. Another index, the *poverty gap squared*, also known as the severity of poverty), considers inequality among the poor through the weighted sum of the poverty gap. The weights correspond to the poverty gaps themselves and thus the poverty gap squared gives more importance to poor individuals that fall far short of the poverty line.

20. **The positive consumption growth seen in recent years means that, on average, the poor are now relatively closer to meeting their basic needs –as defined by the poverty line– than they were 15 years ago.** The economic progress experienced by Mozambique did not only help 11.3 percent of households escape poverty but also pushed those still in poverty closer to the poverty line. The calculations shown in Figure 1.12 illustrate a strong and continued decline in the poverty gap nationally and across different parts of the country. Back in 2002/03, the mean consumption shortfall was 26.6% of the poverty line (also measured in 2002/03 values), 8.3 percentage points (31.2%) more than the corresponding value in 2014/15 (18.3%). These trends are qualitatively and quantitatively similar in rural and urban areas. Similarly, the squared poverty gap has been on a declining trend (Figure 1.13).



**Figure 1.13. A large share of poor households has reduced their consumption shortfall relative to the poverty line, and the inequality among them has also fallen**  
(poverty gap (depth) and poverty gap squared (severity) in percentages)



Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

21. **A large share of the population is clustered around the poverty line, indicating that a small increase in income can lift several people out of poverty but also that many others are vulnerable to fall into poverty.** In other words, many of the poor are now closer to the poverty line and hence are more likely to abandon poverty than ever before. Assuming no behavioral responses, if all poor households received a lump sum daily transfer per capita of \$2.58 meticaís, equivalent to 10% of the value of the poverty line (\$25.85 meticaís or US\$1.49 2011 PPP), the national poverty rate in 2014/15 would fall by 6 percentage points, from 48.4% to 42.4%. The flip side of the clustering around the poverty line is that a slight drop in consumption for households above the poverty threshold (or an increase in the value of the poverty line) would lead to a significant increase in poverty. Indeed, a flat drop in consumption of \$2.58 meticaís for all non-poor households would result in an increase in the poverty rate of 4.6 percentage points. Similarly, 60.4% of the population would be considered poor (rather than the official rate of 48.4%) if the headcount were estimated using the international poverty line of \$1.90 (\$33 meticaís), which is 27% higher than the official rate (Table 1.3). This strong sensitivity of the poverty rates signals the high levels of vulnerability among households near the basic needs poverty line.

**Table 1.3. Poverty rates are sensitive to small changes in consumption and the value of the poverty line**

Scenario	Equivalent change in the poverty line	Poverty rate
Baseline scenario: No change in consumption per capita	Official poverty line (\$25.85)	48.4%
Increase in consumption per capita of \$2.58	10% reduction (\$23.27)	42.4%
Reduction in consumption per capita of \$2.58	10% increase (\$28.43)	53.0%
Using International Poverty Line (US\$1.9 2011 PPP)	27% increase (\$33)	60.4%

Notes: all currency values expressed in meticaís unless specified otherwise

Source: World Bank using IOF-2014/15

### 1.3 The Relationship between Economic Growth and Poverty

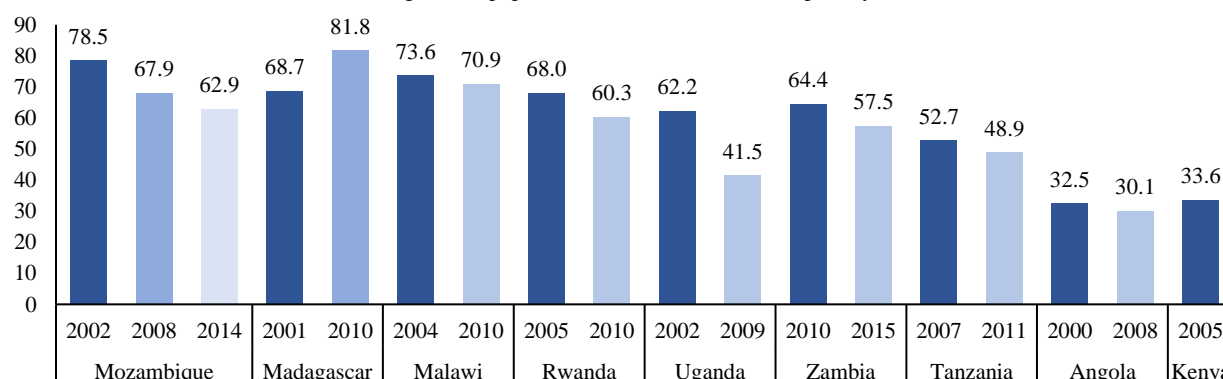
22. **The fall in poverty is consistent with the trend seen in other countries in the region in the last decade or so.** Poverty has been falling in most countries in sub-Saharan Africa (SSA) in the last 10-15 years. Comparisons of poverty levels and changes across countries are difficult because the years of the surveys vary from country to country. Yet, looking at the evolution of numbers circa the middle of the 2000s and early/middle 2010s suggests that the direction and pace of poverty reduction in Mozambique is within the range seen for most countries in the region. For instance, poverty has fallen by nearly 8 percentage points in Rwanda between 2005 and 2010, by almost 7 percentage points in



Zambia between 2010 and 2015 and by close to 4 percentage points in Tanzania – in Mozambique it fell by 5 percentage points in the years between 2008/09 and 2014/15 (Figure 1.14).

**23. Over the long term, the response of poverty to fast and accelerating economic growth in Mozambique has been relatively modest.** The growth elasticity of poverty reduction can give an estimate of how closely (or not) are growth and poverty linked in a country. The elasticity measures the percentage change in poverty with respect to a 1 percentage change in GDP (or consumption per capita). Estimates of this elasticity<sup>6</sup> relative to a group of five selected countries in Eastern Africa with two poverty measurements in the last decade show that the responsiveness of monetary poverty to raising levels of income per capita in Mozambique is moderate. A one percentage increase in GDP per capita in Uganda is associated with a fall in poverty of 0.95 percentage points (elasticity = 0.95), whereas an equivalent change in GDP per capita reduced poverty by 0.3 points in Mozambique (elasticity = 0.30), less than a third (Figure 1.15). Despite the sensitivity of the elasticity calculations to technical assumptions, data sources and period, estimates from previous studies point to the same conclusion, namely that the speed of poverty reduction in Mozambique is moderate.

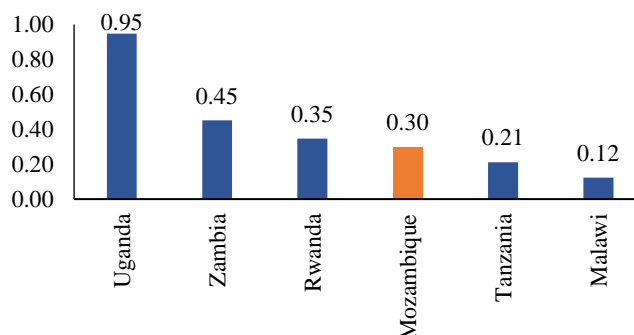
**Figure 1.14. The incidence of monetary poverty fell in Mozambique and in other countries in the region**  
(Percentage of the population below the US\$1.9 PPP poverty line)



Source: World Bank using WDI

**Figure 1.15. The relationship between growth and poverty has not been as strong in Mozambique as it has been in some neighbor countries**

(GDP per capita growth elasticity of poverty, selected countries)

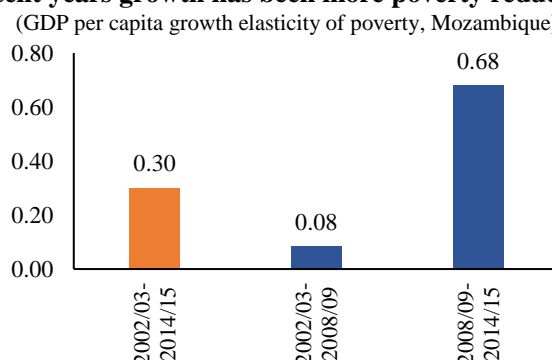


Notes: periods used for the calculation are as follows: Uganda (2002-2009), Zambia (2010-2015), Rwanda (2005-2010), Mozambique (2002-2014), Tanzania (2007-2011) and Malawi (2004-2010). Poverty rates based on the US\$1.9 PPP international poverty line. Source: World Bank using WDI.

<sup>6</sup> For ease of comparison, GDP growth was calculated from growth in GDP per capita from the national accounts whereas the evolution of poverty is obtained from changes in the poverty headcount reflected by the US\$1.9 PPP international poverty line.

24. **However, the pace of poverty reduction in recent years reveals that economic growth and poverty became more closely linked.** The modest value of the growth elasticity of poverty reduction over the long term (0.3) is the result of averaging two intervals of time where GDP per capita grew at a stable rate (on average around 4 percent per year) but poverty evolved at substantially different rates. For most of the 2000s (2002/03-2008/09), poverty dropped by a total of 1.6 percentage points, which translates into an elasticity of 0.08. However, the pace picked up remarkably after 2008/09, with the elasticity rising to 0.68 for the period 2008/09-2014/15 (Figure 1.16). This means that in recent years the country was better able to leverage strong growth for faster poverty reduction. However, as noted below, several challenges continue to prevent the poor from fully participating in the opportunities unleashed and contribute to and benefit from the growth process.

**Figure 1.16. In recent years growth has been more poverty reducing in Mozambique**



Source: World Bank using WDI, IOF-2002/03, IOF-2008/09 and IOF-2014/15

## 1.4 Sensitivity of Poverty Estimates in the IOF-2014/15

### *Non-response rates across panel survey waves*

25. **Longitudinal data follows a given sample of households or individuals over time, providing multiple observations for each of them and allowing testing more complicated economic hypothesis.** Having multiple observations of each household in the sample provides advantages over conventional cross-sectional or time series data. For example, panel data usually gives analysts a larger number of data points improving the efficiency of econometric estimators. More importantly, it allows investigating important economic questions, such as measuring actual fluctuations in household consumption and poverty over time, and testing more complex models of dynamic behavior. Consequently, panel data have becoming increasingly available in developed and developing countries.

26. **For the first time, the IOF-2014/15 in Mozambique was designed and implemented as a panel survey, but it suffered of high rates of nonresponse.** The survey was originally designed to interview over 11,000 households four times (once in each quarter) during a 12-month survey period starting in August 2014 and ending in July 2015. Yet, due to budget constraints, the survey was carried out only during three quarters: Q1 (August-October), Q2 (November-January) and Q4 (May-July). In general, a panel is said to be “balanced” if the data contains the same time periods for all the units of analysis (countries, household, firms, etc.). However, most panel household surveys are “unbalanced” because of the difficulty of re-interviewing every single household in each of the survey waves, which is in fact the case for the IOF-2014/15. As summarized in Table 1.4, the lowest number of respondents is observed in Q2. With respect to Q1, 13% of individuals (10% of households) were lost in Q2, while

5% of individuals (2% of households) were lost in Q4. Around 80% of households in the final pooled sample were interviewed in each of the three waves (see Annex 4 for more details).

**Table 1.4. The levels of attrition in the IOF-2014/15 were high between the first and second quarter**  
(Observations per survey quarter in the IOF-2014/15, unweighted)

	Q1	Q2	Q4
Individuals	58,345	50,774	55,197
Households	11,506	10,373	11,317

Source: World Bank using IOF-2014/15

27. **In addition to the high levels attrition, the nature of the nonresponse in the IOF-2014/15 may result in issues of selection in the sample.** The presence of high rates of nonresponse (attrition) in panel data over several waves may cause error bias in the survey estimates.<sup>7</sup> This type of bias can arise if households that are not re-contacted or refuse to respond the survey differ systematically from those that remain in the sample. The evidence indicates that this sort of non-random attrition was experienced in the IOF-2014/15. For example, compared to non-poor households, the rates of nonresponse among poor households was regularly higher across all waves (Table 1.5). Furthermore, nonresponse between Q1 and Q2 was higher in some of the poorest, more isolated provinces: 37% in Zambezia, 19% in Cabo Delgado, 17% in Niassa and 13% in Nampula. At nearly 13%, the nonresponse in Maputo City, the part of the country with the lowest poverty rate, was also high. While efforts were made in Q4 to track and re-interview all individuals visited in Q1, the attrition rates in Zambezia and Cabo Delgado reached 16% and 11%, respectively (see Annex 4).

**Table 1.5. Attrition rates across survey waves were higher among poor households**  
(Household nonresponse across waves by income groups)

	Q1-Q2	Q1-Q4	Q2-Q4
All	10.0%	7.6%	5.2%
Poor	12.6%	8.1%	7.4%
Non-poor	8.7%	7.4%	5.0%

Source: World Bank using IOF-2014/15

28. **Several variables that are correlated with the poverty status of households are also correlated with the probability of attrition across quarters but overall there is not a pattern in the possible direction of the bias, if any.** There is an overlap of household characteristics that are associated with poverty and attrition. However, even though poor households were more likely to drop out of the sample, there is not a clear pattern in the leading sign of these relationships across waves, making it difficult to conclude on the direction of a potential selection bias. Between Q1 and Q2, for instance, variables such as the age of the household head, ownership of assets (TV and phone) and access to basic services are strongly and significantly correlated with lower probability of both poverty and leaving the sample. In contrast, variables such as household size have an opposite association, namely increasing the chances that a household is both below the poverty line and stays in the sample. Looking at the correlates of attrition between Q2 and Q4, it is worth highlighting that urban households, which are less likely to be poor, had higher chances to stay in the sample.

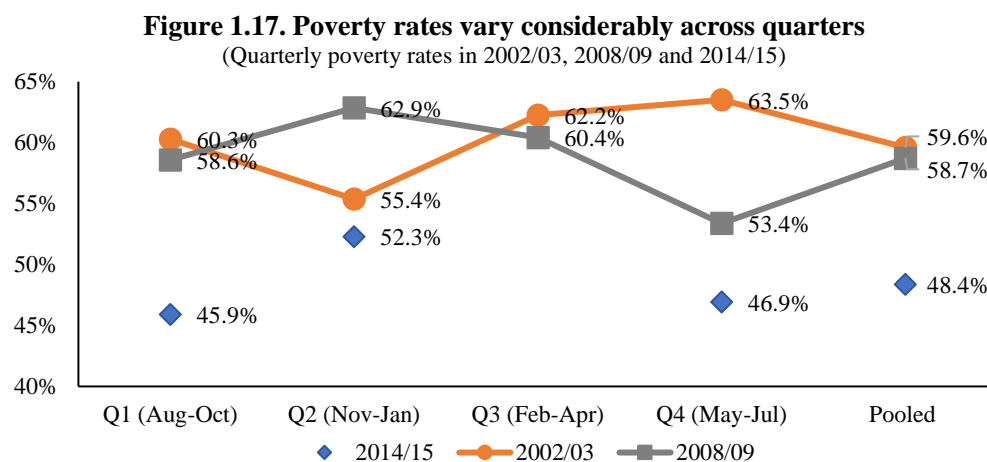
#### *Seasonality of quarterly poverty rates*

29. **Poverty rates in the IOF-2014/15 fluctuate across quarters but these changes are within the range of variation observed in the quarterly poverty rates obtained from the previous cross-**

<sup>7</sup> Replacing lost households with new ones could also lead to similar selection issues affecting the composition of the sample.

**sectional surveys.** The poverty estimates for 2014/15 are sensitive to the choice of quarter. Figure 1.17 depicts the level of variation, increasing from 45.9% in Q1 to 52.3% in Q2 and then falling to 46.9% in Q4. These three values are different in statistical sense from the poverty estimate obtained from the pooled sample (48.4%) that uses the three waves as a single cross section. The changes in the quarterly poverty estimates from the IOF-214/15 are within the level of variation observed in the quarterly rates computed with the IOF-2002/03 and the IOF-2008/09. Overall, there are several possible explanations for the systematic oscillation of the quarterly poverty rates. As discussed further below, food and non-food household expenditures in Mozambique are markedly cyclical owing to the seasonality of agricultural production. Other factors that are intrinsically seasonal such as temporary migration and private transfers are also likely to play a role. In the case of the IOF 2014/15, as noted above, changes in the composition of the sample because of high and possibly non-exogenous attrition could have also added to the variation in poverty rate across quarters.

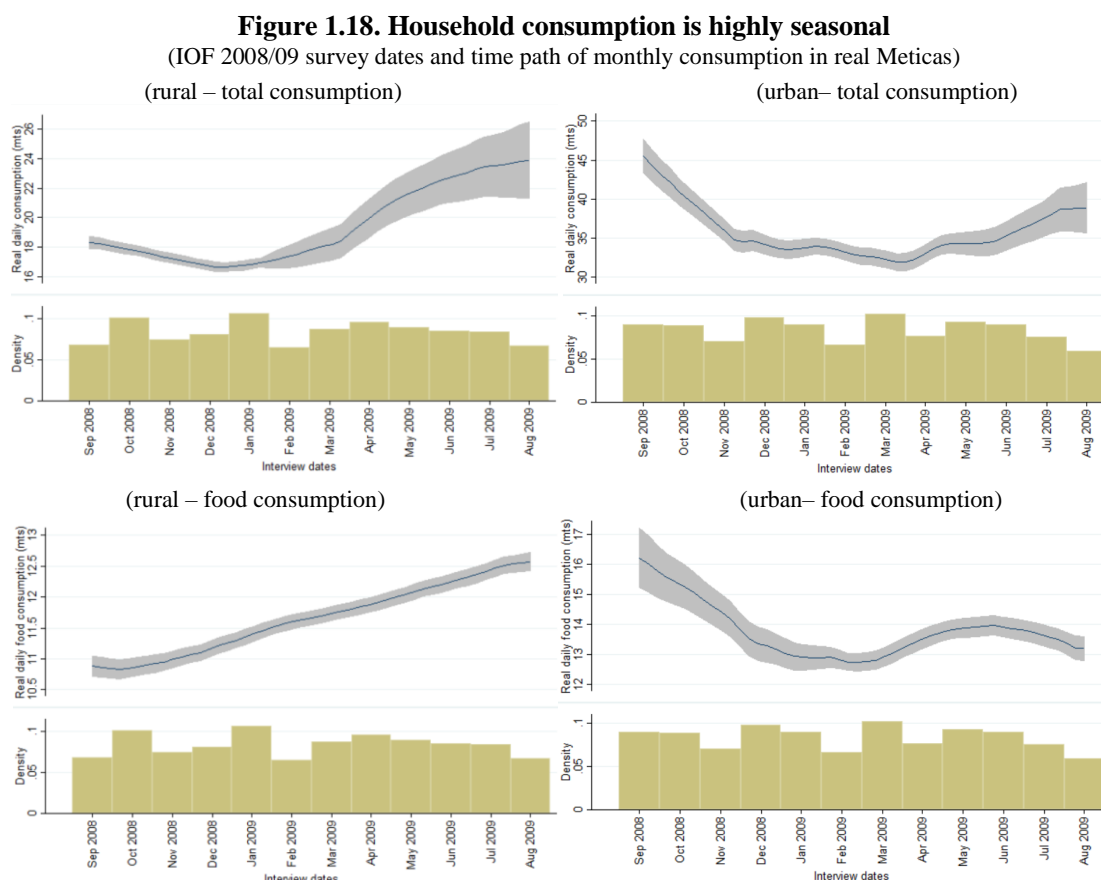
30. **Given the seasonal pattern of the poverty rates over a 12-month period, the overall poverty headcount resulting from the IOF-2014/15 could have been larger had the survey interviewed households in Q3.** Historically the poverty rates in third quarter (February-April) of the survey calendar tend to be above the year-long average. For instance, the poverty rates for Q3 in the IOF-2002/03 and the IOF-2008/09 are well above (around 2-3 percentage points) the weighted average of the poverty rates for Q1, Q2 and Q4 together. As argued below in more detail, this is strongly associated with the seasonality of consumption across the country. This may indicate that the total poverty rate computed with the IOF-2014/15 may have been higher had the survey not skipped Q3.



31. **The intra-annual variability of poverty is largely driven by the strong seasonality of consumption.** A common feature in agrarian economies is that households rely on seasonal agriculture from rain-dependent crop cultivation for their incomes. The inability of agricultural households to smooth their consumption –due largely to poorly functioning credit and insurance markets– means that seasonality in incomes, in turn, can lead to seasonal changes in expenditures. In the case of Mozambique, the seasonal variation in household expenditures is quite large –both in rural and urban areas. The lower panel of Figure 1.18 presents the histogram of survey dates in the IOF-2008/09, showing the broad and fairly uniform temporal coverage of the survey across the year.<sup>8</sup> The upper panel of Figure 1.17 depicts clearly the seasonality of consumption. In rural areas, household

<sup>8</sup> Unfortunately, the IOF-2014/15 is not suitable to depict the full pattern of consumption seasonality across a 12-month period since it collected data for only three of the four quarters between August, 2014 and July, 2015.

expenditures start to increase gradually around March/April, peak in July/August, drop sharply by nearly 25% around September and then level off until February. Nearly two thirds of the total annual expenditures of rural households are concentrated in the six-month period between March and August. The temporal pattern of seasonality is similar for urban households but the levels of variation are different – the peak is about 14% higher than the minimum.

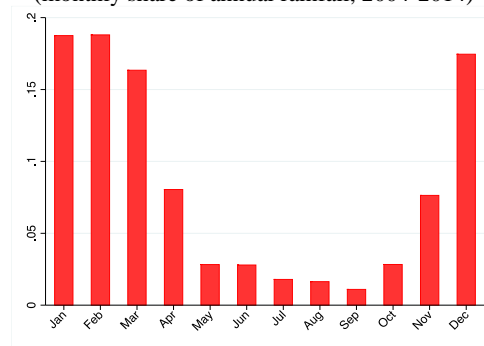


Note: the lower panel of each graph shows the histogram of IOF-2008/09 dates and the upper panel shows a local polynomial regression of consumption on the interview day

Source: World Bank using IOF-2008/09

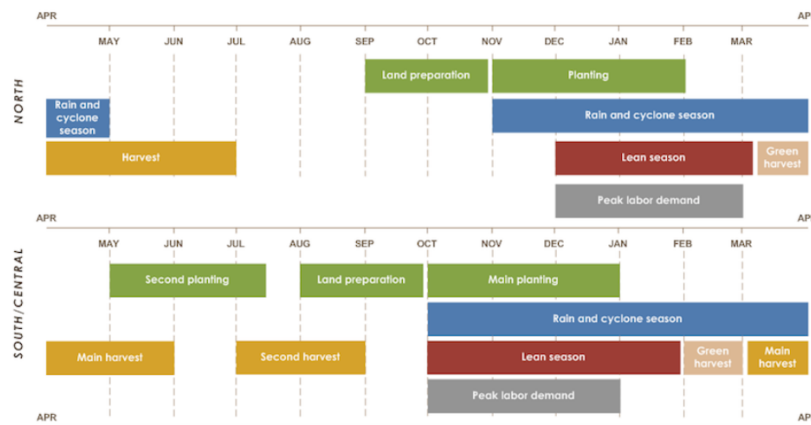
**32. Underlying the seasonality of consumption is the annual growing cycle of the main crops.** Most farming in Mozambique relies on rainfall for water. Less than 25% of farmers reported using irrigation in the 2014 Agricultural Integrated Survey (AIS). Therefore, agricultural yields, income and consumption are largely determined by the seasonality of rainfall and the crop calendar. Mozambique is characterized by two seasons. The wet (rainy) season goes from October to March whereas the dry season extends from April to September (Figure 1.19). The temporality of food availability, which itself is closely associated with the rainfall season, matches very closely the seasonality of consumption. April usually marks the beginning of the post-harvest season for some of the main crops (for instance, maize) across most of the country, improving food availability and lowering staple food prices (Figure 1.20). Food stocks tend to decline gradually around September.

**Figure 1.19. Rainfall patterns are highly seasonal**  
(monthly share of annual rainfall, 2004-2014)



Source: World Bank using CRU-TS data

**Figure 1.20. Crop cycles are highly determined by the seasonality of rainfall**



Source: Famine Early Warning Systems Network (FEWS NET), 2015

33. **The pronounced seasonality of consumption in Mozambique is expected to have negative consequences on critical development outcomes.** Rather than having a smooth consumption, households exposed to high seasonality tend to consume significantly more in the months after harvest than in the later months of the lean season. Considering the high levels of poverty and vulnerability, above all in rural areas, seasonal fluctuation around a minimum (critical) level of consumption are expected to hinder child development in early stages of life. Indeed, the empirical evidence suggests that intra-annual variability is associated with changes in caloric intake, weight, growth and stunting (Behrman 1993, Shetty 1999, Maleta et al. 2003; Miller et al. 2013, Christian and Dillon 2017). These effects are likely to persist over time. Existing studies show a strong link between early life shocks – including shocks caused by consumption seasonality– and long-term human capital, employability and incomes (Alderman 2006, Maccini and Yang 2009, Christian and Dillon 2017). Evidence specific for Mozambique indicates that key socioeconomic outcomes of adults such as employability and per capita consumption are influenced by weather shocks that hit these individuals early in life (Baez, Caruso and Niu, 2017).

## 1.5 Poverty Outlook: Is Mozambique on a Path to End Extreme Poverty by 2030?

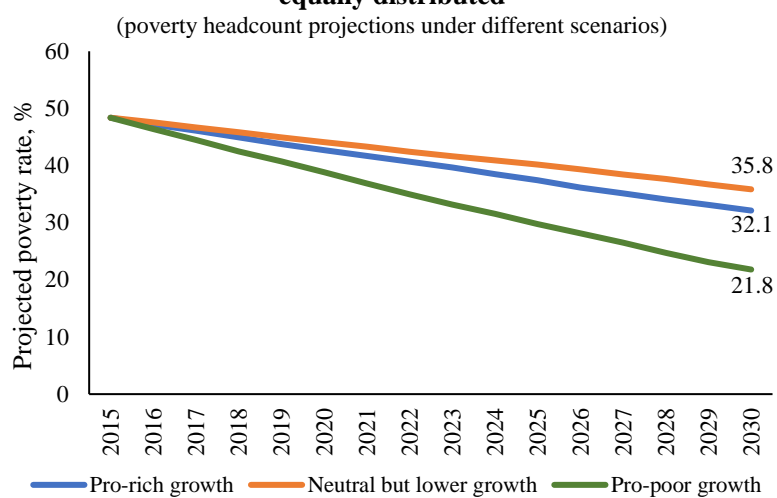
34. **Projections of different consumption growth scenarios based on past performance can give an idea as to whether Mozambique is on a path to end extreme poverty –or reduce it substantially– by 2030.** This section presents simulation results to examine what poverty rates in Mozambique will look like in 10 and 15 years from now assuming recent patterns of consumption growth. Growth levels are determined based on past consumption growth performance and future economic growth projections. More specifically, three different scenarios are simulated as follows: 1) *neutral but lower growth scenario* – assumes annual distribution-neutral consumption growth of 2 percent, below the average annual growth of mean consumption recorded for the period 2002-2014 (2.9 percent) to reflect the lower economic growth of recent years; 2) *pro-rich growth scenario* – assumes that the speed of consumption growth for the upper half of the distribution is 3.5 percent, more than twice the growth rate of the bottom 50 (1.5 percent) and 3) *pro-poor growth scenario* – assumes the opposite of the growth levels set in the pro-rich scenario for the bottom and upper halves of the distribution, namely 1.5 percent for the top 50 and 3.5 percent for the bottom 50.

35. **The most optimistic projection (scenario 3) will reduce poverty significantly by 2030 but it will not eradicate it.** Figure 1.21 shows the trends for the poverty rates between 2015 and 2030 for each of the three scenarios. Monetary poverty would fall from 48.4 percent to 21.8 percent under the pro-poor growth scenario. This would represent a notable reduction in the poverty headcount considering that back in 2002/03 6 in 10 Mozambicans were poor. However, achieving this level of poverty reduction requires not only a high and sustained expansion of consumption but also consumption growth that benefits more than proportionally the bottom half of the distribution. However, based on past performance and the limited inclusiveness of growth in recent years, the projections from the pro-poor growth scenario may be overly-optimistic.

36. **If the pattern of growth remains pro-rich (scenario 2), as in recent years, poverty will continue to fall but at a slow pace, and inequality will worsen even more.** As noted above, household consumption, measured at the mean, grew rapidly (6.8% annually) during the period 2008/09-2014/15. However, consumption growth for the bottom 40 was less than half that level. Projections based on a similar pattern of unequal growth indicate that by 2030 poverty would fall from 48.4 percent to 32.1 percent. The fall in poverty will continue due to positive consumption growth among the poor. Yet, as expected, the total reduction would be around 10 percentage points less than the reduction achieved under a pro-poor growth scenario, underscoring the importance of advancing pro-poor policies. Moreover, if continued, the unequal distribution of growth, with higher growth rates for the top percentiles, will enlarge the gap in incomes between the bottom 50 and the rest of the population, worsening inequality even further.

37. **By 2030, nearly almost 36 percent of the Mozambicans will be poor if consumption growth is equally distributed across the population but below past performance reflecting the slower economic growth experienced in recent years.** Poverty is expected to fall to 35.8 percent under the “neutral but lower growth” scenario, a non-trivial achievement but still far from poverty eradication. Broad-based but slower growth would even have a lower impact on poverty reduction than the current “pro-rich growth” scenario (3.7 percentage points) and substantially lower than the “pro-poor” scenario (14 percentage points). As is evident from the simulations, maximizing the poverty reduction impact of growth in the way forward will require both high and more equal growth than the one experienced in the last six years.

**Figure 1.21. Poverty will fall substantially in the next 15 years if growth remains high and becomes more equally distributed**





## 2. The Inclusiveness of Economic Progress

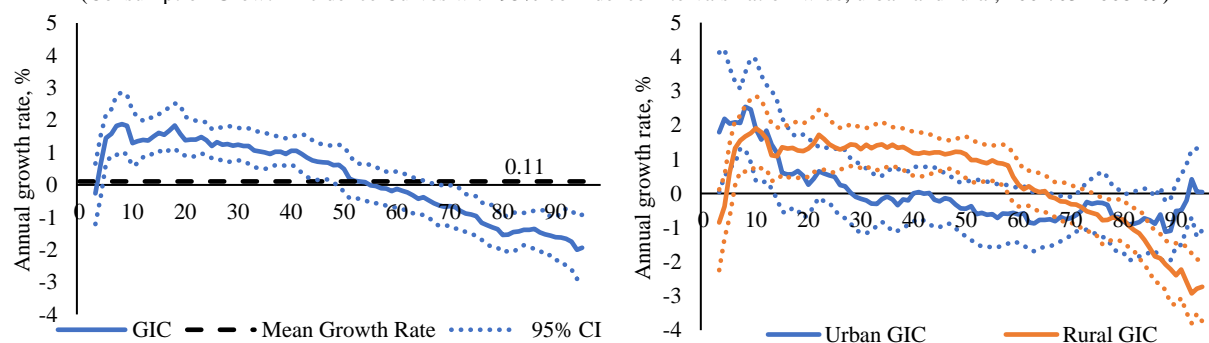
### 2.1 The Incidence of Progress, Shared Prosperity and Inequality

#### *Growth incidence*

38. **An examination of the distributional pattern of growth can shed light on who benefited the most from economic progress in the last decade.** The previous section showed that Mozambique managed to reduce the poverty headcount from 60.3 percent to 48.4 percent between 2002/03 and 2014/15. While a significant achievement, this is just one measure of how households' consumption fared relative to the poverty line. Taking a closer look at changes in the distribution of consumption over time sheds light on which income groups (low-, middle- and/or top income) benefitted the most from the strong economic growth observed in Mozambique over the period of study. This type of analysis also elucidates the role of consumption (or income) growth and redistribution in bringing about improvements in the standards of living and changes in poverty.

39. **In spite of modest consumption growth in the 2000s, low-income households benefitted disproportionately more, amongst all those located in rural areas.** The period 2002/03-2008/09 recorded a small reduction in poverty in Mozambique. The main reason for this is that household consumption barely grew over this time at an annual growth rate at the mean of 0.11 percent. Yet, the growth incidence curve (GIC) for this period, which shows the percent change in average consumption for each percentile of the distribution, indicates that growth was low but “pro-poor” (Figure 2.1). In other words, the small reduction in poverty was a result of the low but broad-based growth that benefited mostly the bottom 50%. In contrast, the consumption of the middle- and higher-income households stagnated by around 1.5% per year. GICs for urban and rural areas confirm that growth lifted the consumption of the poorest households, particularly among poor rural population. For many of these households, however, this modest growth did not push consumption above the poverty line.

**Figure 2.1. Growth between 2002/03 and 2008/09 was low but “pro-poor”, especially in rural areas**  
(Consumption Growth Incidence Curves with 95% confidence intervals nation-wide, urban and rural, 2002/03-2008-09)

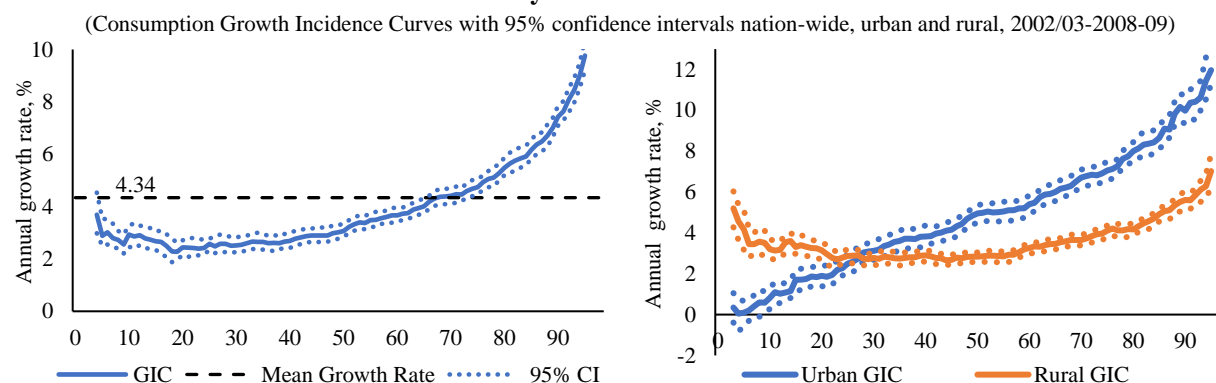


Note: dotted lines in each graph show 95% confidence intervals  
Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

40. **However, more recently, the distributional pattern of growth reversed, with overall stronger average consumption growth that benefiting proportionally more the upper parts of the distribution.** The GIC for the following period, from 2008/09 to 2014/15, shows an opposite pattern

(Figure 2.2). Annual growth in consumption per capita picked up, averaging 4.34% as measured by the growth rate at the mean. Stronger growth across all parts of the distribution increased the pace of poverty reduction relative to previous years. But the GIC for this period is upwardly sloped, indicating that growth benefited disproportionately more the upper parts of the distribution, particularly in urban areas (right panel of Figure 2.2). These two features explain why faster poverty reduction took place alongside with increasing inequality. Annual consumption growth for the top quintile was in the order of 7.5%, approximately three times faster than the growth rate exhibited by the bottom 40. The unequal incidence of growth is evident in the absolute gains of each group. Consumption of the bottom 40 grew by a total of 28.5% over this period. Since this expansion is from a low base, the gains translate into an extra consumption of 120 meticals per person per month (2014/15 prices), equivalent to only 15.5% of the poverty line. The corresponding increase in consumption for the top 20 amounts to 5,422 meticals per person or 7 times the value of the monthly poverty line.

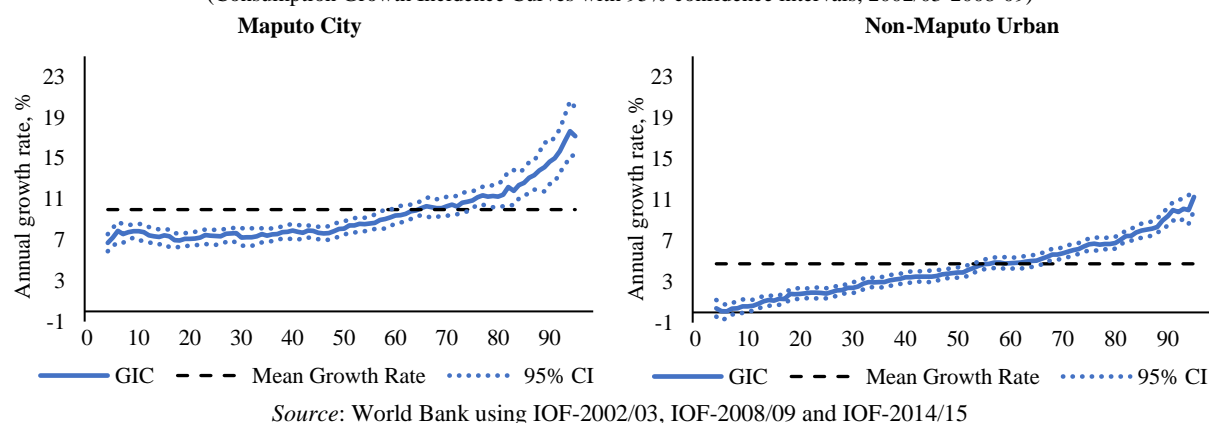
**Figure 2.2. The pattern of growth in the period 2008/09-2014/15 inverted to benefit mostly the non-poor, chiefly those in urban areas**



Note: dotted lines in each graph show 95% confidence intervals  
Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

41. **A closer look at the incidence of growth by geographic areas shows that the “pro-rich” pattern happened indistinctly across the urban centers.** Maputo City, as the capital city and the most dynamic economic urban area in the country, concentrates a high share of individuals from the upper parts of the consumption distribution. A possible hypothesis is that the gains from growth may be increasingly benefiting this segment of the population compared not only to people in the rest of the country but, more specifically, to those from other urban centers. However, results from separate GICs for Maputo and the rest of the urban country for the period 2008/09-2014/15 do not fully lend support to this hypothesis. While the annual growth rate at the mean –and also at the top deciles– is more than twice higher in Maputo compared to that for other urban centers, both show the same “pro-rich” pattern (Figure 2.3).

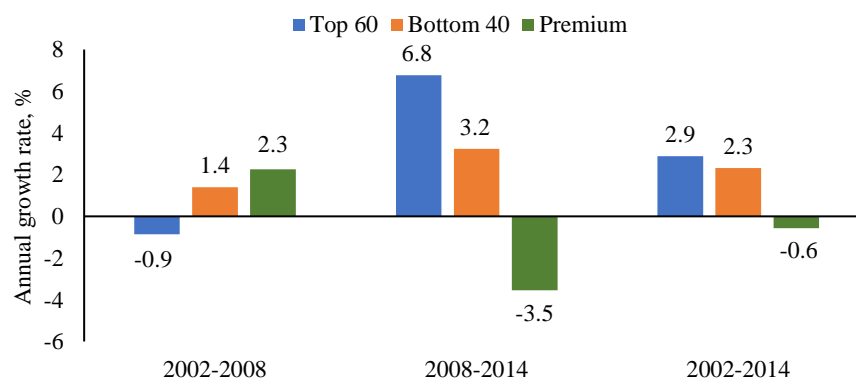
**Figure 2.3. The recent “pro-rich” pattern of growth is evident in Maputo and other urban centers**  
(Consumption Growth Incidence Curves with 95% confidence intervals, 2002/03-2008-09)



### Shared Prosperity

42. **The growth incidence analysis performed above allows assessing if growth in Mozambique is trickling down to the most disadvantaged.** The Shared Prosperity Indicators captures two key elements, economic growth and equity. Sustained economic growth is necessary to increase the living standards of the poor. However, since growth may not be enough, improvements in shared prosperity sense require growth to be inclusive of the less well-off. Figure 2.4 summarizes the findings across different periods (2002/03-2008/09, 2008/09-2014/15 and 2002/03-2014/15) showing the average annual rate of consumption growth for the bottom 40, the growth rate for the top 60 and the difference of the two, which measures the shared prosperity premium of the bottom 40 relative to the top 60.<sup>9</sup>

**Figure 2.4. Positive shared prosperity reversed after 2008 signaling weak inclusiveness**  
(Average annual consumption growth for the bottom 40, top 60 and shared prosperity premium)



Note: shared prosperity premium corresponds to the difference between the consumption growth rate of the bottom 40 and the average growth rate

Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

43. **While all households enjoyed stronger consumption growth after the late 2000s, a less inclusive pattern of growth limits Mozambique’s progress in fostering shared prosperity faster.** Consistent with the discussion above, between the early and late 2000s, consumption levels improved

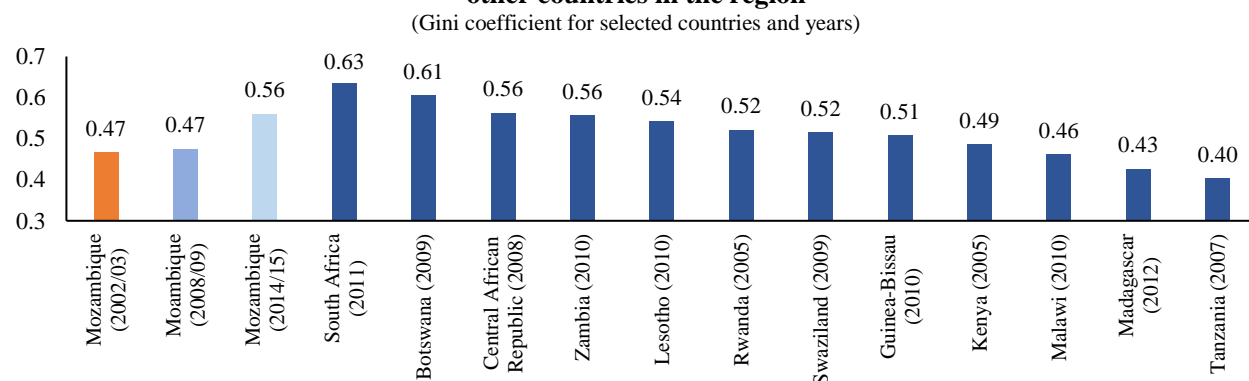
<sup>9</sup> Rather than comparing the growth in consumption of the bottom 40 percent relative average growth rate, the shared prosperity analysis in this part contrasts it against the growth in consumption of the top 60 percent to assess how the less-well off are faring relative to the better off in a period of fast consumption growth.

for the bottom 40 at an average annual rate of 1.4% whereas they worsened on average for the overall distribution by -0.9%. This resulted in a positive shared prosperity premium (2.3%) but in a context of overall slow growth. This pattern inverted in the following period. Consumption levels improved across households between the late 2000s and the middle 2010's, but the improvements were greater among the better off ones. The shared prosperity turned negative (-3.5%) as the average consumption of the top 60 grew faster (6.8% on average per year) than the consumption of the bottom 40 (3.2%). Therefore, in a longer-term perspective, looking at the period 2002/03-2014/15, progress towards shared prosperity has been undermined by the less equitable pattern of growth experienced by the country in recent years. As shown below, this led to a persistent rise in inequality, which can ultimately hinder income growth of the poor and, eventually, undermine economic growth.

### *Inequality*

44. **Mozambique is among the most unequal countries in sub-Saharan Africa.** Data shown in Figure 2.5 indicates that the distribution of household consumption expenditures, as measured by the Gini coefficient<sup>10</sup>, is highly unequal in Mozambique relative to other comparators in the region. Mozambique's Gini coefficient has consistently remained above 0.4, even in rural areas, a high level of inequality per regional standards. Part of the reason is that consumption is not only unequally distributed in urban centers but also in rural areas, in contrast to what is seen in other parts of sub-Saharan Africa.

**Figure 2.5 – The distribution of household consumption is highly unequal in Mozambique relative to other countries in the region**



Source: World Bank using WDI

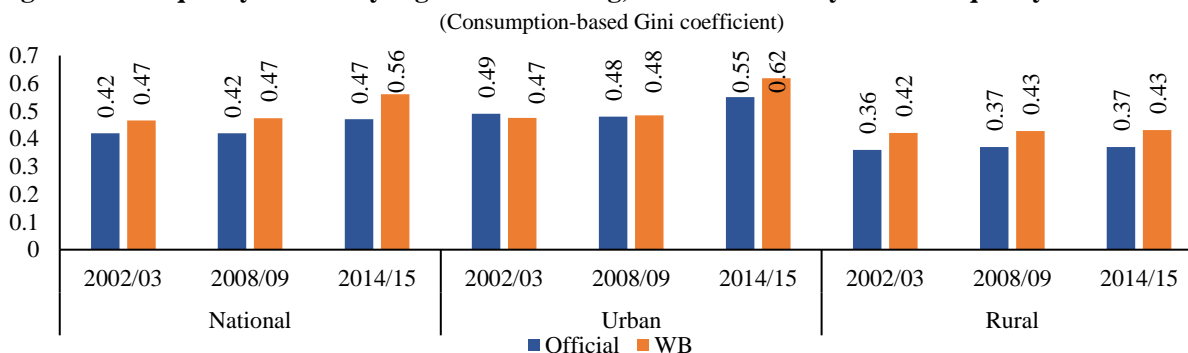
45. **In addition to being high, inequality is increasing.** As noted above, the growth incidence analysis showed that top-income households have recently recorded higher growth rates than those in lower parts of the distribution. Consequently, measures of inequality show a substantial increase in inequality from 2008/09 to 2014/15, with values of the Gini coefficient moving from 0.47 to 0.56. Inequality numbers reported with the official methodology produce the same trend albeit the levels and size of the changes are different (Government of Mozambique, 2016). The Gini coefficient hovered around 0.40-0.42 from 1996/97 to 2008/09 but increased since after reaching 0.47 in 2014/15 (Figure 2.6). While it is a fact that developing countries experience high levels of inequality during the

<sup>10</sup> The Gini Coefficient is the most popular measure of inequality. It is derived from the Lorenz curve, which shows the cumulative proportion of the population on the horizontal axis and the cumulative proportion of consumption or income on the vertical axis, sorted from the poorest to the richest household. The Gini is calculated as the ratio of the area between the Lorenz Curve and the diagonal of perfect equality, namely each household has the same consumption/income share. The Gini coefficient ranges from 0 (perfect equality) to 1 (perfect inequality).

development process, a persistent rise in inequality in Mozambique can undermine growth and poverty reduction.

46. **The worsening of income inequality in recent years is purely the result of higher concentration in urban areas.** Most households that experienced an increase in the share of income held are located in urban centers. Accordingly, the urban Gini coefficient increased from 0.48 in 2008/09 to 0.62 in 2014/15, reaching levels of income inequality rarely seen in other contexts in Sub-Saharan Africa. Instead, in rural areas inequality remained unchanged at 0.43, as measured by the Gini coefficient. The official numbers also replicate these two trends – increasing inequality in urban areas (from 0.48 to 0.55) and static inequality in rural areas (around 0.37) (Figure 2.6).

**Figure 2.6. Inequality is not only high but increasing, a trend driven by worse inequality in urban areas**

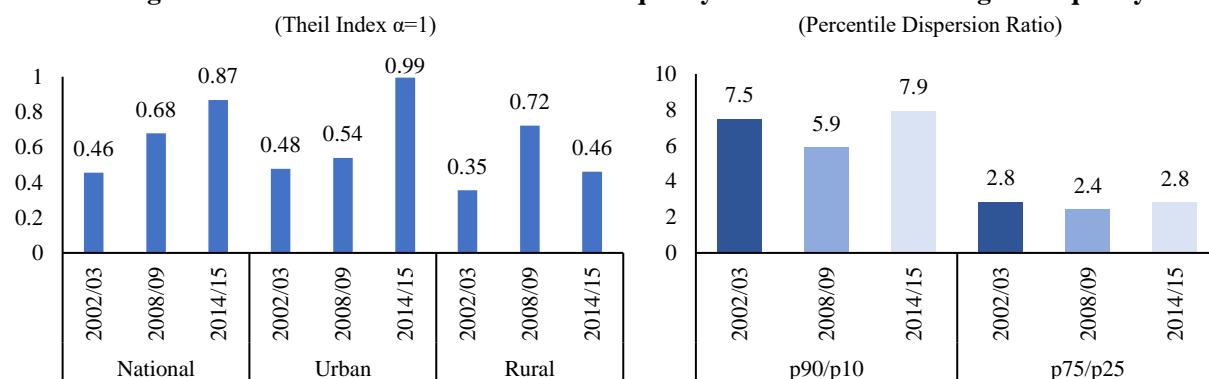


Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

47. **Other measures also show that national and urban inequality has steadily increased.** The Theil index ( $\alpha=1$ ), for example, shows that income inequality nationally and in urban areas is becoming worse over time (left panel of Figure 2.7). The same results also hold when the Theil index is constructed with lower values of the parameter  $\alpha$  (for instance,  $\alpha=-1$ ), which assign more weight to poorer households.<sup>11</sup> Moreover, the Theil index indicates that the large majority (75.4%) of the total inequality in the country is due to inequality within urban and rural areas. Similarly, percentile dispersion ratios – consumption of a top percentile divided by that of a low percentile – illustrates the raising level of inequality. For example, the consumption per capita of the 90th percentile is almost eight times (7.9) larger than the level of expenditures measured for households from the 10th percentile, up from the value calculated in 2002/03 (7.5) (right panel of Figure 2.7).

<sup>11</sup> The Theil index is another statistic used to measure economic inequality. It is based on an “entropic” distance between the actual incomes and the egalitarian state of every individual having the same income share. The parameter  $\alpha$  weights the importance of measuring inequality for higher incomes (higher values of  $\alpha$ ) or for lower incomes (lower values of  $\alpha$ ). A Theil index with  $\alpha=1$  is called Theil T while the one with  $\alpha=0$  is called Theil L or log deviation measure. The resulting value of the Theil index measures the negative entropy namely that higher values indicate more incomes away from the egalitarian ideal.

**Figure 2.7. Other common measures of inequality confirm the worsening of inequality**



Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

## 2.2 The Drivers of Poverty Reduction and Lower Inclusiveness

### *The role of growth and redistribution*

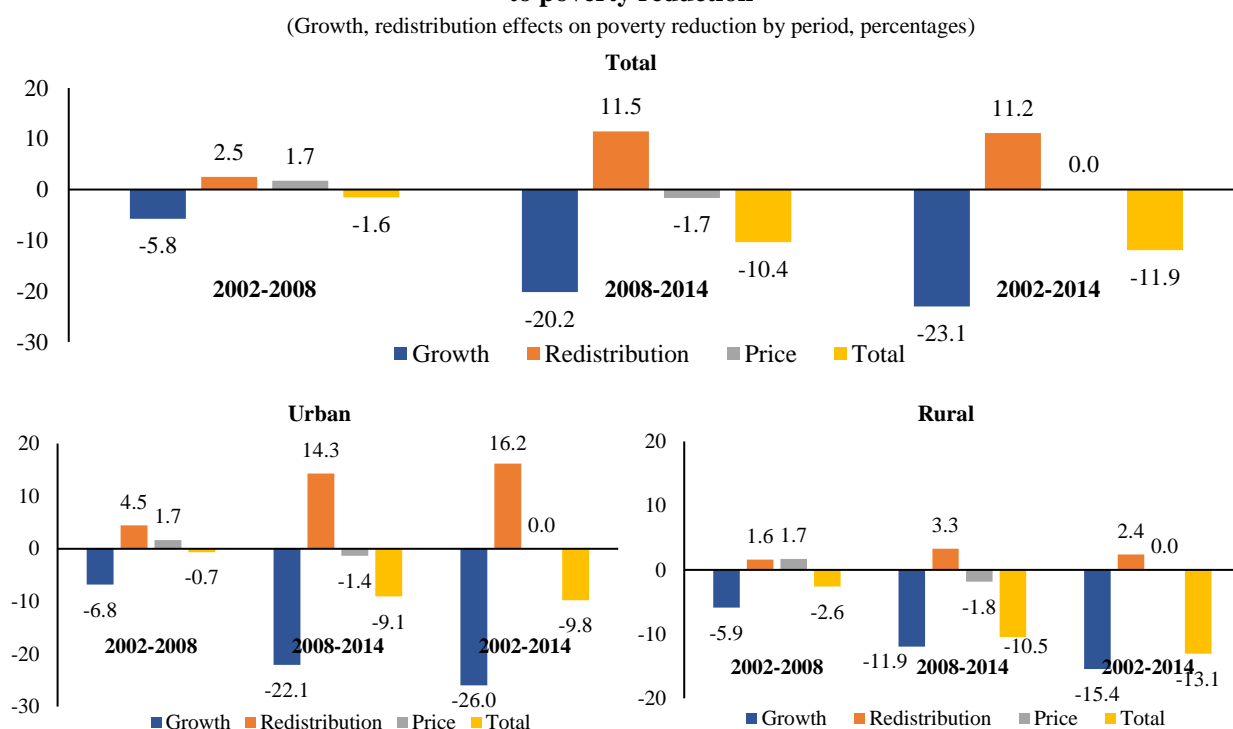
48. **Changes in poverty can be decomposed into “pure growth” and “redistribution” elements to shed light on whether the benefits of growth reach the poor.** There is a common view that stronger economic growth is often an effective way to help households escape poverty. This belief, however, rests on the assumption that growth broadly increases opportunities for the poor to raise their incomes. Yet, the mechanics of the relation between poverty and economic growth involves changes both in mean consumption and changes in the distribution of consumption across households. This report follows the decomposition method proposed by Datt and Ravallion (1992) to isolate the “pure growth” and “pure redistribution” effects associated with the decline in poverty over the period of analysis.<sup>12</sup>

49. **The decline in poverty in Mozambique has been hindered by high and rising inequality, especially in recent years.** As shown in the upper panel of Figure 2.8, the increase in mean household consumption (growth effect) is entirely driving the fall in poverty. In contrast, the increase in inequality in the distribution of consumption (redistribution effect) offsets half of the contribution of the growth effect to poverty reduction, increasing the incidence of poverty. More specifically, the growth effect alone would have reduced poverty by 23.1 percentage points between 2002 and 2014 – bringing the poverty headcount down to 37.2% rather than the actual 48.4% – had the redistribution effect not increased poverty by 11.2 percentage points. The offsetting effect of redistribution on poverty in absolute terms is larger in recent years but is also evident in relative terms in the period 2002/03–2008/09. All in all, this means that Mozambique would have been able to achieve twice as much poverty reduction after 2000 had growth been more broadly-based and enhanced proportionally more the economic opportunities of the poor.

<sup>12</sup> Conceptually, this decomposition is based on the idea that that a measure of monetary poverty can be expressed as the product of mean consumption and a parameterized Lorenz curve. Keeping the Lorenz curve constant gives the distribution neutral growth that would drive the average increase in consumption across the population, for instance, raising the levels of consumption of all households by the same rate. The other part is derived from holding the mean consumption constant (a mean-preserving redistribution) to capture the change in the shape of the consumption distribution driven by, for instance a faster growth in the consumption of the poorest relative to the consumption growth of the richest. There is also a third, much lower “price” effect explained by price adjustments made to the poverty line over time.

50. **The countering effect of inequality on poverty reduction is substantially larger in urban areas.** The bottom panel of Figure 2.8 shows the same growth and redistribution decomposition of poverty but broken down by urban and rural areas. The results for both replicate the qualitative pattern seen at the national level and across different time periods. Yet, there are differences in the relative size of the effects. Looking at the whole period 2002/03-2014/15, the increase in inequality in the distribution of consumption in urban centers offset over 60% of the poverty reduction brought about by consumption growth (16.2 out of 26 percentage points). At 15%, the counteracting effect of raising inequality in rural areas is four times lower.

**Figure 2.8. Increasing inequality in the distribution of consumption has offset the contribution of growth to poverty reduction**



Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

### *The ongoing structural transformation of the economy*

51. **The increasing role of the services sector, an outcome of the current process of structural transformation, has offered a path to jobs outside agriculture.** Mozambique enjoyed remarkable recovery after decades of war. Economic growth rebounded on the back of reconstruction investments, the strengthening of a market-based economy, macroeconomic stability, policy reforms and government and donor expenditures in basic services. Productivity in agriculture picked up. In recent years, however, the sources of growth have gradually shifted away from agriculture. Between the late 1990s and the middle of the 2000s, output growth was pulled by investments in capital intensive industrial activities (largely “megaprojects” in extractive, export-oriented industries) with relatively higher value-added but low job creation. The other emerging economic activity, the services sector, also began to play a larger role in the economy. Between 1996 and 2008, the jobs share of services increased from 9 to 15 percent –which contrasts with the reduction in output share, from 51.8 to 49.8 percent (Table 2.1). The period 2008-2014 shows a quicker increase in the participation of services in



the labor market, explaining nearly one in four jobs available in the economy, a trend that is likely associated with the faster fall in poverty reduction observed after 2008. The GDP share of services also increased remarkably by almost 6 percentage points, reaching 55.7 percent.

**Table 2.1. Industry and services are increasingly playing a more important role in the economy**  
(GDP and jobs composition across economic sectors)

<b>Sector shares of GDP</b>	<b>1996</b>	<b>2003</b>	<b>2009</b>	<b>2014</b>
Agriculture	38.1%	31.4%	30.5%	25.5%
Industry	10.2%	21.1%	19.7%	18.8%
Services	51.8%	47.7%	49.8%	55.7%
<i>Total</i>	100%	100%	100%	100%
<b>Sectors shares of jobs</b>	<b>1996</b>	<b>2003</b>	<b>2009</b>	<b>2014</b>
Agriculture	86.6%	80.5%	80.4%	71.0%
Industry	4.4%	3.4%	4.7%	4.9%
Services	9.0%	16.1%	15.0%	24.0%
<i>Total</i>	100%	100%	100%	100%

Source: World Bank Jobs Diagnostics (2017)

**52. Decomposition analysis shows that growth in labor productivity has been the main engine of economic growth in the last two decades.** A “growth accounting exercise” can be used to decompose GDP per capita growth into four components: productivity, the employment rate, the labor participation rate and the ratio of the working age population to the total population. Results from applying this methodology to Mozambique for the period 1996-2014 show that growth in GDP per capita has almost been driven entirely by rising labor productivity (Table 2.2). In contrast, changes in employment levels and labor force participation have had a negligible contribution.

**Table 2.2. Labor productivity growth is the single greatest contributor to growth in GDP per capita**  
(sources of GDP per capita growth)

	<b>1996-2014</b>	<b>1996-2003</b>	<b>2003-2008</b>	<b>2008-2014</b>
Annual Growth of GDP per capita	4.85	5.41	5.30	3.83
% Yearly Contribution to Growth of:				
Productivity (Y/E)	5.36	5.01	6.30	4.89
Employment Rate (E/LFP)	-0.07	0.27	-0.27	-0.30
Participation Rate (LFP/WAP)	-0.34	0.28	-0.49	-0.87
Demographic Change (WAP/P)	-0.09	-0.15	-0.24	0.11

Source: World Bank Jobs Diagnostics (2017)

**53. In recent years, labor productivity growth has been largely driven by the shift of jobs away from agriculture and into sectors with higher productivity.** Broadly speaking, two forces can raise labor productivity. First, workers can be more productive if there is an increase in the stock of capital or an improvement in technology that leads to higher “total factor productivity” in their sector of employment (*within-sector* productivity growth). Second, productivity can increase with the reallocation of workers from lower to higher productivity sectors (*between-sector* productivity growth). As shown in Table 2.3 below, overall the two sources have contributed nearly half each to labor productivity growth in the period 1996-2014. Yet, after 2008, it is the redeployment of labor across sectors what explains most of the growth in labor productivity, particularly the movement of workers from agriculture (where most of the poor are concentrated) to services. On the contrary, the contribution of the industry sector to labor productivity growth is almost exclusively of the within-sector growth type due to higher capital-to-labor ratios and adoption of better technologies.



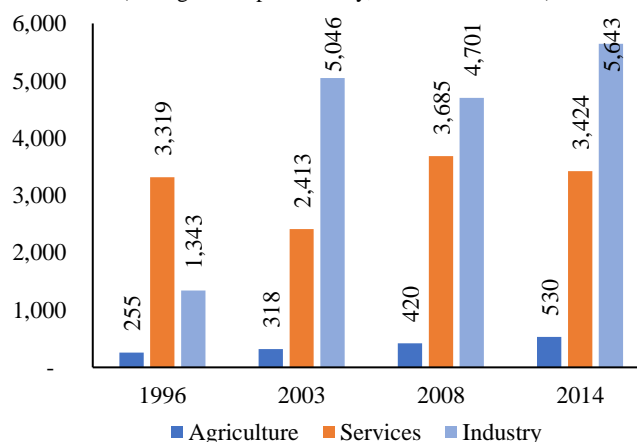
54. **The transition of workers from agriculture into services, where productivity is higher, has likely contributed to the faster increase in the standards of living observed after the late 2000s.** The data shows that labor resources in Mozambique are increasingly used in relatively higher productivity and more skilled intensive activities, a defining feature of the process of structural transformation. Back in 1996, shortly after the end of war, 86.6 percent of workers were primarily engaged in agriculture. That share fell to 71 percent by 2014 and most of that shift was absorbed by the service sector, an area of the economy where productivity is over six times larger than in agriculture despite high levels of informality (Figure 2.9). Conceivably, the earnings and standards of living of workers that joined the service economy – a process that accelerated after 2008 – has increased in tandem with labor productivity growth. Moreover, the fact that more people now hold jobs in non-farm self-employment, even in rural areas, means that households incomes have a higher degree of income diversification. However, additional data and research work is needed to quantify the contribution of the increasing share of jobs in services to opportunities for income growth and poverty reduction.

**Table 2.3. The sources of labor productivity growth are not expanding good jobs fast enough**  
(Decomposition of total labor productivity change within and across sectors, 1996-2014)

Annual Average Growth of:	1996-2014		1996-2003		2003-2008		2008-2014	
	%	% of total	%	% of total	%	% of total	%	% of total
Total Labor Productivity	5.36	100%	5.01	100%	6.30	100%	4.89	100%
<b>Within-Sector Contribution</b>	<b>2.60</b>	<b>49%</b>	<b>1.76</b>	<b>35%</b>	<b>5.73</b>	<b>91%</b>	<b>1.03</b>	<b>21%</b>
Agriculture	1.30	24%	1.12	22%	1.77	28%	1.1	22%
Industry	1.20	22%	3.07	61%	-0.3	-5%	0.6	12%
Services	0.10	2%	-2.42	-48%	4.26	68%	-0.68	-14%
<b>Between-Sector Contribution</b>	<b>2.76</b>	<b>51%</b>	<b>3.24</b>	<b>65%</b>	<b>0.57</b>	<b>9%</b>	<b>3.86</b>	<b>79%</b>
Agriculture	0.59	11%	0.53	11%	0.02	0%	1.01	21%
Industry	0.08	1%	-0.53	-11%	1.05	17%	0.14	3%
Services	2.10	39%	3.25	65%	-0.5	-8%	2.71	55%

Source: World Bank Jobs Diagnostics (2017)

**Figure 2.9. Productivity in services is over six times larger than in agriculture**  
(average labor productivity, constant US\$2010)



Source: World Bank Jobs Diagnostics (2017)

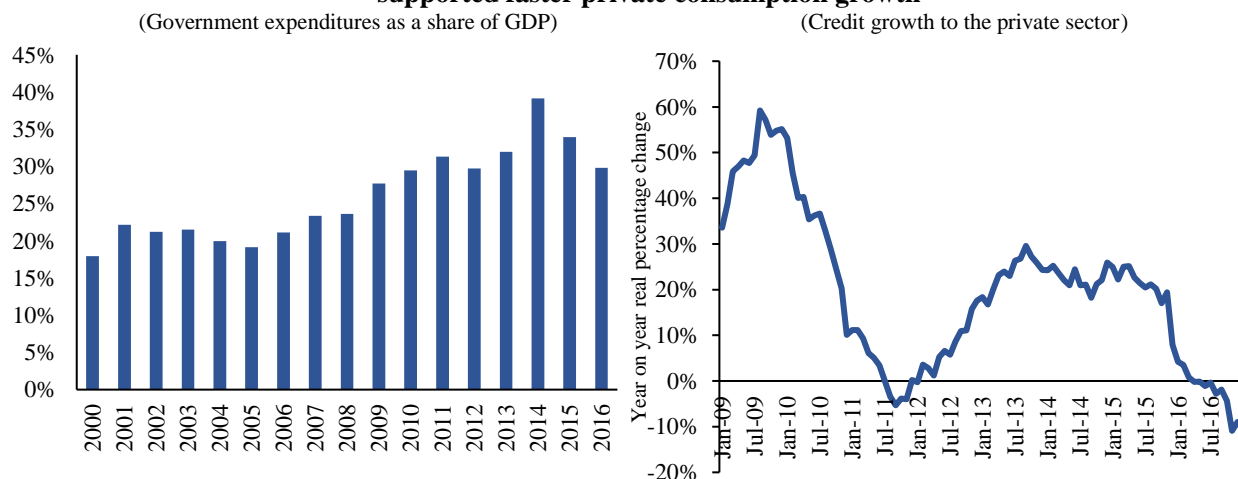
**55. However, without stronger private sector growth in productive, labor-intensive activities, the poverty reduction effects of the current pattern of structural change may be bound to decline.**

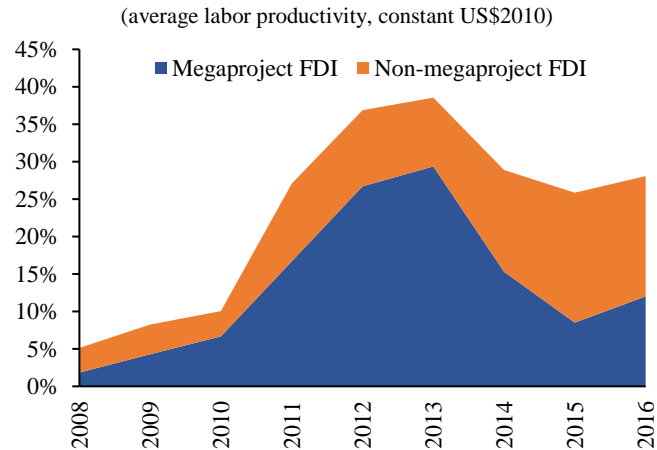
The overall economy appears to be gradually growing a slower pace. In fact, the annual rate of GDP growth has slowed down in the 2010s compared to the ones recorded in the previous decade: 5.41% (1996-2003), 5.3% (2003-2008) and 3.83% (2008-2014) (Table 2.3). Productivity growth in the industry sector is chiefly taking place through investments in capital and innovation in the mining sector, with the resulting low generation of labor and weak linkages with the broader economy. Productivity in services is still low and has been falling in recent years, largely because many of the activities are informal and have low levels of investment in capital. Moreover, the fact that productivity in agriculture has leveled off and even increased in recent years may indicate that unskilled, lowest productivity workers in agriculture are increasingly moving into jobs with declining marginal productivity in the services sector, constraining the opportunities for upward economic mobility. There are also important equity considerations since jobs across most of the formal service sector demand higher skills, which most of the labor force, and especially the poor, are lacking. Sustaining robust and broadly shared growth will require a more diversified, productive and competitive economy moving forward.

#### *A favorable macroeconomic framework*

**56. Several macroeconomic factors were favorable for (private and public) consumption growth during the period of analysis.** Macroeconomic expansionary policies provided the conditions for faster private consumption growth in the period 2008/09-2014/15. As shown in Figure 2.10, public expenditures, measured as a proportion of the GDP, increased steadily between 2008 and 2014, raising from 24 percent to 39 percent. In addition to expansive fiscal policy, Mozambique experienced several years of expansionary monetary policy over the past decade, leading to significant rates of credit growth. Annual credit growth to the private sector averaged 23 percent between 2009 and 2015. The period of analysis was also marked by a sharp increase in external inflows of resources. Foreign direct investments into Mozambique increased progressively, reaching almost 40 percent of GDP in 2013, up from 5 percent in 2008.

**Figure 2.10. Demand-side factors such as fiscal and monetary expansion and strong external inflows supported faster private consumption growth**





Source: World Bank using data from Banco Central de Mozambique

### *The role of internal migration*

**57. As Mozambique grows and becomes more urbanized, an increasing share of the population now lives in urban areas owing in part to migration from rural parts of the country.** External and domestic migration, motivated mostly by economic reasons, is an integral part of the livelihoods in the country. Historically, Mozambican labor migrants travel to South Africa, Zimbabwe, Portugal, Malawi and Tanzania for temporary or permanent work. Internal mobility, especially from rural to urban areas experienced an steady increase since the times of the civil war (1977-1992) as rural residents sought safety in city centers. More recently, migration flows into urban areas have continued pulled mostly by the prospect of better economic opportunities. Data on internal migration is scarce but numbers from the Census 2007 indicate that around 8% of the Mozambicans reside in a district different from the one in which they were born and half of them are located in a province outside the place of birth. As of 2007, nearly 6 in 10 migrants resided in urban cities –more than twice the fraction of migrants that settled in urban areas as reported in the Census 1997 (25.4%), which is suggestive of the continued migration inflows into urban centers.<sup>13</sup>

**58. Migration from rural parts to urban centers is an inherent aspect of the development process, which in principle can support poverty reduction.** Migration is driven by “pull” forces that, for instance, encourage migrants to seek better and more stable jobs and earn higher returns to human capital in the place of destination. Migration can also be motivated by “push” factors, which include, among others, the desire of migrants to overcome liquidity constraints or diversify risks. This report presents findings from decomposition analysis to assess if migration from rural to urban areas has been poverty reducing following the methodology proposed by Ravallion and Huppi (1991). More specifically, the analysis decomposes changes in poverty over time into “intra-regional effects” (poverty changes within urban and rural areas assuming no migration between the two of them), “inter-regional effects” (allowing for changes in the distribution of the population between rural and urban areas keeping poverty rates constant) and an “interaction” term that can be interpreted as a measure of the correlation between the population shifts and the intra-regional changes in poverty.

<sup>13</sup> The lack of information about the place of origin of migrants in the Census 1997 and the Census 2007 does not allow establishing the share of migrants that moved from rural to urban areas.

59. **Rural-urban migration and its associated structural change appear to have contributed little to poverty reduction in Mozambique.** Results for the period of analysis based on the decomposition exercise described above suggest that most of the poor that left their rural homes stayed poor after they settled in urban areas. In other words, the gains in consumption growth that lifted people out of poverty were concentrated on individuals that already lived in rural or urban areas and did not migrate, namely the “intra-regional effect” of the decomposition analysis. In contrast, the “inter-regional effect” shows that shifts in the distribution of population between rural and urban areas did not contribute to poverty alleviation. The results hold even if the horizon of analysis is split to investigate possible differences between the earliest, pro-poor period of growth, and the most recent, pro-rich pattern of growth (Table 2.4). However, it is worth acknowledging that further data and analysis are needed to better assess the role of increased urbanization to poverty reduction.

**Table 2.4. Migration between rural and urban areas has not contributed to poverty reduction**  
(total percentage change in poverty)

Period	Intra-regional effect	Inter-regional effect	Interaction effect
2002/03-2008/09	100.5	-0.48	-0.02
2008/09-2014/15	100.7	-0.83	0.13
2008/09-2014/15	100.8	-0.87	0.10

Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

60. **Scarce employment opportunities, skills mismatch, low productivity and high costs of living undermine the opportunities for rural migrants to improve their livelihoods after they settle in urban centers.** Rural migrants are typically low skilled, have lower reservation wages and are not well connected to networks that facilitate the job search in urban areas. These aspects limit the opportunities for rural migrants to improve their wellbeing through better jobs in urban centers. In fact, after controlling for human capital and occupation, earnings are not significantly higher in urban areas than in rural areas. On average, nominal earnings are 26% higher in urban areas than in rural areas. Yet, the differences in the costs of living are higher, undermining the possibility of a potential urban wage premium among the unskilled (World Bank, 2017c). Moreover, most jobs in urban centers are in the informal sector and concentrated in activities with low productivity. As noted in Chapter 6, excluding Maputo City, the productivity and efficiency gains resulting from the agglomeration of firms remain largely unexploited in most cities across Mozambique.

### *The characteristics of the poor*

61. **Available survey data can be used to profile the characteristics of poor households and understand some of the factors that limit their economic opportunities.** Household surveys in Mozambique collect cross-sectional data on a wide range of aspects including demographics, human capital, asset ownership, economic activities, access to markets and services, and exposure to shocks, thus allowing for comparisons between poor and non-poor households along these dimensions. A comprehensive profile of the poor also helps identify some of the aspects that may systematically undermine their economic opportunities and call for policy action.<sup>14</sup>

62. **The geographic location and demographic structure of households matter for poverty.** Poverty is overwhelming rural in Mozambique. As of 2014/15, the poverty rate is 24 percentage points higher in rural areas than in urban areas, 56% and 32%, respectively. There also large differences in

<sup>14</sup> A limitation of the analysis is that without long-term panel data it is not possible to distinguish which households are vulnerable to fall into poverty and which ones are either transitory or structurally poor.

absolute terms: 8 in 10 poor people live in rural areas. Poor households are larger, having on average nearly 1.1 more members. In addition to family size, the age structure of poor households implies higher levels of dependency since they have relatively more children in ages 0 to 14. Household size dynamics largely reflect the rural-urban poverty split. On average, poor rural households tend to be larger (6.1 members) than poor households that reside in Maputo (5.6 members) (Table 2.5).

**Table 2.5. The livelihoods of the poor differ from those of the non-poor in many key characteristics**

Variable	Poor	Non-poor	Significance (t-test)	Significance (Model)
<b>Household socio-demographics</b>				
Age of household head	43.5	43.9	**	***
Female-headed (%)	23.3	24.2	**	***
Household size	6.8	5.7	***	***
Proportion of children aged 0 to 14 (%)	55.0	42.8	***	***
Lives in rural area (%)	79.0	58.2	***	***
Years of education of household head	3.5	4.3	***	***
Household head is illiterate	19.7	12.8	***	***
<b>Sector of work</b>				
Head works in agriculture (%)	74.6	49.7	***	***
Head works in manufacturing (%)	3.2	4.5	***	
Head works in services (%)	6.6	20.2	***	
Head employed in private sector (%)	1.9	8.9	***	***
Head employed in public sector (%)	6.3	13.5	***	
<b>Access to services</b>				
Improved water	48.0	69.2	***	***
Improved sanitation	14.0	42.4	***	***
Electricity	11.5	42.0	***	***
<b>Within 30 minutes of walking distance to ...</b>				
Road (%)	46.3	66.6	***	***
Market (%)	48.3	65.8	***	***
School (%)	66.5	77.8	***	***
Health facility (%)	64.4	71.3	***	
<b>Asset ownership</b>				
Household has a car	0.4	8.2	***	***
Household has a bicycle	40.1	35.4	***	***
Household has a T.V.	11.0	43.1	***	***
Household has a fridge	4.4	30.7	***	***
Household has a phone	46.1	75.3	***	***

Notes: Column *t-test* shows significance values from a standard unconditional t-test of differences between the means. Column *Model* shows significance values from a binary dependent variable (poor =1, = 0 otherwise) model (probit) controlling for all variables shown and province fixed effects. \*, \*\*, and \*\*\* indicate significance level at 10%, 5%, and 1%, correcting for the clustered nature of the errors in the probit regressions.

Source: World Bank using IOF-2014/15

**63. Poverty is associated with lower levels of education and sector of occupation of the household head.** Overall, the level of school attainment across Mozambique is low, averaging 4.2 years in 2014/15. The level of schooling of the household head is associated with the poverty status of the family, suggesting that education is inherently linked to income-generating opportunities. Table 2.5 details these differences. Household heads that are poor have on average 0.8 fewer years of education than those that are not poor. Similarly, the illiteracy rate among heads of poor households is 19.7%, nearly seven percentage points higher than among non-poor households. The sector of work for the head suggests that poor households are more likely to be engaged in agriculture than the non-poor, 74.6% and 49.7%. While poverty rates have also fallen among household predominantly engaged in agriculture, regression results show that employment in agriculture remains a strong predictor of

poverty. In contrast, heads of non-poor households are more likely to work in sectors such as manufacturing and services, where productivity is higher, and to be employed in wage jobs in the private and public sectors.

**64. Coverage and accessibility to critical infrastructure and services tends to be lower among poor households.** Despite improvement in recent years, poor households continue having lower access to safe water and sanitation, and electricity. Around half of the households that are poor receive piped water but less than 15% (most of which live in urban areas) have access to safe and clean sanitation. In terms of electricity, coverage rates are also low (11.5%) and significantly below the rates seen among the non-poor (42%). The obstacles to infrastructure and services seriously limit the possibilities of the poor to improve their living standards. This is further compounded by low accessibility to roads, which translates into larger levels of isolation. As depicted in Table 2.5, a higher share of the poor is farther away from markets, schools and health facilities. Many of these variables are found to have a strong consumption gradient, increasing the probability that households are located at the bottom of the consumption distribution.

**65. In general, poor households are also characterized by limited ownership of basic assets.** Non-poor households are more likely to possess an engine vehicle but their ownership of bicycles is lower than that of poor households, a finding probably associated with the larger concentration of the former in urban areas and the convenience for the poor of owning a bicycle in rural areas with limited accessibility. For the rest of assets, however, the differences are marked. Ownership of a fridge, an asset that is closely related to the standards of living of the population, is low for the poor (4.4%) and well below the level seen for the non-poor (30.7%). Similarly, the poor are less likely to own a more modern asset such as TVs or a phone, which constrains their access to information and services such as data on price markets, weather alerts and electronic banking. Obviously, the limited coverage of electricity across several parts of the country undermines the holding of some of these assets.

#### *The evolving role of endowments and returns*

**66. Decompositions of consumption growth can elucidate the importance of changes in personal characteristics, such as better education or access to roads, relative to the role played by changes in the returns to those characteristics.** This study performed regression analysis to disentangle the changes in consumption into changes in two components: 1) household *endowments* such as demographic characteristics, education, experience, assets, access to basic services, location, proximity to markets and occupation, among others; and 2) *returns* to those characteristics such as returns to education, experience, land productivity, etc.<sup>15</sup> The approach followed, called the Recentered Influence Function, performs unconditional quantile regressions to decompose the welfare gaps at each decile group of the consumption distribution (Firpo, Fortin and Lemieux 2009). The procedure is carried out in two stages. First, unconditional quantile regressions of log real per capita monthly consumption on household characteristics are estimated for all households. The second stage consists of constructing the counterfactual distribution of consumption that would prevail if poor households had earned the returns on their endowments that were received by non-poor households. The comparison of the counterfactual and empirical distributions allows separating the part of the welfare gap attributable to differentials in endowments and returns (see Annex 5 for more technical details).

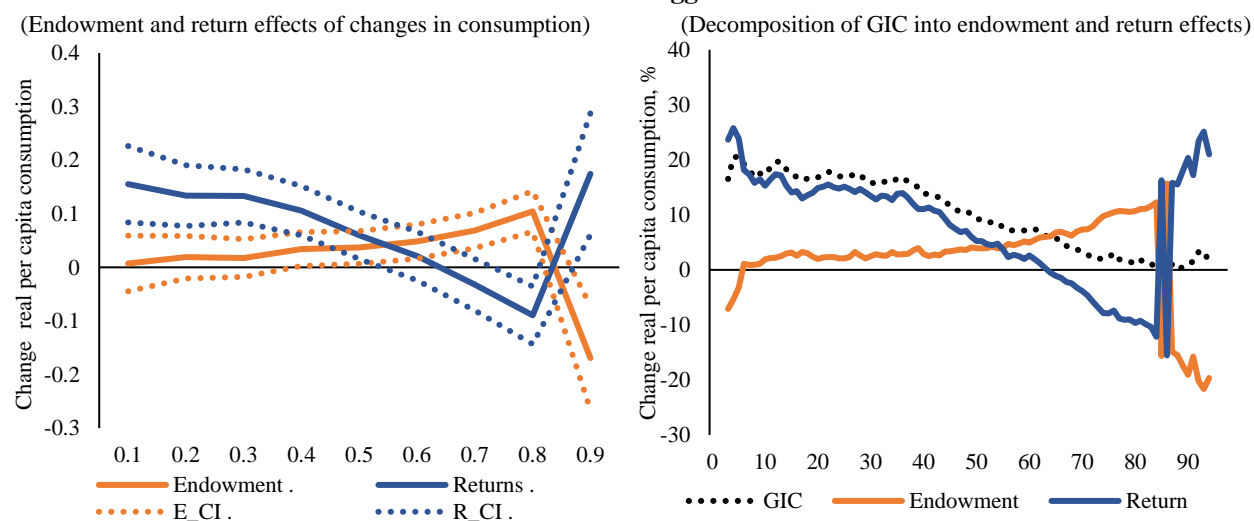
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<sup>15</sup> Although the term “return” is usually used to denote this effect, in reality it captures the marginal effects of the individual characteristics, namely changes in the conditional correlation between a given endowment and household consumption.

67. **The increase of poor households' consumption during the pro-poor growth period was supported by relatively higher returns to endowments.** As noted above, the period 2002/03-2008/09 was characterized by growth in per capita consumption that benefited proportionally more the poor. The pro-poor pattern of growth did not translate into significant poverty reduction because of the low levels consumption at the beginning of the period and the modest speed of growth. Nonetheless, consumption growth for the poor was higher than for the non-poor. The analysis shows that part of the explanation for this is that the distribution of returns (determined by asset ownership and intensity of usage, moderated by price levels) benefited the poor more than the non-poor, barring the top decile. In contrast, the endowment effect is systematically and statistically smaller in magnitude for the bottom 40%. Likewise, for the top decile, the returns effect appears to contribute remarkably more to changes in household consumption than the endowments effect (left panel, Figure 2.11). The decomposition of the Growth Incidence Curve (2002/03-2008/09), shown in the right panel of Figure 2.11, confirms the larger contribution of the returns effect to consumption growth for the bottom half of the distribution.

68. **However, the pattern changed in the late 2000s to one in which the better off households benefitted disproportionately more from higher returns to their individual characteristics.** The explanatory power of the returns effect flipped after 2008/09, becoming the main driver of consumption growth for households in the top 40%. In fact, the returns effect rises continuously as the consumption percentiles increase – the effect is twice as large for the top decile relative to the size of the effect for the 7th decile. In contrast, the returns effect is not only significantly smaller but also statistically indistinguishable from the endowments effects for the bottom segments of the distribution (left panel, Figure 2.11). As the better off became better endowed over time, the structure and functioning of markets facilitated and rewarded proportionally more the utilization and prices of their productive assets relative to the market returns earned by the poor. As depicted in the right panel of Figure 2.12, these trends are consistent with the lack of inclusiveness of growth in recent years.

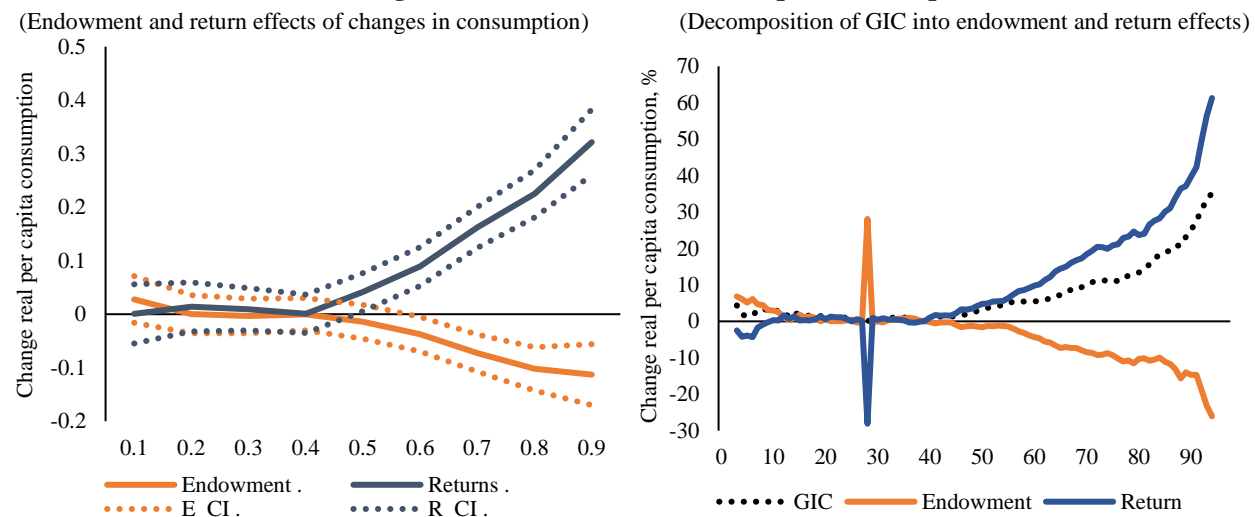
**Figure 2.11. Consumption growth for the poor in the period 2002/03-2008/09 was driven by higher returns rather than the bigger stock of assets**



Note: Results from unconditional quantile regression for the Oaxaca-Blinder decomposition into endowments and returns for the period 2002/03-2008/09. E\_CI = 95% confidence interval for the endowment effect; R\_CI = 95% confidence interval for the return effect; GIC = Growth Incidence Curve

Source: World Bank using IOF-2008/09 and IOF-2008/09

**Figure 2.12. The lack of inclusiveness of growth after 2008/09 is explained by the ability of the better off to earn higher returns on their assets compared to the poor**



Note: Results from unconditional quantile regression for the Oaxaca-Blinder decomposition into endowments and returns for the period 2008/09-2014/15. E\_CI = 95% confidence interval for the endowment effect; R\_CI = 95% confidence interval for the return effect; GIC = Growth Incidence Curve

Source: World Bank using IOF-2008/09 and IOF-2014/15



### 3. Evolution of Living Conditions and Economic Mobility

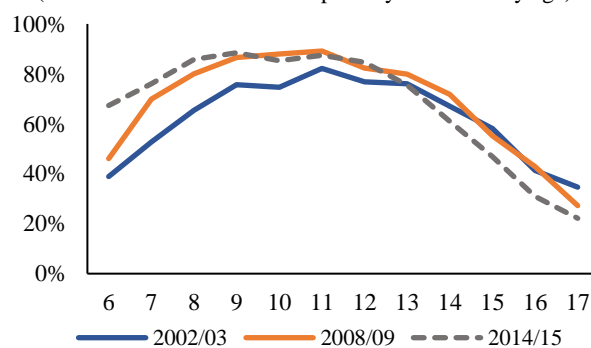
#### 3.1 Trends in Nonmonetary Dimensions of Well-being

69. **The average household in Mozambique has better standards of living today than at the turn of the century.** The previous chapter illustrated that faster and sustained economic growth in the last 15 years led to poverty reduction, albeit modest in part of the period analyzed. As poverty is multifaceted, this section examines whether progress in closing consumption deficits has been accompanied by improvements in nonmonetary dimensions of well-being such as human capital, housing conditions, and access to basic services and assets. Overall, the conclusion is that several human development outcomes and living conditions of Mozambican households have improved significantly. The Fourth National Poverty Assessment arrives to a similar conclusion (Government of Mozambique 2016). However, this progress is not without its challenges. There is a group of the population facing chronic lack of well-being in the nonmonetary sense and, very likely, in the monetary sense as well.

#### *Education*

70. **Some education variables such as school enrollment, attendance and late enrollment show improvement since the early 2000s.** Mozambican children are now more likely to participate in school than before. Back in 2002/03, 43% of children ages 5 to 14 were not enrolled in school, a value that fell to 24.2% in 2014/15. Enrollment in primary school increased by a larger amount. In addition to higher enrollment, children are now more likely to attend and spend more time in school. In 2002/03, 57.8% of children in the 5-14 age range attended school regularly and this ratio increased to 63.8% in 2014/15. Higher enrollment has been accompanied with a reduction in late enrollment and overage enrollment. Between 2002/03 and 2014/15, the share of children ages 6 years (the compulsory official entry age) enrolled in school increased from 39% to 67%. At the same time, the share of overage children (14 years and over) enrolled in primary school has declined (Figure 3.1).

**Figure 3.1. Higher school enrollment has gone in hand with a modest reduction in late enrollment**  
(share of children enrolled in primary education by age)

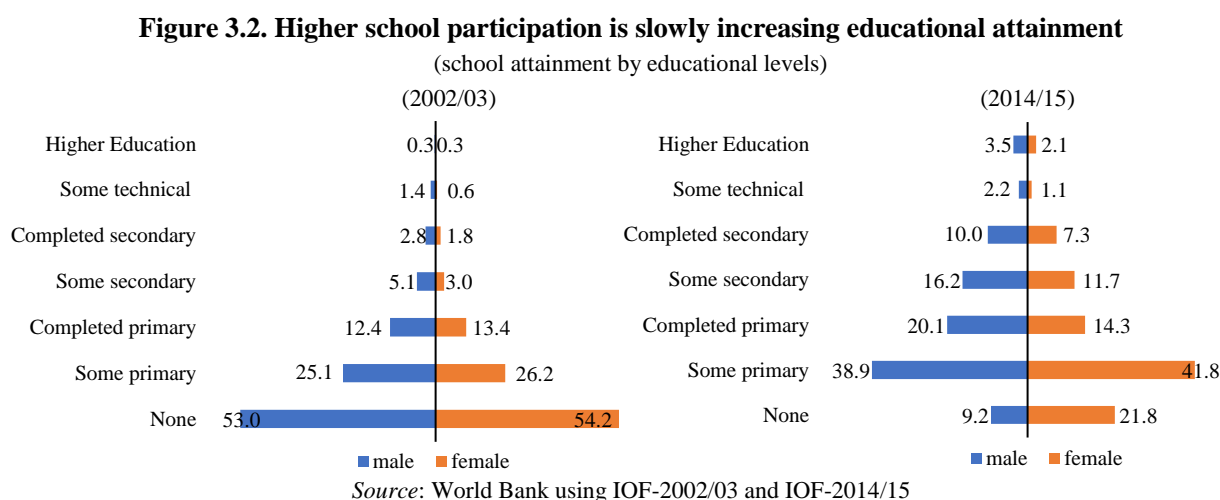


Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

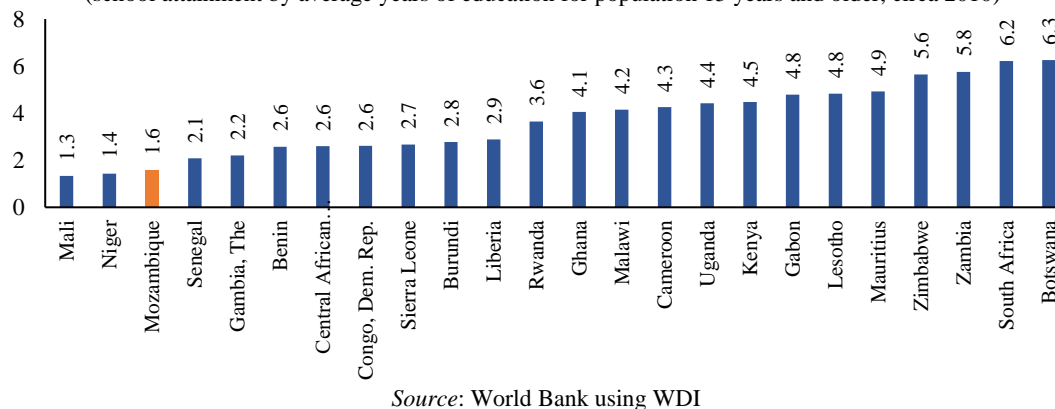
71. **The increase in school enrollment has gone in hand with an increase in educational attainment, although from very low levels.** Mozambicans ages 20 to 65 have on average 5.1 years of schooling, compared to 2.4 in 2002/03 and 3.1 in 2008/09. Similarly, the 2014/15 data shows that the cohort born in 1985-1995 accumulated 0.2 more years of education than the cohort born a decade earlier (5 and 4.8 years of education, respectively). Figure 3.2 shows two snapshots of the school

attainment across education levels for the population 20-65 years old, one for 2002/03 and the other one for 2014/15. The increase is evident, with fewer people without education and instead a higher share of the population that either accumulated some years of primary and secondary education or fully completed both levels. There is also more people going into post-secondary education. Encouragingly, these improvements are seen for both genders although women still lag the shares of men in secondary and post-secondary education.

**72. The Mozambican society is slowly becoming more educated but the overall levels of school attainment remain low, particularly in comparison with other neighboring countries.** Wider access to school and higher attendance are raising gradually the educational attainment of the population. Yet, the average education of Mozambicans still lags the levels observed in other countries in SSA. It is difficult to find comparable cross-country data on school attainment of the adult population, which is often proxied by the average years of education. Possibly the best data available comes from Barro-Lee (2013), a database that harmonizes educational attainment information in national censuses and surveys from several countries around the world. Even though this dataset confirms that human capital is gradually increasing, it also suggests that Mozambique is among the countries in SSA with the lowest levels of school attainment (Figure 3.3).

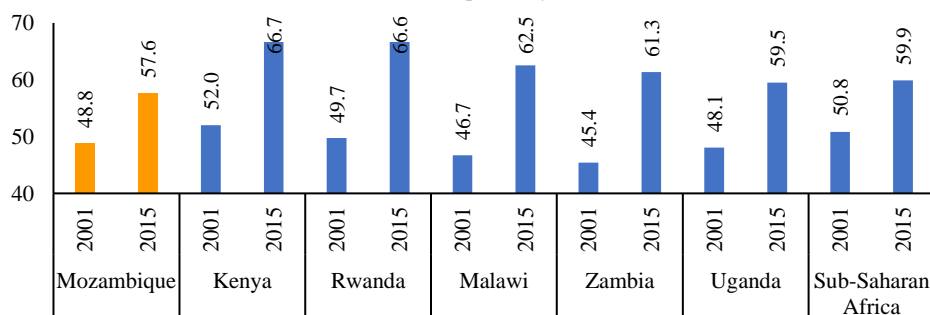


**Figure 3.3. Educational attainment in Mozambique remains low by regional standards**  
(school attainment by average years of education for population 15 years and older, circa 2010)



73. **Consistent with regional and global trends, life expectancy in Mozambique increased by almost 9 years in the last 15 years.** Since 2001, longevity has increased by 0.6 years per year, from 48.8 to 57.6. This pattern is broadly in line with the trends in life expectancy observed in other countries in the region and the overall Sub-Saharan Africa (Figure 3.4). As noted below, underlying this increase in longevity is a reduction in child and maternal mortality, lower morbidity rates and a fall in HIV/AIDS and malaria rates. Health inputs such as access to water, sanitation and health centers have also shown improvement over time.

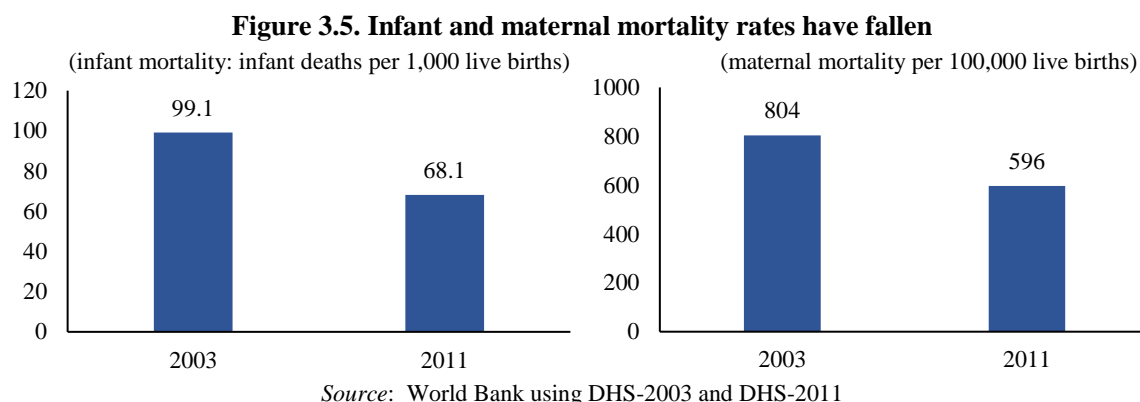
**Figure 3.4. Like other people in the region, Mozambicans are living longer**  
(life expectancy)



Source: World Bank using WDI

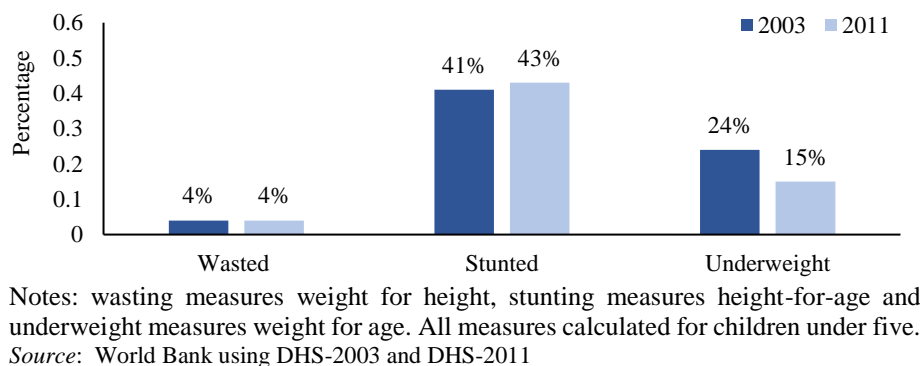
74. **Health outcomes such as infant and maternal mortality and morbidity are moving in the right direction.** Infant and maternal mortality, key leading health indicators, have seen improvement during the new millennia. The infant mortality rate, expressed as the number deaths per thousand live births, fell from 99.1 in 2003 to 68.1 in 2011. Child mortality rates have followed a comparable downward trend. Over the same period, maternal mortality from any cause related to or aggravated by pregnancy have fallen too, from 804 to 596 deaths per 100,000 live births (Figure 3.5). The data also reveal that morbidity rates among children and adults have declined slightly. For instance, the share of children under five with an episode of acute respiratory infection was 1.5% in 2011, down from 9.8% in 2003. The incidence of diarrhea in this age group also fell during the same period (DHS-2003; DHS-2011). Adults also exhibit slightly better health outcomes. The fraction of workers that reported not working due to sickness dropped from 16.8% in 2002/03 to 13.9% in 2008/09.

75. **The improvement in health outcomes is associated with a modest increase in access to and more utilization of health services.** In 2011, 90.8% of pregnant women underwent an ante-natal check, a higher fraction than in 2003 (84.5%). Over the same period, the proportion of children under five with full immunization coverage raised from 43% to 46%. More births were delivered in a health center or with the assistance from a health professional in 2011 than in 2003, 54.3% and 47.7%, respectively. These positive but moderate changes should not however overshadow the multiple challenges that remain. A large fraction of the population still lacks access to basic health services and to improved water and sanitation.



**76. Food security and nutrition continue to be a major challenge.** Food insecurity has improved slightly but remains a major issue, especially in regions prone to droughts and floods. Over half of the households in Mozambique experience food insecurity and around one third are chronically insecure. Undernutrition is further compounded by poor dietary diversity, low meal frequency and poor feeding practices (World Food Program, 2017). Anthropometric indicators for young children (0 to 5 years old) show uneven trends. Whereas underweight (standardized weight-for-age) shows improvement, nationally, 43% of children are stunted –a long-term nutritional deprivation, meaning that their height-for-age is two standard deviations or more below the child growth of a reference group<sup>16</sup> (Figure 3.6). There is regional variation in chronic malnutrition, with Nampula, Sofala and Cabo Delgado exhibiting the highest rates across provinces. Almost 7 in 10 children 6 to 59 months old are anemic, pointing to widespread micronutrient deficiencies (DHS-2011).

**Figure 3.6. More than four in ten children continue to be stunted, a measure of chronic malnutrition**



### *Access to basic services*

**77. Access to improved water and sanitation has improved but a large fraction of the population is not covered.** Safe water, sanitation and hygiene services (WASH) are key determinants of human development, with critical implications on human capital, income growth and poverty reduction. Data from the IOFs show that coverage for both services has been steadily increasing. Nationwide, almost 70% of the population has access to safe water, a 28-percentage point increase from the coverage rate recorded in 2002/03. In regard to access to improved sanitation, nearly 4 in 10 households were covered in 2014/15, twice the coverage level registered in the early 2000's (Figure 3.7). Despite these improvements, coverage rates of improved water and sanitation services in

<sup>16</sup> This group is defined by the World Health Organization.

Mozambique remain below the levels seen in some of the regional peers. For example, Malawi has almost the same coverage of improved sanitation in 2015, but its coverage of safe water reaches 90% of the population. Similarly, access to safe water and sanitation in Rwanda are 76% and 62%, respectively.

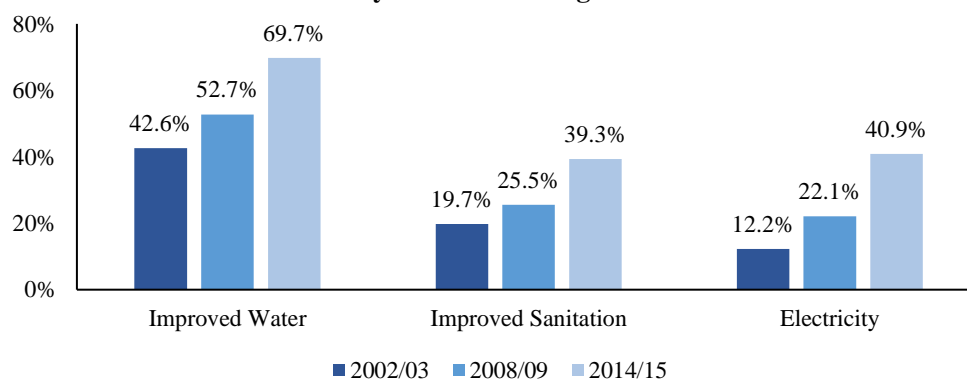
**78. Household location and income levels are strong determinants of access to WASH services.**

There are large differences between urban and rural areas. Access to safe water and sanitation among urban households is 89.4% and 69.4%, respectively. The corresponding rates for rural households are 46.6% and 7.5% (Figure 3.7). Income is also strongly correlated with access, even within urban areas. For example, access to sanitation among urban households in the top consumption quintile is 98.1%, 1.5 times larger than in the first quintile (67.3%). Consequently, rural and poor households bear a disproportionate burden of the impacts of inadequate water and sanitation. In rural areas, close to 40% of the population practice open defecation, which creates a major disease vector that contributes to increasing child mortality rates for malaria, measles and acute lung and respiratory infections. Poor water and sanitation services are also associated with a high incidence of diarrhea.

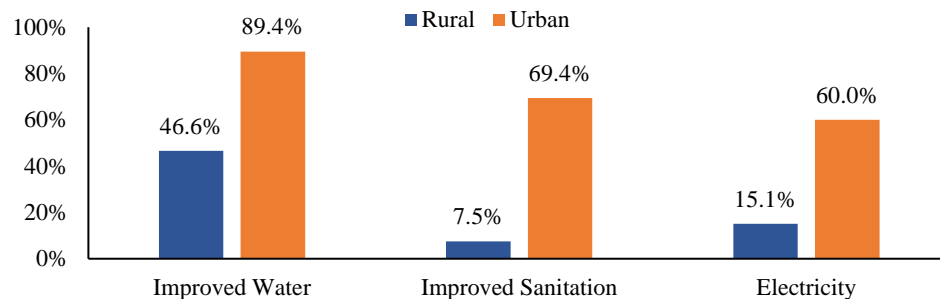
**79. Similarly, despite raising rates of electricity coverage, most households in Mozambique are not connected to the grid and the service is not reliable.**

At 40.9%, electrification rates are low, especially in rural areas where the majority lack access to electricity (Figure 3.7). Nearly 60% of urban households are connected to the distribution network. In contrast, 15.1% of rural households report the use of electricity for lighting, most of which rely on kerosene or wood fires for light (Figure 3.8). Reliance on kerosene and indoor wood fires is associated with negative health and environmental consequences, and it has negative implications on household budgets since the price of kerosene tends to be higher than electricity tariffs (World Bank, 2016b). The underdevelopment of Mozambique's energy sector also translates into major inefficiencies in generation and transmission, reducing the reliability of the system and restricting opportunities for value addition across different areas of the economy.

**Figure 3.7. Access to basic services such as safe water and sanitation and electricity continues to improve but are yet far from being universal**



**Figure 3.8. Location is a strong determinant of access to basic public services**

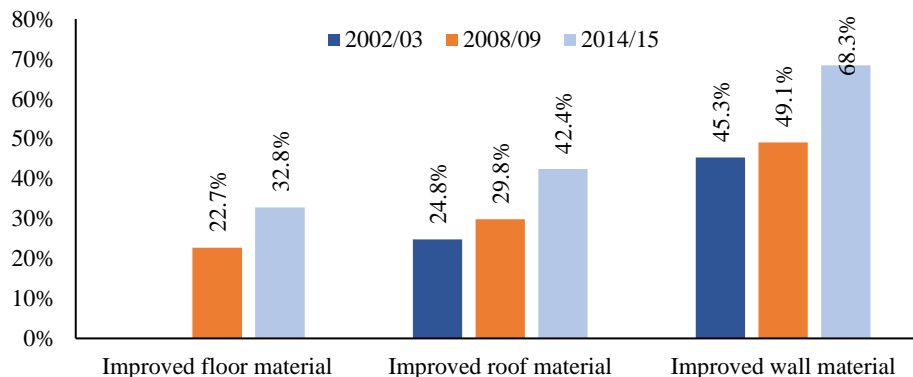


Source: World Bank using IOF-2014/15

### *Housing conditions and assets*

**80. Households have seen improvements in their housing conditions but there is a large gap between urban and rural areas as well as across income groups.** All indicators measuring the quality of housing such as improved floor, improved roof and improved walls show a sustained improvement between 2002/03 and 2014/15, providing evidence for rising living standards (Figure 3.9). While these positive trends are seen in urban and rural areas, they are more marked in the former. For example, the share of urban households that lives in dwellings with a finished roof reached 74.3% in 2014/15, nearly three times higher than the corresponding share in rural areas (27.6%). Likewise, even though the less well-off households also experienced improvements in housing conditions, overall these improvements are correlated with income levels. In fact, all measures of housing conditions get significantly better as one moves up in the consumption distribution. Most of the low-income and rural dwellers continue to live in poor housing conditions, and a large share of the urban population lives in settlements with slum characteristics.

**Figure 3.9. Improvement in household welfare is coupled with improvements in housing conditions**



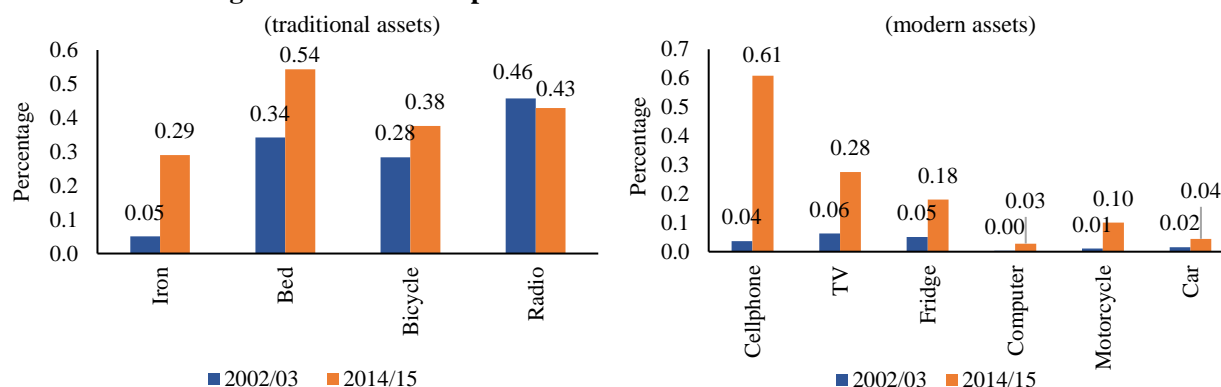
Note: data to calculate indicator of improved floor material not available in the IOF-2002/03

Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15

**81. Ownership of different types of assets has increased.** Mozambicans now own more both traditional and modern assets than what they used to own in the past (Figure 3.10). Ownership of traditional household items such as beds, irons and fridges, among others, has increased, especially in rural areas. For example, as of 2014/15, 54% and 18% of the households reported having beds and fridge, respectively, up from 34% and 5% in 2002/03. There have also been improvements in ownership of transportation, communication and other electronic devices such as bicycles, motorcycles, TVs and, above all, cellphones, which record the most marked increase. The share of

households having a mobile phone has multiplied by 15 from 4% to 61%, including increased ownership among poor households, which reached 46% in 2014/15. This progress should not, however, overshadow the high proportion of households that still lack many of these assets.

**Figure 3.10. Ownership of traditional and modern assets has increased**



Source: World Bank using IOF-2002/03 and IOF 2008/09

### 3.2 Overlapping Deprivations

**82. This section examines the extent to which several non-monetary deprivations overlap, possibly reinforcing each other.** Consumption-based measures of welfare are unlikely to fully depict the multiple aspects of poverty and deprivations of core human wellbeing and functioning. Poor people are often not only characterized by having low consumption but also face multiple deprivations such as lack of education (whether in quantity or quality), weak health, low access to basic services, inadequate jobs, high exposure to risks and few mechanisms to cope with them, among many others. Other segments of the population may be less deprived in non-monetary sense but face challenges earning fair returns on them. The analysis in this section provides an assessment of the extent and nature of multidimensional poverty, illustrating how it has evolved over time and across areas of the country, and what non-monetary deprivations are more closely linked to monetary poverty. The analysis also sheds light on poverty dynamics, more specifically the likelihood that households move out of poverty or stay trapped in poverty.<sup>17</sup>

**83. The analysis looks at a broad set of indicators spanning several aspects of multidimensional poverty.** The set of eight indicators used aims at capturing deprivations along multiple dimensions: *education* (no household member completed primary schooling, at least one school-age child in the household is out of school), *access to services* (no access to electricity, improved water and improved sanitation); *housing conditions* (poor quality dwelling<sup>18</sup>), *asset ownership* (no ownership of at least two of the following assets: fridge, TV, phone, bicycle, car or motorcycle) and the prevalence of *monetary poverty* (household's consumption per capita is below the poverty line). All indicators are broken down by area (urban and rural) and given identical weights. A household is considered multidimensionally poor if it is deprived in at least 3 out of the 8 indicators.<sup>19</sup> The analysis of multiple deprivations is a useful tool to draw attention to areas where further progress is needed.

<sup>17</sup> The exercise has some limitations such as that not all the indicators capture the full spectrum of poverty, the results are sensitive to the choice of indicators and cutoffs, some indicators where substantial progress has been recorded are not necessarily included in the analysis.

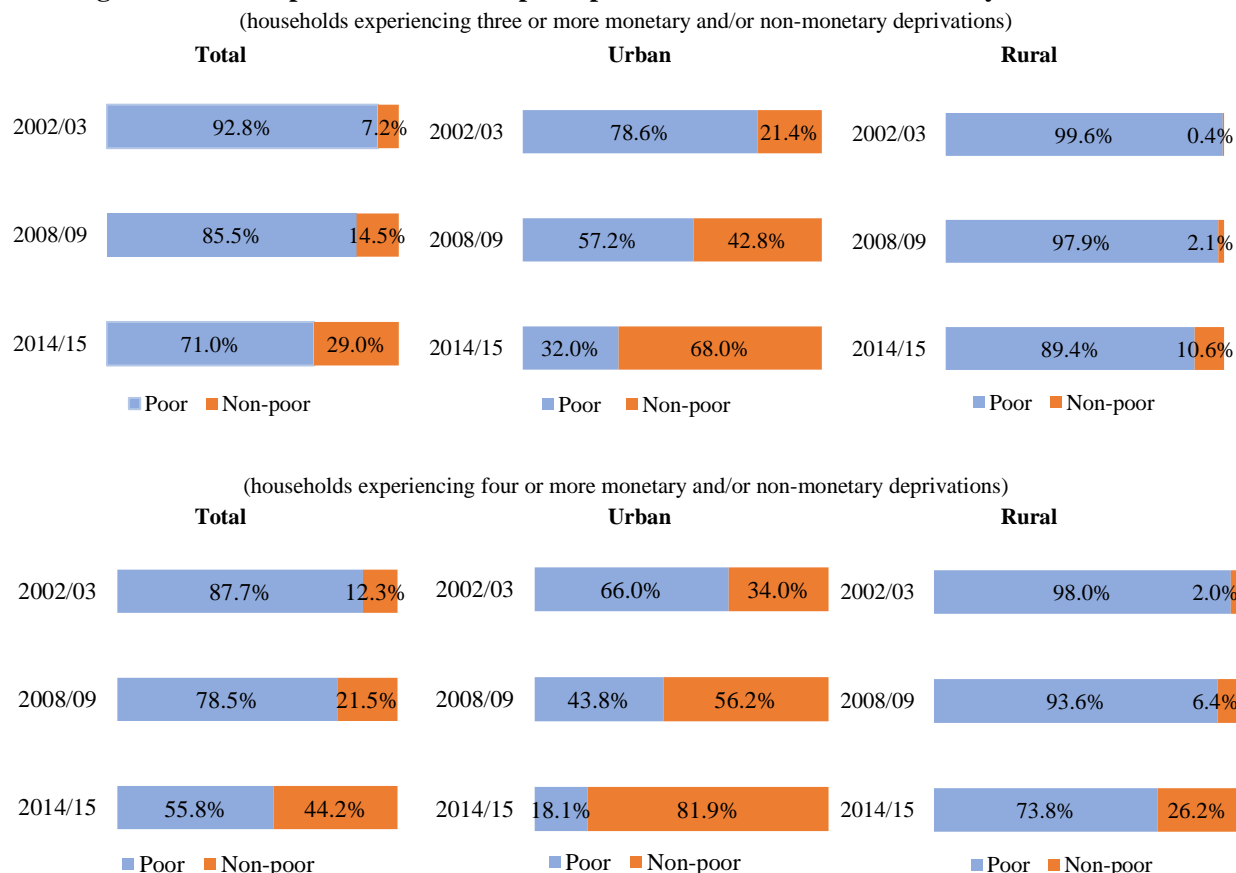
<sup>18</sup> Poor quality dwellings are those whose walls are made of palm, stem or grass.

<sup>19</sup> To get a sense of the sensitiveness of the findings, the results are also shown for a threshold of four multiple deprivations.



**84. Multidimensional poverty has been falling, especially in the last decade, but remains high.** The previous section already showed evidence of improvements in terms of reduction in some deprivations when looking at their evolution separately. Along the same lines, the findings of the multidimensional poverty analysis indicate a moderate decline in the share of households experiencing multiple deprivations all at once (Figure 3.11). In 2002/03, most households (92.8%) and nearly all the rural ones (99.6%) – were multidimensionally poor, that is deprived in 3 or more of the 8 monetary and non-monetary dimensions defined for the analysis. The incidence was lower in urban areas but still over three quarters of their population experienced several deprivations. There has been a sustained but moderate progress in reducing multidimensional poverty, falling to 71.0% in 2014/15, a reduction of 21.8 percentage points. Over 65% of these gains (14.5 percentage points) were achieved in the period 2008/09-2014/15. Notwithstanding that multidimensional poverty is now lower than at the beginning of the 2000s, more than 7 in 10 Mozambicans are still deprived in key aspects of human welfare. Results using a poverty threshold equal to four yield similar findings (bottom panel of Figure 3.11).

**Figure 3.11 – The prevalence of multiple deprivations has declined but mostly in urban areas**



Source: World Bank using IOF-2002/03, IOF 2008/09 and IOF 2014/15

**85. Progress in reducing multidimensional poverty is largely driven by improvements in the standards of living in urban areas.** The share of the urban population experiencing multidimensional deprivation has fallen steadily, from 78.6% in 2002/03 to 57.2% in 2008/09 and to 32.0% in 2014/15. Among the eight dimensions of deprivation, improvements in education, access to electricity and



access to safe water have contributed the most to the reduction of multidimensional poverty in urban areas. In contrast, progress has been noticeably slower in rural areas. The rate of multidimensional poverty saw a minor change between 2002/03 and 2008/09, from 99.6% to 97.9%, and fell moderately faster in the following period, reaching 89.4% in 2014/15 (Figure 3.11). There is a sharp urban-rural divide in the evolution of multidimensional poverty: it has fallen on average by 3.9 percentage points per year in urban centers, nearly five times faster than in rural areas, where it has declined by 0.85 percentage points per year.

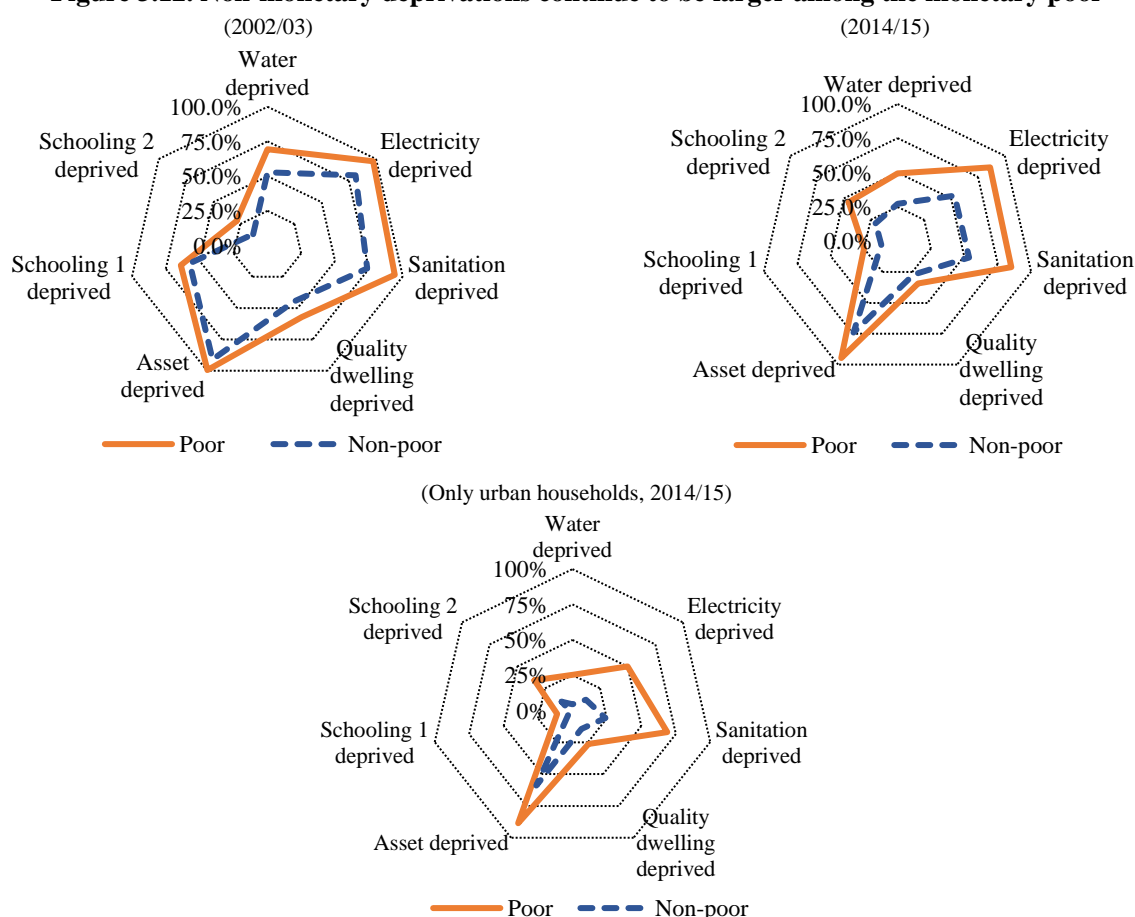
### 3.3 The Relationship between Monetary Poverty and Non-Monetary Poverty

86. **The combination of monetary and non-monetary poverty can reveal interesting aspects as to how consumption poverty and multidimensional poverty relate to each other.** Non-monetary deprivations can be partly driving household consumption deficiencies. At the same time, the relationship between these two aspects of poverty can operate in the opposite direction, namely that insufficient household expenditures contribute to experiencing multiple deprivations. However, monetary and non-monetary poverty may not be closely linked for some groups of people, for whom owning some assets and having access to basic goods and services do not automatically translate into higher consumption levels and growth.

87. **The incidence of both types of poverty is strongly associated in Mozambique.** Compared to households that are above the poverty line, monetary poor households are remarkably more likely to be deprived in each of the 7 non-monetary indicators included in the analysis. For example, 49.4% of the monetary poor live in dwellings that lack access to safe water whereas 27.1% of the monetary non-poor are deprived in this dimension. Analogous differences are seen for the other indicators and for most of them the gaps between the monetary poor and non-poor have either stayed constant or widened across the survey waves (top panel of Figure 3.12). The strong association between monetary and non-monetary poverty is evident across the different surveys and has changed little over time. The disparity in the incidence of non-monetary poverty between the two groups (monetary poor and non-poor) is largely but not exclusively driven by the strong urban-rural divide in the number the deprivations. Indeed, gaps of similar magnitude are also evident in the extent of non-monetary poverty between the urban monetary poor and the urban non-poor (bottom panel of Figure 3.2). Consequently, the overall intensity of non-monetary deprivation is correlated with monetary poverty. The monetary poor are more likely to suffer from multidimensional poverty, for instance dealing with three or more deprivations, than the non-poor (88% compared to 52%).

88. **The overlay of monetary and multidimensional poverty can also be used to categorize the population into welfare groups based on varying degrees of exposure to overlapping monetary and non-monetary deprivations.** More specifically, the population can be divided into four groups: 1) the *chronic poor*, namely those that are poor in multidimensional and monetary sense and thus are less likely to depart the condition of poverty; 2) the *not poor but deprived* is comprised of households whose consumption is above the poverty line but are multidimensionally poor; 3) the *transient poor* corresponds to households that are not deprived in any of the non-monetary dimensions despite being consumption poor; and 4) the *better off* represents households that are not poor by either approach. In the absence of long panel data, this grouping of the population into different welfare groups can shed light on poverty dynamics.

**Figure 3.12. Non-monetary deprivations continue to be larger among the monetary poor**



Note: Schooling deprived 1 = no member in the household completed at least 5 years of education, Schooling deprived 2 = at least one primary-school age children out of school.

Source: World Bank using IOF-2002/03, IOF 2008/09 and IOF 2014/15

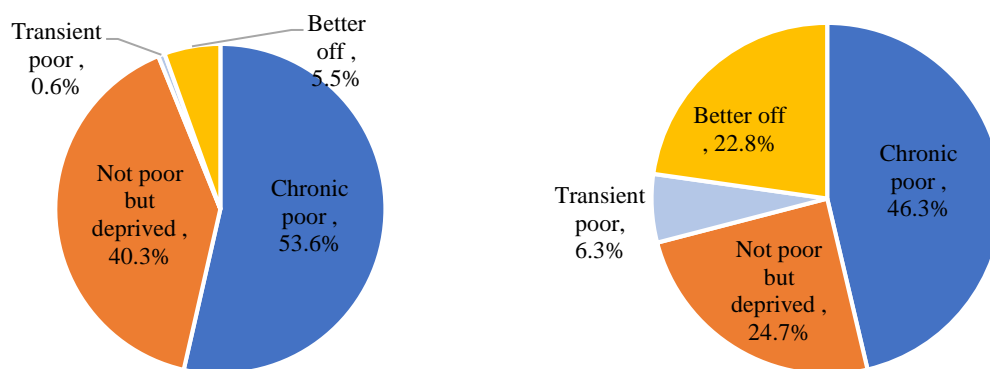
89. **The share of people in chronic poverty has fallen but continues to be the largest group, signaling a poverty trap problem.** The proportion of Mozambicans in chronic poverty fell from 53.6% to 46.3% between 2002/03 and 2014/15 (Figure 3.13). This means that chronic poverty continues to be a challenge following a period of strong economic growth. As of 2014/15, more than 4 in 10 individuals are unable to afford a basic food and non-food basket and are deprived in at least three core, non-monetary measures of human welfare (education, access to basic services, housing conditions and ownership of basic assets). The persistence of these deprivations is likely to continue trapping these households into a condition of monetary poverty. Most of the households likely to be chronically poor are in rural areas (84.9%), particularly in the provinces of Zambezia, Niassa and Nampula.

90. **More than 20% of the population is not monetarily poor but this group faces a high risk of sliding back into poverty.** Another remarkable (and positive) change is the decline in the share of people *not poor but deprived*, which almost halved during the period of analysis, moving from 40.3% to 24.7%. This change is largely driven by the relatively faster monetary poverty reduction observed in the period 2008/09-2014/15 – compared to the period 2002/03-2008/09, a trend that was not matched by a similar evolution in the incidence of multidimensional poverty. This deprivation, however, implies that this group of people is more likely to be economically insecure and therefore be more vulnerable

to fall back into poverty, drawing attention to the need for social protection and safety net mechanisms. In other words, nearly 70% of the population is currently either poor (48.4%) or faces a high risk of experiencing poverty (24.7%).

91. **There has been a sixfold increase in transient poverty as well as a notable increase in the share of people that are neither monetarily poor nor deprived in the non-monetary sense.** In contrast to the chronic poor, the transient poor are not deprived and their consumption poverty could be partly attributed to variability in consumption that is caused by aggregate shocks (such as droughts, economic crises or sharp price changes), idiosyncratic shocks (such as sickness of the main breadwinner or a job loss) or other fluctuating component of consumption, for instance, crop seasonality.<sup>20</sup> Notably, the percentage of Mozambicans classified as transiently poor increased significantly, from less than 1% in 2002/03 to 6.3% in 2014/15. Like the welfare risks of the group *not poor but deprived*, these fluctuations in consumption justify public intervention through, for instance, the establishment of safety net systems. Finally, a favorable outcome of the reduction in monetary poverty and the improvements in living conditions and human development indicators in the last decade is the increase in the share of the *better off*. As of 2014/15, about a quarter of the population is neither monetary poor nor deprived in non-monetary sense, up from 5.5% in 2002/03.

**Figure 3.13 – The chronic poor remains the largest welfare group in the population**  
(welfare groups, 2002/03) (welfare groups, 2014/15)



Source: World Bank using IOF-2002/03 and IOF 2014/15

### 3.4. Mobility into and out of Poverty

92. **Synthetic panels based on cross-sectional data can be used to examine the factors that help households escape poverty.** Analyses of economic mobility are conventionally underpinned by panel data – longitudinal information collected over multiple periods of time for the same households. However, panels are not readily available for most developing countries since they are difficult to administer, costly and often lack statistical representativeness for large geographic areas. In the case of Mozambique, except for the IOF-2014/15, none of the household budget surveys is a panel. Even the IOF-2014/15, which was collected as a panel, has important limitations for assessing economic mobility in the medium- and long-term. The survey spans a period of one year (July, 2014-June, 2015) and high, non-random attrition affected substantially one of the waves of data collection. An alternative

<sup>20</sup> This concept assumes that the constant (permanent) component of income or consumption –as opposed to the fluctuating component– is at or above the poverty line.

is to construct synthetic panels from cross sectional data to estimate point estimates of poverty mobility and other welfare outcome dynamics (Dang and Lanjouw, 2013).

93. **Survey data from 2008/09 and 2014/15 and the synthetic panel methodology are used to predict household transitions into and out of poverty in Mozambique.** The central objective of the exercise is to construct a synthetic panel by projecting for each household surveyed in 2008/2009 (first round) what its consumption per capita would look like in 2014/15 (second round). To do so, an econometric model of consumption per capita is estimated on time invariant covariates (household head age, age squared, gender, years of education and provincial fixed effects) using data from the second round (IOF-2014/15). Coefficients estimates of this model are then multiplied by the time-invariant characteristics measured in the IOF-2008/09 to project the consumption per capita in the second round of all the households interviewed in the first round. Following this, assumptions on the value for the correlation between the error term (fraction of the household consumption not explained by the dependent variables) in the first and second round determine the lower and upper bound estimates of poverty mobility. Validations of this method for countries where actual panels exist show that the “true” estimate of mobility generally lies between the upper and lower bounds obtained from the synthetics panels (Dang and Lanjouw 2013; Lucchetti 2017).

94. **The results indicate that upward economic mobility out of poverty exceeded the downward mobility into poverty during the period of analysis.** In terms of poverty transitions, households can be divided into four groups: i) those who escaped poverty, ii) those who remained poor, iii) those who became poor and iv) those who remained non-poor. Overall, the results show that the poverty headcount fell in the synthetic panel between 2008/09 and 2014/15. The share of households below the poverty line who became non-poor (26.1%) is larger than the proportion of households that were not poor at baseline but fell into poverty (6.9%) during the second round (Table 3.1). This finding corroborates the results derived from the “snap-shots” of welfare portrayed by the two cross sections in 2008/09 and 2014/15 –and discussed in Section 2. In contrast, results from a synthetic panel for the period 2002/03-2008/09 (not shown) indicate that downward mobility into poverty was higher than upward mobility out of poverty.

**Table 3.1. More people moved out of poverty than those than fell into poverty**  
(poverty transitions into and out poverty, 2008/09-2014/15)

	Consumption group in 2014/15		
		Poor	Non-poor
Consumption group in 2008/09	Poor	32.5%	26.1%
	Non-poor	6.9%	34.5%

Source: World Bank using IOF-2008/09 and IOF 2014/15

95. **Several characteristics distinguish households that remained poor from those that could escape poverty.** A comparison between these two types of households reveals variables that are possibly associated with a condition of chronic poverty. There are many similarities with the findings from the overlapping deprivation analysis presented above. In terms of household composition, new non-poor households tend to be smaller, partly because they have fewer children ages 0 to 14. Furthermore, these households are more likely to be headed by women, something that could be related to higher prevalence of temporary migration among male spouses and possibly higher and more diversified incomes. Location and sector of occupation also seem to play a role. Households that managed to transition out of poverty are less likely to be rural and less likely to participate in agriculture. The new non-poor also register higher access rates to improved water and sanitation, and

to electricity, and show slightly higher ownership of modern assets and better connectivity to markets and critical public infrastructure (Table 3.2).

**Table 3.2. There are several differences between households that escaped poverty and those that remained poor between 2008/09 and 2014/15**

Variable	Escaped poverty	Stayed poor	Difference	Significance (Model)
<b>Household socio-demographics</b>				
Age of household head	41.8	43.1	-1.3	***
Female-headed (%)	33.0	25.0	8.0	***
Household size	5.2	5.4	-0.2	
Proportion of children aged 0 to 14 (%)	48.1	49.7	-1.6	***
Lives in rural area (%)	77.1	81.6	-4.5	***
Years of education of household head	2.7	2.8	-0.2	
Household head is illiterate	63.0	69.9	-6.9	***
<b>Sector of work</b>				
Head works in agriculture (%)	79.3	84.7	-5.4	***
Head works in manufacturing (%)	2.5	2.7	-0.2	**
Head works in services (%)	3.4	1.4	2.0	***
Head employed in private sector (%)	7.2	4.3	2.9	***
Head employed in public sector (%)	0.4	0.2	0.2	
<b>Access to services</b>				
Improved water	41.0	33.8	7.2	***
Improved sanitation	9.9	4.8	5.1	***
Electricity	6.6	2.9	3.7	***
<b>Within 30 minutes of walking distance to ...</b>				
Road	0.6	0.4	0.2	
Market	35.0	42.2	-7.2	**
School	6.7	2.9	3.8	**
Health facility	2.2	1.0	1.2	
<b>Asset ownership</b>				
Household has a car	52.0	45.8	6.2	***
Household has a bicycle	44.7	39.2	5.5	***
Household has a T.V.	75.0	68.8	6.2	***
Household has a fridge	27.9	23.4	4.5	***

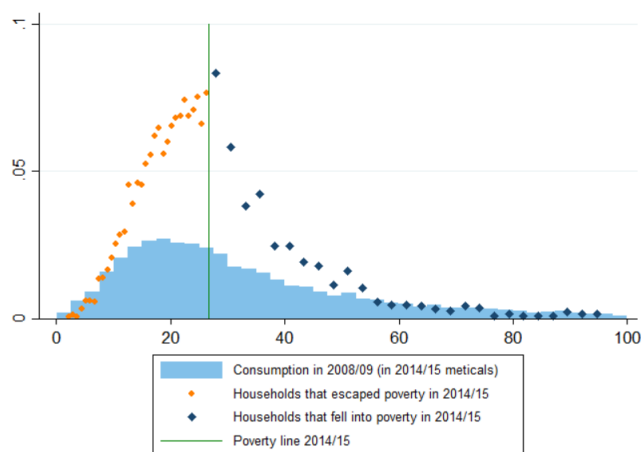
Notes: Column *Model* shows significance values from a binary dependent variable (escaped poverty=1, =0 otherwise) model (probit) controlling for all variables shown and province fixed effects. \*, \*\*, and \*\*\* indicate significance level at 10%, 5%, and 1%, correcting for the clustered nature of the errors in the probit regressions.

Source: World Bank using IOF-2014/15

96. **Most of the households that moved out of poverty between 2008/09 and 2014/15 were relatively close to the poverty line.** Synthetic panels also allow identifying the initial position in the consumption distribution of households that managed to close the consumption deficit and became non-poor. Figure 3.14 shows that the density of households that crossed the poverty line (orange dots) increases almost monotonically as the consumption distribution approaches the poverty line from the left. However, the analysis also shows that a non-trivial fraction (28.8%) of the new non-poor originated from the lowest consumption quintile, suggesting strong economic mobility among this group. The initial location of households that were not poor but became poor also reveals an information on the transitions into poverty. The pattern for this subset of households mirrors the dynamics seen among those that transitioned out of poverty. Households above but closer to the poverty line exhibit higher vulnerability to poverty than those in the upper parts of the distribution. Non-poor households near the poverty line are basically a shock away from sliding back into poverty.

**Figure 3.14. The closer households were to the poverty line the more likely they were to transition into or out of poverty between 2008/09 and 2014/15**

(Distribution of 2008/09 consumption and 2014/15 poverty switchers)



Source: World Bank using IOF-2008/09 and IOF 2014/15

## 4. Inequality of Opportunities

### 4.1 Inequality of Opportunities

97. **A context of high and increasing inequality and weak inclusiveness in Mozambique makes it important to measure and understand inequality of opportunity among children.** As noted in the previous sections, monetary and non-monetary poverty has fallen –albeit at a moderate pace– over the last 15 years. However, poverty reduction has not gone in hand with lower inequality. On the contrary, inequality remains high and appears to be on an upward trend. Efforts to reverse this trend and create more equal conditions for all require assessing the state of equity fundamentals in Mozambique. This section presents findings from estimating the Human Opportunity Index (HOI), an indicator that measures the influence of personal circumstances –exogenous variables such as gender, race or place of birth for which individuals have no control or responsibility– on the access that people get to the basic services that are necessary for a productive life. To make the findings more relevant for policy, the analysis focuses on estimating inequality of opportunity among children rather than inequality of outcomes among adults.

98. **The approach followed in the analysis captures both the coverage of basic services and how equitable they are distributed.** The HOI is a synthetic measure that summarizes the level of basic opportunities in a society and how equitable these opportunities are distributed across the population. The first element of the index –the average coverage rate of basic services– is measured directly using survey data. The second element of the index –the equity of opportunity distribution– measures the gap in access rates for a certain service in a group defined by personal circumstances (for example, parental education or gender) relative to the average access rate for that service for the whole population. (Barros et al. 2009). The second component discounts the average coverage rate by the fraction of the opportunities that needs to be reassigned from the better-off groups to the worse-off groups to attain equal opportunity in the population under study. The higher the inequality in the allocation of opportunities, the higher the rate of discount.

99. **The index is calculated at different points in time and for five basic opportunities that are linked to human capital, access to basic services and quality of housing.** Survey data from the IOF-2002/03, IOF-2008/09 and IOF 2014/15 is used for the estimation of the HOI in each of these years. The 5 opportunities considered in the index for children ages 5 to 11 are: 1) the child is enrolled in primary education, 2) the household uses either piped water, public tap or mineral/bottle water for human consumption; 3) the dwelling is connected to a sewer system or has access to a septic tank and/or improved latrine; 4) the energy for lighting is electricity; and 5) the housing material is adobe, cement and/or brick. The 7 children circumstances defined are: 1) location, 2) gender of the child, 3) child's area of residence (urban or rural), 4) per capita household consumption, 5) years of schooling of the family head, 6), number of siblings and 7) if the child lives in either a single-parent or two-parent household.

100. **Mozambique has registered an increase in the coverage of basic opportunities for children but they are still far from being universal.** In line with the results of the previous section, the coverage of the indicators about human capital, access to basic services and quality housing opportunities considered in the analysis increased between 2002/03 and 2014/15. In education, for instance, the enrollment of children in primary school age (6 to 11 years old) increased from 64.3% in 2002/03 to 81.2% in 2014/15. Similarly, a larger share of children now lives in households with access to water (57.3%) compared to an average coverage in the early 2000s of 36.9%. The same pattern is

seen for opportunities linked to access to sanitation, electricity and quality housing. However, while these increases in coverage point to changes in the right direction, they occurred from a very low base. Moreover, the pace of progress is slow to fill the gaps in coverage in the medium-term let alone in the short-term. For example, at the current rate (average growth of 1.59 percentage points per year), 50 more years will be needed before children's access to electricity is universal.

**101. The increasing coverage of basic opportunities hides important inequalities in the access to them.** The increase in average coverage figures do not indicate whether children of a certain gender, location or parental background have different access rates. As noted above, however, the second element of the HOI accounts for the inequality in the distribution of existing basic opportunities when coverage is not universal. The results for Mozambique indicate that a large share of opportunity needs to be reallocated from the more advantaged to the less advantaged groups to achieve equality of opportunity: 3.8% in education, 15.9% in water, 34.6% in sanitation, 53.3% in electricity and 5.0% in housing for 2014/15.<sup>21</sup> The redistribution that is necessary for the equality of opportunities in areas such as electricity, water and sanitation is significant but lower in education and quality housing (Table 4.1). Overall, looking across time, opportunities are becoming slowly more equally distributed over time. Efforts in expanding access to education are paying off in terms of leveling the field for children—at least in terms of enrollment (not necessarily quality) in primary education.

**Table 4.1. The distribution of some opportunities is highly unequal but is slowly improving**  
(unequal distribution of opportunities across personal circumstances)

	Education	Water	Sanitation	Electricity	Quality housing
2002/2003	8.7%	16.9%	55.3%	67.4%	12.3%
2008/2009	5.1%	16.6%	46.3%	65.2%	12.5%
2014/2015	3.8%	15.9%	34.6%	53.3%	5.0%

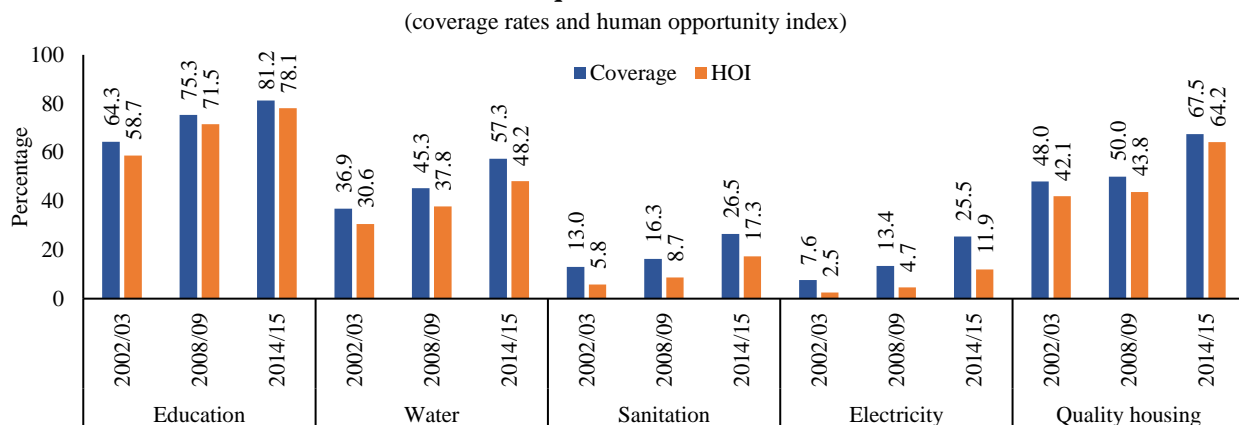
Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF 2014/15

**102. The human opportunity index has increased but highlights the need to minimize large inequality of opportunity in some dimensions.** The index expresses the interaction between the availability of opportunities and how equal they are distributed. Since now there are more opportunities than before, the value of the HOI has increased over time. However, given that the index is sensitive to the allocation of these opportunities across circumstances, its value is always below the coverage rate across all years and dimensions, indicating that basic goods and services have been and remain to be distributed unevenly largely based on location, family background or gender, among others. As mentioned before, the largest inequitable distribution is seen in services such as water, sanitation and electricity. As of 2014/15, for example, 25.5% of children ages 6 to 11 lived in households with access to electricity. However, when the coverage rate is “penalized” by the way is unequally allocated across all children, the rate (namely, the HOI) falls to 11.9%. In contrast, the HOIs in education and quality housing are both higher and more evenly distributed. For instance, 96.2% of the opportunities in primary education enrollment (ratio of the HOI to the coverage rate, 78.1/81.2) are equally allocated (Figure 4.1).

<sup>21</sup> Inequality of opportunity in sanitation, for instance, implies that 34.6% of the total available coverage would have to be reallocated among the six circumstance groups (as shown below, mostly from urban to rural households) to equalize the probability of access across all children.



**Figure 4.1. The allocation of human opportunities is becoming more equally distributed but large inequalities remain**

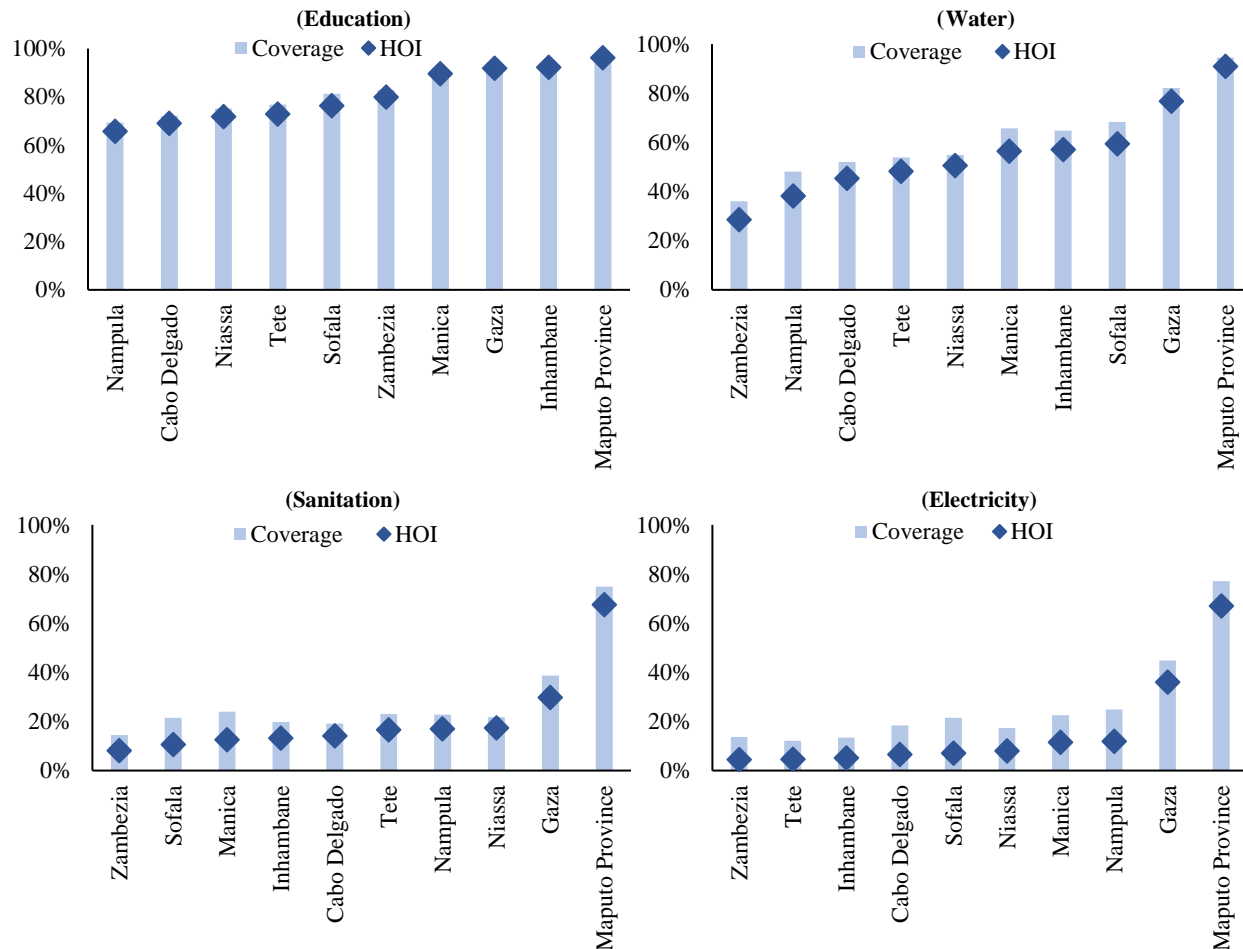


Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF 2014/15

**103. Subnational analysis shows large variation in the availability of opportunities across provinces and across personal circumstances within provinces.** The increasing coverage of basic opportunities masks large variation across regions in Mozambique. Coverage rates have increased for all provinces but those where monetary poverty has been historically the highest (such as Zambezia, Nampula and Niassa) also show lower availability of human opportunities. The largest gap of the dimensions analyzed is in electricity. As of 2014/15, nearly 8 in 10 households in Maputo Province have access to the grid compared to 13.6% in Zambezia (Figure 4.2). Furthermore, the poorest provinces not only record lower coverage rates of basic opportunities but also exhibit the most unequal distribution of the opportunities available. For example, following with opportunities associated to access to electricity, 67.2% of the coverage in Zambezia needs to be reallocated away from the better-off groups to the worse-off groups within the province to achieve equal coverage. On the other side of the spectrum is Maputo Province, where 13.2% of the coverage is unequally assigned across personal circumstances (Figure 4.3).

**Figure 4.2. Human opportunities are unequally allocated across and within provinces**

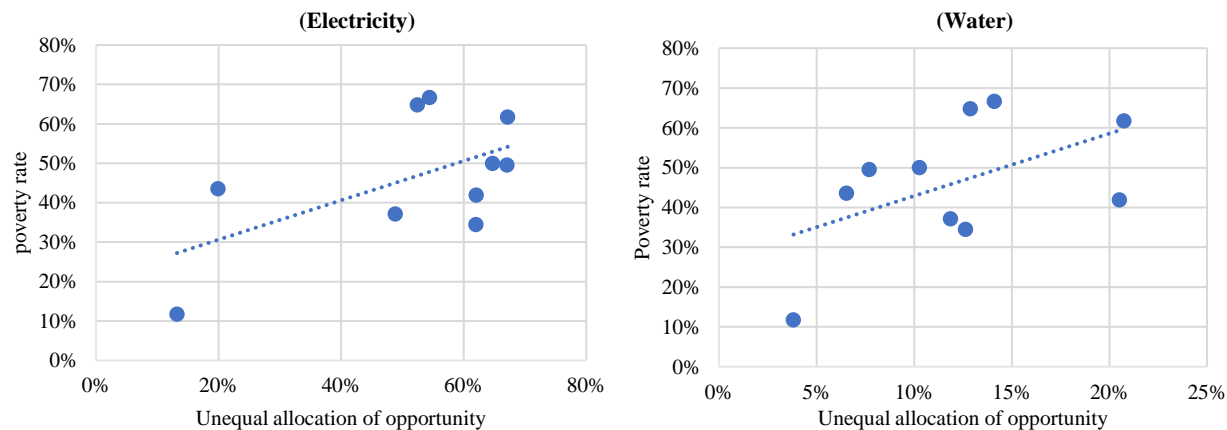
(coverage rates and human opportunity index, 2014/15)



Source: World Bank using IOF 2014/15

**Figure 4.3. Human opportunities tend to be more unequally distributed in the poorest provinces**

(unequal distribution of opportunities across personal circumstances and poverty rates by province, 2014/15)

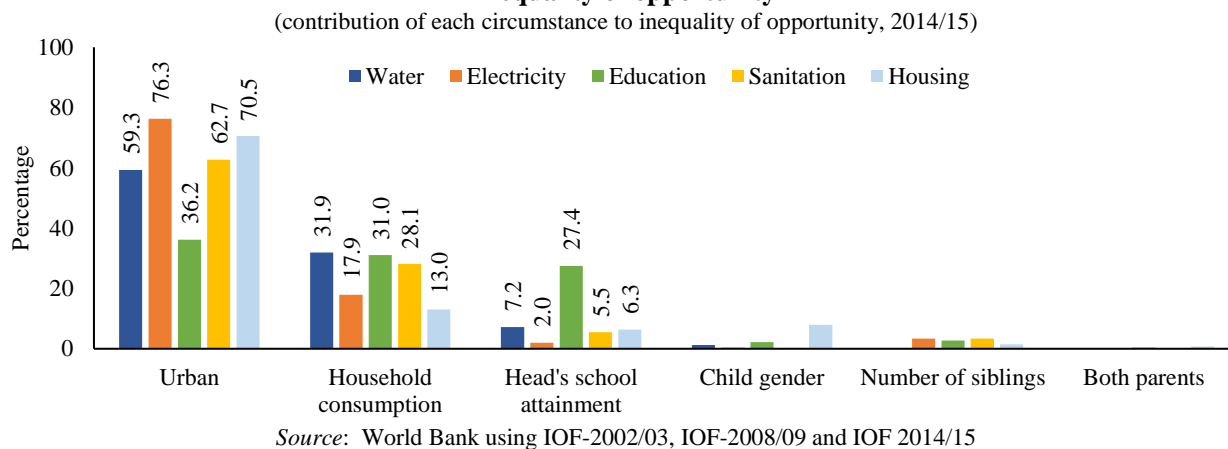


Source: World Bank using IOF 2014/15

## 4.2 What Aspects Matter the Most for Inequality of Opportunity?

104. **The chances of Mozambican children later in life are largely influenced by their location and family background.** It is important to uncover the personal circumstances that matter the most for the highly unequal access to opportunities in Mozambique. The analysis performed decomposes the unequal allocation in each of the opportunities across all the six personal circumstances. Irrespective of the dimensions considered (education, water, etc.), three personal circumstances beyond the control of children are the most salient in explaining the severity of opportunity deprivation: whether the household is located in an urban center, household's per capita consumption and the school attainment of the household head. For instance, almost all (98.4%) of the unequal access to water is driven by location (59.3%), per capita consumption (31.9%) and head's human capital (7.2%). These three characteristics are also important drivers of inequitable distribution of opportunities with relatively high HOIs, such as education (94.8%) or housing (89.8%) (Figure 4.4). This pattern has remained constant over time. Decomposition analysis for the HOI in 2002/03 shows that back then this sub-set of circumstances was also the largest contributor to the overall inequality of opportunity.

**Figure 4.4. Location, household consumption possibilities and parental education drive most of the inequality of opportunity**



105. **Policies to promote equality of opportunities are critical in the way forward for a country dealing with the challenge of high and persistent inequality.** The previous sections made it clear that economic growth in Mozambique has been robust and relatively stable but not inclusive. Poverty has fallen but at a speed lower than expected and the gains from growth are disproportionately benefiting the better off, pushing already high levels of inequality further up. Moreover, this section shows evidence that exogenous circumstance such as place of residence, consumption possibility and parental education constrain the set of opportunities for children. Breaking this inequality trap in adult outcomes in the future will require a renewed emphasis of public policy toward equality of opportunity for current children. Moving forward, efforts to widen the coverage and promote equality of opportunity for children will require directing marginal investments to increase access to basic goods and services to children from disadvantaged groups, particularly those from rural households and low levels of income.

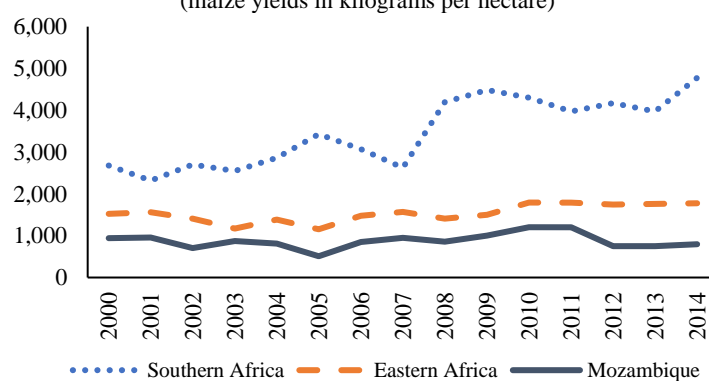
## 5. Productivity, Market Development and Vulnerability in Agriculture

### 5.1 Linkages between Subsistence Agriculture, Low Productivity and Rural Poverty

106. **Agriculture is the mainstay of Mozambique's economy.** The country is rich in natural endowments well suited for agriculture such as extensive fertile land, abundant water and favorable climate. The agricultural sector employs nearly 80% of the labor force, which is one of the highest rates across countries in Sub-Saharan Africa. Even though the share of agriculture in the national income has been falling continuously, it still represents around 25% of the GDP. Within agriculture, crop production represents about 75% of the sector's value-added (World Bank, 2016c). Since the middle of the 1990s, growth in agriculture has been robust and steady, especially during the 2000s, where annual growth averaged 8%. More recently, between 2010 and 2015, the sector expanded at an average rate of 3.9% annually.

107. **Overall, agriculture productivity levels and growth in Mozambique are low by global and regional standards.** For example, the gap between average cereal yields in Mozambique and global averages is large and has been growing. Between 2000 and 2009, the gap between average world cereal yields and yields in Mozambique increased more than 2 percent annually (World Bank 2016c). Maize is the most commonly grown crop and is thus a useful proxy indicator to measure productivity.<sup>22</sup> In general, maize yields per area cultivated are extremely low in Mozambique. In 2015, the average maize yield for farmers who planted maize was 836 kilograms (kg) per hectare and half of them had yields under 480 kg per hectare. This is not only low on regional standards (as seen in Figure 5.1), but is also far below Mozambique's agricultural potential.

**Figure 5.1: Average maize yields are lower in Mozambique than in other neighboring countries**  
(maize yields in kilograms per hectare)



Source: FAOStat

108. **There are also large productivity gaps within Mozambique between agriculture and other sectors in the economy, limiting the levels and growth of earnings for farmers.** Different methods and data estimate that labor productivity in the secondary and tertiary sectors are between 7 and 12 times higher than in agriculture. Data for 2014 shows that the productivity level in agriculture was about one-third of the average productivity for the whole economy (World Bank, 2017a).

<sup>22</sup> In the AIS 2015 survey, over 84 percent of farmers reported growing maize in the first season. For these farmers, maize alone averaged 0.8 hectares, therefore occupying a significant part of their fields, and more than any other single crop. Therefore, for the rest of this chapter, maize yields from the first season (many farmers do not plant in the second season) will be used as the benchmark crop to assess productivity.

Consequently, incomes remain significantly lower in agriculture than in other sectors of the economy. The large difference in productivity levels across sectors is also indicative of barriers to labor mobility, which, in turn, hinder the opportunities to raise overall productivity.

**109. Most of the rural poor are smallholders engaged in subsistence agriculture that rely on family labor.** Understanding the root causes of poverty in Mozambique requires looking at agriculture since their livelihoods are for the most part linked to the productivity of their land and labor. In fact, data from the IOF 2014/15 shows that the large majority of the rural poor (93.9%) are primarily engaged in agriculture. Most of them are smallholder farmers. The median farm size in the Integrated Agriculture Survey (AIS-2015), which collects data on socio-demographics, farm size, agricultural production outcomes and market access from 7,485 agricultural households,<sup>23</sup> was 1.27 hectares. There is not much variation across most of the distribution, with the average size ranging from 0.75 to 2.13 hectares between the 25th and 75th percentiles, respectively. Most of the food smallholders produce is intended for their own consumption. A typical farmer plants an average of 3.5 crops per season, mostly staple crops.<sup>24</sup>

**110. Few smallholder farmers commercialize their production or grow cash crops, signaling limited opportunities to increase their incomes and a cycle of poverty.** The market orientation of farmers in Mozambique is low. Almost 100% of smallholder farmers surveyed in the AIS 2015 reported growing at least one staple crop, however only 13% sold any of their production. The earnings from these sales were low, averaging 2.87 Meticals per household per day or 11% of the poverty line (25.85 Meticals). Moreover, while 18% of farmers reported growing cash crops, only 45% percent of these farmers (8% percent of all farmers in the sample) sold any of their production. Consequently, most of agricultural output is retained by producers for self-consumption within the household. Under these conditions, and as further elaborated below, many farmers may be trapped in a cycle of poverty. The focus on subsistence farming and limited income growth is a likely manifestation of their weak human capital, limited access to financial markets, isolation from infrastructure and markets, and large exposure to uninsured risks, among others.

**111. Farmers who grow cash crops are more productive in their staple crop production as well.** Farmers who cultivate cash crops are generally more productive than those who only cultivate staple crops. As shown in Figure 5.2, the median maize yield for the first group was 600 kg per hectare, 33% higher than the median maize yield for farmers who did not produce cash crops (449 kg per hectare). This suggests that farmers with greater market linkages may also have the incentives that boost their staple crop productivity as well.

**112. There is a strong negative correlation between poverty and agricultural productivity across provinces.** The AIS-2015 includes information on agricultural production at the farmer level but does not collect data on household consumption, which is captured in the IOF-2014/15. However, both surveys are statistically representative at the province level, allowing for the investigation of the relationship between poverty and agricultural productivity (proxied by maize yields per hectare) at that level of disaggregation. The results show that farmers in the poorest provinces remain less productive, on average, than those in the rest of the country (Figure 5.3). In Nampula and Zambezia, for instance,

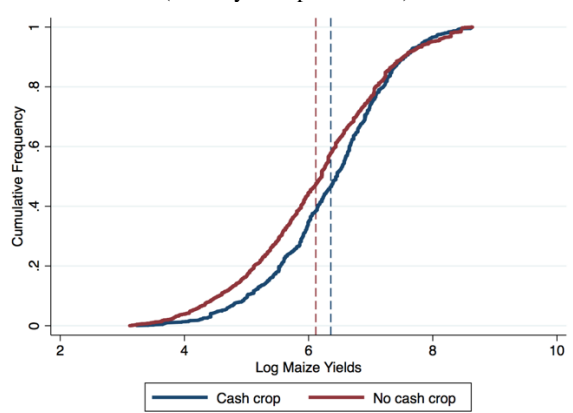
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<sup>23</sup> The survey is administered every other year by the Ministry of Agriculture and Food Security with technical support from the University of Michigan. Like the household budget surveys (IOFs), data from the Agricultural Integrated Survey is representative at the national and provincial levels.

<sup>24</sup> In fact, six main staple crops accounted for 92 percent of the total crop area planted by smallholders in Mozambique (namely maize, pulses, cassava, groundnuts, rice, and sorghum).

where headcount poverty rates are particularly high, the average maize yield was 593 kg per hectare. In the rest of the country, the average yield equals 951 kg per hectare –and 759 kg per hectare when Maputo City and Maputo Province are excluded from the sample.

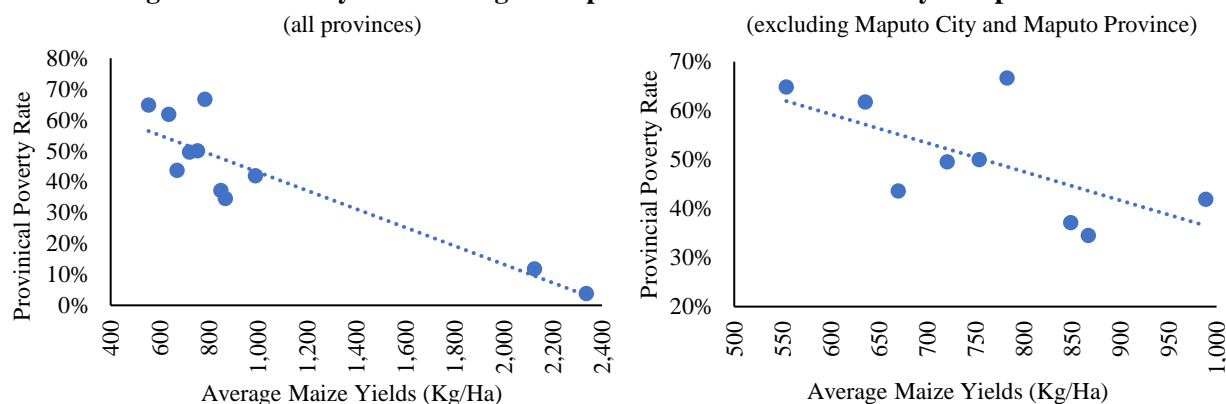
**Figure 5.2: Maize productivity is higher among farmers that have a stronger market orientation**  
(maize yields per hectare)



Note: Cumulative distribution functions trimmed at 1st and 99th percentiles. Vertical lines show mean values.

Source: World Bank using AIS 2015

**Figure 5.3: Poverty rates are higher in provinces with lower maize yields per hectare**

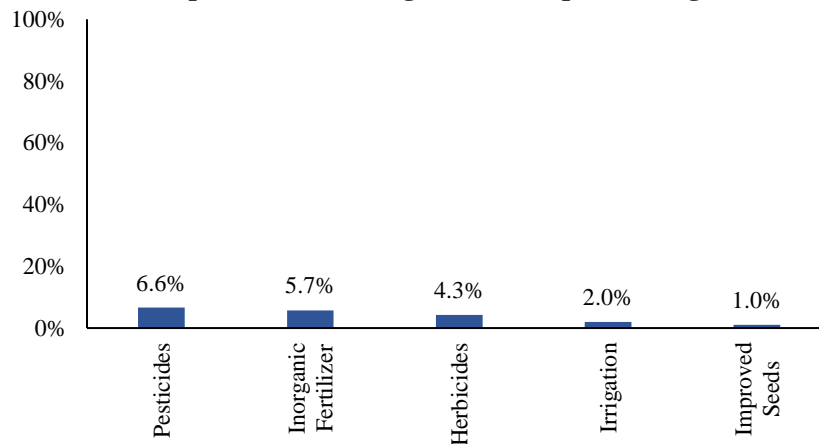


Source: World Bank using AIS 2015 and IOF 2014/2015

## 5.2 Limited Use of Modern Inputs Undermine Productivity

113. **Rates of adoption of productivity-enhancing technologies appear to be remarkably low, even more so among farmers that only cultivate staples.** As illustrated in Figure 5.4, only 1% of farmers employed improved seeds in 2015. In the same year, only 2% of farmers used any irrigation method. Similarly, employment of fertilizers was broadly uncommon, as only 5.7% of farmers declared having used it. Pesticides, another important input, were used by 6.6% of farmers, and herbicides by only 4.3%. Rates of technology adoption and utilization of productivity-enhancing inputs are particularly low in the cultivation of food crops.

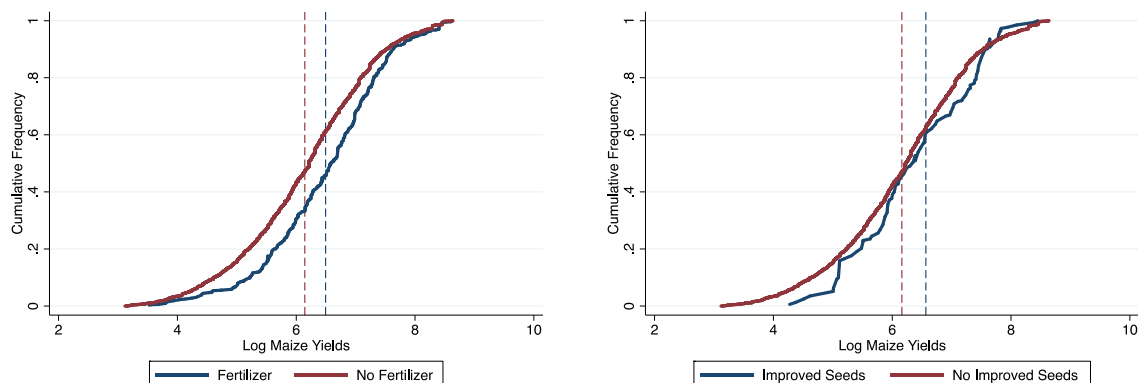
**Figure 5.4: There is low adoption of modern agricultural inputs among farmers in Mozambique**



Source: World Bank using AIS 2015

114. **The evidence available suggests that farmers who adopt technologies such as irrigation, fertilizer, and pesticides, are more productive than those who do not.** Correlation analysis shows that, on average, maize yields in the first crop season were higher for technology adopters (Figure 5.5). Most significantly, there is a clear difference in average yields between users and non-users of fertilizer and improved seeds: while those who used fertilizer produced 1,028 kg of maize per hectare, the latter produced 810 kg per hectare, 27% less. Likewise, farmers who used improved seeds obtained an average of 1,002 kg of maize per hectare whereas farmers who did not obtained 821 kg of maize per hectare. The results were similarly positive for those who used irrigation and pesticides, although the magnitude of difference is slightly lower. The differences, which have been trimmed at the 1st and 99th percentiles to remove outliers, are all statistically significant.<sup>25</sup>

**Figure 5.5. Farmers that adopt technologies such as irrigation and fertilizer obtain higher maize yields**



Source: World Bank using AIS 2015

115. **Higher input intensity results in significantly higher crop yields, even after controlling for other relevant factors.** The adoption of agricultural technologies is also positively correlated with

<sup>25</sup> In order to provide a more complete analysis of the relationship between input usage and agricultural productivity in Mozambique, a discussion of synergies among different inputs would be needed. However, due to data limitations, it has not been possible to investigate this relationship further for this note.

maize yields, even when controlling for access to agricultural services (extension services, agricultural associations, and credit), for demographic characteristics (age, gender, and education level of household head), for climatic shocks (droughts, cyclones, floods, and fires), and for regional fixed effects (Table 5.1). The adoption of at least one agricultural technology (among irrigation, fertilizer, and pesticides) is correlated with a 11% increase in average maize yields, *ceteris paribus* (as shown in Column 5). Similar findings hold for agricultural technologies individually. In particular, the use of improved seeds and fertilizer are associated each with 21% higher maize yields, as depicted in Column 3 and 4. Overall, adoption of enhanced production technologies appears to result in higher productivity outcomes and, possibly, opportunities for higher incomes.

**Table 5.1: The adoption of modern inputs is positively correlated with agricultural productivity after controlling for other relevant factors**

(results from OLS regressions)					
Dependent Variable:	Maize Yield (Log), Kilograms/Hectare				
	(1)	(2)	(3)	(4)	(5)
Used Improved Seeds	0.209* (0.107)				
Used Irrigation		0.0546 (0.0415)			
Used Fertilizer			0.207*** (0.0315)		
Used Pesticide				0.108 (0.0754)	
Used Any Technology					0.114*** (0.0359)
Constant	6.451** * (0.0476)	6.451*** (0.0480)	6.413*** (0.0472)	6.437*** (0.0422)	6.427*** (0.0437)
<i>N</i>	5,055	5,055	5,055	5,055	5,055
<i>R</i> <sup>2</sup>	0.114	0.114	0.116	0.114	0.115

Notes: Clustered standard errors at the provincial level shown in parentheses. \*\*\* denotes significance at the 1% level, \*\* denotes significance at the 5% level and \* denotes significance at the 10% level. Sample has been trimmed at the 1st and 99th percentiles. Controls included in all regressions include dummies for characteristics of the household's head (age, gender, education level), dummies for access to services (extension services, membership in agricultural associations, agricultural credit), dummies for the occurrence of shocks and province fixed effects.

Source: World Bank using AIS 2015.



**Box 5.1 – Encouraging the use of modern inputs to increase agricultural productivity requires addressing the liquidity and risk constraints facing small farmers**

**Despite the yield increasing potential, farmers may not be investing in fertilizer –and other modern inputs– because of liquidity constraints and high exposure to risks.** Previous studies, including evidence for Mozambique, show that fertilizer increases a farmer’s maize yield by 40-80%, depending on the quantity of fertilizer applied (Goujard et al. 2011 and Maria et al. 2017). However, investing in fertilizer is difficult to afford for credit constrained farmers in Mozambique. Results from a basic simulation, shown in Table 5.2, demonstrates that, although using fertilizer can significantly increase yields –and overall profits, the costs involved are not trivial. Based on 2017 market prices for fertilizer and maize, average maize yields would need to increase by at least 33% from using 100 kg of fertilizer, just for a farmer to earn the same net gain from using fertilizer compared to no fertilizer. While test plot results show that this is feasible, (100 kg of fertilizer increased yields by an average of 45 percent), price fluctuations and climate risks may result in unexpected losses. Thus, in absence of crop insurance, risk aversion may be an additional “cost factor” that discourages fertilizer use in Mozambique.

**Table 5.2: The economic returns to investing in fertilizer for maize in Mozambique**

	Yield (kg/ha)	Cost of fertilizer (meticaïs)	Value at average harvest season market price (meticaïs)	Net gain (meticaïs)
No fertilizer	1,175	0	15,275	15,275
100 kg of fertilizer/ha	1,704	5,000	22,152	17,152
200 kg of fertilizer/ha	2,281	10,000	29,653	19,653

Note: The “Yield” calculations are based on test plot results from the International Potash Institute’s “Maize Intensification in Mozambique” project. The “Cost of fertilizer” was based on 2017 average value of 2,400 meticaïs per 50 kg sack of NPK or Urea fertilizer. Given market distance, an additional 100 meticaïs was added to each sack of fertilizer for the transport cost. The “Value at average harvest season market price” was based on the average market price in May 2017 across 14 towns in Mozambique, using data from SIMA. This gave an average price of 13 meticaïs/kg of maize.

Source: World Bank

**116. Smallholder farmers also have limited access to key production support services and low rates of participation in agricultural associations, likely limiting their opportunities to adopt improved technologies.** Services from agricultural extension or through membership in agrarian associations, and rural credit are either not widely available or used by the rural population. In 2015, 6% of farmers in the AIS report having received information from an agricultural extension program and less than 1% had received agricultural credit. Similarly, a small fraction of farmers (4%) reported being members of an agricultural association, possibly forgoing economic opportunities from pooling resources, exploiting economies of scale, mobilizing community resources in pursuit of economic benefits, and addressing market failures such as the lack of credit or individual liability. Membership in cooperatives can also facilitate access to agricultural inputs such as seeds, fuel or fertilizers, support the transportation, distribution and marketing of farm products or provide sources of financing. Multivariate analysis suggests that access to credit, extension services, and participation in farmers’ cooperatives are positively correlated with uptake of enhanced agricultural inputs and technologies. For instance, credit and extension services increase the probability that farmers use improved seeds (Table 5.3).

**Table 5.3: Access to production support services raises the probability that farmers adopt improved technologies**

(results from Probit regression)

Dependent Variable:	(1) P(Improved Seeds)	(2) P(Irrigation)	(3) P(Fertilizer)	(4) P(Pesticide)	(5) P(Any Technology)
Received Credit	0.0107 (0.549)	0.171 (0.224)	0.623* (0.347)	0.383 (0.404)	0.678** (0.323)
Member of Agr. Association	0.00657 (0.291)	0.236 (0.155)	0.212 (0.156)	0.474*** (0.103)	0.407*** (0.102)
Extension Service	0.350*** (0.101)	0.444*** (0.0761)	0.643*** (0.102)	0.498*** (0.100)	0.589*** (0.0903)
Age of Household Head	0.00297 (0.00272)	0.00253 (0.00193)	-0.00363 (0.00223)	-0.00339** (0.00158)	-0.00299** (0.00141)
Education of Household Head	0.0144 (0.00968)	0.0388** (0.0155)	0.0252* (0.0151)	0.0165 (0.0105)	0.0207* (0.0109)
Female Household Head	0.00725 (0.134)	-0.0876 (0.0678)	-0.270*** (0.0796)	-0.244*** (0.0899)	-0.199*** (0.0679)
Land size	0.0341** (0.0169)	-0.0421 (0.0565)	0.0313 (0.0265)	0.0417* (0.0236)	0.0368 (0.0286)
Constant	-2.449*** (0.111)	-2.276*** (0.156)	-0.942*** (0.114)	-1.129*** (0.0894)	-0.837*** (0.0737)
<i>N</i>	6,675	6,729	6,729	6,729	6,729

Notes: Clustered standard errors in parentheses. \*\*\* denotes significance at the 1% level, \*\* denotes significance at the 5% level and \* denotes significance at the 10% level. Controls in all regressions include province dummies.

Source: World Bank using AIS 2015

### 5.3 Barriers to Commercialization of Agricultural Output

**117. Even if farmers increased their agricultural productivity, storage capacity and processing facilities are limited.** These are critical constraints to reduce post-harvest loss, which is estimated at over 30% (Ministry of Agriculture of Mozambique, 2011). Moreover, given seasonal production of food, storage capacity is very important for market development and household food security. Yet, most farmers lack storage capacity and processing facilities. In 2015, for instance, AIS data shows that 44% of farming households owned any type of silo and 13% had an improved silo. Similarly, around two thirds of farmers have some type of storage space for food. The same data indicates that hardly any farmers has acquired knowledge related to processing of agricultural goods, which would further enable households to preserve and commercialize their production.

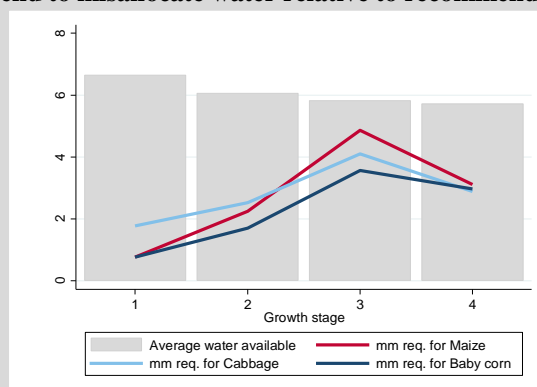
**118. Seasonal price fluctuations of agricultural goods further compound the need for farmers to access market smoothing mechanisms.** Given the lack of storage facilities and processing facilities, most farmers who sell their surplus harvest tend to sell immediately after harvest, often creating a market glut and pushing down prices. Conversely, during the lean season, few farmers are selling their production and this leads to higher food prices. This is seen vividly in Figure 5.8 as maize prices in January (peak lean season) can double over the prices in May (peak harvest season). These price fluctuations are indicative of significant market failures and imperfect information for farmers who are selling part of their production. In 2015, only 14% of farmers reported having received price information in the last 12 months. This may also be partially responsible for the disinclination towards commercializing staple crops, as farmers receive poorer returns right after harvest when they are most likely to sell.

## Box 5.2 – Testing inputs for effectively managing irrigation investments

### *Irrigation Monitoring*

**As farmers experience irrigation for the first time effective management of water resources will be key in a context of increasing water stress.** A clear priority is to bring irrigation access to more farmers. But access to irrigation infrastructure is only part of the problem. An impact evaluation assessed how effectively Mozambican farmers who have access to irrigation are currently managing their water. A year of high-frequency monitoring data revealed that many farmers misallocate water resources. Despite the crops typically cultivated require much less water at early growth stages, farmers on average follow constant schedules, leading to lots of overwatering early in plants lives (Figure 5.6).

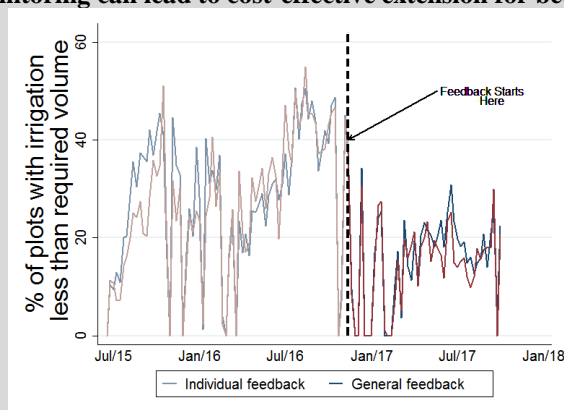
**Figure 5.6: Farmers tend to misallocate water relative to recommendations over crop stages**



### *Effective Extension*

**Simple reminders could farmers improve allocations.** If farmers don't know where they stand regarding requirements, providing useful advice to improve allocations might require collecting detailed data for everyone, which would be prohibitively expensive. An impact evaluation tested giving some farmers detailed feedback and others only simple general reminders about crop needs. As shown in Figure 5.7, the low cost general reminders were just as effective as the expensive individual feedback in reducing the share of farmers with insufficient water. These results provide an example of how effective monitoring can create a foundation for cost-effective extension for better management.

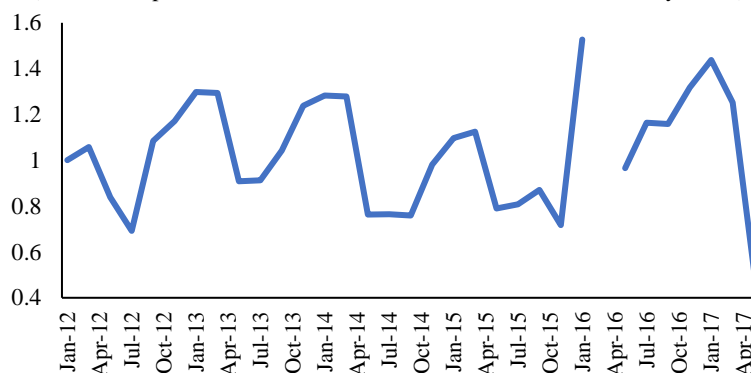
**Figure 5.7: Simple monitoring can lead to cost-effective extension for better water management**



Source: Christian, Paul, Florence Kondylis, Valerie Mueller, Astrid Zwager, and Tobias Siegfried. "Water When it Counts: Relieving Water Scarcity Through Irrigation Monitoring in Mozambique." Unpublished Mimeo.

**Figure 5.8: Maize price fluctuations follow the harvest season**

(Real maize price in Chimoio, Manica Province indexed to January, 2012)



Note: Prices indexed are in Meticals per kilogram

Source: World Bank using SIMA (Sistema de Informação de Mercados Agrícolas), 2017

**119. Relative isolation and transport costs are another major barrier for farming households to access input and output markets, and raise productivity.** Econometric analysis of the determinants of agricultural productivity for Mozambique finds that farmers who live in villages with a larger share of maize sold are found to be significantly more productive than those who do not (World Bank 2017). Closeness to markets facilitate accessibility to productivity enhancing inputs, such as fertilizers and improved seeds, and allows farmers to sell their surplus and generate additional cash that they can save or reinvest. Consequently, the remoteness of farmers to markets is correlated with higher incidence of poverty. Nampula and Zambezia are the two provinces with the highest poverty headcount in Mozambique, and they are also the provinces where rural households face longer travel times to reach markets and other basic services, as seen in Table 5.4. The positive association between provincial poverty rates and, for example, travel times to the nearest market is illustrated in Figure 5.9. Around 17% of the rural population in Mozambique is estimated to live within 2 kilometers of the nearest road in good condition (World Bank, 2016c).

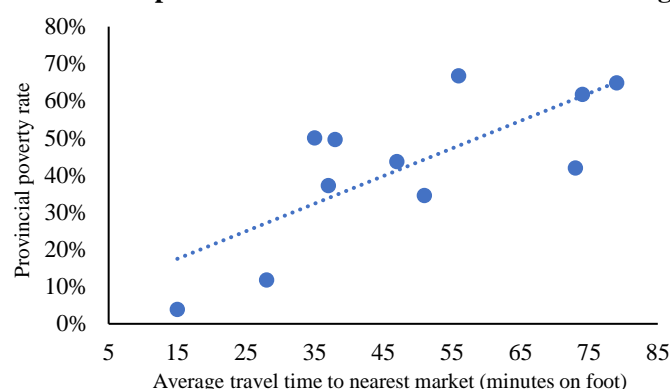
**Table 5.4: Travel times on foot to markets and key services are longer in the poorest provinces**

	Mozambique	Nampula and Zambezia	Rest of the country
<b>Market</b>			
0-60 minutes	74.5%	66.5%	79.4%
60+ minutes	25.5%	33.6%	20.6%
<b>Bus Stop</b>			
0-60 minutes	72.1%	58.1%	80.7%
60+ minutes	27.9%	41.9%	19.3%
<b>Primary School</b>			
0-60 minutes	91.6%	87.2%	94.3%
60+ minutes	8.4%	12.8%	5.7%
<b>Health Facility</b>			
0-60 minutes	94.2%	92.2%	95.4%
60+ minutes	5.8%	7.8%	4.6%

Note: All differences between Nampula/Zambezia and the rest of the country are statistically significant at the 1% level.

Source: World Bank using AIS 2015

**Figure 5.9 – The more isolated a province is from the nearest market the higher is its poverty rate**



Source: World Bank using AIS 2015

## 5.4 Agriculture is Particularly Risky in Mozambique

**120. High levels of incidence of climate-related shocks are observed in rural Mozambique.** Agriculture by nature is a risky activity but more so in Mozambique where the incidence of weather shocks is high by regional standards. The country is often confronted with erratic rainfall, droughts, floods, cyclones, pests, and diseases. In 2015, about 78% of farmers lost part of their crops, animals, or implements due to climatic shocks. A similar share of farmers reported losses due to natural hazards in previous waves of the AIS (2005, 2008 and 2012). Drought has been identified as the most important agricultural risk, occurring on average every four or five years. Floods appear to be the second most important climate-related risk in the country. Lastly, cyclones are common along the Mozambican coastline during the wet season, and tend to inflict the highest level of damage on farm infrastructure and tree crops.

**121. Droughts tend to affect a large share of farmers, with devastating effects on crops.** In fact, Mozambique, along with much of Southern and Eastern Africa, experienced a devastating drought in the 2015/16 growing season. In 2015, at the onset of the event, 44% of farmers surveyed in the AIS reported experiencing a drought. Figure 5.10 illustrates the relationship between the regions most affected and early crop losses. More specifically, the graph shows the Water Requirement Satisfaction Index (WRSI), a measure of drought risk for the 2014-15 cropping year.<sup>26</sup> The index shows that during the drought in 2014-5 the water requirements for maize crops fell below the threshold in the southern part of the country, traditionally the region most vulnerable to droughts. The colored dots show the frequency of reported crop losses during the first phase of the drought.<sup>27</sup> The darkest dots, which identifies villages with the largest fraction of households reporting crop losses, overlap very closely with the lowest values of the WRSI index, namely the areas where the rainfall was never sufficient to allowing sowing.

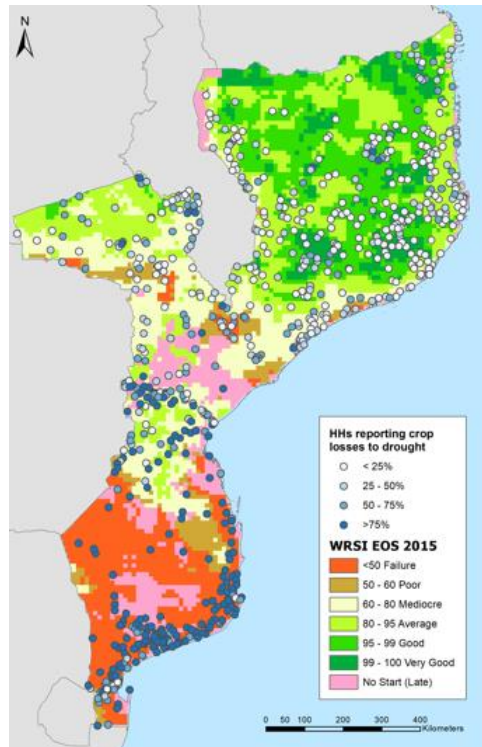
**122. Climatic shocks exert both direct and indirect effects on agricultural output and rural livelihoods.** In the absence of functioning markets for credit, savings and insurance, major aggregated shocks are expected to reduce agricultural output and, consequently, negatively affect rural livelihoods.

<sup>26</sup> Originally developed by the United Nations Food and Agriculture Organization (FAO), the WRSI is used to monitor drought risk for a growing season. WRSI returns a value of 0 to 100 based on water availability across the growing season and incorporates crop-specific parameters to reflect drought risk at all stages of a plant's development, from sowing to harvesting.

<sup>27</sup> The AIS-2105 survey does not distinguish losses by crop. However, the maize crop-cycle used to construct the map approximates the cycle of other rainfed grains in Mozambique.

Conditional correlations between the occurrence of shocks and maize yields suggest that droughts and floods are negative associated with agricultural productivity of Mozambican farms in 2015. Farmers who experienced droughts obtained on average 8% lower maize yields than those who did not. Likewise, farmers who experienced floods obtained 18% lower maize yields than those who did not, respectively (Table 5.5).

**Figure 5.10 – Large parts of the country reported crop losses at the onset of the 2015/16 drought**



Notes: map is based on the first season maize growing cycle and reflects weather data beginning in late 2014  
Source: World Bank (2017) based on estimates of the WRSI and AIS 2015.

**123. Lower productivity among farmers affected by shocks may reflect negative indirect effects through inefficient risk management mechanisms, before the shock, and coping mechanisms, after the shock.** In the absence of complete credit and insurance markets, agricultural households that are particularly vulnerable to climate shocks are often found in the literature to opt for lower-risk, lower-return crops in preparation for the shocks. Existing evidence with data from Mozambique suggests that in fact weather shocks influence cropland decisions. To maintain a buffer stock of staples for home consumption, Mozambican farmers have been found to self-insure by shifting land use away from cash and permanent crops after droughts, and from horticulture and permanent crops after floods (Salazar-Espinoza et al. 2015). This reallocation follows a short-term pattern, and it is consistent with the idea that households first tap into their buffer stock of food staples to smooth consumption when a shock occurs. Another coping strategy, still under-researched for Mozambique, is to delay adoption of productivity-enhancing technologies and sell animals and other productive assets to compensate for losses caused by shocks.

**Table 5.5 -- Maize yields are lower for farmers that experienced droughts and/or floods**  
(results from Probit regression)

Dependent Variable:	Maize Yield (Log), Kg/Ha	
	(1)	(2)
Drought	-0.0765** (0.0383)	
Flood		-0.181*** (0.0415)
Constant	6.367*** (0.0768)	6.383*** (0.0765)
<i>N</i>	5,182	5,182
<i>R</i> <sup>2</sup>	0.125	0.127

Notes: Standard errors shown in parentheses. \*\*\* denotes significance at the 1% level, \*\* denotes significance at the 5% level and \* denotes significance at the 10% level. Controls included in all regressions include dummies for characteristics of the household's head (age, gender, education level), dummies for access to services (extension services, membership in agricultural associations, agricultural credit), dummies for use of agricultural technologies (improved seeds, irrigation, fertilizer, pesticides), and provincial dummies.

## 5.4 Food Insecurity of the Rural Poor

**124. Food availability in Mozambique has slowly improved over time.** The last two decades have seen a slow but sustained improvement in the number of calories and the amount of protein available for domestic consumption. On average, daily calories consumed per capita increased from around 1,800 in the 1990s to about 2,300 for the period 2010-2013. Protein consumption increased as well, from about 34 to 46 grams per capita per day over the same period. However, vegetable crops continue to account for a large share of the typical diet, and amongst them cereals play a key role. Around 40% of calories and 50% of protein come from cereals (World Bank, 2017b).

**125. Despite the overall increase in food availability, seasonal food insecurity remains a major issue.** Because of the seasonality of agricultural production and limited capacity to smooth consumption, many farmers do not produce enough food to feed their family throughout the year. During the lean season in 2015, 78% of farming families report eating two or fewer meals a day. Almost a quarter of farming households reported having no cereal or cassava reserves from the previous season. The average number of months of reserves of basic food stuffs for farming families in the AIS-2014 was less than 3 months. The high volatility of food security and consumption is further exacerbated by climate shocks and erratic rainfall.

**126. Food security of the rural poor is largely determined by own food production.** As noted above, because of the widespread prevalence of subsistence agriculture, most farmers in Mozambique consume all or nearly all of what they produce. For this reason, food security is largely determined by farmers' own production. The average number of meals during the lean season increases with an improvement in maize yields, an increase in the area cultivated and ownership of livestock (Table 5.6) (World Bank, 2017b). Furthermore, the size of local food markets is positively correlated with the number of meals consumed, highlighting the important role of markets in smoothing food availability. At the same time, farming families that experience higher crop losses and are more isolated (based on the distance to improved roads and major highways, proximity to cities with a population of 20,000 people or more, and the ownership of a cell phone) are more likely to go hungry during the lean season.

**Table 5.6 – Farmers production is a strong determinant of their own food security**  
(results from Poisson regression)

<b>Dependent variable:</b> Average number of meals in the lean season	<b>Poisson Regression</b>			<b>Zero-inflated Poisson Regression</b>		
	<b>Coef.</b>	<b>z</b>	<b>P&gt; z </b>	<b>Coef.</b>	<b>z</b>	<b>P&gt; z </b>
<b>Determinants</b>						
Maize yields (log)	0.028	7.250	0.000	0.028	2.940	0.003
Cultivated area (all crops)	0.007	5.720	0.000	0.008	2.580	0.010
Livestock owned (TLU)	0.011	7.040	0.000	0.012	3.520	0.000
Suffered crop loss	-0.026	-5.170	0.000	-0.026	-2.180	0.029
Isolation index	-0.017	-3.550	0.000	-0.023	-2.040	0.041
Size of local food market (log)	0.011	3.850	0.000	0.010	1.520	0.129
Female household head	0.024	2.170	0.030	0.022	0.840	0.402
Dependency ratio	0.002	0.110	0.909	0.002	0.040	0.971
Education household head	0.008	5.870	0.000	0.009	3.000	0.003
constant	0.457	11.490	0.000	0.450	4.550	0.000
Wealth index	0.028	5.720	0.000			
<b>Inflate components</b>						
Wealth Index				0.009	0.000	1.000
constant				-6.895	0.000	0.996

Note: based on 3,888 observations of maize producing households. The estimated Vuong-test statistic of -0.02 does not indicate that the Poisson regression model should be rejected in favor of the Zero-inflated Poisson regression.

Source: World Bank (2017) using IAS-2015.



## 6. Human Capital, Labor Force and Jobs

### 6.1 School Services, Access and Attainment

127. **The availability of basic education services has been expanding countrywide but higher education is mainly offered in urban areas.** Mozambique is currently in the early stages of a demographic transition, which presents major pressure on the demand for education. As of 2015, 45% of the population was under the age of 15, a fairly consistent percentage since 1960 (varying only 2-3% over this time period). Similarly, public education investments have been increasing. Mozambique abolished school fees for primary education in 2004 and government expenditure on education as a percentage of GDP has risen over the past several years, reaching levels above the average for other sub-Saharan African countries. Between 2009 and 2014, public expenditure increased from 2.7 to 3.1% of GDP, whereas in sub-Saharan Africa this average decreased from 1.9 to 1.7% over the same period. This translated into more schools and teachers across the country but large regional disparities remain. The largest number of schools in rural areas covers only the first level of primary education (grades 1 to 5); most of the schools offering secondary education (grades 8 to 12) are in urban areas.<sup>28</sup>

128. **Larger investments in education have increased literacy rates but there are still substantial gaps.** Overall, literacy rates for adults 21 years and older rose from 42% in 2002/03 to 50% in 2014/15. However, the rate of progress is slow. Furthermore, there are significant disparities with respect to other countries in the region as well as across different socioeconomic groups within Mozambique. Relative to the average adult literacy rate across sub-Saharan African countries of 62%, Mozambique fares considerably worse, at 55% (UNICEF 2015). As of 2014/15, literacy rates for adults in rural areas (37%) are nearly half of the rates seen for their urban counterparts (70%). Changes in literacy in the last 15 years benefited disproportionately the better off. While 35% of the adult poor can read and write—similar to the levels recorded in 2002/03, the proportion among the non-poor increased from 53% to 60% (Table 6.1). In addition to these variations, the spatial distribution of literacy is correlated with poverty, with the poorest provinces experiencing higher rates of illiteracy (Figure 6.1).

**Table 6.1: People are slowly becoming literate but large difference across different groups remain**  
(Literacy rates for adults age 21 and older)

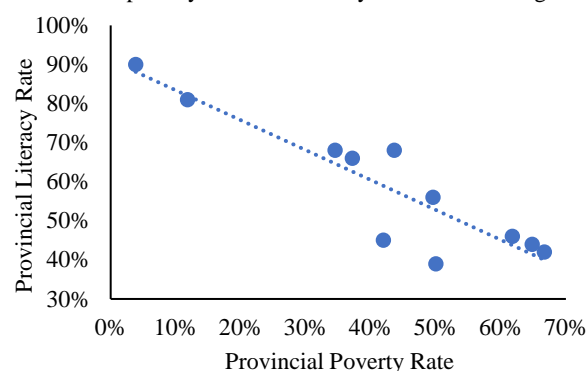
	2002/03	2008/09	2014/15
<b>Total</b>	42%	45%	50%
<b>By Gender</b>			
Male	61%	63%	66%
Female	27%	30%	35%
<b>By Urban/Rural</b>			
Urban	66%	69%	73%
Rural	31%	33%	37%
<b>By Poor/Not Poor</b>			
Above Poverty Line	53%	54%	60%
Below Poverty Line	34%	36%	35%

Source: World Bank using IOF 2002/2003, IOF 2008/2009, IOF 2014/2015

<sup>28</sup> General education in Mozambique has four levels, two for primary (EP1 and EP2, which are compulsory) and two for secondary (ES1 and ES2). EP1 covers the first five years of primary education (ages 6-11, or grades 1-5) and is the level most commonly attended. EP2 covers the next two years (ages 12-13, or grades 6-7). ES1 covers ages 14-16 (grades 8-10) and ES2 ages 17-18 (grades 11 and 12).

**Figure 6.1. Provinces with the higher poverty rates also have the lowest levels of literacy**

(Correlation between poverty rates and literacy rates for adults age 21 and older)



Source: World Bank using IOF 2014/2015

129. **Mozambique has made measurable progress in increasing school enrollment and attendance in primary education.** As of 2014/15, over 90% of primary-aged children reported attending primary school.<sup>29</sup> Furthermore, these rates were equal for both females and males, with relatively small disparities between urban children (95%) and rural children (89%). Moreover, lower primary enrollment rates are also relatively similar across consumption quintiles, which is reasonable given that Mozambique abolished primary school fees in 2004, minimizing the cost of schooling for households (World Bank, 2016b). However, regional disparities in primary attendance are still evident. For example, the province of Niassa had a primary attendance rate of 86% in 2015 whereas in Maputo City it was 99%. As noted below, regional variation in enrollment in education is partly driven by demand-side barriers, particularly distance to school in remote areas. The increasing trends in primary enrollment are starting to manifest in the labor market. This is particularly true in urban areas where around 60% of the young private sector workers have now attained some post-primary education (World Bank 2017a).

130. **Secondary school attendance rates have also been on the rise, however, in contrast to the relatively larger equity in primary school access, there exist large discrepancies across location, gender, and income levels.** Starting from very low levels in 2002/2003, with less than one-fifth of secondary-school aged children attending secondary school, attendance rates have now more than doubled, to an average of 38% for the country. But some socioeconomic groups have benefited less from this expansion than others. In particular, rural students have less than half the attendance rates as do urban students. Similarly, secondary school attendance rates have climbed for males and females, and also for the poor and non-poor, but the gaps in absolute terms between these groups have either stayed the same or even widened (Table 6.2).

<sup>29</sup> The sample for these calculations is restricted to survey respondents ages 6-13 who had not yet completed primary school and reported that they were currently studying

**Table 6.2. While most children attend primary education, several other are still out of secondary school**  
(Attendance rates by school level)

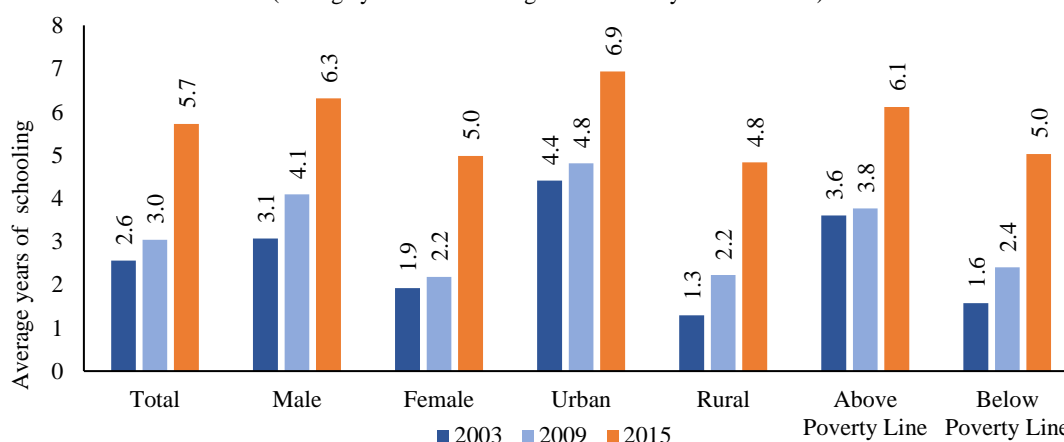
	Primary education			Secondary education		
	2002/03	2008/09	2014/15	2002/03	2008/09	2014/15
<b>Total</b>	93%	78%	91%	17%	30%	38%
<b>By Gender</b>						
Male	92%	79%	91%	22%	39%	42%
Female	93%	76%	91%	13%	23%	35%
<b>By Urban/Rural</b>						
Urban	95%	85%	95%	35%	53%	58%
Rural	91%	74%	89%	3%	15%	23%
<b>By Poor/Not Poor</b>						
Above Poverty Line	95%	83%	93%	26%	40%	46%
Below Poverty Line	91%	74%	89%	9%	21%	24%

Note: sample for attendance in primary education = survey respondents ages 6-13 who had not yet completed primary school and reported that they were currently studying; sample for attendance in secondary education = survey respondents ages 11-21 reported that they were currently studying in a grade that was not primary education.

Source: IOF 2002/2003, IOF 2008/2009, IOF 2014/2015

**131. More schools and higher attendance rates have resulted in increased educational attainment as measured by the average years of schooling of the population.** As of 2003, average educational attainment in Mozambique was 2.6 years of schooling among the adult population (21 years and older). Starting from that low base, Mozambique more than doubled the average educational attainment for all adults, to 5.7 years in 2015 (Figure 6.2). There is some degree of convergence in educational attainment between groups, with the largest percentage gains among females, rural populations, and those below the poverty line. However, these groups are still behind in average years of schooling relative to their counterparts (males, urban dwellers and those above the poverty line). Furthermore, there is still significant room for improvement, as the group with the highest educational attainment in 2014/15, urban dwellers, averaged 6.4 years of schooling among adults.

**Figure 6.2. Educational attainment in Mozambique is increasing across the board**  
(average years of schooling for adults 21 years and older)



Note: Average years for 2003 were calculated based on the highest education level achieved by the respondent (e.g. completed lower primary = 5 years of schooling).

Source: IOF 2002/2003, IOF 2008/2009, IOF 2014/2015

**132. However, factors out of control of the children still determine significantly their probability of attendance, particularly in secondary education.** Regression analysis with data from the IOF-

2014/15 is used to identify household-level factors that are correlated with school attendance in primary and secondary education. Overall, children from households below the poverty line are on average around 30% less likely to go to school compared to non-poor households. Females have 4.0% less probability of attending school than males. Similarly, children living in rural areas have 47.8% less probability of attending school than urban children. The chances of attending school decline as children age or they get married. Finally, the distance of the school is one of the biggest determinants to attend school, making children living far from a school 30% less likely to attend classes (Table 6.3).

**Table 6.3. Attendance to primary and secondary education is constrained by several individual-, household- and community level factors**

(results from probit regression of correlates of school attendance)

Dependent Variables	P(attending)
Female	-0.0403*** (0.0126)
School is far	-0.307*** (0.0152)
Household size	0.0170*** (0.00233)
Child is over 13 years	-0.655*** (0.0222)
Rural	-0.478*** (0.0135)
Married	-0.465*** (0.0217)
Below poverty line	-0.294*** (0.0138)
Constant	0.993*** (0.0423)
<i>N</i>	52,676

Notes: Sample restricted to survey respondents ages 6-21. Clustered standard errors in parentheses. \*\*\* denotes significance at the 1% level, \*\* denotes significance at the 5% level and \* denotes significance at the 10% level. "School is far" is a dummy variable, where 0=school is within 30 minutes walking; 1=school is farther than 30 minutes walking. Controls included in all regressions include province dummies. Coefficients of other control variables are not shown in the table  
*Source:* World Bank calculations using IOF 2014/2015

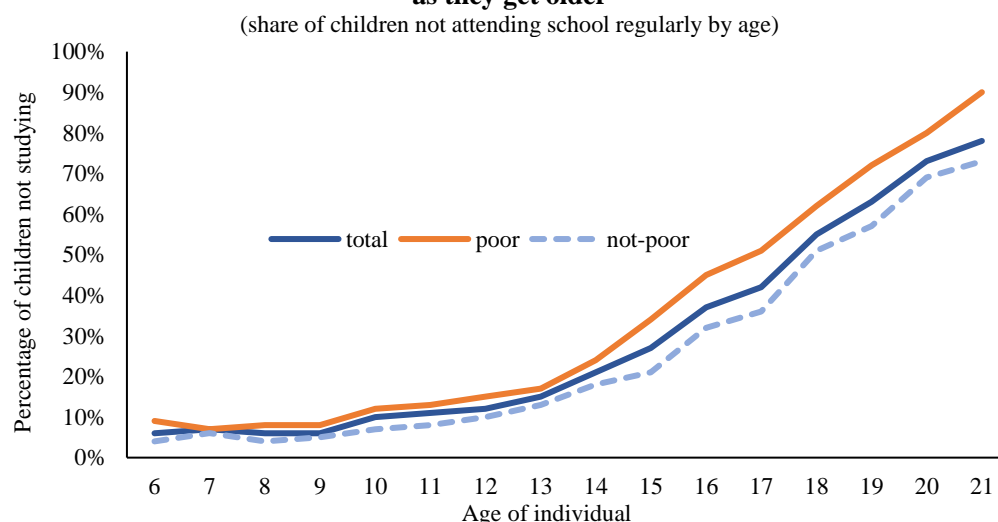
## 6.2 School Efficiency

**133. Remarkable progress in increasing access to education is overshadowed by underperforming efficiency in the sector, for instance late enrollment and high dropout rates at early grades.** Per the school system, the expected age of a first-grade student should be 6 years old. However, in 2014/2015 the average age for a first-grade student was 7.4 years old. In fact, in the 2011 Demographic and Health Survey, almost 49% of children age six years old had never been to school, which was exacerbated in rural areas where 56% of six years old has still not entered school. Even at age nine, 15 percent of children were still not enrolled in primary school. In qualitative interviews, Mozambican parents reported that their primary-aged children were "not yet ready for school" as the main reason why they were not currently enrolled, despite access to primary schools. This may be related to other factors regarding childhood development, such as nutrition, low birthweight, etc.

Similarly, secondary school shows similar inefficiencies in regard to late entry. Whereas a student should be 13 years old upon entering the first grade in secondary education, eight grade, the average age for student in this grade in 2014/15 is 15 years old.

**134. High dropout rates, especially among the poor, also reduce the efficiency of the educational system and create inequalities in human capital accumulation.** School dropout at early ages jointly with late entry drastically reduces overall schooling. Figure 6.3 shows the fraction of children 6 to 21 years old in 2014/15 that attend that primary or secondary school by grade and whether they belong to a household that is below or above the poverty line. The results indicate that drop-outs among older children constitute the bulk of children who are not currently studying even though they are of school-age and have not yet completed secondary school. Dropout rates start to pick up at age 14 and are more marked for poor children relative to the non-poor. Those children that are out of school (24% of individuals 6 to 21 years old) complete on average 4.6 years of schooling, less than the necessary to finish primary school. Rurality and age appear as the main determinants of dropping out school. In addition, marriage and pregnancy are two important factors for dropping out school for females while boys listed “school has no value/lack of interest” for almost half of the cases for why they were not studying.

**Figure 6.3: The risk of dropping out of school is higher for children from poor households and increases as they get older**



Note: Sample includes individuals who have studied previously and are no longer studying, thus measuring actual dropouts and not those who never went to school in the first place. The sample also excludes individuals who have already completed secondary school.

Source: World Bank using IOF 2014/2015

**135. Despite being set on a trend to achieve universal enrollment in primary education, the rate of completion of this level of instruction remains low.** As noted above, primary school enrollment has been increasing and is now above the average for countries in sub-Saharan Africa. Yet, as it is the case in other parts of the region, and in other developing countries, this progress drops off when it comes to students completing primary school or enrolling in secondary school. Nevertheless, the numbers suggest that this bottleneck is particularly serious in the case of Mozambique, perhaps due to the increasing opportunity costs of enrolling children in school as they age and the spatially uneven supply and remoteness of secondary schools. Data from 2014 shows that less than half of the

Mozambican children that start primary education manage to complete it, over 20 percentage points below the rate for sub-Saharan Africa (69%) (Table 6.4).

**Table 6.4. More children are enrolled in primary education but fewer can complete it relative to the performance in other countries in the region**

(school enrollment by level and primary completion rate, 2014)

	<b>Mozambique</b>	<b>Sub-Saharan Africa</b>
Net primary enrollment	88%	78%
Primary completion rate, total (% of relevant age group)	48%	69%
Net secondary school enrollment	19%	33%

Note: sub-Saharan Africa average sample excludes high-income countries

Source: World Development Indicators

**136. Mozambique also faces major challenges in terms of school quality and student learning.** As of 2014, student learning outcomes were dismally low—with only 6.3 percent of third-grade students mastering the required reading abilities (World Bank 2014). Furthermore, relative to other sub-Saharan Africa countries, Mozambique has very low school performance, despite having above average government expenditure on education as a share of GDP. Cognizant that teachers are a key factor in determining student learning, government expenditure has invested heavily in hiring more teachers. On the one hand, this has improved lower primary student-teacher ratios. However, this rapid expansion in hiring has led to many teachers who are poorly qualified and have serious gaps in knowledge and teaching ability. Grade 4 teachers scored only 29 out of 100 on a teacher assessment measuring their proficiency in Portuguese language, math and pedagogy (World Bank 2016). Weak teacher supervision has led to very high rates of teacher absenteeism, which ultimately reduces the number of days a student spends learning each year.

### 6.3 The Returns to Investing in Education

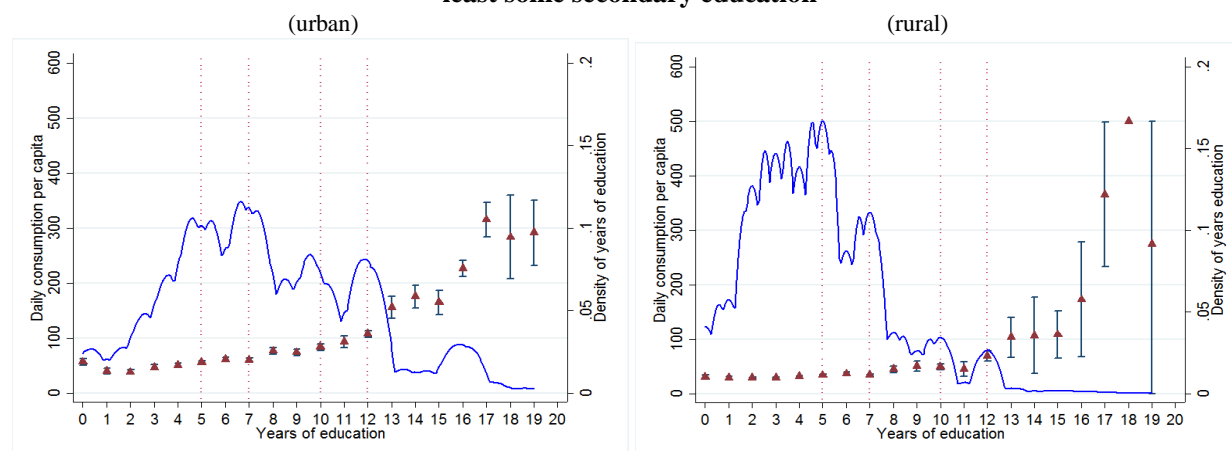
**137. Investing in human capital is fundamental for economic growth and poverty reduction.** Education is a critical pillar of economic development. Investing in quality education raises the productivity of workers, advances knowledge and technology, and promotes entrepreneurship, among many other economic, social and non-market benefits. At the individual level, the contribution of education is often measured by the increase in labor productivity and market earnings. Under certain assumptions, differentials in earnings by years of education – after controlling for some differences across individuals – have been the traditional method used to estimate the rate of return to investment in schooling (Montenegro and Patrinos, 2014). In this section, this study presents estimates of the private returns to schooling for Mozambique using household expenditures data from the IOF-2014/15.<sup>30</sup>

**138. The welfare of households in Mozambique is positively associated with the school attainment of the household head, above all for those that transition into secondary education and higher education.** Individuals invest in education largely with the motivation of enhancing their skills and raising their productivity and earnings. Survey data for 2014/15 supports this notion for the case of Mozambique. Figure 6.4 depicts the relationship between household welfare and school attainment for all household heads 20 to 65 years old. Average daily consumption per capita,

<sup>30</sup> For several reasons income data is not used for the estimation of the returns to schooling. First, a large fraction of farmers is engaged subsistence agriculture and do not sell their produce in market. Second, agricultural labor and other workers are often fully paid in kind. Third, income data in the data across surveys is patchy since not many workers report earnings.

represented in the graph by the red triangles, raises as the number of years of education increases. Two features stand out from this association. First, as expected from the functioning of the labor markets, the relationship between the two variables appears to be stronger in urban areas than in rural areas. Second, the positive effect of education on consumption becomes quantitatively and statistically strong only after individuals complete the 7 years of primary education, corresponding to the compulsory level of instruction in Mozambique. Looking across grades, the largest share of adults is concentrated among those that accumulated 7 and 5 years of education in urban and rural areas, respectively –shown in the blue lines.

**Figure 6.4. Household consumption increases with the years of education of family heads that have at least some secondary education**



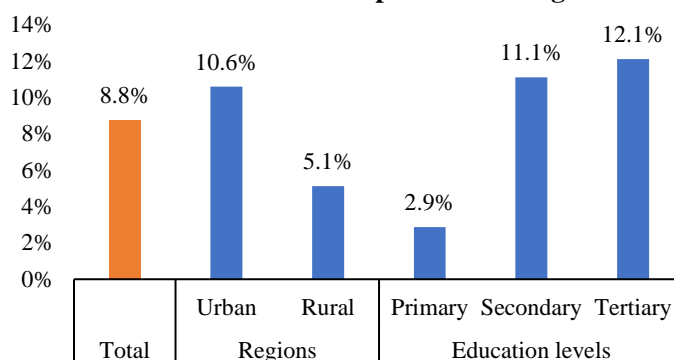
Notes: red triangles show averages of daily household per capita consumption. Bars crossing the triangles represent the 95% confidence intervals. The blue line shows the kernel density of the populations across years of education. Red dotted lines show the relevant four years of transition across educational levels in Mozambique: Primary Education Level 1 (grades 1 to 5), Primary Education Level 2 (grades 6 to 7), Lower Secondary Education (grades 8 to 10) and Upper Secondary Education (grades 11 to 12).  
Source: World Bank using IOF 2014/2015

**139. Private returns to schooling are positive and on average each additional year of education increases household consumption per capita by around 9 percent.** This study estimated the private rate of return per year of schooling following the standard method established by Mincer (1974) and using data from the IOF-2014/15. Basically, this framework runs a regression of log consumption on years of education and several other variables to account for statistical differences in the population such as gender, age and years of experience, including linear and non-linear terms for the latter two variables. The correlation obtained from the earnings function shows that the average rate of return in the total population sample is estimated at 8.8 percent. This means that investing in an additional year of schooling pays off in terms of raising labor market earnings and consumption possibilities, and ultimately offering a path out of poverty.

**140. The returns to schooling are highest in urban areas and at the secondary and tertiary levels of education, which provides an indication of excess demand for skilled labor.** The average return to schooling is obtained from the entire population so it masks substantial variation across space and educational levels. Different specifications of the earnings function estimated above can be used to calculate the average returns to schooling by regions and education levels. The results of these regressions, shown in Figure 6.5, indicate that an additional year of education increases consumption by more than twice in urban areas relative to the average return estimated for rural households, 10.6 percent compared to 5.1 percent. This result is consistent with evidence coming from other low- and middle-income countries and is in line with the fact that the demand for skilled labor is often stronger

and grows faster in urban centers of countries going through a process of structural transformation. Looking across levels of schooling, the results suggest that the highest payoffs are concentrated in secondary and tertiary education (11.1 percent and 12.1 percent, respectively), around four times larger than the returns experienced by workers with some or completed primary education. These differentials in returns signal a growing demand for skilled labor in Mozambique, particularly in urban areas.

**Figure 6.5. Skilled workers in urban areas experience the highest returns to schooling**



Notes: The rates of returns shown were obtained from estimating a model of consumption per capita on years of schooling (as a continuous variable and grouped by education levels) and a set of covariates that includes age and experience (linear and quadratic terms), dummies for area of residence and province fixed effects.

Source: World Bank using IOF 2014/2015

## 6.4 Labor Supply and Jobs Outcomes

**141. Labor force participation has fallen in Mozambique since the mid-1990s but remains well above the average for countries in the region.** Labor participation declined from 84.2% in 1995/96 to 79.4% in 2014/15, but it is still above the average participation in sub-Saharan African (69%). At 92.1%, labor participation for adults 25 years and older in rural areas is particularly high and even across provinces. By 2014/15, on average, women were as likely as men to engage in the labor market nationwide (78.7% and 80.1%, respectively) but in rural areas they exhibit higher labor participation. Breaking the sample by poverty status shows that the poor are slightly more likely to work (77.9%) than the nonpoor (74.7%) (Table 6.5).

**Table 6.5. Labor force participation is high across different socioeconomic groups**  
(labor force participation rates)

Age 15+					Age 25+			
					Urban		Rural	
Total	Male	Female	Poor	Non-Poor	Male	Female	Male	Female
79.4	80.1	78.7	77.9	74.7	88.9	77.2	92.1	92.4

Source: World Bank using IOF 2014/2015

**142. A slow process of structural transformation means that the job structure is shifting gradually away from agriculture and only partly into wage employment.** As noted in Chapter 1, the share of jobs in agriculture has steadily declined from 86.6% in 1995/96 to 71.5% in 2014/15. This share increases to 86.1% in rural areas and is more marked for women. Yet, most Mozambicans continue to work in agriculture, particularly those that are poor. The next largest job categories are non-farm self-employment and private wage-based activities, each accounting for 12% of all the jobs,



which are highly clustered in urban areas. Much of the transition away from agriculture has taken place within non-farm self-employment (highly represented in retail trading through household enterprises), which has constrained productivity and poverty reduction gains. Private wage-based activities are largely concentrated in the services sector. Despite growth in private wage employment in the last decade, it represents only 27.8% of urban employment by 2014/15 (Table 6.6).

**Table 6.6. Most of the jobs in Mozambique are still in agriculture**  
(Urban-rural and gender differences in employment by job type, 2014/15, percentages)

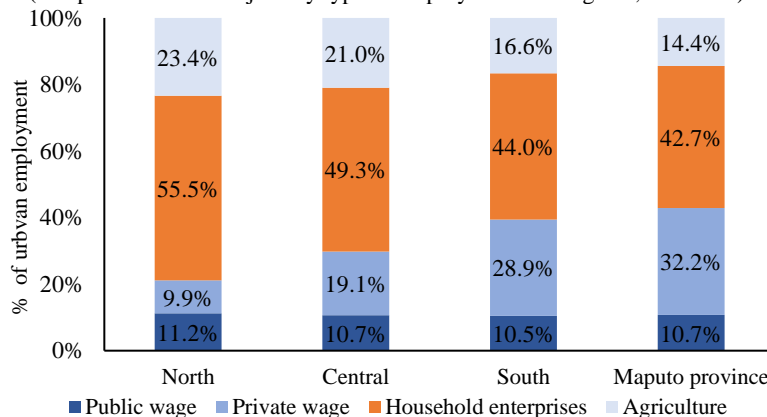
Type of Employment	All	Urban	Rural	Male		Female	
				Urban	Rural	Urban	Rural
Agriculture	71.5	34.8	86.1	24.2	76.4	46.4	93.4
Non-Farm Self-Employment	12.2	27.1	6.3	25.2	10.1	29.4	3.2
Non-Farm Wage Employment							
o/w: Private Sector	12.2	27.8	6.0	38.3	10.6	16.1	2.2
Public Sector	4.1	10.2	1.7	12.0	2.9	8.1	0.7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>

Note: Where the respondent has more than one job, the table reports primary jobs. Agricultural employment: primarily farmers working on small holdings and consuming a significant share of their production, but including commercialized farmers, as well as wage work in Agriculture, Fishing and Forestry (collecting wood and other forest products). Non-Farm Self-Employment: employment in this category includes owners of informal businesses outside the agriculture sector and anyone working in them (family or not). Wage employment: includes all labor force participants who report working outside the Agriculture sector and receiving payment for work from an unrelated individual. It includes the public and private sectors.

Source: World Bank using IOF 2014/2015

**143. The modest effects of the structural transformation on employment are highly concentrated in the capital city, Maputo, and its surrounding areas, possibly driving its faster poverty reduction.** Jobs (whether in wage employment or self-employment) into higher valued-added activities are not expanding fast enough across the country to absorb a growing, better educated labor force and support poverty reduction. Regional analysis of employment patterns shows that the shift into higher quality jobs is concentrated in the capital city (Figure 6.6). Employment in Maputo and other peri urban parts of Maputo province, which accounts for about 12% of the total population, has almost completely diversified out of agriculture. Nearly 12% of the primary jobs in these areas are in agriculture. This contrasts with the composition of employment in cities such as Beira and Nampula where agriculture accounts for almost a quarter of urban jobs, due mostly to the farming activities on the *machambas* of urban families located in peri urban areas. Maputo Province represents 32% of all urban jobs and 39% of all the private wage jobs. Commercial and financial activity is concentrated in Maputo city. This employment transformation away from agriculture has likely contributed to the faster poverty reduction registered in Maputo Province but at the same time can lead to widening spatial inequality.

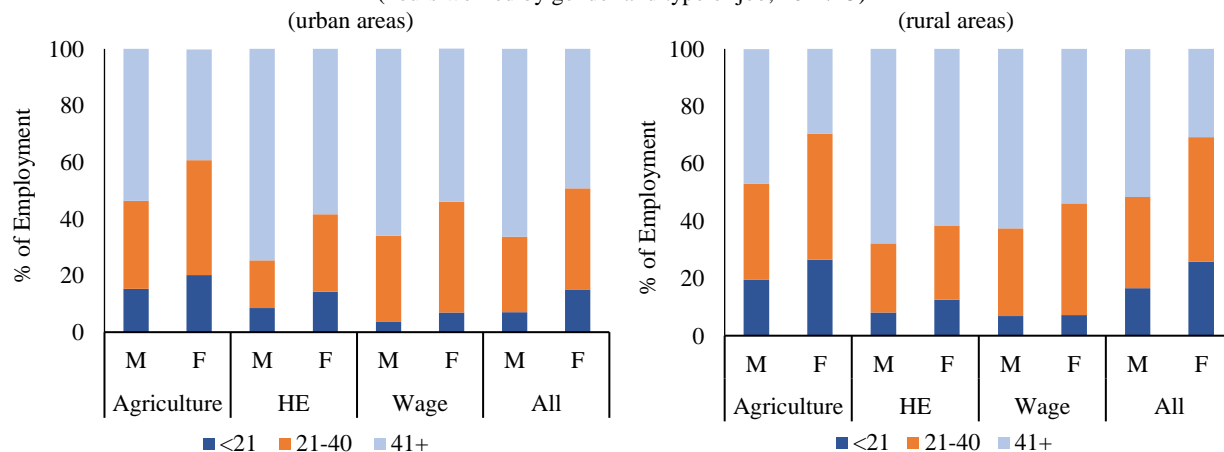
**Figure 6.6. Urban jobs within Maputo Province have been diversifying away from agriculture**  
(composition of urban jobs by type of employment and regions, 2011/4/15)



Source: World Bank using IOF 2014/2015

**144. Several workers have more than one job and many others, particularly poor rural women, are underemployed despite desiring full-time work.** In 2012, around 15% of adults over the age 20 report having a secondary activity. The most common type of second job is working in non-farm self-employment, chiefly in household enterprises, particularly among those whose primary activity is in agriculture due to seasonality of work in this sector. A larger share of workers in urban areas have their primary jobs in household enterprises. Working on own farms or garden plots is also another important source of secondary activity (Table 6.6). Alongside participation in multiple activities, many workers are not employed to their fullest capacity. Underemployment is more prevalent in rural areas and systematically higher among women irrespective of their location (urban or rural) or type of job (Figure 6.7). Women who work in agriculture work the least the number of hours, a common pattern observed in most countries across Sub-Saharan Africa.

**Figure 6.7. Workers such as those engaged in agriculture, the poor and women work fewer hours**  
(hours worked by gender and type of job, 2014/15)



Note: M = male workers, F = female workers, HE = household enterprises

Source: World Bank using IOF 2014/2015

**145. Inability to find more work, responsibility of domestic chores and illness are the leading reasons as to why workers are not working full time.** The main factors driving underemployment

are comparable across income groups and gender. Responsibilities with domestic work is the leading reason to be underemployed among poor and non-poor workers, especially female ones. Nearly one in four individuals in the labor force are not able to work longer hours due to their engagement in unpaid household tasks. Other important factors reducing the employability of workers are the lack of interest in working more hours and the inability to find additional jobs, which are likely explained by discouraged workers that have given up seeking employment. The lack of agricultural plots and poor health are also associated with lower labor force participation and underemployment among poor and non-poor individuals that do not work full time (Table 6.7).

**Table 6.7. Most people cannot work due to unavailability of jobs, illness and domestic chores**  
(Reasons for not working full time, adults 21 years old and above, 2014/15)

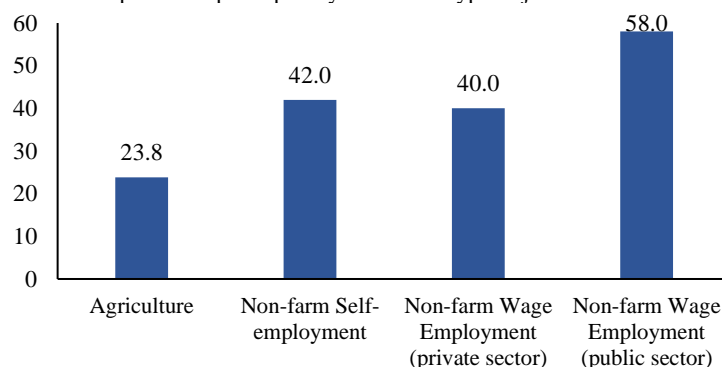
Reason	Poor			Non-poor		
	Male	Female	Total	Male	Female	Total
Cannot find more work	7.3%	2.7%	4.5%	11.0%	4.1%	6.8%
Sick	8.0%	9.0%	8.6%	8.5%	9.1%	8.9%
Domestic work	13.5%	32.5%	25.0%	12.1%	30.0%	23.0%
Unavailability of agricultural land plots	12.8%	14.6%	13.9%	10.7%	13.7%	12.5%
Attends school or training	0.6%	0.4%	0.5%	1.3%	0.6%	0.9%
Does not want to work more hours	14.2%	7.5%	10.2%	10.4%	6.7%	8.2%
Others	43.7%	33.3%	37.4%	46.0%	35.7%	39.8%

Source: World Bank using IOF 2014/2015

146. **Livelihood patterns are largely influenced by the sector of work and the ability of the ability of workers to enter the higher paying non-agricultural jobs.** Reliable and comprehensive income data is difficult to obtain from contexts such as the one that prevails in Mozambique and other SSA countries, where a large share of workers is engaged in informal jobs, mostly in agriculture, and subsistence farming is widespread. Yet, household consumption data offers an approximation of the earnings of household heads across different types of jobs. Figure 6.8 shows that the median consumption per capita of households whose head is employed primarily in non-farm wage jobs in the private and public sectors is 68% and 143% higher, respectively, than those working primarily in agriculture. Non-farm self-employment is also correlated with higher living standards compared to employment in agriculture. But the opportunities to get higher paying non-agricultural jobs are skewed towards urban, male and more educated workers, as shown in Table 6.8. Not surprisingly, workers that are poor –even the urban ones– are also highly underrepresented in wage and skilled employment.

**Figure 6.8. Per capita expenditures are almost twice as high in households headed by workers in non-farm self-employment and wage employment**

(Median household expenditure per capita by sector and type of job of household head, 2014/15)



Source: World Bank using IOF 2014/2015

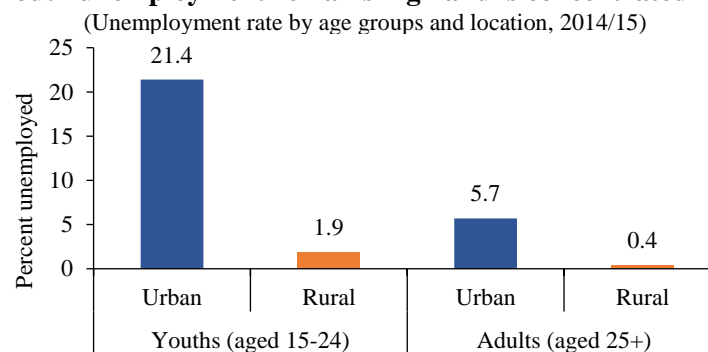
**Table 6.8. Urban, male and skilled workers are disproportionately represented in wage employment**  
(Characteristics of workers across different types of jobs, adults 21 years old and above, 2014/15)

Characteristics	Agriculture	Non-farm Self-employment	Non-farm Wage Employment (private sector)	Non-farm Wage Employment (public sector)
Urban	21.4%	57.9%	66.6%	74.4%
Years of education	4.5	5.7	6.7	6.9
Literate	41.4%	75.0%	86.4%	97.0%
Age	40.1	39.8	36.3	39.4
Female	59.3%	43.2%	16.7%	31.7%
Poor	54.7%	27.6%	25.5%	14.4%

Source: World Bank using IOF 2014/2015

147. **Trends in wage and skilled employment for new entrants suggest that the supply of labor continues to exceed the demand, leading to rising unemployment among the urban youth.** The overall unemployment rate has been steadily increasing since the late 1990s largely driven by youth unemployment. Most of the secondary school graduates cannot find wage jobs in the private sector. The share of 21-30 years old workers with secondary school in non-farm self-employment has been expanding at a faster rate than in private wage employment. Furthermore, the unemployment rate of secondary school leavers in urban areas is on the rise. In 2014/15, unemployment among urban workers 15 to 24 years old is 21.4%, remarkably higher than the joblessness rate of urban adults 25 years old and above (5.7%) (Figure 6.9). At the time of the survey, nearly two thirds of the unemployed urban youth were without a job for over a year despite being actively searching for one. While this is a common feature across most countries –advanced and developing, this pressure is not anticipated to lessen in Mozambique considering the demographic transition, which has just started, and the subsequent rapid growth in the labor force (see Box 1.2).

**Figure 6.9. Youth unemployment remains high and is concentrated in urban areas**



Source: World Bank using IOF 2014/2015. Taken from World Bank Jobs Diagnostics (2017)

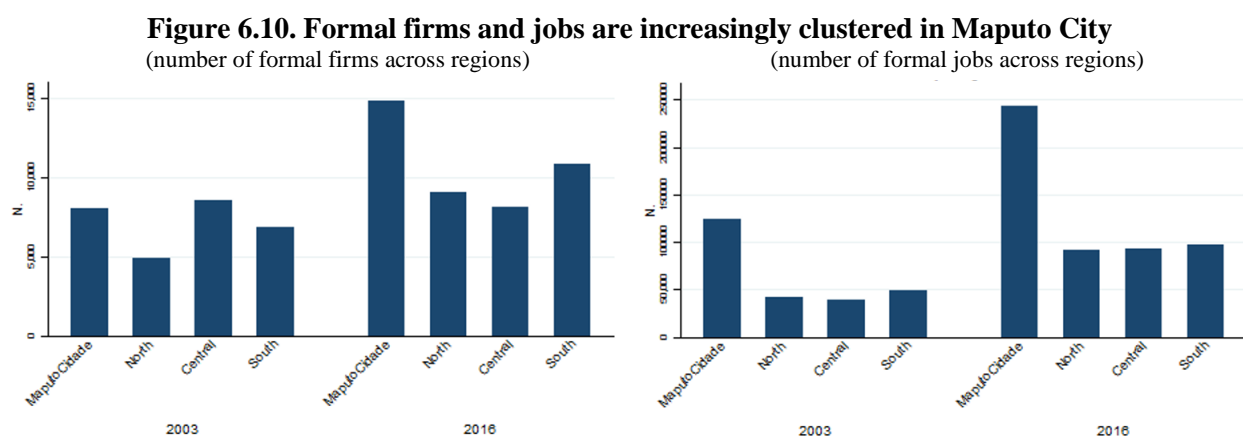
## 6.5 Formal Enterprises and Labor Demand

148. **The formal enterprise sector, the most important source of wage-based employment in Mozambique, has been expanding at a satisfactory rate in the last decade.** Data from the Mozambican Enterprise Census (CEMPRE) in 2003 and 2015/16 allows tracking the evolution of firms and jobs in the formal sector, namely firms that are registered with national and subnational authorities. Whereas, this represents a limited subset of all jobs in the country, the formal sector offers the best prospect for Mozambicans to work in higher quality jobs and escape poverty in a sustained manner.

The sector has experienced healthy growth in the 2000s notwithstanding a business environment that is not fully conducive to firm and job creation and growth.<sup>31</sup> The total number of registered firms increased from about 28,000 to around 43,000, corresponding to an annual growth rate of 3.7%. Total employment more than doubled, from 255,000 to 525,000, recording annual growth of 5.7%, faster than Mozambique's working age population growth.

**149. The majority of formal firms are small but most of the formal jobs is linked to larger firms.** In 2015/16, almost 9 in 10 firms (85%) are micro-sized, namely employing fewer than 10 workers. Despite this structure, the composition of jobs is skewed towards the largest enterprises. Firms that employ more than 100 workers represent for approximately 2.3% of all formal firms, yet they account for 53% of total formal employment. The fastest growth in formal jobs in the period 2003-2015/16 took place in the mid-sized firms, those employing between 10 and 100 workers, followed by employment hired in the large firms.

**150. The regional distribution of firm and job creation reveals large geographic disparities that favor Maputo City over other parts of the country that have lower levels of economic development and higher poverty.** The largest increase in the number of firms between 2003 and 2016 occurred in the capital, Maputo City, and in the North region. The Central region, in contrast, exhibited a small decline in the number of firms, which raises the concern that firm creation, and economic growth more broadly, may be bypassing some of the poorest provinces. The growth of employment was evenly distributed among all regions, including the Central region. However, this means that the gap in terms of the spatial distribution of formal employment between Maputo City, which concentrates around 50% of all formal jobs, and the rest of the country remains largely unchanged (Figure 6.10). Looking across sectors, Services has been the most dynamic in terms of formal employment generation, yet, its labor productivity has been among the slowest of all sectors, raising questions about the sustainability of its job creation in the future (World Bank 2017a).



Source: World Bank using CEMPRE-2003 and CEMPRE-2015/16. Taken from World Bank Jobs Diagnostics (2017)

**151. The clustering of formal enterprises and jobs in Maputo City has led to higher labor productivity and opportunities for sustained poverty reduction, but they are largely confined to the capital city.** In theory, the agglomeration of firms is argued to create economies of scale and

<sup>31</sup> The “2017 Doing Business” ranked Mozambique 137th out of 190 countries. Weak governance and weak access to credit and infrastructure are among the top constraints. Furthermore, labor regulations that set the value of the minimum wage and severance pay well above the average value-added per worker also tend to encourage informality and frequent turnover.

positive network effects for the firms that are clustered together. The evidence available suggests this notion for Maputo City, where there is a productivity advantage to firm agglomeration. Regression analysis shows that regional variables for provinces outside Maputo are all negatively and strongly correlated with labor productivity (Column 4, Table 6.9). The differences in productivity compared to the reference region of Maputo City are not trivial: -39% in the region North, -27% in the region Center and -13% in the region South. The concentration of better jobs in Maputo City provides a plausible explanation to the higher levels of prosperity and economic development and faster poverty reduction relative to other regions, particularly those in the north and center of the country.

**Table 6.9. The agglomeration of firms in Maputo City led to higher labor productivity compared to the rest of the country**

(Labor Productivity Regression Coefficients, Dependent Variable = Log(Output/Employment))				
	Equation 1	Equation 2	Equation 3	Equation 4
<i>Number of Employees</i>				
Size 20-49	-0.055	-0.146*	-0.156***	-0.157**
Size 50-249	0.074	0.015	0.019	0.075
Size 250-499	0.037	0.059	0.035	0.037
Size 500+	-0.291	-0.291	-0.297	-0.454
<i>Age of Firm</i>				
Age 6-9		0.139**	0.126**	0.160***
Age 10-19		0.348***	0.298***	0.311***
Age 20-29		0.524***	0.428***	0.410***
Age 30+		0.580***	0.505***	0.526***
<i>Region</i>				
North			-0.493***	
Central			-0.319***	
South			-0.138*	
<i>Sector Dummies</i>				
Agriculture				-0.383***
Min/Util./Const.				0.164
Commerce				0.179*
Services				0.024
Constant	5.409***	4.618***	4.943***	5.357***
No. Observations	5,697	4,428	4,428	4,428
R-squared	0.002	0.093	0.108	0.057

Note: Analysis based on a restricted data sample from CEMPRE 2015/16 that excludes firms less than 10 and of less than 2 years of age. Asterisks denote increasing statistical significance: \*p < 0.1, \*\*p < 0.05, \*\*\*p < 0.01.

Source: World Bank using CEMPRE-2015/16. Taken from World Bank Jobs Diagnostics (2017)

## References

- Alderman, H., J. Hoddinott, and B. Kinsey. 2006. "Long Term Consequences of Early Childhood Malnutrition." *Oxford Economic Papers*, 58(3): 450-474.
- Alfani, F., C. Azzari, M. d'Errico and V. Molini (2012), "Poverty in Mozambique. New Evidence from Recent Household Surveys," Policy Research Working Paper, n. 6217, The World Bank.
- Arndt, Channing & Tarp, Finn (ed.) (2016). "Measuring Poverty and Wellbeing in Developing Countries," OUP Catalogue, Oxford University Press, number 9780198744818, April.
- Amendola, N and G. Vecchi (2014), "Durable Goods and Poverty Measurement," World Bank Policy Research Working Paper, 7105.
- Baez, J., G. Caruso and C. Niu, Chiyu. 2017. "Tracing Back the Weather Origins of Human Welfare: Evidence from Mozambique". World Bank Policy Research Working Paper No. 8167.
- Barro, R. and J. Lee, 2013. "A new data set of educational attainment in the world, 1950–2010". *Journal of Development Economics*, Vol. 104, September, pages 184-198
- Barros, R., F. Ferreira, J. Molinas and J. Saavedra; 2009. *Measuring Inequality of Opportunities in Latin America and the Caribbean*. Latin American Development Forum, World Bank. Washington, D.C.
- Behrman, Jere R. 1993. "The economic rationale for investing in nutrition in developing countries." *World Development*, 21(11): 1749-1771.
- Christian, P. and Dillon, B. 2017. "Growing and Learning When Consumption is Seasonal: Long-Term Evidence from Tanzania", manuscript, World Bank.
- Christian, P., F. Kondylis, V. Mueller, A. Zwager, and T. Siegfried. "Water When it Counts: Relieving Water Scarcity Through Irrigation Monitoring in Mozambique." Policy Research working paper; no. WPS 8345; Impact Evaluation series. Washington, D.C..
- Dang, H. and P. Lanjouw; 2013. "Measuring poverty dynamics with synthetic panels based on cross-sections," Policy Research Working Paper Series 6504, The World Bank.
- Datt, G. and M. Ravallion, 1992. "Growth and redistribution components of changes in poverty measures: A decomposition with applications to Brazil and India in the 1980s," *Journal of Development Economics*, Elsevier, vol. 38(2), pages 275-295, April.
- Deaton A. and S. Zaidi (2002), "Guidelines for Constructing Consumption Aggregates for Welfare Analysis." *Living Standards Measurement Study Working Paper* n. 135. The World Bank, Washington, DC.
- Firpo, S., N. Fortin and T. Lemieux, 2009. "Unconditional Quantile Regressions", *Econometrica*, Vol. 77, No. 3, May, pp. 953-973
- Goujard, O, M van den Berg, P. Heffer, and S. Zingore. (2011) "Maize Intensification in Mozambique: Demonstrating to Farmers the Benefits of Better Land and Crop Management." International Potash Institute. E-IFC, No. 28.

Government of Mozambique. 2016. “Poverty and Well-Being in Mozambique - Fourth National Poverty Assessment (IOF 2014/15)”, Ministry of Economy and Finance.

Lucchetti, L.. 2017. “Who escaped poverty and who was left behind? A non-parametric approach to explore welfare dynamics using cross-sections”. Policy Research working paper; no. WPS 8220. Washington, D.C.

Maccini, S. and D. Yang. 2009. “Under the Weather: Health Schooling, and Economic Consequences of Early-Life Rainfall.” *American Economic Review*, 99(3).

Maria, R., J. Americano, J. Matusso and C. Gundana. “Optimizing Fertilizer Use within the Context of Integrated Soil Fertility Management in Mozambique.” CABI, 2017.

Maleta, K, SM Virtanen, M Espo, T Kulmala, and P Ashorn. 2003. “Seasonality of growth and the relationship between weight and height gain in children under three years of age in rural Malawi.” *Acta Paediatrica*, 92(4): 491-497.

Maria, R., J. Americano, J. Matusso and C. Gundana. 2017. “Optimizing Fertilizer Use within the Context of Integrated Soil Fertility Management in Mozambique.” CABI.

Miller, Jacqueline, Brett Ritchie, Cuong Tran, Sean Beggs, Christina Olly Lada, Kathryn Whetter, and Lynne Cobiac. 2013. Seasonal variation in the nutritional status of children aged 6 to 60 months in a resettlement village in West Timor.” *Asia Pacific Journal of Clinical Nutrition*, 22(3): 449.

Mincer, J. 1974. *Schooling, Experience and Earnings*. New York: Columbia University Press for the National Bureau of Economic Research

Montenegro, C. and H. Patrinos. 2014. “Comparable Estimates of Returns to Schooling Around the World”. World Bank, Policy Research Working Paper 7020, Washington D.C.

Mozambique Ministry of Agriculture (2011). Plano Estratégico para o Desenvolvimento do Sector Agrário (PEDSA) para 2011-2020.

Mozambique Ministry of Economy and Finance (2016). “Pobreza E Bem-Estar Em Moçambique: Quarta Avaliação Nacional. (IOF 2014/15).

Mozambique National Institute of Statistics (2015). *Statistical Yearbook*.

Ravallion, M, and M. Huppi. 1991. "Measuring changes in poverty: a methodological case study of Indonesia during an adjustment period". *The World Bank Economic Review*. Vol. 5, no. 1, pp. 57-82.

Salazar-Espinoza, C., S. Jones and F. Tarp, 2015. "Weather shocks and cropland decisions in rural Mozambique," *Food Policy*, Elsevier, vol. 53(C), pages 9-21.

Shetty, PS. 1999. “Adaptation to low energy intakes: the responses and limits to low intakes in infants, children and adults.” *European Journal of Clinical Nutrition*, 53: S14-33.

United Nations Children’s Fund (UNICEF), 2016. *UNICEF Annual Report 2015*. ISBN: 978-92-806-4843-0

World Bank. 2014. Mozambique - Public expenditure review : addressing the challenges of today, seizing the opportunities of tomorrow. Public Expenditure Review (PER). Washington, DC.



World Bank. (2016a). Searching for the demographic dividend in Mozambique: an urgent agenda. Washington, D.C.: World Bank Group. <https://hubs.worldbank.org/docs/imagebank/pages/docprofile.aspx?nodeid=26519678>

World Bank. (2016b). “Mozambique – Systematic Country Diagnostic”. Washington, D.C.: World Bank Group.

World Bank. (2016c). “Accelerating Poverty Reduction in Mozambique: Opportunities and Challenges”. Policy Report. Washington, D.C.

World Bank (2017a). “Let’s Work Mozambique Country Pilot – Jobs Diagnostic Report”. Policy Report. Washington, D.C.

World Bank (2017b). “Agriculture productivity, market access and vulnerability in Mozambique: Insights from spatial analysis”. Policy Report. Washington, D.C.

World Bank (2017c). “Accelerating Urbanization to Support Structural Transformation in Mozambique – Mozambique Urbanization Review”. Policy Report. Washington, D.C.

World Food Program (2017). “Food Security and Nutrition Challenges in Mozambique”. [https://www.wfp.org/content/2017-food-security-and-nutrition-challenges-mozambique?\\_ga=2.192791081.280471179.1510175415-319268952.1502827115](https://www.wfp.org/content/2017-food-security-and-nutrition-challenges-mozambique?_ga=2.192791081.280471179.1510175415-319268952.1502827115)

## Annex 1. Poverty Estimation in Mozambique

### *Survey data*

Official estimates of poverty in Mozambique are based on the household survey known as *Inquérito Sobre Orçamento Familiar* (IOF) for its name in Portuguese. The IOFs (also known in some years as *Inquérito Sobre aos Agregados Familiares*, IAF) are a series of repeated cross-sectional surveys –except for the IOF 2014/15– conducted by the National Institute of Statistics of Mozambique (INE). There have been four rounds so far – 1996/97, 2002/03, 2008/09 and 2014/15. All IOFs collect data on household consumption, demographics (including education and health), asset ownership, housing, etc.

The most recent survey, IOF 2014/15 was intended as a non-rotating four by four panel system, where each household would have been interviewed 4 times during the 12 months’ survey cycle, and during all four weeks in a month. In practice, due to budget shortcomings, the survey was carried on only during the I (AUG-SEP-OCT), II (NOV-DEC-JAN) and IV (MAY-JUN-JUL) quarters (from now on, Q1, Q2, Q4). The IOF 2014/15 sampling base is the 2010 sampling frame, drawn upon the 2007 Census data and cartography. The sample design is intended to be representative at (i) national, (ii) national urban and national rural, (iii) regional (South, Center and North) and (iv) provincial levels (ten provinces plus Maputo City). The survey is meant to be the source of data for assessing the progress of the national Action Plan for the Reduction of Poverty (*Plano de Acção para a Redução da Pobreza*, PARP) and for revising the weights in the consumer price index.

The IOFs are using a diary approach to collect consumption, where every individual in a household is asked to record (on a daily basis) all food and non-food consumption transactions that occurred over the course of one week, including consumption of self-produced items. The IOFs also included a recall module for non-food expenditures, particularly (semi-)durables and other irregularly purchased items.

### *Poverty estimation methodology used in the Poverty Assessment*

This Poverty Assessment employed an updated methodology to estimate poverty levels in Mozambique (see Box 1.1 for more information). The following describes the main steps followed.

*Step 1 - Building the welfare indicator.* The Mozambican poverty estimates are traditionally based on aggregate household consumption as the key welfare indicator. As in many other parts of sub-Saharan Africa, consumption is considered a more reliable indicator of welfare than income.<sup>32</sup> The consumption aggregate includes food and non-food consumption. Information on food consumption is found in i) the diary of purchases and auto-consumption, ii) the employment section, where individual consumption of food outside home is recorded, iii) the module collecting information on travels, and iv) the recall section (catering services). In the diary module it is asked for how many days the purchase is expected to last. Households report on average purchase of about 17 items per week, with 25 percent of households reporting 6 items or less, and 75 percent of households reporting 26 items or less. Significant differences in these purchase patterns are found between rural and urban settlements: on average, an urban household report purchasing almost three times more items than a rural household (24 items as opposed to less than 9).

To ensure that only the food consumed over the period of a week is taken into account, the methodology normalized to one week the food intended to last more than 7 days. Given  $y_{h,i}^d$  the value of item  $i$  purchased

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<sup>32</sup> First, consumption is typically less fluctuating than income and gives a better and steadier picture of long term welfare. Second, individuals feel more comfortable answering questions related to consumption than to income. Third, income measurement in countries with a large agricultural or informal sector is often highly inaccurate.

the day  $d$  of the seven-day diary by) household  $h$ , and  $n_{h,i}^d$  the number of days that item is supposed to last for, the weekly consumed value included in the consumption aggregate is the following:

$$y_{h,i} = 7 * \frac{\sum_{d=1}^7 y_{h,i}^d}{\sum_{d=1}^7 n_{h,i}^d}$$

Information on non-food consumption is found in i) the diary of purchases and auto-consumption, ii) the recall module, and iii) the sections of the questionnaire concerning durables, housing, education and travels. Treatment of all non-food consumption other than housing and durables is straightforward, as it is just the sum of all expenses for non-food goods, ranging from tobacco to clothing, utilities, expenses related to health, transport, leisure and culture, education, insurance services, and other general goods and services. The distribution of self-assessed rents in the surveys follows a path similar to that of the distribution of predicted rent from a hedonic model for urban households using dwelling characteristics as covariates. For that reason, it was decided for this report to use the subjective rent as proxy for the value of services from dwelling for homeowners and individuals living for free.

An appropriate measure of their consumption of durables is the value of the services that they provide. This is equivalent to the annual cost of holding the stock of each durable, which depends on prices at the beginning and end of year, interest rates (opportunity cost) and the rate of depreciation. Let  $S_{td}^h$  be the number of durables  $d$  owned by household  $h$ ,  $v_t^d$  the price of durable  $d$  at the time of purchase, and let  $n_t$  and  $\pi_t$  be, respectively, the nominal interest rate and the inflation rate and  $\delta_d$  the depreciation rate of item  $\delta_d$ . Then, the total value of services from durables for each household ( $TD$ ) can be defined as:

$$TD = \sum_{d=1}^D S_{td}^h v_{td} (n_t - \pi_t + \delta_d)$$

The depreciation rate is often inferred by the data itself when the survey collects information on the vintage of owned durables, together with their current and purchased value. In the case of the IOF 2014/15, unfortunately, the only information available on durables is the number of durables owned per type, and the number and purchase value of durables purchased in the last 12 months or 30 days according to whether information on the durable was collected, respectively, in the durable section or in the recall section of the questionnaire. In order to impute the current value of durables, this study computed the median value by province for all durables newly purchased and assumed that all of them were already used for one year. As for the depreciation rates, the study adopted the values often used in the literature reported by the Bureau of Economic Analysis (BEA) (More details on the note “Poverty Measurement in Mozambique, World Bank, 2017).

Given  $\bar{v}_{tdp}^n$  the median price of a new durable good  $d$  in province  $p$  at time  $t$ , and  $\delta_d$  the associated depreciation rate, therefore, the value associated to a used durable good  $d$  for all households living in province  $p$  at time  $t$ ,  $v_{tdp}^u$ , is defined as:

$$v_{tdp}^u = \bar{v}_{tdp}^n (1 - \delta_d)$$

The annual inflation rate in 2014 was 7.4 per cent and in 2015 6.3 percent (Mozambique Central Bank, Annual Report, p.61) while the interest rate on treasury bonds varied between 9.875 percent and 10.75 over the same period (<http://www.bvm.co.mz/index.php/mercado/obrigacoes>). We take the average value for both inflation rate, and nominal interest rate, obtaining  $\pi_t = 6.85$  and  $n_t = 10.31$ . Therefore, the value of both purchased and owned durables goods to be included in the consumption aggregate is defined as follows (where  $v_{td} = v_{td}^n$  for newly purchased durable items and  $v_{td} = v_{tdp}^u$  for used items):

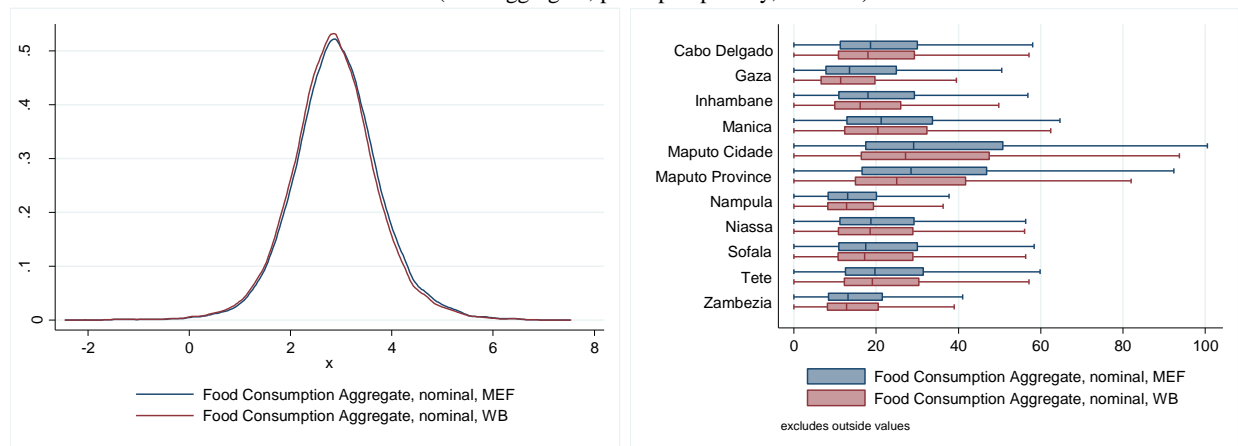
$$TD = \sum_{d=1}^D S_{td}^h v_{td} (0.1031 - 0.685 + \delta_d)$$

*Step 2 – Comparing the consumption aggregate against the values used in the official methodology.*

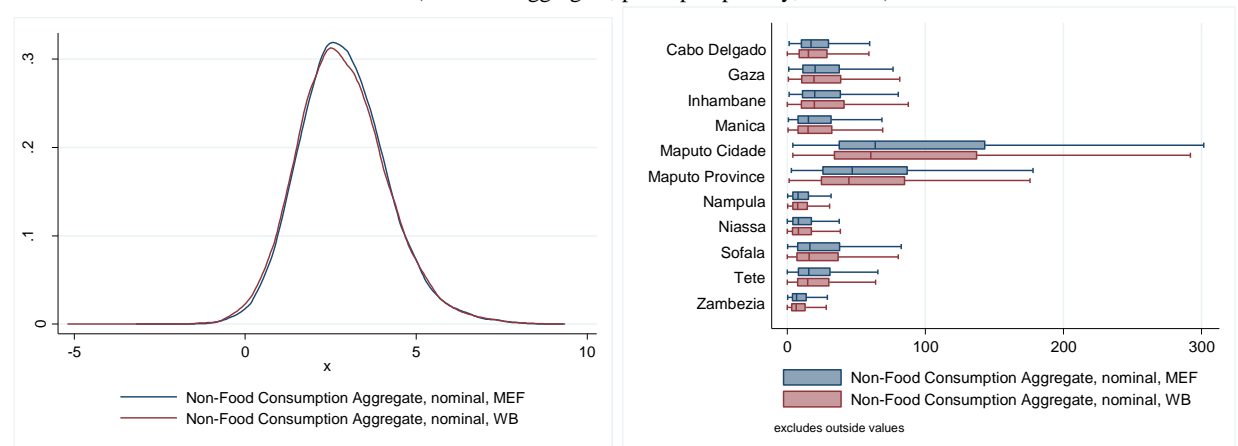
As shown in Figure A.1.1, measures of the food components estimated for this report match almost perfectly the official estimates (except for Gaza and Maputo Province). There are, however, some small differences. The official methodology includes in-kind (food) income in the consumption aggregate but does not account as food meals and beverages reported in the tourism section of the questionnaire. The methodology employed in this report does the opposite. In terms of the non-food component, the aggregates estimated in this report slightly underestimates the values calculated with the official methodology, which is largely driven by the multiple assumptions adopted for the estimation of the value of services from several durables and housing.

**Figure A.1.1. Comparison between the food and non-food components of the consumption aggregate in the WB and MEF methodologies**

(food aggregate, per capita per day, nominal)



(non-food aggregate, per capita per day, nominal)



Source: World Bank using IOF-2014/15

*Step 3 – Spatial and temporal price adjustments.* Expenditure is utility consistent and therefore a good indicator for individuals' welfare only if a set of hypotheses is satisfied. One of the hypotheses is that individuals must face identical prices. This is often not the case. Prices usually vary both over time and across space: for instance, the same good can cost more in urban than in rural areas, or more at the end of

the year than the beginning of the year. To have meaningful utility comparisons, prices need to be adjusted to consider these differences.

- *Temporal price adjustment.* Since the survey has been conducted over a period of a year, it is advisable to deflate prices to get a comparable welfare aggregate across observations collected at different points in time. This report selected Q4 as the quarter of reference. A temporally adjusted welfare aggregate,  $\tilde{w}$ , is obtained by inflating the nominal welfare aggregate in each quarter to reflect Q4 prices:

$$\tilde{w}(q_i) = w(q_i) \frac{CPI(q_4)}{CPI(q_i)}$$

- *Spatial price adjustment.* It is necessary to deflate the welfare aggregate spatially to adjust for the fact that households living in different regions likely face different prices. This is done constructing a Paasche index on food prices for each household  $h$ ,  $P_h$  (Deaton and Zaidi, 2002 recommend the index to be built at household level). Given  $k = 1, 2, \dots, K$  food items consumed in each household  $h$ ,  $P_{Rk}$  the reference price referred to item  $k$  and  $w_{hk}$  the budget share of item  $k$  for household  $h$ , the index is computed as follows:

$$P_h = \left( \sum_{k=1}^K w_{hk} \frac{P_{Rk}}{P_{hk}} \right)^{-1}$$

*Step 4 – Poverty lines.* The poverty lines are defined using the daily per capita consumption aggregate after the temporal and spatial adjustments. To construct the poverty line, this study first defines a reference group whose consumption aggregates are between the 35th and 6th deciles of the distribution. Second, the expenditure and calorie intake of each food item for each household is computed to determine the typical food basket in the reference group. Third, the total expenditure of food and calorie intake is calculated for each household and this information is used to estimate the average price per calorie. The next steps is to obtain the mean price/calorie and mean calorie intake across households in the reference group<sup>33</sup>. The food poverty line is the product of the two as follows:

$$PL_{food} = \bar{p}_{Kcal} * \overline{Kcal}$$

where  $PL_{food}$  is the food poverty line,  $\bar{p}_{Kcal}$  is the mean price/calorie (in metical) and  $\overline{Kcal}$  is the mean calorie intake. The overall poverty line is determined by the subset of households in the reference group whose food expenditure is equal or close to the food poverty line.<sup>34</sup> More specifically, the poverty line ( $PL$ ) is given by the median non-food share of these households ( $\tilde{S}_{non-food}$ ) as follows:

$$PL = \frac{PL_{food}}{1 - \tilde{S}_{non-food}}$$

The non-food poverty line is:

$$PL_{non-food} = PL - PL_{food}$$

Table A.1.1 summarizes the calorie requirement (the mean calorie intake of the reference group) used in the study

Table 1. A Summary of calorie requirement and poverty lines	
Calorie requirement	1,460.09 Kcal
Food poverty line	18.84 Metical
Non-food poverty line	7.01 Metical
Overall poverty line	25.85 Metical

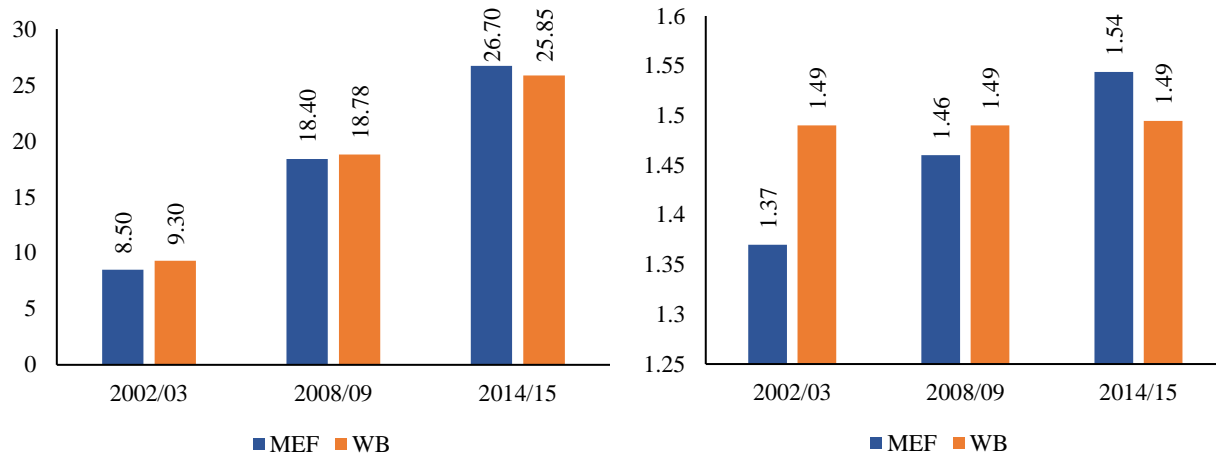
Source: World Bank using IOF 2014/15

<sup>33</sup> The sample to compute the mean price/calorie and mean calorie intake excludes those households whose daily per capita calorie intake is in the highest 1% ( $\geq 16956.22$  Kcal). Those observations are treated as outliers.

<sup>34</sup> More specifically, the food expenditure of these households is between 0.9-1.1 times of the food poverty line.

## Annex 2. Values of the Poverty Lines

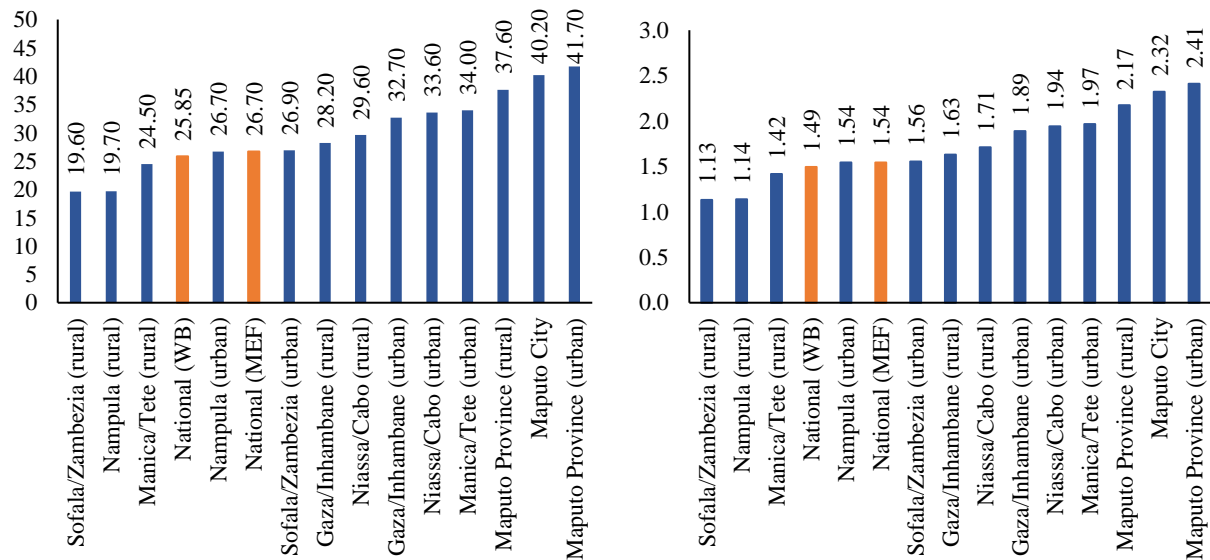
**Figure A.2.1. Comparison of poverty lines**  
(local currency units) (US\$PPP2011)



Note: Official national poverty line (MEF) proxied by a population weighted average of the 13 poverty lines defined in the official poverty methodology for each of the corresponding survey years.

Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15.

**Figure A.2.1. Comparison of poverty lines (provinces)**  
(local currency units) (US\$PPP2011)



Note: Official national poverty line (MEF) proxied by a population weighted average of the 13 poverty lines defined in the official poverty methodology for each of the corresponding survey years.

Source: World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15.

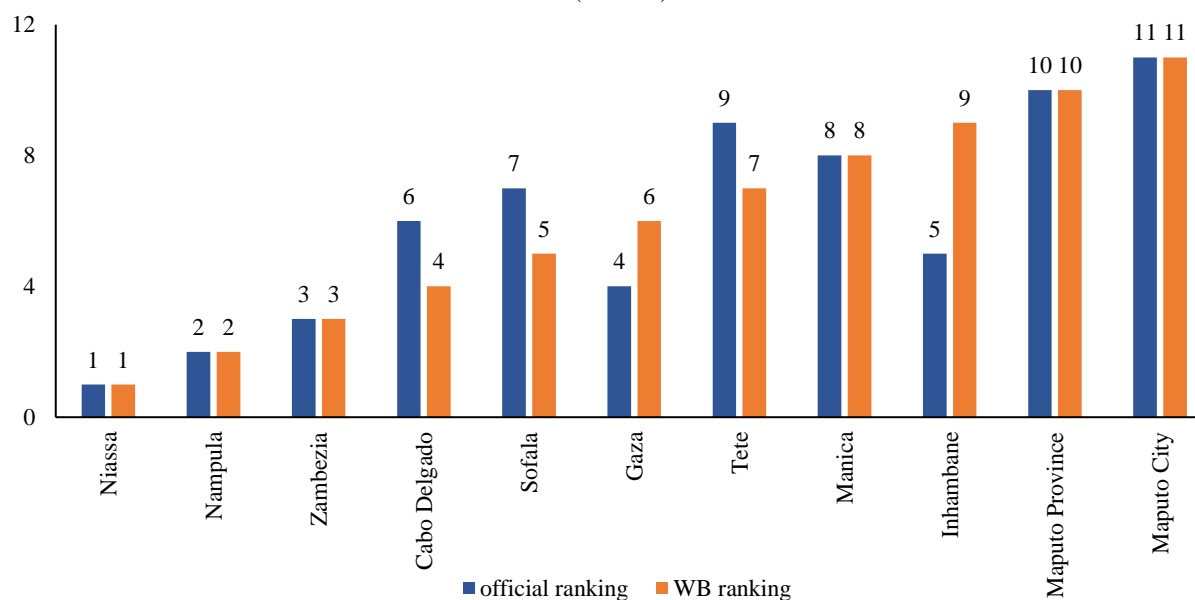
### Annex 3. Poverty Rates by Province

**Table A.3.1. Poverty rates by province and survey (MEF and WB methodologies)**

Province	2002/03		2008/09		2014/15	
	MEF	WB	MEF	WB	MEF	WB
Niassa	48.3	66.23			60.60	66.70
Nampula	49.1	57	51.4	60.66	57.10	64.84
Zambezia	49.7	40.72	67.2	74.01	56.50	61.76
Cabo Delgado	60.3	44.16	39	57.45	44.80	50.03
Sofala	41.3	46.58	54.4	62.29	44.20	49.56
Gaza	55.4	73.64	61	61.81	51.20	43.62
Tete	60.5	78.02	41	63.45	31.80	41.93
Manica	44.7	64.62	52.8	54.47	41.00	37.15
Inhambane	78.1	71.91	54.6	54.77	48.60	34.52
Maputo Province	59	45.92	55.9	49.33	18.90	11.80
Maputo City	42.9	28.13	29.9	14.25	11.60	3.83

Source: MEF and World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15.

**Figure A.3.1. Provincial poverty ranking (MEF and WB methodologies)**  
(2014/15)



Source: MEF and World Bank using IOF-2002/03, IOF-2008/09 and IOF-2014/15.

#### Annex 4. Attrition in the IOF 2014/15

As summarized in Table A.4.1, the second quarter (Q2) of the survey cycle (NOV-DEC-JAN) has the lowest number of respondents. With respect to Q1, 13 percent of individuals (10 percent of households) are lost in Q2, while only 5 percent of individuals (or 2 percent of households) are lost in Q4.

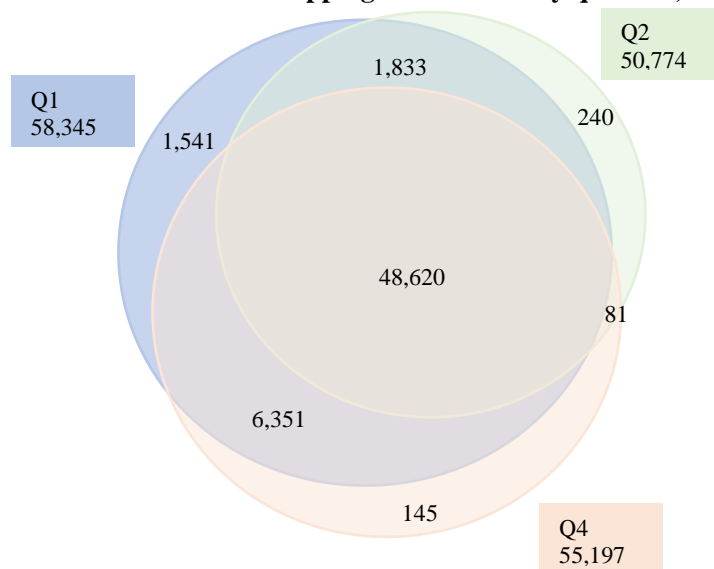
**Table A.4.1. Observations per survey quarter, unweighted**

	Q1	Q2	Q4
Individuals	58,345	50,774	55,197
Households	11,506	10,373	11,317

*Source:* World Bank using IOF-2014/15

Figure A.4.1 shows that new observations were across waves after Q1 was collected.<sup>35</sup> With respect to Q1, 321 new individuals were surveyed in Q2 (81 of whom are again surveyed in Q4), and 145 new individuals entered the survey in Q4. Summarizing, 48,620 individuals appear in all three quarters, and 58,811 individuals have been covered at least once in the survey year. This means that Q1 includes 99 percent of all individuals ever interviewed in the survey year, while almost 20 percent of individuals are lost if the analysis is based on those observations that covered in all the three quarters.

**Figure A.4.1. Observation overlapping between survey quarters, individuals**



*Source:* World Bank using IOF-2014/15

Looking at the overlap between quarters in Figure A.4.2, Q2 stands out as the quarter with highest attrition: 1,074 households which were interviewed in Q1 were not interviewed again in Q2 (a loss of 9 percent of households with respect to Q1). On the other hand, in Q4, only less than 1 percent of households recorded in Q1 have been not interviewed again in Q4. Nevertheless, in Q4, 686 (nuclear) households appear in the roster without any information.

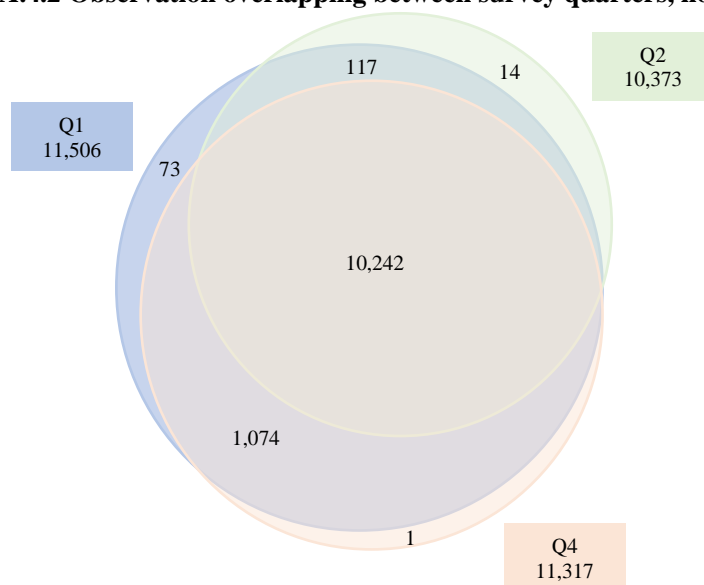
The attrition between survey rounds seems more accentuated in some provinces: in Zambezia only 63 percent of individuals appear in Q2, followed by Cabo Delgado (81 percent), Nassa (83 percent) Nampula and Maputo City (both 87 percent) and Tete (89 percent). In Q4, Zambezia still loses 16 percent of surveyed

<sup>35</sup> Households who moved out from their dwellings between quarters were substituted by those that moved in, on the assumption that their characteristics did not differ significantly.



individuals, followed by Cabo Delgado where 11 percent observations are missing in Q4 (see Table A.4.2 and Table A.4.3).

**Figure A.4.2 Observation overlapping between survey quarters, households**



Source: World Bank using IOF-2014/15

**Table A.4.2. Observations per survey quarter, by province, unweighted**

	Q1	Q2	Q4
Cabo Delgado	5,038	4,188	4,502
Gaza	4,260	3,957	4,161
Inhambane	4,076	3,782	3,939
Manica	5,110	4,733	4,915
Maputo City	5,540	4,945	5,218
Maputo Province	4,938	4,624	4,790
Nampula	7,157	6,329	6,710
Nassa	4,553	3,836	4,353
Sofala	5,537	5,282	5,510
Tete	4,859	4,385	4,711
Zambezia	7,277	4,713	6,388

Source: World Bank using IOF-2014/15

**Table A.4.3. Observations per survey quarter, by province, as a share of the number of individuals overall interviewed in each province**

	Q1 ∪ Q2 ∪ Q4	Q1	Q2	Q4
Cabo Delgado	5,145	97.9	81.4	87.5
Gaza	4,319	98.6	91.6	96.3
Inhambane	4,158	98.0	91.0	94.7
Manica	5,172	98.8	91.5	95.0
Maputo City	5,673	97.7	87.2	92.0
Maputo Province	5,012	98.5	92.3	95.6
Nampula	7,273	98.4	87.0	92.3
Nassa	4,644	98.0	82.6	93.7
Sofala	5,618	98.6	94.0	98.1
Tete	4,950	98.2	88.6	95.2
Zambezia	7,532	96.6	62.6	84.8

Source: World Bank using IOF-2014/15

## Annex 5. The Unconditional Quantile Regression Model

The Recentered Influence Function (RIF) regression approach proposed by Firpo, Fortin and Lemieux (2009) provides a simple regression-based procedure for performing a detailed decomposition of different distributional statistics. The RIF-regression model is called unconditional quantile regression when applied to the quantiles. The technique consists of decomposing the welfare gaps at various quantiles of the unconditional distribution into differences in households endowment characteristics such as education, age, employment etc., and differences in the returns to these characteristics. These components are then further decomposed to identify the specific attributes which contribute to the widening welfare gap.

This report applies the RIF unconditional quantile regression to examine the poor-non-poor welfare differentials along the consumption distribution. The results of this analysis are presented in Chapter 2. The procedure is carried out in two stages. The first stage consists of estimating unconditional quantile regressions on log real per capita monthly household consumption for poor and non-poor households, then constructing a counterfactual distribution that would prevail if poor households had received the returns that pertained to the non-poor households. The comparison of the counterfactual and empirical distributions allows to estimate the part of the welfare gap attributable to households' characteristics differentials, known as the "endowment effect", and the part explained by differences in returns to characteristics, the so-called "return effect". The second stage involves dividing the endowment and return components into the contribution of each specific characteristic variable.

The method can be easily implemented as a standard linear regression, and an ordinary least squares (OLS) regression of the following form can be estimated:

$$RIF(y, Q_\theta) = X\beta + \varepsilon \quad (1)$$

where  $y$  is log real per capita monthly household consumption, and  $RIF(y, Q_\theta)$  is the RIF of the  $\theta$ th quantile of  $y$  estimated by computing the sample quantile  $Q_\theta$  and estimating the density of  $y$  at that point by using the kernel method:

$$RIF(y, Q_\theta) = Q_\theta + (\phi - I\{y \leq Q_\theta\}) / f_Y(Q_\theta) \quad (2)$$

(2) is the marginal density function of  $y$  and  $I$  is an indicator function. RIF can be estimated by replacing  $Q_\theta$  by  $\theta$ th sample quantile and estimating  $f_Y$  by kernel density.

$X$  is the regressors matrix including the intercept,  $\beta$  is the regression coefficient vector and  $\varepsilon$  is the error term. The regressors include groups of variables such as 1) household demographic and general characteristics variables (e.g. household size, gender of household head, share of household members that are children, etc.); 2) household human capital measured by the number of years of schooling of the household head; 3) the household head employment sector; 4) asset ownership including indicating whether the household owns livestock, bicycle, cell phone, telephone, computer; and dummies capturing the housing conditions; 5) access to basic services (electricity, safe water and sanitation) and 6) geographical-level factors captured by spatial fixed effects.

Model (1) was estimated for the 10th to 90th quantiles. The unconditional quantile regression estimates were used to decompose the gap in poor-non-poor consumption growth into a component attributable to differences in the distribution of characteristics and a component due to differences in the distribution of returns as follows:

$$\widehat{Q}_\theta^t - \widehat{Q}_\theta^{t'} = \{\widehat{Q}_\theta^t - \widehat{Q}_\theta^{t*}\} + \{\widehat{Q}_\theta^{t*} - \widehat{Q}_\theta^{t'}\} = (\overline{X^t} - \overline{X^{t'}}) \widehat{\beta}_\theta^t + \overline{X^{t'}} (\widehat{\beta}_\theta^t - \widehat{\beta}_\theta^{t'}) \quad (3)$$

where  $\widehat{Q}_\theta$  is the  $\theta$ th unconditional quantile of log real per capita monthly household consumption,  $\bar{X}$  represents the vector of covariate averages  $\widehat{\beta}_\theta$  the estimate of the unconditional quantile partial effect. Superscripts  $I$ ,  $I'$  and  $*$  designate respectively the poor, non-poor and counterfactual values.

$\widehat{Q}_\theta^* = X^{I'} \widehat{\beta}^I$  is the counterfactual quantile of the unconditional counterfactual distribution which represents the distribution of welfare that would have prevailed for group  $I'$  (poor households) if they have received group  $I$  (non-poor households) returns to their characteristics.<sup>36</sup> The first term on the right-hand side of equation (3) represents the contribution of the differences in the distributions of household characteristics to consumption growth at the  $\theta$ th unconditional quantile, denoted “endowment effect”. The second term of the right-hand side of the equation represents the inequality due to differences in returns to the household characteristics at the  $\theta$ th unconditional quantile, denoted the “return effect”.<sup>37</sup>

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<sup>36</sup> The decomposition results may vary with the choice of the counterfactual distribution. For example, the results change if the counterfactual used is the distribution that would have prevailed for group  $I$  if they have received group  $I'$  returns. The choice of the counterfactual in this analysis was motivated by looking at the gaps of the poor with respect to the non-poor.

<sup>37</sup> This appendix was adapted from “Appendix 4: The Unconditional Quantile Regression Model & Analysis of Spatial Inequality”, Tanzania Mainland Poverty Assessment, World Bank, 2016.