“Poverty Reduction Setback in Times of Compounding Shocks”

Mozambique
—Poverty Assessment—

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Poverty and Equity Global Practice
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Table of Contents

EXECUTIVE SUMMARY **8**

INTRODUCTION **11**

CHAPTER 1: BACK-TO-BACK SHOCKS HAVE ERASED SOME OF THE GAINS IN POVERTY REDUCTION **13**

1.1 Turbulent years in the recent past have put Mozambique on a lower growth trajectory 13
1.2 A more challenging economic context translated into higher poverty 16
1.3 The uneven distribution of poverty across the Mozambican geography 19
1.4 Poverty changes were driven by compounding shocks 25
Documenting the burden of COVID-19 on poverty *25*
Other shocks during the 2015-20 period are responsible for half of the overall poverty increase *27*
1.5 In addition to low incomes, household welfare and economic opportunities are constrained by deprivations in multiple dimensions 31
Human capital accumulation *34*
Education *34*
Health and nutrition *37*
Access to services (water, sanitation and electricity) *39*
Housing conditions and assets *40*
1.6 The Relationship between Economic Growth and Poverty 41
Poverty elasticity and passthrough rates in Mozambique *41*
Poverty outlook *43*

CHAPTER 2. INEQUALITY REMAINS HIGH BUT FELL WITH THE PANDEMIC **46**

2.1 Income status and location largely explain which household benefitted from the low levels of growth 46
2.2 As a shock that fell more heavily on urban areas, COVID-19 improved overall inequality 49
2.3 Growth, inequality and poverty are intertwined 51
2.4: Geography matters for poverty and equity outcomes 53
2.5 An uneven playing field for human opportunities and economic capabilities 63
Intergenerational mobility *70*
Gender *74*

CHAPTER 3. PROFILING THE LABOR MARKET: LOW ECONOMIC TRANSFORMATION, LOW AVAILABILITY OF PRODUCTIVE JOBS **78**

3.1 Labor force participation 78
3.2 Unemployment 81
3.3 Type of Employment 82
3.4 Underemployment 83
3.5 Child Labor 89
3.6 What type of labor does the market demand? 92

CHAPTER 4. THE FISCAL SYSTEM AND PRIVATE TRANSFERS INFLUENCE POVERTY AND EQUITY – IN GOOD AND BAD WAYS **94**

4.1 Low-income households are not necessarily better-off after the net effects of paying taxes and receiving public transfers are considered 94
4.2 Other public and private transfers are household welfare enhancing 99

CHAPTER 5 LIVELIHOODS IN A RISKY ENVIRONMENT **102**

5.1 Households deal with the twin challenges of high exposure to risk and weak ability to cope 102
5.2 Weather events pose a big burden on rural livelihoods 103
5.3 Weather events also impact negatively urban economic infrastructure and productivity 110
5.4 Will the poor bear the big burden of higher temperatures and more frequent and severe weather shocks? 114

5.5 Behaviors can shape actions to mitigate, adapt and become more resilient 116

CHAPTER 6 – POLICY CONSIDERATIONS 119

6.1 Addressing vulnerability to environmental shocks 119
6.2 Addressing macroeconomic shocks and structural challenges 120
6.3 Addressing pandemics 122

ANNEX 1: POVERTY 124

COVID-19 impact counterfactual model 124
Per capita GDP growth per province, 2015-20 (%) 126
Per capita GDP growth disaggregated by province, 2015-20 (%) 126
Sectoral GDP growth, 2015-20 (%) 128
World Bank Poverty Measurement in Mozambique 128

ANNEX 2: INEQUALITY 133

Consumption shares and cumulative shares by ventile (2014/15-2019/20) 133

ANNEX 3: LABOR MARKET 134

Oaxaca-Blinder Decomposition of monthly salaries across gender 134

ANNEX 4: THE FISCAL INCIDENCE ANALYSIS AND TRANSFERS 134

Mozambique's FIA 2023 134
Average transfers (in MZN) by province 135

ANNEX 5: WEATHER SHOCKS 137

Influence of Wet and Dry Spells on Vegetation Dynamics during the growing season 137
Modelling Poverty and Distributional Impacts of Climate Change Shocks 138

REFERENCES 140

Figures

Figure 1.1: Mozambique growth performance (%) 13
Figure 1.2: Per capita GDP growth (2010-21, %) 15
Figure 1.3: Exchange Rate and Inflation (2010-21) 15
Figure 1.4: FDI and Capital Investments (or Capital expenditures) 16
Figure 1.5: National Poverty Rate and per capita GDP (2003-2020 %) 17
Figure 1.6: Poverty Rate and Number of Poor (2003/03-2019/20) 18
Figure 1.7: National Poverty Gap and Severity (1996-2020; %) 19
Figure 1.8: National, Urban and Rural Poverty Rates (2003-2020 %) 19
Figure 1.9: National, Urban and Rural Poverty Gaps (2003-2020 %) 20
Figure 1.10: Proportion of Rural and Urban Population per Consumption Decile (2019/20) 20
Figure 1.11: Population Shares across Consumption Quintiles 21
Figure 1.12: Poverty Evolution by Province (2002/03 – 2019/20 %) 22
Figure 1.13: Relative and absolute poverty increases by province (2015-20; %; pp;) 23
Figure 1.14: Distribution of Population per province and ventile, 2019-20 24
Figure 1.15: Percentage and number of poor in Sub-Saharan Africa ($2.15 IPL, latest since 2015) 24
Figure 1.16: Estimated poverty trends with and without the effects of COVID-19 (2014/15-2019/20 %) 26
Figure 1.17: Per capita GDP growth per regions, 2012-20 (%) 27
Figure 1.18: GDP output, growth and per capita by selected sectors, 2015-20 29
Figure 1.19: Households experiencing three or more multidimensional deprivations (national, urban, rural; 2002/03-2019/20) 32
Figure 1.20: Share of poor households deprived across dimensions 33
Figure 1.21: Human capital index for Mozambique and peers, 2020 34
Figure 1.22 Coverage rate of education for children (%), nationally, urban and rural areas 2014/15-2019/20 35
Figure 1.23 School attendance rates by age and location (%) 35
Figure 1.24: School attendance status by age group and SES quintile, 2019/20, % 36
Figure 1.25: Infant and child mortality ratios, Mozambique versus SSA 38
Figure 1.26: Percentage of population with access to basic services 39
Figure 1.27: Rural-Urban access to basic services (2015 and 2020) in % 40
Figure 1.28: Percentage of households that report improvement in housing conditions 40
Figure 1.29: Improvement in housing conditions per income quintile group (2019/20; %) 41
Figure 1.30: Comparison of Poverty Changes and Growth in Sub-Saharan Africa and Mozambique 1996-2020 42
Figure 1.31: Comparison of Growth in Surveys and National Accounts in Mozambique 1996-2020 and World 43
Figure 1.32: Poverty outlook up to 2030 under different growth and passthrough scenarios (%) 45
Figure 2.1: Growth Incidence Curve (2014/15-2019/20; %) 46
Figure 2.2: Censored (1st percentile) Rural and Urban Growth Incidence Curves (2014/15-2019/20; %) 47
Figure 2.3: Cumulative consumption shares by ventile (2014/15-2019/20) 47
Figure 2.4: Gini Coefficient (2002/03-2019/20; %) 48
Figure 2.5: Gini Coefficient in Sub-Saharan Africa (latest datapoints since 2015) 49
Figure 2.6: Average historical Gini coefficient seasonal percentage deviation in previous surveys (%) 50
Figure 2.7: Gini coefficient with and without COVID-19 impact (%) 50
Figure 2.8: Poverty outlook with LNG under different inequality change scenarios (%) 52
Figure 2.9: Poverty outlook without LNG under different inequality change scenarios (%) 53
Figure 2.10: Estimated Poverty Rate by Province and District 54
Figure 2.11: Estimated Number of Poor by Province and District 54
Figure 2.12: Monetary vs. multidimensional poverty 56
Figure 2.13. Monetary poverty and specific non-monetary outcomes 56
Figure 2.14: Poverty and economic density 58
Figure 2.15: Poverty and accessibility 59
Figure 2.16: Conflict and natural disaster risks 61
Figure 2.17: Economic potential and its linkage with poverty 62

Figure 2.18: Coverage rate of basic opportunities for children (%), nationally 65
Figure 2.19: Coverage rate of basic opportunities for children (%), rural areas 66
Figure 2.20: Coverage rate of basic opportunities for children (%), urban areas 66
Figure 2.21: Coverage, HOI, and D-index for access to opportunities among children in 2014/15, % 67
Figure 2.22: Coverage, HOI, and D-index for access to opportunities among children in 2019/20, % 67
Figure 2.23: Decomposition of trends in the HOI between 2014/15 and 2019/20, by scale and distribution effects, change in percentage points 68
Figure 2.24: Contribution of each circumstance to inequality of opportunities in 2014/15 and 2019/20, % 69
Figure 2.25 – Mobility Curves by consumption Quintile 72
Figure 2.26 – Differences in education gaps by gender by consumption Quintile 73
Figure 2.27 – Differences in education gaps in urban vs rural areas by consumption Quintile 73
Figure 2.28 – Intergenerational mobility trends 74
Figure 2.29: Share of married and unmarried girls attending school (%) 76
Figure 3.1: Labor force participation by age and gender (population 15 years and above; %) 79
Figure 3.2: Labor force participation by location and gender (percentage of population 15 years and above) 79
Figure 3.3 Labor force participation by province and gender (population 15 years and above; %) 80
Figure 3.4: Characteristics of inactive population that is currently not in school - age, gender, and location (15 years and above) 80
Figure 3.5: Unemployment rate by gender and age (%) 81
Figure 3.6: Unemployment rate by region 82
Figure 3.7: Sector of work by employer type, 2019/2020 (%) 83
Figure 3.8 Number of People Working in the Household 83
Figure 3.9: Share of People that Work fewer Than 40 Hours (per Province) 84
Figure 3.10: Earnings across sectors of employment (2019/2020; MZN) 85
Figure 3.11: Poverty across employment sectors (2019/20; %) 86
Figure 3.12: Share of the population by type of employment across gender, age and region (%) 88
Figure 3.13: Poverty Rate by Occupation 89
Figure 3.14: Employment and labor participation by age 89
Figure 3.15: Share of households with at least one working child 90
Figure 3.16: Child labor in rural and urban areas 90
Figure 3.17: Sector of employment among working children 91
Figure 3.18: Child Labor (ages 5 to 14) 91
Figure 3.19 Percentage of firms by managers' highest level of education 92
Figure 3.20: Percentage of permanent, full-time production workers in highly, semi, and unskilled jobs 93
Figure 3.21: Basic skills among informal workers 93
Figure 4.1. Inequality and Poverty Impacts of the main taxes and transfers (2020) 94
Figure 4.2. Net Cash Position of Households after taxes and transfers, Share of Market Income Plus Pensions (2020) 97
Figure 4.3. African Countries Ranked by Tax Revenue, Share of GDP (%) 98
Figure 4.4. African Countries Ranked by Social Expenditure, Share of GDP (%) 98
Figure 4.5 Percentage of household with at least one member living outside[1] (%) 101
Figure 4.6 Average annual transfer received by households with at least one member living outside[2] (MZN) 101
Figure 5.1: According to the ND-GAIN matrix, Mozambique is one of the most vulnerable and least prepared countries to climate change as of 2019 102
Figure 5.2: Remote-Sensed Harvest Cycles suggest that Agricultural Production is Volatile 105
Figure 5.3: Harvest Cycles during the Growing Season are affected by Weather Events 106
Figure 5.4: All provinces experienced frequent occurrences of dry and wet spells across critical growing season months between 2004 and 2022. 107
Figure 5.5: Vegetation Dynamics in 2019 in Idai-Affected Districts 107
Figure 5.6: Harvest Cycle Disruptions in 2015 in Drought-Affected Districts 108
Figure 5.7: Shocks to Harvest Cycles in January 109
Figure 5.8: Actual and Counterfactual Night-Time Light Radiance from Beira 111
Figure 5.9: Percentage Difference from the Pre-Idai Path in Beira 112

Figure 5.10: Actual and Counterfactual NTL Radiance from Nampula 112
Figure 5.11: Percentage Difference from the Pre-Idai Path from Nampula 113
Figure 5.12: NTL Radiance rebounded quickly in smaller towns and ports after weather events 113
Figure 5.13: Poverty impact (international poverty line) 115
Figure 5.14: Value-added by sector, deviations from baseline scenario (%) 115
Figure 5.15: Impact on the poverty gap (international poverty line) 116
Figure 5.16: Perceived negative impacts of climate change on agricultural production 117
Figure 5.17: Share of respondents in Mozambique who think that climate conditions for agriculture got worse than 10 years previous, by province (2019) 117
Figure 5.18: Climate change literacy vs. literacy rate 118
Figure 1a: Seasonal consumption relative deviation from the mean in previous surveys (%) 124
Figure 1b: Average seasonal consumption relative deviation from the mean in previous surveys (%) 125
Figure 1c: Average seasonal consumption relative deviation from the mean in previous surveys (%) 125
Figure A: Per capita GDP growth per province, 2015-20 (%) 126
Figure B: Per capita GDP growth disaggregated by province, 2015-20 (%) 126
Figure C: Sectoral GDP growth, 2015-20 (%) 128

Tables

Table 1.1: Provincial Poverty rates (2019/20 and 2014/15; %) 21
Table 1.2: Rural/Urban Split by Province (2019/20) 23
Table 1.3 - Household Ownership of durable assets across surveys (%) 33
Table 2.1: Shapley Decomposition of the Poverty Rate (percentage points) 51
Table 2.2: Shapley Decomposition of the Poverty Gap (percentage points) 51
Table 2.3: Poverty rates at the provincial level 55
Table 2.4: Opportunities and circumstances of the Human Opportunity Index 64
Table 2.5: Main reason for not attending school among children ages 6-12 years in 2019/20, % 70
Table 2.6: Main reason for not attending school among children ages 13-18 years in 2019/20, % 70
Table 2.7 – Transition Matrix 71
Table 3.1 - Poverty by number of hours usually worked across gender 85
Table 3.2 - Poverty by number of hours usually worked across location 85
Table 3.3 - Poverty by number of hours usually worked across sectors 86
Table 3.4 - Monthly salary, years of education and years of experience across gender and location (for those with salary data) 87
Table 4.1. Fiscal Impoverishment, 2020 (Market income, plus pensions to consumable income) 98
Table 4.2. Percentage of households that receive transfer (%) 99
Table 4.3: Average transfers to households (in MZN) 100
Table 4.4: Average transfers by consumption quintile (per household and month, in MZN) 100
Table 5.1: Households victims of natural shocks and their wellbeing 104
Table 5.2: Household losses due to natural shocks in the last 12 months 104
Table 5.3: Households coping mechanisms after natural disasters 110

Boxes

Box 1.1: Poverty measurement: Consumption- or Income-based? 17
Box 1.2: COVID-19 and interruptions of routine health services 38
Box 2.1: The underestimation of inequality drawn from standard household surveys 49
Box 4.1: Second fiscal incidence analysis (FIA) for Mozambique (2023) 95

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Executive Summary

The 2023 Poverty Assessment provides a poverty and equity analysis of the period from 2015 to 2020, primarily drawing on data from the 2019/20 household budget survey (IOF 2020), which was conducted during the COVID-19 pandemic. This shock has had large and wide-ranging impacts, constituting a significant setback to the socioeconomic landscape. Therefore, the findings presented in this report reflect the wellbeing of the population during this particularly difficult time and their dynamics should be appropriately contextualized. Due to the strong but transitory nature of the shock, some of the observed effects, chiefly the changes in poverty and inequality, should be interpreted to a large extent as temporary. Data from the 2022 household budget survey (IOF 2022) will provide further insights into this matter.

The period analyzed in this report (2015-2020) is characterized by high economic volatility, both domestically and globally, explaining the significant reversal in poverty reduction. After falling ten percentage points down to 48.4 percent during the period from 2009 to 2015, poverty in Mozambique increased by seven percentage points in the absence of COVID-19, resulting in a poverty rate of around 55 percent. Shocks such as the hidden debt crisis and the ensuing macroeconomic instability led to a significant slowdown in GDP growth. The economic fragility was further compounded by the effects of two strong cyclones (Kenneth and Idai) that hit the country in 2019. This report finds that the COVID-19 pandemic doubled the increase in poverty, adding another seven percentage points. At the peak of the crisis, the poverty rate reached 62.8 percent, more than erasing the gains achieved before 2015. The evolution of regional and sectoral GDP during the period analyzed matches these trends and provides insights into the spatial and economic drivers of the increase in poverty. Moreover, the increase in monetary poverty occurred alongside an increase in multidimensional poverty, confirming the households' loss in wellbeing captured by consumption. The evidence shows that deterioration in non-monetary dimensions of household welfare began before COVID-19, with the pandemic exacerbating the negative trend.

As expected, urban areas were disproportionately affected by COVID-19 as lockdowns and movement restrictions hit secondary and particularly tertiary sectors the hardest – which explains more than 90 percent of the poverty increase (13 percentage points). Rural areas were relatively less affected by the pandemic (six percentage points) and more by the preceding shocks of the 2015-20 period (ten percentage points). The increase in poverty in rural areas pre-COVID-19 also appears to be linked to the overall demand shock associated with the economic slowdown, which the data shows affected performance across all sectors of the economy, slowing farm and off-farm incomes in the rural space. The impacts of environmental shocks on agriculture, particularly in 2015 (Chedza cyclone) and 2019 (Idai and Kenneth cyclones), were key drivers of rural poverty, but other factors likely contributed to the worsening of poverty in rural areas. First, non-agricultural workers in rural areas were negatively impacted by the hidden debt crisis. Second, agricultural workers engaging in off-farm income-generating activities were negatively affected by the contraction in the secondary and tertiary sectors. Third was the impact of price hikes, particularly for imports, resulting from the strong currency devaluation in 2016 and related high inflation.

Overall, poverty continues to be disproportionately concentrated in the north, both in absolute and relative terms. Conflict and fragility have exacerbated the incidence of poverty in this part of the country. At the same time, inequality remains high with a Gini ratio of 50.4 percent. This is despite a fall of 5.7

percentage points, mostly induced by a disproportionate drop in consumption among richer segments in urban areas during lockdowns and reduced mobility measures to control the spread of COVID-19.

While shocks are largely responsible for the significant setback in poverty reduction, persistent structural issues explain the stubbornly high levels of extreme poverty. Recurrent environmental shocks of different intensities keep eroding infrastructure investments and agricultural output. Slow economic transformation hinders growth and faster improvement in living conditions. Educational attainment is generally low, even though it correlates strongly with wage jobs in the public and private sectors – jobs that provide greater pay and security, but that remain out of reach for a majority. Agriculture, the sector where poverty is higher, provides the livelihood for 72 percent of the population while presenting very low productivity levels. The sector also operates with low levels of human capital as the majority of agricultural workers (over 75 percent) have only completed lower primary education or have no formal education at all. The labor market is characterized by few formal jobs, numerous informal jobs and low pay. In addition, and despite high labor force participation and employment rates, underemployment remains a pervasive issue. Almost half of those employed work less than 40 hours a week. Underemployment is significantly associated with higher poverty rates, in particular among women, because of the need to perform household chores traditionally associated to their role within the families (childcare, fetching water, cooking, etc.).

The fiscal system, which provides an instrument to alleviate poverty and help build the productive capacity of individuals, is slightly progressive but increases poverty. Taxes are marginally progressive, mostly because only the upper percentiles pay income tax and because the poorest percentiles buy less in formal shops implementing Value Added Tax (VAT). The fact that the fiscal system is progressive and yet poverty-increasing can be explained by indirect taxes disproportionately affecting the lower deciles of the upper half of the distribution, precisely those with incomes close to the poverty line. In fact, the net position of households (direct transfers minus both direct and indirect taxes) is negative for all but the first decile. Nonetheless, government expenditures are progressive and strongly so in the case of universal health and education as well as social transfers.

Environmental shocks had significant and long-lasting impacts in Mozambique. This report documents the large size and duration of economic damages and the negative effects on livelihoods. While agriculture employs a large part of the population (72 percent), its contribution to GDP is only 25 percent, so even if regular environmental impacts may not appear dramatic in terms of overall economic output, they do affect people's livelihoods deeply. The 2023 Mozambique Poverty Assessment finds that harvest cycles are frequently disrupted by weather events across districts and years, leading to up to a 25-30 percent drop in per capita food consumption and a 12 to 17 percentage point increase in poverty when and where that happens. Furthermore, the high degree of uncertainty created by erratic rainfall disincentivizes agrarian households from investing in the sunk costs (e.g., seeds and tools) needed to improve their agricultural productivity.

Given the recurrent exposure of Mozambique to both endogenous and exogenous shocks, strengthening resilience needs to be at the heart of policy design and implementation. The hidden debt crisis unleashed an endogenous shock that, as such, can be prevented or mitigated in the future through strengthened macroeconomic and fiscal governance. Cyclones, floods and droughts constitute exogenous shocks that are recurrently and increasingly affecting the country and on which the country can exert some sort of control to reduce vulnerability by strengthening adaptation in areas like agriculture, infrastructure and housing. Adopting impact mitigation measures such as strengthening the health system or disaster-linked social protection would also ameliorate the impacts of these shocks. The COVID-19 pandemic's impact

represented an exogenous shock upon which the country had little control beyond relying on mitigating measures. Future preparedness for the type of shock brought about by COVID-19 needs to be broadly addressed by strengthening health systems and safety nets as well as the necessary digital infrastructure to dampen the impact on the educational system and labor markets.

Introduction

Following the end of a 15-year civil war in 1992, Mozambique experienced a remarkable recovery. Reconstruction investments, the strengthening of a market-based economy, macroeconomic stability, policy reforms, and government and donor expenditures in basic services resulted in a rebound of economic growth and household incomes. Agricultural productivity also improved, leading to better livelihoods for most poor households. These positive developments contributed to Mozambique's sustained and strong economic growth, with a 7.2% average annual GDP growth rate between 2000 and 2016. As a result, Mozambique became one of the fastest-growing countries in Sub-Saharan Africa. The population's incomes were boosted by this economic expansion, with GDP per capita increasing annually by an average of 4% over the same period, rising from USD 629 to USD 1,280 (2017 PPP). This beneficial momentum, however, all but came to a halt in later years as per capita GDP stagnated after the discovery of hidden debts (2016) and then contracted with the COVID-19 pandemic to USD 1,233 (2017 PPP) in 2020.

The Poverty Assessment presented here showcases Mozambique's efforts at poverty reduction between 2002 and 2020, with specific focus on the timeframe encompassing the two most recent household budget surveys conducted in 2014/15 and 2019/20. The latter survey, despite having been carried out during pandemic lockdowns, was implemented face-to-face and is deemed fully comparable with the former. According to the findings of this study, the quality of life for the majority of Mozambicans experienced significant improvement from the early 2000s until 2015. During this period, the poverty rate exhibited a consistent downward trend, declining from 60.3 percent in 2002/03 to 48.4 percent in 2014/15. However, this positive trend was abruptly reversed during the 2015-20 period, with a notable increase of seven percentage points in the poverty rate. Furthermore, it is estimated that an additional seven-percentage point increase in poverty was caused by the COVID-19 pandemic. In a telling and worrisome summary of the situation in which Mozambican households live, the 2020 average daily consumption of Mozambicans was just 11 meticais above the poverty line (MZN 40.0). While urban areas show double that figure, the average consumption in rural areas fell below the poverty line (MZN 35.6)

Likewise, in welfare dimensions other than monetary, though the average household in Mozambique now has higher access to basic services such as education, health, safe water, sanitation and electricity, and owns more and better assets than at the beginning of this millennium, this improvement has been somewhat eroded in recent years. This mirrors the reversal in the poverty rate trend previously described. Challenges remain as a considerable portion of the population, particularly in rural areas, continue to face chronic well-being deprivation in non-monetary terms.

The previous spell of high GDP growth rates and falling poverty was accompanied by increasing inequality, which partially dampened the effect of the former on the latter. The latest period under focus in this report, on the contrary, experienced an improvement of the distribution of consumption with the Gini coefficient falling by 5.7 percentage points. Within the context of intensively adverse shocks to the Mozambican economy, this fall in inequality seems to stem mostly from the pandemic’s disproportionate impact of the consumption of the better off rather than an improvement in the inclusivity of growth.

The Mozambican Government followed a Five-Year Plan (2015-19) (*Plano Quinquenal do Governo*) with the distinct objectives of consolidating national unity, peace, and sovereignty; developing human and social capital; promoting employment, productivity, and competitiveness; enhancing economic and social infrastructure; and ensuring sustainable and transparent management of natural resources and the environment. These priorities were supported by three pillars: guaranteeing the rule of law, democratic

principles, and social justice; promoting a balanced and sustainable macroeconomic environment; and strengthening international cooperation. The Government aimed to expand and improve basic services, foster a favorable business environment, support national entrepreneurship, and enhance vocational training to achieve inclusive and sustained economic growth, increase job opportunities, and improve the productivity and income of rural and urban households. Special attention was given to youth, women, and veterans, with a focus on housing and employment. Additionally, agriculture and industrialization were prioritized as key factors for the modernization and diversification of the national economy.

In addition to this strategic plan, the Government adopted mitigation measures to combat the pandemic in 2020. These included increasing total government spending from 30.5 to 33.5 percent of GDP. Response measures included deferring income and corporate tax advance payments for small firms, reducing electricity tariffs, and crediting facilities on favorable terms. To protect families, the Government expanded the beneficiaries of social protection programs by over one million, simplified ID requirements for mobile money transfers to these beneficiaries, suspended VAT on some goods, and established a fuel stabilization fund allocating savings to the COVID-19 response.[1] In-depth analyses of government policies and programs, and their outcomes in key areas for poverty reduction such as transparency and governance[2], agriculture[3] and education[4] have recently been conducted and made available. All of this provides a relevant context to the poverty changes presented in this report.

This Report relies on several data sources. The main source providing the poverty, inequality and labor figures herein is the 2019/20 Household Budget Survey (*Inquérito sobre Orçamento Familiar*, IOF2019/2020) conducted by the National Statistical Institute (*Instituto Nacional de Estatística*, INE) starting in November 2019 and spanning 13 months. The survey's sample was drawn from the 2017 Census and allows for poverty figures to be representative at national and provincial as well as rural and urban levels. The fieldwork included data collection from 13,297 households interviewed across four quarters as in previous surveys, to account for seasonality effects like the impact on households' consumption of relatively more abundant post-harvest periods.

The starting point for the analysis is Chapter 1, which synthesizes progress in reducing poverty between 2014/15 and 2019/20. This chapter also looks at the regional distribution of poverty, the impact of the pandemic, multidimensional poverty, the profile of the poor, changes in the responsiveness of poverty to growth, discusses trends in non-monetary dimensions of wellbeing, and simulates future poverty trends. Chapter 2 examines the distribution of growth and inequality reduction over the period, the pandemic's impact, discusses the growth-poverty-inequality relationship, assesses the spatial dimensions of poverty and estimates the Human Opportunity Index for Mozambique. Chapter 3 focuses on labor markets and provides insights into labor force participation, unemployment, underemployment, employment sectors, child labor, and labor market demand conditions. Chapter 4 presents a fiscal incidence analysis and information on transfers. Chapter 5 examines the relevance of environmental shocks, assesses the impact of weather events on agricultural production and night-time light radiance in urban areas. It also models poverty and distributional impacts of climate change shocks and presents findings on climate change literacy in Mozambique. Finally, Chapter 6 discusses a variety of policy implications.

[1] World Bank, 2022: Mozambique Institutions and Economic Transformation Programmatic DPF.

2 Programa Quinquenal do Governo 2015-19

3 World Bank, 2022, Mozambique Economic Update: Getting Agricultural Support Right.

4 World Bank, 2023, Mozambique Public Expenditure Review: Rebalancing Public Spending. Washington D.C: World Bank Group.

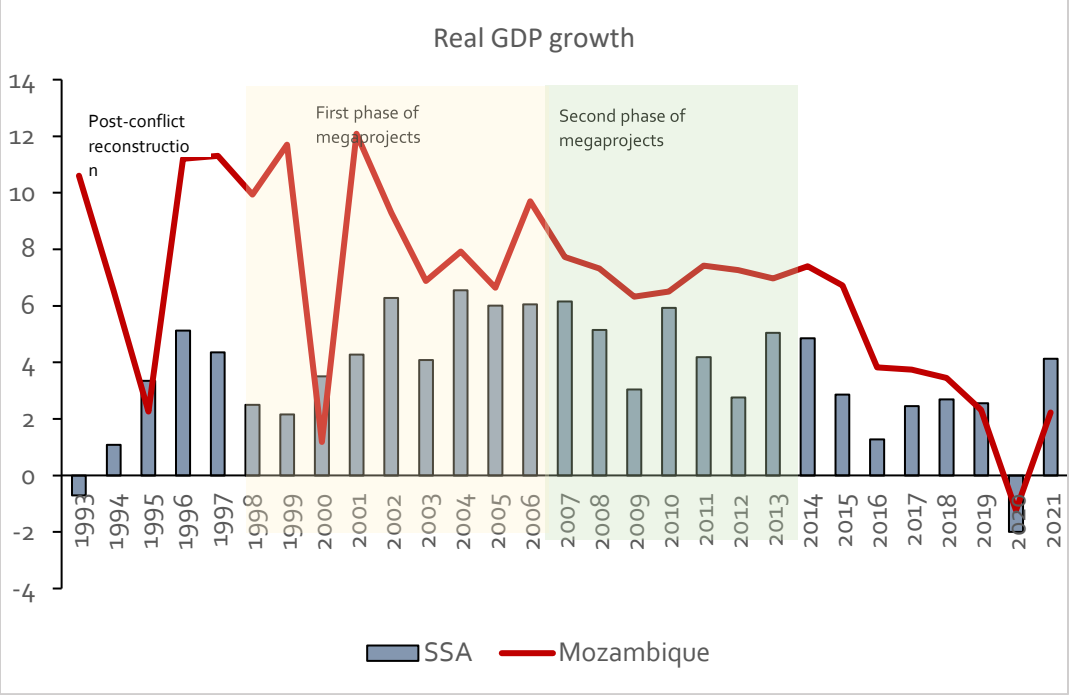
Chapter 1: Back-to-back shocks have erased some of the gains in poverty reduction

Mozambique's economy faced a slowdown and poverty increased during the 2015-2020 period. Economic activity decelerated dramatically following the hidden debt crisis in 2016, particularly in per capita terms. The economic fall-out was compounded by tropical cyclones Idai and Kenneth in 2019, with per capita GDP turning negative, and by the COVID-19 pandemic in 2020, resulting in a severe contraction of per capita GDP from negative 0.6 to negative 4.1 percent. The poverty rate increased seven percentage points from 48.4 percent in 2014/15 during this period, and another seven percentage points to 62.8 percent with the pandemic, with nearly 19 million people estimated to be living below the national poverty line in 2020. The COVID-19 pandemic increased poverty rates by 6 percentage points in rural areas and 10 in urban areas.

1.1 Turbulent years in the recent past have put Mozambique on a lower growth trajectory

Mozambique's economy suffered large upheavals in the 2015-20 period caused by successive shocks. Growth plunged from an average of 8 percent in 1993–2015 to 3 percent in 2016–2019 (**Figure 1.1**), owing to series of shocks, including the hidden debt crisis, tropical cyclones and, to some extent, insurgency in northern Mozambique. As a result of the subdued growth and a strong population growth of roughly 3 percent a year, per capita income declined dramatically. The COVID-19 crisis hit the country in the midst of the economic slowdown. The economic recovery from the COVID-19 pandemic has recently gained momentum and growth reached 4.1 percent in 2022 (12 percent in per capita terms), from 2.3 percent in 2021 despite the worsening global economic context.

Figure 1.1: Mozambique growth performance (%)



Source: World Development Indicators

Following a period of relative stability, inflation peaked in 2022, as international prices surged due to the Russian invasion of Ukraine. Tighter fiscal and monetary policies, and a strong currency, had brought inflation under control, from 15 percent in 2017 to 3 percent in 2020. The global economic recovery and supply chain disruptions led to inflation climbing to 5.7 percent in 2021, almost double the 2020 rate. The impact of the war in Ukraine on fuel and food prices led to further price pressures in 2022. Headline inflation reached 9.8 percent in December 2022 (year-on-year), the highest since 2017. Elevated inflation led to a rise in the cost of credit as the Bank of Mozambique (BM) raised policy rates, making real interest rates in Mozambique one of the highest in the region.

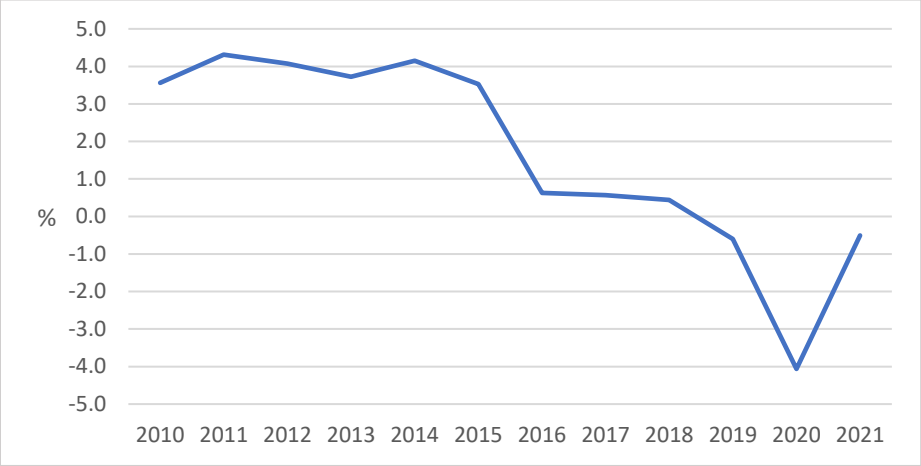
Macroeconomic vulnerabilities remain considerable, despite progress in macroeconomic management. The overall fiscal deficit narrowed from 7.1 percent of GDP in 2015 to 5.9 percent in 2022. However, fiscal capacity remains heavily constrained with limited space for development spending, as the public sector wage bill, debt service, and pensions currently absorb more than 90 percent of tax revenues. Total public debt stock declined to 102 percent of GDP in 2022, from 127 percent in 2016, mainly reflecting exchange rate appreciation, and limited access to external financing. Still, the country remains at high risk of debt distress, although debt is deemed sustainable in a forward-looking sense. Further, total domestic debt has continued to rise, as the authorities have resorted to the domestic debt market to cover increasing fiscal pressures - emanating from the increase in the wage bill, natural disasters shocks, and security and humanitarian needs in the north.

The strong growth performance in recent decades has helped reduce poverty, but at an uneven pace and in tandem with high inequality. Growth disproportionately benefited those at the top of the income distribution, with the Gini coefficient rising from 47 to 56 percent between 2002 and 2015. This pattern is partly due to heavy reliance on the extractive industry, with limited linkages to the broader economy, and low productivity in the agricultural sector—the main source of livelihood for the poor. Mozambique's growth strategy has particularly been limited in its capacity to generate productive jobs. Furthermore, the shift in the structure of the economy away from agriculture has been slow. Although agriculture's share of employment fell by 13 percentage points, from 83 percent in 1997 to 72 percent in 2020, it remains at high levels. At the same time, the sector's output share declined from 30 to 24 percent along this period. The bulk of the labor force shed by agriculture moved into services, whose employment share rose from 14 to 21 percent between 1997 and 2019. Although services provided a wider pathway to non-agriculture jobs, the sector is dominated by relatively low-productivity commerce and informal activities.

The uneven distribution of growth is also reflected of large gaps in living standards and economic opportunities across provinces as well as between rural and urban areas. Growth has benefited large urban centers disproportionately. Furthermore, large differences remain in human and physical capital between urban and rural areas. Disparities in access to basic infrastructure have been growing, with rural areas in the central and northern provinces lagging far behind.

From a poverty perspective, the 2015-20 period was one of very significant macroeconomic shocks that directly impacted the livelihoods of Mozambicans. Economic activity decelerated dramatically following the hidden debt crisis in 2016, as seen above, particularly in per capita terms (**Figure 1.2**). The revelation of previously undeclared loans plunged Mozambique into an economic crisis and macroeconomic instability, derailing its track record for high growth.

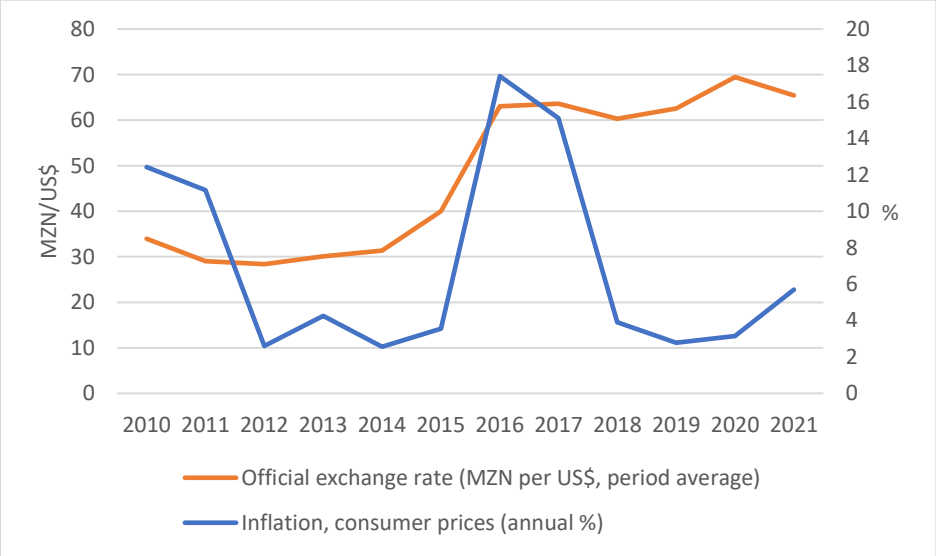
Figure 1.2: Per capita GDP growth (2010-21, %)



Source: World Development Indicators.

The discovery of hidden debt led to a severe crisis of economic governance and a major economic slowdown. Inflation surged and the value of the national currency plummeted, losing half its value vis-à-vis the US dollar, as seen in **Figure 1.3.**

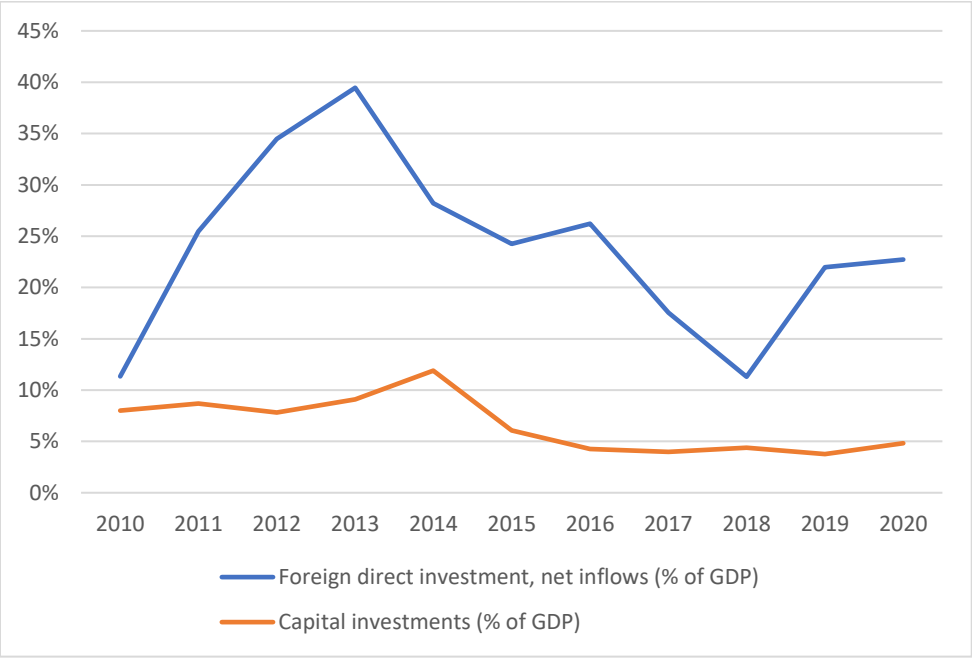
Figure 1.3: Exchange Rate and Inflation (2010-21)



Source: World Development Indicators.

Foreign Direct Investment inflows dropped from 24.3 to 11.3 percent of GDP between 2015 and 2018. **This added to a sharp contraction of capital expenditures**, which started falling already in 2015 and shrank to a half (6.7 percent) by 2017 – level from which it has practically not recovered (**Figure 1.4**). The fall in government investment crucially limited the government's ability to expand and restore essential infrastructure to foster the country's development.

Figure 1.4: FDI and Capital Investments (or Capital expenditures)



Source: Budget accounts (various), Boost and the National statistics institute.

The economic fallout from the debt scandal was compounded by tropical cyclones Idai and Kenneth in 2019, whose economic impact can be appreciated in **Figure 1.2** with per capita GDP turning negative. This extreme weather events resulted in stagnation of agricultural production in the centre and north of the country, an important source of livelihoods for over 70 percent of Mozambicans.

Then COVID-19 hit in 2020 leading to a severe contraction of per capita GDP from negative 0.6 to negative 4.1 percent (**Figure 1.2)**. The effects of the pandemic throughout the economy cannot be understated, and the analysis in this chapter clearly shows its direct effect on poverty. The Conflict in the north of the country, beyond its dramatic humanitarian impact, is sure to have affected economic performance. Yet a simple look at the evolution of the number of events of violence against civilians and battles, both with sharp increases in 2017, does not appear to show evident, distinguishable impacts on overall output. This notwithstanding, the conflict also had detrimental effects on the government's ability to invest in development, as military spending more than doubled during the period.

1.2 A more challenging economic context translated into higher poverty

The IOF 2019/20 survey this report mostly relies on was implemented the year the COVID-19 pandemic struck, with profound socioeconomic effects throughout the world. Mozambique was no exception and endured prolonged lockdowns and other restrictions to movement and activity. Intertwined with the effects of the pandemic are the developmental results for the previous six years of macroeconomic volatility and sluggish economic growth as well as natural (chiefly cyclones) and man-made (hidden debt crisis and increasing conflict in the north) shocks. As a result, households experienced a substantial reduction in consumption across the country.

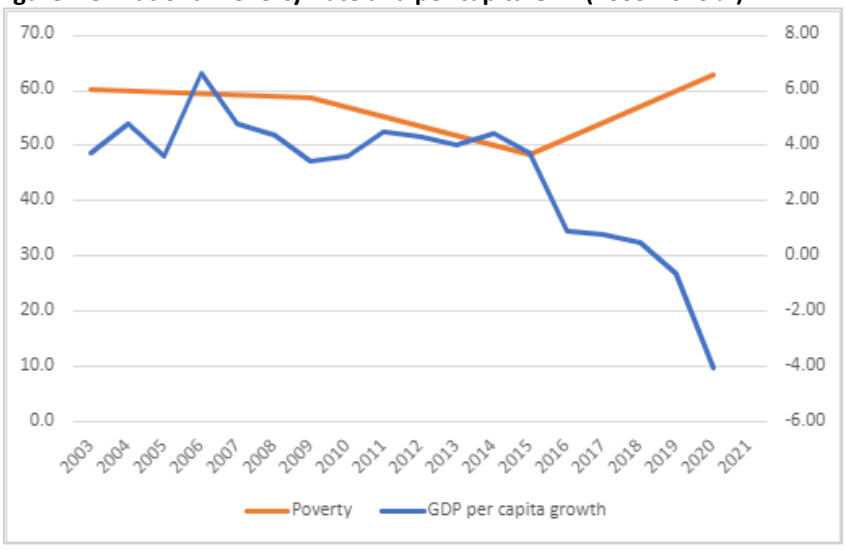
Box 1.1: Poverty measurement: Consumption- or Income-based?

In countries with high rates of poverty and informality, it is standard practice to use household consumption instead of income to assess poverty and inequality. Households primarily deriving their livelihoods from the informal sector, as is the case for most of the population in rural areas engaged in agriculture, tend to register highly variable incomes across time. This is due to agricultural seasonality and the relatively unforeseeable character of informal earnings. Consumption, however, tends to be smoother as basic expenditure needs are less affected by seasonal conditions. Food, housing, transport, and energy, for instance, are all expenditures that cannot easily be differed and are part of a steady consumption required by the household. The downside of using consumption to measure poverty is of course that it misses savings. While this may not have a significant effect on the measurement of poverty in countries with a high headcount rate, it can have it on the measurement of inequality because the better off the household, the more using consumption instead of income may miss in terms of savings, something that is further discussed in Chapter 2.

Overall, 62.8 percent of Mozambique's population or 18.9 million people were estimated to live under the national poverty line[5] in 2020, an increase of 14.4 percentage points from the last survey in 2014/15 **(Figure 1.5)**. The downward trend of the of the 2008/09-2014/15 period reverses and poverty raises from 48.4 to 62.8 percent, undoing the important gains in poverty reduction of the preceding decade. With the headcount rate well above the 2008/09 level (58.7 percent), Mozambicans find themselves in a worse situation than a decade ago.

The sluggish per capita GDP growth after the hidden debt crisis in 2016 and before the deep drop of the COVID-19 pandemic in 2020 point to the fact that poverty had already fallen substantially by the time COVID-19 struck.

Figure 1.5: National Poverty Rate and per capita GDP (2003-2020 %)

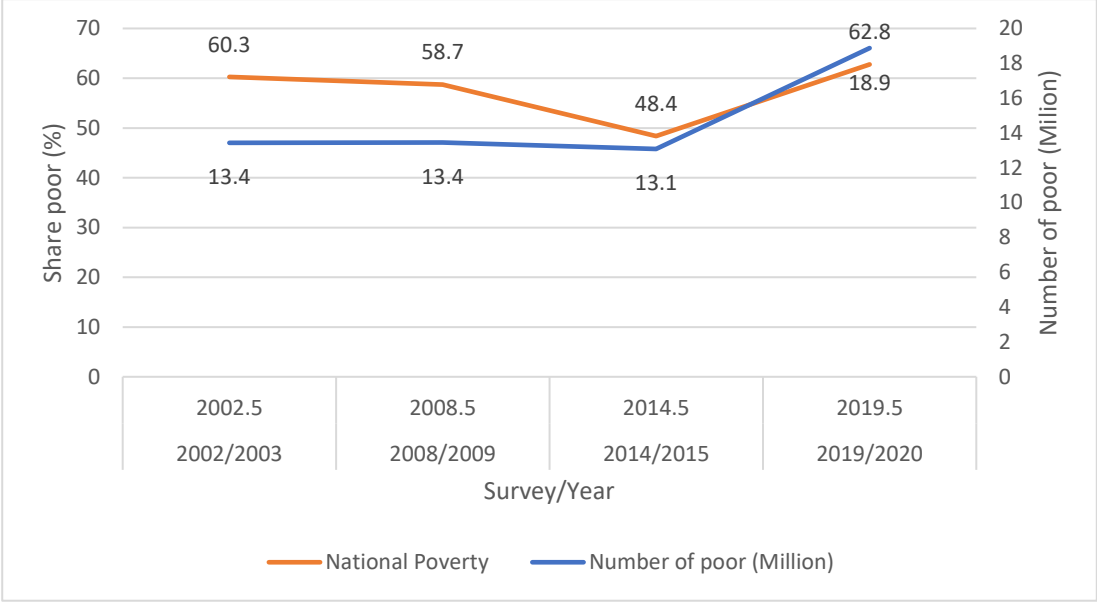


Source: IOF 2014/15 and 2019/20

[5] In Mozambique, the World Bank uses a single national poverty line based on a minimum consumption basket similar to that used by the Government. There exist large methodological differences, however, in the estimation of poverty levels between the WB and the Government. While the former relies on a single poverty line and accounts for price differences across the countries by applying a spatial deflator, as is standard in the WB across countries, the Government traditionally applies different poverty lines for each rural and urban area in each province.

In a context of fertility rates as high as 4.7 (2020) and an associated population growth of 3 percent, the pronounced increase in the poverty rate has resulted in an even steeper rise in the number of poor. Indeed, **Figure 1.6** shows that the number of poor remained roughly constant in the period between 2003 and 2015 despite two consecutive poverty reduction spells. In the last period, in contrast, the number of poor substantially jumped from 13.1 to 18.9 million, an increase of 5.8 million additional poor.

Figure 1.6: Poverty Rate and Number of Poor (2003/03-2019/20)



Source: IOF 2014/15 and 2019/20

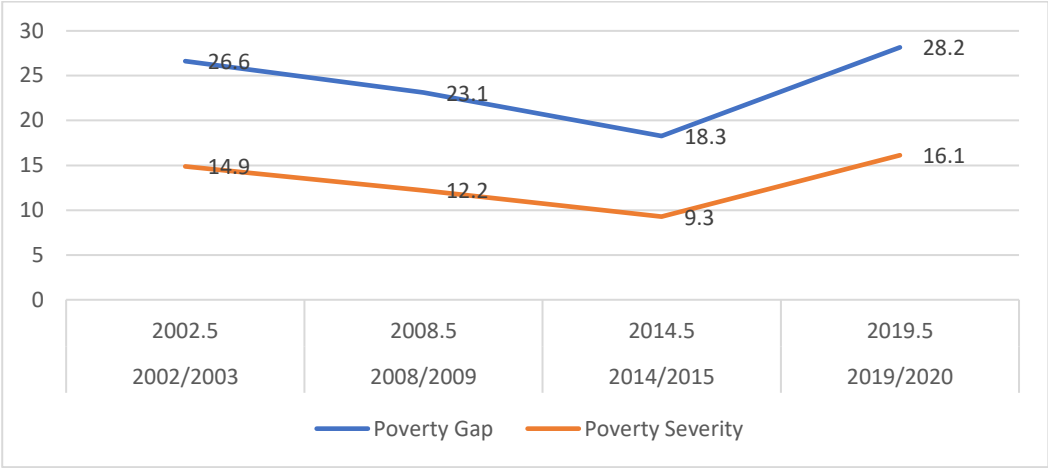
The sharp increase in the headcount rate is accompanied by a similar surge in the poverty gap, as reflected in **Figure 1.7**. The poverty gap measures how relatively far below the poverty line the average consumption of the poor falls.[6] This measure fell steadily in the two previous survey periods, from 26.6 percent in 2002/03 to 18.3 percent in2014/15. In 2020, however, it climbed to 28.2 percent, above 2008/09's level. This means that the average poor person consumes 30 meticais a day, almost 30 percent below the poverty line (MZN 40).

Such a fall can be explained by a generalized drop in household consumption and does not stem from a relatively large group of households around the poverty line having fallen just below it. If that had been the case, we would not observe such an increase in the depth of poverty as the recently impoverished household would have pulled the average consumption of the poor closer to the poverty line. This is also shown by the severity of poverty, which places additional weight on the poorest among the poor.[7] A marked increase in the last spell indicates that there is a higher concentration of poor households at very low levels of consumption.

[6] The poverty gap expresses the distance between the mean consumption of the poor and the poverty line relative to the poverty line.

[7] The severity of poverty is the average value of the squared relative distance of the poor to the poverty line and is a measure that is sensitive to differences between the poor by disproportionately valuing the presence of very poor people far below the poverty line.

Figure 1.7: National Poverty Gap and Severity (1996-2020; %)



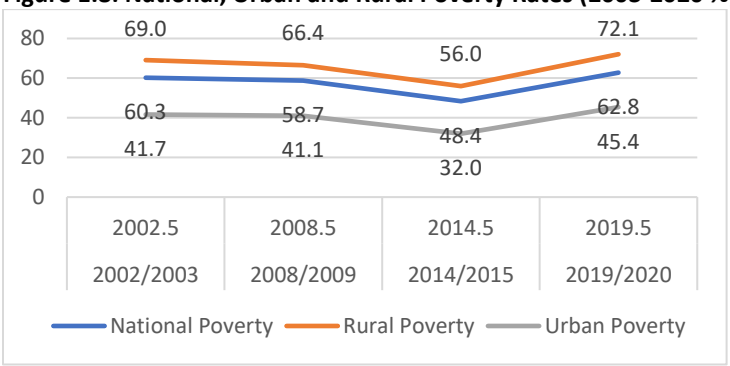
Source: IOF 2014/15 and 2019/20

An important caveat is necessary when reading the above poverty results obtained from the 2019/20 survey. Roughly three quarters of the data were collected during recurring lockdown periods in response to the pandemic. These results should to some extent be viewed as transient. The implication is that some of the substantial fall in consumption is due to the impact of the lockdowns and decreased mobility. Not only did economic activity fall, but it is also highly plausible that households attenuated consumption in times of uncertainty and movement restrictions. This is particularly pertinent to the upper part of the distribution, thus contributing to the relatively stronger shock we capture in higher percentiles. The result is that the poverty rates estimated herein may considerably differ from the 'underlying' poverty level.

1.3 The uneven distribution of poverty across the Mozambican geography

Along the same lines of previous poverty assessments, the regional distribution of poverty shows a country with a stark contrast between urban and rural areas (Figure 1.8). Rural poverty at 72.1 percent is 26.7 percentage points higher than urban poverty (45.4 percent). A weak pattern of poverty convergence between urban and rural areas can be observed up to 2015. Yet the gap has widened again in the last period due to a slightly larger absolute poverty increase in rural areas (16.1 percentage points). Urban areas have experienced a dramatic 42 percent relative increase in poverty (13.4 percentage points) in 2020.

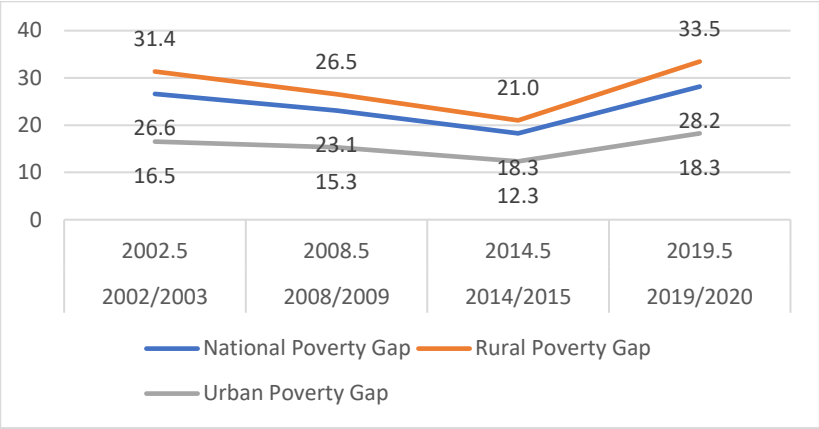
Figure 1.8: National, Urban and Rural Poverty Rates (2003-2020 %)



Source: IOF 2014/15 and 2019/20

The disproportionate increase in poverty in urban relative to rural areas can be explained by the fact that while there has been a generalized contraction in consumption over the last period up to 2020, urban areas appear to have disproportionately been impacted. These results strongly suggest that the effects of COVID-19 were disproportionally felt in urban areas where imposed reduced mobility appears to have had larger impacts. This is also consistent with emerging evidence from other countries, including from Sub-Saharan Africa. In addition, it is plausible that the preceding macroeconomic and extreme natural events also affected urban, coastal areas the most, relatively speaking (see **Chapter 5** on shocks for further detail). The latter qualification is important, however, and a caveat is therefore in order. Urban areas may have been disproportionately impacted relative to their consumption levels. Yet rural areas, with a much higher poverty headcount and gap (**Figure 1.9**), have experienced a widespread worsening of consumption levels of those already living in poverty and for whom any fall in consumption has more serious effects on household welfare.

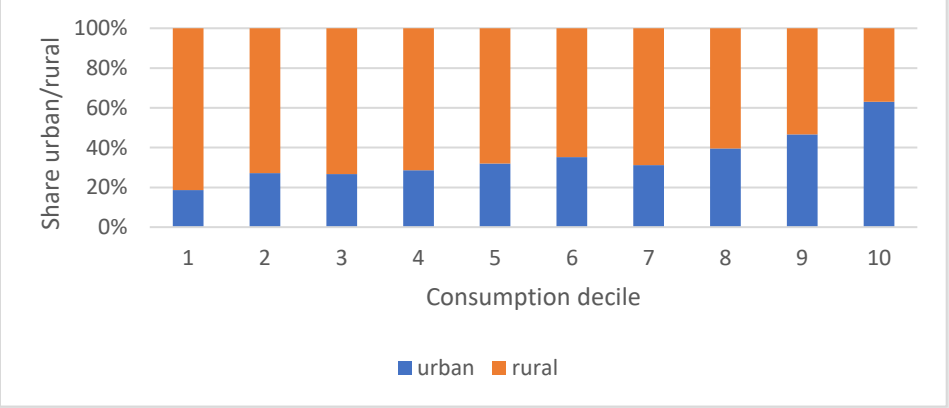
Figure 1.9: National, Urban and Rural Poverty Gaps (2003-2020 %)



Source: IOF 2014/15 and 2019/20

A striking characteristic of the geography of poverty in Mozambique is that although poorer households are disproportionately located in rural areas, they are by no means circumscribed to these. Indeed, **Figure 1.10** shows that there remain significant shares of rural population even in the uppermost consumption deciles. In other words, a smaller but nonetheless significant share of the better off (worse off) households live in rural (urban) areas. This notwithstanding, while only a third of the country's population is urban, over 60% of the richest 10 percent of the population live in urban areas.

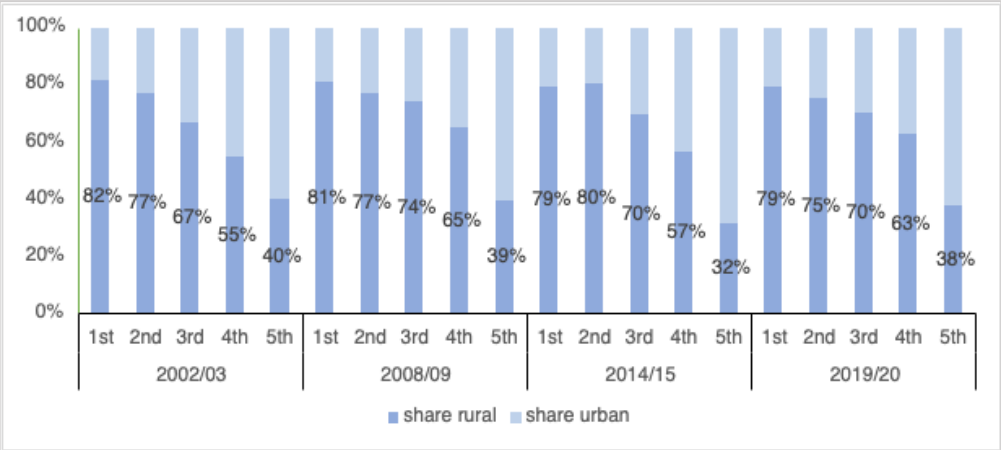
Figure 1.10: Proportion of Rural and Urban Population per Consumption Decile (2019/20)



Source: IOF 2014/15 and 2019/20

The overtime comparison of the evolution of rural/urban shares across quintiles displayed in **Figure 1.11** appears to indicate a marked change in the proportion of people living in rural areas in the top consumption quintile both in 2015 and 2020. While in 2015 this proportion fell, it increased very substantially from 32 to 38 percent in 2020, possibly indicating a higher impact of COVID-19 on urban relative to rural areas. This would be consistent with the findings on impacts of COVID-19 reported further down, with urban areas experiencing a stronger hit.

Figure 1.11: Population Shares across Consumption Quintiles



Source: IOF 2014/15 and 2019/20

Except for Maputo City (11.4 percent) and Maputo Province (22.4 percent), all other provinces show poverty rates well above 40 percent, as presented in **Table 1.1**. On the lower part of the spectrum, Tete and Inhambane present poverty rates of 49.5 and 56.2 percent, respectively, whereas Nampula (81.0 percent), Cabo Delgado (77.6 percent), Zambezia (75.1 percent), and Gaza (65.1 percent) find themselves at the top end. Niassa follows with 58.5 percent and provides a somewhat positive result with markedly lower headcount than its poorer neighbours at the top of the provincial ranking and a substantial fall in poverty of 8.5 percentage points from 2015 to 2020. Cabo Delgado, with a poverty rate of 50 percent back in 2015 is now the second poorest province, witnessing a dramatic increase of 27.6 percentage points.

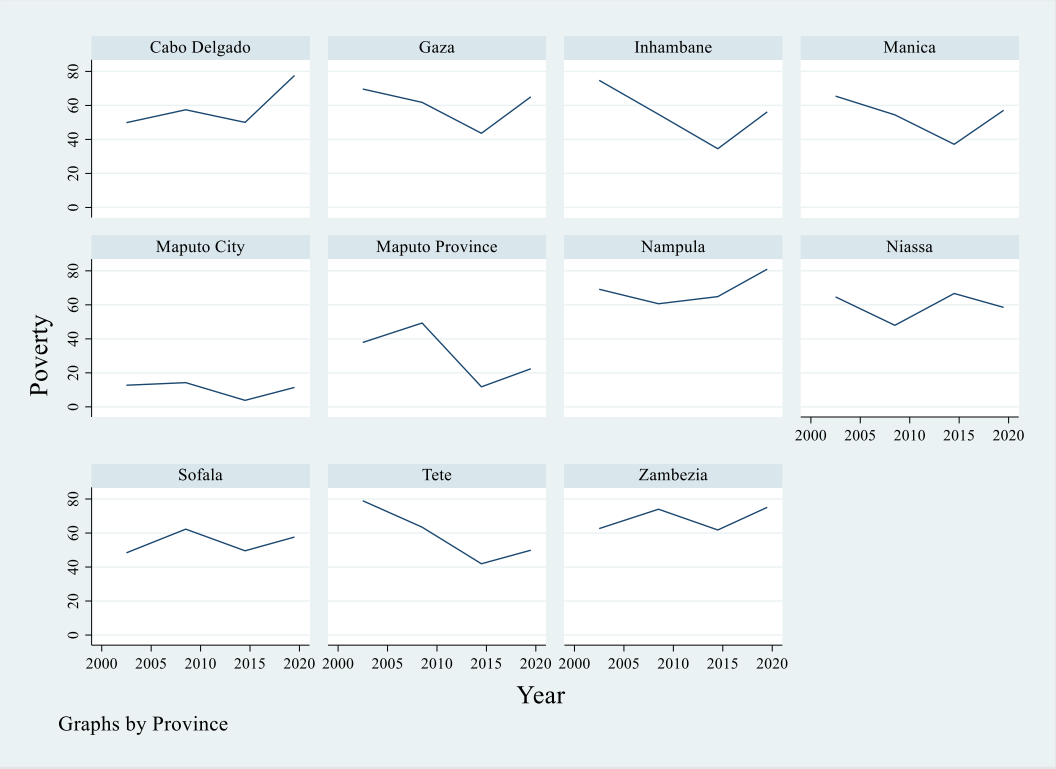
Table 1.1: Provincial Poverty rates (2019/20 and 2014/15; %)

Province	2014/15 Poverty Rate	2019/20 Poverty Rate
Maputo City	4	11.4
Maputo Province	12	22.4
Tete	42	49.9
Inhambane	35	56.2
Manica	37	57.1
Sofala	50	57.6
Niassa	67	58.5
Gaza	44	65.1
Zambezia	62	75.1
Cabo Delgado	50	77.6
Nampula	65	81.0

Source: Own estimations based on IOF 2019/20.

The evolution of the poverty rate by province over time is shown in Table 1.1 and displayed in **Figure 1.12.** All provinces but one follow the national trend with a stark increase in the headcount during the last spell. The notable exception is Niassa, where the poverty rate alternates between large drops and increases over time. Among the potential explanatory factors for the relatively better situation of Niassa vis-à-vis its immediate neighbours could arguably be its easy access to Lake Niassa and its avoidance of large natural shocks such as the tropical storms and floods in Nampula or the conflict in Cabo Delgado (and increasingly in Nampula). Also, the recent opening of important road and railway links to Nampula may have played a decisive role in ameliorating poverty in this province. This seems to be supported by food insecurity indicators, which also portray a region which is performing significantly better than its bordering provinces. Famine Early Warning System Network data show far lower food insecurity in Niassa than in neighbouring Zambezia, Nampula and Cabo Delgado. Indeed, Niassa is the only province in the country apart from Maputo City which does not present any area under situation of stress or crisis in terms of access to food.[8] In all other provinces except Nampula, poverty broke away from the previous downward trend during the 2008/09-2014/15 period and climbed very significantly. In Nampula, the province with the highest percentage of poor, the poverty rate continued and even accelerated the upward trend it has presented since 2008/09.

Figure 1.12: Poverty Evolution by Province (2002/03 – 2019/20 %)

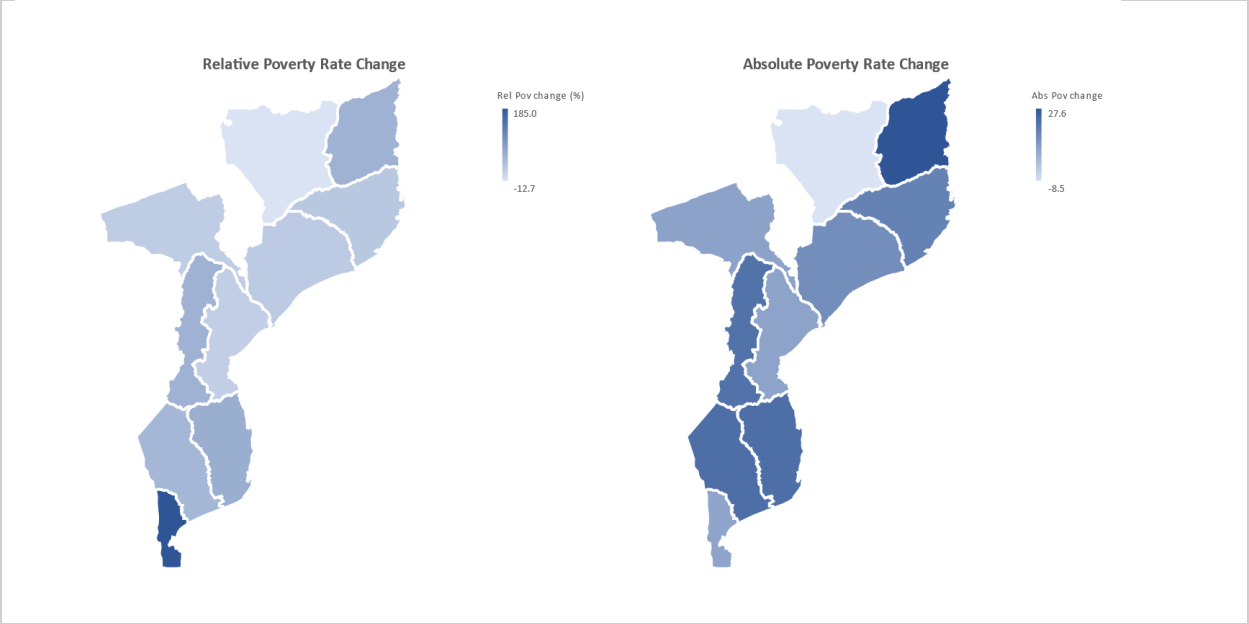


Data source: IOF 2014/15 and 2019/20.

Regionally, while poverty has increased in all regions, the relative increase is far larger in Maputo City and Province, as shown in F**igure 1.13**.

[8] In: https://fews.net/southern-africa/mozambique. Visited on September 19, 2022.

Figure 1.13: Relative and absolute poverty increases by province (2015-20; %; pp;)



Source: Own estimations based on IOF 2014/15 and 2019/20.

The only province with most of the population living in urban areas is Maputo City, as can be seen in **Table 1.2**. Maputo Province is the only other province with more than a 40 percent urban population, whereas in all other provinces the share of rural population is well above 60 percent, ranging from 63.3 percent in Nampula to 81.9 percent in Zambezia. Given the size of the provinces and their geographic spread, it is difficult to identify urban vs. rural as effectively as it is to identify coastal vs. interior impacts on poverty of shocks from a simple analysis of the proportion of rural/urban population and geographic situation relative to the coast. For this reason, a geographic correlation analysis is provided below in section (2.3).

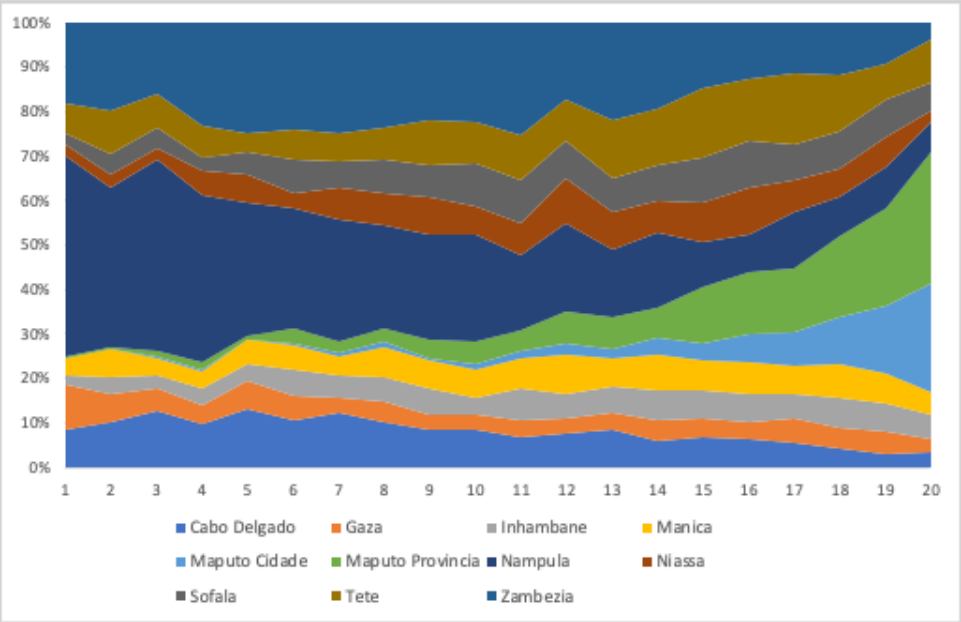
Table 1.2: Rural/Urban Split by Province (2019/20)

Province	***Urban***	***Rural***
Maputo City	100.0	0.0
Maputo Province	71.3	28.7
Sofala	42.1	57.9
Nampula	36.7	63.3
Manica	34.9	65.2
Gaza	33.4	66.6
Inhambane	29.0	71.0
Niassa	26.2	73.8
Cabo Delgado	23.6	76.4
Tete	22.9	77.1
Zambézia	18.1	81.9
Total	**34.9**	**65.1**

Source: Based on IOF 2019/20.

The geographical distribution of the population by expenditure ventiles (**Figure 1.14**) clearly shows how the top ten percent (two top ventiles) of the population is largely concentrated in Maputo city and Maputo Province. On the other side of the expenditure distribution, poorer people are clearly concentrated in Nampula, Zambezia and Cabo Delgado, results that are displayed in more detailed in Ch2.

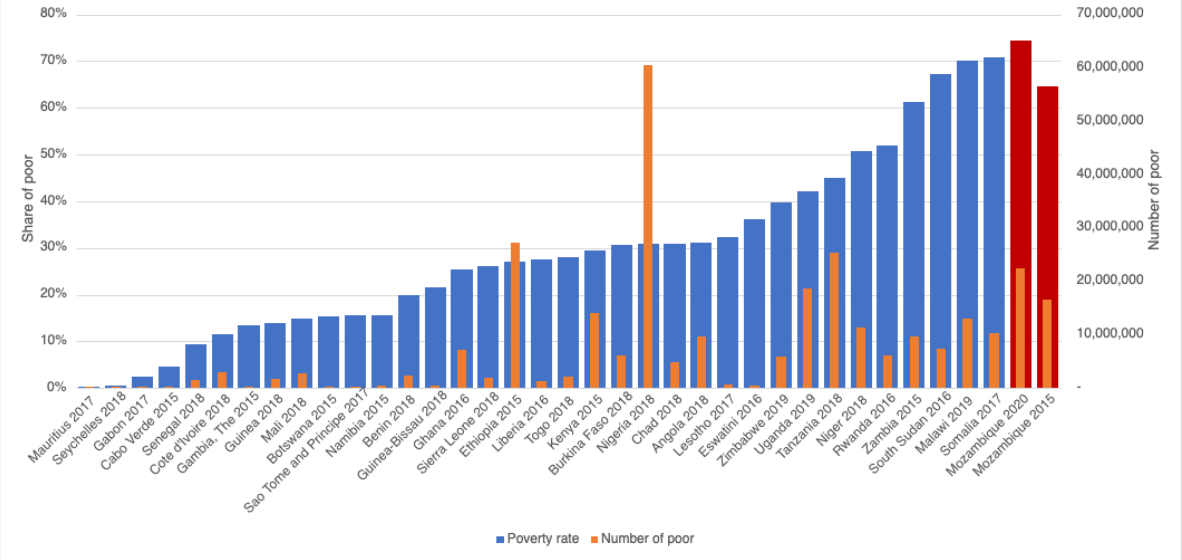
Figure 1.14: Distribution of Population per province and ventile, 2019-20



Source: Own estimations based on IOF 2019/20.

Regionally, both in 2015 and 2020 the country was among the poorest countries in Sub Saharan Africa, although results presented in **Figure 1.15** do not account for the impacts of COVID-19 in countries other than Mozambique. This holds true in relative, percentage of poor (left axis), as well as in absolute terms, the total number of poor (right axis), with 74.4 precent and 22.4 million respectively. The comparison, however, needs to be caveated because Mozambique is the only country with a survey carried out during COVID-19. As data from other countries that have carried out surveys during or immediately after COVID-19 become available, other countries may show poverty rates as high or higher than those of Mozambique.

Figure 1.15: Percentage and number of poor in Sub-Saharan Africa (USD 2.15 IPL,[9] latest since 2015)



Source**:** IOF 2019/20 and World Development Indicators. Latest estimates since 2015.

[9] International Poverty Line: USD 2.15 a day per person in 2017 Purchasing Power Parity USD

1.4 Poverty changes were driven by compounding shocks

Identifying the drivers of changes in poverty is no easy task and is particularly difficult in the case of compounding shocks. The present section utilizes two approaches to determine the likely causes behind the dramatic increase in poverty observed between 2015 and 2020. First, it deploys an innovative technique to estimate the additional contribution of the pandemic to poverty by simulating poverty in 2020 in the hypothetical absence of COVID-19. This simulation is based on past historical seasonality in the survey consumption aggregate. Second, based on the somewhat close relationship between per capita GDP growth and poverty changes, it looks at the regional and sectoral variation in GDP throughout the period to try to identify what changes may be associated with the overall poverty change in the period.

Documenting the burden of COVID-19 on poverty

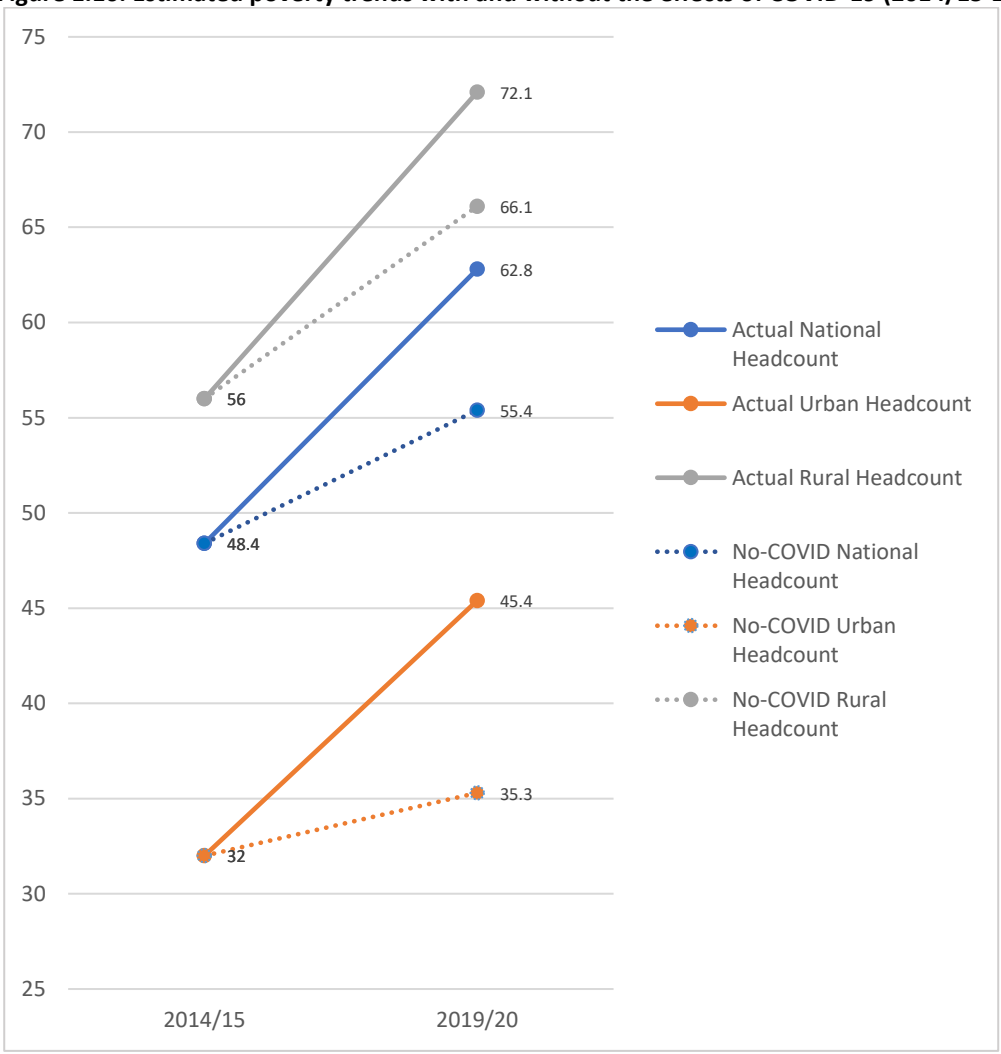
The COVID-19 pandemic and subsequent responses through widespread lockdowns delivered a heavy blow to economies throughout the world. The recent Human Development Flagship Report (World Bank, 2022) shows that the erosion of human capital from the pandemic was largest among the poor and that this could lead to a sharp increase in inequality in the future. Yet, less is known in terms of the real extent of this impact on poverty in countries in the Sub-Saharan region. When lockdowns started in Mozambique in March 2020, the IOF2019/20 was under way and had just completed the first quarter of data collection. As it turns out, this provides an opportunity to estimate the impact of COVID-19 on poverty by recreating a "COVID-free" counterfactual based on the historical consumption pattern observed in the previous three consecutive surveys (2002/03, 2008/09, 2014/15) as shown in Annex 1.

In the absence of COVID-19 and based on the historical seasonality in consumption patterns of the previous three surveys, the national poverty rate in 2019/20 may have been around 55.4 percent instead of the 62.8 percent derived from the survey. The pandemic alone may therefore have reversed the poverty reduction of the preceding period, leading poverty to surge by over 7 percentage points[10] and plunging an estimated additional 3 million Mozambicans into poverty. With an estimated 5.8 million additional poor in the last spell and three of them directly 'attributable' to COVID-19, we can conclude that the number of poor might have increased by around 3 million during this period even without the effects of the pandemic. The economic upheavals of that spell seem to have all but reversed the poverty reduction of the preceding 2008/09-2014/15 period.

The seasonality adjustment to 2019/20's national consumption can also be applied to both rural and urban populations as the survey is representative at those levels. Doing this provides a coherent story vis-à-vis the evolution of national, urban and rural poverty discussed in the previous section, namely that the effect of COVID-19 was relatively larger on urban than rural poverty. In absolute terms, the net impact of COVID-19 on rural poverty is estimated at 6 percentage points, compared to 10 percentage points in urban areas, as shown in **Figure 1.16**. Without the pandemic and based on the counterfactual, the poverty rate in urban areas would have increased by 3 percentage points while that in rural areas would have done so by a staggering 10 percentage points. The poverty rate in urban and rural areas without the impact of COVID-19 would have been 35.3 and 66.1 percent, respectively.

10 Given the counterfactual nature of the exercise, rounding up 7.4 percentage points to full points is arguably more in accordance with the accuracy of the estimate.

Figure 1.16: Estimated poverty trends with and without the effects of COVID-19 (2014/15-2019/20 %)



Source: Own calculations based on IOF2019/20.

Overall, rural areas saw poverty surge during the 2015-20 period, with COVID-19 contributing around one third to the total increase. Urban areas, on the contrary, experienced a mild increase in poverty in the whole period but a very sharp increase, while by over 40 percent, during the pandemic. These results indicate that poverty increased significantly in rural areas and slightly so in urban areas during this period, while the reverse appears to have happened because of the pandemic.

As discussed in the first section of this chapter, recent events would have led to an increase in poverty even without the additional impact of the pandemic. From a macroeconomic perspective, it appears that the fallout from the hidden debts had the strongest impact in the 2015-20 period. It is therefore safe to assume that this impact directly affected the welfare of households in a major way. Environmental shocks can also be clearly linked to impacts (more on this in Chapter 4) although to a lesser degree. What is less straightforward is what role rapid population growth and inflation may have played in this poverty increase. The former adds a mechanical contribution to poverty as it is characterized by higher growth rates among the poor. The latter does not provide a clear direction of change in poverty and depends on relative food inflation, the construction of the consumption aggregate and the extent of households' self-consumption in relation to other expenditures, among other things.

Other shocks during the 2015-20 period are responsible for half of the overall poverty increase

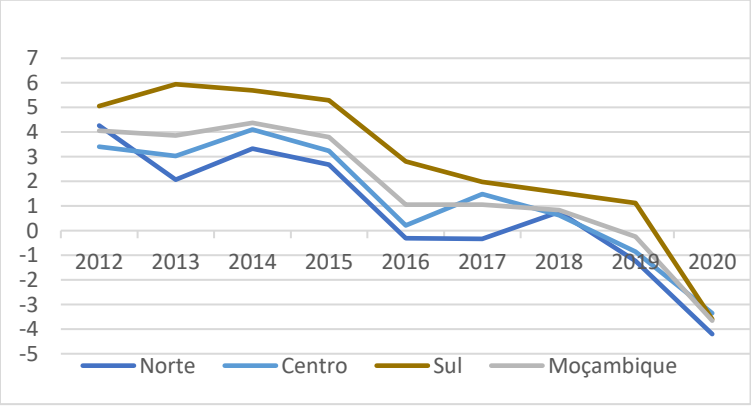
Surveys upon which poverty estimates are based represent snapshots in time. Identifying where poverty changes stem from, however, requires data during the in-between periods. One available source of more frequent data is national accounts. Yet these data pose some challenges. GDP data in countries with high informality, like Mozambique may not be fully reliable as it inadequately captures output from this sector. Indeed, informal activity may also be captured by Night-Time Light (NTL) satellite data – as reported in World Bank 2021. This is particularly true for official province-level figures. On the other hand, NTL data does not accurately capture variations in economic activity as it is characteristically cumulative in nature. Therefore, caution must be exercised when interpreting the following GDP figures at the provincial and sectoral levels due to potential quality issues.

Per capita GDP growth per region

The evolution of per capita GDP since 2015, as depicted in Figure 1.2 in section 1.1, provides a clear explanation of the observed changes in poverty. In 2016, following the discovery of hidden debts, per capita GDP declined by three percentage points. It further contracted by an additional one percentage point in 2019, when cyclones Idai and Kenneth struck, and it plummeted by over three percentage points in 2020 due to the COVID-19 pandemic. Half of the decline in per capita GDP occurred before COVID-19, while the other half occurred during the pandemic. This aligns well with the estimated increase in poverty, with half of it directly attributed to the impact of COVID-19 (seven percentage points) and the other half attributed to previous shocks.

Although the increase in poverty rates, between 12 and 14 percentage points, was similar across all three regions in absolute terms, the relative increase was much higher in the south as this region presents much lower poverty levels. The northern and central regions had poverty rates of 63.3 percent and 76.1 percent, respectively, while the estimated poverty rate in the south was 38.5 percent. These poverty results align well with the trajectories of per capita GDP across the regions as shown in **Figure 1.17**. All three regions experienced a significant decline in per capita GDP of approximately three percentage points in 2016 following the hidden debt crisis. With the pandemic, their economic growth further contracted, leading to increased poverty.

Figure 1.17: Per capita GDP growth per regions, 2012-20 (%)



Source: INE

The southern region, which initially had higher per capita GDP growth until 2020, did not recover from the 2016 shock and has witnessed a decline in per capita GDP every year since. However, it still experienced a small increase in urban poverty during the period, excluding the pandemic's effect (3.3 percentage points). The impact of the pandemic in the south was more pronounced compared to the other two regions, explaining the disproportionate increase in urban poverty (10.1 percentage points), particularly in the Maputo area, as shown in **Figure 1.13**.

The northern region has the highest poverty rate (76.1 percent). It also experienced a sharp decline in per capita growth in 2016, closely associated with the hidden debt crisis. The following year showed no growth, followed by a slight one percentage point improvement in 2018 and consecutive declines of two and three percentage points in 2019 and 2020, respectively. This region encountered multiple reductions in per capita GDP during the five-year 2015-2020 period, indicating that COVID-19 was not the sole driver of poverty increases. The conflict and the aftermath of the hidden debt crisis also played important roles.

The growth pattern of the more rural northern and central regions reveals a larger overall fall in per capita GDP growth in the years preceding the pandemic. This confirms the finding that while COVID-19 also had an impact on rural areas with an estimated increase in poverty of six percentage points, previous shocks had a larger effect on poverty, resulting in a ten –percentage point increase.

Per capita GDP growth per province

Per capita GDP growth per province shows a somewhat complex picture of general falls but with some diversity, (see Annex1: Figure A and Figure B, disaggregated by province). Three provinces—Maputo City, Gaza, and Inhambane—appear to have suffered relatively less from the 2016 crisis. All other provinces experienced a strong contraction that year. However, when COVID-19 struck, the opposite appears to hold true. These three provinces experienced a disproportionately larger fall in per capita growth than the rest. Since these provinces had the highest rates of growth at the beginning of the period, they also show the most dramatic changes in poverty. Gaza and Inhambane experienced absolute declines while Maputo's relative poverty levels changed significantly due to its lower poverty levels. These observations correlate well with the intensity of absolute and relative poverty changes observed in Figure 1.13 in section 1.3.

In the north, Cabo Delgado, which had enjoyed a recovery in per capita GDP growth in 2018, subsequently saw the largest falls following increased violence, explaining the marked increase in poverty observed in this region in 2019 and 2020. Sofala is the province that experienced the sharpest decline in per capita growth in 2019, the year Idai and Kenneth cyclones hit the country. Niassa's per capita GDP record is somewhat puzzling as it consistently fell over the period while poverty was reduced, indicating possible data quality issues (see poverty discussion on Niassa). Cabo Delgado clearly shows the impact of the conflict with the sharpest economic contraction over the period.

In the center, while Sofala experienced sharp substantial contractions in both 2019 and 2020, Zambezia, Tete, and Manica saw a sharper fall in 2020, indicating that the 2019 cyclones affected Sofala the most, and COVID-19 subsequently impacted all of them. Tete and Sofala experienced the strongest contractions after the hidden debt crisis in 2016, although Tete seemed to have partly recovered in subsequent years and up until the pandemic hit.

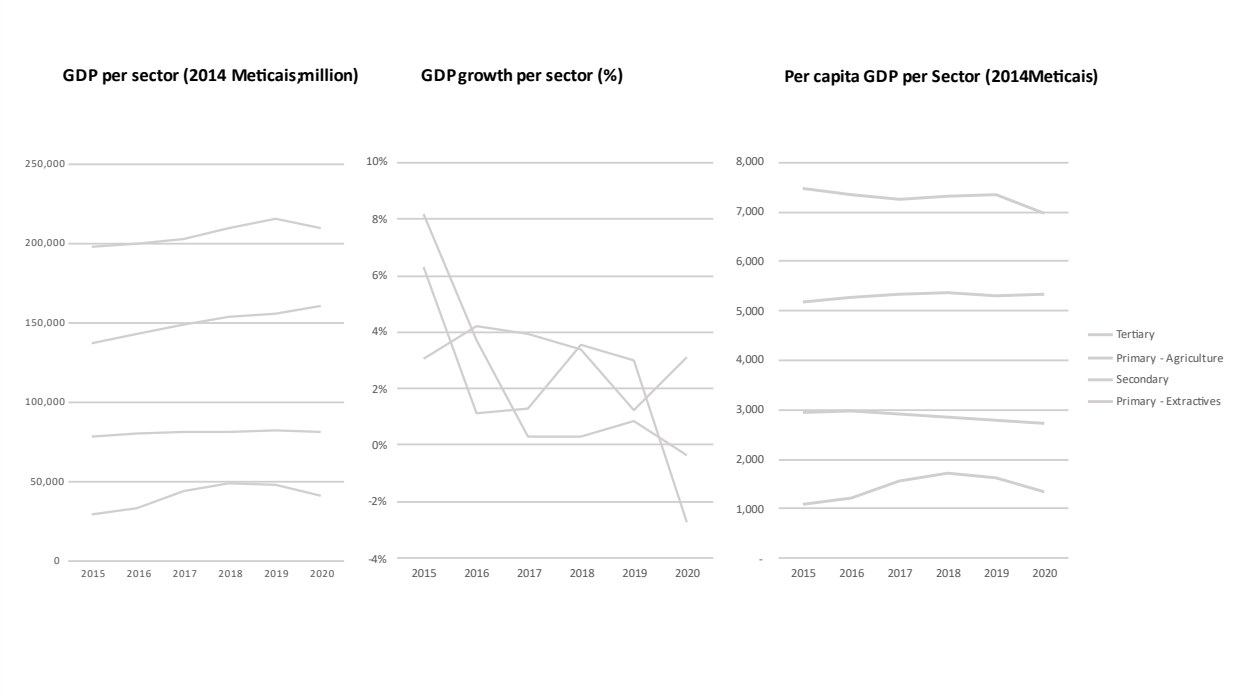
In the south, the effects of COVID-19 in Maputo City, Gaza, and Inhambane confirm its disproportionate impact on more urban areas. These provinces maintained positive per capita economic growth

throughout the period after the hidden debt shock but experienced a dramatic contraction with the pandemic. Maputo Province, instead, experienced a sharp fall in 2016 from which it never recovered. This was followed by milder contractions in 2019 and 2020, but from an already low level of output. Maputo City, while maintaining positive growth rates over most of the period, saw the largest fall from eight percent per capita GDP growth in 2015 to below minus four, the sharpest COVID-19 related fall experienced anywhere. The fact that per capita growth in the capital turned negative only in 2020 strongly indicates that most of the increase in poverty observed there stems from the effects of the pandemic, as lockdowns and reduced mobility hit it the hardest.

GDP per sectors

Between 2016 and 2019, constant GDP grew in all sectors except the secondary sector, which remained stagnant for the entire period after a sharp deceleration between 2015 and 2017 (**Figure 1.18**, **left and right panels**). In terms of per capita, the secondary sector saw a steady contraction from 2016 onward. This was led by a significant fall in manufacturing throughout the period, with these declines being most severe in 2016 and again in 2020. The contraction in manufacturing was amplified by a dramatic two-year decline in construction output following the debt crisis, and it fell sharply again in 2020 despite a growth spurt in 2019 (**Figure 1.18**). The per capita contraction of output in the secondary sector likely contributed to some of the increases in poverty by specifically affecting households in deciles close to the poverty line over this period (deciles five to seven).

Figure 1.18: GDP output, growth and per capita by selected sectors, 2015-20



Source: INE

Activity in extractives increased until 2018 when a slight decrease was followed by a significant drop as the conflict affected operations in the north (see Figure C in Annex 1). In terms of growth, extractives experienced the largest variations, with very high rates up to 2017 and negative ones after 2018. Contrastingly, the impact of the conflict itself may appear to be more associated with the relative poverty

increases registered in the north (22.9 percent) and specifically in Cabo Delgado (55.2 percent). The significant increase in poverty in Cabo Delgado, despite extractives showing strong growth during three of the five years in this period, indicates that it is the conflict that mainly drove poverty rates up. Furthermore, it reveals that extractives do not appear to have had much impact in terms of reducing or at least attenuating poverty in this province.

The tertiary sector saw its growth rate fall to practically zero between 2015 and 2017, with a slight recovery in 2018 and 2019. It was then significantly affected by the pandemic in 2020 as lockdowns and restricted mobility particularly impacted transportation and logistics, as well as hotels and restaurants (Figure C in Annex 1). COVID-19 disruptions in the tertiary sector are more linked to urban areas and constitute a key driver of the poverty increases observed in these areas (13.4 percentage points). Moreover, substantial disruptions in this sector, with logistics/transportation and hotels/restoration accounting for ten percent of GDP, partly explain the overall poverty increase resulting from the pandemic.

Agriculture's total output slowly increased each year, except in 2019, due to the impact of cyclones Kenneth and Idai. This contributed to the very high baseline poverty level in rural areas as most of the population continues to rely on agriculture (72 percent). Per capita GDP in agriculture appears to have remained stagnant with little sign of improvement in productivity as the proportion of the population engaged in this sector remained practically unchanged. In contrast, the secondary sector's per capita output decreased from 2016 onwards. This suggests that the impacts of shocks on agriculture may have been localized to some extent in the central and coastal regions and that a decline in manufacturing and construction has also contributed to the substantial poverty increase identified for the entire period.

Overall, it is apparent that the aftermath of the hidden debt crisis affected all key GDP sectors profoundly, except for extractives and agriculture. Some subsectors experienced a steep decline in output consequently, namely commerce, construction, real estate and services for companies, and financial activities, albeit the latter with some delay. The contraction in these areas had a noticeable effect on poverty given that they generally provide jobs that allow households to stay above the poverty line.

Conclusions

The decline in capital expenditures stemming from the hidden debt crisis directly constrained investments in education, health, roads, infrastructure, and a plethora of other significant areas. This had important, indirect effects on demand, thus hampering overall economic output. The dramatic contraction in government capital expenditures from 12 percent to eight percent of GDP in the aftermath of the hidden debt discovery is a key contributing factor behind the seven-percentage point increase in national poverty in the 2015-20 period and is independent of the effects of the pandemic.

The hidden debt crisis led to a fall in capital expenditures, public spending in general, and foreign direct investment. These effects are apparent in the per capita GDP trend observed at all levels: national, rural, urban, by regions, and by sectors. One exception is agriculture, which experienced changes in per capita GDP mainly driven by environmental shocks. Two events significantly affected agricultural output. In 2015, agriculture hardly grew at all in per capita terms because of cyclone Chedza, resulting in an estimated loss of approximately USD 861 million. The impact of Cyclone Chedza included the displacement of thousands of people, destruction of infrastructure, and damage to crops. The most affected regions were Tete, Manica, Sofala, and Maputo Province which showed the sharpest fall in agricultural output per capita.

The second and most powerful agricultural shock was induced by the 2019 Kenneth and Idai cyclones, leading to a four –percentage point fall in per capita agricultural GDP and absolute decline in this sector's output. Cyclone Idai alone affected over 400,000 farming households and about two million people in Sofala, Manica, Tete, Zambézia, Inhambane, Cabo Delgado and Nampula provinces. The provinces of Sofala, Zambezia, Manica, and Tete were particularly impacted. Cyclone Idai caused an estimated total damage of about USD 1.4 billion and losses of USD 1.39 billion.

It is worth noting that while the impacts of environmental shocks on agriculture may not be geographically widespread, they can push a significant number of people into poverty due to heavy localized impacts along the densely populated coast. Additionally, since a majority of the population dependent on agriculture is either already poor or just above the poverty line, any shock can easily push them below the poverty line.

Despite showing modest per capita output growth in agriculture during much of the period, farmers may have also been substantially affected by the demand shock brought about by the hidden debt crisis through losses in off-farm income. The secondary and tertiary GDP sectors experienced significant contractions following this crisis, contributing to the increase in rural poverty. The impacts of environmental shocks on agriculture, particularly in 2015 (Chedza cyclone) and 2019 (Idai and Kenneth cyclones) were key drivers of rural poverty, but other factors likely contributed to the worsening of poverty in rural areas. First, non-agricultural workers in rural areas were negatively impacted by the hidden debt crisis. Second, agricultural workers engaging in off-farm income-generating activities were negatively affected by the contraction of the secondary and tertiary sectors. Third, price hikes, particularly for imports, resulting from the strong currency devaluation in 2016 and related high inflation also disproportionately impacted the poor in rural areas.

1.5 In addition to low incomes, household welfare and economic opportunities are constrained by deprivations in multiple dimensions

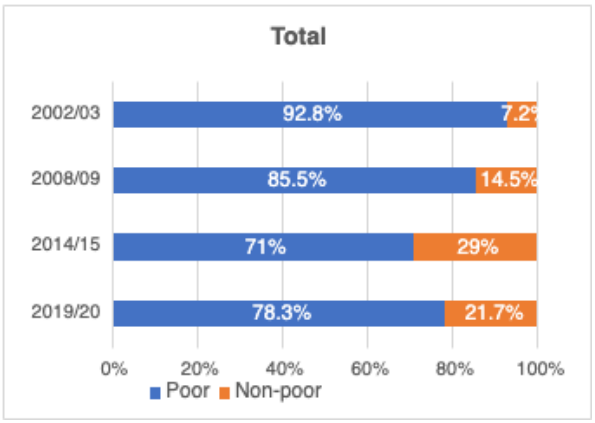
Poor people in Mozambique experience not only low consumption but also face multiple deprivations, such as limited access to basic services, are unable to accumulate human and physical capital, are highly exposed and weakly resilient to shocks, among many others. These deprivations, in turn, limit income generation opportunities, creating a vicious cycle between non-monetary and monetary poverty. This report updates the multidimensional poverty analysis presented in the World Bank's 2018 Poverty Assessment, which examined the extent to which eight indicators of non-monetary and monetary deprivations overlap and reinforce each other: *Education* (no household member completed primary schooling; at least one school-age child in the household is out of school); *Access to service*s (no access to electricity; no access to improved water; no access to improved sanitation); *Housing conditions* (poor quality dwelling); *Asset ownership* (no ownership of at least two of the following assets: fridge, TV, phone, bicycle, car or motorcycle); prevalence of monetary poverty (household's consumption per capita is below the poverty line). All indicators are given identical weights. A household is considered multidimensionally poor if it is deprived in at least 3 out of the 8 indicators.

Mirroring the increase in monetary poverty, recent years have also erased some of the previous gains in terms of reducing multidimensional poverty. In 2002/03, 92.8 percent of Mozambican households, and nearly all rural ones, were deemed multidimensionally poor (**Figure 1.19. Panel A and B).** This share declined over time, reaching 71 percent by 2014/15. However, there was a marked urban-rural divide multidimensional poverty fell to 32 percent in urban centres, but it fell only to 90 percent for rural

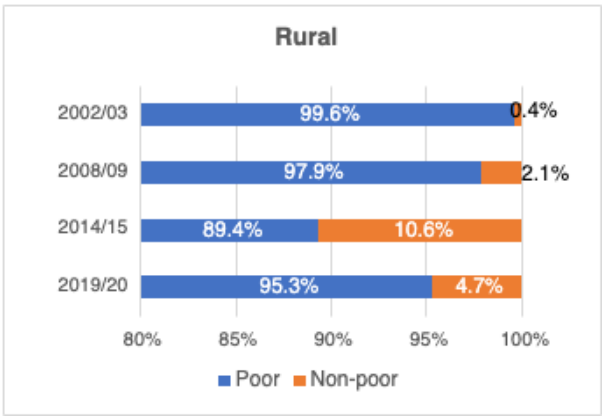
households[11] (**Figure 1.20**). More recent numbers show changes in the opposite direction. Multidimensional poverty rates increased to 78.3 percent between 2014/15 and 2019/20, going back to the levels last seen in 2002/03 in rural areas (95 percent) while also increasing sharply in urban areas, reaching 46 percent. The increase in multidimensional poverty has been driven by a worsening of the indicators related to water, housing quality, durable assets and schooling (**Figure 1.20**). This deterioration in non-monetary poverty dimensions appears to support the hypothesis that living conditions and economic opportunities were already moving in the wrong direction even before COVID-19 hit.

Figure 1.19: Households experiencing three or more multidimensional deprivations (national, urban, rural; 2002/03-2019/20)

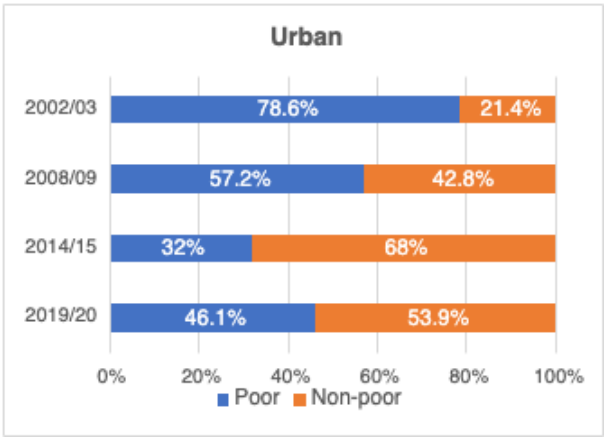
Panel A



Panel B



Panel C



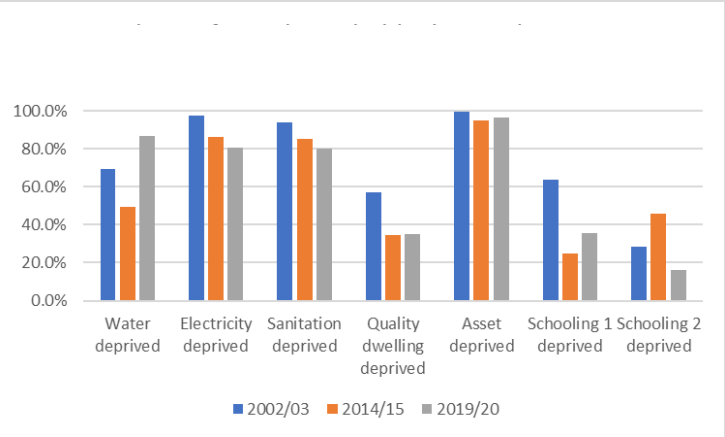
Source: IOF 2019-20

As noted above, monetary and non-monetary poverty reinforce each other in a vicious cycle. Compared to households that are above the poverty line, households that are poor in a monetary sense are more likely to be deprived in each of the seven non-monetary indicators. For example, 80.7 percent of the monetary poor live in dwellings that lack access to electricity whereas 46.2 percent of the monetary non-poor are deprived in this dimension. In general, and as demonstrated in previous poverty diagnostics for Mozambique, poor households are often characterized by the following aspects: living in families with a higher number of members and therefore higher dependency ratios; having more limited access to basic

[11] This trend is holds irrespective of the poverty threshold.

services such as electricity, clean water and sanitation; being headed by individuals with lower levels of education; and relying more on economic activities in the primary sector (agriculture, forestry, fishing, and extraction of natural resources) to support their livelihoods. As shown right below, even though the composite multidimensional poverty index shows an overall setback, unpacking the evolution of the different non-monetary indicators reveals a mixed picture and sector specific challenges.

Figure 1.20: Share of poor households deprived across dimensions



Source: IOF 2019/20.

In relation to household ownership of traditional and modern durable assets, the trends over the past two decades display a mixed pattern. Analysing the four surveys conducted from 2002/03 to 2019/20, there was a general decrease in the ownership of traditional assets, except for beds (as presented in **Table 1.3**). In 2002/03, only 5.4 percent of households owned a bed, but this figure significantly rose to 58.4 percent by 2019/20. While the ownership of bicycles and radios initially increased, a decline in ownership was observed from 2014/15 onwards.

Table 1.3 - Household Ownership of durable assets across surveys (%)

	Durable Asset	IAF 2003/04	IOF 2008/09	IOF 2014/15	IOF 2019/20
Traditional Assets	Coal ironing machine	n.a.	20.4	16.6	6.6
	Bed	5.4	39.2	52.6	58.4
	Bicycle	14.1	38.2	33.3	23.3
	Radio	18.4	45.9	39.7	17.9
Modern Assets	Electric ironing machine	n.a.	7.1	13.0	11.6
	Mobile phone	2.3	23.4	56.1	62.1
	TV set	1.7	12.6	24.4	23.3
	Fridge	0.4	6.0	6.4	6.8
	Computer	0.1	1.6	2.6	1.4
	Motorcycle	0.2	3.8	8.2	8.2
	Brand new car	0.1	0.5	0.9	0.4
	Used car	n.a.	1.8	3.3	3.4

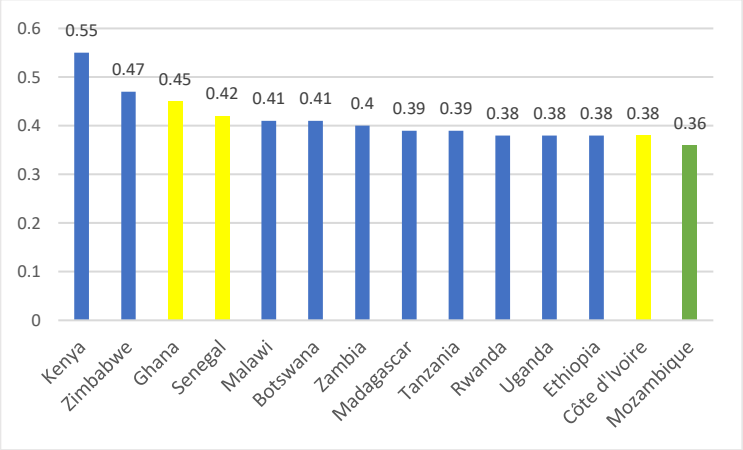
Source: Own estimations based on IOF 2019/20.

Regarding the ownership of modern assets, there was a noticeable upward trend from 2002/03 to 2014/15. However, subsequent positive changes in ownership were minimal or non-existent. The only exception was the ownership of mobile phones, which exhibited a significant increase from 56.1 percent in 2014/15 to 62.1 percent in 2019/20. For other modern assets such as fridges, motorcycles, and used cars, household ownership remained relatively stable. However, the ownership of TV sets, computers, and brand-new cars showed a decline during the observed period.

Human capital accumulation

According to the Human Capital Index (HCI) of 2020, a child born in Mozambique today will only reach 36 percent of her human capital potential by the age of 18 relative to a benchmark of full health and complete education, signalling substantial present and future productivity losses. The HCI rose from 0.34 in 2012 to 0.36 in 2020, below most of its peers in SSA and below the low-income country (LIC) average (**Figure 1.21**). Key factors underlying this weak performance include (1) a high and persistent prevalence of stunting among children under five years of age (43 out of 100 children are stunted), (2) low school learning (almost halving effective school attainment from 7.4 to 4.4 years), and (3) a low adult survival rate (69 percent of 15-year-olds survive until age 60). These poor human capital outcomes are the cause and result of a growth trajectory characterized by a lack of inclusiveness and represent an important binding constraint to productivity and future economic growth.

Figure 1.21: Human capital index for Mozambique and peers, 2020

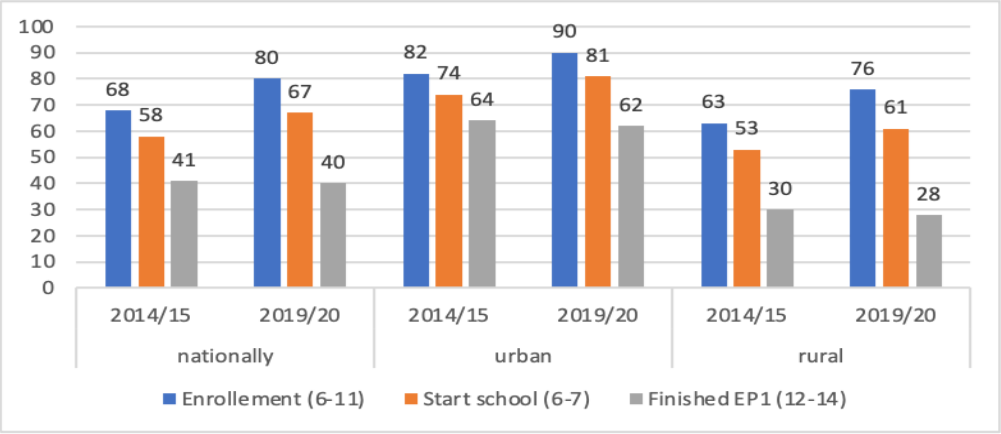


Source: World Bank (https://www.worldbank.org/en/publication/human-capital)
Note: Aspirational peers are coded in yellow, while peer countries are blue.

Education

Enrolment in primary and secondary education shows sustained improvement over time. Enrolment of children in primary school age (6 to 11 years old) increased from 68 percent in 2014/15 to 80 percent in 2019/20 at the national level (Figure 1.28). For rural areas, the percentage increase was larger, from 63 percent in 2014/15 to 76 percent in 2019/20, but is still far behind urban areas, which registered an increase from 82 percent in 2014/15 to 90 percent in 2019/20. Rural-urban gaps in education participation have also declined, but rural children are still significantly less likely to be in school than their urban counterparts in all age groups. Rural children are much less likely to be in school in early ages, especially during the ages of 6-8 years (**Figure 1.22**). By age 15, urban children are over 20 percent more likely to be in school than rural children.

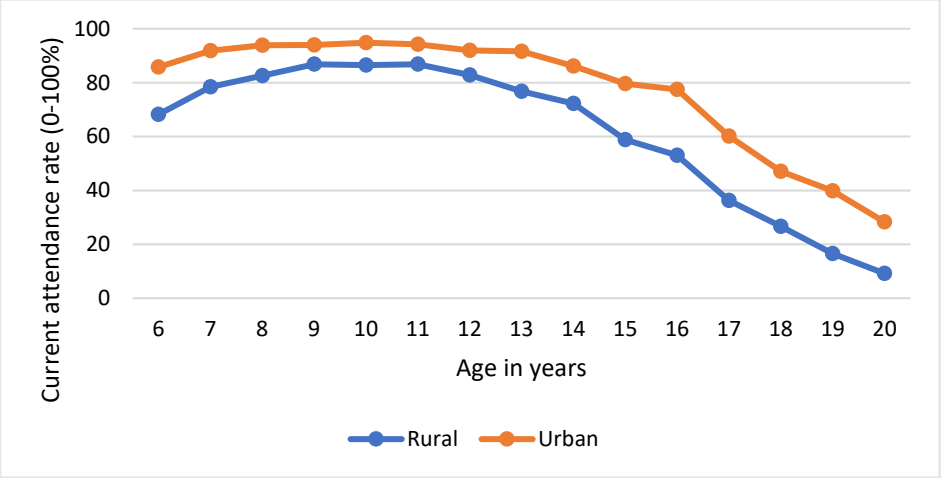
Figure 1.22 Coverage rate of education for children (%), nationally, urban and rural areas 2014/15-2019/20



Source: World Bank, using IOF 2014/15 and IOF 2019/20. Note: "*Start school (6-7)*" refers to 6–7-year-old students starting school on time. *"Finished EP1 (12-14)"* refers to 12- to 14-year-old students having finished primary school on time.

The overall increase in school enrolment and attendance has gone hand in hand with an increase in educational attainment, but high dropout rates persist. While still low, the average educational attainment in Mozambique has increased from 3.8 years of schooling among the adult population (21 years and older) in 2015 to 4.9 years in 2020. However rural areas continue to lag behind urban areas, with 3.4 and 7.3 years of schooling, respectively. (Figure 1.31). Literacy rates for adults aged 15 and above increased to 61 percent, up from 56 percent in 2015. Yet, high dropout rates, especially of children of lower secondary age, reduce dramatically the efficiency of the educational system (**Figure 1.23**). COVID-19 aggravated this situation likely due to the mobility restrictions put in place to contain the pandemic. In fact, dropout rates are now higher than in 2003 and more marked among women at the beginning of secondary school (13-15-year-olds).

Figure 1.23 School attendance rates by age and location (%)

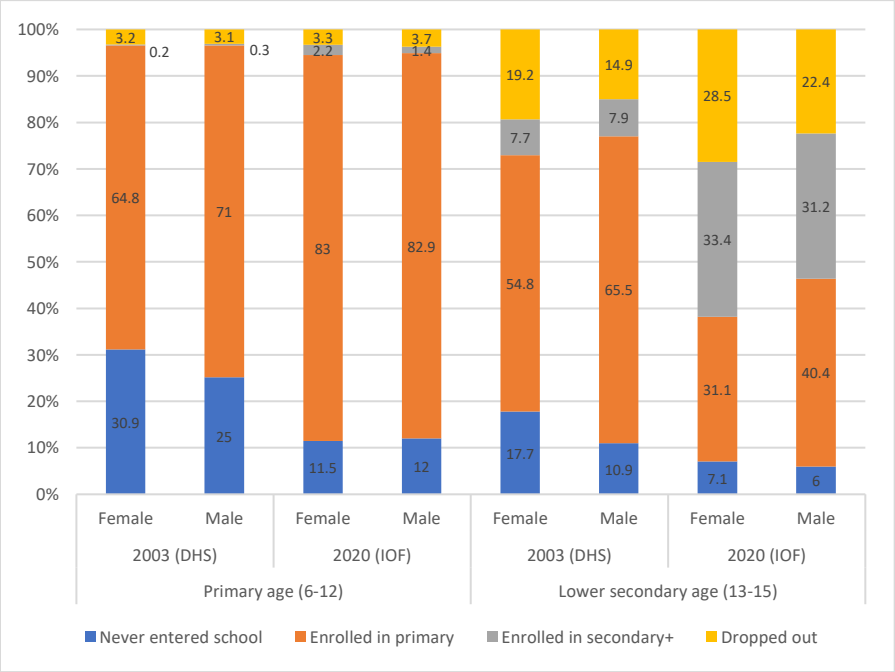


Source: IOF 2019/20

Inequality in education attendance across income groups and regions is substantial. There are three components to overall differences in grade attainment between children of high and income. First, significant percentages of low-income children are not entering school or are entering late. According to the 2019/20 IOF survey, 11.4 percent of children in the poorest quintile aged 13-15 had never been to school, compared with less than 1 percent of quintile 5 (**Figure 1.24**). Second, lower income children are

more likely to leave school early than richer children: 56 percent of Q1 children aged 16-17 had already left school in 2019-20, compared with just 20.4 percent of Q5 children. Third, richer children are progressing through grades more efficiently by starting school on time and not repeating. In 2019/20, 67.2 percent of top quintile children aged 13-15 were enrolled in lower secondary (the correct level for the age group), compared with just 8.9 percent of poorest quintile children. There also obvious gaps across regions. Nearly half of 13–17-year-olds in northern provinces never entered school dropped out early. This contrast with much smaller numbers in southern provinces. The cumulative effects are especially notable in completion rates, as only about half of 16–20-year-olds have completed EP1 in the northern provinces, compared with nearly 90 percent in the southern provinces.

Figure 1.24: School attendance status by age group and SES quintile, 2019/20, %



Source: IOF 2019/20

The COVID-19 pandemic has resulted in significant learning losses, which are expected to exacerbate existing inequities and make the challenge of providing quality education in Mozambique more complex. According to the most recent national learning assessment conducted by the Ministry of Education and Human Development (MINEDH) in 2017, only five percent of Grade 3 students in Mozambique were able to read at the expected level in 2016. While regional assessments such as the Service Delivery Indicators (SDI) and the Southern and Eastern Africa Consortium for Monitoring Education Quality (SEACMEQ) have shown some improvement,[12] the assessment results consistently demonstrate very low levels of achievement. With the school closures during COVID-19, learning loss is likely to have occurred at all levels of education. However, there are currently no available data to fully document the extent of the learning losses due to COVID-19 in Mozambique.

The challenges that affect the provision of quality education in Mozambique are numerous and evident in the very low levels of learning in comparison with peer countries. Measures of student learning, including test scores from national and regional assessments, are one of the main output indicators for

[12] Southern and Eastern Africa Consortium for Monitoring Educational Quality Mozambique (SACMEQ) Mozambique IV Na

education quality. Although results from the SDI (2014, 2018) and SEACMEQ (2007, 2013) show some evidence of improvement over time, test scores in language and mathematics are lower than almost all other participating countries. Learning levels are particularly low in the northern provinces, and the results from student assessments consistently demonstrate large learning gaps by gender and region[13].

Health and nutrition

Life expectancy has continued to increase, though adult mortality remains high. In 2020, Mozambique's life expectancy was 61.4 years, up from 57.2 in 2015, according to the WDI. This puts Mozambique close to the Sub-Saharan Africa (SSA) life expectancy of 62.0 in 2020. As discussed in more detail below, underlying this increase in longevity is a reduction in child and maternal mortality, a fall in HIV/AIDS and malaria rates, and improved access to basic health services. Notwithstanding this progress, in 2020 the adult mortality rate was still one of the highest in the world, at 377 per 1,000 for males, and 257 per 1,000 for females. Only 68 percent of 15-year-olds are expected to live to the age of 60.[14] Some of the only countries with worse adult mortality rates are Sierra Leone, Central African Republic, South Sudan, Chad, Somalia, Eswatini, and Lesotho (ranging from 385 to 534 per 1,000 for males, and 264 to 408 for females).[15]

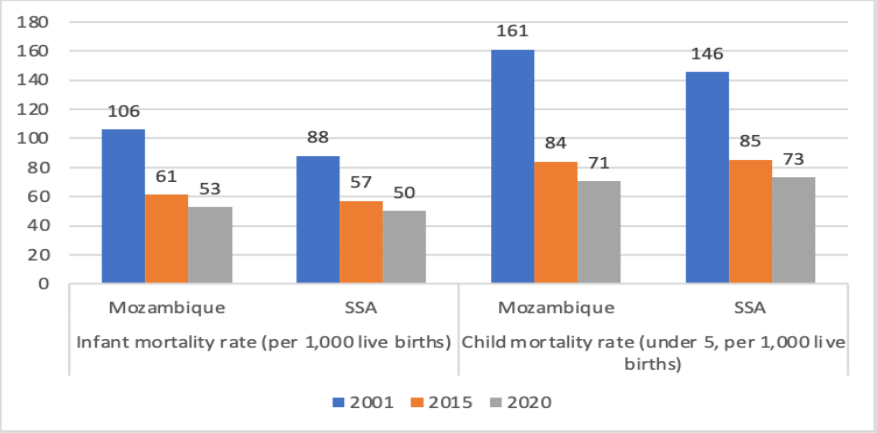
A high disease burden is a key factor contributing to these ongoing high adult mortality rates, especially HIV/AIDS. As of 2020, the prevalence of HIV/AIDS in Mozambique for those between 15-49 years was 11.5 percent, down from 12 percent in 2015. However, this rate is still quadruple the rate for SSA, at 3.6 percent, and is the fifth highest incidence rate of HIV/AIDS in the world. It is by far the leading cause of death among adults – both men and women aged 15-49. However, HIV/AIDS kills women at a significantly higher rate than men, accounting for 63 percent of causes of mortality among women aged 15-49 compared to 42 percent of causes of death among their male counterparts.[16] Women face higher prevalence and mortality rates, lesser ability to negotiate safer sex and protect themselves from men's risky behaviors, and a greater burden of care for those made sick and orphaned by HIV/AIDS. On average, fifty percent more women have HIV/AIDS than men with the prevalence rate for women at 15.4 percent versus 10.1 percent for men. [17] Amongst young people ages 15-24, the difference is even starker with prevalence amongst young men only a third of that of young women. And yet, women are more likely to be contributing to lowering the spread of HIV/AIDS by taking antiretroviral medication at higher rates than infected men – 82 percent versus 70 percent, respectively.[18]

On the other hand, maternal, infant, and child health outcomes are closer to the regional averages and continuing to move in the right direction. As of 2017, the maternal mortality ratio (modelled estimate) had dropped to 289 per 100,000 live births, almost half that of the SSA average of 534. This is closely tied to improvements in access to ante- and post-natal health services, with numbers of assisted births rising from 54 percent in 2011[19] to 85 percent in 2020[20]. Most direct causes of maternal mortality are linked to

[13] World Bank, 2023, Mozambique Public Expenditure Review: Rebalancing Public Spending. Washington D.C: World Bank Group.
[14] World Bank, Human Capital Index, https://databank.worldbank.org/data/download/hci/HCI_2pager_MOZ.pdf
[15] Source: World Development Indicators (WDI)
[16] Global Burden of Disease Estimates by the Institute of Health Metrics and Evaluation, 2019. https://vizhub.healthdata.org/gbd-compare/
[17] IMSIDA 2015, Supplemental Report (2019).
[18] IMSIDA 2015, Supplemental Report (2019).
[19] Macicame I, Magaço A, Cassocera M, et al. Intervention heroes of Mozambique from 1997 to 2015: estimates of maternal and child lives saved using the Lives Saved Tool. J Glob Health. 2018;8(2):021202. doi:10.7189/jogh.08.021201
[20] MISAU- DSMC. 2020

conditions that could have been detected through ante-natal care, such as pre-eclampsia, and the inability to access emergency obstetrical care in life-threatening emergencies.[21] However, the most frequent causes of maternal death remain indirect causes including malaria, HIV/AIDS and anaemia.[22] Infant mortality and child mortality, also expressed as the number of deaths per thousand live births, have also fallen considerably, and are now on par with the SSA average of 50 and 73, respectively (**Figure 1.25**). Infant and child mortality are closely linked to poor maternal, neonatal and child health, along with chronic and acute malnutrition. High rates of adolescent pregnancies are also an important contributor, as pregnant adolescents have lower body mass indexes themselves and higher rates of anaemia, leading to significantly lower birth weights and other indicators of new-born health.[23]

Figure 1.25: Infant and child mortality ratios, Mozambique versus SSA



Source: World Development Indicators

Box 1.2: COVID-19 and interruptions of routine health services

The COVID-19 outbreak has particularly affected access to reproductive, maternal and child health and nutrition services. As a result of disruptions in all essential services due to the COVID-19 pandemic, maternal mortality in Mozambique may have increased by as much as 15 percent and child mortality by 16 percent in 2021. The volume of family planning services provided nationally between April and June 2020 was 27.5 percent lower than during the same period in 2019. Rates of institutional deliveries during the earliest months of the pandemic (April-August 2020) were up to 10% lower in some provinces compared to the same period in 2019. As a result, the estimated protection provided by family planning services, measured as Couple-Years of Protection – a measure that estimates the protection from pregnancy provided by contraceptive methods during a one-year period, was 18% lower than during the same period of 2019. Thus, efforts to improve resources available for family planning, and to reduce adolescent pregnancy and total fertility have likely lost significant ground. Mental health has also been significantly affected according to a rapid assessment conducted by the United Nations which found that half of men and women reported that their mental or emotional health had deteriorated during the onset of the COVID-19 pandemic.[24]

Food security and nutrition, especially for children, continue to be major challenges, and are susceptible to numerous shocks. Most people cannot afford the minimum costs for an adequately diversified diet.

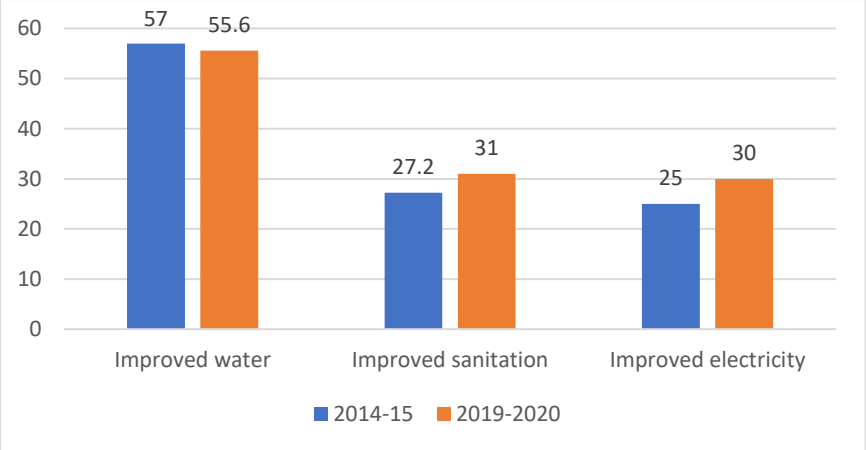
[21] UNFPA, "SRHS Situation Analysis in Mozambique."
[22] UNFPA, "SRHS Situation Analysis in Mozambique."
[23] Jaén-Sánchez N, González-Azpeitia G, Saavedra-Santana P, Saavedra-Sanjuán E, Manguiza AA, et al. (2020) Adolescent motherhood in Mozambique. Consequences for pregnant women and newborns. PLOS ONE 15(6): e0233985. https://doi.org/10.1371/journal.pone.0233985
[24] "COVID-19 Rapid Gender Assessment - Mozambique 2020."

Coupled with other factors – such as high rates of infectious and water-borne diseases and limited access to health services, water and sanitation – this lies at the roots of persistently high levels of malnutrition, which affects 43 percent of children under five, with peaks of 46 percent in rural areas.[25] Conflict, drought and the impact of the COVID-19 pandemic on economic activities are among the main drivers of food insecurity. The number of people facing high levels of acute food insecurity (IPC Phase 3 or above) across the country decreased from 2.9 million people between January and March 2021 to 1.9 million in the period November 2021 to March 2022, which coincided with the lean season. For the projection period (April to September 2022), coinciding with the harvest period, the situation is expected to improve in all provinces and cities in the country, except for Cabo Delgado province. Nationally, the number of people in Crisis (IPC Phase 3) or worse is estimated to decrease from the current 1.9 million people to 1.4 million people.[26]

Access to services (water, sanitation and electricity)

Access to basic services have slightly improved but large disparities in coverage remain across diverse groups of the population. Safe water, sanitation and access to electricity are key determinants of human development, with critical implications for human capital, income growth and poverty reduction. Data from the IOFs from 2014/15 and 2019/20 show that, except for improved water, coverage for sanitation and electricity services have been increasing, although very slightly (**Figure 1.26**). Access to improved water decreased from 57 percent to 55.6 percent while the improvements in access to sanitation and electricity are positive but low (the former increased from 27.2 percent to 31 percent while the latter did so from 25 percent to 30 percent). There are, however, large gaps between income groups, and rural and urban areas.

Figure 1.26: Percentage of population with access to basic services



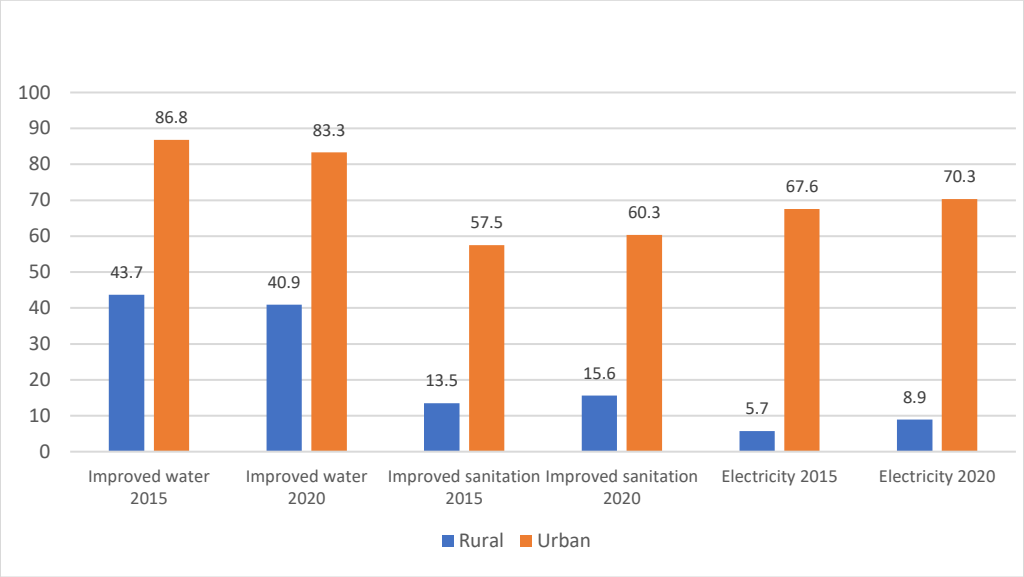
Source: IOF 2019-20

Household location and income levels are strong determinants of access to basic services. There are also significant differences between urban and rural areas (**Figure 1.27**). Access to improved water, sanitation and, most notably, electricity is far greater among urban households. Except for improved water, where both urban and rural percentages slightly dropped, access to sanitation and electricity increased between 2015 and 2020, although marginally. The urban/rural gap is particularly stark when it comes to access to

[25] World Food Program.
[26] World Food Program. https://www.ipcinfo.org/ipc-country-analysis/details-map/en/c/1155342/?iso3=MOZ

electricity, which can be almost eight times greater among urban households (70.3 percent) than rural households (8.9 percent). Income also helps explain access to services. Nearly 60 percent of urban households in the top consumption quintile are connected to the electricity grid or have access to sanitation, five times larger than the coverage levels in the first quintile (12 percent).

Figure 1.27: Rural-Urban access to basic services (2015 and 2020) in %

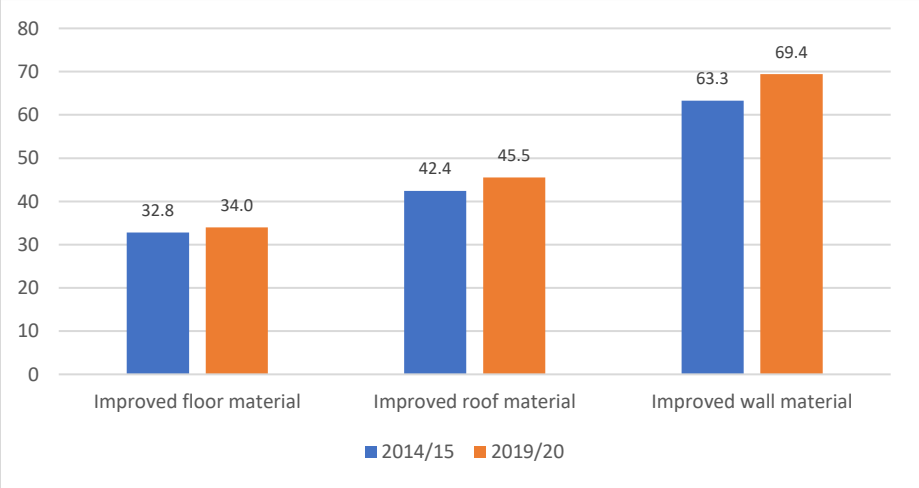


Source: IOF 2019-20

Housing conditions and assets

Households have experienced improvements in their housing conditions. Indicators measuring the quality of housing such as improved floor, improved roof and improved walls show positive, yet small, developments between 2014/15 and 2019/20 (**Figure 1.28**). This constitutes evidence for rising living standards though not as marked as the 2002/03-2014/15 period.

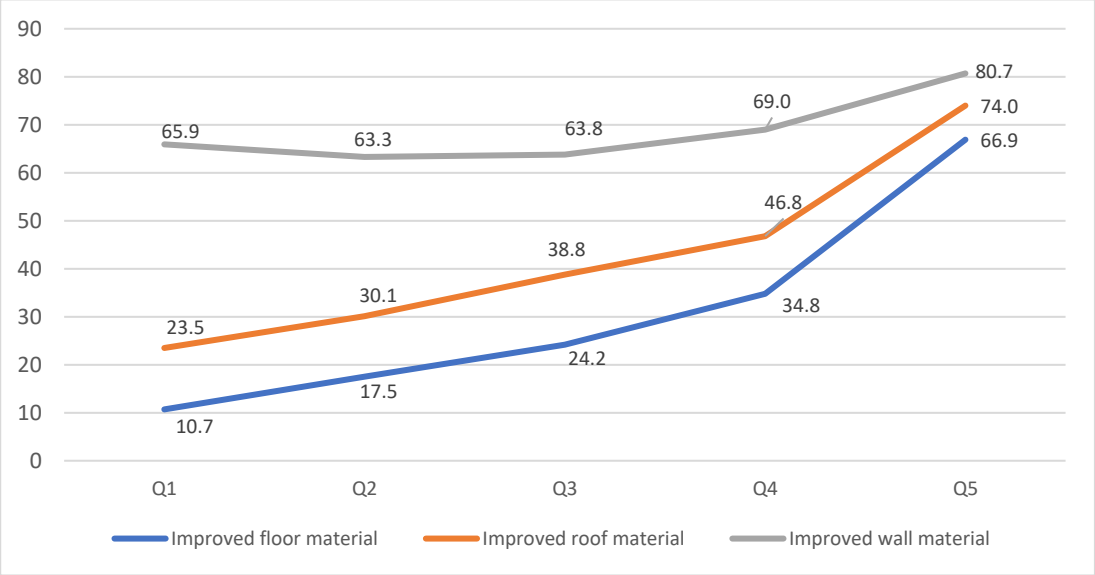
Figure 1.28: Percentage of households that report improvement in housing conditions



Source: IOF 2019-20

Similarly, even though the less well-off households also experienced improvements in housing conditions, overall, these improvements are correlated with income levels. As shown in **Figure 1.29**, all measures of housing conditions get significantly better as one moves up in the consumption distribution. The only exception to this rule is in the improved conditions of wall material, where the most significant variation occurred at the first quintile of income consumption while the rest of the quintiles saw no significant variations.

Figure 1.29: Improvement in housing conditions per income quintile group (2019/20; %)



Source: IOF 2019/20

1.6 The Relationship between Economic Growth and Poverty

Poverty elasticity and passthrough rates in Mozambique

Poverty elasticity of growth is a measure of the extent to which economic growth affects poverty reduction. In other words, it quantifies the relationship between a change in a country's economic growth and the resulting change in the poverty level. Poverty elasticity is often used to measure and compare how effectively different countries leverage economic growth into poverty reduction. Mathematically, the poverty elasticity of growth is calculated by taking the percentage change in the poverty rate and dividing it by the percentage change in economic growth. If the elasticity is high (in absolute terms), a small amount of economic growth can lead to significant poverty reduction. If it is low, even substantial economic growth may not effectively reduce poverty.

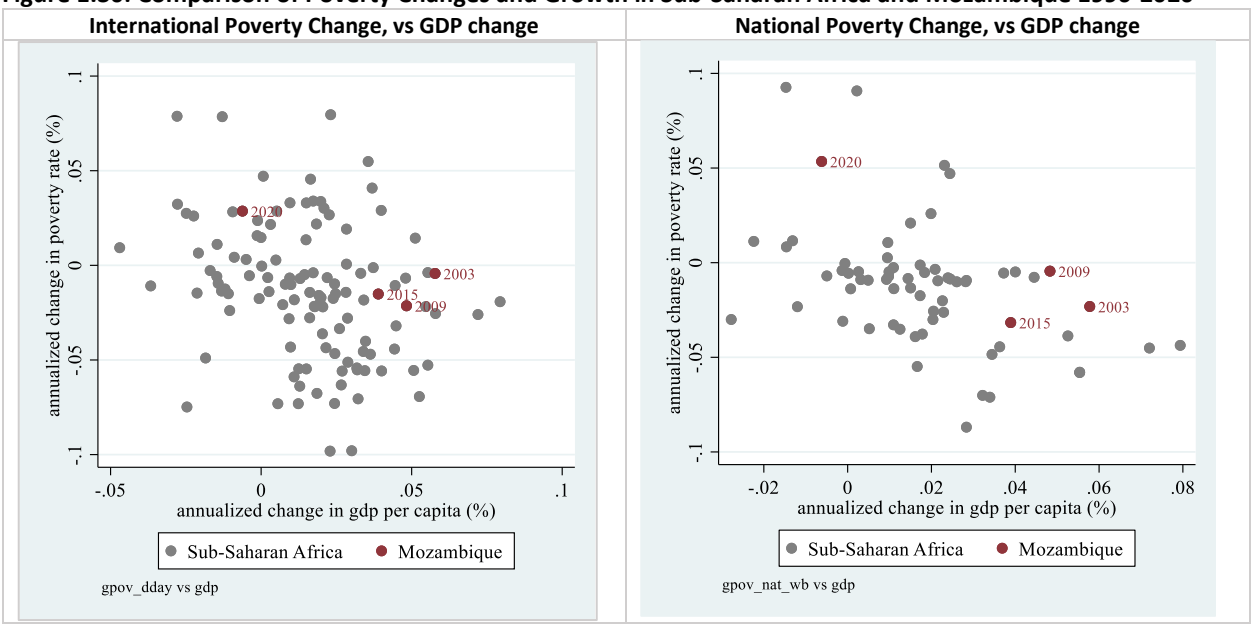
$$\lim_{\Delta pcGDP \to 0} \frac{\Delta Poverty(\%)}{\Delta pcGDP(\%)} = \infty$$

The poverty elasticity of growth can be estimated using poverty at different poverty lines and various components of economic growth, namely Gross Domestic Product (GDP), Household Final Consumption Expenditures (HFCE), and sectorial growth rates. This section uses annualized growth rates, which

converts the cumulative growth rate over the inter-survey period (between surveys) into an equivalent average annual growth rate.[27]

Surveys from Mozambique between 1996 and 2020 show patterns of growth elasticity of poverty with respect to GDP that echo broader trends seen across Sub-Saharan Africa. During this period, Mozambique experienced phases of economic growth, but this growth did not always lead to proportional poverty reduction. In some years, despite robust GDP growth, poverty levels remained high or decreased only slightly, highlighting a lower poverty elasticity of growth. Overall, the estimates of poverty elasticity of growth for Mozambique are similar to those seen in other Sub-Saharan African countries, as seen in **Figure 1.30**.

Figure 1.30: Comparison of Poverty Changes and Growth in Sub-Saharan Africa and Mozambique 1996-2020



Note**:** The graphs present the annualized changes in poverty rates between consecutive surveys using the international poverty line (left panel) and the national poverty line (right panel). The depicted changes in national accounts (GDP) and the changes estimated using annualized growth rates were computed for Sub-Saharan African countries with a poverty rate of more than 20%. Mozambique's poverty changes are shown in red, other observations in gray. Outliers with greater than +/- 10 percent annualized change in poverty have been excluded for clarity. **Sources:** World Development Indicators (WDI), World Bank Poverty and Inequality Platform, and Mozambique's Household Budget Surveys (IOF) for the years 2002/03, 2008/09, 2014/15, and 2019/2020.

The passthrough rate of national accounts growth to household survey growth rates refers to the extent to which changes in a country's national accounts data (such as GDP or HFCE) are reflected in changes in household incomes as measured by surveys. It is typically measured by taking the annualized growth rate of household surveys divided by annualized growth in a national accounts measure. Visually, we can explore this by comparing growth rates in a scatter plot.

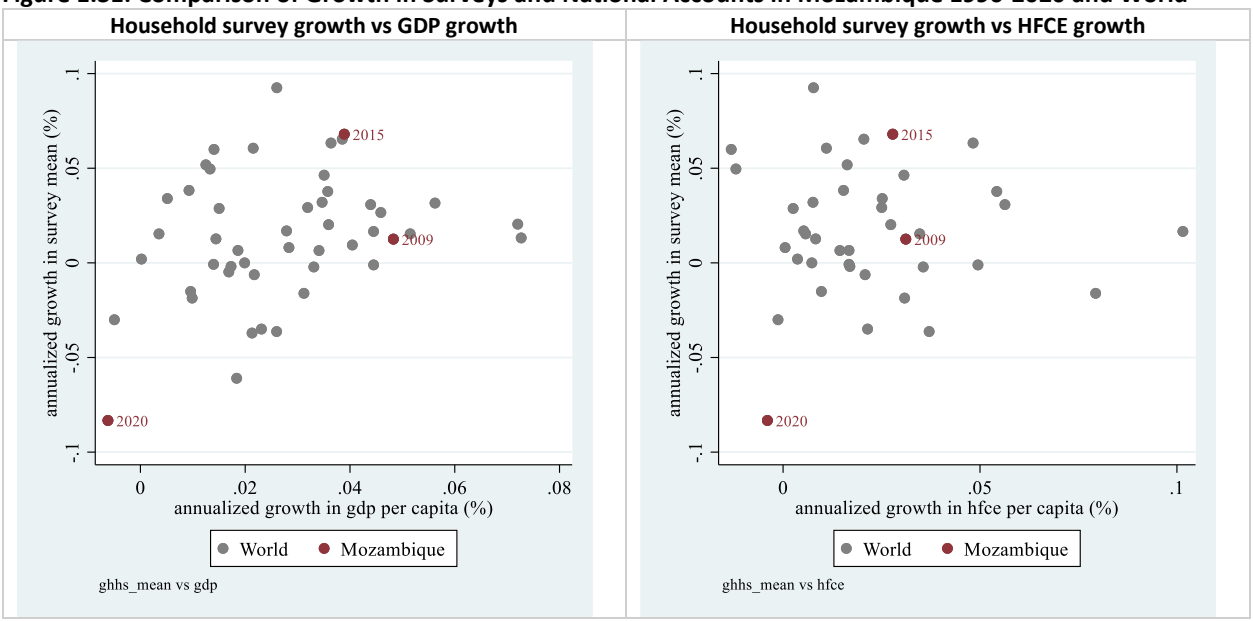
This scatter plot chart provides a comparison between the growth rates in household survey data and national accounts estimates, namely GDP and Household Final Consumption Expenditure (HFCE). The survey growth rates from other countries than Mozambique are based on the most recent data from the

[27] Decimal years are used to account for the fact that surveys do not align with calendar years.

World Bank's Global Database of Shared Prosperity, which includes changes in household survey means for comparable periods and surveys.

In this representation (**Figure 1.31**), Mozambique's 2020 data – one of the few data points available during the COVID-19 pandemic period – is located at the bottom left of the scatter plot. Despite the pandemic's impact, the trend in Mozambique aligns with the broader observation that surveys typically reflect slower growth or contraction compared to national accounts estimates. The pattern for HFCE is less clear and weaker overall, a pattern also found in earlier studies.

Figure 1.31: Comparison of Growth in Surveys and National Accounts in Mozambique 1996-2020 and World



Note: The graphs present the annualized changes in growth in surveys and national accounts – GDP (left panel) and HFCE (right panel. Survey growth for other countries from the Global Database of Shared Prosperity. **Sources:** World Development Indicators (WDI), World Bank Poverty and Inequality Platform, and Mozambique's Household Budget Surveys (IOF) for the years 2002/03, 2008/09, 2014/15, and 2019/2020.

Poverty outlook

Growth and poverty reduction in Mozambique have both slowed in the past decade. Although Mozambique is expecting to enjoy a natural resource boom, which has the potential to drive strong economic growth and reduce poverty, this outcome is not guaranteed. Experiences from other countries show that overall economic effects of natural resource booms can be mixed. Yet, if managed well, natural resource booms have the potential to fuel rapid economic growth, which can help accelerate poverty reduction if growth is shared across the income distribution.

The following provides some simple illustrations for how poverty in Mozambique could evolve under various scenarios for growth and distribution of growth over the next decade. For growth to contribute effectively to poverty reduction, it needs to happen in a way which also benefits the poor. The assessment of the potential impact of growth on poverty reduction is based on WB economic projections as of September 2022, together with population growth projections from the World Development Indicators (WDI). Under a scenario of no new natural gas resources, GDP per capita growth is expected to be only

0.83 percent per year. Under a scenario that incorporates projected revenues from LNG, GDP per capita is projected to grow at 4.67 percent per year. Such projections entail a great degree of uncertainty, but nevertheless provide an informative baseline for the growth of the economy.

Another important source of uncertainty is how overall economic growth measured in national accounts (such as GDP) translates into growth of households' consumption and income, the market driver of poverty reduction. A recent review has found that national average growth rates, as measured by household surveys, are significantly lower than those seen in national accounts, typically by 0.5 to 1 percentage points, but often more in high growth environments.[28] Looking at only resource-rich countries, they find that the gap can be even larger. Looking at the experience of Mozambique, the evidence shows particularly low passthrough of growth at the macro level (i.e in national accounts) to growth at the micro level (in household consumption, as measured by surveys).[29]

Since we need to rely on GDP projections to forecast household survey growth between surveys in the future, we need to apply a passthrough rate. Given that there is little robust evidence of a solid relationship between national accounts growth and survey growth in Mozambique, we chose to apply two passthrough rates – one of -0.5, reflecting the 2009 to 2020 period, and the World Bank's common method projecting poverty from the latest household survey, assuming a 0.87 passthrough factor from GDP to national survey growth.[30] This gives annualized household survey growth of 0.73% and 0.42% under the Non-LNG trajectory and 4.1% and 2.3% under the LNG-scenario.

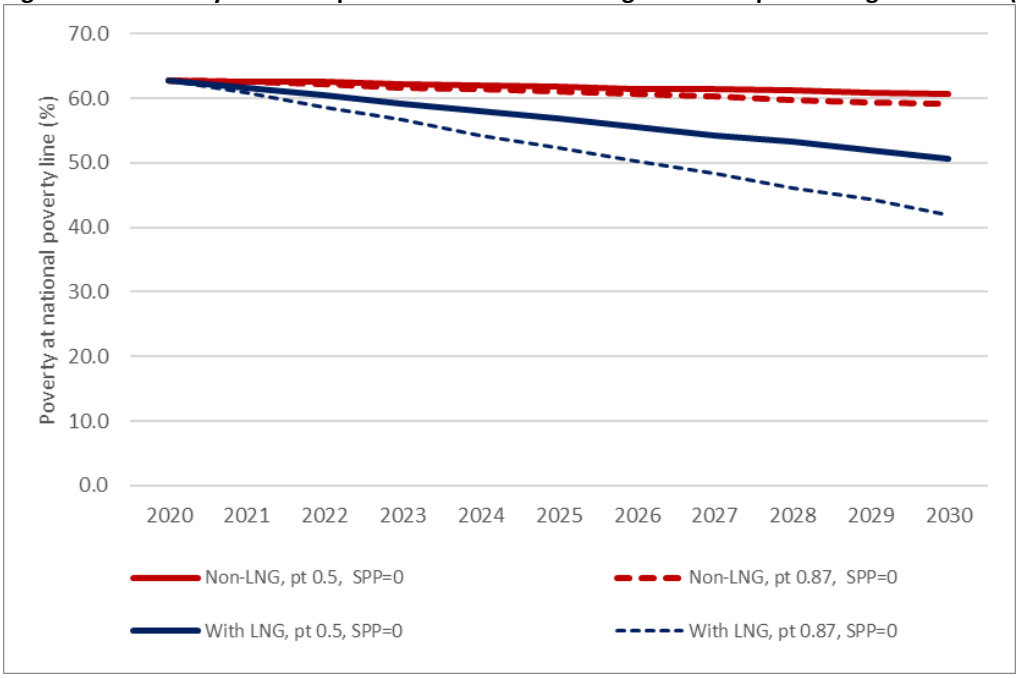
The fact that projected per capita GDP growth rates between 2020 and 2030 range from 0.4% to 4.1%, results in strongly diverging poverty projections, as shown in **Figure 1.32**. This reflects the uncertainty of future household consumption growth in Mozambique. Thus, the trajectories are only meant as illustrative possible paths of poverty in Mozambique, and do not, as such, present likely forecast. Nevertheless, they provide important illustrations of how welfare could evolve in the country and the importance of ensuring that growth is strong, stable and above all widely shared.

[28] Prydz, Espen Beer; Jolliffe, Dean; Serajuddin, Umar. 2022. Disparities in Assessments of Living Standards Using National Accounts and Household Surveys. *Review of Income and Wealth.* https://doi.org/10.1111/roiw.12577

[29] The assessment of passthrough is complicated by the recent economic volatility caused by the COVID-19 pandemic. From the last survey in 2015 to the 2020 survey, household consumption contracted by an annualized rate of 7 percent, while GDP per capita stayed constant (0 percent growth). It is therefore not possible to establish a plausible pattern between national accounts and survey growth over the period. Looking at the COVID-adjusted consumption measure for 2020 and growth since 2009, we find a passthrough of 0.5 of (non-adjusted) GDP to consumption (approximately 2 percent growth in GDP and 1 percent growth in survey). Looking at GDP per capita and survey growth from 2002 to 2020 shows a passthrough rate of only 0.27.

[30] To use national accounts growth rates to predict survey-based mean per capita income and consumption expenditure growth, an adjustment factor is needed to account for the empirically observed discrepancies between national accounts growth and survey growth: national accounts data tend to grow faster than surveys. The adjustment factor, which has commonly been set at 0.87 of national accounts growth rate (see Jolliffe et al 2014). Notably, the default methodology of World Bank's Macro-Poverty Outlooks also utilizes the 0.87 estimate. The 0.87 facto has recently been deemed at the upper end of what is empirically seen in recent data, and thus represents an optimistic assumption with Lakner et al (2022) found that two-thirds of all cases are predicted to have a passthrough rate between 0.72 and 0.86.

Figure 1.32: Poverty outlook up to 2030 under different growth and passthrough scenarios (%)



Notes: Poverty projections 2020-2030 with and without LNG production for different rates of passthrough (pt) of national accounts growth to survey growth. All scenarios assume distribution neutral growth.
Source: Author's estimates, using Povsim and 2020 IOF Household Survey.

Overall, the poverty outlook under these assumptions entails a marginal reduction in the percentage of poor without LNG revenues and more substantial reductions if these revenues are accounted for. The magnitude of this poverty reduction will be strongly dependent on the passthrough rate experienced over the coming years, if all else remains equal. **How much of GDP growth will pass through to poverty reduction, however, remains unclear given both the large variability in recent spells and the fact that the production of gas may not generate many permanent jobs. This will be greatly dependent on whether the right conditions (for instance, a prudential macro framework, private sector growth enablers etc.) are in place. Moreover, LNG effects on poverty will therefore largely depend on how the government uses the associated revenues.**

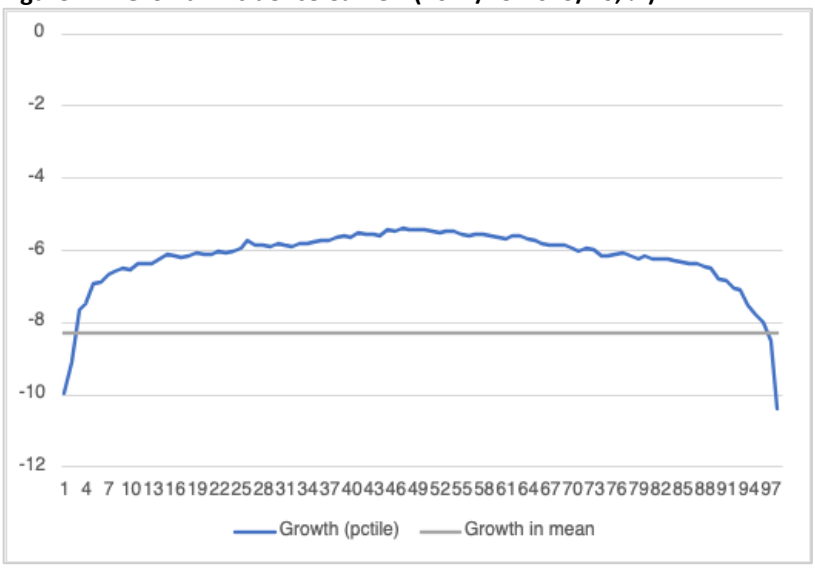
Chapter 2. Inequality remains high but fell with the Pandemic

Mozambique remains among the most unequal countries in Sub Saharan Africa despite a recent reduction in inequality. The Gini coefficient decreased by 5.7 percentage points as a direct consequence of the pandemic disproportionately affecting urban areas. Spatial disparities in poverty remain significant, with Cabo Delgado, Nampula, and Zambezia provinces accounting for 60% of the poor population. Poor households experience overlapping deprivations, including limited access to education, services, and infrastructure. Gender inequality continues to be widespread and hinders poverty reduction and the accumulation of human capital. The Human Capital Index (HCI) in 2020 was 0.36, reflecting very low human capital potential.

2.1 Income status and location largely explain which household benefitted from the low levels of growth

Along with the sharp increase in the poverty rate experienced in Mozambique between 2015 and 2020, inequality is estimated to have fallen in this period. The growth incidence curve (GIC) for this spell, displayed in **Figure 2.1**, shows that all percentiles saw their consumption fall sharply, by over eight percentage points in the mean, but not equally. As can be seen, the two central quartiles (percentiles 25th to 75th) were slightly less impacted by this generalized contraction. The GIC does not clearly show significant differences in consumption across the distribution except for the tails.

Figure 2.1: Growth Incidence Curve[31] (2014/15-2019/20; %)

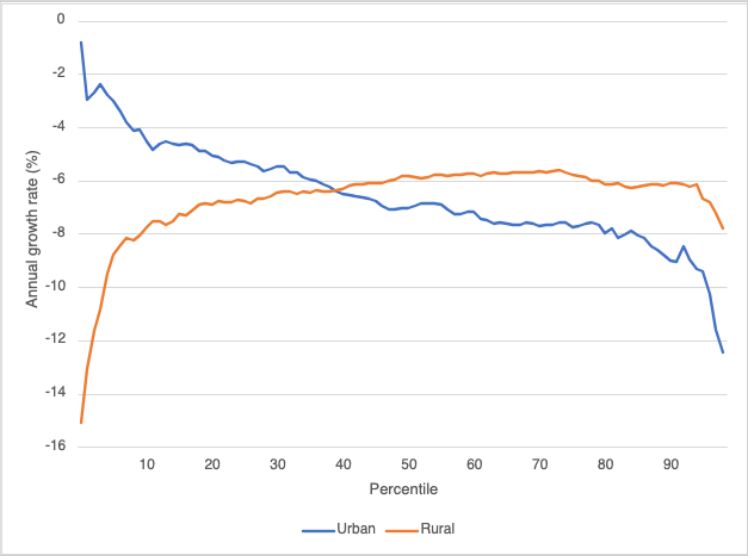


Source: Own estimations based on IOF2014/15 and IOF2019/20. Note: Censored (1st percentile).

Yet this masks very significant differences between rural and urban areas for the period 2015-2020. In rural areas, the poorer suffered deeper contraction in consumption whereas in urban areas the richer part of the distribution fared worst. Overall, this conveys a story of widespread fall in consumption, with particularly negative impacts among the poorer rural population and the richer urban dwellers (**Figure 2.2**).

[31] We censor the growth incidence curve at the first percentile because it presents a high concentration of households with implausibly low consumption.

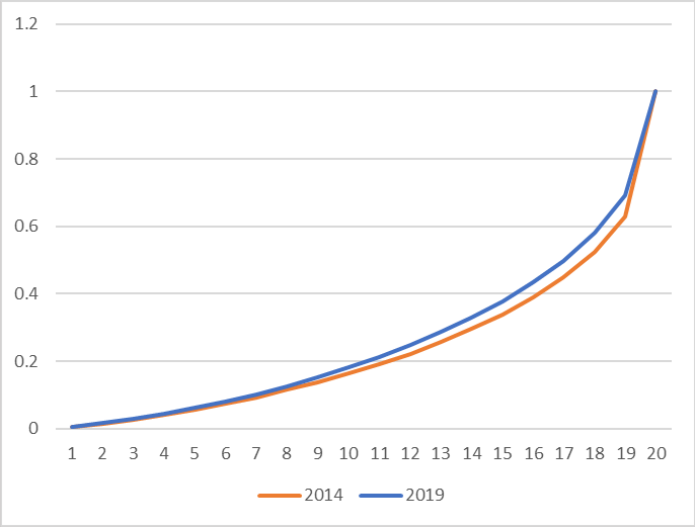
Figure 2.2: Censored (1st percentile) Rural and Urban Growth Incidence Curves (2014/15-2019/20; %)



Source: Own estimations based on IOF2014/15 and IOF2019/20.

The fact that all percentiles saw their consumption decrease effectively explains the very substantial increase in poverty reported in **Chapter 1**. But the flatness of the national GIC displayed in figure 2.1 does not indicate at first sight a clear direction of the change in inequality. This is confirmed by the comparison of the cumulative consumption shares (Lorenz Curves) for both survey years, 2014/15 and 2019/20. **Figure 2.3** clearly illustrates a slight improvement in the distribution over the period as the latest curve remains above the original one. This explains the fall in inequality as measured by Gini. It does not, however, translate to a higher rate of growth of the bottom 40 percent of the distribution when compared to the rate for the country as a whole. Indeed, the Shared Prosperity Premium, which is defined precisely as the difference between these rates, is negative.

Figure 2.3: Cumulative consumption shares by ventile (2014/15-2019/20)



Source: Own estimations based on IOF2014/15 and IOF2019/20.

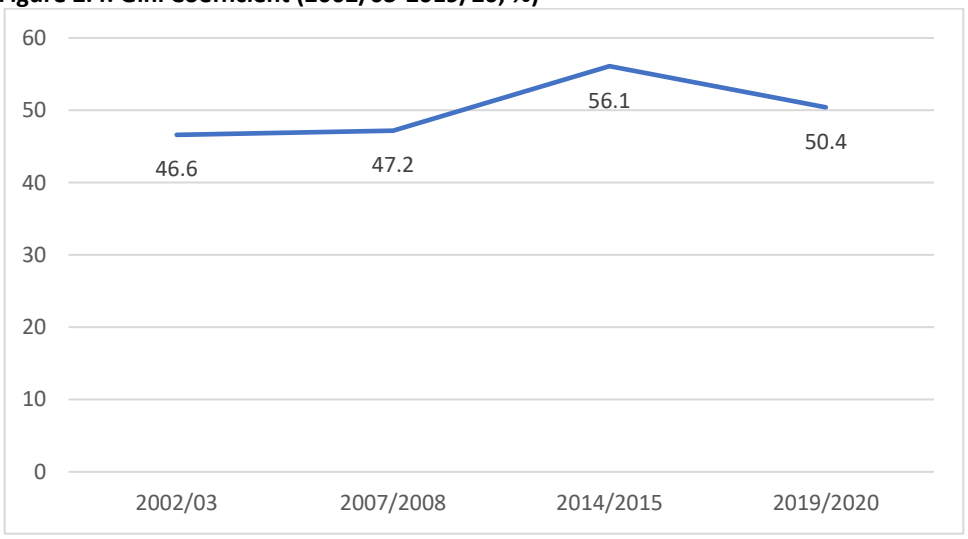
What explains these results, even though the GIC (displayed in **Figure 2.1**) is not clearly progressive, is the high concentration of consumption at the top percentiles. This means that shifts in this tail of the

distribution have a large effect on the overall change in inequality as measured by the Gini coefficient. The drop in inequality seems driven mostly by the large change in the share of the top five percent. Consumption in this group falls by about 45 percent, while for the rest of the distribution it drops by about 30 percent. Moreover, the top quintile had a share of 37 percent of total consumption in 2015, but that fell to 31 percent in 2020.

The Gini coefficient is typically thought to be very sensitive to changes in the middle of the distribution but not at the tails. Yet here it seems to be a case where change in the top tail really matters. The top's share in total income is so large that a relatively large reduction in their incomes gives everyone else a much larger share of total consumption. It is very clear from the Lorenz curve above that there is a fall in Gini because the share of total consumption has increased for the bottom 90 percent. Furthermore, the share of each consumption share and cumulative shares by ventile reveals a high concentration at the top decile (see Annex 2).

Overall, the greater loss of consumption experienced by the top percentiles over the 2015-20 period led the Gini coefficient to drop by 5.7 percentage points from an all-high value of 56.1 to 50.4 percent (**Figure 2.4**). While this is the first fall experienced by the country in the 2000s, it is unlikely to mark a structural change in the trend since it is likely to be due to the uneven impact of COVID-19 on the better-offs.

Figure 2.4: Gini Coefficient (2002/03-2019/20; %)

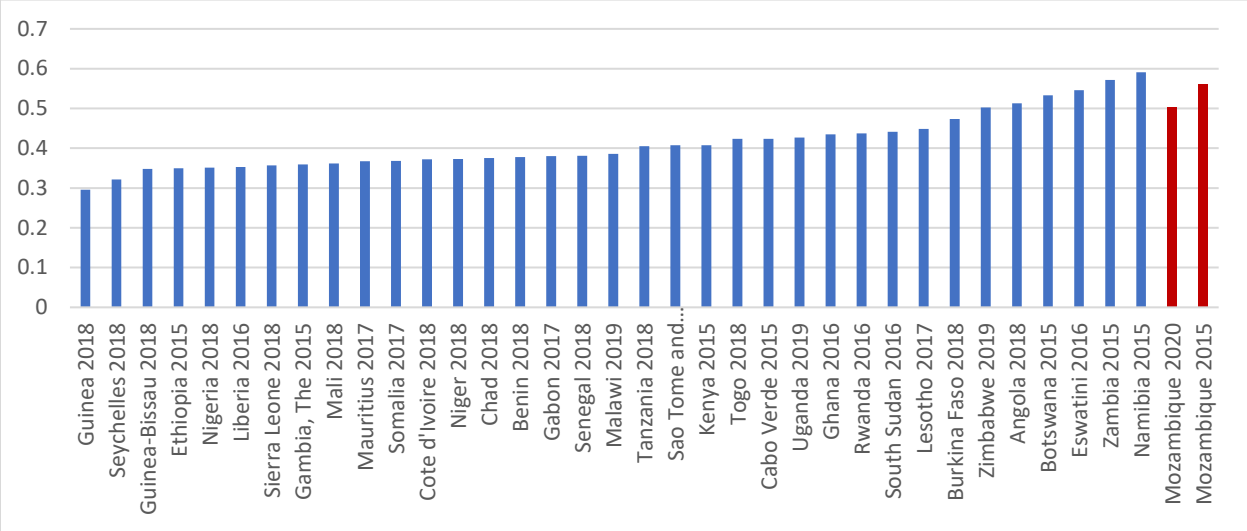


Source: Own estimations based on IOF2014/15 and IOF2019/20.

Moreover, despite the seemingly transitory decline, Mozambique remains among the most unequal countries in Sub Saharan Africa, moving from the fourth highest in the region in 2015 to number seven. It must be, however, considered that data from all other countries displayed in **Figure 2.5** do not include the impact of the pandemic, which is found to have had varying net effects on countries' inequality level.[32]

[32] World Bank (2022). Poverty and Shared Prosperity Report.

Figure 2.5: Gini Coefficient in Sub-Saharan Africa (latest datapoints since 2015)



Source: IOF 2019/20 and World Development Indicators.

Box 2.1: The underestimation of inequality drawn from standard household surveys

The measurement of inequality using only Household Budget Surveys generally provides a lower bound for several reasons, namely:

1. While using consumption instead of income to measure poverty in low-income countries generally works well for the reasons presented in Chapter 1, it does less so when measuring inequality as savings are not accounted for. Since the latter disproportionately accrues within the richer percentiles, consumption inequality is lower than income inequality and is thus a lower bound.
2. In some countries, a few very rich households may have a significant effect on the overall level of inequality and may be missing from the survey sample, thus biasing data on inequality downwards.
3. Richer households tend to present higher rates of non-response, thus also leading to a downward bias of inequality.
4. Richer households tend to under-report income – although it is less clear if this also happens with consumption.

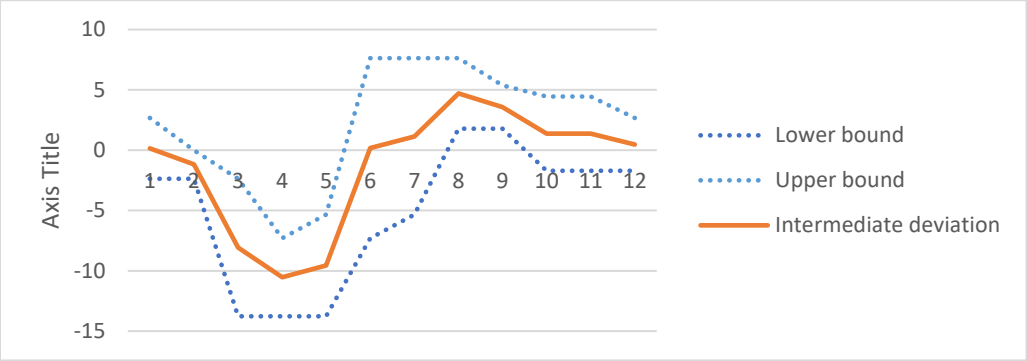
2.2 As a shock that fell more heavily on urban areas, COVID-19 improved overall inequality

A priori, it makes sense to suspect the pandemic as the prime explanatory hypothesis for the considerable 5.7 percentage point fall in inequality. Particularly so considering the stronger impact on consumption among the top percentiles detected over this period. This would be consistent with lockdowns having had greater consumption impact on urban and richer households, as shown by the downward urban GIC displayed in the previous section. Additionally, this would also bode well with some international evidence on the disproportionately larger dampening effects of COVID-19 on consumption at higher income levels in the face of mobility restrictions and uncertainty.[33]

33 Baker, R.S., Farrokhnia, R.A., Meyer, S., Pagel, M. and Constantine, Y. (2020), "How Does Household Spending Respond to an Epidemic? Consumption During the 2020 COVID-19 Pandemic", Covid Economics, No 18, pp. 73-108. Chetty R. , Friedman J. N. , Hendren N. , Stepner M. , and The Opportunity Insights Team. 2020. How did COVID-19 and stabilization policies affect spending and employment? A new real-time economic tracker based on private sector data. NBER Working Paper 27431.

To gauge the extent to which this may be the case, it is possible to apply the same methodology used in **Chapter 1** based on the seasonality of inequality values across survey quarters.[34] Two findings clearly stand out. First, that the seasonal effect is very large, with deviations that can exceed ten percentage points from the annual value. Second, that inequality appears to be lowest right after the main grain harvest from March to May, which makes sense in a country where agriculture is so important for the livelihoods of a majority of households (**Figure 2.6**).

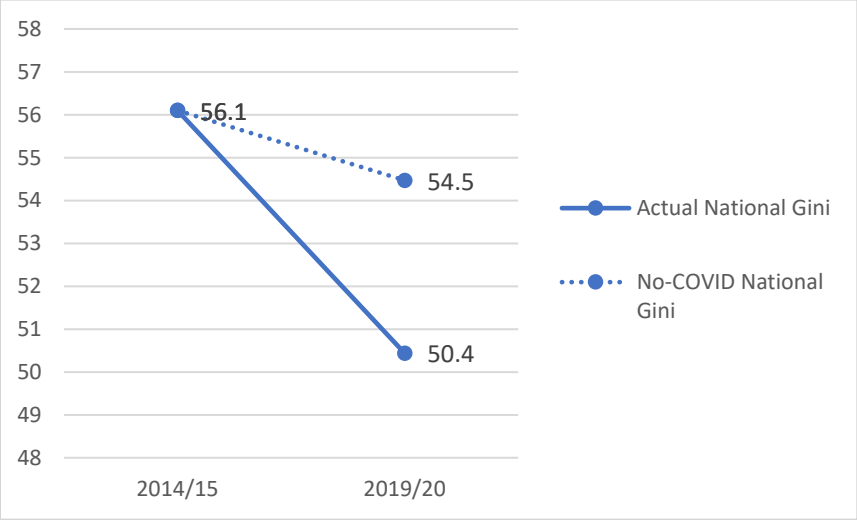
Figure 2.6: Average historical Gini coefficient seasonal percentage deviation in previous surveys (%)



Source: Own Estimations using IOFs 2002/02, 2008/09, 2014/15.

The average historical inequality seasonal pattern indicates that, without COVID-19, the country's Gini coefficient would have likely been around 54.5 percent reflecting a dampening, if muted, effect on inequality, as shown in **Figure 2.7**. This implies that the pandemic resulted in a very significant four percentage point decrease in inequality in less than a year.

Figure 2.7: Gini coefficient with and without COVID-19 impact (%)



Source: Own Estimations using IOFs 2002/02, 2008/09, 2014/15 and 2019/20.

[34] In this case, instead of looking at changes in the poverty rate across the survey-year, the historical comparison focuses on seasonal changes of the Gini coefficient. Using the three consecutive surveys (IOFs 2002/03, 2008/09, 2014/15) preceding the last IOF (2019/20), again, it is possible to obtain a historical average seasonal pattern for Gini values at the national level, as displayed in Figure 2.6.

2.3 Growth, inequality and poverty are intertwined

In order to determine the contribution of economic growth and changes in the distribution to changes in poverty, we decompose the latter into growth and distributional components following Shapley (1953)[35] and Shorrocks (1999).[36] Results in **Table 2.1** show that during the periods of 2003-2008 and 2008-2015, poverty decreased thanks to positive per capita growth, particularly during the second spell. Had this growth not been accompanied by increases in inequality, poverty reduction would have been more than double in both periods. The 2015-2020 period represents a complete reversal of the previous two periods in large part due to the major shocks that hit the country. A contraction in per capita consumption led to a very substantial increase in poverty (21.5 percentage points) that was only partially attenuated by the stark fall in inequality (-7.1 percentage points).

Table 2.1: Shapley Decomposition of the Poverty Rate (percentage points)

	Change in Poverty Rate	Growth Contribution	Distributional Contribution
2002/03-2008/09	-1.6	-4.1	2.6
2008/09-2014/15	-10.3	-21.8	11.5
2014/15-2019/20	14.4	21.5	-7.1
2002-2020	2.5	-1.7	4.2

Source: Own calculations based on IOFs 2002/03, 207/08, 2014/15 and 2019/20.

While the decomposition of changes in the poverty rate provides a sense of the contribution of growth and inequality, the decomposition of changes in the poverty gap better captures the type of growth that took place over a certain period in terms of its pro-poorness. Following a relative definition of pro-poorness, whereby the poor disproportionately benefit more from growth, Negre (2010)[37] provides several categories[38] that can be used to describe the changes experienced in Mozambique during the most recent spells (**Table 2.2**).

Table 2.2: Shapley Decomposition of the Poverty Gap (percentage points)

	Change in Poverty Gap	Growth Contribution	Distributional Contribution	Pro-Poorness
2002/03-2008/09	-3.5	-2.6	-0.9	Pro-Poor Growth
2008/09-2014/15	-4.8	-12.3	7.5	Pro-NonPoor Growth
2014/15-2019/20	9.9	13.9	-4	Anti-nonPoor Contraction
2002-2020	1.55	-1.2	2.7	Pro-Poor Growth

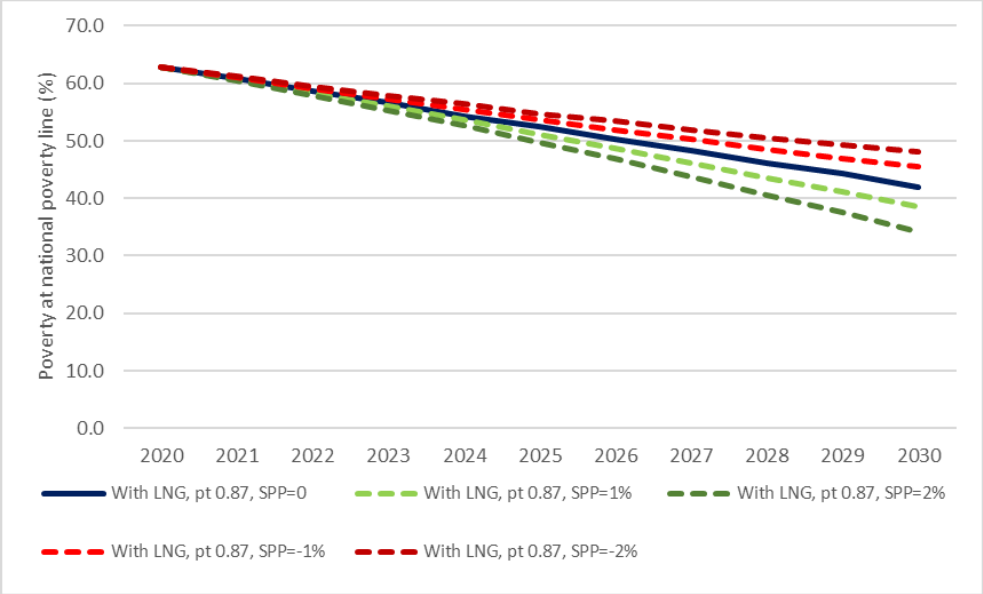
Source: Own calculations based on IOFs 2002/03, 2008/09, 2014/15 and 2019/20.

[35] Shapley, L. (1953). 'A Value for n-Persons Games'. In A. Shorrocks (ed.), 'Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value'. Essex: University of Essex and Institute for Fiscal Studies.
[36] Shorrocks, A. (1999). 'Decomposition Procedures for Distributional Analysis: A Unified Framework Based on the Shapley Value'. Mimeo: Essex: University of Essex and Institute for Fiscal Studies.
[37] Negre, Mario. Concepts And Operationalization Of Pro-Poor Growth, WIDER Working Paper 2010/047 Helsinki: UNU-WIDER, 2010.
[38] These categories are: Pro-Poor (Pro-NonPoor) Growth when economic growth disproportionately benefited the poor (nonpoor) and Anti-Poor (Anti-NonPoor) Recession when per capita growth disproportionately hurt the poor (nonpoor).

Each of the last three periods presented in **Table 2.2** experienced a different type of growth. In the first period (2003-09), both growth and distributional changes helped reduce the poverty gap; whereas in the second period (2009-15), distributional changes contributed to the average consumption of the poor falling further below the poverty line. The former (latter) period disproportionately benefitted the poor (nonpoor) and was, therefore, pro-poor (pro-nonpoor). The last spell up to 2020 saw the poverty gap increase but considerably less than it would have, had distributional changes not attenuated this effect by disproportionately focusing the impact of the contraction on the nonpoor. This is a contraction that hurts the poor disproportionately less than the nonpoor.

The poverty outlooks presented in Chapter 1 (Section 1.7) based on different growth projections (with and without LNG) and passthrough rates did not account for any future distributional changes. Since it is not possible to model future changes in inequality, one alternative is to capture the different poverty endpoints associated with a range of inequality changes. **Figures 2.8 and 2.9** do exactly that by simulating the poverty rate with and without LNG, respectively, up to 2030 under five different inequality change scenarios ranging from a -2.0-percentage point annual change in Shared Prosperity Premium (SPP) to a +2.0-percentage point annual change in SPP.

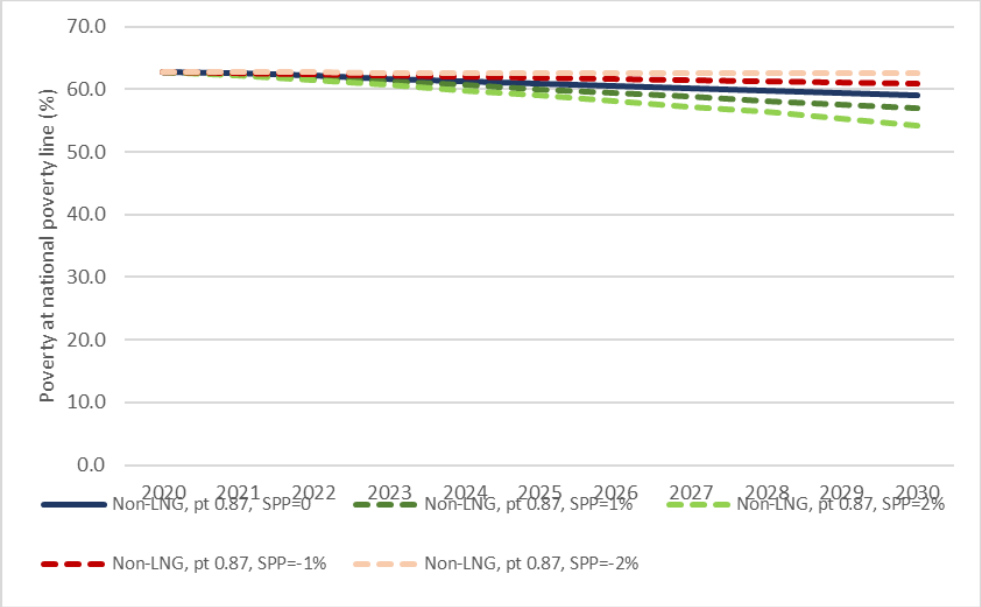
Figure 2.8: Poverty outlook with LNG under different inequality change scenarios (%)



Source: Own estimations based on Povsim simulations, Mozambique's CEM GDP projections and WDI population growth.

The role that inequality can play in reducing poverty is apparent in both growth scenarios and could lead to a range of very different endpoints by 2030. (Figure 2.9). The range of results is broader in the case of LNG revenues having a similar effect on poverty than current GDP composition.

Figure 2.9: Poverty outlook without LNG under different inequality change scenarios (%)



Source: Own estimations based on Povsim simulations, Mozambique's CEM GDP projections and WDI population growth.

2.4: Geography matters for poverty and equity outcomes

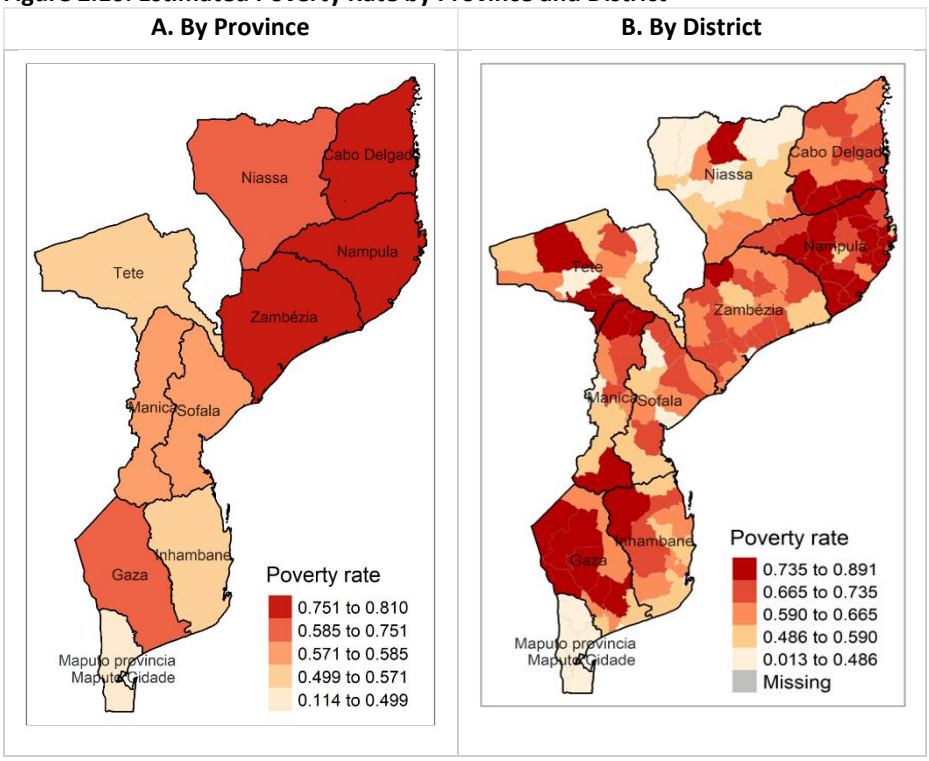
This section examines spatial disparities in poverty across Mozambique and how these disparities are also interlinked with other dimensions of development. It is divided into two parts: The first section presents poverty estimates for 2019/20 at the province and district levels, while the second section examines how spatial disparities in poverty are associated with various other measures of development (e.g., human capital, access to services). This second section also sets out to discuss a set of factors that may drive such spatial inequalities with a particular focus on 3Ds – density, distance, and division – borrowed from the 2009 World Development Report *Reshaping Economic Geography,* as well as several major natural disaster risks that the country faces.

There are several poverty hotspots across the country

While the provincial-level poverty map reveals significant inequalities in poverty across the country, it masks important variations *within* each province. A small-area poverty estimation method is applied to produce a district-level poverty map (129 districts in total), which helps shed light on such intra-provincial spatial disparities.

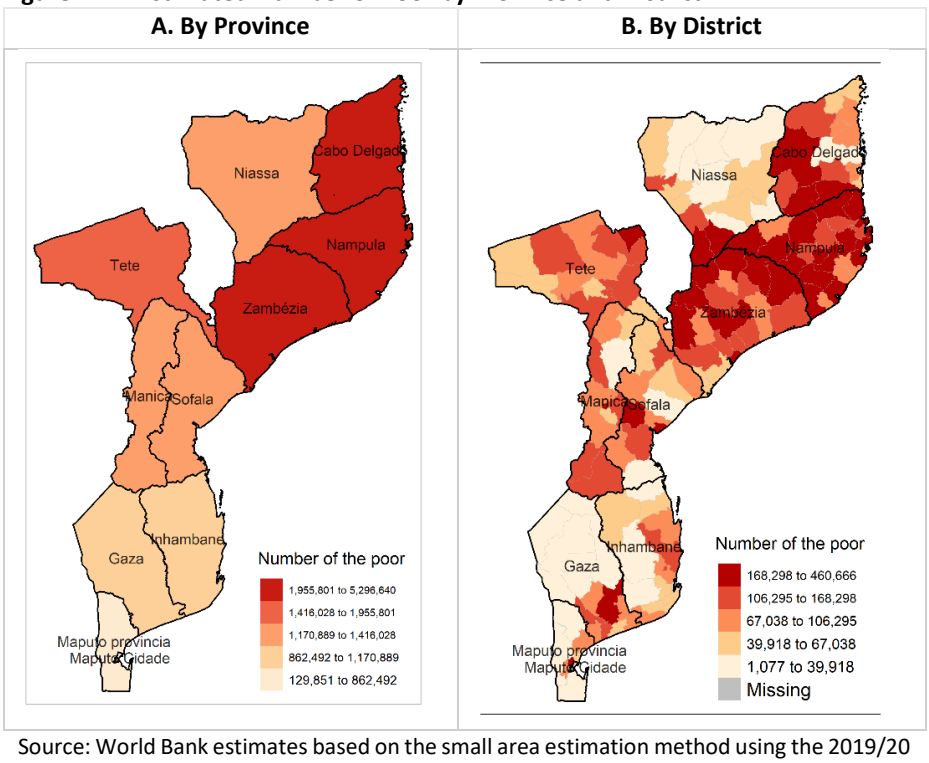
The district-level poverty map identifies three major pockets of poverty (Figure 2.10 and 2.11). A first pocket of poverty is found in the northeastern part of Mozambique, mainly in Nampula. Four of the ten poorest districts in Mozambique are in Nampula, including Murrupula (89 percent), Monapo (88 percent), Mossuril (81 percent) and Ribáuè (81 percent). A second pocket of poverty is identified in districts in the southern provinces of Gaza and Inhambane, including Massingir (Gaza) (85 percent), Guija (Gaza) (83 percent), Chicualacuala (80 percent) as well as Mabote (Inhambane) (79 percent). A third pocket of poverty stretches across several districts spatially clustered from Tete Province in the northwest to the northern parts of Manica and Sofala Provinces in the central region of the country, such as Guro (Manica) (88 percent), Machaze (Manica) (83 percent), Changara (Tete) (82 percent), Marávia (Tete) (79 percent), Marara (Tete) (79 percent), Tambara (Manica) (78 percent) as well as Cheringoma (Sofala) (72 percent).

Figure 2.10: Estimated Poverty Rate by Province and District



Source: World Bank estimates based on the small area estimation method using the 2019/20 IOF and 2017 population census.

Figure 2.11: Estimated Number of Poor by Province and District



Source: World Bank estimates based on the small area estimation method using the 2019/20 IOF and 2017 population census.

The poorest provinces of Cabo Delgado, Nampula and Zambezia are also home to a disproportionately large share of the country's poor. This is highlighted in **Table 2.3**, which shows the poverty headcount rates, standard errors of those estimates, and share of the poor (in percent) at the provincial level. These three provinces alone account for about 60 percent of the total poor population in the country. The number of the poor and poverty rate are also highly positively associated at the district level. The highest concentration of the poor is seen in Nampula (Nampula) (2.5 percent), followed by Milange (Zambezia) (2.5 percent), Monapo (Nampula) (2.4 percent), Erati (Nampula) (2.0 percent) and Mogovolas (Nampula) (1.9 percent).

Table 2.3: Poverty rates at the provincial level

Rank	Province	Poverty headcount	Standard Error	Share of Poor (%)
1	Nampula	0.81	0.01	27.7
2	Cabo Delgado	0.77	0.01	10.23
3	Zambezia	0.75	0.012	21.81
4	Gaza	0.65	0.019	5.07
5	Niassa	0.58	0.019	6.12
6	Sofala	0.57	0.018	7.40
7	Manica	0.57	0.019	6.26
8	Inhambane	0.56	0.018	4.51
9	Tete	0.49	0.018	7.57
10	Maputo Provincia	0.22	0.014	2.60
11	Maputo Cidade	0.11	0.012	0.67

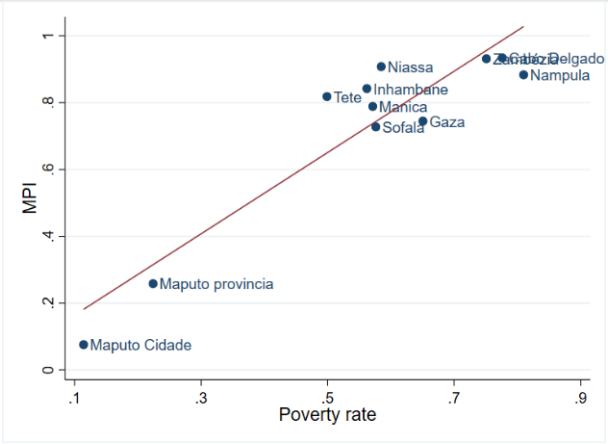
Source: IOF 2019/20

Although urbanization is linked to less incidence of poverty, some of the predominantly urban districts host a relatively high share of the poor. Overall, urban districts with higher population densities tend to be less impoverished, as indicated by a lower rate of poverty. However, some of those urban districts are also home to a significant share of the country's poor. While Matola City (Maputo Province) and Beira City (Sofala) are both among the least impoverished districts (with a poverty rate of 18 and 30 percent, respectively), they account for a sizable proportion of the poor (1.2 and 1.1 percent of the total poor population in the country). Some of the predominantly urban districts in the northern and central provinces also account for a relatively higher number of the poor, including Nampula (Nampula) (2.6 percent), Mocuba (Zambezia) (1.6 percent), Nacala Porto (Nampula) (1.1 percent) and Chimoio (Manica) (1.1 percent).

Monetary poverty is accompanied by lower human capital and poorer access to basic public services. A correlation plot between strict monetary poverty and the MPI presented in chapter 1 shows that those provinces with a higher level of monetary poverty—such as Zambezia, Cabo Delgado, and Niassa—suffer from a higher level of multidimensional poverty (**Figure 2.12**). Conversely, those areas with the lowest levels of monetary poverty also tend to have fewer deprivations in non-monetary dimensions. For instance, poorer districts are prone to have lower primary education completion rates (among people 15 + years old) and higher absence rates (among children between 6 and 17 years old), while these districts also have poorer access to core public services such as improved water (**Figure 2.13**).

Figure 2.12: Monetary vs. multidimensional poverty

A. Correlation between MPI and poverty



B. MPI at the provincial level

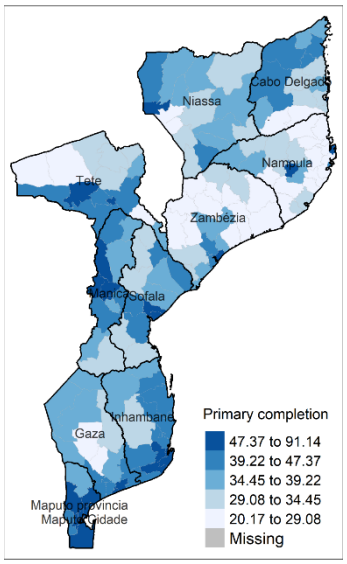
Rank	Region	MPI
1	Cabo Delgado	0.934
2	Zambezia	0.931
3	Niassa	0.908
4	Nampula	0.883
5	Inhambane	0.842
6	Tete	0.818
7	Manica	0.789
8	Gaza	0.745
9	Sofala	0.727
10	Maputo Provincia	0.258
11	Maputo Cidade	0.076

Sources: MPI derived based on World Bank staff calculation from the IOF 2019/20

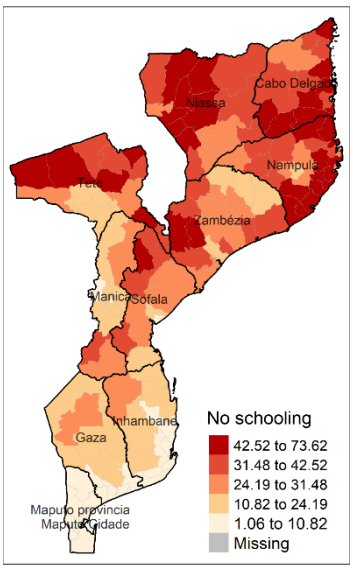
Figure 2.13. Monetary poverty and specific non-monetary outcomes

A. Access to Education and Public Services

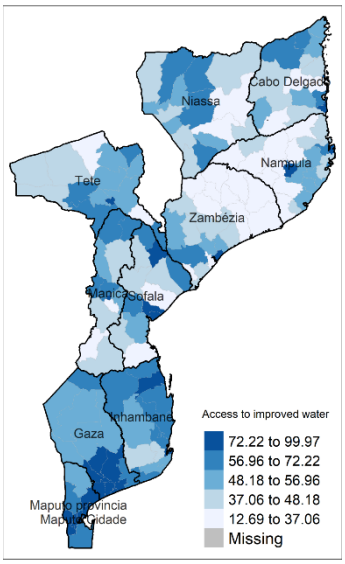
A. % of primary education completion (age + 15)



B. % of school-age children (age 6-17) who never attended school



C. % of people with access to improved water



Sources: World Bank staff calculation based on the 2017 population census.

What drives the spatial disparities?

Based on an analytical framework borrowed from the 2009 World Development Report Reshaping Economic Geography, three Ds help explain the pattern of territorial development seen in the country: density, distance, and division.[39]

A high concentration of economic activity is seen in a few major cities, particularly in the capital city of Maputo. Most economic activities and population are concentrated geographically in the capital city of Maputo and its vicinity (e.g., Matola) as well as a few key secondary cities in the northeast (e.g., Nampula, Pemba), the center (e.g., Beira, Chimoio) and the northwest (e.g., Tete). This skewed distribution is by no means unique to Mozambique. It was found that cities provide more than 80 percent of global GDP.[40] In Mozambique, Maputo is the country's largest urban center and economic hub where the bulk of commercial and financial activities is concentrated. Despite making up only four percent of the country's total population, Maputo contributes about 20 percent of Mozambique's GDP.[41] Not only is the city of Maputo the wealthiest place in the country, but it is also where most of the growth in the number of jobs and firms has occurred over the past two decades.[42]

Poverty rates are lower in more urbanized and more densely populated districts. Among the least impoverished areas are those districts that house some of the largest cities in the country such as Maputo, Beira, and Tete. Indeed, population density is one of the strongest predictors of district-level poverty rates (**Figure 2.14 Panel C**). Economic density contributes to driving structural transformation and local economic growth in Mozambique. It is in these large cities – particularly in Maputo – that more productive, salaried jobs are available. For instance, Maputo Province, including the city of Maputo, accounts for about 60 percent of private wage jobs in the country.[43]

[39] The first of the three is Density, which, as applied here, is defined as the economic mass or output per unit of land area (often measured as gross domestic product [GDP] per square kilometer). Densely populated cities or urban settlements are generally taken as a strong indicator of economic density (and growth potential). The second factor is Distance, which is the ease or difficulty of transporting goods, services, labor, capital, information, and ideas between two locations. Completing the 3Ds is the concept of Division, which is defined in both physical and social terms. It captures tangible barriers to growth, such as cross border trade restrictions, and differences in access to services and economic opportunities across population groups such as those based on gender, age, economic activity (for example, between pastoralists and farmers), as well as displaced individuals and other vulnerable groups.

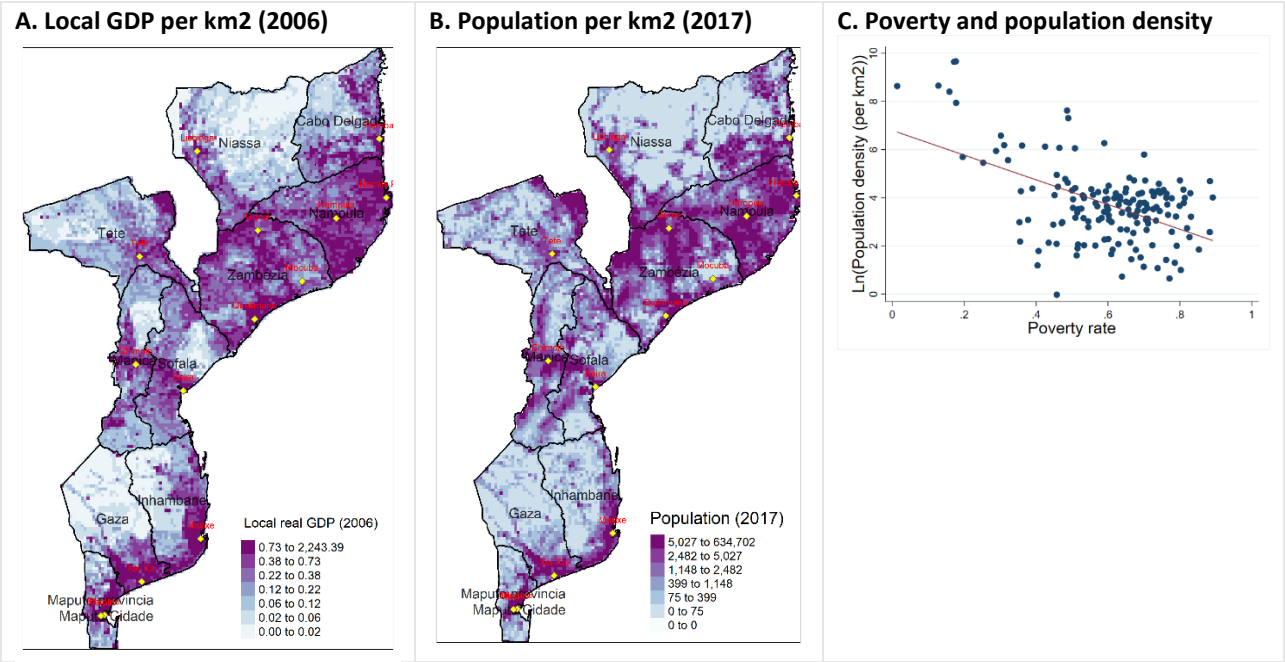
[40] Dobbs et al. (2011).

[41] See https://urbanresiliencehub.org/city-economy/maputo/.

[42] Lachler and Walker (2018).

[43] Ibid.

Figure 2.14: Poverty and economic density



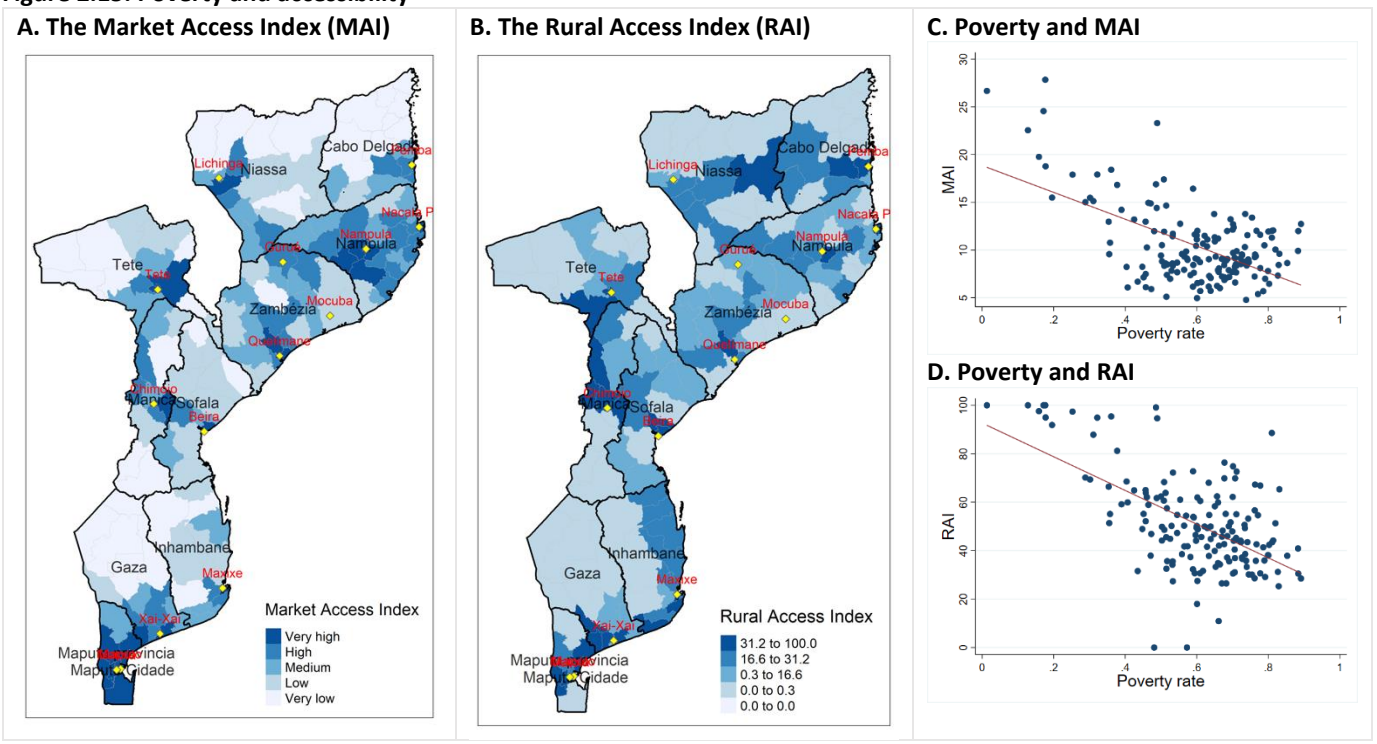
Sources: Gridded GDP data estimated based on nighttime light, population and land cover data (Ghosh et al. 2010); gridded population data from WorldPop, district-level population density calculated based on the 2017 population census and district boundary shapefile; poverty rate from 2019/20 IOF

High distance – or a lack of accessibility to major markets – limits economic opportunities and **further entrenches poverty in already lagging regions.** Accessibility to major markets offers multiple benefits, such as helping to facilitate rural-urban migration and further expansion of cities,[44] generating new job opportunities for rural farmers,[45] boosting local economic activities[46] and income,[47] and increasing the value of agricultural land.[48] Conversely, poor areas with limited accessibility to those urban centers will most likely continue to be trapped in poverty, thus worsening spatial inequalities.[49]

In Mozambique, poorer districts also have limited connectivity to major markets and connective infrastructure. A measure of market access – which is defined as the sum of populations in major markets that can be reached within a certain travel time from each district[50] – shows that some of the most impoverished districts in Gaza, Inhambane, Tete, Manica, and Sofala are also placed the farthest away from major markets in the country (**Figure 2.15 Panel A**). A similar pattern emerges for the Rural Access Index (RAI), which is the share of rural population living within two kilometers from all-season roads (proxied by OpenStreetMap) (**Figure 2.15 Panel B**).[51] Rural accessibility is particularly low in Zambezia and Nampula where a large majority of the rural population lives distant from major roads. Overall, Mozambique presents a strong negative relationship between these measures of accessibility and poverty, in which better accessibility is often accompanied by less poverty (**Figure 2.15 Panel C).**

[44] Jedwab and Storeygard (2022); Redding and Sturm (2008).
[45] Herzog (2021).
[46] Storeygard (2016); Jedwab and Moradi (2016).
[47] Jaworski and Kitchens (2019).
[48] Donaldson and Hornbeck, 2016.
[49] World Bank, 2009.
[50] Market access is measured by the estimated number of people in major cities that can be reached within certain travel time. For details, see Annex 3.
[51] See Annex 3 for more details.

Figure 2.15: Poverty and accessibility



Sources: The Market Access Index calculated based on data on city population from the 2017 population census and travel time computed based on the friction map provided by Weiss et al. (2018). The Rural Access Index is computed based on gridded population data from WorldPop, road network data from OpenStreetMap, and urban extent data from the Global Human Settlement Layer Urban Centres Database (GHS-UCDB) (Florczyk et al. 2019).

Limited accessibility to major markets poses a significant constraint to generating economic opportunities for rural farmers. Limited market access is among the leading factors that constrain the use of inputs and improved technologies (for example, improved seeds and tractors,) among rural farmers in Mozambique.[52] Low market accessibility and rural connectivity stem largely from the poor quality of roads that undermine connectivity between rural areas and urban markets. While primary roads have been well-maintained by the central government, only about one-quarter of secondary and tertiary roads are in good condition, thus seriously limiting market access.[53]

Some of the poorest districts in the northern region are also found in a highly fragile environment with a high level of division, conflict and violence. High division deeply entrenched in socio-economic cleavages has been another key factor that puts the country's growth and poverty reduction at risk. Since its independence in 1975, the country has experienced recurrent episodes of conflict and violence, including a civil war (1977–1992) followed by low-level armed conflicts persisting to this day. Since 2017, the northern province of Cabo Delgado – the second poorest province in the country – has become the next frontier of conflict (Figure 2.16 Panel A). According to the Displacement Tracking Matrix (DTM) of the International Organization for Migration (IOM), this conflict has generated about 750,000 internally displaced persons (IDPs) (as of September 2021); most of them have sought safety in urban areas within

[52] Cunguara and Darnhofer, 2011.
[53] World Bank 2017.

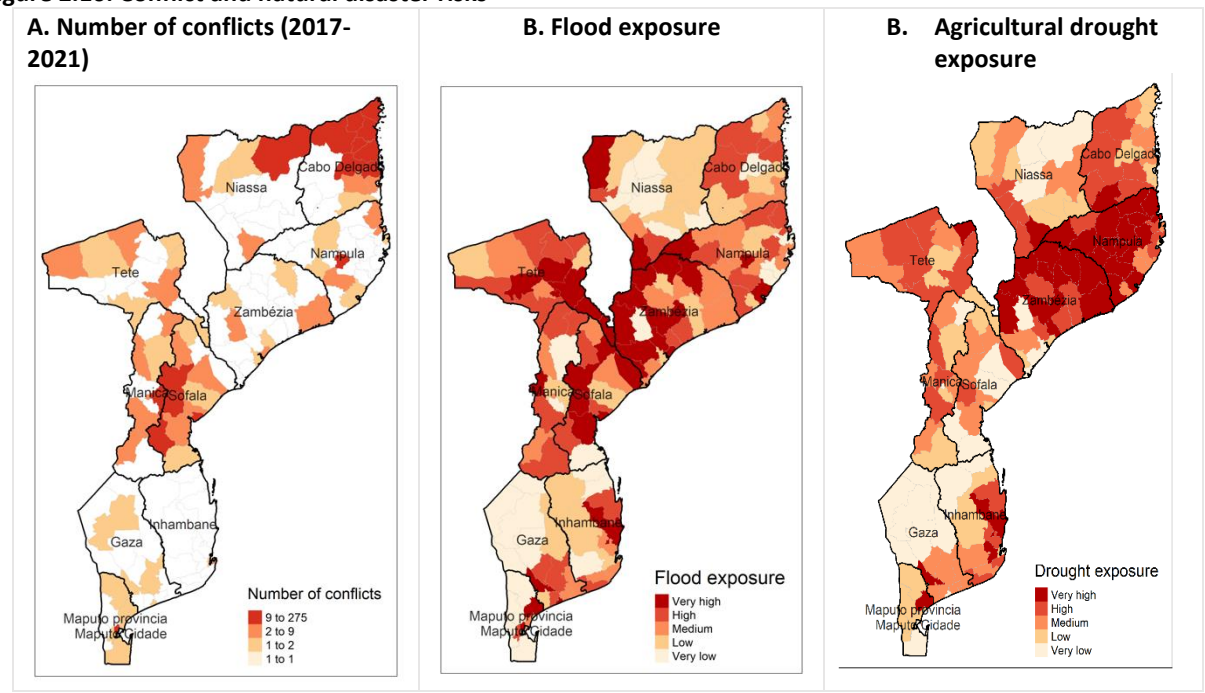
Cabo Delgado or its neighbouring provinces of Nampula, Niassa and Zambezia. This influx of IDPs adds to already high deficits in infrastructure and public services among northern cities.[54]

Some of the poorest areas in the northern and coastal provinces also suffer from exposure to various increasingly recurrent natural disasters, including cyclones, floods, and droughts. Cyclones pose recurrent threats to the poor particularly in the northern and coastal provinces of Nampula, Zambezia and Sofala. A cyclone risk map generated by the World Bank's Global Facility for Disaster Reduction and Recovery (GFDRR) shows that Zambezia and Sofala are particularly vulnerable to the significant economic impact of cyclones, followed by Nampula, Tete and Gaza.[55] In March 2020, Cyclone Idai flooded an estimated 3,000 sq. km of land and 715,378 hectares of cultivated land, displacing over 400,000 and affecting over 1.5 million most of whom were in Sofala Province and Manica Provinces. Most recently, Cyclone Gombe in March 2022 also inundated an estimated 20,500 hectares of cropland in Zambezia and Nampula Provinces.[56]

Floods and droughts present additional risks to the livelihoods of many poor households – particularly rural farmers. Mozambique experiences average annual losses of US$440 million due to floods alone, which disproportionately affect the poor and vulnerable.[57] The impact of flooding is greatest in the coastal provinces of Zambezia, Sofala, and Nampula as well as Tete Province in the northwest (**Figure 2.16 Panel B**). In addition to devastating floods, droughts are also common. The northern (e.g., Cabo Delgado, Nampula), central (e.g., Zambezia and Tete) and southern provinces (e.g., Inhambane) were estimated to have experienced the greatest loss of agricultural production due to drought hazard during 2010-2020 (**Figure 2.16 Panel C**).[58]

[54] World Bank's (2021a)
[55] World Bank (2019).
[56] https://www.fao.org/giews/countrybrief/country.jsp?lang=es&code=MOZ.
[57] World Bank (2021a).
[58] Calculated based on the total value of agricultural production from Global Spatially-Disaggregated Crop Production Statistics Data for 2010 (SPAM) Version 2.0 (Yu et al. 2019). We aggregate the value of agricultural production only for pixels that are classified as cropland in Potapov et al.'s (2021) 2019 global map of crop extent and where the Vegetation Health Index – a proxy measure of vegetation condition ranging from 0 (poorest) to 100 (excellent) – is below 40, a threshold used to define drought conditions (https://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/vh_TechniqueBackground.php). Since each of these data have different extents and spatial resolutions, they are resampled to have a consistent extent and resolution.

Figure 2.16: Conflict and natural disaster risks



Sources: Number of conflicts calculated based on ACLED; number of people exposed to flood hazard refers to the size of population subject to an expected flood inundation depth of 10cm or above for a return period of 20 years based on WorldPop and Fathom; and lastly total value of agricultural production (International USD2009/10) from SPAM (Yu et al., 2019), cropland from Potapov et al. (2021), and drought data from STAR - Global Vegetation Health Products (https://www.star.nesdis.noaa.gov/smcd/emb/vci/VH/vh_4km.php).

However, the poorer provinces in the northern and central regions hold great economic potential should current structural barriers to growth be eased. There are several key drivers that determine the growth potential of a certain geographical area, including market access, economic density, urbanization, human capital, and local transport connectivity, among others.[59] In Mozambique, areas of economic potential are spatially concentrated in the southern and central regions – particularly around major cities like Maputo, Beira and Chimoio – according to the Economic Potential Index (EPI) constructed based on several indicators of economic endowments[60] (**Figure 2.17 Panel A**). Not surprisingly, poorer areas also suffer from lower growth potential (**Figure 2.17 Panel B**). The northern provinces are characterized by low economic densities, lack of connective infrastructure and low human capital, which all coalesce to drag those places into a vicious cycle of suboptimal territorial development.

The potential is particularly concentrated in districts around secondary cities. In the lagging northern and central provinces, there are several key secondary cities in that can serve as drivers for regional growth and poverty reduction. These cities include Nampula and Nacala Porto in Nampula; Quelimane, Mocuba and Gurué in Zambezia; and Pemba in Cabo Delgado. According to the estimates of this study, 14 percent of the country's poor live within and near those six major cities in Nampula, Zambezia and Cabo Delgado.

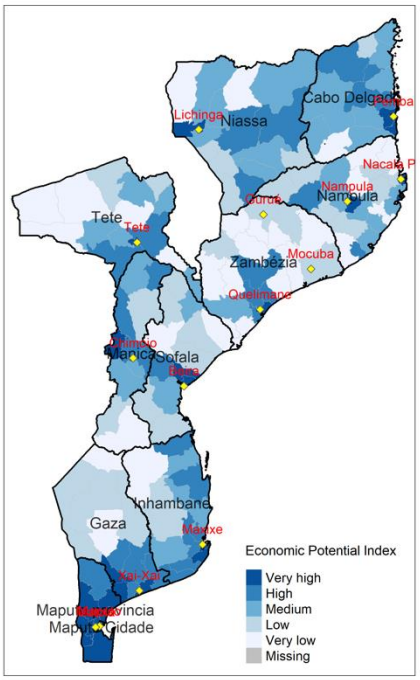
[59] Roberts (2016).

[60] The EPI is computed based on the methodology proposed in Roberts (2016). The EPI is calculated based on the sum of the z-scores of the following indicators: population density (the 2017 population census); the Market Access Index (see more details in Annex 3); the Rural Access Index (see more details in Annex 3); and primary education completion rate (the 2017 population census).

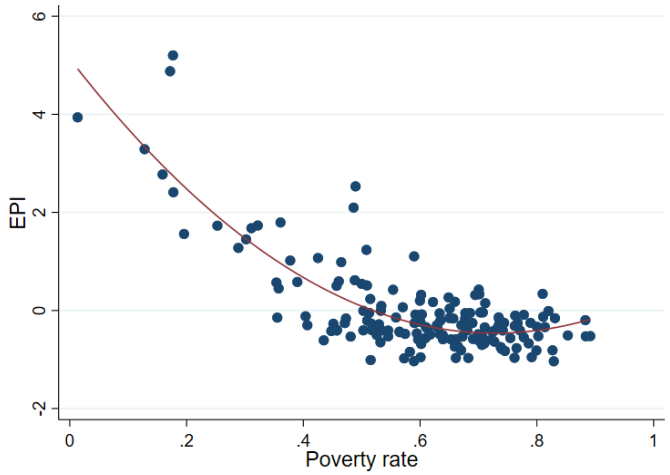
Improving linkages between peri-urban and rural areas, on the one hand, and these key secondary cities could strengthen the growth potential of the north. For instance, investing in connective infrastructure along the Nacala Corridor – which stretches from the city of Tete located 200km inland from the Mozambican coast through Nampula to the port of Nacala – would help generate new economic opportunities not only for those living in those urban centers but also nearby farmers by linking rich agricultural regions in Nampula Province to a global market (through the port of Nacala).[61] Investment in the regional corridor would also need to be coupled with improved public services and infrastructure in those key cities, which are recurrently damaged and undermined due to natural disasters and are now under increasing pressure due to the inflow of IDPs.[62]

Figure 2.17: Economic potential and its linkage with poverty

A. The Economic Potential Index



B. Economic potential and poverty



Sources: The EPI is computed based on the methodology proposed in Roberts (2016). The EPI is calculated based on the sum of the z-scores of the following indicators: population density (the 2017 population census); the Market Access Index (see more in Jedwab and Storeygard, 2020 and Weiss et al., 2015); the Rural Access Index (see more details in https://datacatalog.worldbank.org/search/dataset/0038250); and primary education completion rate (the 2017 population census).

[61] Arup (2016).
[62] World Bank (2021).

2.5 An uneven playing field for human opportunities and economic capabilities

The Human Opportunity Index (HOI) used in the following measures inequality in access to opportunities and it helps identify which socio-demographic characteristics have the largest contribution to inequality. Changes of its components over time also provide insights into the drivers of change[63].

The HOI is a useful tool for policy makers, measuring inequality in access to opportunities and identifying which socio-demographic characteristics have the largest contributions to inequality. Decomposing changes in the HOI over time can also indicate how improvements in access to opportunities have come about, namely through changes in coverage or through equalization effects. This is important for Mozambique, as the coverage of many opportunities is starting from a low baseline level and improving equality of opportunity is important for building inclusive human capital.

A context of increased monetary poverty in Mozambique makes it important to measure and understand inequality of opportunity among children as building human capital forms the basis of economic growth and shared prosperity. As noted in the previous sections, intergenerational mobility in Mozambique is low and monetary and non-monetary poverty increased between 2014/15 and 2019/20, in part due to major shocks over the period. However, the Gini index went down substantially and changes in access to basic services and non-monetary indicators of wellbeing and opportunity for human development may have followed different trends, particularly because many of these indicators are cumulative over time. As such, 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. The analysis focuses on estimating inequality of opportunity among children rather than inequality of outcomes among adults.

The approach followed in the analysis captures both the coverage of basic services and how equitably 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. It is composed of basically two elements based on household surveys data, namely:

- Average coverage rate of basic services
- Equity of the distribution of opportunity

The first component of the index –the average coverage rate of basic services– is measured directly using survey data. The second element–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).[64] 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.

The index is calculated for 2014/15 and 2019/20 and for nine basic opportunities related to education, health, access to basic services, and quality of housing. The estimation of the HOI uses survey data from

63 for more datils see https://www.worldbank.org/en/topic/poverty/lac-equity-lab1/equality-of-opportunities

64 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.

the IOFs 2014/15 and 2019/20. The nine opportunities considered in the index and the seven children circumstances defined are shown in **Table 2.4** below.

Table 2.4: Opportunities and circumstances of the Human Opportunity Index

Opportunities		
Type	**Definition of indicator**	**Name of indicator**
Education	School enrollment (children ages 6-11 years)	Enrollment (6-11)
	Started school on time (enrolled in grade 1 at the official entry age) (children ages 6-7 years)	Start school (6-7)
	Finished lower primary education on time (completed grade 5) (children ages 12-14 years)	Finished EP1 (12-14)
Health	Slept under mosquito net last night (children ages 0-59 months)[65]	Mosquito net (0-59 months)
	Child is not stunted (children ages 0-59 months) [66]	Not stunted (0-59 months)
Dwelling	Improved drinking water (children ages 6-11 years) [67]	Water (6-11)
	Improved sanitation (children ages 6-11 years)	Sanitation (6-11)
	Electricity is used for lighting (children ages 6-11 years)	Electricity (6-11)
	Quality housing based on walls being constructed from cement or bricks (children ages 6-11 years)	Quality housing (6-11)
Circumstances		
Type	**Definition of circumstance**	**Name of circumstance**
Characteristics of household members	Number of children (ages 0-14 years) present in the household, excluding child considered for the HOI	Number of children
	Household head and spouse both present in the household	Both parents
	Child's sex	Sex
Household characteristics	Head of household's education level	Household head education
	Average household consumption per adult equivalent	Consumption per capita
	Household lives in an urban area (as opposed to a rural area)	Urban
	Province where the household lives	Province

While coverage of most opportunities has increased over the past five years, major gaps remain, especially for rural areas. Between 2014/15 and 2019/20, Mozambique registered an increase in the coverage for all the opportunities for children considered in this analysis other than access to improved

[65] The age range of 0-59 months is the age range used in the IOF survey for this indicator, and thus that is what is used for the HOI in this analysis.

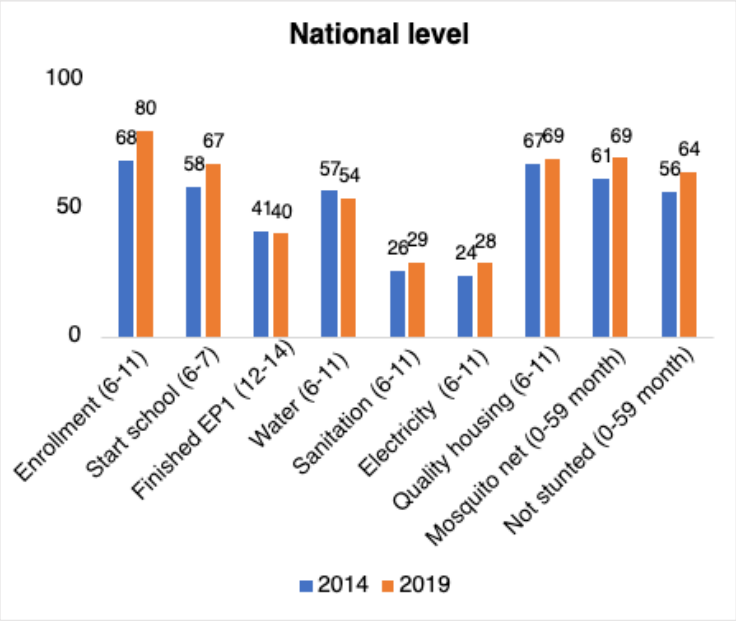
[66] Children are defined as stunted if their height-for-age is more than two standard deviations below the 2006 WHO Child Growth Standards. To calculate this, we used zscore6 Stata ado: Leroy, Jef L (2011). zscore06: Stata command for the calculation of anthropometric z-scores using the 2006 WHO child growth standards. http://www.ifpri.org/staffprofile/jef-leroy

[67] The specific answer choices for the questions about drinking water sources changed slightly between the 2014/15 IOF survey and the 2019/20 IOF survey. However, the changes were quite minor and are unlikely to have made a significant difference. In 2014/15, the answer choices included in the definition of improved drinking water were: piped inside the dwelling, piped in the yard, piped in the neighbor's dwelling, water fountain, borehole, well with manual pump, water from protected springs, water from unprotected springs, rainwater, and bottled water. The answer choices not included in the definition of improved water for 2014/15 were: water cistern, protected well, river, lake, lagoon, and other. In 2019/20, the answer choices included in the definition of improved drinking water were: piped water inside the house, piped water outside the house/yard, piped water to the neighbor's house, public tap water, water from borehole (well with manual pump), protected well water without pump, rain water, and mineral water/bottled. The answer choices not included in the definition of improved water for 2019/20 were: non-protected well water, spring/fresh water, surface water, and other.

water. These trends were reflected at the national level, as well as in both rural and urban areas. Despite considerable progress, absolute levels are still far from being universal and major gaps in coverage persist between urban and rural areas, with substantially lower rates for all opportunities in the latter. In education, for instance, the enrolment of children in primary school age (6 to 11 years old) increased from 68 percent in 2014/15 to 80 percent in 2019/20 at the national level (**Figure 2.18**). For rural areas, the percentage increase was larger, from 63 percent in 2014/15 to 76 percent in 2019/20 (**Figure 2.19**), but still far behind urban areas, which registered an increase from 82 percent in 2014/15 to 90 percent in 2019/20 (**Figure 2.20**).

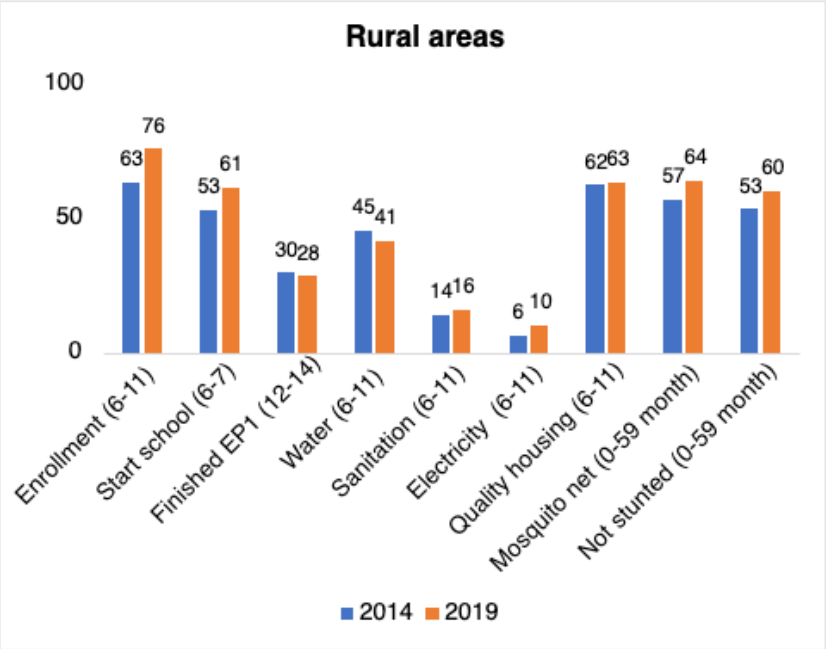
However, when it comes to educational achievement, such as the share of children completing primary school on time, rural areas perform at half the rate of urban areas and registered a decrease between 2014/15 to 2019/20 from 30 percent to 28 percent, respectively. In addition, large gaps between rural and urban areas were observed for access to basic services, including electricity, improved sanitation, and improved water. The pace of progress for some indicators was notably faster than others. In particular, school enrolment, starting school on time, sleeping under a mosquito net, and not being stunted all improved 8-12 percentage points over the five-year period. In contrast, opportunities for access to improved water, improved sanitation, electricity, quality housing and finishing lower primary registered very little progress (3 to 4 percentage points change over the five-year period).

Figure 2.18: Coverage rate of basic opportunities for children (%), nationally



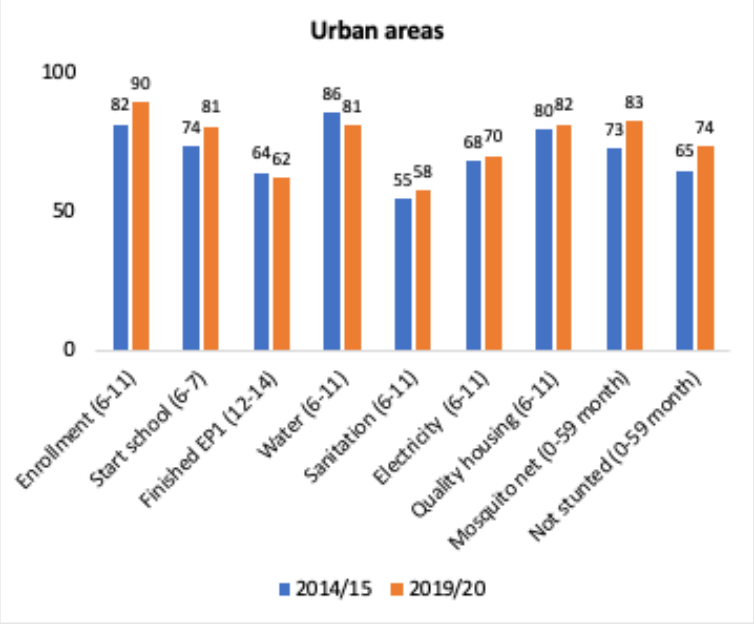
Source: World Bank, using IOF 2014/15 and IOF 2019/20

Figure 2.19: Coverage rate of basic opportunities for children (%), rural areas



Source: World Bank, using IOF 2014/15 and IOF 2019/20

Figure 2.20: Coverage rate of basic opportunities for children (%), urban areas

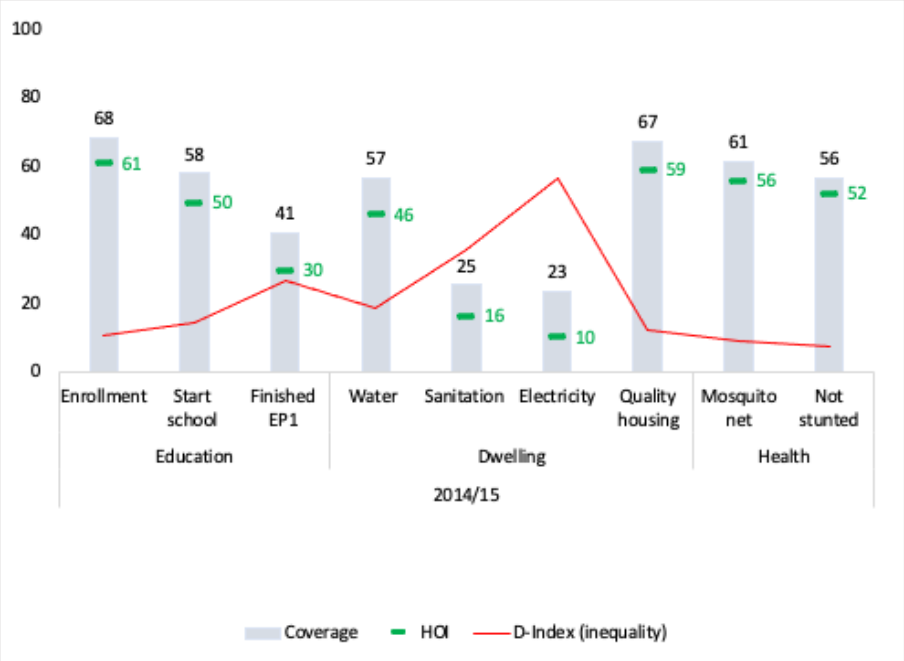


Source: World Bank, using IOF 2014/15 and IOF 2019/20

Low coverage rates of basic services are associated with higher rates of inequality of opportunity for both 2014/15 and 2019/20. The same opportunities that have the lowest coverage rates also have the highest degree of inequality in access. **Figures 2.21 and 2.22** show the coverage rates (bars) and HOI (green lines) for the opportunities considered in the analysis. The gap between the bars and green lines reflects the "penalty" due to the inequality of opportunities among children with different circumstances. As might be expected, the opportunities with the highest coverage rates also tend to have the highest HOI, such as school enrolment and quality housing. However, for some opportunities, the HOI is

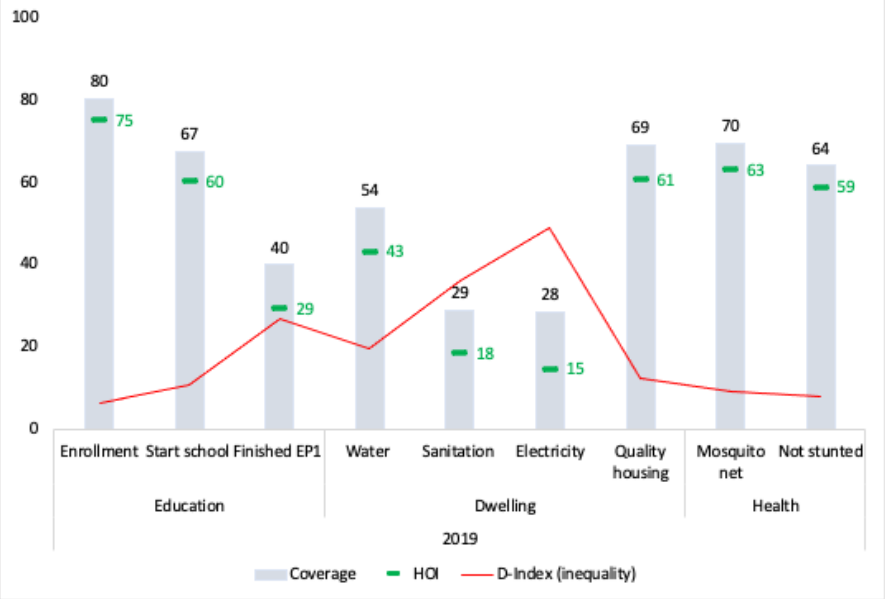
substantially lower than the coverage rate, indicating higher rates of inequality. For example, in 2019/20 the HOI for access to improved sanitation is just 66 percent of the coverage rate, and the HOI access to electricity in the home is just 54 percent of the coverage rate. This stands in contrast to opportunities like enrolment, starting school on time, sleeping under a mosquito net, and not being stunted, where the HOI is much closer to the coverage rate (albeit still with significant gaps). While the HOI increased for most opportunities between 2014/15 and 2019/20, this overall regional pattern did not change much over the five-year period.

Figure 2.21: Coverage, HOI, and D-index for access to opportunities among children in 2014/15, %



Source: World Bank, using IOF 2014/15

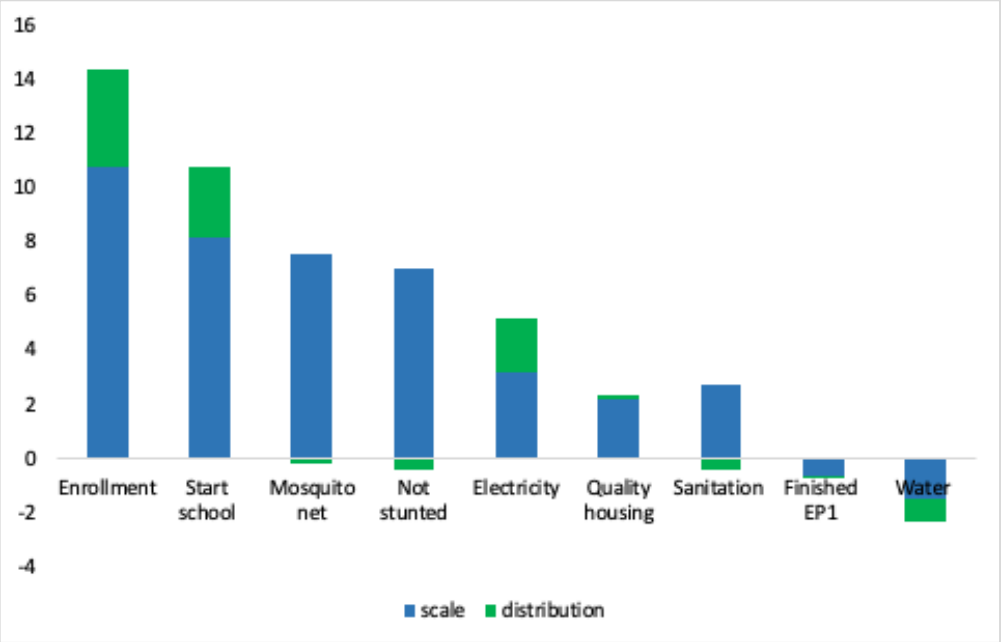
Figure 2.22: Coverage, HOI, and D-index for access to opportunities among children in 2019/20, %



Source: World Bank, using IOF 2019/20

Most opportunities registered at least some improvement in the HOI between 2014/15 and 2019/20, but this improvement has come mainly from increasing coverage as opposed to increasing equality of access by better targeting expansion. The only opportunities that had a decrease in the HOI were finishing lower primary on time (HOI dropped from 30 percent to 29 percent) and access to improved water sources (HOI dropped from 46 percent to 43 percent). For the other seven opportunities, the HOI improved between two and 14 percentage points, with one of the biggest gains being for school enrolment (**Figure 2.23**). Decomposing the changes in HOI across years, however, shows that, for all the opportunities, the biggest change was due to scale effects (increasing coverage rates). Indeed, for the opportunities to sleep under a mosquito net, not being stunted, quality housing, and access to improved sanitation, no improvement comes from reducing inequality. In contrast, school enrolment, starting school on time, and access to electricity did improve in part due to distribution effects, though still not as much as the change due to increased coverage rates.

Figure 2.23: Decomposition of trends in the HOI between 2014/15 and 2019/20, by scale and distribution effects, change in percentage points



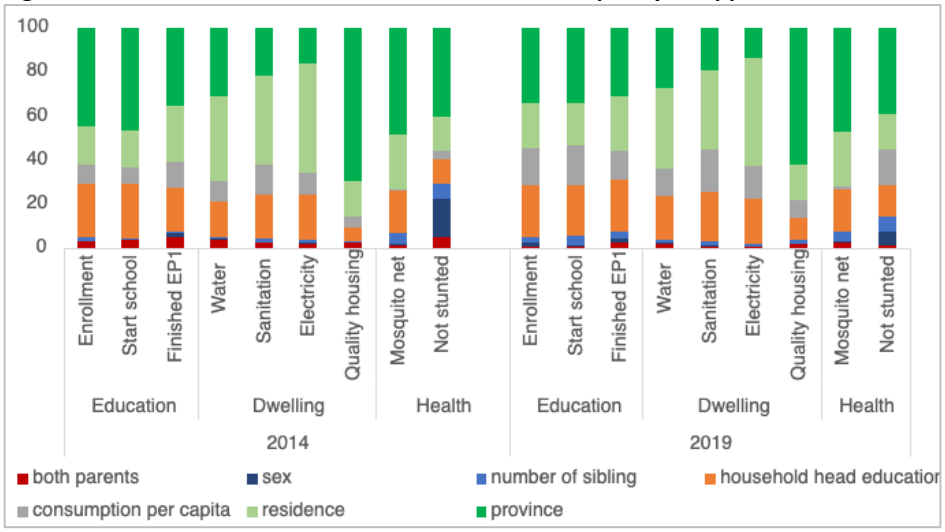
Source: World Bank, using IOF 2014/15 and IOF 2019/20

The opportunities of Mozambican children later in life are largely influenced by their location. For all opportunities, location factors (urban versus rural, and province) account for the majority of inequality in access. Figure 2.24 shows the relative contribution of seven different circumstances related to a child's household and household members to inequality of opportunities. Overwhelmingly, for both 2014/15 and 2019/20, the biggest determining factors for access to all opportunities was the household's residence in an urban or rural area and the province they lived in. [68] The household head's education level was the third most important factor, again for both periods and across all opportunities considered. Interestingly, there was a strikingly low role of monetary wellbeing in explaining inequality of all the opportunities. While there is indeed a strong correlation between monetary wellbeing and where a household lives (urban or rural, and province), this highlights the particularly strong spatial dimension of inequality of

[68] In the 2018 Poverty Assessment for Mozambique, provinces were not included as a circumstance, and HOIs were constructed for separate provinces, however, in order to better understand the linkage between regions and inequality, provinces were used specifically as a circumstance in this analysis.

access. Another interesting finding was that, in 2014/15, the sex of a child was the second largest contributor to inequality in not being stunted. In particular, girls were significantly less likely to be stunted than boys. However, by 2019/20, this factor became far less important, as province, residence (urban versus rural), consumption per capita, number of siblings, and the household head's education level became bigger explanatory factors.

Figure 2.24: Contribution of each circumstance to inequality of opportunities in 2014/15 and 2019/20, %



Source: World Bank, using IOF 2014/15 and IOF 2019/20

Whereas supply barriers to education exist, the main reason for not enrollment is lack of interest or low perceived utility. Even for children of primary school age (6-12 years), the main reason cited for not being in school was the lack of interest in school or the perception that school has no use (**Table 2.5**). This was also the main reason for children of secondary school age (13-18 years), although other reasons such as getting married gained substantially more prominence as well (**Table 2.6**). While distance to school and expense were each mentioned by around 10 percent of respondents as well, these reasons did not stand out as much. Interestingly, there was little difference between urban and rural areas, as well as for households from the poorest and richest wealth quintiles. These results were fairly similar for 2014/15 as well, indicating little change over the last five years in terms of the main reasons why children dropped out of school. The fact that so many people reported a lack of interest in school or the belief that school has no use potentially indicates low quality of education available as well as low (perceived or real) economic returns to more years of schooling.

Table 2.5: Main reason[69] for not attending school among children ages 6-12 years in 2019/20, %

	Area			Consumption quintiles				
Children ages 6-12 years	Total	Rural	Urban	1 (Poorest)	2	3	4	5 (Richest)
Working	1.79	2.15	0.00	4.07	1.24	0.00	1.41	1.41
Failed	2.38	2.35	2.51	2.88	0.81	1.49	1.08	5.64
Lack of openings at school	2.94	2.76	3.79	2.16	2.14	0.51	7.46	2.36
Illness/injury	2.96	3.02	2.65	1.10	6.64	2.14	3.63	1.96
School is too expensive	7.81	6.60	13.72	3.54	1.24	14.42	15.94	4.48
School is too distant	10.13	11.50	3.39	3.32	8.61	12.36	14.55	13.97
Of no use / lack of interest	53.29	54.67	46.52	57.25	63.0	50.94	42.27	52.56
Other	18.72	16.94	27.44	25.68	16.2	18.13	13.67	17.62

Source: IOF 2019/2020.

Table 2.6: Main reason[70] for not attending school among children ages 13-18 years in 2019/20, %

	Area			Consumption quintiles				
children ages 13-18 years	Total	Rural	Urban	Poorest	2	3	4	Richest
Pregnancy	3.62	3.12	5.04	3.27	6.81	2.83	3.11	2.22
Working	6.02	5.72	6.87	2.81	5.58	7.02	7.34	7.99
School is too distant	6.22	7.17	3.55	3.62	6.98	4.97	6.46	9.69
School is too expensive	15.43	12.57	23.48	17.68	15.8	17.93	14.4	10.78
Got married	16.24	17.89	11.60	13.79	11.8	10.74	18.8	26.16
Of no use / lack of interest	40.76	42.84	34.87	45.44	41.7	43.19	38.2	34.34
Other	11.71	10.69	14.59	13.38	11.1	13.32	11.4	8.82

Source: IOF 2019/2020.

Intergenerational mobility

Lack of intergenerational mobility, or the extent to which economic and social inequality is transmitted from one generation to the next, and the gap in educational attainments between children born in households at the top and at the bottom of the income distribution, are important measures of equality of opportunity in a society (e.g., Black and Devereux, 2011; Hertz et al., 2008; Heckman and Mosso, 2014; Van der Weide et al., 2021). Moreover, recent studies have demonstrated that low levels of intergenerational mobility can contribute to a slowdown of economic growth and development (e.g., Neidhöfer et al., 2021a). In Mozambique, where poverty and inequality are pervasive, understanding gaps in education and the degree of intergenerational mobility is critical for developing effective policies to reduce inequality and promote economic prosperity. However, among African countries, which display the lowest intergenerational mobility worldwide, Mozambique classifies among the countries in the region with the lowest levels of mobility (Alesina et al., 2021).

[69] Respondents were asked to give just one reason (the main reason) why they were not currently studying.
[70] Respondents were asked to give just one reason (the main reason) why they were not currently studying.

This part of the report provides a detailed picture of intergenerational mobility and educational gaps in Mozambique using data from the 2019/2020 IOF Household Survey. The sample comprises both co-resident and non-co-resident children born between 1970 and 2001.

The most probable transition for children is to attain the same level of education as their parents or slightly above, with limited opportunities for upward mobility from the bottom of the distribution to the top. Table 2.7 displays the educational transition matrix for Mozambique, where each cell is expressed as a percentage of each row. The rows represent the education level of parents, while the columns show the share of children with a certain level of education for each parental education level. The diagonal line represents families where there is no change in educational levels between generations, while the observations above the diagonal indicate upward mobility, and below the diagonal indicate downward mobility. The matrix suggests that although there is some upward mobility, the most likely transition is for children to achieve the same level of education as their parents or slightly above. Moreover, transitions from the bottom of the distribution to the top are very unlikely, indicating limited opportunities for social and economic mobility.

Table 2.7 – Transition Matrix

	Children Education				
Parental Education	No Education	Incomp. Primary	Comp. Primary	Incomp. Secondary	Comp. Secondary or beyond
No Education	11.16	51.58	12.61	17	7.64
Incomp. Primary	4.31	40.73	12.33	27.3	15.32
Comp. Primary	2.57	24.71	12.95	30.71	29.06
Incomp. Secondary	2.66	14.44	5.02	36.97	40.91
Comp. Secondary or beyond	0.16	4.73	2.81	18.98	73.32

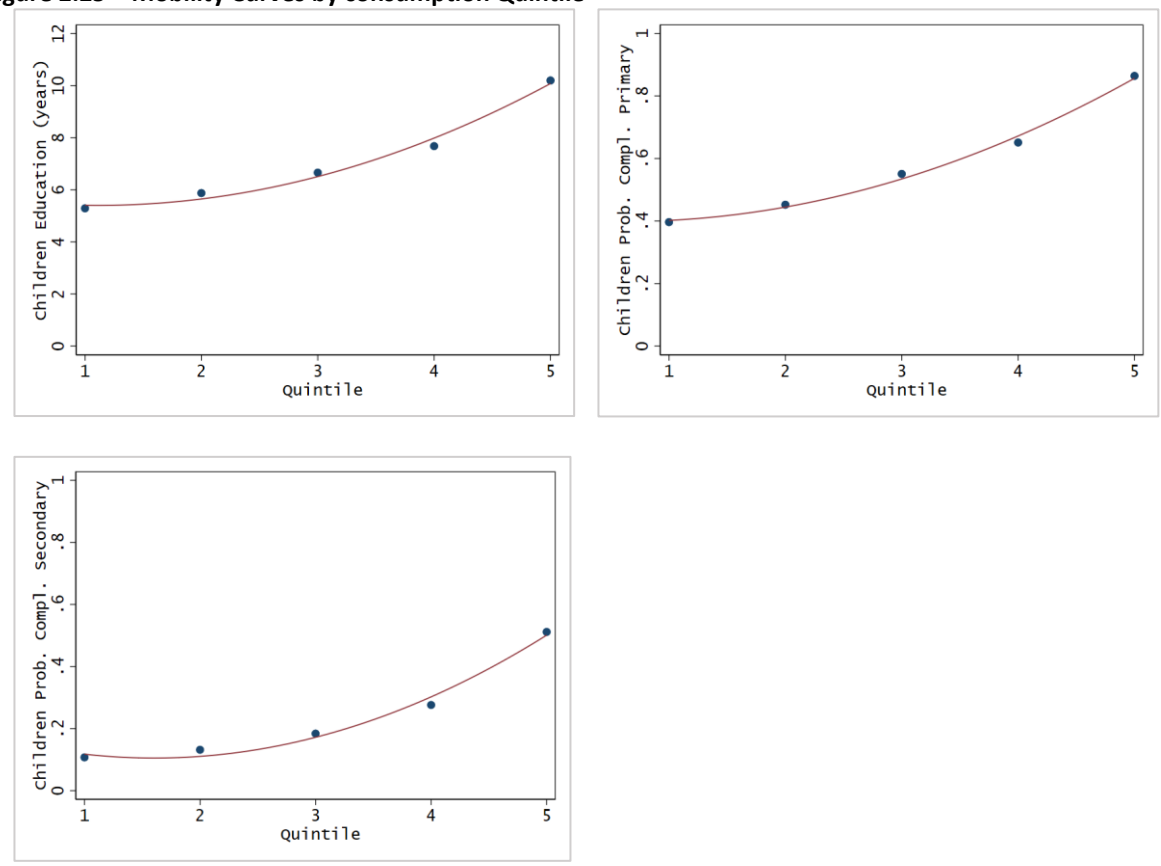
Source: own elaborations using IOF 2019/2020.

There is a clear and significant relationship between children's educational attainment and their household's socioeconomic status, resulting in a large gap in the completion of primary and secondary education between high and low status families. The mobility curves shown in **Figure 2.25** offer valuable insights into how household resources are linked to the educational achievements of children. The graphs show the average years of education attained by children based on the household's consumption quintile. Additionally, the likelihood of completing primary and secondary education is shown. The steep slope of the mobility curves suggests that intergenerational mobility is low. Children from families with more resources have significantly more years of schooling compared to those from families in the lower quintiles. In the bottom quintile of the wealth distribution, children have less than six years of schooling on average, while in the top quintile, they have more than ten years of schooling.

Completing primary education is almost universal among families with high socioeconomic status, while children from lower status families are much less likely to complete primary education: less than five out of ten children from households in the first two quintiles complete primary education. Also, the likelihood of completing secondary education is significantly lower for children from low status families, and the gap between families depending on their socioeconomic status is much wider. Children from the

top quintile are around three times more likely to complete secondary education compared to the average of those from the three lowest quintiles.

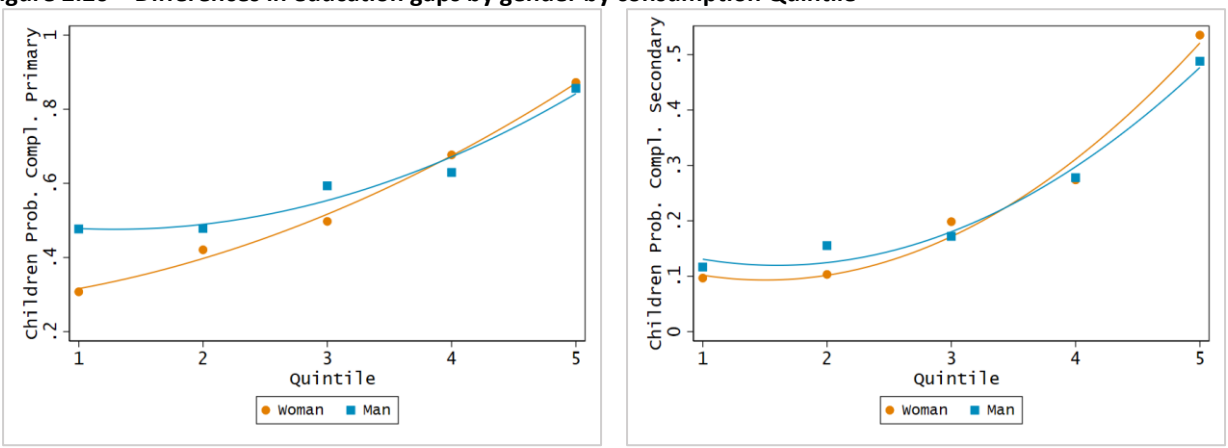
Figure 2.25 – Mobility Curves by consumption Quintile



Source: own elaboration using IOF 2019/2020.

Gender differences in educational outcomes vary depending on the specific educational outcome being measured and differ across the wealth distribution. There are significant gender differences in primary education completion rates in the lower part of the distribution—girls from households in the first three quintiles are less likely to complete primary education than boys—while there is no gap between the likelihood of boys and girls among richer households completing primary education (see **Figure 2.26**). However, we do not observe any differences in secondary education completion rates between boys and girls across all consumption quintiles. Further research is needed to understand the specific reasons for these differences and to fully comprehend the factors that contribute to gender and wealth gaps in education outcomes in Mozambique.

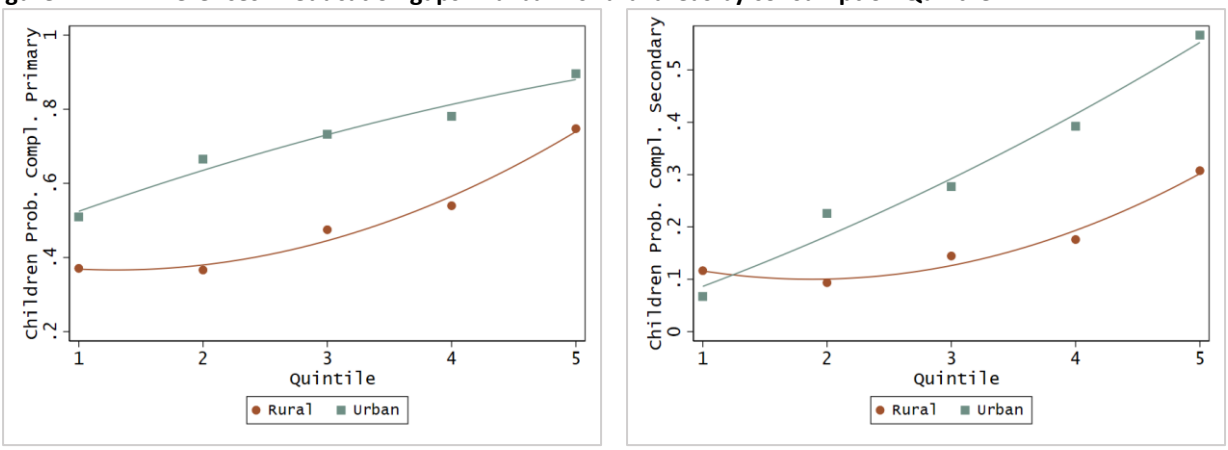
Figure 2.26 – Differences in education gaps by gender by consumption Quintile



Source: own elaborations using IOF 2019/2020.

Although urban areas may offer improved access to education, socioeconomic gaps remain a persistent issue. **Figure 2.27** highlights significant disparities between urban and rural areas in terms of primary and secondary education completion rates. Urban children have higher chances of completing both levels of education compared to their rural counterparts. These differences may be attributed to higher opportunity costs and lower availability of secondary education in rural areas. However, children in the lowest consumption quintile have similarly low probabilities of completing secondary education in both urban and rural areas. Nonetheless, socioeconomic inequalities in education completion persist in both areas.

Figure 2.27 – Differences in education gaps in urban vs rural areas by consumption Quintile



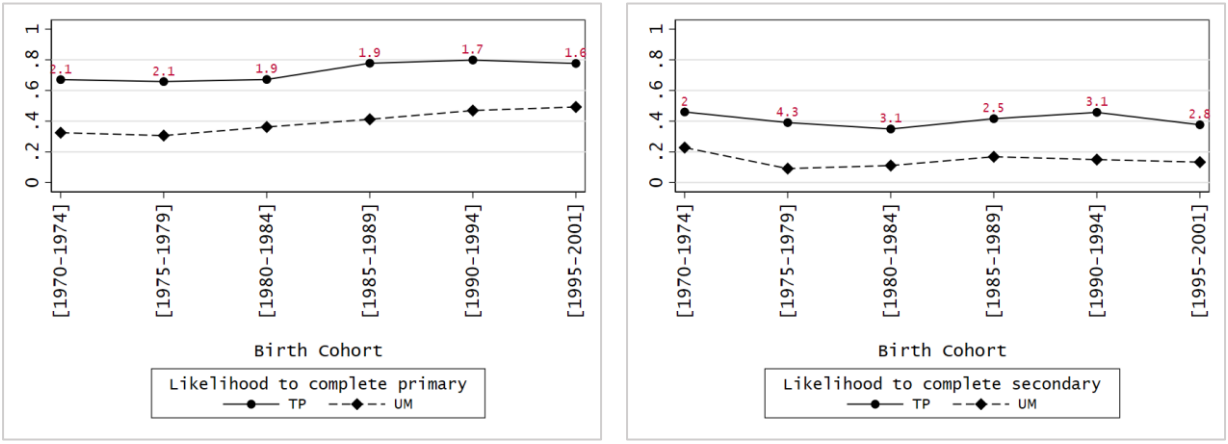
Source: own elaborations using IOF 2019/2020.

Intergenerational inequality in education has been rather stable, or even increased over time. Figure 2.28 provides insights into intergenerational mobility trends across cohorts born between 1970 and 2001. The graph on the left shows the likelihood of children completing primary education, while the graph on the right shows the likelihood of completing secondary education. Two indicators are shown: TP (top persistence) represents the likelihood for children from households in the 4th and 5th quintile of the consumption distribution and UM (upward mobility) for children from households in the first three quintiles. The indicated number shows the ratio of the two estimates, highlighting how much more likely children from families with higher socioeconomic status are to complete primary or secondary education compared to children from poorer households.

The trends over time show an increase in the likelihood of completing primary education among all children. The improvement is slightly stronger for children from richer households, whose likelihood improves from below 70% to around 80% (the improvement among low status children is from around 30% to around 50%). For secondary education, the trend for children from high status families oscillates around a likelihood of 40%. However, there is a slight decline and then stable trend in the likelihood of children from poorer families completing secondary education (from around 20% to less than 20%). As a result, educational gaps are rather stable over time. The ratio of the indicators is around two for primary education and between two and 4.3 for secondary education, which means that the likelihood of high-status children completing secondary education is up to four times higher than that of their low-status peers.

The COVID-19 pandemic is likely to exacerbate the existing intergenerational mobility trends for the cohorts currently in the school system. Recent projections for Latin American and Sub-Saharan African countries suggest a decrease in intergenerational mobility for these regions (Neidhöfer et al., 2021b; 2022). These findings indicate the potential deterioration of educational and economic opportunities available to disadvantaged individuals and highlight the urgent need for policy interventions to mitigate its effects.

Figure 2.28 – Intergenerational mobility trends



Source: own elaborations using IOF 2019/2020.

Gender

Gender inequality continues to undermine agency, human capital accumulation and poverty reduction. Mozambique's Gender Development Index figure in 2021 (0.922) reflects gender-based inequalities throughout the country. Women in Mozambique have a Human Development Index (HDI) of 0.428, compared to 0.464 for men as of 2012. An HDI of 0.428 aligns Mozambique's women with those in Mali, which ranks 186 out of 191 countries in the HDI ranking, only one level below Mozambique (HDI of 0.446). Similarly, an HDI of 0.464 aligns Mozambique's men with those in Guinea (HDI of 0.465), which ranks 182 out of 191 in the HDI ranking.

Gender-based violence (GBV) is an extreme denial of agency and has significant costs. In addition to the direct physical and psychological harm to women, GBV is a drain on human capital development, poverty reduction, and growth. Conservative estimates suggest that up to 3.7 percent of GDP can be lost annually

due to GBV – about the amount most developing countries spend on primary education.[71] Available data on GBV for Mozambique (MISAU, 2011) shows that: 37 percent of women and girls have experienced physical or sexual violence, and 12 percent have reported being forced to have sex at least once in their lives; over 40 percent of women were married before they were 18 years old; and, one in every four children aged 15-19 experienced physical violence, with girls three times more likely to experience sexual violence than boys.[72] The ongoing humanitarian crisis and natural disasters have further aggravated the situation of women and girls; further limiting their access to basic services and increasing their risk of facing GBV.

Child marriages and adolescent pregnancies are both a cause and a product of poverty. As of 2015, 53 percent of women were married before the age of 18, and 17 percent before the age of 15. Child marriage is more prevalent in the rural areas and highest in the northern and central regions. Poverty leads families to marry off their daughters, or girls themselves decide to marry early to relieve the burden on their families.[73] Where bride price (*lobolo*) is practiced (primarily in the southern region) early marriage can become a household poverty reduction strategy. Adolescents in child marriages begin their reproductive lives earlier, and conversely, unintended pregnancies often push adolescents into an early marriage. Child brides generally lack agency to negotiate marital relations which puts them at greater risk, not only of premature pregnancy, but also of sexually transmitted infections (STIs).[74] This likely contributes to adolescents and young women aged 15-24 bearing a higher Human Immunodeficiency Virus/ Acquired immunodeficiency Syndrome (HIV/AIDS) burden of disease (9.8 percent) compared to that of their male counterparts (3.2 percent).[75] Countrywide, adolescent girls in rural areas are almost twice as likely to become pregnant as those in urban areas and similarly. The poorest are more than twice as likely to become pregnant than the wealthiest. In urban areas, and particularly in the south of the country, there has also been a rise in adolescent pregnancies outside of marriage.[9] A combination of lack of accurate information about sexual and reproductive health; taboos around teen sexuality; lack of access, misinformation and reticence to use modern contraception; as well the inability to negotiate 'safer sex' are driving these high rates of adolescent pregnancies.

Child marriages and adolescent pregnancies are further connected to poverty through the education channel. In Mozambique, marriage and pregnancy have been cited as top reasons for not being enrolled in school.[76] This affects all provinces; however, there is significant regional variation with one in ten girls in Maputo Province and one in four girls in Manica Province citing pregnancy as the reason for not being in school. Married girls are much less likely to be enrolled in school than unmarried girls (**Figure 2.29)**. Conversely, having lower levels of education is linked to a higher likelihood of early pregnancy and motherhood. Causality between child marriage and early pregnancy, and lack of education is

71 World Bank. 2018. Fact Sheet: Update on Addressing Gender-Based Violence in Development Projects. https://www.worldbank.org/en/news/factsheet/2018/08/30/fact-sheet-update-on-addressing-gender-based-violence-in-development-projects

72 World Bank (2022). "Mozambique Gender Assessment."

73 Maryse C. Kok et al., "Being Dragged into Adulthood? Young People's Agency Concerning Sex, Relationships and Marriage in Malawi, Mozambique and Zambia," *Culture, Health & Sexuality* 0, no. 0 (February 25, 2021): 1–26, https://doi.org/10.1080/13691058.2021.1881618.

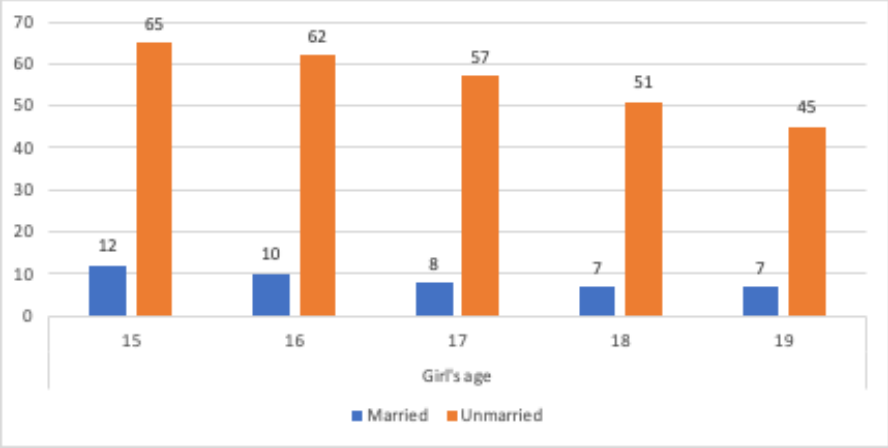
74 Ministério do Género, Criança e Acção Social, Moçambique. (2016). Perfil de Género de Moçambique. https://doi.org/https://doi.org/10.3929/ethz-b-000238666

75 Ministério da Saúde (MISAU), Instituto Nacional de Estatística (INE), and ICF. 2019. Survey of Indicators on Immunization, Malaria and HIV/AIDS in Mozambique 2015: Supplemental Report Incorporating Antiretroviral Biomarker Results. Maputo, Mozambique, and Rockville, Maryland, USA: INS, INE, and ICF.

76 MINEDH, Analise do Sector de Educação (ESA): Relatório Final, Julho 2019.

bidirectional.[77] Six in 10 adolescents without any level of education have children or are pregnant by age 19 whereas for those with secondary or higher levels of education this number drops to three in 10. A recent meta review found that increasing girls' education has been shown to be one of the most effective ways to reduce adolescent pregnancy and early marriage suggesting the need to redouble efforts to keep girls in school. Recent shifts in policy to allow pregnant girls to attend regular classes are encouraging but will need to be accompanied with efforts to address root causes. [78]

Figure 2.29: Share of married and unmarried girls attending school (%)



Source: World Bank (2021) "Mozambique Systematic Country Diagnostic Update." Data from 2017 Census.
Note: "Married" includes girls formally married, in a marital union, married in the past or currently divorced or widowed.

Women's underemployment and concentration in less productive jobs and sectors is partly driven by unequal burdens of care and domestic responsibilities, constraining their economic potential. Significant gender differences exist in time allocation for domestic responsibilities, often guided by deep-rooted social norms, and this can be a driving force behind gender gaps in labor force participation rates and bias the type of economic opportunities women can access. The social norms which drive time allocation are, to some extent, based on socio-cultural perceptions of men's and women's responsibilities towards the wellbeing of the household. The unequal burdens of care work and domestic responsibilities result in women engaging in fewer hours of paid labor and prioritizing job flexibility over job quality. Domestic responsibilities often prevent women from taking better quality jobs, such as waged employment with fixed schedules or full-time work. Often, a lower-quality job in the agricultural sector, part-time work, or being self-employed provides more flexibility to women, allowing them to meet childcare and other domestic demands[79]. Increasing access to childcare is an effective mechanism for increasing women's employment. A study conducted in Mozambique indicates that childcare service provision increased the caregivers' employment rate by 26 percent[80].

Rapid assessments conducted on the impact of COVID-19 on gender in Mozambique suggest that violence against women and child abuse increased during the pandemic, while access to support services was disrupted. Almost half of women felt that GBV had gotten worse since the onset of COVID-19, and many

77 Chata Malé and Quentin Wodon, *Basic Profile of Early Childbirth in Mozambique*, World Bank, 2016
78 USAID, "Gender Assessment for USAID/Mozambique Country Development Cooperation."p. 18. In December 2018, the Government revoked an earlier law requiring schools to transfer pregnant students to evening classes.
[79] World Bank. 2018. Fact Sheet: Update on Addressing Gender-Based Violence in Development Projects. https://www.worldbank.org/en/news/factsheet/2018/08/30/fact-sheet-update-on-addressing-gender-based-violence-in-development-projects
[80] World Bank (2022). "Mozambique Gender Assessment."

reported directly knowing someone who had experienced physical violence[81]. The Pandemic exacerbated GBV for several reasons, including those linked to poverty-related stress, the psychological stress of increased social isolation, and the decreased ability of women to escape from abusive partners.[82] Additionally, the sudden onset of increased economic stress and anxiety may have led to negative coping mechanisms and exacerbated violent behavior at the household level, including child maltreatment and corporal punishment, transactional sex and exploitation of child labor to increase the family income.[83] A COVID-19 rapid gender assessment revealed that women and men experienced employment losses, but while women had a smaller decline, their household and childcare burdens increased. The study also revealed that 1 in 4 girls did not continue with their learning due to school closures.[84]

[81] IMASIDA 2015

[82] Maryse C. Kok et al., "Being Dragged into Adulthood? Young People's Agency Concerning Sex, Relationships and Marriage in Malawi, Mozambique and Zambia," *Culture, Health & Sexuality* 0, no. 0 (February 25, 2021): 1–26, https://doi.org/10.1080/13691058.2021.1881618.

[83] Gender-Based Violence in Mozambique."

[84] Ministério do Género, Criança e Acção Social, Moçambique. (2016). Perfil de Género de Moçambique. https://doi.org/https://doi.org/10.3929/ethz-b-000238666

Chapter 3. Profiling the labor market: low economic transformation, low availability of productive jobs

The high labor force participation rate conceals issues related to the quality of employment and large disparities in earnings across sectors. Unemployment rates are low at 5.2 percent, with marginal differences between genders. Younger people and urban residents face higher unemployment rates. The low unemployment rate conceals issues of employment quality, as over 70 percent of the employed work in the agriculture sector, specifically subsistence agriculture with minimal working conditions and productivity. Child labor persists, with 38 percent of children aged 5-17 engaged in work.

The present chapter exploits the IOF 2019/20 with a view to displaying the most relevant information on labor from a poverty and inequality perspective in Mozambique. It also uses some findings from the 2018 Enterprise Survey and 2020 Informality Survey that have been already addressed elsewhere[85]. The chapter discusses the interplay between jobs, employment and poverty, examining how they are interconnected.

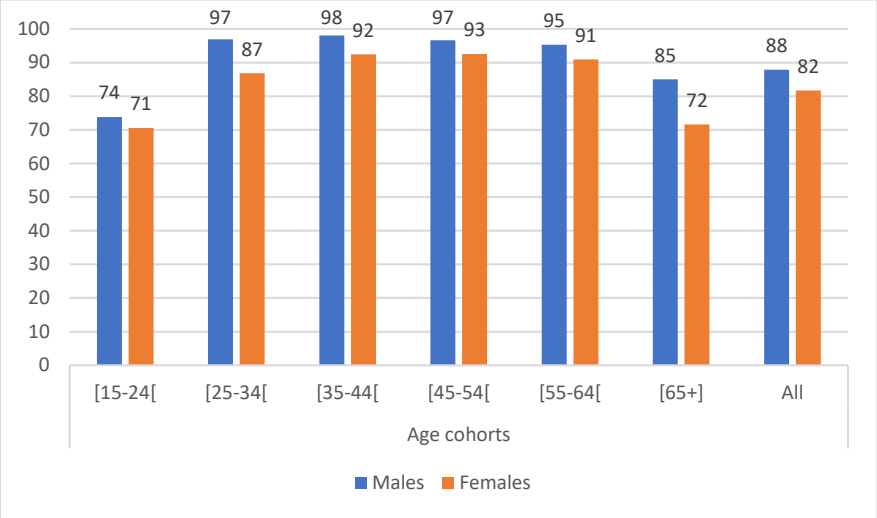
3.1 Labor force participation[86]

The Mozambican labor market is characterized by a high participation of the working-age population, indicating the existence of a sizeable supply of labor available to engage in the production of goods and services, relative to the population of working age. The overall participation rate is 84.6 percent, with males more present in the labor force. The gender difference is small, except in Maputo City and Maputo Province. Total participation nationally is 87.9 percent among males and 81.7 percent among females (**Figure 3.1 and Figure 3.3**). In rural areas, where people are intensively engaged in agriculture and cannot afford to stay idle, participation is highest. (**Figure 3.2**). These rates are comparatively higher than those observed in peer countries such as Cotê d'Ivoire (64.7 percent in 2019), Ghana (71.3 percent in 2017), Guinea (52.9 percent in 2019), Tanzania (80.4 percent in 2020) and Uganda (46.9 percent in 2021)

[85] World Bank. 2019. Enterprise Surveys: Mozambique 2018 Country Profile. © World Bank, Washington, DC. http://hdl.handle.net/10986/32087 License: CC BY 3.0 IGO; and INE. 2022. Inquérito ao Sector Informal - INFOR 2021, Moçambique - Relatório Final.

[86] Mozambique officially considers working-age population all those aged 15 years and above. Participation in the labor force involves wage and non-wage workers, and unemployed people. Those that have done any work for at least one hour in the seven days prior to the interview, for payment in cash, in kind, or for the benefit of the household are deemed employed. In other words, working on the farm, the selling of any products or the performance of any other economic activity in the seven days prior to the interview is considered employment. Those not able or willing to work and unemployed people that did not look for jobs in the thirty days prior to the interview are not deemed to be part of the labor force.

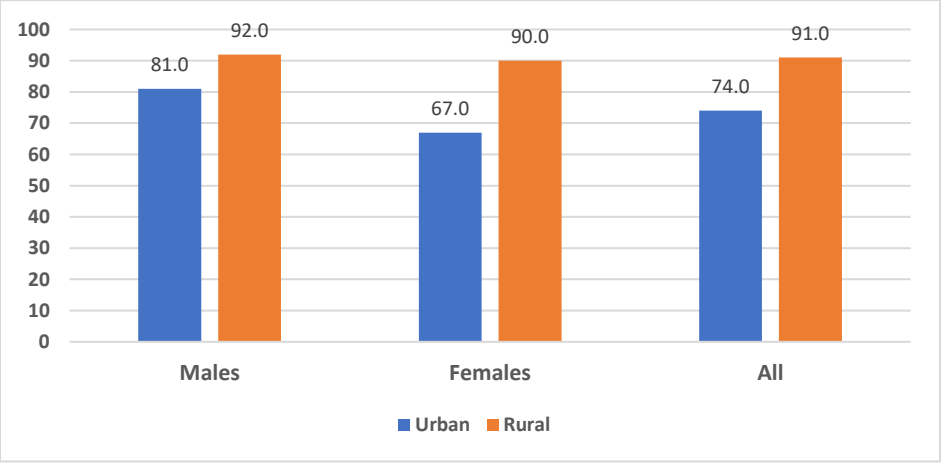
Figure 3.1: Labor force participation by age and gender (population 15 years and above; %)



Source: Own calculations based on IOF 2019/20

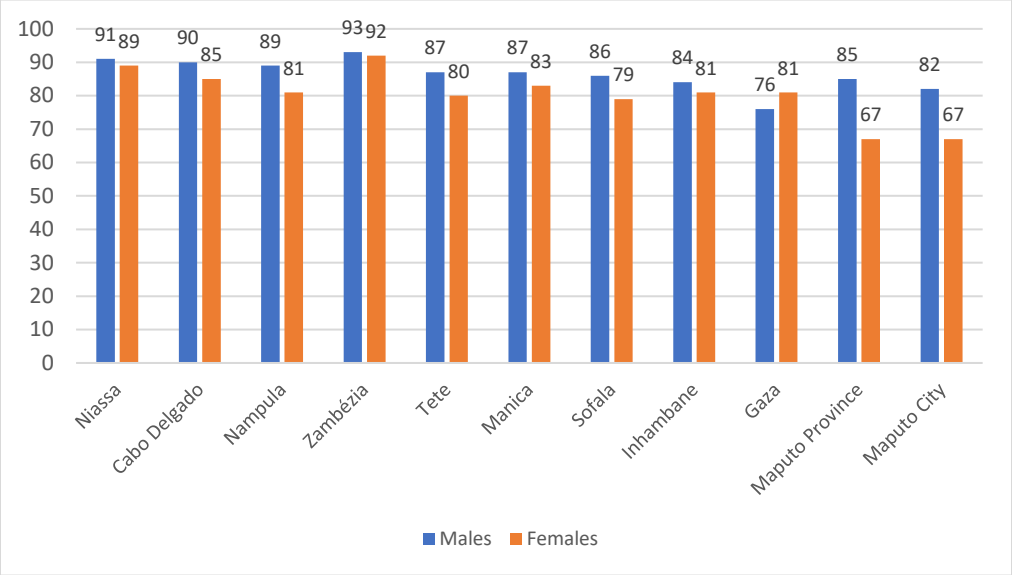
In rural areas, female participation (90 percent) is highest and very similar to that of males (92 percent) (**Figure 3.2**). In urban areas there is a significantly lower female participation; this is 14 percentage points below that for males. By far, the largest differences between female and male labor force participation are registered in Maputo City (15 percentage points) and Maputo Province (18 percentage points), which are the most urban provinces.

Figure 3.2: Labor force participation by location and gender (percentage of population 15 years and above, %)



Source: Own calculations based on IOF 2019/20

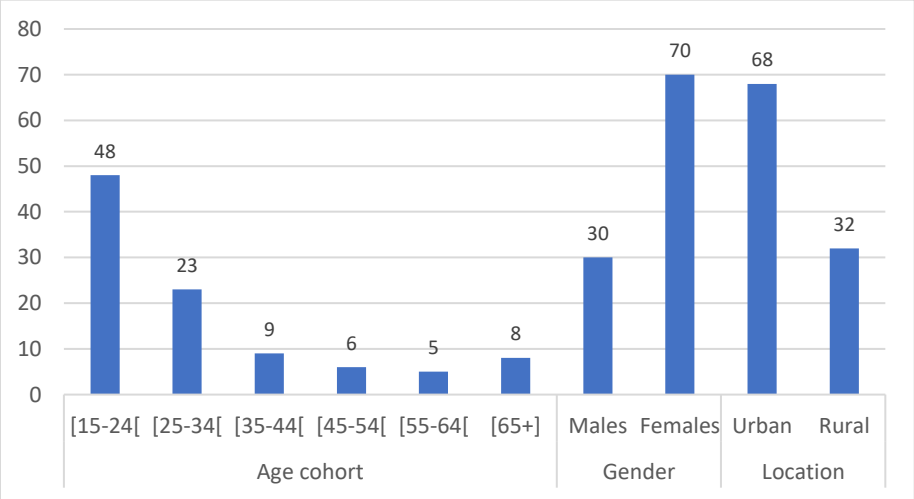
Figure 3.3 Labor force participation by province and gender (population 15 years and above; %)



Source: Own calculations based on IOF 2019/20

Despite the negligible share of people who are not in the labor force, more than half of them do not attend school. This is particularly worrisome for the youngest cohort aged 15-24 (**Figure 3.4**). Close to 50 percent of those inactive are youngsters aged 15-24 and over 2/3 are women and concentrated in urban areas.

Figure 3.4: Characteristics of inactive population that is currently not in school - age, gender, and location (15 years and above, %)



Source: Own calculations based on IOF 2019/20

According to IOF 2019/20 data, the majority (85 percent) of rural households are heavily reliant on agriculture for their livelihoods. This is particularly true for those living in poverty, who primarily focus on crop production on small landholdings and, to a lesser extent, livestock rearing. However, despite nearly all smallhold farmers cultivating at least one staple crop, only 13 percent participate in marketing a portion of their produce. The primary source of income derived from agriculture is self-consumption, while a smaller proportion comes from self-employment through the sale of their own harvest. Notably, the northern and central regions exhibit relatively higher levels of commercialization due to their

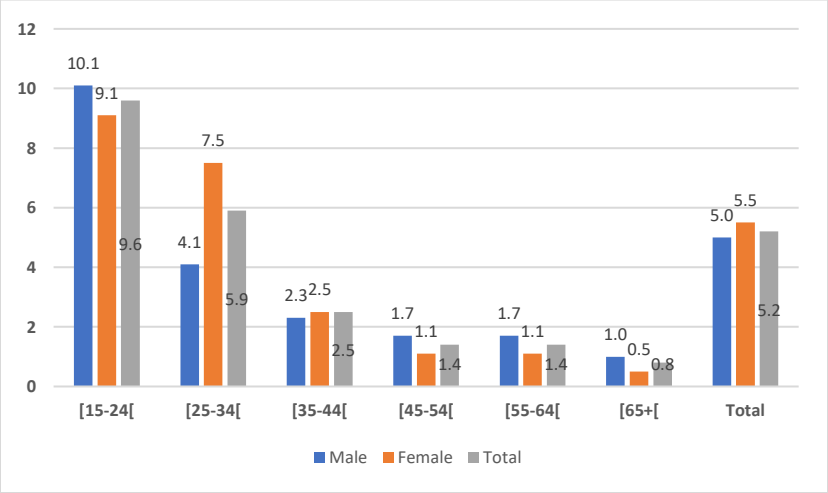
predominant cultivation of cash crops. The country has significant untapped potential for expanding cultivated areas, as less than 15 percent of the estimated 36 million hectares of arable land is utilized for permanent crop cultivation. Livestock rearing is limited and prevalent in the southern region, while the central and northern regions have relatively lower average cattle holdings. The primary reason for this disparity is the notable presence of the tsetse fly, a carrier of trypanosomes, particularly in the Zambezia and Nampula provinces.

In recent years, there has been a rise in non-farm employment, primarily concentrated in urban areas. However, in the central and northern regions, non-agricultural employment remains limited and displays minimal fluctuations. In rural areas, the scarce opportunities for non-farm jobs are predominantly occupied by men, accounting for more than 80 percent of the total rural workforce engaged in off-farm activities. Conversely, women in rural areas overwhelmingly continue to be involved in agriculture, with 96 out of 100 employed individuals being employed in this sector.

3.2 Unemployment

The unemployment rate in Mozambique is low, at 5.2 percent, and there is little difference between the genders--5 percent among men and 5.5 percent among women (**Figure 3.5**). However, there are substantial differences across age cohorts, regions and the income ladder with younger people experience higher unemployment.

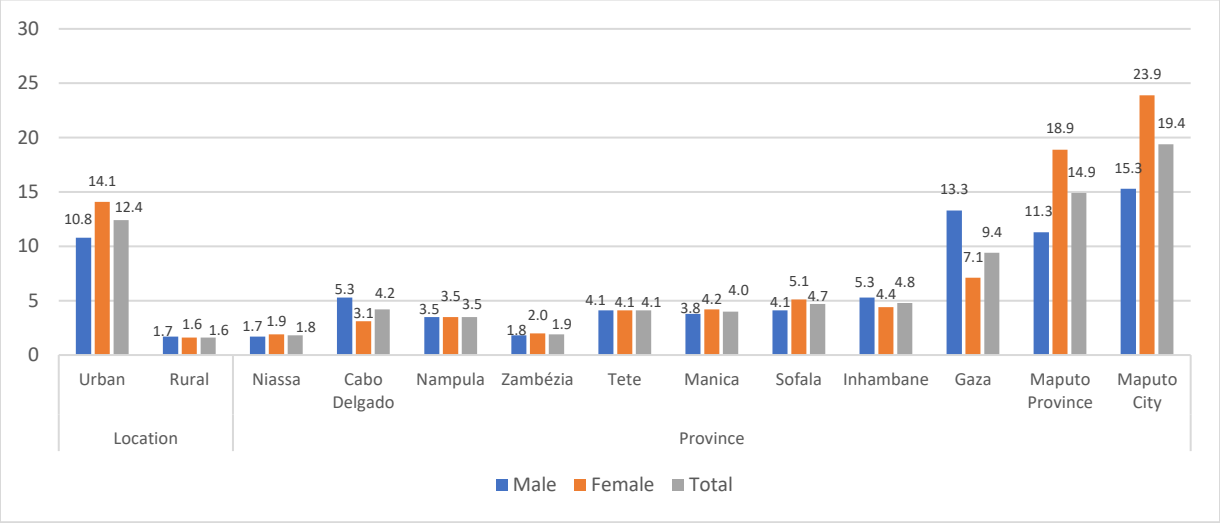
Figure 3.5: Unemployment rate by gender and age (%)



Source: Own calculations based on IOF 2019/20

Further, unemployment rates are highest in urban areas, particularly in Maputo City and Maputo Province (**Figure 3.6**). Male unemployment in Gaza is the second highest in the country well above any other province and slightly below Maputo City's rate.

Figure 3.6: Unemployment rate by region, %



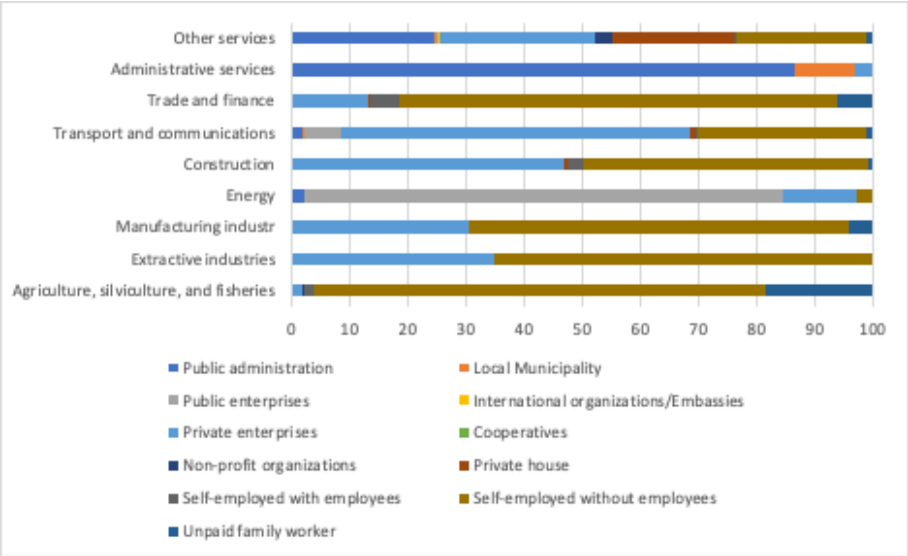
Source: Own calculations based on IOF 2019/20

The low unemployment rates mask issues of quality of employment. About 72 percent of those in employment work in the agriculture sector, in particular in subsistence agriculture, where working conditions are challenging and productivity very low. About 10 percent work in trade and finance and 8 percent work in other services areas. The remaining areas of work present very small shares in employment. Women show much lower shares of participation than males across all sectors with the notable exception of agriculture, silviculture and fisheries, where their share (81.1 percent) is 19 percentage points above that of men.

3.3 Type of Employment

Works in the agricultural sector are mostly self-employed (without employees) and unpaid family workers in informal activities with very low productivity. Their respective shares in the employed population are 78 and 18 percent (**Figure 3.7**). There is also a large share of self-employed people (without employees) working in extractive industries, manufacturing, construction and trade & finance (65-75 percent). Those employed in services are mostly wage workers in the public sector, private sector and municipalities.

Figure 3.7: Sector of work by employer type, 2019/2020 (%)

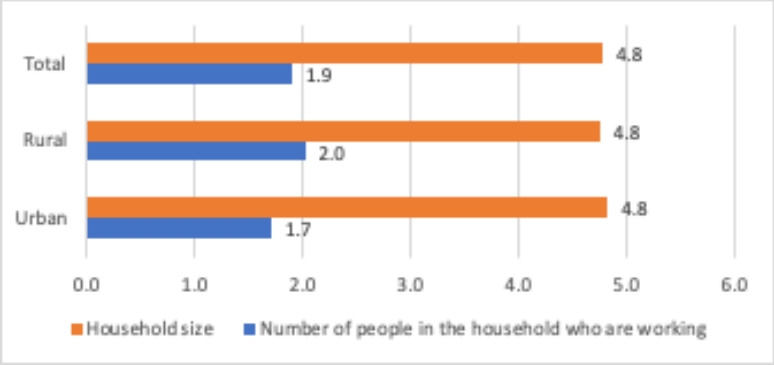


Source: Own calculations based on IOF 2019/20

3.4 Underemployment

The dependency ratio in Mozambique is 2.5, meaning that there are 2.5 household members for every person that is actively working. This proportion varies by area, being 2.4 in urban settings and increasing to 2.8 in rural areas, where the number of household members who are working is lower (**Figure 3.8**).

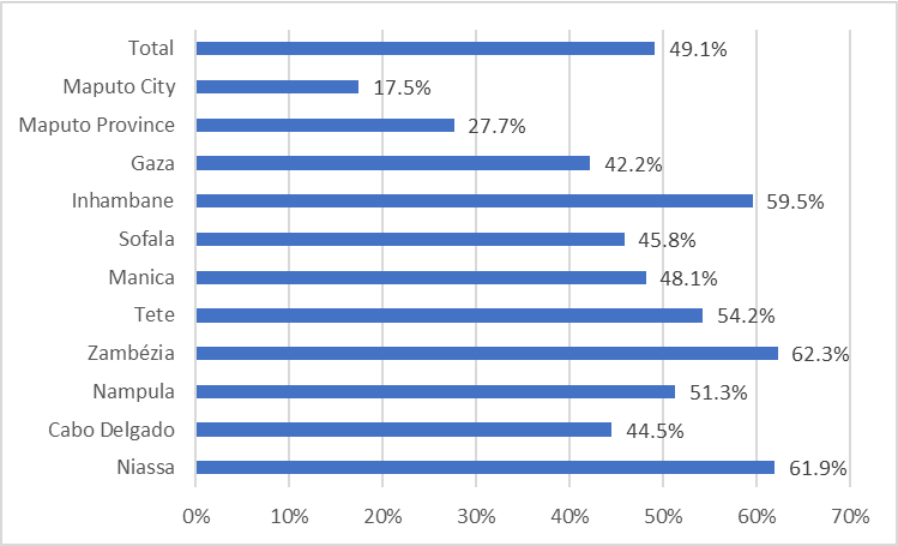
Figure 3.8 Number of People Working in the Household



Source: Own calculations based on IOF 2019/20.

On average, people work around 30 hours per week and almost half of those working are active for fewer than 40 hours per week. However, there are significant differences across provinces. As shown in **Figure 3.9**, workers in the city of Maputo experience more intense working weeks (around 45 hours of work per week and less than 20 percent of those employed work fewer than 40 hours per week), followed by those working in the rest of Maputo Province. Conversely, nearly 60 percent of workers in Inhambane, Zambézia and Niassa work fewer than 40 hours per week, with those in Inhambane only working around 22-23 hours per week. Results also show higher poverty rates among those working fewer hours: while 62.2 percent of those working fewer than 40 hours per week are identified as poor, this proportion drops to 51.3 percent for people working at least 40 hours per week.

Figure 3.9: Share of People that Work fewer Than 40 Hours (per Province)



Source: Own calculations based on IOF 2019/20.

Nearly 30 percent of those working fewer than 40 hours per week indicated that they were busy with household chores (this proportion raises to almost 40 percent for women), while 18 percent said that these were the normal working hours for their activities. Around 10% stated that there was insufficient agricultural land available for them to work on more, and another 10% said that they did not want to work more hours. Only 7.2 percent indicated that they wanted to work more but could not find more work.

The poverty rate is significantly greater among individuals working fewer than 40 hours per week, with men appearing to be slightly more impacted than women (Table 3.1**).** Roughly 78 percent of male workers and 68 percent of female workers expressed their willingness to work additional hours per week. About 44 percent of women identified household chores as the primary barrier preventing them from increasing their weekly working hours, whereas only 20 percent of men cited this reason. On the other hand, the main obstacle for men in working more hours is the standard work duration, as indicated by 43 percent of men.

In both urban and rural areas, there is a correlation between working fewer than 40 hours per week and higher poverty rates, although the impact is more pronounced in urban areas. In urban areas, working fewer than 40 hours per week is associated with a substantial increase of 17.2 percentage points in poverty, while in rural areas, the increase in poverty among those working fewer than 40 hours per week is comparatively smaller, at 4.3 percentage points (Table 3.2). Around 75 percent of workers in urban areas and 68 percent of workers in rural areas indicated their willingness to work additional hours per week. For both urban and rural workers, the primary obstacle to working more hours is the standard work duration, closely followed by household chores.

Table 3.1 - Poverty by number of hours usually worked across gender

Gender	Male	Female	Total
Works at least 40 hours	52.0%	52.0%	52.0%
Works less than 40 hours	66.8%	65.4%	66.0%

Source: own calculations based on IOF 2019/20.

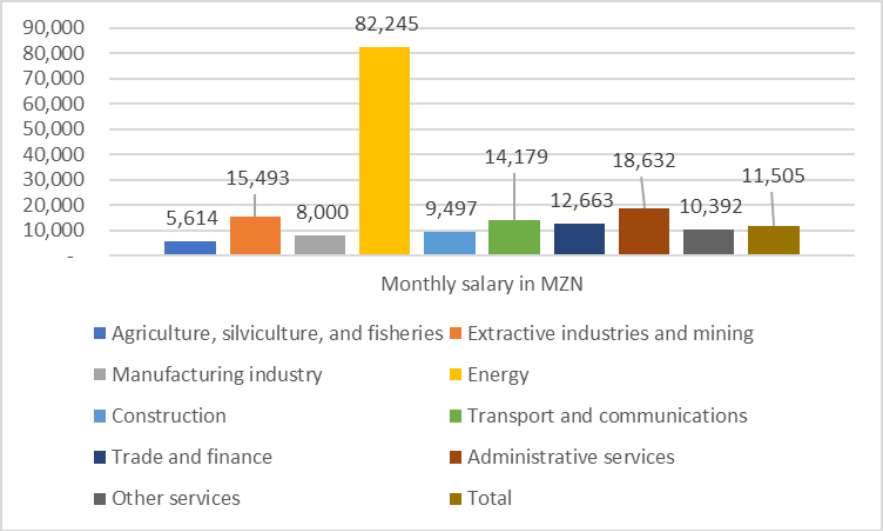
Table 3.2 - Poverty by number of hours usually worked across location

Locations	Urban	Rural	Total
Works at least 40 hours	36.4%	65.3%	52.0%
Works less than 40 hours	53.6%	69.6%	66.0%

Source: own calculations based on IOF 2019/20.

People engaged in agriculture exhibit the lowest level of educational attainment. Over 50 percent of those working in the agricultural sector have no formal education and only 19 percent have completed primary school. In contrast, the energy sector, which has the lowest share of workers, has a larger share of people (44 percent) with a university degree completed. **Linked to the higher education level, earnings are highest for those working in the energy sector.** On average, they earn 80,000 MZN per month (**Figure 3.10**). Conversely, the agriculture sector, with the lowest educational attainment and where most of the population works, has the lowest pay, averaging 5,600 MZN per month.

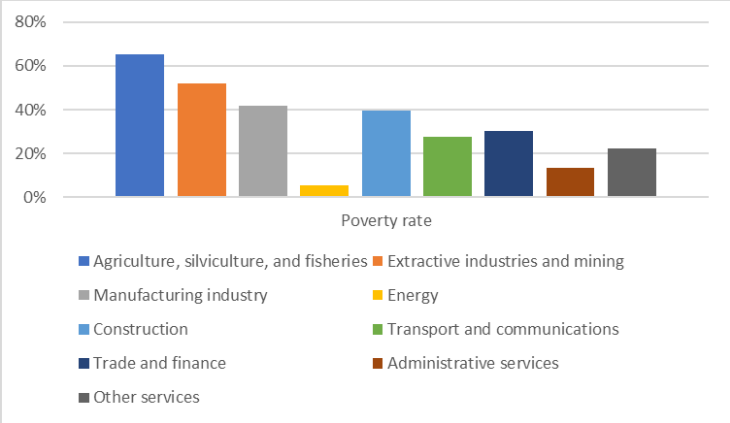
Figure 3.10: Earnings across sectors of employment (2019/2020; MZN)



Source: Own calculations based on IOF 2019/20

Poverty is highest among those working in agriculture, where 65 percent of workers are deemed poor. Those working in energy, administrative sectors, and other services are the least poor, presenting rates of 5, 13, and 22 percent, respectively (**Figure 3.11**).

Figure 3.11: Poverty across employment sectors (2019/20; %)



Source: Own calculations based on IOF 2019/20

The impact of underemployment on poverty is evident in all sectors, but it is particularly notable in the secondary and tertiary sectors. Working fewer than 40 hours per week in these sectors is associated with a 4.1 percentage point increase in poverty for the secondary sector, and a six-percentage point increase in poverty for the tertiary sector (Table 3.3). Approximately 67 percent of workers in the primary sector, 85 percent in the secondary sector, and 84 percent of workers in the tertiary sector expressed their willingness to work additional hours per week. In the primary sector, the two primary obstacles to working more hours are the standard work duration and household chores, as indicated by 37 percent of workers for each factor. In the secondary and tertiary sectors, the main barrier to working more hours is also the standard work duration, as reported by 43 percent of workers in each sector. However, the second most significant obstacle in these sectors was the challenge of finding additional work.

Table 3.3 - Poverty by number of hours usually worked across sectors

Sectors	Primary	Secondary	Tertiary
Works at least 40 hours	68.1%	43.1%	30.1%
Works fewer than 40 hours	69.8%	47.1%	36.0%

Source: own calculations based on IOF 2019/20.

Low educational attainment is associated with the least productive jobs while higher educational attainment is associated with wage employment in the public and private sectors, jobs that provide greater pay and security. Most of those with no education are self-employed without employees (79 percent) and unpaid family workers (14 percent). On the other side of the spectrum, over 70 percent of those that have completed a *Licenciatura* degree work in the public and private wage sectors. Figure 3.14 shows that individuals who have attained qualifications in higher education have a higher share of wage employment. The top educational attainers with a Doctorate degree work in Public Administration or private enterprises.

Table 3.4 presents data on the average monthly salary, years of education, and years of experience disaggregated by gender and location for the labor force population. The average years of education and experience are reported only for individuals with available salary data in the IOF 2019/20 survey. Across both urban and rural areas, men have higher monthly salaries compared to women. The data indicates that, on average, men in the labor force have completed 6.7 years of education, whereas women have completed 5.9 years. However, when considering only those observations with salary data, women exhibit

higher levels of education than men in both urban and rural areas. Years of experience, calculated by subtracting years of education plus 6 years (representing the age of school entry) from the individuals' age, reveal that salaried men possess more years of experience overall compared to women. In sum, the findings suggest that men generally earn higher monthly salaries than women in both urban and rural areas. Although men have more years of education on average, focusing on observations with salary data shows that women tend to be more educated. Additionally, men tend to have more years of experience than women overall.

Table 3.4 - Monthly salary, years of education and years of experience across gender and location (for those with salary data)

		Male	Female	Tota
Urban	*Monthly salary in thousands MZN*	13.9	10.9	13.0
	Years of education completed	9.7	10.4	9.9
	Years of experience	20.1	18.2	19.5
Rural	*Monthly salary in thousands MZN*	9.4	6.1	8.8
	Years of education completed	7.7	8.6	7.9
	Years of experience	20.1	17.3	19.5
Total	*Monthly salary in thousands MZN*	12.4	9.9	11.8
	Years of education completed	9.1	10.0	9.4
	Years of experience	20.1	18.0	19.5

Source: own calculations based on IOF 2019/20.

To better understand the sources of the observed gender wage gap, we make use of Oaxaca-Blinder decompositions (see annex 3).[87] In this analysis, the focus is placed on the log of monthly salary as the outcome variable and an Oaxaca-Blinder decomposition is conducted to understand the differences between male and female workers. The purpose of this decomposition is to separate the observed differences into two main components: the "explained" component, which can be attributed to disparities in characteristics or endowments, and the "unexplained" component, which may be associated with gender labor discrimination or unobservable factors.[88]

The log of monthly salary is significantly higher among male workers (Group 1) compared to female workers (Group 2), as indicated by the coefficients of the two groups (Table 5). This positive difference is statistically significant, implying that, on average, male workers have better salaries than their female counterparts, even after controlling for factors such as schooling, experience, sector of work, and location. The explained component, which represents the effect of observable characteristics (e.g., years of education and experience), is negative and statistically significant. This suggests that, overall, the

[87] The Oaxaca-Blinder decomposition is an econometric method used to decompose the observed differences in an outcome variable (such as wages or earnings) between two groups into two components: the "explained" component and the "unexplained" component. It is commonly used to analyze and understand the sources of wage or earnings disparities between different demographic groups, such as gender or race.

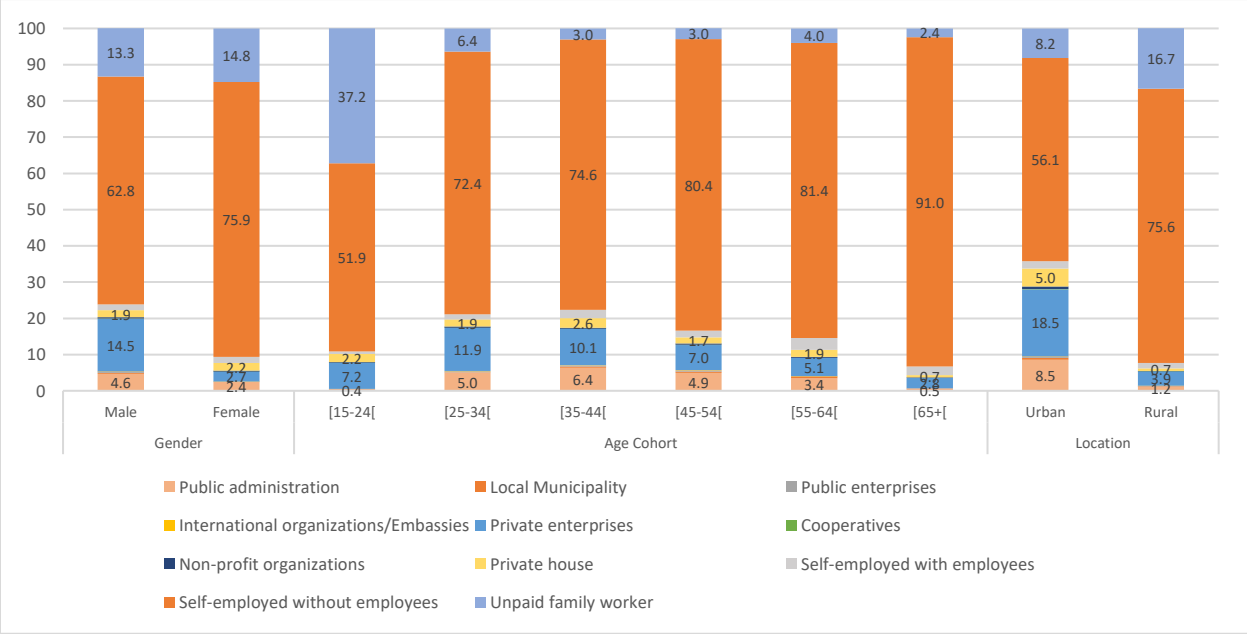
[88] To perform the decomposition, we specifically consider the characteristics “years of education” and “experience”. Additionally, we control for the worker's sector of activity and location. These control variables help account for the potential influence of factors other than education and experience on the salary differences between males and females. By incorporating these variables, we aim to provide a more comprehensive understanding of the factors contributing to the observed disparities. Group 1 comprises male workers, while Group 2 consists of female workers, forming the two groups under comparison.

observed characteristics contribute more to the group with lower outcomes, namely female workers. Women possess relatively better endowments in terms of years of education, which should theoretically lead to higher salaries compared to men.

However, the unexplained component, representing the coefficients effect, is positive and statistically significant. This suggests the presence of potential unfairness or discrimination that cannot be accounted for by the included observable characteristics. It is important to note that this unexplained component may also encompass unobservable characteristics, such as skills, that are not captured in the analysis. Additionally, there might be variations in the valuation of the characteristics used in the study. It is important to exercise caution when interpreting these findings, as the Oaxaca-Blinder decomposition alone cannot establish causality or definitively prove the existence of discrimination.

The population distribution by type of employment displayed in **Figure 3.12** shows that, overall, a higher share of females (75.9 percent) is engaged in self-employed activities without employees than males (62.8 percent). This share also increases across ages, with the oldest cohorts reporting the highest share in this category (81.3 percent). Stark differences characterize the rural-urban divide driven by the significant proportion of urbanites engaged in the private sector.

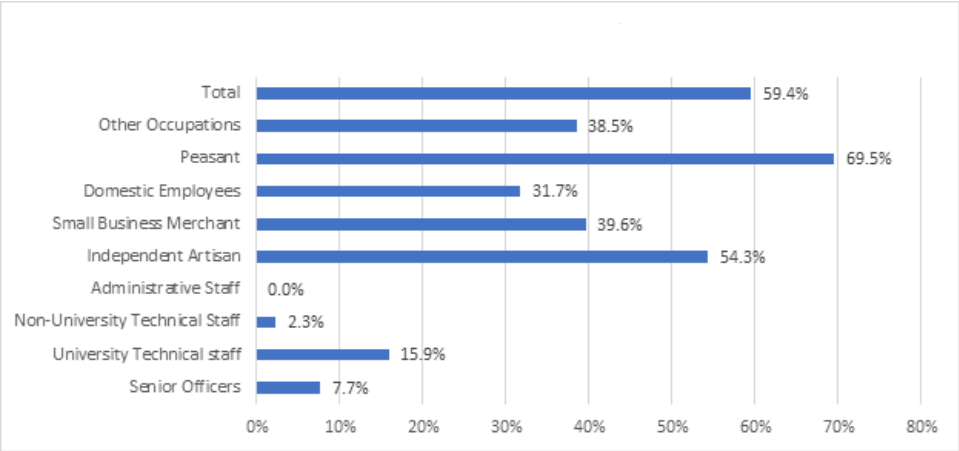
Figure 3.12: Share of the population by type of employment across gender, age and region (%)



Source: Own calculations based on IOF 2019/20

Having a job in Mozambique does not guarantee being out of poverty, especially for those engaged in low skill activities. As shown in **Figure 3.13**, results indicate that nearly 60% of those employed are poor. As expected, this proportion of those living in poverty varies greatly depending on the type of occupation, ranging from almost 70% for peasants to 2.3% and 0% for non-university technical staff and administrative staff, respectively.

Figure 3.13: Poverty Rate by Occupation



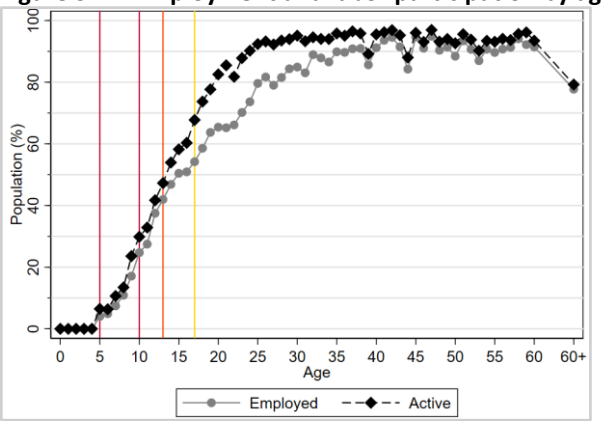
Source: Own calculations based on IOF2019/20

3.5 Child Labor

Child labor is a persistent issue in many low-income countries, including Mozambique. Despite the country's ratification of international legislation on child labor, these regulations are not necessarily adopted. This is especially evident in the informal sector, which represents a significant portion of the economy.

Figure 3.14 provides a comprehensive overview of labor participation in Mozambique, illustrating the percentage of individuals participating in the labor market (either employed or active) for each age. On average, 38% of children aged 5 to 17 years old are engaged in child labor, a significantly higher percentage than the Sub-Saharan African average of around 24% (ILO and UNICEF, 2020). The percentage of employed children varies according to age, with between 10% and 20% of children aged 5 to 10 employed, increasing to approximately 30-50% for children aged 11 and 13, and up to 50-70% for children aged between 14 and 17.

Figure 3.14: Employment and labor participation by age

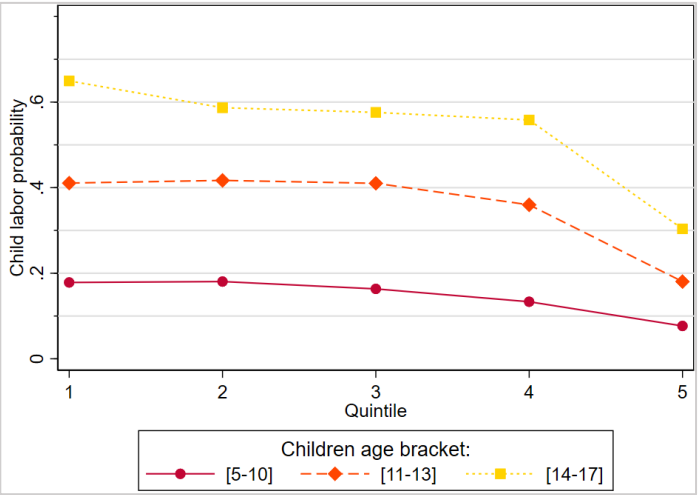


Source: Own calculations based on IOF 2019/20

However, child labor patterns are significantly higher among poorer households. **Figure 3.15**, which estimates child labor by accounting for household-level characteristics, shows the probability of a household with children in the respective age group having at least one working child. The likelihood of child labor is unevenly distributed across the distribution, measured by consumption quintiles.

Specifically, almost two out of ten households in the two lowest quintiles of the distribution have at least one child aged 5-10 who is working. Among children aged 11-13 and 14-17, households in the lowest quintile exhibit child labor probabilities of around 40% and more than 60%, respectively. In contrast, the likelihood of having working children aged 14-17 in households belonging to the top consumption quintile is around 30%. Among all other quintiles, the likelihood of child labor is higher than 10% for children in primary school age, higher than 30% for children aged 11-13, and higher than 50% for adolescents.

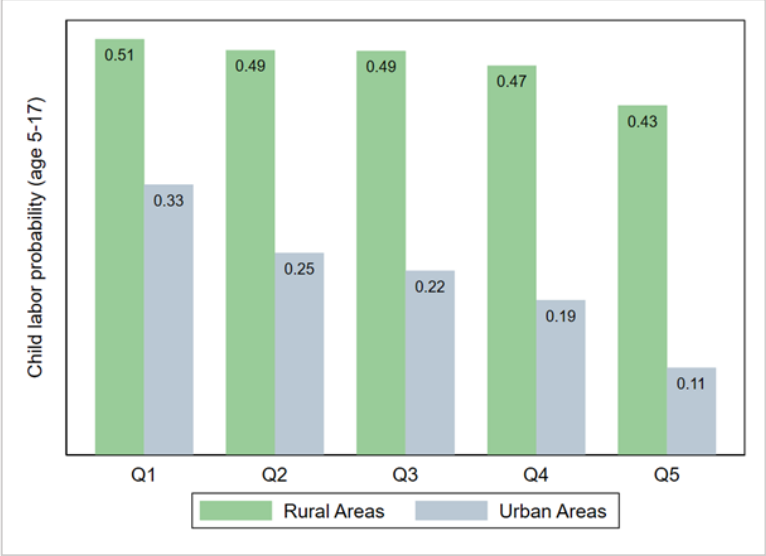
Figure 3.15: Share of households with at least one working child



Source: Own calculations based on IOF 2019/20

As illustrated in **Figure 3.16**, child labor is primarily concentrated in rural areas, indicating a strong correlation with agricultural activities. However, child labor is also prevalent in urban regions. In fact, approximately one-third of children aged 5-17 from households in the lowest consumption quintile in urban areas are engaged in labor. This emphasizes the significant presence of child labor in both rural and urban settings in Mozambique.

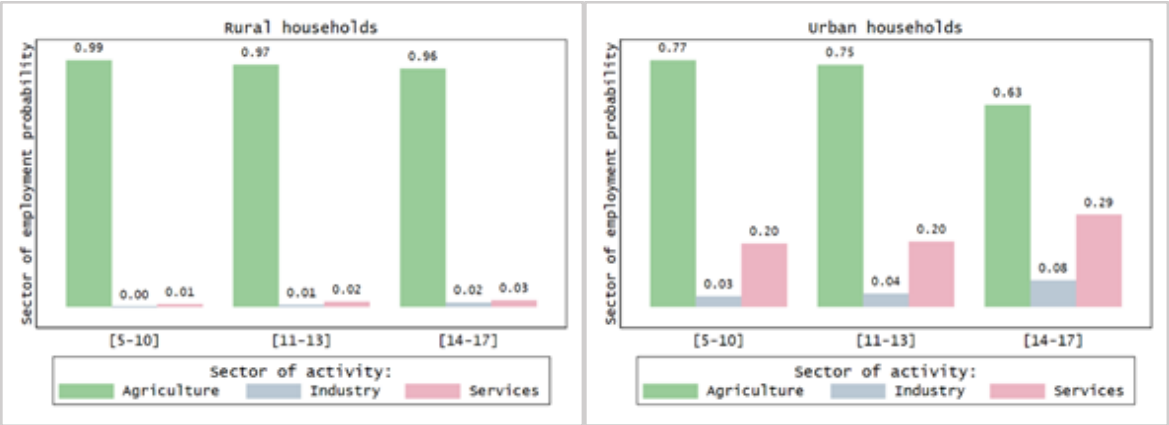
Figure 3.16: Child labor in rural and urban areas



Source: Own calculations based on IOF 2019/20

Figure 3.17 reveals that the majority of children in both rural and urban areas are involved in agriculture. Nevertheless, particularly in urban regions, a notable proportion of children are employed in the service sector, and a significant number of them are also involved in industry. It is important to note that a considerable portion of all working children are unpaid family workers, accounting for 93% among children aged 5-10 and 10-13, and 80% among children aged 14-17.

Figure 3.17: Sector of employment among working children

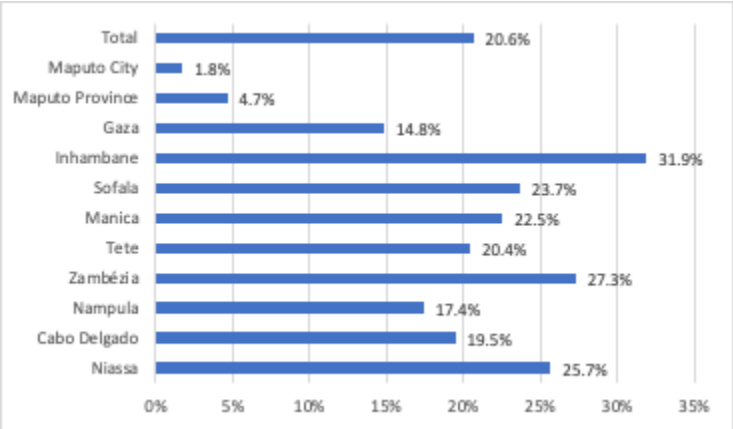


Source: Own calculations based on IOF 2019/20

These patterns suggest that there are significant disparities in educational opportunities and future outcomes for children in Mozambique. The presence of child labor may also serve as a mechanism for perpetuating intergenerational inequalities. Children who work miss out on opportunities to learn and develop skills that would be essential for higher earning future careers. They are, therefore, more likely to be trapped in low-paying jobs, and their potential for upward mobility is limited.

The regional picture of child labor is displayed in **Figure 3.18** and shows great variance across provinces. Nationally, 20 percent of all children aged five to 14 are working, with Maputo City and Province exhibiting significantly lower rates, 1.8 and 4.7 percent respectively. On the other side of the spectrum, Inhambane (31.9 percent), Zambezia (27.3 percent) and Niassa (25.7 percent) present the highest rates of child labor in the country.

Figure 3.18: Child Labor (ages 5 to 14)



Source: Own calculations based on IOF 2019/20

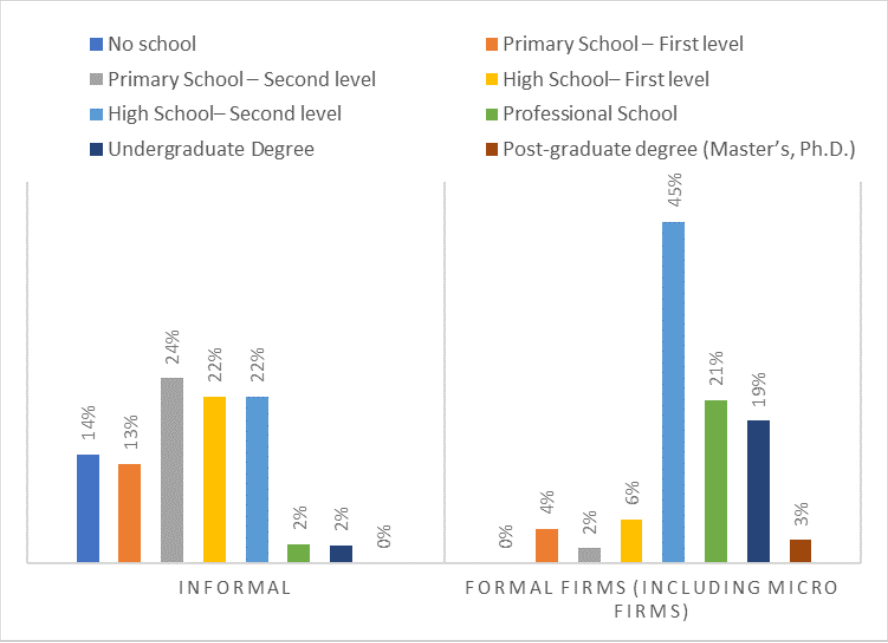
The reported rather high child labor rates in Mozambique can be attributed to various factors, some of which align with the reasons mentioned for children not attending school (see Tables 2.5 and 2.6 in Section 2.5 of this report). Firstly, the lack of interest or low perceived utility of education may lead children to seek alternative means of contributing to their households' income, resulting in engagement in labor activities. Moreover, the prevalence of child marriage in Mozambique, particularly among adolescents, not only disrupts their education but also increases their likelihood of engaging in labor to support their families. Additionally, the distance to schools and the financial constraints associated with education can push children into the labor market as an alternative to attending school. These factors, combined with the persistently low quality of education and limited economic opportunities, contribute to the perpetuation of high child labor rates in Mozambique.

3.6 What type of labor does the market demand?

In the private sector, informal firms contribute significantly to employment. Half of the total jobs created by the private sector came from formal firms with five or more employees, 43% from unregistered firms, and 10% from micro firms with fewer than five employees. Micro firms have, on average, three employees (including both permanent and temporary workers) and larger formal firms have on average 45 employees. Most informal firms are small, having on average only two employees and very few have more than five (around 60% of informal firms have only one employee). In turn, almost 60% of workers in informal firms are women and the typical person working in the business, including paid and unpaid workers, has on average two and half years of work experience.

Registered firms are more likely to employ managers with higher levels of education informal firms. Almost half of formal firms have managers with a second-level secondary school degree, 21% have a professional degree, and 19% have an undergraduate degree. In turn, managers of informal firms have lower levels of education, with around 14% of them not having completed any level of formal education and 13% with only first-level primary schooling (**Figure 3.19**).

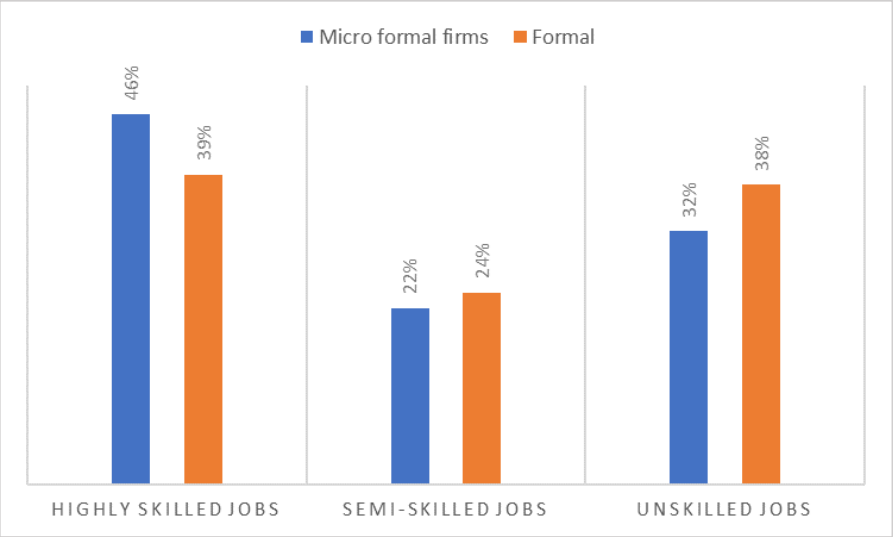
Figure 3.19 Percentage of firms by managers' highest level of education



Source: Enterprise Survey, 2018.

The distribution of workers by skilled jobs differs among micro and larger registered firms (**Figure 3.20**). On average, 46% of permanent, full-time production workers in formal micro firms are hired for highly skilled jobs, such as occupations requiring extensive theoretical and technical knowledge, 22% for semi-skilled jobs, and 32% for unskilled jobs. Formal firms with five or more employees tend to have a lower proportion of skilled jobs than micro firms, mainly due to a greater number of workers in unskilled jobs (39% are high-skilled jobs, 24% semi-skilled and 38% unskilled jobs).

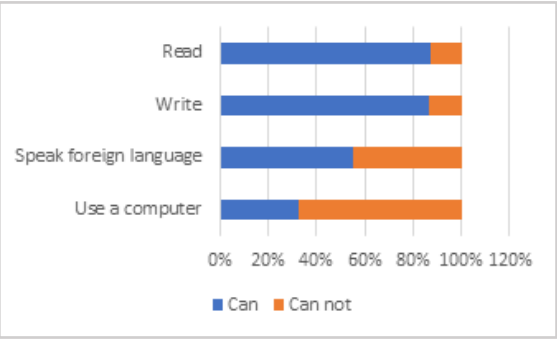
Figure 3.20: Percentage of permanent, full-time production workers in highly, semi, and unskilled jobs



Source: Enterprise Survey, 2018. Note: 'Highly skilled jobs' refer to professionals whose tasks require extensive theoretical and technical knowledge. 'Semi-skilled jobs' refer to technicians whose tasks require some level of mechanical or technical knowledge. 'Unskilled jobs' refer to tasks that involve no specialized knowledge.

While the majority of workers in informal firms can read and write (illiteracy is still around 10%), **a substantial proportion have limited knowledge of how to use a computer** (only 32% indicate knowing how to do so) and 55% of them speak a language other than their native language (**Figure 3.21**).

Figure 3.21: Basic skills among informal workers



Source: Enterprise Survey, 2018.

Most firms had to implement contractive measures in response to the COVID-19 pandemic. Almost 70% of firms report having laid off personnel, 46% reduced salaries and 19% sold assets. However, firms do not report having taken new debt, having adjusted their production or services, nor having received assistance during this time.

Chapter 4. The fiscal system and private transfers influence poverty and equity – in good and bad ways

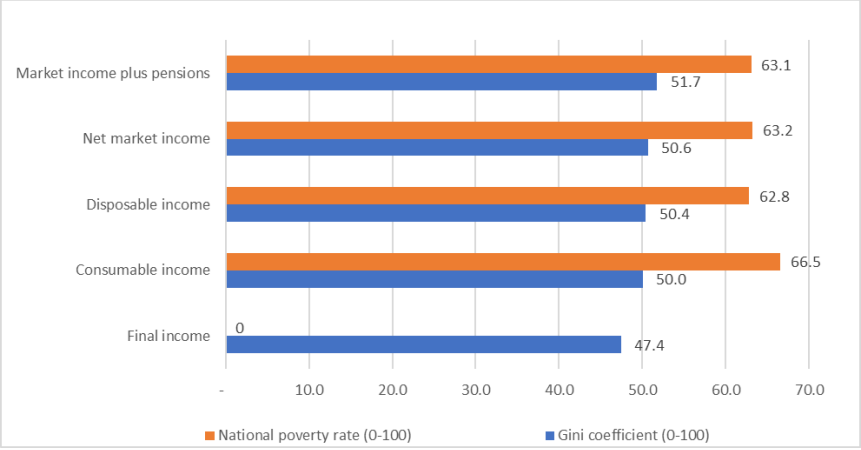
The fiscal system is slightly progressive and reduces inequality but increases monetary poverty. The effect of all taxes, cashable transfers, and in-kind benefits is progressive and it reduces inequality by 4.3 Gini points as of 2020. However, if one considers only the taxes and transfers that affect the cash position of households and excludes in-kind benefits, the combination of taxes and transfers modelled in Mozambique increases the national poverty headcount by 3.5 percentage points. Indirect taxes explain most of the poverty increase, particularly the VAT and customs duties. Only the poorest decile is a net receiver after paying taxes and receiving cashable transfers; the rest of deciles are net-payers. Transfers and remittances disproportionately benefit non-poor households on average, particularly those in urban areas. Remittance flows show a clear divide between non-poor and poor households across provinces, with the non-poor disproportionately benefiting from remittances in both urban and rural areas.

This section addresses two important issues that play a key role in shaping poverty and inequality. The first one is the role the government itself plays through taxation and expenditure, i.e. the siscal system. The second one is private transfers, in particular remittances from temporary or permanent migrants. Mozambique has substantial populations who have migrated to urban areas or to South Africa and who periodically transfer part of the earnings home.

4.1 Low-income households are not necessarily better-off after the net effects of paying taxes and receiving public transfers are considered

The combination of taxes and transfers in Mozambique reduces inequality but increases the national poverty headcount. If one considers the effects of all taxes, cashable transfers, and in-kind benefits (from market income plus pensions, to final income), the combination of taxes and transfers modelled in Mozambique reduces inequality by 4.3 Gini points as of 2020. However, if one considers only the taxes and transfers that affect the cash position of households and excludes in-kind benefits (from market income plus pensions to consumable income), the combination of taxes and transfers modelled in Mozambique increases the national poverty headcount by 3.5 percentage points (**Figure 4.1**).

Figure 4.1. Inequality and Poverty Impacts of the main taxes and transfers (2020)



Source: World Bank calculations based on IOF 2019/20,and fiscal administrative data; following the CEQ methodology (Lustig 2018). *Notes: 1)* Disposable income equals the official consumption aggregate in Mozambique. Net market income=Disposable

income minus direct transfers. Market income plus pensions= Net market income plus direct taxes. Consumable income=Disposable income minus indirect taxes plus indirect subsidies (indirect subsidies to households not available in 2020). Final income=Consumable income plus in-kind benefits from public health and public education. 2) All income concepts are measured in real, per capita terms, for poverty and inequality measurement. 3/ Poverty impacts are measured at consumable income, since for this indicator the analysis focuses on the impacts of cashable interventions on households' purchasing power (excluding in-kind benefits from health and education).

The inequality reduction (-4.3 Gini points) and the poverty increase (+3.5 percentage points) associated with the combination of taxes and transfers modelled in Mozambique as of 2020 is similar to the magnitudes found in the previous fiscal incidence study (2015) performed by the World Bank.[89]

Box 4.1: Second fiscal incidence analysis (FIA) for Mozambique (2023)

The World Bank conducted the second fiscal incidence analysis (FIA) on Mozambique in 2023 using the Commitment to Equity (CEQ) methodology (see Lustig 2018 Annex 5 for more information). The analysis combines the latest household budget survey - the 2020 Inquérito sobre Orçamento Familiar (IOF)- and fiscal administrative data to simulate the distributional impacts of the main taxes and public transfers on households' welfare. The main fiscal interventions covered in the 2020 Fiscal Incidence Analysis for Mozambique were: (i) direct taxes (Personal Income Tax-PIT on five income categories); (ii) direct transfers (the Basic Social Subsidy Program-PSSB and the Productive Social Action Program-PASP, including their COVID-19 top-up transfers); (iii) indirect taxes (custom duties, Value Added Tax-VAT, excises, and fuel tax); and (iv) in-kind benefits from public health and public education services.

The CEQ Methodology establishes different income concepts to analyze how the taxes and public transfers affect households' welfare at different stages of redistribution. In the 2020 Fiscal Incidence Analysis for Mozambique, the analysis starts with Disposable Income equated to Consumption (the official welfare aggregate). Other CEQ income concepts are calculated backwards and forward as follows: Net market income equals Disposable income minus direct transfers. Market income plus pensions equals Net market income plus direct taxes. Consumable income equals Disposable income minus indirect taxes plus indirect subsidies (indirect subsidies to households not available in 2020). Final income equals Consumable income plus in-kind benefits from public health and public education.

The Fiscal Incidence Analysis serves as a comprehensive tool for addressing key inquiries within the realm of poverty and inequality, specifically examining the effects of taxes and social transfers. By conducting this analysis, we gain insights into the impact of fiscal policies on poverty levels and income inequality, while also assessing the progressivity or regressivity of taxes and transfers. Furthermore, this analysis enables us to identify the distribution of tax burdens and social benefits among different households, determining which households bear the tax burden and receive the advantages of social expenditures. By quantifying the net payers and net receivers of the fiscal system, the Fiscal Incidence Analysis contributes to evidence-based decision-making.

The CEQ methodology has been implemented in over 70 countries, which enables the international comparability of results. However, it is important to note that the CEQ methodology has certain limitations. As most static incidence analysis, the CEQ standard framework does not account for behavioral changes that taxation and expenditure policies have on households. It also does not account for general equilibrium effects nor long-term impacts of fiscal policies, nor the quality of public health and public education services.

[89] The 2015 Fiscal Incidence Analysis for Mozambique conducted by the World Bank found that the combination of taxes, cashable transfers and in-kind benefits reduced the inequality by 4.1 Gini points; whereas the combination of taxes and cashable transfers increased the national poverty headcount by 3.5 percentage points.

The poverty and inequality estimates of disposable income in Mozambique are equal to the official estimates, since the disposable income is equal to the official consumption aggregate in the Mozambique Fiscal Incidence Analysis. But for the analysis of the effects of the fiscal system on poverty and inequality, one must compare the relevant pre-fiscal versus post fiscal income concepts. Poverty impacts are calculated by looking at the difference in the poverty headcount between market income plus pensions (pre-fiscal income) and consumable income (post-fiscal income, excluding in kind benefits). Inequality impacts are calculated by looking at the difference in the Gini index between market income plus pensions (pre-fiscal income) and consumable income (post-fiscal income, including in kind benefits) and do not equal the inequality changes in the consumption aggregate as in-kind benefits are not captured in the latter.

Primary education benefits explain most of the inequality reduction from the fiscal system. **Indirect taxes explain most of the poverty increase, particularly the VAT and customs duties** Most of the inequality reduction (Marginal Contribution-MC[90] of 2.3 Gini points) is explained by in-kind benefits from public primary education, which is the largest and second most progressive[91] of all the public transfers included in the model. Indeed, primary education benefits modelled represent 4.6 percent of households' market income plus pensions, and the share is highest among the poorest decile (28.9 percent). The in-kind benefits from public primary education are the most equalizing transfer because poor households tend to have more children.

On the other hand, marginal contributions show that the VAT explains most of the poverty increase (MC of -2.3 percentage points, e.g., an increase in the national poverty headcount). Custom duties have the second largest contribution to the poverty increase (MC of -1.2 percentage points). While VAT and custom duties are estimated to be mildly progressive in the current model, they both have an impoverishing effect for being large taxes. For instance, the VAT and custom duties represent about 4.9 and 2.6 percent of households' market income plus pensions, respectively. Direct taxes also contribute to poverty increase but their effect is much smaller given that these taxes are progressive and exert an almost negligible burden among poor households. In effect, poor households are more likely to work in the informal sector while richer households are more likely to have formal jobs and have higher income[92].

The fiscal system had several progressive interventions as of 2020[93].. In effect, all direct taxes (PIT on five income categories) and direct transfers (PSSB and PASP) are progressive relative to market income plus pensions. Also, all indirect taxes are progressive with respect to disposable income; this includes the VAT (mildly progressive), which is the largest tax in Mozambique. The finding of VAT progressivity (after accounting for consumption informality in the fiscal incidence analysis) is in line with recent international evidence that finds that poorer households are more likely to purchase in informal establishments that

[90] The marginal contributions (MC) allows to identify the main drivers of the inequality reduction and the poverty increase due to the fiscal system. Marginal contributions depend both on the size and progressivity of fiscal interventions. Positive marginal contributions mean that the fiscal intervention contributes to a poverty or inequality reduction; negative marginal contributions mean that the fiscal intervention contributes to a poverty or inequality increase.

[91] The PSSB program is the most progressive transfer, however, its marginal contribution to inequality reduction is lower because it represents a smaller share in households' market income.

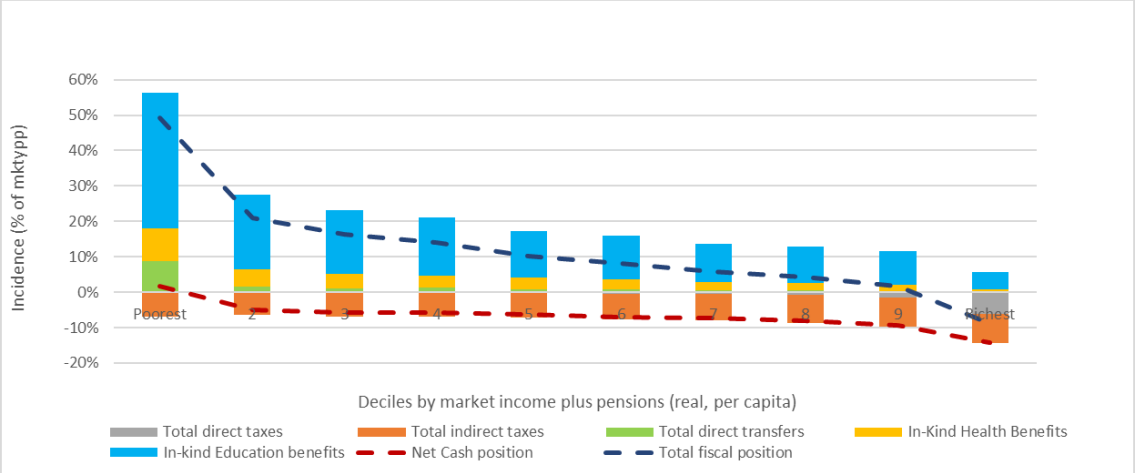
[92] As a result, the current fiscal incidence study estimates that the richest decile in Mozambique pays about 86 percent of total direct taxes modelled.

[93] Progressivity based on the calculation of the Kakwani Index (KI) for each fiscal intervention. The KI for taxes is calculated as the difference between the concentration coefficient of the tax and the Gini of the income concept. Conversely, the KI for a transfer is calculated as the difference between the Gini of the income concept and the concentration coefficient of the transfer. This allows that in both cases, a positive KI means that a tax or transfer is progressive; a negative KI means that it is regressive, and a zero KI means neutral.

face lower VAT burden (Bachas, Gadenne, and Jensen 2020)[94]. The progressivity of indirect taxes shows that most of these taxes are paid by the upper part of the distribution[95]. Their overall effect, however, is a generalized impoverishment of the population. Lastly, this study finds that in-kind benefits from public health and public education are progressive relative to consumable income, except for tertiary and TVET education benefits. Tertiary education is regressive since richer households have greater access to upper levels of education.

Only the poorest decile (decile 1) is a net receiver after paying taxes and receiving cashable transfers; the rest of deciles are net-payers. Figure 4.2 shows the net impact of the combination of taxes and public transfers measured by the net cash position (red dashed line) and the total fiscal position (blue dashed line) for each decile ranked by market income plus pensions (pre-fiscal income). The net cash position looks at the impact of all cashable interventions (taxes and transfers) on market income plus pensions, and the total fiscal position measures the impact of cashable interventions plus in-kind benefits from health and education. The net cash position (red dashed line) is the one used to identify net payers and net receivers of the fiscal system, since cashable interventions are the ones that affect monetary poverty at consumable income. Based on this indicator, only decile 1 (the poorest) experiences a small net cash gain equivalent to 1.8 percent of pre-fiscal income; in contrast, decile 2 experiences a cash loss of −4.9 percent, and this cash loss rises by income group until reaching −14.3 percent among households in decile 10 (the richest). The fact that deciles 2–6 are net payers to the fiscal system is consistent with impact toward increasing the national poverty headcount and the fiscal impoverishment among the poor. On another hand, the fact that the post-fiscal cash loss is larger among richer households relative to poorer households is consistent with the fiscal system's overall contribution to reducing inequality. and illustrates the progressivity of the system.

Figure 4.2. Net Cash Position of Households after taxes and transfers, Share of Market Income Plus Pensions (2020)



Source: World Bank calculations based on IOF 2019/20 and administrative data; following CEQ methodology, Lustig 2018. Note: 1/Net cash position= Direct transfers- Direct taxes – indirect taxes (as a share of market income plus pensions). 2/ Total fiscal position= Direct transfers+ In-kind benefits from health and education- Direct taxes –Indirect taxes (as a share of market income plus pensions).

[94] The VAT burden that households pay in informal establishments is lower because: (i) when considering only the direct effect, the VAT burden is zero (Bachas et al. 2020); and (ii) even when accounting for indirect effects or cascading effects (taxed inputs that increase prices of final output in exempt or informal purchases), the indirect effect is smaller than the VAT burden faced by formal purchases. (Inchauste et al. Forthcoming). The current fiscal incidence study for Mozambique (2020) applies indirect effects calculated for exempt/informal household purchases and assumes that these purchases pay zero direct VAT.

[95] For instance, when looking at absolute incidence, the current model estimates that deciles 1-6 (the poor) only paid 27 percent of total VAT modelled and the remainder 73 percent was paid by deciles 7-10 (non-poor), Similar estimations were found for" total indirect taxes".

Fiscal impoverishment indicators show that 96 percent of poor individuals (at consumable income) became poor due to the combination of taxes and transfers. Measuring the fiscal impoverishment using the national poverty line shows that 96 percent of the post-fiscal poor population (at consumable income) in Mozambique experiences some degree of fiscal impoverishment due to the combination of taxes and cashable transfers modelled, while only 4 percent of the pre-fiscal poor population (at market income plus pensions) experiences fiscal gains (**Table 4.1**).

Table 4.1. Fiscal Impoverishment, 2020 (Market income, plus pensions to consumable income)	**National poverty line (%)**
Fiscal impoverishment among the poor (at consumable income)	96.0
Fiscal gains among the poor (at market income plus pensions)	3.6

Fiscal systems that are inequality-reducing, yet poverty-increasing are common in the African region (Beegle and Christiansen, 2019). This largely reflects the fact that fiscal systems in the African region depend substantially on indirect taxes but have limited social protection systems. Like Mozambique, other CEQ analyses in Africa – have found that fiscal systems reduce inequality but increase poverty (notably in the case of Ethiopia, Ghana, and Tanzania). In the sample of comparator countries, only Namibia and South Africa have fiscal systems that reduced both inequality and poverty. These two countries are wealthier and have larger and targeted direct transfer programs that offset the impoverishing effects of indirect taxes on households. While Namibia and South Africa are both upper-middle-income countries, it is remarkable that Mozambique, a low-income country, ranks third in the selected sample in tax revenue and social expenditure[96] (22.1 percent and 11.3 percent of GDP, respectively) (**Figures 4.3 and 4.4**). This suggests that there is room for improving the design and implementation of fiscal policies in Mozambique for enhancing their distributional impacts.

Figure 4.3. African Countries Ranked by Tax Revenue, Share of GDP (%)

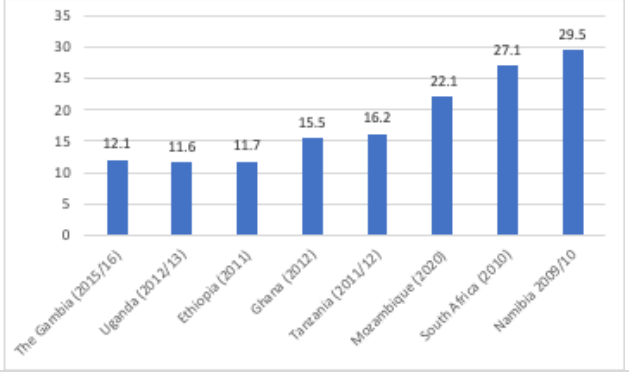
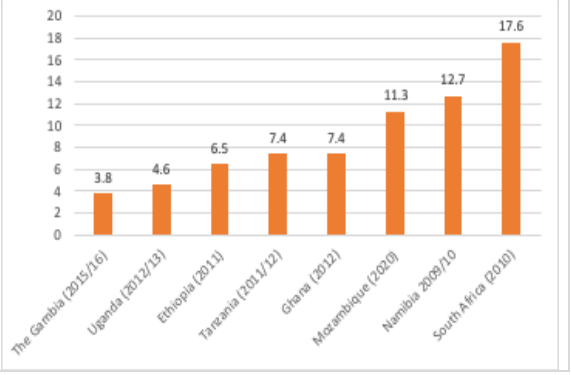


Figure 4.4. African Countries Ranked by Social Expenditure, Share of GDP (%)



Sources: Mozambique: World Bank calculations. Ethiopia 2011: Hill et al. 2017. Ghana 2012: Younger, Osei-Assibey, and Oppong 2015. Namibia: World Bank 2017. South Africa: Inchauste et al. 2017. Tanzania: Younger, Myamba, and Mdadila 2016. Uganda 2012/13: Jellema et al. 2016.

Note: Social expenditure in Figure 3.24 refers to the sum of social protection, health and education expenditure, the components included in the Fiscal Incidence Analysis.

[96] Social expenditure in Figure 4.4 refers to the sum of social protection, health and education expenditure, the components included in the Fiscal Incidence Analysis.

Mozambique is another example in the Africa region of a country where the redistributive role of the fiscal system still needs to be improved; since the combination of taxes and transfers achieve inequality reduction yet increase the national poverty headcount. This happens because Mozambique combines high reliance on indirect taxes for tax revenue collection along with limited social protection systems. Even though this analysis finds that indirect taxes are overall progressive (due to issues such as informality), they still represent a large cash loss among poor households. Hence, to offset the impoverishing effects of the tax system, the Mozambican social protection system should be strengthened in terms of coverage and generosity of the main social protection programs.

4.2 Other public and private transfers are household welfare enhancing

Overall, a similar share of poor and non-poor households receives transfers, as seen in **Table 4.2**. In absolute terms, the total number of poor households receiving any transfers (2.1 million) is more than doubles that of non-poor ones (1.0 million), which closely resembles the country's proportion of poor vs. non-poor households (2.1). Furthermore, transfers are slightly more concentrated in urban than in rural areas, shown by generally larger shares of urban households receiving them, notably for the category 'Other transfers'. For all other categories, remarkably including 'Non-profit Institutions', the shares of recipients across poverty status and urban/rural location are strikingly similar. Some small differences can be observed, however, for remittances from relatives living outside and abroad, with the former slightly benefitting a higher share of the poor and the latter the non-poor.

Table 4.2. Percentage of households that receive transfer (%)

	All		Urban		Rural	
	Non-Poor	Poor	Non-Poor	Poor	Non-Poor	Poor
Pension[1]	2.6	1.6	3.0	2.3	2.2	1.4
Non-profit institutions[2]	2.3	2.1	2.4	2.0	2.1	2.2
Relatives living outside[2]	37.8	39.3	37.5	40.9	38.2	38.8
Relatives working abroad[2]	4.6	3.9	4.9	3.9	4.2	3.8
Other transfers	15.8	12.2	18.8	17.6	12.5	10.3
Total households	1,006,720	2,091,845	557,144	572,319	449,576	1,519,102

Notes: [1] Includes divorce, orphans/widowhood and alimony pension. [2] Includes transfer in-kind.

The gaps between non-poor and poor households can be clearly observed in the average amounts transferred (**Table 4.3**)**.** Average transfers from remittances and 'Other transfers' are significantly higher for the non-poor, particularly those in urban areas, where transfers received from relatives working abroad are four times higher for the non-poor than they are for the poor. This finding of higher average transfers for non-poor households can also be observed in pension transfers. These are nearly 2.43 times larger for the non-poor than for their poor counterparts on a national level.

The non-poor/poor gap is less evident in rural areas when it comes to remittances and 'Other transfers' (**Table 4.3**)**.** This is, in part, thanks to the adoption of digital technologies by migrant workers and their families. This allows remittances to reach the rural poor more easily, and they can then have a significant impact.

Table 4.3: Average transfers to households (in MZN)

	All		Urban		Rural	
	Non-Poor	Poor	Non-Poor	Poor	Non-Poor	Poor
Pension[1]	4,220	1,670	5,580	1,931	2,077	1,521
Non-profit institutions[2]	1,043	1,282	1,070	1,011	1,006	1,366
Relatives living outside[2]	2,475	984	3,478	1,252	1,332	886
Relatives working abroad[2]	7,804	2,036	10,151	2,547	4,576	1,857
Other transfers	3,429	1,226	4,015	1,381	2,402	1,135

Notes: Transfers in local currency at December 2021 prices. [1] Includes divorce, orphans/widowhood, and alimony transfer. [2] Includes transfer in-kind. Sample is restricted to households with a positive transfer

The average value of transfers increases as one moves from the poorer to the richer part of the distribution except for the transfers from non-profit institutions, which tend to favor the lower quintiles more (Table 4.4). Overall, people in urban areas receive much higher transfers than those in rural areas. The highest average transfers for 'Pensions', transfers from relatives living outside the household and remittances from relatives working abroad are at the 4th quintile. There is a significant gap between the 1st and 4th quintiles when observing pensions and 'Other transfers' (a multiplier of six times). This same pattern can be observed within both urban and rural areas, with average transfers steadily rising from the lower to the upper part of the consumption distribution. Again, the highest averages within the 4th quintile. Additionally, people living in urban areas – notably those in the upper part of the distribution (those in the 4th and 5th quintiles) – receive more transfers than their peers in rural areas.

Table 4.4: Average transfers by consumption quintile (per household and month, in MZN)

	Expenditure quintile				
	1st	**2nd**	**3th**	**4th**	**5th**
All					
Pension[1]	1,339	2,280	2,900	8,281	7,686
Non-profit institutions[2]	1,357	1,625	889	1,269	
Relatives living outside[2]	1,339	1,141	1,459	6,692	3,304
Relatives working abroad[2]	3,724	2,893	4,662	9,411	
Other transfers	1,190	1,369	2,320	7,551	6,682
Urban					
Pension[1]	1,482	2,633	4,996	9,101	7,686
Non-profit institutions[2]	1,262	1,151	834	1,360	
Relatives living outside[2]	1,540	1,440	2,629	8,137	4,519
Relatives working abroad[2]	3,743	3,455	9,694	11,892	
Other transfers	1,279	1,661	3,178	9,725	6,682
Rural					
Pension[1]	1,139	1,841	1,683	3,679	
Non-profit institutions[2]	1,438	1,875	912	54	
Relatives living outside[2]	1,152	962	964	2,150	110
Relatives working abroad[2]	3,707	2,569	2,118	5,638	
Other transfers	1,040	1,115	1,707	2,761	

Notes: Transfers in local currency at December 2021 prices. [1] Includes divorce, orphans and alimony transfers. [2] Includes transfer in kind. Sample is restricted to households with a positive transfer.

Based on the survey, remittances from partners or offspring living abroad appear to largely benefit the non-poor. The percentage of non-poor households with at least one member living outside of Mozambique is higher than that of poor households. The average transfers from those working abroad are also higher for the non-poor (**Figure 4.5 and 4.6**). However, overall, half of the total amount of remittances accrue to poor households because these are more numerous.

Figure 4.5 Percentage of household with at least one member living outside[1] (%)

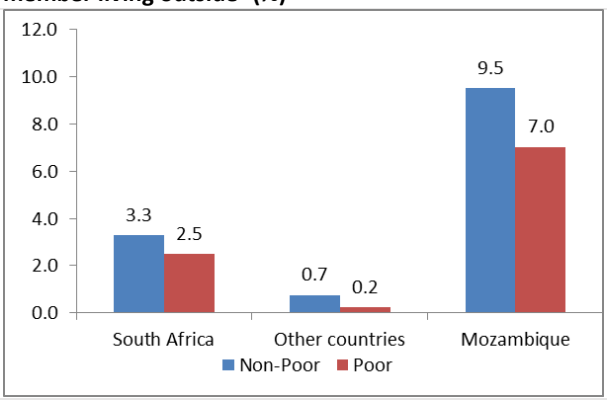
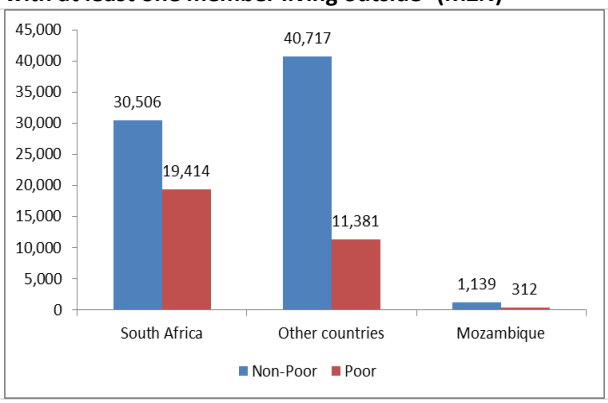


Figure 4.6 Average annual transfer received by households with at least one member living outside[2] (MZN)



Notes: [1] The households member considered are spouse of head of household or her/his sons [2] Sample is restricted to households that receive monetary or in-kind transfers in the last year, transfer in local currency at December 2021 prices.

As shown in **Figure 4.5**, poor households have a lower percentage of relatives living outside the household than non-poor households. The main destination is Mozambique itself and then South Africa. Over three percent of non-poor households in Mozambique declare having at least one of their members living in South Africa, whereas the respective proportion of non-poor households is 2.5 percent. The percentage of non-poor households that have at least one member living elsewhere in the world is more than double that observed in poor households, as would be expected by the generally higher costs involved. **Figure 4.6** shows that, on average, non-poor households that have at least one member living in South Africa received remittances of 30,506 MZN per year. The average transfer received by households that have relatives in other parts of the world is larger. The average is 40,717MZN per year in non-poor households and 11,371 MZN for the poor. Overall, poor households receive less remittances on average than non-poor.

The provincial breakdown of remittances shows a stark divide between the non-poor and poor. Annex 4 shows clear differences in almost every province, most notably in Manica and Niassa. The disparity, though still existent, is less in Inhambane and Tete, where the gap between the non-poor and poor is narrower. In essence, the non-poor disproportionately benefit from remittances both in urban and rural areas. Average transfers for the non-poor in urban areas get as high as 63,056 MZN in Manica and 24,551 MZN in Niassa whereas the highest figure for the urban poor is 103,551 MZN in Manica. By the same token, the non-poor in rural areas benefit largely from remittances in comparison to their poor peers. The only provinces where the gap between the two groups narrows is Nampula, Sofala and Inhambane.

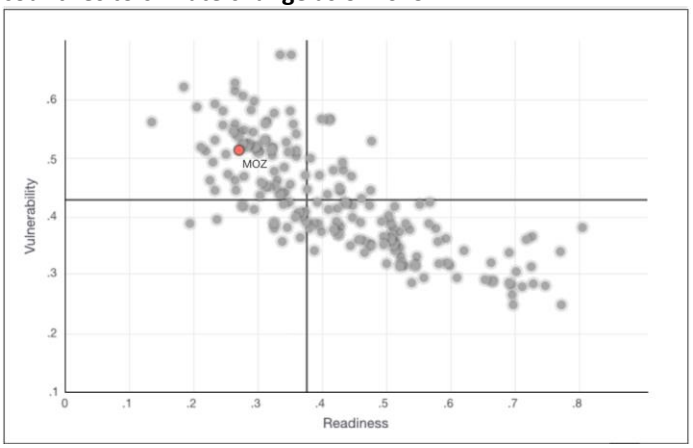
Chapter 5 Livelihoods in a risky environment

Mozambique is among the countries in SSA most exposed and vulnerable to weather-related shocks. Climate change–related shocks take a heavy toll on households, particularly the rural ones, through lower agricultural output and reduced consumption. As climate change causes greater volatility in rainfall, it is likely that these anomalous dry and wet spells will become even more frequent and intense. Consequently, food production will become more volatile, even if overall seasonal rainfall does not change. This, in turn, is likely to lead to food insecurity and increased poverty for agrarian households as well as net food consumers in both rural and urban areas.

5.1 Households deal with the twin challenges of high exposure to risk and weak ability to cope

Mozambique is among the countries in SSA most exposed and vulnerable to weather-related shocks. Over the last five years, Mozambique has experienced both droughts (for instance, the 2015/2016 one in the southern region) and a number of severe cyclones, most notably Idai and Kenneth in 2019. The mean annual temperature in Mozambique increased by 0.6˚C between 1960 and 2009, while average rainfall totals declined over the same period. Sea level rise is likely to exceed half a meter by the 2090s, with significant consequences for the 60 percent of Mozambicans who currently reside in low-lying areas. If no further action is taken to aid in adaptation, the sea level rise could increase economic flood losses in major coastal cities by a factor of five between 2012 and 2030. Mozambique is one of the most vulnerable and least prepared countries to deal with climate change. The ND-GAIN index, which assesses a country's vulnerability to and preparedness for climate change, ranks Mozambique 154th out of 181 countries (**Figure 5.1**). Therefore, as severe weather events become more frequent, it is likely that the economic and social consequences of climate change will increase. Without investments in preparedness and disaster risk management, climate change is expected to cause economic damages of between USD 2.3 billion and USD 7.4 billion[97] during the period 2003–2050.

Figure 5.1: According to the ND-GAIN matrix, Mozambique is one of the most vulnerable and least prepared countries to climate change as of 2019



Source: ND-GAIN Index, https://gain.nd.edu/our-work/country-index/matrix/

Note: The ND-GAIN Matrix illustrates the comparative resilience of countries. The vertical axis shows the score of vulnerability and the horizontal axis shows the readiness score.

[97] Discounted and in 2003 prices. World Bank (2010); Arndt et al. (2012).

Climate change–related shocks take a heavy toll on households, particularly the rural ones, through lower agricultural output and reduced consumption. In the past, cyclones, floods, and droughts have led to crop failures, a drop in per capita food production and consumption among affected households, and increased poverty. The IPCC multimodal SSP1-1.9 model ensemble projection is that, compared to the 1995-2014 reference, precipitation in Mozambique will decrease during the 2020-2039 climate period and become more volatile.[98] The Intensification of droughts is also expected to reduce crop yields and reduce water availability. Additionally, river floods will become more intense across the main basins due to projected increases in extreme precipitation during the rainy seasons. Indeed, two out of the three indicators in the ND-GAIN index, where Mozambique scores the worst, are on the projected change in cereal yields and agricultural capacity. Whereas Mozambique's overall score in the ND-GAIN index in 2019 was 38.1, the score for the projected change of cereal yields was 0.940 and the score for agricultural capacity was 0.982 (with scores closer to 1.0 being worse).[99]

5.2 Weather events pose a big burden on rural livelihoods

Mozambique is highly susceptible to droughts, floods and cyclones. Between 2000 and 2012, there were 741 droughts, 437 floods, and 137 cyclones (World Bank 2021). The World Bank (2021) estimates that two cyclones in 2019 (Idai and Kenneth) slashed 20 percent (US $ 3 Billion) of Mozambique's GDP. The evidence produced for this section shows that both unusually dry and wet 20-day rainfall spells exert a significant negative impact on remote-sensed vegetation dynamics, a proxy of the normal development of crops, during the growing season.[100] While data on agricultural production (particularly for households engaged in producing food to meet their own consumption) is sparse in non-survey years, this analysis suggests harvest cycles are frequently disrupted by weather events across districts and years. It is unlikely that disrupted harvest cycles would be able to recuperate sufficiently between January and April, and replanting is not possible this late in the season. Consequently, agrarian households engaged in subsistence farming face shocks that make them particularly vulnerable to food insecurity. Baez et al (2019) show that an extreme weather event in Mozambique can lead to up to a 25-30 percent drop in per capita food consumption and a 12 to 17.5 percentage point increase in poverty. Furthermore, the high degree of uncertainty created by erratic rainfall disincentivizes agrarian households from investing in the sunk costs (e.g., seeds and tools) needed to improve their agricultural productivity.

Based on the IOF 2019/20 survey data, it has been found that 31 percent of households in Mozambique have encountered a natural shock at least once in their lifetime (as shown in Table 5.1). This occurrence is more prevalent among households located in specific provinces. For example, in the provinces of Sofala (79.1 percent) and Manica (62.5 percent) situated in the central region of the country, Inhambane (56.4 percent) and Gaza (40.1 percent) in the southern region, and Cabo Delgado (39 percent) in the northern region. Furthermore, the data reveals that rural households are more prone to natural shocks compared to their urban counterparts. Approximately 34.3 percent of rural households have encountered such shocks, while the corresponding figure for urban households is 24.7 percent. These findings highlight the geographical disparities in the incidence of natural shocks within Mozambique. They emphasize the importance of regional considerations and the need for targeted interventions to support households in

[98] Mozambique - Trends & Variability - Projections | Climate Change Knowledge Portal (worldbank.org)

[99] https://gain-new.crc.nd.edu/country/mozambique#:~:text=The%20high%20vulnerability%20score%20and,the%2025th%20least%20ready%20country.

[100] The vegetation averages at the district level are computed using pixels from crop, crop-mix and grassland categories of the Annual International Geosphere-Biosphere Programme (IGBP) classification for 2017 (which was a normal year).

areas more susceptible to natural disasters. Such efforts can contribute to enhancing resilience and reducing the impact of these shocks on affected communities.

Table 5.1: Households victims of natural shocks and their wellbeing

Province	Household has previously suffered from a natural disaster	Household wellbeing got worse after a natural disaster
Niassa	9.3	13.0
Cabo Delgado	39.0	35.6
Nampula	18.1	38.4
Zambézia	28.4	26.2
Tete	24.8	30.8
Manica	62.5	26.1
Sofala	79.1	61.6
Inhambane	56.4	42.5
Gaza	40.1	42.3
Maputo Province	12.7	26.4
Maputo City	7.6	26.8
Urban	24.7	31.2
Rural	34.3	34.6
Total	**31.0**	**33.4**

Source: own calculations based on IOF 2019/20.

Table 5.2 highlights the detrimental impacts of natural disasters in Mozambique, specifically focusing on two key consequences. Approximately 50.9 percent of households reported losses in crops within the 12 months prior to the survey as a result of natural disasters, while 18.7 percent experienced losses in food. Examining these consequences in more detail reveals that Tete province had the highest proportion of households affected by crop losses, with 74.1 percent reporting such incidents. Following closely behind, Gaza province had 69 percent of households affected. Regarding losses in food, Cabo Delgado and Niassa provinces had the highest percentages, with 32.5 percent and 29.7 percent of households, respectively, indicating such losses.

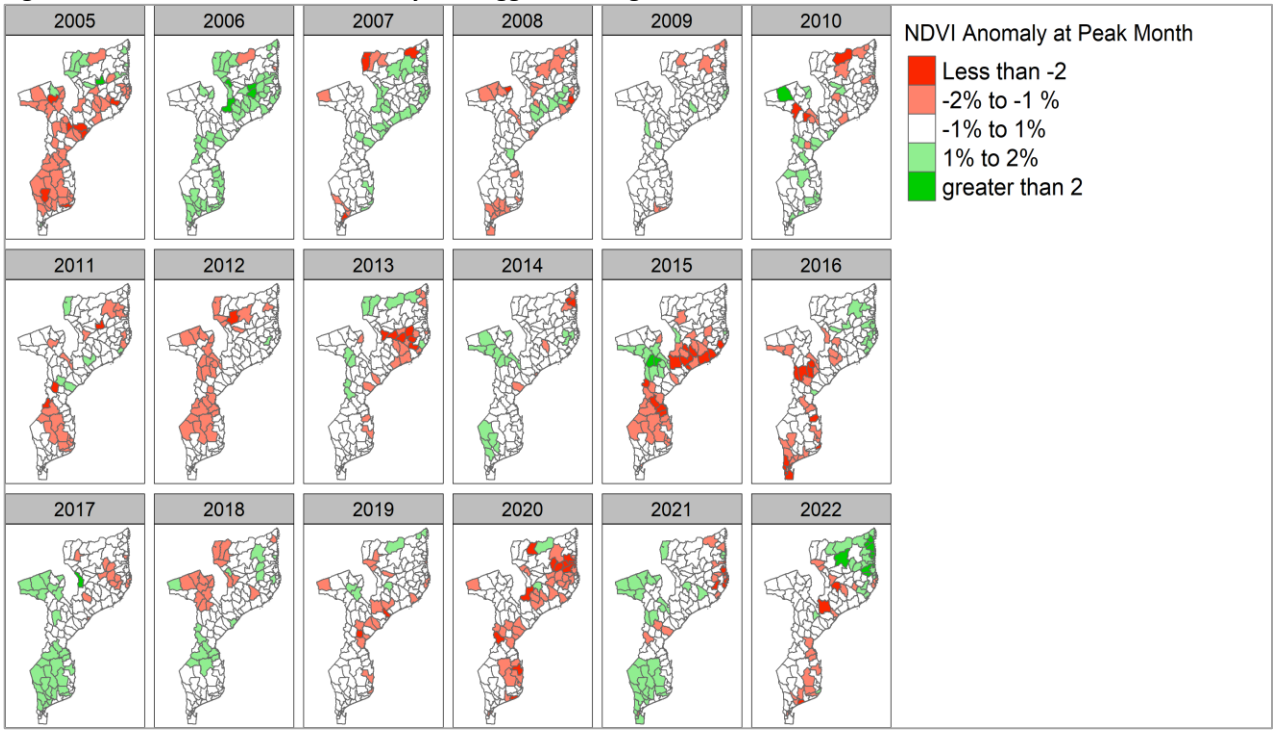
Table 5.2: Household losses due to natural shocks in the last 12 months

Household losses	Percent of Households
Major agricultural equipment (Tractors, Irrigation systems, etc.)	0.2
Small farming equipment (Hand tools, storage containers, etc.)	1.9
Seeds	12.3
Fertilizers/Pesticides	0.4
Crops	50.9
Small domestic animals	6.6
Large Pets (Cows, Donkeys, etc.)	1.4
Major Assets/Domestic Appliances (TV, Radio, Cooler, Bicycle, etc.)	4.9
Small household goods (Kitchen utensils, clothes, etc)	9.7
Food	18.7
No losses	24.0

Source: own calculations based on IOF 2019/20.

Harvest cycles are regularly disrupted across years and districts. Figure 5.2 shows the Normalized Differenced Vegetation Index (NDVI) anomaly at the peak month which corresponds to the harvest that occurs in that year.[101] While the harvests in 2005 and 2015 were disrupted across much of the country, there were very few years when some districts did not experience NDVI anomalies (during the peak month) that were less than -1 standard deviation from the average. Rembolt et al (2013) summarize a large literature that shows that these anomalies are correlated with crop yields at harvest, with the correlation coefficient ranges estimated between 0.5 and 0.7. Therefore, NDVI anomalies that are lower than a negative one standard deviation are likely to be associated with large drops in crop yields at harvest.

Figure 5.2: Remote-Sensed Harvest Cycles suggest that Agricultural Production is Volatile

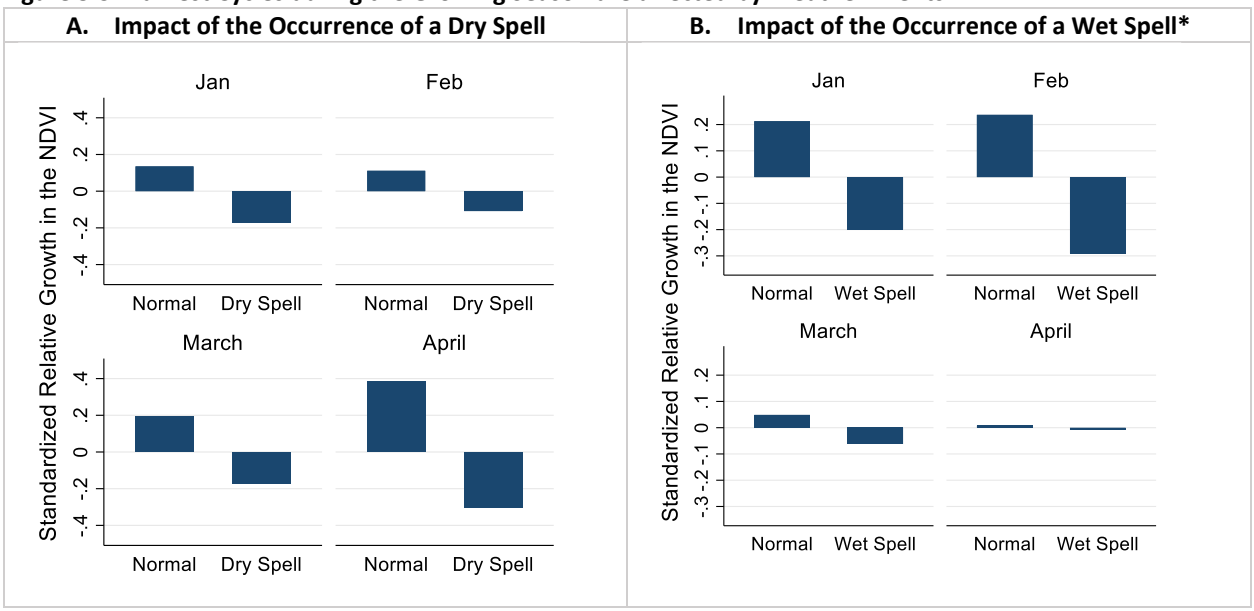


Notes: World Bank calculations based on MOD13A1.061 Terra Vegetation Index (16-Day Global 500m) from NASA/USGS (Didan 2021) from Google Earth Engine.

[101] The Normalized Differenced Vegetation Index is an index of plant growth and health. When measured during the growing season of a crop cycle it is related to the absence of crop stress (e.g., https://earthobservatory.nasa.gov/features/MeasuringVegetation/measuring_vegetation_2.php). The NDVI anomaly during the month in which it typically peaks are linked to crop yields.

Both dry and wet spells significantly impact harvest cycles and, likely yields, negatively[102]. To estimate the impacts of anomalous weather events on harvest cycles, we compute the standardized relative increase in the NDVI and compare these to unusually dry or wet rainfall patterns (**Figure 5.3**).[103][104]

Figure 5.3: Harvest Cycles during the Growing Season are affected by Weather Events



Notes: World Bank computations, data is CHIRPS Daily: Climate Hazards Group InfraRed Precipitation (Version 2.0) from Funk et al 2015.

The influence of wet spells on agricultural production was larger between 2014 and 2022 than between 2004 and 2013, while dry spells exerted a comparable influence across both periods. As Annex 5 shows, a (lagged) wet spell after 2013 was 1.7 times as damaging to crop growth compared to the period between 2004 and 2013. Crop growth was 0.27 vs 0.16 standard deviations lower than what was typical for that district and month after 2013. The magnitudes of the impacts of dry spells were similar (-0.28 vs -0.22 standard deviations).

Anomalous rainfall patterns frequently disrupt harvests because both wet and dry 20-day spells occur more than 40 percent of the time during the growing season in all provinces. Consequently, weather risk to agriculture is challenging to quantify and index against. **Figure 5.4** shows that, across all provinces, wet spells and dry spells occur more than 40 percent of the time in all months between January and April. Therefore, even if the growing season started well, households have been vulnerable to weather-induced agricultural production shocks in every month from January to April. Further, as climate change causes

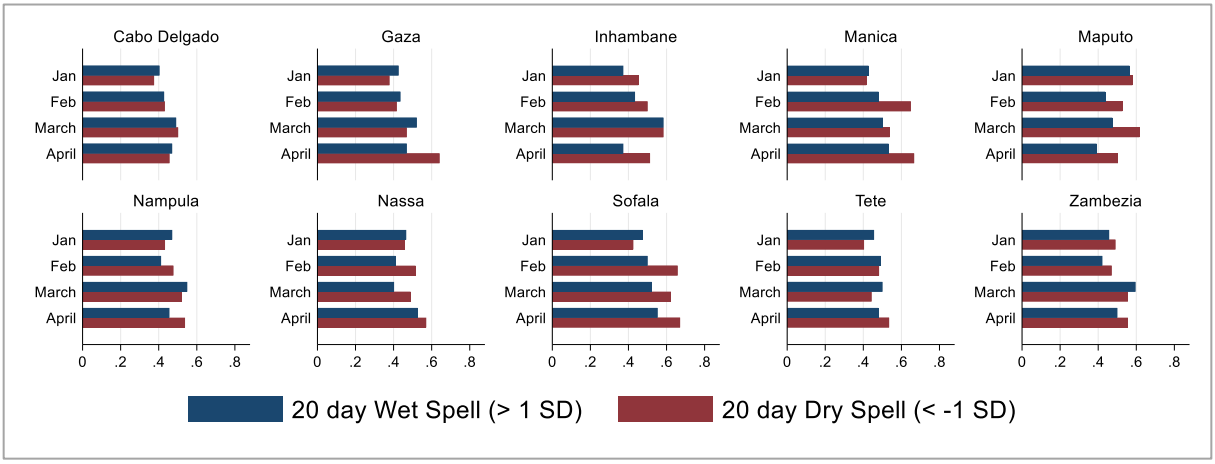
[102] This report defines a dry spell as a 20-day period in which the total rainfall is below one standard deviation of the corresponding period (and district) average between 2004 and 2022. A month contains a dry spell if the last day of a dry spell falls in that month. Similarly, a wet spell is defined to be a 20-day period in which total rainfall is above one standard deviation of the same period's average.

[103] The changes are standardized so that the mean is zero and the standard deviation is one for every location and month. This is calculated as the actual monthly increase in the NDVI minus the average monthly increase in the NDVI, standardized so that a positive value implies above average rainfall and the unit is in standard deviations. Therefore, NDVI may increase after a crop cycle is disrupted because of vegetation growth that is not related to food production. By computing deviations from typical monthly changes, we can estimate the disruption of a crop cycle (after January, replanting is less common in Mozambique.) Traditional proxies for the NDVI include the anomaly at the peak or the sum of the NDVI values around it. However, we use a landcover mask that includes cropland, cropland mix and grasslands because identifying cropped pixels is challenging.

[104] Our results for the start of the growing season (November and December) are mixed. This may be because households have an opportunity to replant in January if the rainy season starts later.

greater volatility in rainfall, it is likely that these anomalous dry and wet spells will become even more frequent and intense. Consequently, food production will become volatile, even if overall seasonal rainfall does not change.

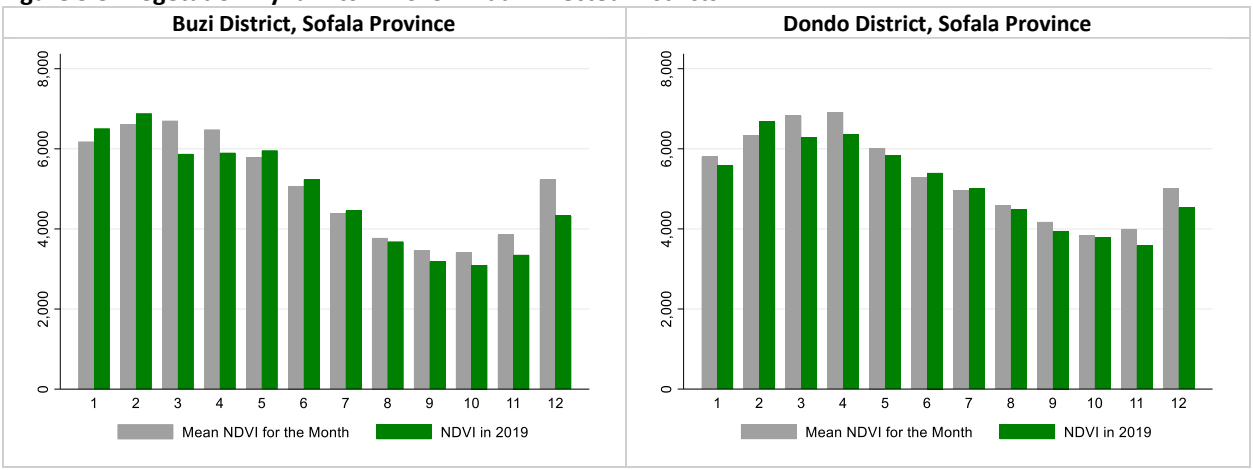
Figure 5.4: All provinces experienced frequent occurrences of dry and wet spells across critical growing season months between 2004 and 2022.



Notes: World Bank computations, data is CHIRPS Daily: Climate Hazards Group InfraRed Precipitation (Version 2.0) from Funk et al 2015.

What these findings show is that both wet and dry spells invariably impact harvests negatively. This, in turn, is likely to lead to food insecurity and increased poverty for agrarian households as well as net food consumers in both rural and urban areas. This is particularly true for those engaged in subsistence farming and wage earners in the agriculture sector. Susceptibility to negative impacts caused by changes in weather is particularly exacerbated by Mozambique's repeated exposure to extreme weather events. Cyclone Idai (March 2019) severely affected crop dynamics very close to the harvest in affected districts. As **Figure 5.5** shows, for two Idai-affected districts in Sofala province, NDVI fell quickly during March and April -- precisely the months in which it normally peaks (i.e., just before the harvest).

Figure 5.5: Vegetation Dynamics in 2019 in Idai-Affected Districts

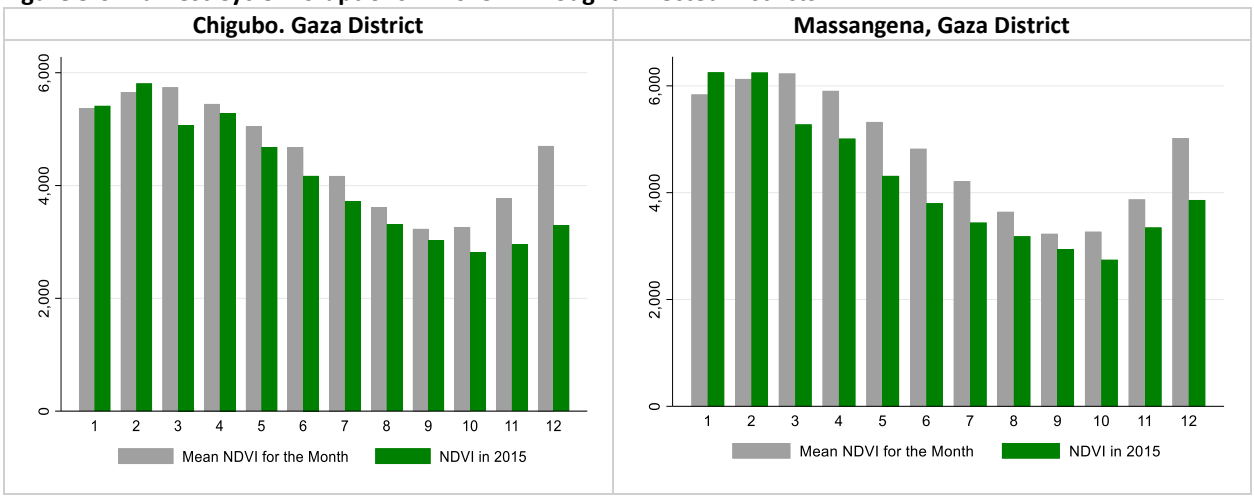


Source: World Bank calculations based on MOD13A1.061 Terra Vegetation Index (16-Day Global 500m) from NASA/USGS (Didan 2021) from Google Earth Engine.

Similarly, the drought in 2015 severely disrupted crop growth very close to the harvest season in affected districts. As **Figure 5.6** shows, for two drought-affected districts in south-western Mozambique, NDVI fell unexpectedly during the months in which it normally peaks (i.e., just before the harvest). In March 2015,

NDVI fell by 12.7 percent in Chigubo, while it normally goes up by 1.6 percent in March. Concurrently, it fell by 15.5 percent in Massangena when it normally goes up by 1.7 percent in March.

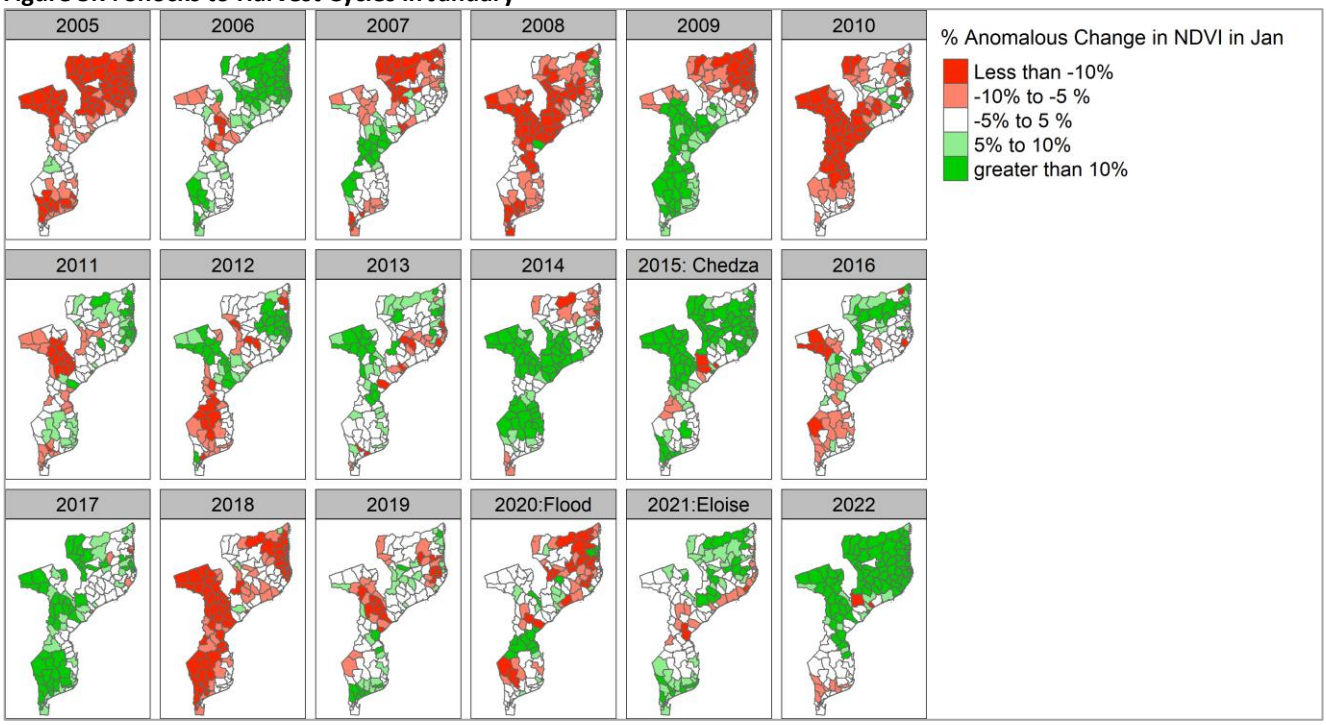
Figure 5.6: Harvest Cycle Disruptions in 2015 in Drought-Affected Districts



Source: World Bank calculations based on MOD13A1.061 Terra Vegetation Index (16-Day Global 500m) from NASA/USGS (Didan 2021) from Google Earth Engine.

Across the last two decades, January has remained the month in which the crop cycles are most vulnerable to disruptions. This is because cyclones, floods, as well as dry spells occur frequently. As **Figure 5.7** shows, NDVI growth is especially volatile in January, but is also especially spatially correlated. Crucially, January is the month in which shocks to agricultural production are likely to covary across large spatial areas. Therefore, the impacts will be at a national scale and ex-post risk mitigation would necessitate a large increase in imports or food aid, in contrast to March in which the production shocks are more idiosyncratic. Further, this gives the government and other organizations a few more months to prepare for a disrupted harvest compared to disruptions in March and April. However, replanting is not possible after January, consequently shortfalls to local food production are likely to lead to food insecurity.

Figure 5.7: Shocks to Harvest Cycles in January



Notes: World Bank calculations based on MOD13A1.061 Terra Vegetation Index (16-Day Global 500m) from NASA/USGS (Didan 2021) from Google Earth Engine

Coping mechanisms are important for survival and recovery during and immediately after a crisis or disaster. They are often short-term, reactive measures used to address the immediate needs and challenges arising from the event. It is concerning to note that a significant percentage, specifically 41.7 percent, of households do not employ any coping mechanisms in the aftermath of a natural disaster (Table 5.3). This highlights a concerning vulnerability among these households, as they rely heavily on government safety nets for support.

Among the households that do implement coping mechanisms, certain strategies are more prevalent. The most common coping strategies reported are borrowing food, utilizing the Ganho-ganho system,[105] and reducing the amount of food consumed. Approximately 22 percent of households mentioned borrowing food as a coping mechanism, while 13.4 percent reported using the Ganho-ganho system. Additionally, 12.6 percent of households stated that they cope with the situation by decreasing the quantity of food consumed.

These findings shed light on the coping strategies adopted by households in response to the challenges posed by natural disasters. They emphasize the need for targeted interventions and support systems to enhance the resilience and coping capacity of vulnerable households, particularly those who currently lack effective coping mechanisms.

[105] During certain periods of the farming cycle, the farm owner announces the availability of paid work, which can be compensated with money, drinks, food, or even clothing. Typically, designated areas are assigned to interested parties, who are usually agricultural families, to cultivate crops. After completion, they receive the agreed-upon compensation. The same process is followed for the opening of roads and pathways. Another name used for this practice is "biscato" or “biscate”.

Table 5.3: Households coping mechanisms after natural disasters

Coping Mechanisms	Percent of Households
Borrow food	22.0
Buy food on credit	6.4
Increase consumption of wild foods	5.0
Decreasing the amount of food eaten	12.6
Change consumption to cheaper foods	5.0
Household members emigrated to look for work	1.1
Take children out of school	1.5
Decrease spending on education	0.6
Put children to work	1.1
Decrease health expenses	0.7
Use savings/reduce contributions with "xitique"	3.5
Borrow money	11.0
Sell production goods (seeds/tools)	2.0
Sell household goods	1.3
Use the “Ganho-ganho” system	13.4
Sell the land	0.3
Diversify your means of income	5.6
Change job	0.6
Change your place of residence	2.7
Do not do anything	41.7

Source: own calculations based on IOF 2019/20.

5.3 Weather events also impact negatively urban economic infrastructure and productivity

It is challenging to assess the human impacts of cyclones because real-time data are not available. Changes in Night-Time Light radiance provide an estimate of the changes in economic activity (Chen and Nordhaus 2011, Mellander et al 2015). Therefore, we use remote-sensed VIIRS Night-time light radiance (Elvidge et al 2013) to estimate the impacts of major cyclones in urban areas in central and northern Mozambique.

This section uses three sources of data – data on cyclone incidence from EM-DAT International Disaster Data Base, Night-Time Light Radiance (VIIRS), and administrative boundaries of the affected Postos (GADM). The EM-DAT International Disaster Data Base provides the incidence date and districts, or provinces associated with each event. The month and year associated with each event are used, since the analysis is at a monthly timescale. The Night-Time Light Radiance is based on the (VIIRS) Monthly Cloud-free DNB Composite from the SNPP satellite (Elvidge et al 2013). The GADM database provides vector data on urban locations from which the Night-Time Light Radiance monthly time series can be extracted.

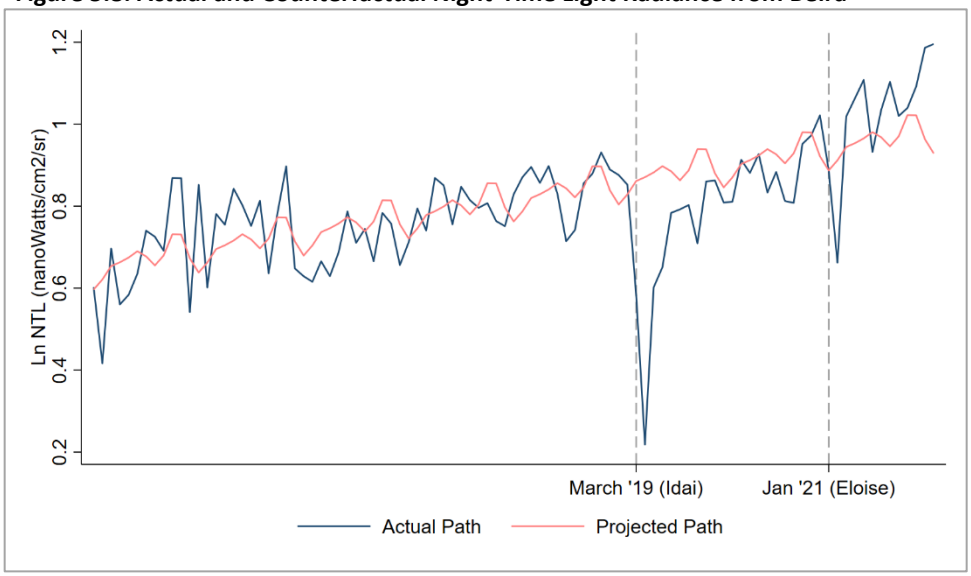
The unit of analysis is at the GADM Administrative level 3 – the analysis focuses on the two largest towns in central and northern Mozambique, Beira and Nampula respectively. Both towns have been severely affected by cyclones and other weather events in the last decade. In addition, this section reports estimates of the impacts on Night-Time Light Radiance time series from four other ports and towns in provinces affected by cyclones. Three major events may be analyzed using the VIIRS data: Cyclone Idai, the January 2020 storm and flood in the northern provinces, and cyclone Eloise. Cyclone Idai mainly affected Sofala and Nampula provinces in March 2019. Beira, the major town in Sofala province was severely

affected. The impacts of Cyclone Kenneth from Cyclone Idai cannot be disentangled because the latter arrived only a month later, and therefore, is not separately included in this analysis. In January 2020, there was a storm and a major hydrological event (a flood) that affected Cabo Delgado, Nampula, Sofala, Zambezia and Tete provinces. In January 2021 tropical cyclone Eloise affected Sofala, Inhambane and Manica provinces, but the analysis also shows impacts on Nampula.

This section uses a methodology that estimates the impacts of the fast-onset cyclones in three steps. First, the projected path of the NTL series before the event is constructed by estimating a trend and seasonal pattern using a harmonic function.[106] This path is projected forward from just before an event through January 2022. The difference between the counterfactual (i.e., the projected path) and the actual NTL monthly time series is then computed. The duration of the impacts is determined by the number of months it takes before the actual NTL series is back at the counterfactual. This provides an estimate of how long Night-Time Light radiance took to return to normal and is plausibly related to a rebound in economic activity.

Idai's impact on Night-Time Light (NTL) radiance lasted 11 months in Beira. NTL radiance from Beira plummeted to 60 percent of its mean value because of cyclone Idai's impact in March 2019 and by 20 percent of its value because of Eloise's impact in January 2021. Figure 5.8 below shows that the actual path reverted to the projected path in February 2020. While NTL radiance fell again after Eloise in Jan 2021, this time it reverted to the counter-factual path quickly, and then moved above it. **Figure 5.9** shows that it only reverted to the pre-Idai counterfactual path by February 2020. However, it rebounded quickly after Eloise and increased at a faster rate than the pre-Idai counterfactual.

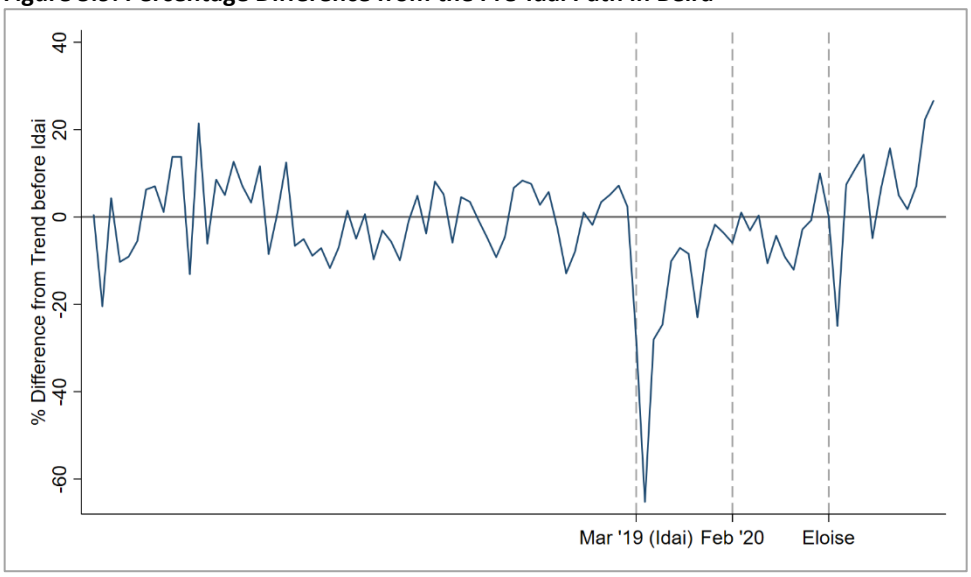
Figure 5.8: Actual and Counterfactual Night-Time Light Radiance from Beira



Source: World Bank calculations. Data are from Elvidge et al 2013

[106] The specification includes six trigonometric terms at different frequencies. These harmonic terms are used to adjust for seasonal influences from both typical natural and human sources (e.g., festivals) across months.

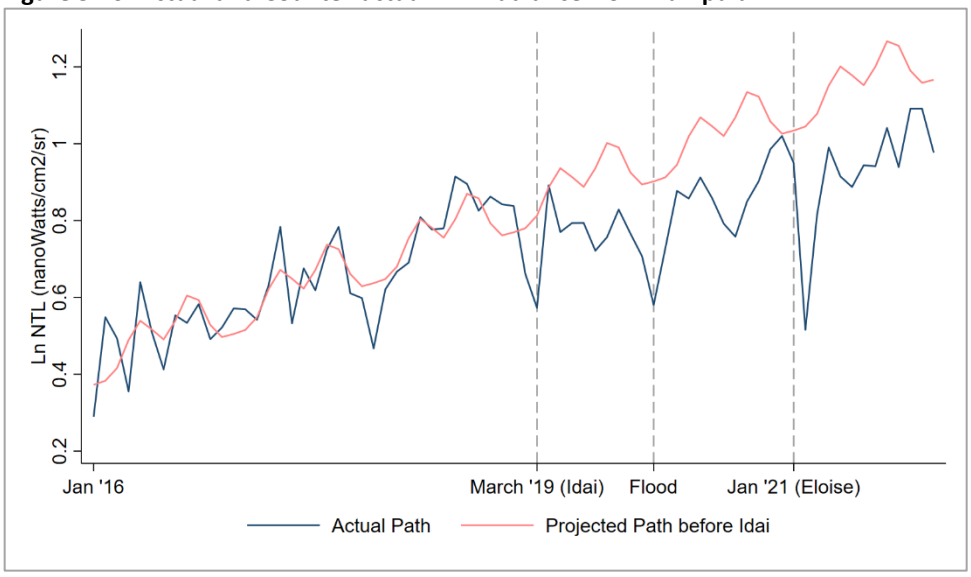
Figure 5.9: Percentage Difference from the Pre-Idai Path in Beira



Note: World Bank calculations. Data are from Elvidge et al 2013

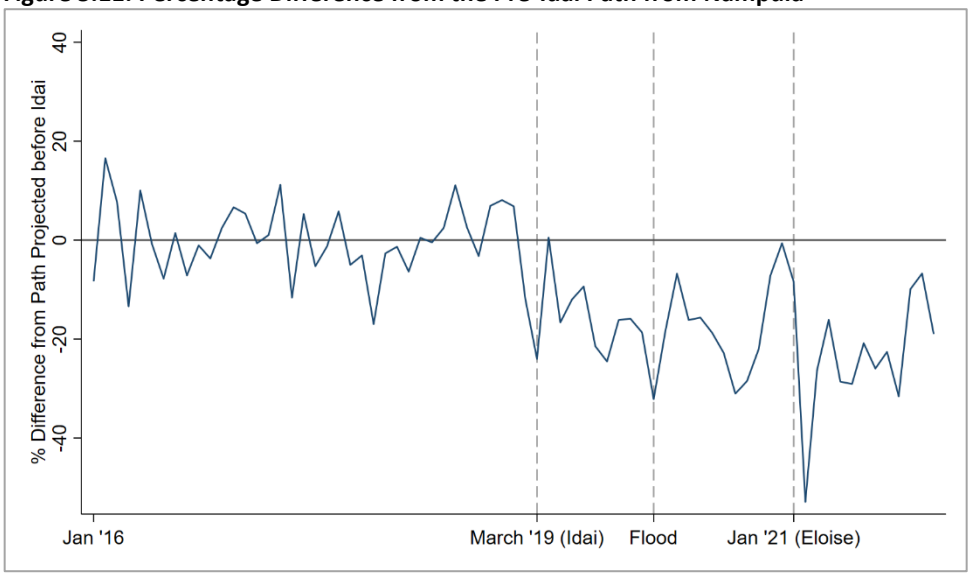
Night-Time Radiance plunged in Nampula in the aftermaths of Idai, the January 2020 flood, and Eloise. Idai's immediate impact on NTL radiance was considerably smaller in Nampula than Beira; however, Night-Time Light radiance did not revert to its counter-factual path. While Beira is the largest town in central Mozambique, Nampula is the largest and most important town in northern Mozambique. **Figure 5.10** shows that Nampula was severely affected by all three major events and did not return to the pre-Idai counter-factual through January 2020. **Figure 5.11** shows that NTL radiance from Nampula fell by 20 percent after Idai (in contrast to 60 percent in Beira, which is where Idai made landfall), reverted temporarily, but then followed a downward trajectory. It was reverting to the pre-Idai counterfactual just before Eloise, and then fell by more than 50 percent in the aftermath of Eloise.

Figure 5.10: Actual and Counterfactual NTL Radiance from Nampula



Note: World Bank calculations. Data are from Elvidge et al 2013

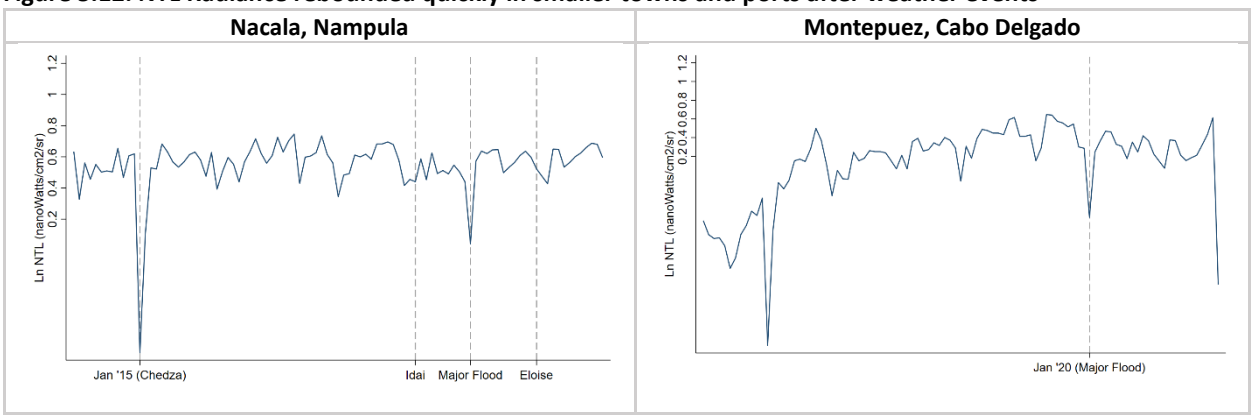
Figure 5.11: Percentage Difference from the Pre-Idai Path from Nampula

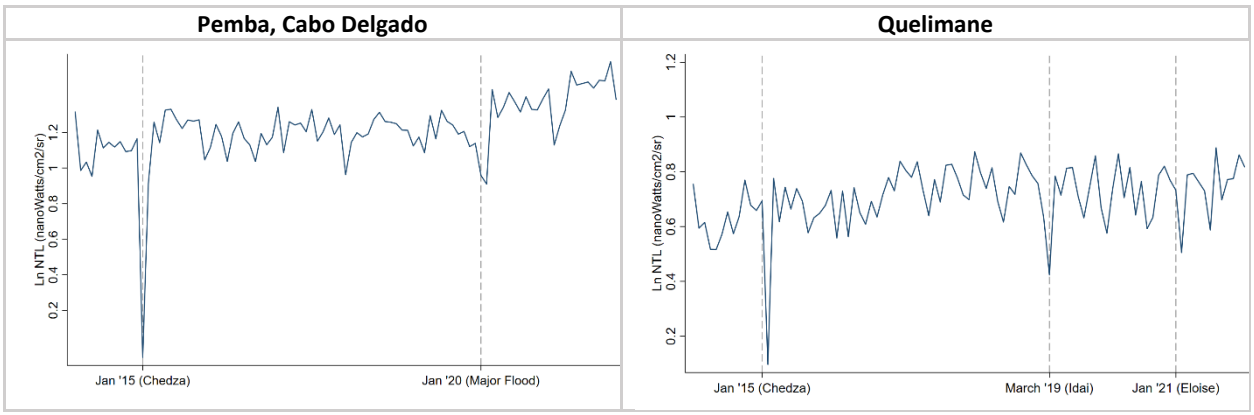


Note: World Bank calculations. Data are from Elvidge et al 2013

Night-time light radiance rebounded quickly in the smaller towns and ports, all of which did not have growth in Night-Time Light radiance before the weather events. Even though Nacala is the major port in Nampula province, the NTL rebounded quickly (within a month) after all major events. This pattern holds for other ports and towns in the provinces affected by cyclones in central and northern Mozambique. Night-Light radiance fell sharply to below 1 Nanowatts cm2/SR (which is approximately dark), but rebounded quickly, within one month (**Figure 5.12**).

Figure 5.12: NTL Radiance rebounded quickly in smaller towns and ports after weather events





Note: World Bank calculations. Data are from Elvidge et al 2013

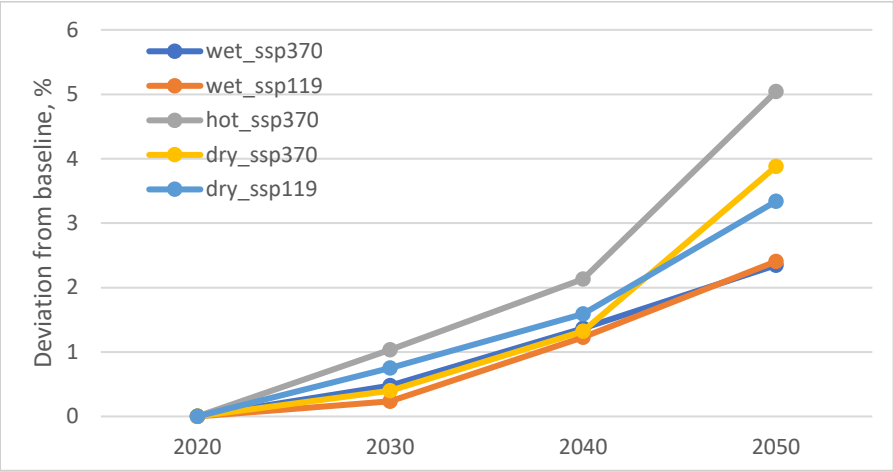
The NTL analysis suggests that, in the absence of stronger ex-ante policies (that lead to improved adaptation and mitigation, as well strong ex-post policy responses), fast-onset weather events like cyclones may result in lower private incentives to invest in and contribute to the industrialization of, the larger towns in central and northern Mozambique. This absence of funding will likely engender slower recoveries in Beira and Nampula, while the smaller towns may be able to rebound more quickly. It is possible that a fast recovery may simply reflect reconstruction efforts rather than a return to normal. However, unlike Nampula and Beira, night-time light radiance rebounded quickly in the smaller towns and ports that did not exhibit growth in Night-Time Light radiance before the weather events, suggesting that these places were not industrializing at a discernible rate prior to the events. It is therefore safe to assume that these towns would not be likely targets of significant funding. This suggests a greater need for stronger policy responses for regional hubs such as Beira and Nampula. Only by securing these larger towns against extreme weather events and providing stronger ex-post responses can investment and industrialization be incentivized to the benefit overall growth in these regions as a whole.

5.4 Will the poor bear the big burden of higher temperatures and more frequent and severe weather shocks? [107]

Climate change will increase the poverty rate in Mozambique. In all future climate scenarios, the economic losses from climate change impacts are expected to increase poverty. By 2050, under the worst-case "hot" scenario, the poverty rate measured against the international poverty line will increase relative to the baseline by 5 percent, which puts 1.6 million additional individuals in poverty. These impacts are smaller under the two "dry" climate scenarios. Yet the smallest effects are seen under the two "wet" climate scenarios, where the poverty rate increases by more than 2 percent relative to the baseline scenario (**Figure 5.13**).

[107] These results are also reported in the Mozambique Climate Change and Development Report (World Bank, 2023).

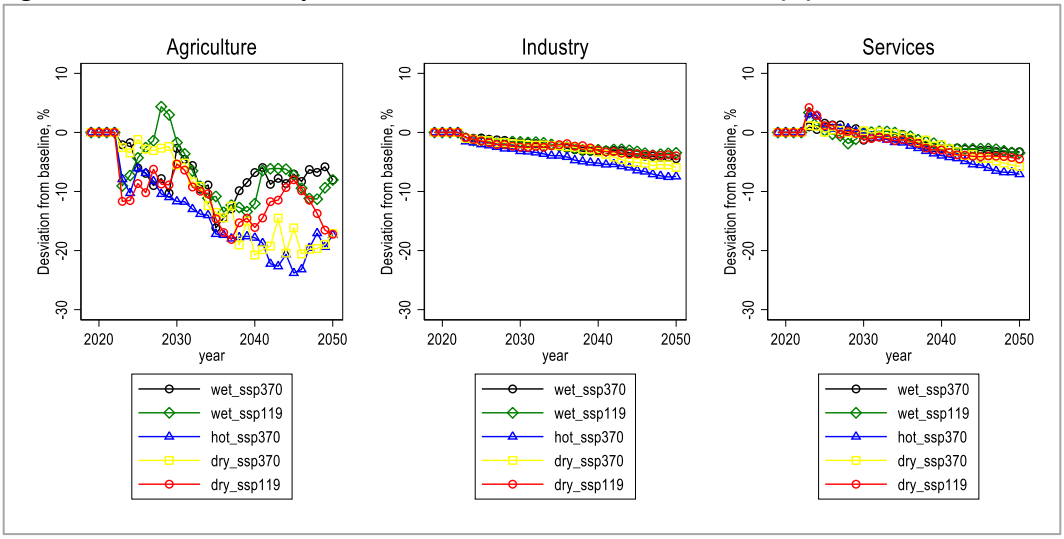
Figure 5.13: Poverty impact (international poverty line)



Source: Own estimations.

The impact on headline poverty is muted because the baseline poverty level is high and concentrated in the agriculture sector. The effects of climate shocks in the modelling are heavily concentrated in the agricultural sector (**Figure 5.14**). This sector accounts for the highest level of poverty in the country due to the importance of subsistence farming. With the brunt of impacts falling on agriculture and people in this sector mostly already in poverty, the headcount rate shows relatively small increases. This caveat is important because the simulated impacts on the poverty rate are certain to be an understatement of the effects of climate change on household welfare. Indeed, simulations also show that, on average, consumption of the poor will fall further below the poverty line –an increase in the level of deprivation among the poor– with all of the climate scenarios modelled herein, as seen further below (see Annex 5 for more information).

Figure 5.14: Value-added by sector, deviations from baseline scenario (%)

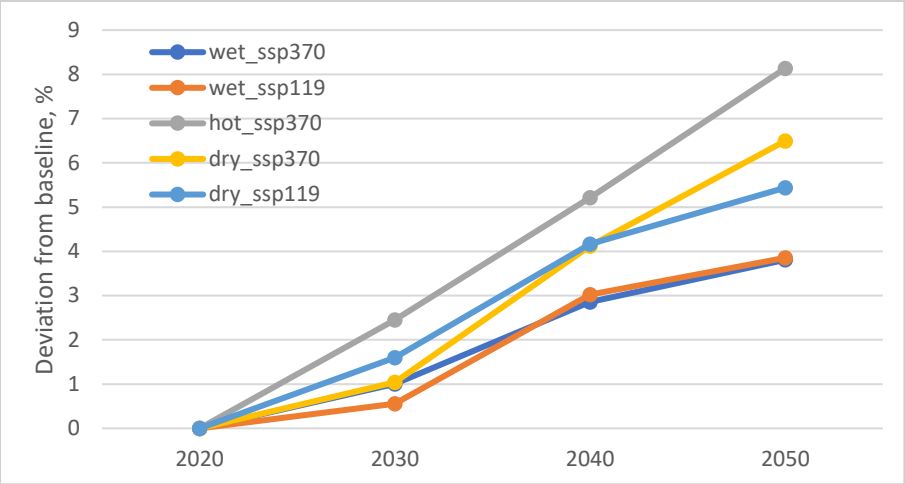


Source: Own estimations.

The negative impacts of climate change will most significantly impact those at the bottom of the welfare distribution. The effect of all future climate scenarios on the intensity of poverty (how far below the poverty line the poor proportionally fall) are larger than the equivalent impacts on the headline poverty.

For example, by 2050, under the worst-case "hot" scenario, the poverty gap will increase relative to the baseline scenario by more than 8 percent **(Figure 5.15)**

Figure 5.15: Impact on the poverty gap (international poverty line)



Source: Own estimations.

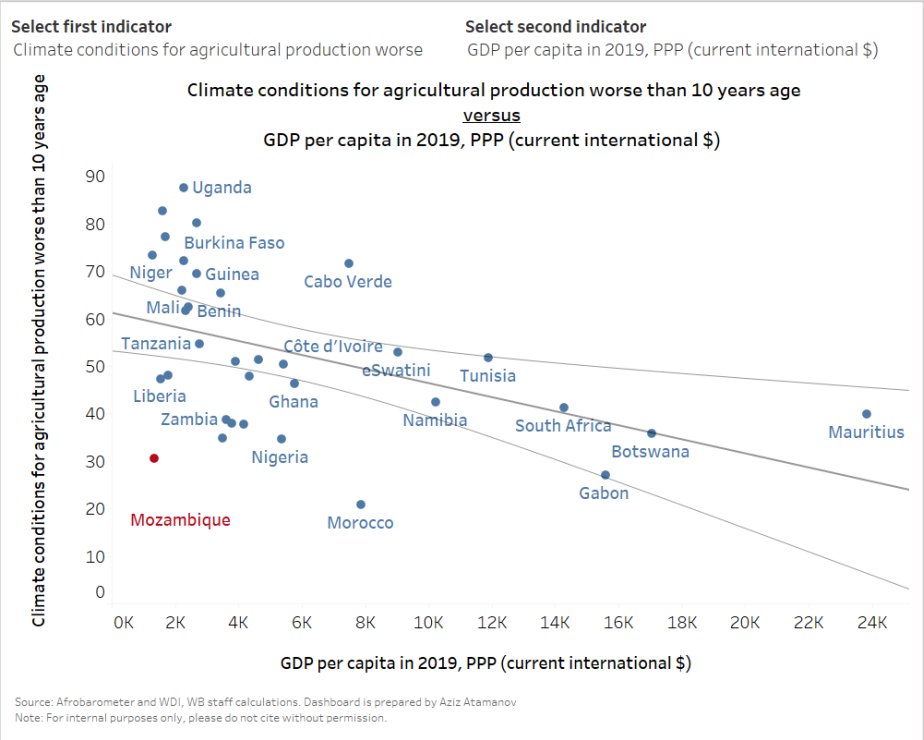
The poverty impacts of climate change will differ across regions due to spatial concentration of weather risks in certain parts of the country. The increase in the poverty rate by region relative to the baseline under the worst-case "hot" scenario ranges between 3 to 11 percent. The largest increases can be seen in the provinces of Manica (11 percent), Niassa (9 percent), and Maputo (9 percent), while the smallest impacts (approximately 3 percent) can be found in the provinces of Nampula and Zambezia.

The impacts of climate change will be proportionally higher in urban areas. In the most pessimistic scenario, poverty rates in urban areas will increase by 8 percent compared to only 4 percent in rural areas. However, these differences are relative to a much lower level of poverty in urban areas in the baseline year and a baseline scenario showing declines in urban areas over time at a much faster rate than in rural areas. These results may also, at least partially, stem from the fact that urban areas are disproportionately located in coastal regions, along the main road that spans the entire country. This is an area increasingly hit by recurring cyclones.

5.5 Behaviors can shape actions to mitigate, adapt and become more resilient

Understanding perceptions on climate change is important to raise awareness and create more effective policies to strengthen resilience and adaptation. This section succinctly looks at climate change literacy in Mozambique and how people perceive it in comparison to regional peers. The Afrobarometer 2019 reports a significantly lower share of respondents in Mozambique indicating that climate conditions worsened compared to a decade earlier in comparison to other countries with similar 2019 GDP per capita in PPP terms (**Figure 5.16**).

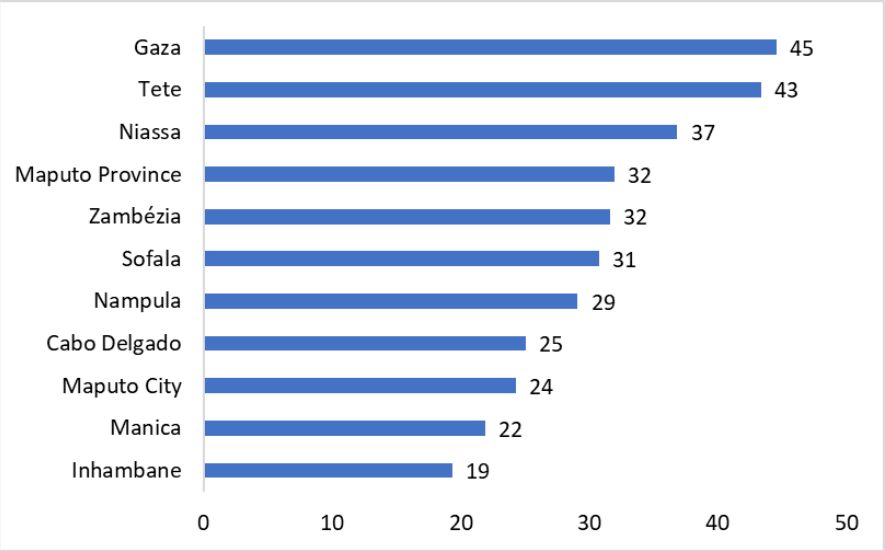
Figure 5.16: Perceived negative impacts of climate change on agricultural production



Source: Afrobarometer 2019 and WDI, World Bank staff calculations.

Though it is clear from the data that climate conditions are worsening in Mozambique, the impact of poor climate change literacy is evident in the low percentage of respondents aware of these impacts. **Figure 5.17** shows that as few as 19% in Inhambane and only as high as 45% in Gaza provinces recognize the impacts that climate conditions have had on agriculture over the last decade. With limited climate change literacy, the desire of those within the country to alter behaviors that may ameliorate the impacts that these changes will have on livelihoods may also remain limited.

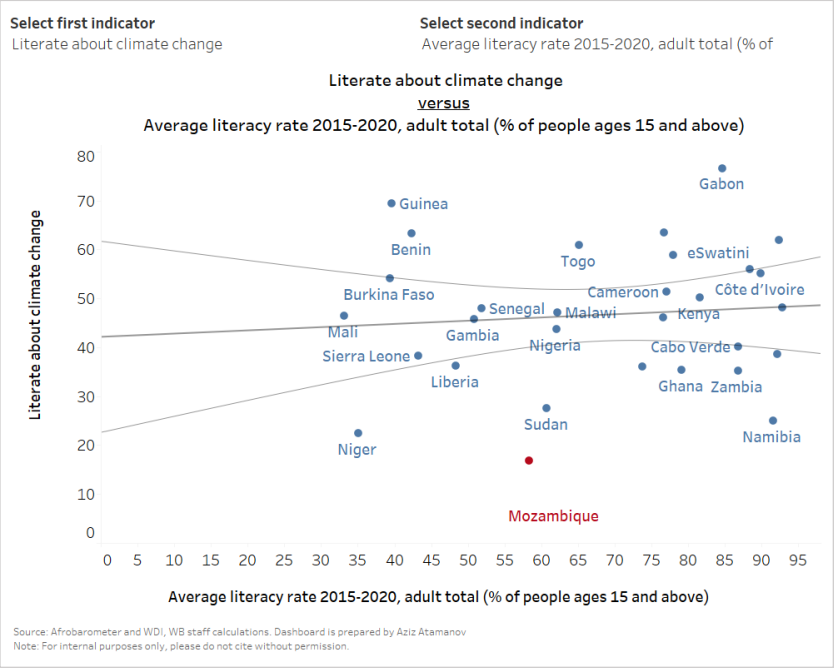
Figure 5.17: Share of respondents in Mozambique who think that climate conditions for agriculture got worse than 10 years previous, by province (2019)



Source: Afrobarometer 2019.

Mozambique has the region's lowest climate change literacy. Literacy in this instance refers to whether individuals have heard of climate change, know that climate change is associated with negative weather changes, and know that human activity is the main cause of climate change. It is also worth noting that climate change literacy is not correlated with overall literacy of population in the country, as shown in **Figure 5.18**.

Figure 5.18: Climate change literacy vs. literacy rate



Source: Afrobarometer 2019 and WDI, World Bank staff calculations.

Relatively low levels of climate change literacy combined with significant adverse effects on food production and broader consumption provide a somewhat dissonant picture of how Mozambique's population view increasing weather shocks. These impacts, however, are posed to increase.

Chapter 6 – Policy Considerations

While poverty in Mozambique remains structurally high, a series of both endogenous and exogenous shocks led to further significant increase in the 2015-20 period. The hidden debt crisis unleashed an endogenous shock that, as such, can be prevented or mitigated in the future through strengthened macroeconomic and fiscal governance. Cyclones, floods and droughts constitute exogenous shocks that are recurrently and increasingly affecting the country. However, the country can exert some control by strengthening adaptation and impact mitigation measures to reduce vulnerability. The COVID-19 pandemic's impact also represented an exogenous shock upon which the country had little control beyond relying on mitigation measures. Future preparedness for this type of pandemic needs to be broadly addressed by strengthening health systems and safety nets as well as the necessary digital infrastructure to dampen the impact on the education system and labor markets.

Given the importance of shocks in increasing poverty in Mozambique, the country needs to strengthen its focus on resilience. This section outlines several policy implications that emerge from the analysis presented in the preceding chapters while heavily drawing on sectoral work recently produced by the World Bank. The focus is placed on how to increase resilience to shocks while highlighting areas that have been covered at significant depth in the analysis and are of particular importance to the strengthening of equity conditions and accelerating poverty reduction. Some of the reforms and recommendations to enhance Mozambique's resilience to extreme shock events are summarized in the following areas:

6.1 Addressing vulnerability to environmental shocks

Mozambique is one of the countries in SSA most exposed and vulnerable to weather-related shocks. Over the last five years, Mozambique has experienced both droughts and several severe cyclones, most notably Idai and Kenneth in 2019. Therefore, as severe weather events become more frequent, it is likely that the economic and social consequences of climate change will increase without investments in preparedness and disaster risk management.

As shown in the latest Country Climate and Development Report (CCRD), Mozambique's high exposure and vulnerability to multidimensional shocks requires further strengthening of the country's policy framework for response, prevention, and resilience. The Government has made good progress in addressing climate and health shocks and has built strong foundations for resilience in the public infrastructure sector. This complements well its readiness to respond to emergencies with an ambitious set of Disaster Risk Management (DRM) measures. Notwithstanding this, the DRM system must be strengthened further to improve the coordination of disaster risk prevention and management, emergency response, and post-disaster reconstruction. Looking forward, it is critical that the National Institute for Disaster Management (INGD) ensures transparency, accountability and predictability regarding emergency response activities financed by the Disaster Management Fund (DMF). The DRM system also needs to further strengthen institutional capacity and effectiveness. Specific regulations for preparedness, early warning, emergency response, and post-disaster recovery are also needed, including for slow onset events such as droughts.

Mozambique needs to fully mainstream climate change into its national development strategy. This means building a more resilient society while enabling the economy to adjust to the challenges and opportunities of global decarbonization. Better prepared institutions can reduce the costs of investments

in resilience and enable the productive and inclusive use of natural gas revenues. Climate sensitive public investment management, robust fiscal and sovereign wealth fund frameworks, efficiency enhancing sector polices, and better management of the country's natural capital are some of the policies that would help make building resilience more affordable while laying the foundations for economic diversification.

Chapter 5 on Environmental Shocks highlights how fast-onset weather events like cyclones can have a significant impact on the development of central and northern Mozambique, particularly on the larger towns of Beira and Nampula. In the absence of strong ex-ante policies to improve adaptation and mitigation and ex-post policies to support recovery, private incentives to invest in these regions may decrease. As a result, the slower recovery of Beira and Nampula, which were significantly impacted by extreme weather events, may hinder overall growth and industrialization in the region. Smaller towns, which may be better equipped to rebound more quickly, may experience a faster recovery, but this could be more a reflection of reconstruction efforts rather than a return to normal. Thus, there is a significant need for stronger policy responses, particularly for regional hubs like Beira and Nampula, to secure these larger towns against extreme weather events and incentivize investment and industrialization. This is crucial to ensure the entire region's growth and development.

Agriculture, the primary source of income for 85 percent of rural households, is highly exposed to various forms of extreme weather, and households often cope by depleting their assets – including reduction of livestock and consumption and taking children out of school. Three mechanisms can help increase resilience in the agricultural sector: 1) Promoting risk transfer mechanisms such as micro-level insurance bundled with other risk-reducing products; 2) Increasing the availability and use of local weather information among smallholders to better manage risks. This could be achieved, for instance, using radios and ICT technologies; 3) Expand coverage of formal safety nets, including adaptive schemes to avoid costly risk-averse behaviors. This includes expanding Mozambique's existing cash transfer program for low-income families, especially in the aftermath of a disaster.

6.2 Addressing macroeconomic shocks and structural challenges

Better Human Capital results

As shown in the education section in Chapter 1 and confirmed by the Human Opportunity Index (HOI) in Chapter 2, Mozambique has a long way to go to providing universal access to basic opportunities – an aspirational goal – but progress has been made in some areas and could provide lessons for other sectors. Although Mozambique has made progress in reducing inequality as measured by the Gini index, there is still a great deal to be done in order to address inequality of opportunities among children. The results from this analysis show that coverage rates for most opportunities are improving, though these gains have not been ubiquitous – there have been only marginal gains in some areas and decreases in others. Therefore, better understanding of the factors involved that enabled significant improvement in some areas, such as enrollment in school, starting school on time, sleeping under a mosquito net, and reducing stunted growth, could potentially shed light on what constraints need to be overcome for other opportunities to achieve similar progress.

The analysis in section 1.8 on trends in non-monetary dimensions of wellbeing shows that educational inequality is still high in Mozambique. The country needs to reform the education financing framework to ensure that it is predominantly based on spending per student. This can increase regional equity,

giving priority to disadvantaged groups. Improving equity in the results of the education sector, both from a regional and socioeconomic perspective, depends critically on increasing equity in spending and improving the conditions for disadvantaged groups to progress to higher levels of education. Specific measures to consider include: a) Approving legislation that reforms the national education financing framework to improve regional equity in primary, secondary and early childhood education, associating the allocation of funds for schools based on enrollment levels by province and district, and applying higher weights for disadvantaged students/regions; b) Accelerate the implementation of the decentralization process accompanied by results-based accountability (with a focus on education outcomes) and capacity building for the subnational level entities; c) Ensure adequate budget allocation for technical and professional education, and consider financing mechanisms through private sector collaborations; d) Consolidate and establish new financing mechanisms in tertiary education, such as the institutionalization of competitive financing mechanisms and the use of performance-based contracts to shift the funding gradually from input financing towards performance or project-based financing; and e) Create financial incentives for provinces and districts aimed at improving education outcomes, coupled with technical support to achieve these outcomes.

Intergenerational mobility is critical for developing effective policies to reduce inequality and promote economic prosperity. Better educated youths will contribute to reducing income inequality and facilitate social mobility. An important enabler for this is the development of higher-level skills through quality post-secondary education and training in priority areas relevant to future economic development. This should be coupled with policies to incentivize the creation of jobs linked to modern productive systems in areas such as industrial maintenance, agriculture, ICT, and construction, among other priority sectors. Women's access to scholarship and internship programs should be prioritized to expand female enrollment in TVET and Higher Education.

Expanding infrastructure and narrowing gaps

Poor connectivity limits economic opportunities for the poorest regions in Mozambique. The growth of cities is central to improving agricultural output, and connectivity to cities and towns is a channel for growth in rural areas. Small cities connect farmers to input and output markets, while medium-sized cities serve as logistical and transport hubs and host larger consumer markets. Improving the business climate and supporting small and medium-sized enterprises (SMEs) could help maximize the benefits of these rural-urban economic corridors and enhance the developmental impact of capital-intensive megaprojects in extractives.

Transportation networks and logistical capacity are key to connecting rural areas to urban centers and export points. Expanding transport corridors will be essential to promoting productive farming practices, enhancing smallholder participation in markets, and increasing their incomes. Given fiscal and absorptive constraints, investments should prioritize selected road types (feeder roads, rehabilitation of bridges and culverts) in areas with strong potential for agricultural productivity, especially in the northern and central regions.

Public investment, budget allocation and revenue mobilization will need to take spatial disparities into account if they are to succeed in reversing the growing gaps in access to public services. For example, public investment and access to infrastructure needs to be balanced across regions. It is essential to establish specific fiscal targets to reach underserved areas in the five-year plan (*Plano Quinquenal do Governo*). Budget allocation formulas could be updated to take access gaps into account.

Mozambique needs massive infrastructure investment to enhance private sector competitiveness and support job creation, while addressing the major access needs of the population. Investing in roads and transportation logistics, digital connectivity, and energy are key to enabling faster growth while strengthening rural-urban linkages; this will allow for the positive development of secondary cities. Such investment in infrastructure will include: 1. support in accessing electricity and water services; 2. improving the quality of strategic roads; and 3. support for large urban centers while gradually extending this to fast-growing cities, including in the northern region.

Strategic support is needed in secondary fast-growing cities to avoid the expansion of under-serviced peri-urban areas. Cities are expanding informally in the context of poorly managed urbanization that contributes to deteriorating living conditions and public goods in some cities. The influx of internally displaced people (IDPs), particularly in northern cities, has put enormous pressure on those with an already limited capacity to manage urban growth. Mozambique needs to invest in transformative urban infrastructure, particularly urban corridors which will connect the more established areas where jobs are located with the fast-expanding peri-urban areas where poor households have their homes. Support should focus on helping low-capacity, fast-growing cities to roll out land-use planning instruments incorporating mapping of climate risk and sensitive land use. They should also undertake systematic land tenure and modernize the land cadastre.

To tap into the full potential of digital transformation it will be necessary to tackle connectivity gaps and digital adoption gaps. Without specific interventions targeting remote areas, the marginalized, and women, the benefits of infrastructure deployment could further entrench inequalities. Furthermore, improved digital connectivity should be paired with improvements in digital skills and literacy, the coverage of digital identity schemes, access to digital payments and other financial services, as well as digital support to start-ups and existing businesses.

6.3 Addressing pandemics

The impact of COVID-19 on the urban population and groups of people that are typically not covered under social protection has highlighted the need to develop an adaptive and shock-responsive social protection system with effective targeting and coverage. Mozambique's recent move toward digitization of payments will increase sector efficiency, transparency, and accountability. Strengthening the country's social protection system so that programs such as the Basic Social Subsidy Program (Programa de Subsídio Social Básico), (PSSB), and the Direct Social Action Program (Programa de Apoio Social Directo), (PASD), have better targeting and coverage of the poor is key to offseting the impoverishment caused by indirect taxes (the country's main source of tax revenue).

A key aspect to improving the distributional impacts of the social protection system in Mozambique is the existence of a systematized targeting criterion so that programs are better equipped to reach poor households. Moreover, improving targeting is important because expanding coverage with weak targeting could lead to inefficiencies of the social protection budget (e.g., leakage). Ongoing reforms aimed at modernizing the social protection management information system and payment system need to continue to reach the poor in a more efficient and effective manner. After expanding coverage of social protection (SP) programs, the global generosity of transfers should be assessed, so that they are large enough to offset the effects of taxes paid by poor households.

As shown by the Fiscal Incidence Analysis (Chapter 4), Mozambique is a regional example of a country where the redistributive role of the fiscal system still needs to be improved. The government has triggered the expansion of social protection programs in response to various shocks including natural disasters, and most recently in response to COVID-19 when the coverage of social protection programs was significantly expanded. The latter included the provision of top-up transfers to current beneficiaries of the PSSB and PASP programs (vertical expansion) in addition to new emergency beneficiaries (horizontal expansion). However, these are temporary policies in response to shocks, and the expansion of regular social protection programs remains very limited. In this sense, the structural challenges of coverage and generosity prevail in Mozambique's social protection system.

To maximize impacts, it is critical to ensure efficient coverage of social protection programs. As of now, only the Productive Social Action Program (PASP) makes use of the proxy-means test score to identify and target poor households, and more evidence is needed on the efficiency of the system and tools in general to inform a progressive coverage strategy. Strengthening the country's social protection system so that social protections expand their coverage and generosity (based on solid targeting methods) is key to offsetting the impoverishing effects of indirect taxes (the country's main source of tax revenue) among the vulnerable and poor.

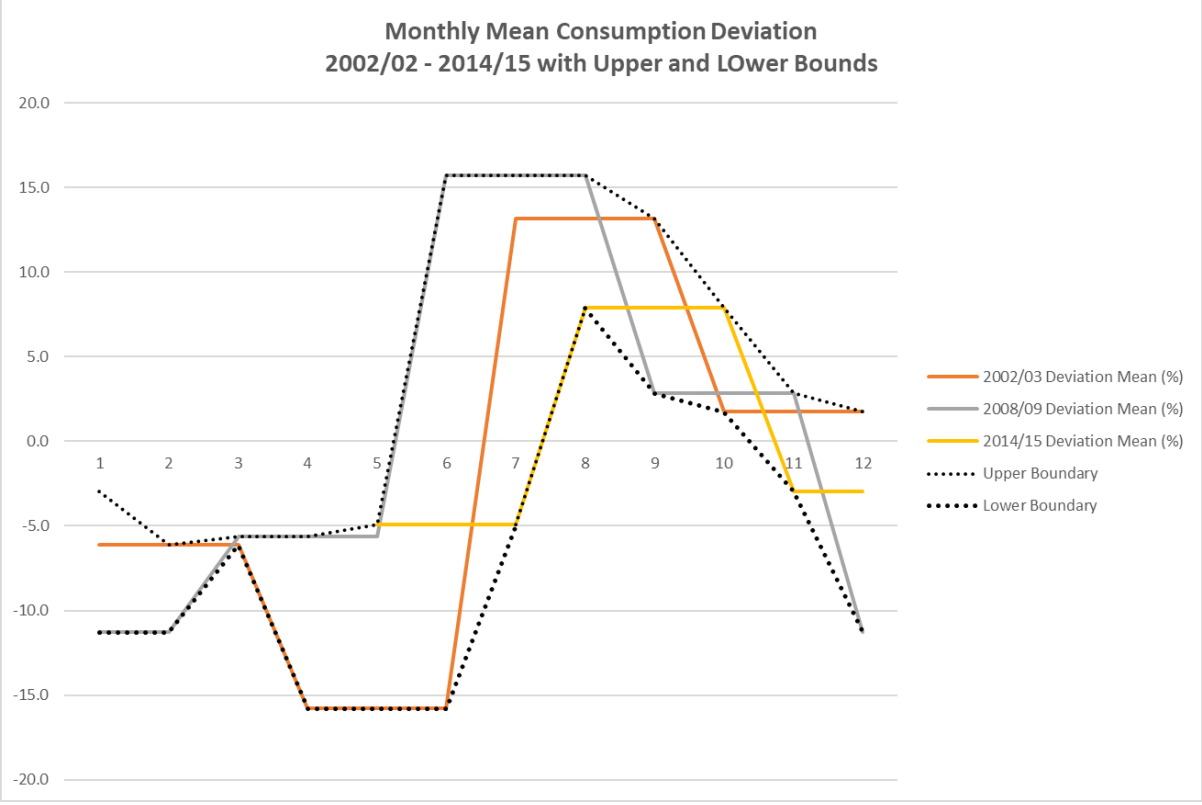
Annex 1: Poverty

COVID-19 impact counterfactual model

Household budget surveys in Mozambique are fielded over a whole year (not necessarily following a calendar year) and it is composed of four rounds of data collection in subsequent quarters. Distributing data collection across the year is primarily done to account for seasonality in consumption. People whose consumption and income heavily depend on their own food production, as is the case for most of the Mozambican population, particularly in rural areas, will typically defer some expenditures to until after harvest. Better off urban populations show higher expenditures around annual holidays at the end of the calendar year.

As it happens, these seasonality effects on consumption are well captured in past surveys. Each previous survey allows estimating a national consumption estimate per quarter. Matching those quarterly datapoints with the calendar months, regardless of the order of the survey quarters, provides a clear seasonal pattern in each of the three surveys preceding the IOF2019/20. Displaying their deviation from the survey mean consumption all together, it is possible to derive upper and lower bounds of the historical monthly national average consumption deviation in survey years (**Figure 1a**).

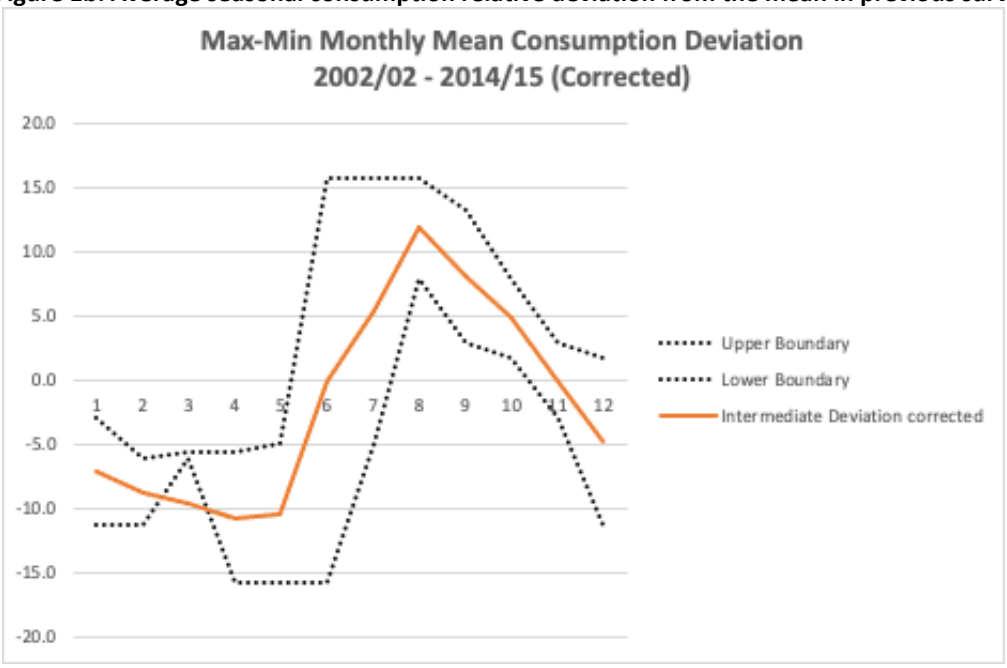
Figure 1a: Seasonal consumption relative deviation from the mean in previous surveys (%)



Source: Own calculations based on IOF2019/20.

The average of the bound estimates per month[23] provide a historical average consumption deviation pattern accounting for seasonality (**Figure 1b**).

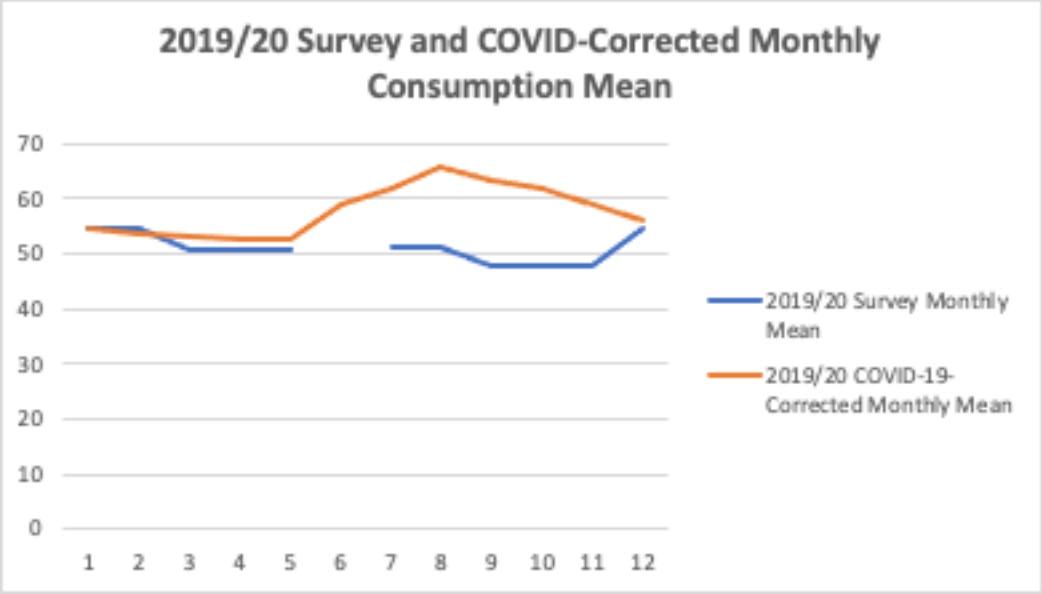
Figure 1b: Average seasonal consumption relative deviation from the mean in previous surveys (%)



Source: Own calculations based on IOF2019/20.

It is then possible to build an approximation to the counterfactual of both monthly seasonal consumption pattern and its survey average by imposing this pattern on the last survey (2019/20). This provides an estimate of what 2019/20 survey's average consumption would have been, had it not been for the impact of COVID-19,[24] based on historical seasonal consumption records from three surveys (**Figure 1c**).

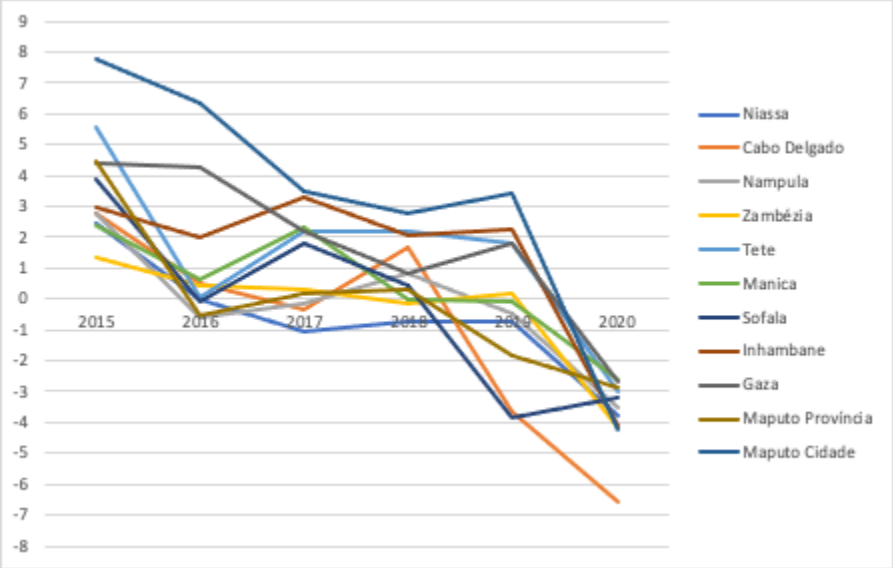
Figure 1c: Average seasonal consumption relative deviation from the mean in previous surveys (%)



Source: Own calculations based on IOF2019/20.

Per capita GDP growth per province, 2015-20 (%)

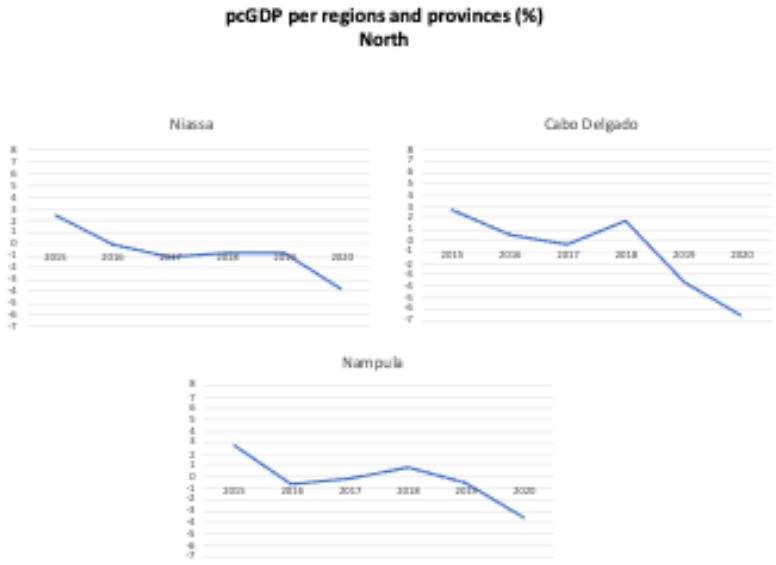
Figure A: Per capita GDP growth per province, 2015-20 (%)



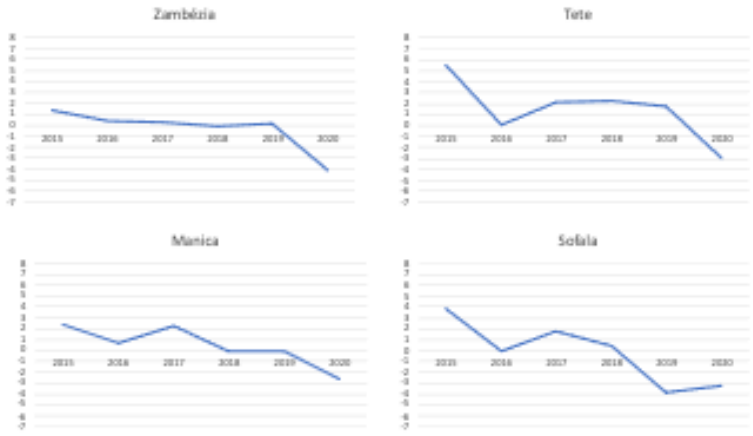
Source: INE

Per capita GDP growth disaggregated by province, 2015-20 (%)

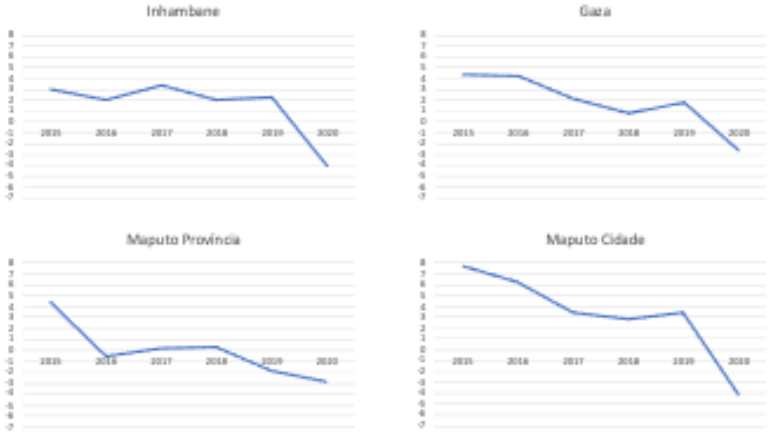
Figure B: Per capita GDP growth disaggregated by province, 2015-20 (%)



pcGDP per regions and provinces (%)
Center



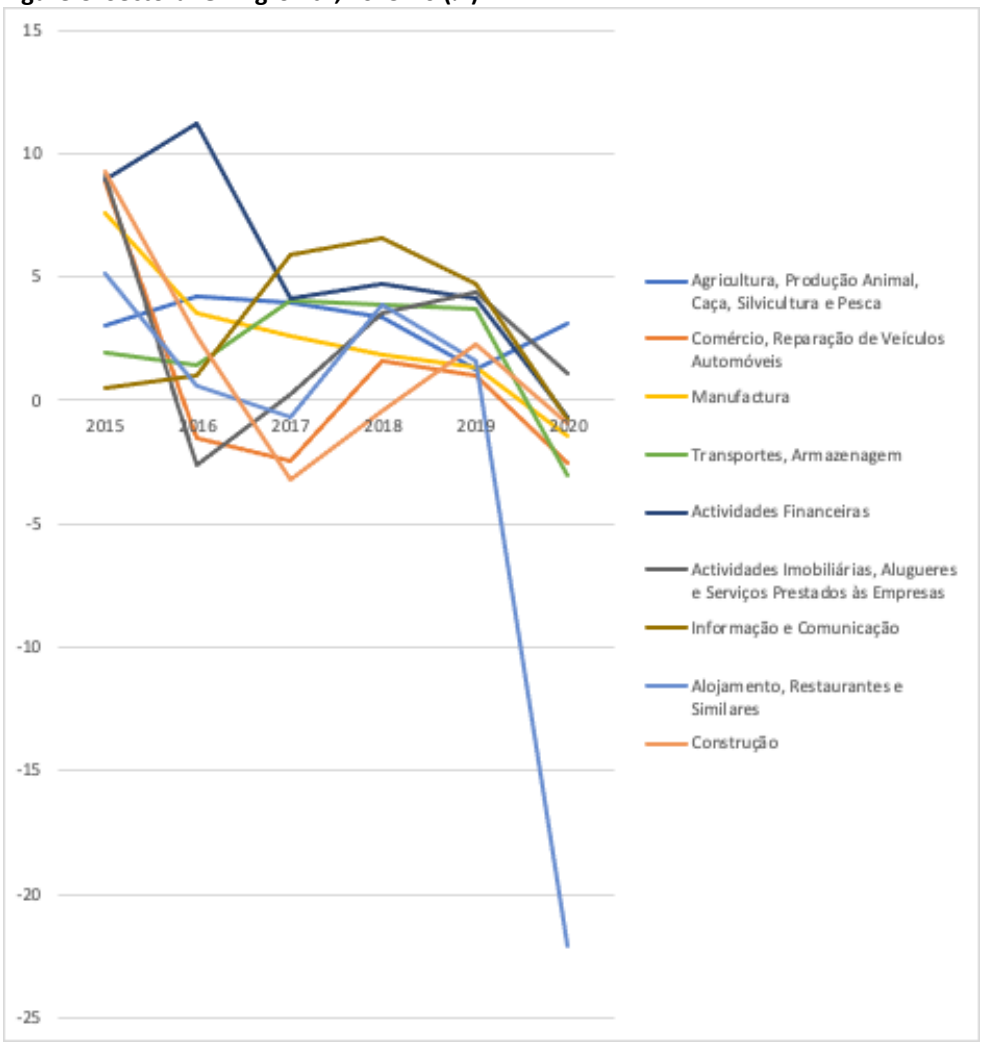
pcGDP per regions and provinces (%)
South



Source: INE

Sectoral GDP growth, 2015-20 (%)

Figure C: Sectoral GDP growth, 2015-20 (%)



Source: INE

World Bank Poverty Measurement 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 cross-sectional surveys –except for the IOF 2014/15– conducted by the National Institute of Statistics of Mozambique (INE). There have been five rounds so far – 1996/97, 2002/03, 2008/09, 2014/15 and 2019/20. All IOFs collect data on household consumption, demographics (including education and health), asset ownership, housing, etc. Even though small changes in the questionnaires mean that the rounds 2014/15 and 2019/20 are not 100% comparable.

For the most recent survey, the Inquérito sobre Orçamento Familiar (IOF 2019/20), the National Statistical Institute (Instituto Nacional de Estatística, INE) began conducting data collection in November 2019. The fieldwork lasted 13 months. The survey's sample was selected from the 2017 Census and is designed to be representative at national, regional (north, center and south) and provincial levels, as well as in rural and urban areas nationally. Data was collected from 13,297 households in four quarters during the fieldwork. 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,[108] 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. Following international standard consumption is considered a more reliable indicator of welfare than income.[109] 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).

To ensure that only the food consumed over the period of a week is considered, 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 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 travel. 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

[108] IOF 2019/20 included a two-week diary but results are very similar to using only one week. In this Poverty Assessment, one week has been used for greater comparability with previous surveys.

[109] First, consumption is typically less fluctuating than income and provides 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 due to drastic changes in revenues during the year.

and services. A commonly used predicted rent from a hedonic model for urban households using dwelling characteristics as covariates was not used in this case because of very low reported rentals, particularly in rural areas, and for consistency with past poverty estimations. For that reason, and because we wanted to be consistent with the previous round of the survey, 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. In the 2014/15 round, both hedonic regression and subjective reporting provided similar results. That did not happen in this round (2019/20). For consistency purposes self-reporting was used, but this decision might need to be reviewed in the future.

An appropriate measure of the 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 π_t be, respectively, the nominal interest rate and the inflation rate and δ_d the depreciation rate of item δ_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 2019/20, 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) .

Given $\bar{v}_{tdp}^n$ the median price of a new durable good d in province p at time t, and δ_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):

$$TD = \sum_{d=1}^{D} S_{td}^h v_{td}(0.103 - 0.68 + \delta_d)$$

Step 2 – 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 inflation in 2020 was only 3.4 percent no temporal price adjustment has been made to the consumption aggregate.

- *Spatial price adjustment*. It is necessary to deflate the welfare aggregate spatially to adjust for the fact that households living in different regions faces different prices. This is done constructing a Paasche index on food prices for each region 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 3 – Poverty line. For the purpose of full comparability with previous poverty figures for 2015, this report simply updates the poverty rate by general inflation over the 2015-20 period, resulting in a poverty line of 40.0 meticais in 2020 prices.

Alternative options to this choice would include, for instance, using a different CPI (Comparative Price Index) or re-estimating the poverty line that the World Bank produced for the 2015 figures (World Bank, 2018). Using food's CPI over the 2015-20 period (75 percent) instead of general CPI (55 percent) leads to an additional 4 percentage points increase in poverty. However, considering that 60 percent of households' food consumption nationally is self-produced, and up to XX percent in rural areas where poverty is concentrated, the impact of increased food prices on self-subsistence farmers is not straightforward as their produce accrued a higher market value. Also, the poverty line could have been re-estimated from scratch using the same methodology as last time around. This has not been done to preserve maximum comparability across time given the short period between surveys and the uncertain impact of food inflation discussed above.

The 2015 World Bank national poverty line was defined using the daily per capita consumption aggregate after the temporal and spatial adjustments. To construct the poverty line, World Bank (2018) 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.[110] The food poverty line is the product of the two as follows:

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

[110] 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% (>= 16956.22 Kcal). Those observations are treated as outliers.

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.[111] 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	18.8 Metical
Non-food poverty line	7.0 Metical
Overall poverty line	25.8 Metical

Source: World Bank (2018) using IOF 2014/15

To maintain the national poverty line constant in real terms, we adjust the poverty line from the 2014-15 survey, which was 25.85 Meticais per person per day, based on the average inflation rate between the two survey periods. This adjustment is done using the national monthly Consumer Price Index (CPI). The 2014/2015 Household Budget Survey (IOF) was conducted from August 2014 to July 2015, during which the average CPI was 81.65, as reported by the National Statistics Institute (INE). The 2019/2020 IOF was conducted from December 2019 to November 2020, with an average CPI of 126.44. The inflation rate between these two periods was 54.85 percent. Therefore, the poverty line for the 2019/2020 survey period, adjusted to 2020 currency, is 40.03 Meticais per person per day.

[111] More specifically, the food expenditure of these households is between 0.9-1.1 times of the food poverty line.

Annex 2: Inequality

Consumption shares and cumulative shares by ventile (2014/15-2019/20)

Ventiles	2014/15 share	2019/20 share	2015 cumulative share	2020 cumulative share
1	0.23	0.16	0.006	0.006
2	0.38	0.27	0.016	0.016
3	0.47	0.33	0.028	0.029
4	0.54	0.39	0.041	0.045
5	0.61	0.44	0.057	0.062
6	0.68	0.50	0.074	0.081
7	0.75	0.55	0.094	0.103
8	0.82	0.61	0.115	0.126
9	0.90	0.68	0.138	0.153
10	0.99	0.75	0.163	0.182
11	1.09	0.82	0.191	0.213
12	1.20	0.90	0.222	0.248
13	1.33	1.00	0.256	0.287
14	1.49	1.11	0.295	0.330
15	1.69	1.24	0.338	0.378
16	1.95	1.42	0.388	0.433
17	2.33	1.68	0.448	0.498
18	2.93	2.10	0.523	0.580
19	4.15	2.90	0.630	0.692
20	14.41	7.94	1.000	1.000

Source: Own estimations based on IOF2014/15 and IOF2019/20.

Annex 3: Labor Market

Oaxaca-Blinder Decomposition of monthly salaries across gender

```
Blinder-Oaxaca decomposition                    Number of obs     =      5,062
                                                Model             =     linear
Group 1: gender = 1                             N of obs 1        =      3,581
Group 2: gender = 2                             N of obs 2        =      1,481

   endowments: (X1 - X2) * b2
 coefficients: X2 * (b1 - b2)
  interaction: (X1 - X2) * (b1 - b2)
```

lnwage	Coefficient	Std. err.	z	P>|z|	[95% conf.	interval]
overall						
group_1	8.819977	.01917	460.09	0.000	8.782404	8.857549
group_2	8.705742	.0280072	310.84	0.000	8.650848	8.760635
difference	.1142352	.0339395	3.37	0.001	.0477149	.1807554
endowments	-.1107925	.0279691	-3.96	0.000	-.1656109	-.0559741
coefficients	.1995096	.0283175	7.05	0.000	.1440084	.2550109
interaction	.0255181	.0200404	1.27	0.203	-.0137604	.0647965
endowments						
years_education	-.1451405	.0218098	-6.65	0.000	-.1878869	-.1023942
experience	.0508724	.0097638	5.21	0.000	.0317358	.070009
Sectores_Activ2	.0895203	.0212035	4.22	0.000	.0479623	.1310784
Sectores_Activ3	-.0983269	.0207259	-4.74	0.000	-.138949	-.0577048
location2	-.0077179	.0057516	-1.34	0.180	-.0189909	.003555
coefficients						
years_education	-.0942397	.0719725	-1.31	0.190	-.2353031	.0468238
experience	-.0427006	.0461675	-0.92	0.355	-.1331873	.047786
Sectores_Activ2	-.0193261	.0071365	-2.71	0.007	-.0333133	-.0053388
Sectores_Activ3	-.3483451	.0959099	-3.63	0.000	-.536325	-.1603652
location2	.0035126	.013742	0.26	0.798	-.0234212	.0304463
_cons	.7006086	.1315913	5.32	0.000	.4426944	.9585228
interaction						
years_education	.0085974	.0066845	1.29	0.198	-.0045041	.0216988
experience	-.004831	.0052878	-0.91	0.361	-.015195	.005533
Sectores_Activ2	-.0647568	.0229521	-2.82	0.005	-.1097422	-.0197714
Sectores_Activ3	.0847734	.0237595	3.57	0.000	.0382057	.1313412
location2	.001735	.006791	0.26	0.798	-.011575	.0150451

Annex 4: The Fiscal Incidence Analysis and Transfers

Mozambique's FIA 2023

Section 4.1 presents results of the 2020 Fiscal Incidence Analysis[63] for Mozambique based on the IOF 2020 household socioeconomic survey and fiscal administrative data. The fiscal incidence analysis simulates the main taxes and transfers of the country's fiscal system during 2020, thus providing evidence on the distributional impacts of the government's revenue and expenditure policies on households' welfare during the first year of the pandemic. As the Government of Mozambique has been considering additional public finance consolidation measures after COVID-19, the fiscal incidence model built for this study also serves as a platform to simulate the ex-ante distributional impacts that potential fiscal reforms could have on households' welfare.

The Fiscal Incidence Analysis in Mozambique for 2020 modelled the following taxes and transfers[64][65], following different allocation techniques[66]:

a. Direct taxes: personal income tax on five income categories, namely employment income, self-employed income, investment, property income and other income;
b. Direct transfers: the Basic Social Subsidy Program (PSSB) and the Productive Social Action Program (PASP), including the additional top-up COVID transfer that existing beneficiary households from these programs received in 2020[67];
c. Indirect taxes: custom duties, Value Added Tax, excises, and fuel tax;

In-kind benefits from public health and public education services. One of the limitations of the current fiscal incidence model is that the number of beneficiaries of the PASP program is underreported in the IOF 2020 survey[68], so its poverty-reduction impacts presented herein are an underestimation[69]. The overall impact of PASP on the poverty rate, however, is not expected to be very large because the PSSB program (well-covered in the current model[70]) provides a larger share of government's direct transfers relative to PASP (64 percent vs. 18 percent, respectively). In terms of magnitudes, the PSSB's executed budget was equivalent to 0.5 percent of GDP in 2020, about five times higher than the PASP (0.1 percent of GDP). [71]

Average transfers (in MZN) by province

			Pension[1]	Non-profit institutions[2]	Relatives living outside[2]	Relatives working abroad[2]	Other transfers
Cabo Delgado	All	Non-Poor	2,373	1,066	1,399	12,697	1,462
		Poor	2,295	1,791	806	342	903
	Urban	Non-Poor	1,247	3,042	1,893	6,588	1,305
		Poor	547	2,577	977	710	746
	Rural	Non-Poor	2,525	668	1,202	12,873	1,598
		Poor	3,292	1,103	764	175	979
Gaza	All	Non-Poor	2,785	413	2,673	6,541	5,163
		Poor	2,146	2,190	1,922	4,369	2,152
	Urban	Non-Poor	3,297	438	2,593	7,324	4,492
		Poor	2,279	533	1,843	5,393	2,498
	Rural	Non-Poor	1,763	398	2,767	5,965	5,922
		Poor	2,052	2,355	1,974	3,882	1,875
Inhambane	All	Non-Poor	3,979	1,537	2,165	3,934	2,993
		Poor	2,040	1,269	1,293	3,541	619
	Urban	Non-Poor	3,921	2,783	2,615	3,776	4,975
		Poor	1,421	495	1,482	3,962	823
	Rural	Non-Poor	4,048	592	1,806	3,989	1,516
		Poor	2,270	1,762	1,254	3,486	561
Manica	All	Non-Poor	2,152	930	1,553	64,947	3,943
		Poor	1,813	998	1,151	1,890	1,480
	Urban	Non-Poor	2,887	1,342	1,922	104,023	5,240
		Poor	1,784	1,592	1,305	472	1,405
	Rural	Non-Poor	663	768	1,072	5,377	1,425
		Poor	1,833	927	1,082	2,199	1,521
Maputo Cidade	Urban	Non-Poor	5,977	680	3,641	5,568	4,526
		Poor	2,259	1,051	1,712	3,360	1,374
Maputo Provincia	All	Non-Poor	6,323	704	3,923	4,287	4,428
		Poor	2,554	506	1,895	2,687	2,412
	Urban	Non-Poor	8,475	768	4,429	4,042	4,527
		Poor	2,363	614	1,842	2,517	2,132

	Rural	Non-Poor	3,532	206	2,136	5,080	4,202
		Poor	2,770	409	1,989	2,950	2,785
Nampula	All	Non-Poor	5,987	1,630	2,457	7,040	1,894
		Poor	1,683	199	755	323	482
	Urban	Non-Poor	5,987	220	3,346	9,646	2,311
		Poor	1,644	378	996	528	596
	Rural	Non-Poor		2,511	962	404	827
		Poor	1,701	81	625	214	360
Niassa	All	Non-Poor	1,533	573	2,500	25,840	2,699
		Poor	1,171	752	1,545	1,288	1,571
	Urban	Non-Poor	1,756	814	3,731	68,323	3,233
		Poor	1,585	83	1,662	2,558	2,148
	Rural	Non-Poor	1,411	468	1,876	3,985	2,319
		Poor	774	1,010	1,495	716	1,208
Sofala	All	Non-Poor	5,345	2,218	5,029	4,107	4,688
		Poor	2,323	2,669	1,228	3,193	1,966
	Urban	Non-Poor	5,345	2,192	6,394		5,289
		Poor	2,411	1,166	1,564	2,323	902
	Rural	Non-Poor		2,239	1,841	4,107	3,082
		Poor	2,101	3,237	994	3,627	2,876
Tete	All	Non-Poor	3,666	1,276	936	583	1,137
		Poor	1,353	1,590	586	389	744
	Urban	Non-Poor	6,422	1,597	1,554	297	1,125
		Poor		764	711	1,457	1,395
	Rural	Non-Poor	971	11	711	831	1,142
		Poor	1,353	1,672	556	275	568
Zambezia	All	Non-Poor	1,725	443	1,562	2,464	1,320
		Poor	1,119	431	968	784	1,190
	Urban	Non-Poor	3,208	801	2,533	1,634	1,686
		Poor	1,826	766	1,433	797	1,269
	Rural	Non-Poor	1,370	230	1,189	2,881	983
		Poor	921	397	896	782	1,174

Notes: Transfers in local currency at December 2021 prices. [1] Includes divorce, orphans/widowhood and alimony pension. [2] Includes transfer in-kind. Sample is restricted to households with a positive transfer

Annex 5: Weather shocks

Influence of Wet and Dry Spells on Vegetation Dynamics during the growing season

Table A1: The Influence of Wet Spells on Vegetation Dynamics during the growing season

	(1)	(2)	(3)	(4)	(5)	(6)
	Standardized Relative NDVI Growth					
	2004-2022	**2004-2013**	**2014-2022**	**2004-2022**	**2004-2013**	**2014-2022**
Lagged Wet Spell	-0.26***	-0.15***	-0.37***	-0.21***	-0.16***	-0.27***
	(-14.46)	(-5.37)	(-17.31)	(-9.76)	(-6.20)	(-9.81)
Constant	0.13***	-0.08***	0.33***	0.63***	0.51***	0.30***
	(14.62)	(-5.55)	(34.23)	(12.76)	(10.71)	(9.35)
Observations	9,600	4,992	4,608	9,600	4,992	4,608
R-squared	0.02	0.01	0.03	0.17	0.19	0.12
Year FE	No	No	No	Yes	Yes	Yes
Month FE	No	No	No	Yes	Yes	Yes
# Districts	128	128	128	128	128	128

*** p<0.01, ** p<0.05, * p<0.1. All regressions employ district fixed effects. Robust standard errors clustered at the district level. Notes: A wet spell is defined to be a 20-day period which has total rainfall that is greater than 1 Standard Deviation more than the average for that period. A month has a wet spell if the end of a wet spell occurs in that month. Standardized Relative NDVI Growth is the difference between actual monthly NDVI growth and the average NDVI growth for that month. Four months are included in these regressions: January, February, March, and April.

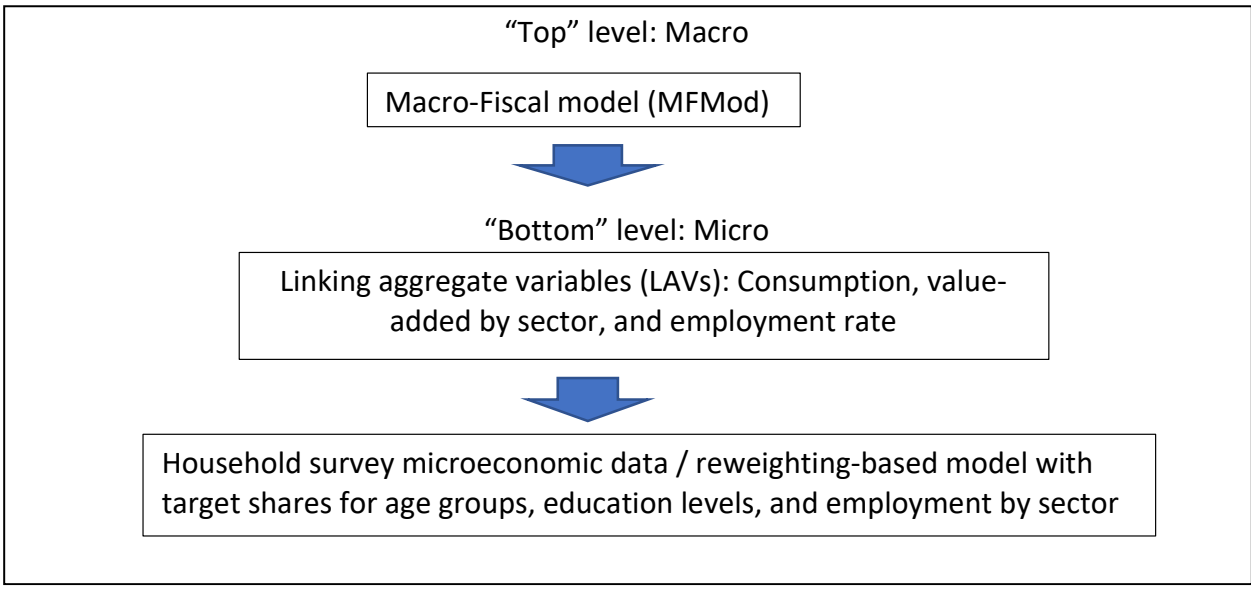
Table A2: The Influence of Dry Spells on Vegetation Dynamics during the growing season

	(1)	(2)	(3)	(4)	(5)	(6)
	Standardized Relative NDVI Growth					
	2004-2022	**2004-2013**	**2014-2022**	**2004-2022**	**2004-2013**	**2014-2022**
Dry Spell	-0.40***	-0.35***	-0.43***	-0.23***	-0.22***	-0.28***
	(-19.76)	(-12.13)	(-15.82)	(-10.15)	(-8.11)	(-8.44)
Constant	0.20***	0.04***	0.36***	0.42***	0.33***	0.28***
	(19.76)	(2.77)	(28.98)	(9.35)	(7.35)	(7.84)
Observations	9,728	5,120	4,608	9,728	5,120	4,608
R-squared	0.04	0.03	0.04	0.16	0.19	0.12
Year FE	No	No	No	Yes	Yes	Yes
Month FE	No	No	No	Yes	Yes	Yes
# Districts	128	128	128	128	128	128

*** p<0.01, ** p<0.05, * p<0.1. All regressions employ district fixed effects. Robust standard errors clustered at the district level. Notes: A dry spell is defined to be a 20-day period which has total rainfall that is less than -1 Standard Deviation than the average for that period. A month has a dry spell if the end of a dry spell occurs in that month.

Reweighting-based approach for top-down microsimulations with MFMod

The welfare effects of the different climate-related scenarios are estimated using a top-down macro-micro model.[112] At the top, we use the Macro-fiscal model (from here on, MFMod)[113], and at the bottom, we apply a reweighting-based approach to the most recent household survey data available for the country as shown below:[114]



MFMod generates a small number of macroeconomic time series that can be used as linking aggregate variables; among them, we use aggregate consumption, value-added by sector (agriculture, industry, and services), and the employment rate.

Our dataset contains consumption at the household level and employment sector but does not contain individual-level labor income. We split household consumption (without including transfers) among members using a regression between this variable and the average characteristics of the households (e.g., age, gender, education, sector, etc.).

Changes in poverty and inequality are determined by changes in weights and changes in real consumption per capita. We have generated a new set of weights for each simulated year and scenario using a procedure that aims to achieve specific population totals for selected variables subject to the constraint that the adjustments to the original weights are as small as possible.[115]

[112] There is a large body of literature about macro-micro models, which typically considers linking a Computable General Equilibrium model to a microsimulation model. See Ahmed and Donoghue (2007), Bourguignon and Bussolo (2013), Ruijven, O'Neill, and Chateau (2015), and Savard (2003) for reviews of the literature on these methods.

[113] See Burns, Campagne, Jooste, Stephan, and Bui (2019) and Burns, Jooste, and Schwerhoff (2021) for detailed descriptions of the model.

[114] Similar strategies have been applied in the literature to link a macroeconomic model to a microeconomic dataset. See for example, Buddelmeyer, Hérault, Kalb, and van Zijl de Jong (2012), Ferreira and Horridge (2006), and Hérault (2010).

[115] This problem is solved using the wentropy command developed by Paul Corral and Rodrigo Salcedo in Stata (available at https://github.com/pcorralrodas/wentropy), which is an improved version of the maxentropy command (see Wittenberg, 2010).

The target populations are threefold:

1. The total population subdivided by gender and age (10-year cohorts), derived from the U.N. population projections.
2. The total population subdivided by education level under the assumption that new young cohorts (20-30 years old) entering the population are as educated as the current 20–30-year-old group.
3. The total population subdivided by employment sector (number of individuals in a sector over total population).[116]

We have created the target value for the latter using the change in value-added by sector and an employment-to-value-added elasticity by sector.[117] After doing this, we have increased employment in the base year following growth in value-added, and we have scaled the ratio of total employment over population up or down to match the total employment numbers derived from MFMod.[118] After developing a new set of weights, we modified consumption per capita of working individuals by sector; this was done under the assumption that the wage bill would maintain a constant share of the value-added. We then derived the necessary change in "wages" given the change in employment previously computed such that the wage bill growth matches the value-added. After we modified consumption for working individuals, we re-centered the average consumption to its original mean (such that the ratio between average consumption of working individuals to non-working individuals remains constant) and we then computed household consumption per capita, including working and non-working individuals. After doing this, we applied the growth rate of consumption per capita from MFMod to the entire population. Finally, we have used the resulting simulated distribution and the new set of household weights for each year and scenario to compute distributional statistics such as poverty, the Gini coefficient, consumption by decile, poverty by region, among others.

[116] This follows the assumption made in Global Income Distribution Dynamic (GIDD). See Bussolo, De Hoyos, and Medvedev (2010) for a description of the model.

[117] We use an historical average for Sub-Saharan Africa taken from the literature (see Kapsos, 2005).

[118] We use the employment rate and the population total derived from the UN projections to estimate the number of individuals that are employed.

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