TANZANIA MAINLAND POVERTY ASSESSMENT

Tanzania's Path to Poverty Reduction and Pro-Poor Growth

PART 1

WORLD BANK GROUP

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Acknowledgement

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The analysis in the different volumes reflects the work of several researchers, including World Bank staff, academics, and consultants. The core team worked closely with each of the teams to ensure the consistency of the analytical methods, findings, and main messages across the different teams.

The data cleaning and construction of the consumption aggregate using HBS 2017/18 was prepared by Sasun Tsirunyan (Consultant). The spatial analysis of poverty was produced by David Newhouse (EA2PV) and Takaaki Masaki (EA1PV). Additional support for the analysis of climate effects and other hidden dimensions of poverty was provided by Jia Jun Lee (GENGE). The analysis of agricultural and nonfarm enterprises was produced with the support of Foluyinka Fakoya (Master student, Georgetown University) and Freeha Fatima (EA1PV). The analysis of poverty dynamics was produced by Wendy Karamba and Arden Finn (EA1PV). Additional analytical and research support was provided by David Garcés Urzainqui (PhD, Vrije Universiteit Amsterdam and Tinbergen Institute), Kristen Himelein (EEAPV), Jonathan Kastelic (DECPM) and Diana Winter (Master student, Georgetown University). The analysis of structural transformation and productivity gaps was produced by Marco Ranzani (EA1PV) with the support of Christiane Wissa (Sr. Statistician, University of Cairo). Firms performance was examined by Andre Marie Taptue (EA2PV) and the analysis of occupational choices benefitted from the support of Diana Winter. The analysis of economic choices by socially embedded individuals was prepared by Ingela Alger (Professor, Toulouse School of Economics).

The report was prepared in close collaboration with the Ministry of Finance and Planning and the National Bureau of Statistics of the United Republic of Tanzania. We express our sincere thanks to Dr. Albina Chuwa, Sylvia Meku, and the Household Budget Survey team from the National Bureau of Statistics for the important support, fruitful collaboration and critical feedback provided throughout the preparation of the report and for facilitating the exchanges.

The report benefited from several consultations and insights from groups of stakeholders, including senior officials from the Ministry of Finance and Planning, the Office of the Prime Minister, Tanzania Social Action Fund, REPOA, and development partners.

The report also benefited from comments and advice from Yutaka Yoshino (AFCE1), Nobuo Yoshida (EA1PV), Tomomi Tanaka (EA1PV), and Mohamed Ihsan Ajwad (HMNSP). The team gratefully acknowledges guidance from Bella Bird (Country Director AFCE1), Preeti Arora (Country Program Coordinator, AFCTZ), and Pierella Paci (Practice Manager EA1PV).

The team offers its thanks to Loy Nabeta (AFREC), Elizabeth Howton (ECREF), Kafu Kofi Tsikata (AFREC), Anne Grant (Editor) and Jaime F. Alvarez (GCSSV) for their precious help during the editing and communication process. The team also extends its thanks to Martin Buchara (EA1PV), Diana Mpoki Mwaipopo (AFCE1), Anahit Poghosian (EA1PV), Arlette Sourou (EA1PV), Anila Jane Mohan (AFCE1), Tsehaynesh Michael Seltan (EA1PV), and Santosh Kumar Sahoo (EA2PV) for their invaluable assistance during the preparation of the report.

Acronyms and Abbreviations

CPI	Consumer Price Index
DHS	Demographic and Health Survey
FDI	Foreign Direct Investment
GDP	Gross Domestic Product
HBS	Household Budget Survey
HE	Household Enterprises
HIV	Human Immunodeficiency Virus
MDI	Multidimensional Deprivation Index
NBS	National Bureau of Statistics
NFE	Nonfarm Enterprise
NGO	Nongovernmental Organization
NPS	National Panel Survey
pp	Percentage points
PSSN	Productive Social Safety Net
PPP	Purchasing Power Parity
ROSCA	Rotating Savings and Credit Association
SACCOS	Saving and Credit Cooperative Society
SSA	Sub-Saharan Africa
SDG	Sustainable Development Goal
TASAF	Tanzania Social Action Fund
TZS	Tanzanian shilling
UN	United Nations
WASH	Water, sanitation, and hygiene
WDI	World Development Indicators
WHO	World Health Organization

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Overview

Over the past decade Tanzania recorded remarkable economic growth and a persistent decline in poverty. The country's strategic location, its rich and diverse resources, its socio-political stability, and its economic reforms over the past four decades contributed to its economic success and serve as a foundation for further building up the economy. Continued government efforts to improve living conditions have resulted in a sustained increase in access to basic services and improvement in human capital outcomes (though from a low base), which helped to reduce poverty. After plateauing between 2001 and 2007, in 2018 the poverty rate fell from 34.4 to 26.4 percent.

However, Tanzania's success is not unmitigated. Poverty was not reduced as much as the population grew, resulting in an increase in the absolute number of poor people. In 2018, about14 million people lived below the national poverty line of TZS 49,320 per adult equivalent per month and about 26 million (about 49 percent of the population) lived below the $1.90 per person per day international poverty line. Vulnerability is also still high: For every four Tanzanians who moved out of poverty, three fell into it. A large number of nonpoor people living just above the poverty line are at risk of slipping below it. Beyond the persistent gaps between urban and rural areas, there are large disparities in the distribution of poverty across geographic regions. Poverty is highly concentrated in the western and lake zones, lowest in the eastern zones.

The reduction in poverty is also low in relation to Tanzania's remarkable economic growth. The growth elasticity of poverty indicates that a 10 percent increase in GDP growth per capita in Tanzania can be expected to reduce the proportion of the poor by about 4.5 percent—low compared to estimates for other developing countries. This is due to both the concentration of employment in slow-growing sectors and the dilatory transformation of the economy. Based on national accounts data, industry and services are growing much faster than agriculture, driving the growth and transformation of the economy. However, the fastest-growing subsectors each employ on average no more than 3 percent of the general population. They also tend to employ significantly more educated Tanzanians; their workers who have completed secondary and above exceed 60 percent on average. Data from household surveys indicate a transition of labor from low-productive agriculture to higher-productive industry and services, but the transition is significantly slower than the transformation suggested by national accounts data. Lack of education and productive resources hold people back from improving their economic standing by moving to more productive sectors. Only those equipped with more human capital and assets are able to benefit from the opportunities generated by economic growth; they increase their incomes and consumption much faster than the rest of the population. The result is more inequality. This pattern is partly driven by intergenerational transmission of poverty: Low parental education and economic status constrain the employment of their children, limit their upward mobility, and slow structural transformation. This contributes to perpetuate poverty and inequality across generations and deters efforts to eradicate poverty.

This report provides a comprehensive analysis of poverty and inequality in Tanzania and identifies some priority actions if poverty is to be reduced. The analysis is contained in two parts. The first part is based on the results of the Household Budget Surveys (HBSs) for 2017/18, 2007, and 2011/12; several rounds of National Panel Surveys (NPSs); and Demographic Health Survey (DHS) data; it also combines spatial information from the population census and other sources with HBS data to (1) provide a rigorous analysis of the evolution, profile, and determinants of poverty and inequality; (2) explore movements in and out of poverty and their drivers; and (3) examine the distribution of poverty and living conditions across the country at a detailed geographic level. The second part examines the pattern of structural transformation, firm profiles, job creation, and financial inclusion using the rebased GDP figures released in February 2019 plus data from the Statistical Business Register (SBR), Census of Industrial Production (CIP), national accounts, NPS, Integrated Labor Force Surveys (ILFS), and other sources.

Executive Summary

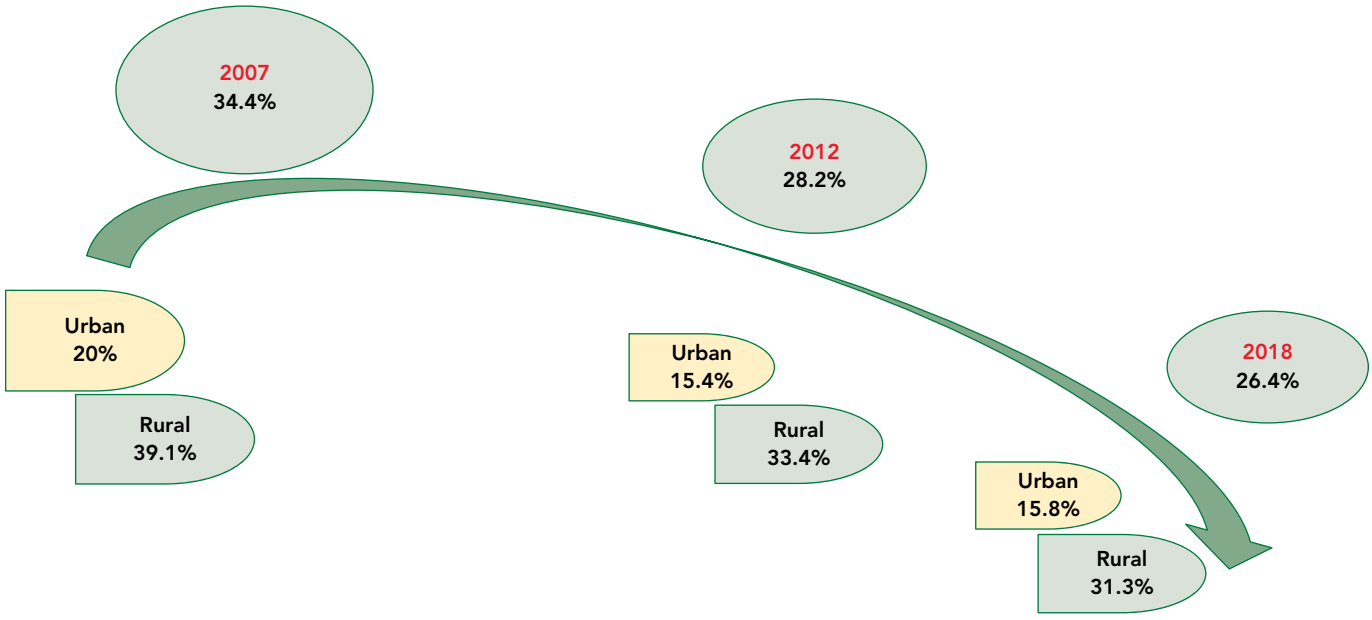
Poverty has been falling for a decade, but recently the pace has slowed.

Between 2007 and 2018 Tanzania's national poverty rate fell from 34.4 to 26.4 percent and extreme poverty fell from 12 to 8 percent. The figures on poverty trends are drawn from the results of the Household Budget Surveys (HBS) for 2007, 2011/12, and 2017/18. The poor are defined as those whose consumption is below the national poverty line and who therefore were not able to meet their basic consumption needs; the extreme poor were not able to afford enough food to meet the minimum nutritional requirements of 2,200 kilocalories (Kcal) per adult per day. The national basic needs poverty line for 2018 was TZS 49,320 per adult per month and the food poverty line was TZS 33,748. Poverty fell across the board but faster in rural areas, where poverty fell from 39.1 to 33.1 percent, compared to a decline from 20.0 to 15.8 percent in urban areas (Figure ES.1). Extreme poverty went down from 13.3 to 9.7 percent in rural areas and from 7.4 to 4.4 percent in urban areas.

Poverty declined faster between 2007 and 2012 than it has since. For 2007–12, poverty averaged a decline of 1 percentage point (pp) a year, but the total reduction since has been from 28.2 to 26.4 percent. In rural areas, between 2012 and 2018 poverty eased from 33.4 to 31.3 percent, while urban poverty stagnated at around 16 percent.

Poverty in urban areas outside Dar es Salaam did not really begin to fall until 2012. The reduction in urban poverty between 2007 and 2012 was driven entirely by a plunge in the proportion of poor people in Dar es Salaam, from 14 to 4 percent; in other urban areas the drop was marginal, from

FIGURE ES.1: Poverty Trends, National Poverty Line, 2007–18, Percent



Source: HBS 2007, 2011/12 and 2017/18.

22.7 to 21.5 percent. In contrast, between 2012 and 2018, urban areas outside the metropolitan city saw poverty fall to 19.2 percent, while in Dar es Salaam it rose to 8 percent. However, this increase is questionable: it may be driven by changes in the sampling method as survey-to-survey imputation results indicate a decline in poverty from 14 to 8 percent in 2007–12 and stagnation since then.

The depth and severity of poverty also eased. For 2007–18, the depth of poverty, which measures how far on average poor households are from the poverty line, decreased from 10 to 6 percent—in other words, a poor household would on average need TZS 3,058 per adult equivalent per month to escape poverty. Since poverty is deeper in rural areas, the amount needed there is TZS 3,650, far more than the TZS 1,726 per adult equivalent per month for poor households in urban areas. The low poverty severity index, which was more than halved, from 4.5 in 2007 to 2.1 in 2018, suggests that inequality between poor households is fairly low.

The robust record of poverty reduction is not affected by changes in survey methodology. Assessing the changes in poverty over time is subject to issues of comparability stemming from changes in survey design. The 2017/18 HBS introduced computer-assisted personal interviews (CAPI), lessened the length of the diary from 28 to 14 days, and redesigned the sample for regional representation. Analysis and robustness checks, using survey-to-survey imputation methods, showed that the new survey design had little impact on changes in poverty levels and that Tanzania's record of poverty reduction is solid.

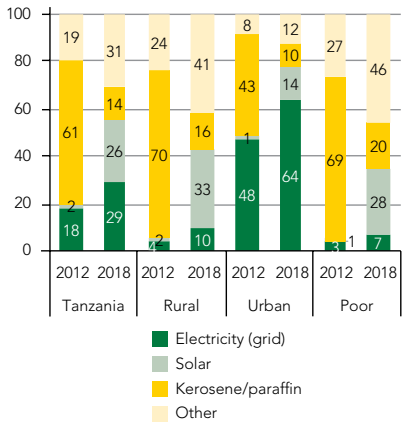
Gradual improvement in living conditions and human capital helped reduce poverty.

Access to electricity has progressed somewhat but electrification of the whole country is still insufficient, particularly in rural areas and for poor households. Although 29 percent of Tanzania's households have access to electricity, access is available to just 10 percent of rural and 7 percent of poor households (Figure ES.2). The country's strategy to diversify toward solar energy has started to pay off, particularly in rural areas, where 33 percent of households use solar energy for lighting compared to 14 percent in urban areas. Despite some improvements, about 45 percent of households still rely on such inefficient lighting sources as torches and kerosene. Use of efficient energy sources for cooking has also improved slightly, but over 80 percent of all households, and more than 90 percent of rural and poor households, continue to rely on firewood and charcoal.

More Tanzanians now have safe drinking water, particularly in urban areas, where the percentage of households with improved water sources has almost doubled. Piped water systems and household connections to them (mainly urban) contributed to the improvement (Figure ES.3). Water systems also helped to raise the percentage of households with access to piped water, in or outside the dwelling, which has greatly reduced the time and distance needed to access water. However, many households still lack access to a safe source of drinking water. In 2018, the drinking water of about 26 percent of households was unimproved and unsafe—for urban households the rate was 12 percent and for rural 34 percent.

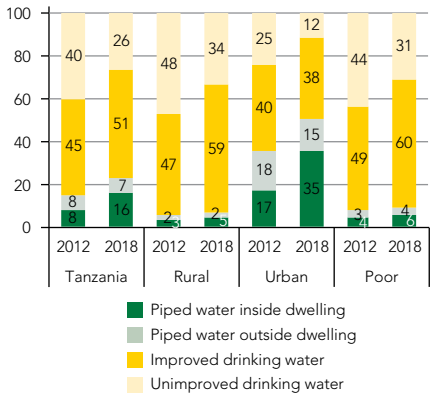
Access to basic and limited sanitation improved considerably in urban areas but is still highly problematic in rural areas. Between 2012 and 2018 the percentage of urban households with improved sanitation rose from 36 to 58 percent, but in rural areas from just 5 to a still low 11 percent (Figure ES.4). In 2018, 65 percent of Tanzanian

FIGURE ES.2: Source of Lighting, Percent



Source: HBS 2011/12 and 2017/18.

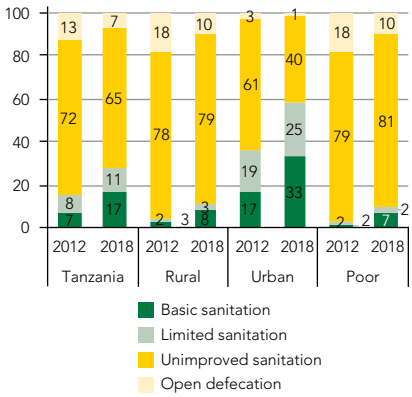
FIGURE ES.3: Access to Water, Percent



Source: HBS 2011/12 and 2017/18.

Note: Using WHO definitions, *improved water* includes public tap, protected dug well. *Unimproved water* includes unprotected sources and surface water.

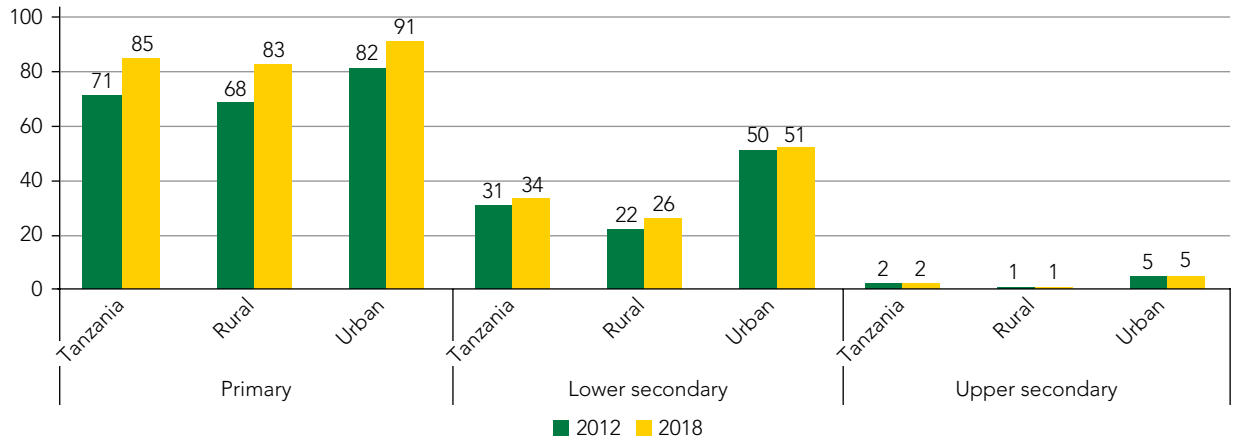
FIGURE ES.4: Access to Sanitation, Percent



Source: HBS 2011/12 and 2017/18.

Note: Using SDG definitions, *basic sanitation* includes non-shared flush toilets or improved pit latrines. *Limited sanitation* includes shared flush toilets or improved pit latrines.

FIGURE ES.5: Net Education enrollment rates 2012–18, Percent



Source: HBS 2011/12 and 2017/18.

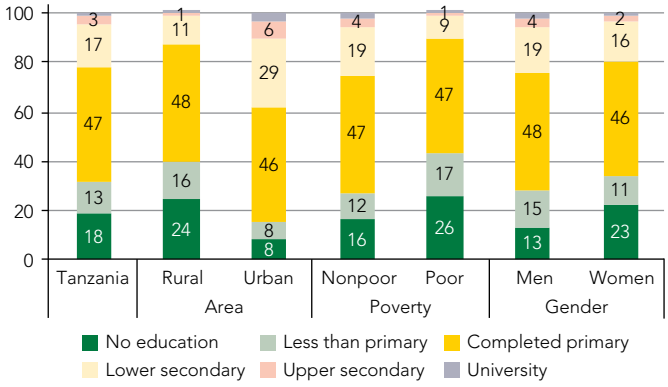
households used unimproved sanitation systems; in rural areas 10 percent of households still mainly use open defecation.

Better access to roads, markets, and public transportation also helped account for the rise in household living standards. Access to roads, public transportation, and markets improved throughout the country, but especially in rural areas and for poorer households. Access to cell phone signals, health centers, and to a lesser extent banks also expanded among the poor, especially in urban areas other than Dar es Salaam. However, improvements were from the low base and are still far from sufficient.

As ownership of modern assets has risen, ownership of traditional goods has declined. More Tanzanian households now have mobile phones, televisions, motorcycles, refrigerators, and to a lesser extent cars and laptops. Fewer now own more traditional items like radio sets or stoves.

Human development outcomes, particularly in education, are also better. Gross and net enrollment rates in primary schools went up slightly between 2012 and 2018 in both rural and urban areas. However, gross enrollment in both lower and upper secondary decreased, and net enrollment increased only marginally. The combination of stagnant or decreasing gross enrollment with increasing net enrollment does, however, suggest improvements in enrollment within the qualifying age categories and in fewer students repeating classes. Yet in 2018 the lower secondary enrollment rate was only 34 percent, and upper secondary enrollment barely reached 2 percent (Figure ES.5). While more adults aged 15 and older are now attaining lower secondary, the rate is still just

FIGURE ES.6: Educational Achievements of Adults 15+, 2018, Percent



Source: HBS 2017/18.

17 percent; the education profile has improved mostly for the younger generation (Figure ES.6). Overall, primary and lower secondary education increased for the poor in both urban and rural areas, but enrollments in upper-secondary and university education were significantly larger among the richest urban households. Increased education for women seems to have helped to slightly reduce the total fertility rate. Adult mortality and the probability of dying before age 50 have also fallen.

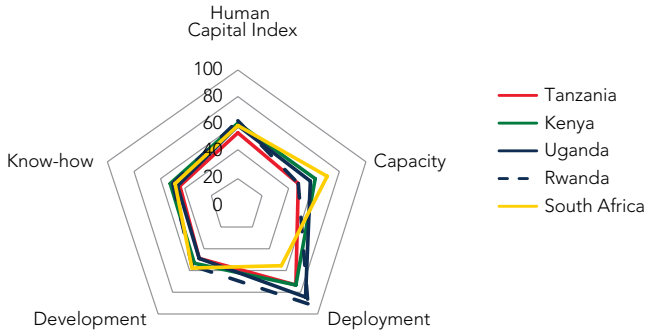
Despite these improvements, achievements in human capital are low. Tanzania was ranked 128th out of 157 countries in the 2018 World Bank Human Capital Project with a low Human Capital Index (HCI) score of 0.4. Low expected years of schooling is among the main limiting factors to the HCI. The World Economic Forum Global Human Capital Report

of 2017 also ranked Tanzania 106th of 130 countries in HCI. Tanzania trails countries with similar income levels, underperforming particularly in the know-how sub-index (109th) due to the very low share of high-skilled employment, limited availability of skilled employees, and low economic complexity (Figure ES.7).

Over the last decade anthropometric indicators for children under 5 got better, but undernutrition is still chronic, especially in rural areas. According to the 2015/16 DHS, almost 35 percent of Tanzanian children under 5 are stunted and 12 percent are severely stunted, indicating a cumulative growth deficit. The problem is particularly acute in rural areas, where about 38 percent of under-5 children are stunted (Figure ES.8).

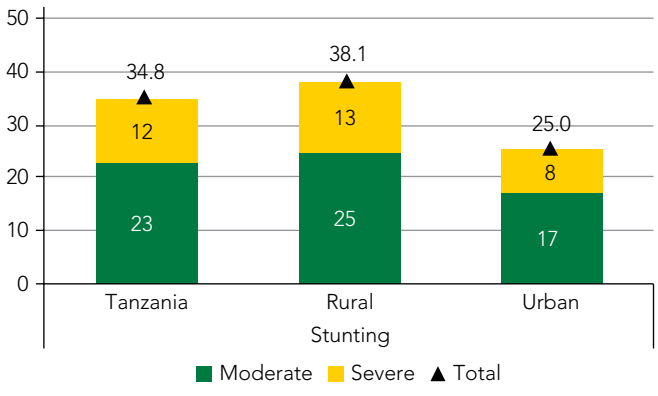
There has been a progressive shift to more productive work in services and industry, but the shift has mostly occurred in urban areas, and among better-off groups.

FIGURE ES.7: Human Capital Index



Source: Human Capital Report, 2017.

FIGURE ES.8: Under-5 Children Nutrition Deficit, Percent

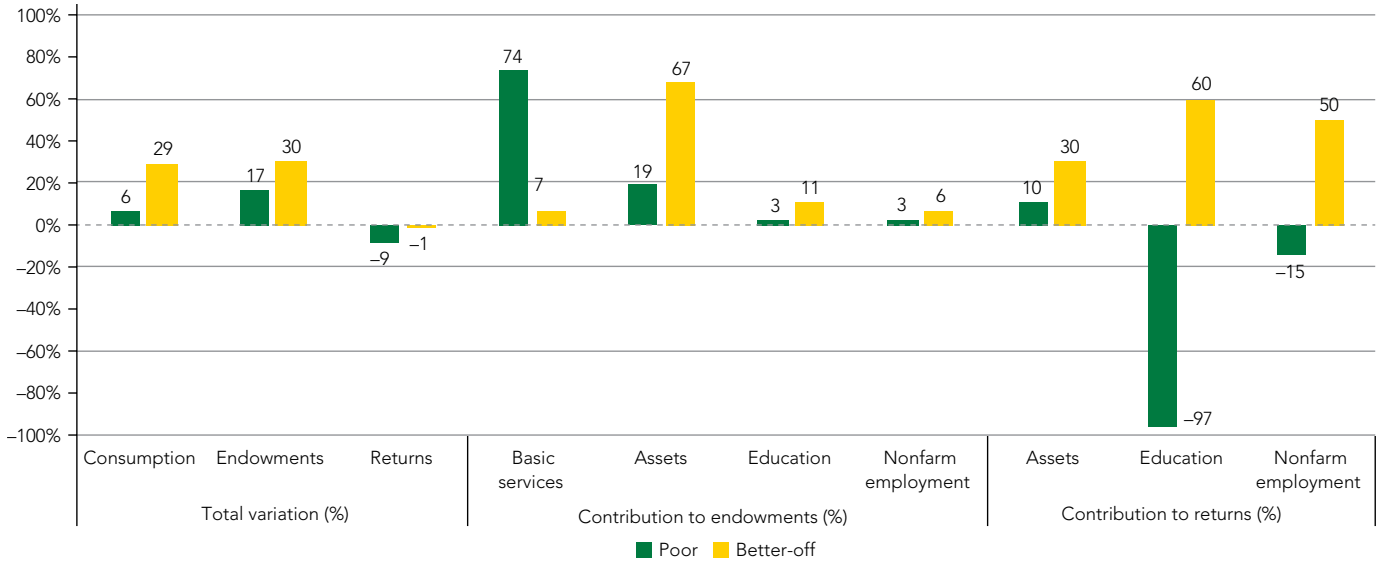


Source: DHS 2015/16.

Movement out of agriculture seems to have accelerated since 2012, coupled with more jobs and higher earnings, especially in services and to a lesser extent industry (Figure ES.9). Self-employment also increased. However, these positive changes occurred primarily among households in urban areas that were only moderately poor or already better-off. Poor rural households saw only a slight increase in engagement in self-employment and, while remaining positive, their returns declined over recent years (Figure ES.10). Poor urban households outside Dar es Salaam saw a slight increase in wage employment and in private businesses, coupled with a modest improvement in returns. In general, better-off households, which have more education and other assets, were better-positioned to take advantage of the opportunities generated by economic growth and so were able to raise their consumption much faster than poor households.

These improvements helped to raise household consumption, but the benefits were partly offset by the lack of opportunities for meaningfully higher economic returns. The reduction in poverty was driven by better access to basic services, assets, and infrastructure; and more human capital, which helped to raise both household endowments and living standards. However, these endowments no longer generate the same increase in consumption as previously, so that the reduction in poverty was slower than what would have been achieved previously. The expansion of access to education and the increase in educational attainment in the general population has paralleled changes in labor market requirements, so that the rewards for years of schooling below a certain level have declined. In particular, the gains in income, and consumption, associated with primary education have become minimal. Consequently, poorer households, whose heads are generally older and cannot access more education, have seen a marked decline in the returns to their years of schooling. As more people have mobile phones and access to mobile signals and the Internet, the value that such devices add to consumption lessens. Popular for business purposes and fund transfers, mobile phones continue to positively affect the livelihoods of the poor, but since 2012 their marginal benefits have narrowed, especially in urban areas and in moderately poor households, for whom ownership of these assets has expanded rapidly but opportunities for their productive use have not (Figure ES.11). Similarly, returns from greater market access have been falling, especially in rural areas. Possession of modern transportation assets like motorcycles and cars has significantly reduced the returns to bicycles and other basic transport alternatives, which are still quite prevalent among the poor.

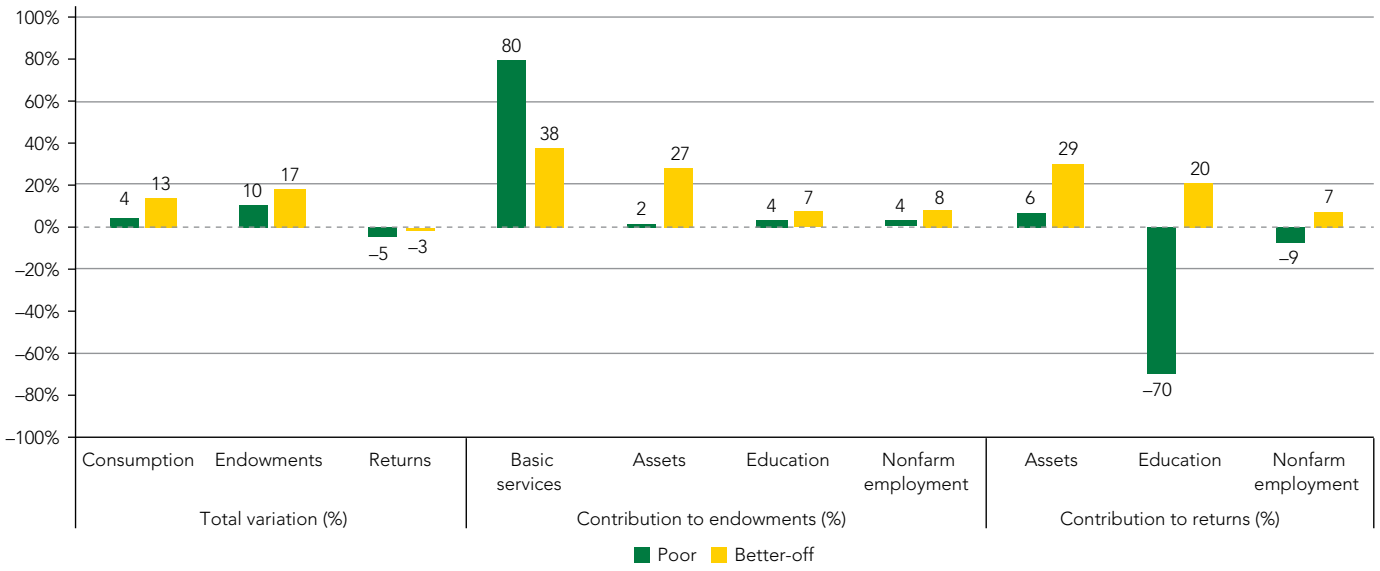
FIGURE ES.9: Drivers of Poverty Reduction in Mainland Tanzania, 2012–18: Endowments and Returns Effects, Percent



Source: HBS 2011/12 and 2017/18.
Notes:

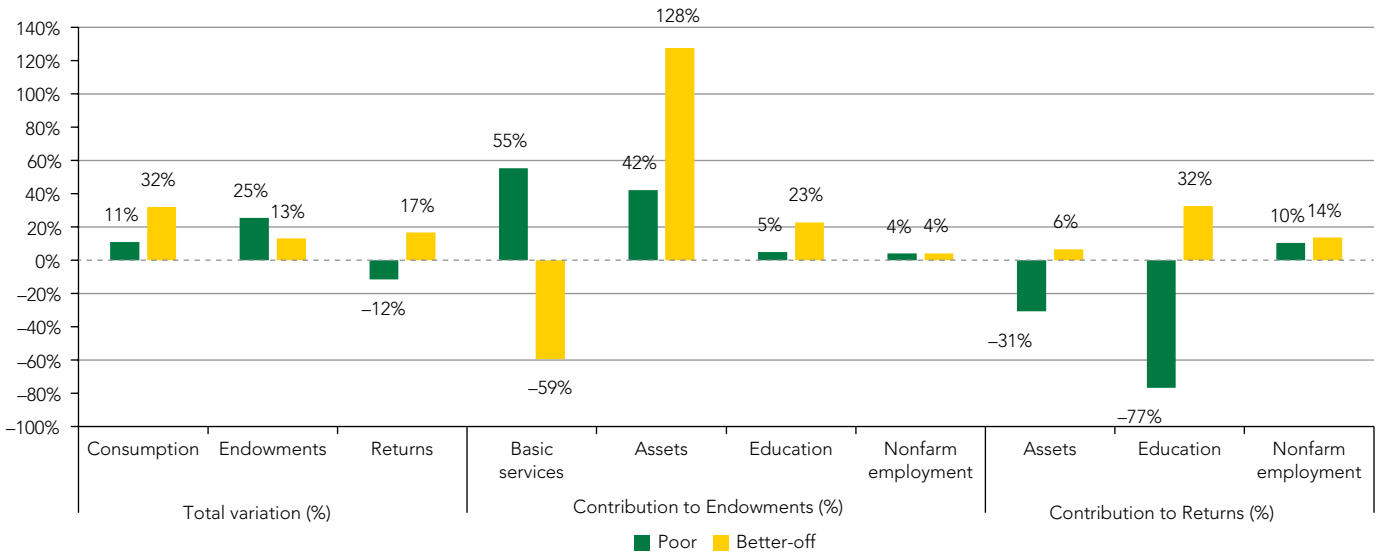
- Results are based on the unconditional quantile regression, which decomposes changes in consumption over time into changes in people characteristics or *endowments* (i.e., increased education levels, ownership of assets, and access to productive employment) and the *returns* that they get for those endowments (i.e., returns to education, employment, and assets). The method applies the Oaxaca-Blinder decomposition to each unconditional decile of the consumption distribution to assess the amount of poverty reduction attributable to changes in the endowments of households and the amount due to changes in the returns to these endowments.
- The poor are those in the first three deciles and the better-off are those in the two highest deciles.
- Nonfarm employment groups self-employment as well as employment in services and industry. Improvements among the poor are due to higher engagement in *self-employment alone,* while improvements among the better-off are due to higher engagement in *self-employment with others* as well as better access (and higher returns) to wage employment and employment in industry and services.

FIGURE ES.10: Drivers of Poverty Reduction in Rural Areas, 2012–18, Percent



Source: HBS 2011/12 and 2017/18.

FIGURE ES.11: Drivers of Poverty Reduction in Urban Areas, 2012–18, Percent



Source: HBS 2011/12 and 2017/18.

Poverty reduction has not been responsive to Tanzania's remarkable economic growth, and inequality has worsened.

Considering Tanzania's remarkable economic growth, reducing its poverty has been very slow. Growth in gross domestic product (GDP) averaged 6.3 percent from 2007 to 2017, dropping to 3.3 percent when adjusted by population size. These figures are based on the GDP series, base year 2015, released in February 2019. The new series show a slight increase in GDP and less volatility in economic growth since 2012. The trend in the previous rebasing, released in December 2014, base year 2007, was similar, with GDP growth averaging 6.3 percent and GDP per capita growth 3.5 percent for 2008–13. However, persistent growth has had only a modest impact on poverty.

The growth elasticity of poverty dropped from a low –1.02 in 2007–12 to –0.45 in 2012–18. Thus, a 10 percent increase in GDP growth per capita can be expected to produce a 4.5 percent decrease in the proportion of the poor. This is very low—for developing countries, on average poverty is expected to drop by over 20 percent when per capita GDP rises by 10 percent.

In 2007–12 the pattern of growth in household consumption diverged significantly from GDP growth due to a discrepancy between price deflators, but the difference narrowed in 2012–18. How much poverty reduction responds to economic growth depends on whether economic growth is defined based on changes in GDP per capita in the national accounts or measured directly from the household surveys on which poverty estimates are based. Economic growth estimated using changes in mean household consumption per capita calculated from HBS 2007 and 2012 was only 0.9 percent annually, significantly lower than growth in GDP per capita. Using survey-based mean consumption to measure growth shows an estimated growth elasticity of poverty of –4, which implies that household consumption has more impact on poverty reduction than GDP per capita. The difference between the estimates of the growth elasticity of poverty is due to the discrepancy between the price deflators the GDP deflator and the consumer price index (CPI) used to convert nominal GDP and household consumption values to real terms. The GDP deflator implies a much slower rate of inflation than the CPI, which resulted in significantly higher growth of real GDP per capita than of mean household consumption. In 2012–18, GDP and CPI deflators produced similar inflation rates of about 38 percent, making the growth rates more comparable, whether based on household consumption per capita (1.5 percent) or GDP per capita (3.3 percent). Thus, no matter how growth is measured, the response of poverty to economic growth is very low (–0.73 using survey mean figures and –0.45 using GDP figures).

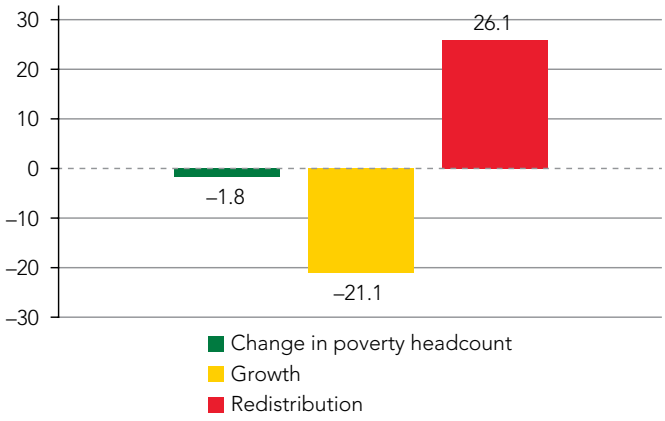
Poorer people therefore benefitted less from economic growth. The pro-poor growth signs that emerged in 2012 seem to have reversed in 2018—consumption growth in 2012–18 was significantly lower for those at the bottom of the consumption distribution than among the better-off (Figure ES.12). The pattern replicated that of 2001–07 but not 2007–12, when growth mainly benefitted poorer groups.

The beneficial effects of economic growth were partly offset by worsening inequality. The poverty headcount fell faster in 2007–12 than in later years, despite a much lower increase in mean household consumption. In 2012–18, the positive impact of household consumption growth on poverty reduction (the growth effect) was largely offset by the rise in inequality (the redistribution effect) (Figure ES.13). The deterioration in the Gini coefficient supports this: having gone down from 38.5 to 35.8 percent in 2007-12 it has risen to 39.5 in 2018. Throughout the region, inequality was lower than it had been initially in rural areas (at 33.5 percent) but jumped in urban areas, essentially in Dar es Salaam where the Gini coefficient reached 43 percent in 2018, up from 40 percent in 2007 and 36 percent in 2012.

FIGURE ES.12: Growth Incidence Curves, 2012–18, Percent

Source: HBS 2011/12 and 2017/18.

FIGURE ES.13: Growth and Redistribution Effects, 2012–18, Percentage points



Source: HBS 2011/12 and 2017/18.

Growth was driven by sectors where few in the general population work, particularly the poor. The fastest-growing sectors are construction, information and communication technology (ICT), real estate, nonmarket services (e.g., education, health, and public administration), and to a lesser extent mining, transport, and trade. Each of these sectors employs on average no more than 3 percent of the population. However, their employees tend to be significantly more educated and better-off, who average 60 percent or more of their workers. These sectors employ over 20 percent of Tanzanian workers with lower secondary education and above. Within agriculture, where most Tanzanians work, particularly the poorer ones, the crops and livestock subsectors grew relatively fast at about 5 percent. However, even there, few of the poor produce market-oriented crops and livestock; they mostly operate subsistence farms.

Tanzanians with more education and skills were thus better positioned to benefit from fast- growing sectors. Better-off Tanzanians, who have more human capital and productive assets, were better able to take advantage of the opportunities generated by the fast-growing sectors. Their income and consumption rose significantly faster than for those with less education and fewer endowments employed in sectors growing more slowly. As a result, inequalities widened. Another result was the persistence of the urban-rural welfare gap: urban dwellers with more education and assets could better access productive jobs and maintain their higher economic status. Policies to empower the rural poor did partly reduce urban-rural gaps among poorer groups, but among the better-off inequality worsened.

A greater proportion of households are operating their own businesses, which could be a pathway out of poverty. In 2018, about 14 percent of households own nonfarm enterprises (NFEs), up from 9 percent in 2012. Here, however, there is a location and gender bias: the proportion of households operating NFEs is about three times higher in urban areas and fewer women own NFEs than men. Since 2012, the proportion of women engaged in NFEs has risen in rural areas but fallen in urban areas.

The profile of households operating NFEs closely resembles that of the better-off households: (1) The household heads were more educated, with lower secondary school completion rates of about 17 percent, compared to 12 percent nationally and less than 6 percent among farmers. (2) They had fewer children and thus fewer household members and lower dependency ratios. In 2018 the average size of an NFE household was about 5, and of farming households 6. (3) Households that operated NFEs, especially in urban areas, were at the top of the consumption distribution, with average monthly consumption about 2.5 times that of farming households.

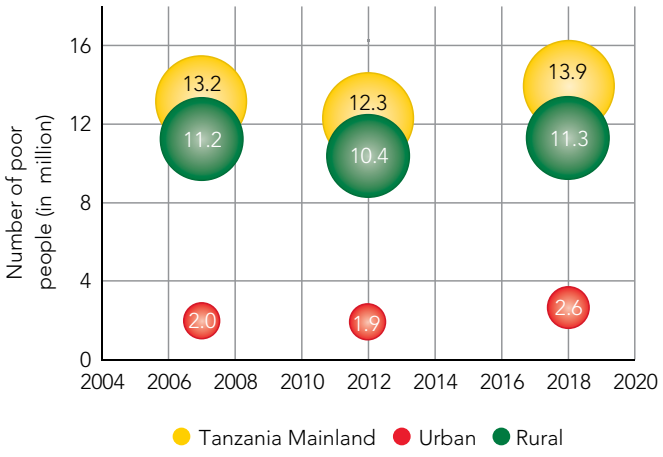
Despite being better-off, most NFE households continued to operate in the informal sector, lacked access to formal funding sources, and created few jobs. In 2018 the majority of NFEs were either mobile with no fixed location (24 percent) or operated out of the owner's house (32 percent). Moreover, in 2012 only 11 percent had been registered with the business registration and licensing agency (BERLA), and in 2018 this had not changed. Moreover, in both 2012 and 2018, most NFEs were no more than two years old.

Despite initially relying on personal savings or agricultural proceeds to start their businesses, after 2012 more NFEs began to use formal sources of credit to run their operations, though the increase is from a very low basis. The share of NFEs funded by owner savings fell from 36 to 33 percent and the share funded by Credit Co-Operative Society (SACCOS) and bank loans rose from 2 to 3 percent. Reliance on loans from family or friends also grew. It will take a long time for NFEs to create economies of scale and scope. Only a few employ workers who are not members of the household. In 2018, 27 percent of NFEs were working proprietorships and 25 percent reported having unpaid household members working in the business. Only 7 percent hired paid workers who were not household members.

Slow progress in poverty reduction has pushed up the number of poor people, leaving a noticeable share of the population still at risk of at least transitory poverty.

Because the population grew faster than poverty was reduced, in 2018, about 14 million Tanzanians lived in poverty, up from 13 million in 2007 and 12 million in 2012. In 2018, 32 percent of the population lived in urban areas, up from 29 percent in 2012. As urbanization accelerated, the increase of the poor was proportionately higher in urban areas, but the majority still live in rural areas. In 2007–18, the urban population rose by about 7 million and the number of urban poor by 0.6 million—a result of both urbanization and the dilatory pace of urban poverty reduction (Figure ES.14). Most of the changes occurred outside Dar es Salaam, where the population has gone up by nearly 5 million and the number of poor by nearly 0.7 million. In rural areas, the total population went up by only 26 percent, the number of poor people was almost unchanged, and the number of extremely poor declined. However, over 80 percent of the poor (11.3 million) continue to live in rural areas, where 3.5 million of them suffer extreme poverty; in urban areas, 2.6 million live in poverty and 745,000 in extreme poverty.

FIGURE ES.14: Number of Poor People, 2007–18, Million



Source: HBS 2007, 2011/12 and 2017/18.

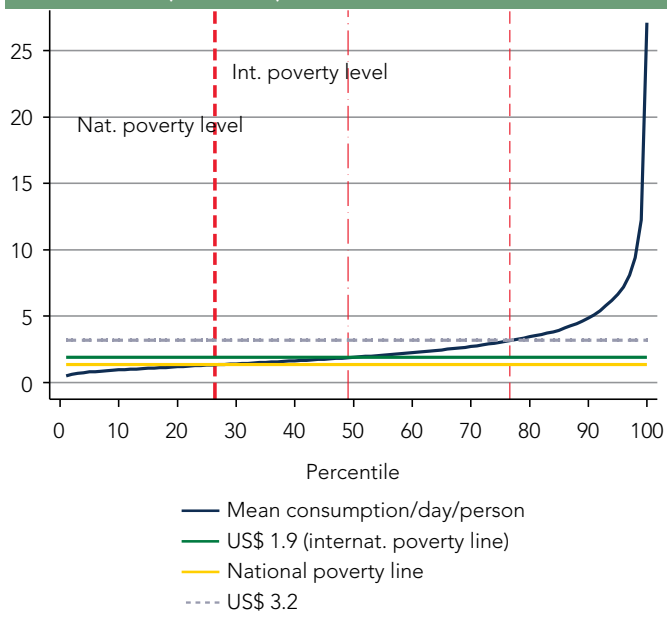
A large proportion of the population is clustered around the poverty line. Raising the consumption of poor households by just TZS 350 per adult equivalent per day would lift about half of the poor out of poverty. However, a quite significant proportion of Tanzanians who live just above the poverty line are at risk of being pushed into poverty by an economic shock (Figure ES.15). Mobility in and out of poverty is thus very high.

Between 2010 and 2015, the poverty status of nearly 30 percent of the population changed. Analysis of the dynamics of poverty based on National Panel Surveys (NPSs) found that about 16 percent of Tanzanians escaped poverty and about 12 percent fell into it. In both years, about 60 percent of the population were nonpoor and 12 percent stayed poor (Figure ES.16).

Transition out of poverty has generally been coupled with shifts to more productive activities, within agriculture or outside to services. Over 70 percent of those who moved out of poverty still considered agriculture their primary work activity, even though many supplied more hours to services

and industry. Also, many moved from unpaid family helper status to self-employed or wage worker. The others moved from agriculture to services or, to a lesser extent, industry. On average, in all sectors they worked more hours, but even more in productive ones. Meanwhile, those who fell into poverty moved to less productive work, such as unpaid family helper, and continued to spend most of their time in farming. They also tended to work fewer hours. Yet exposure to shocks does not seem to have significantly affected transitions into and out of poverty. The numerous initiatives to empower the poor seem to have brought them closer to fulfilling basic consumption needs, but the big jump out of poverty is yet to be achieved.

FIGURE ES.15: Consumption Density around the Poverty Line in 2018 (2011 PPP).



Source: HBS 2017/18.

FIGURE ES.16: Transition In and Out of Poverty, 2010–15, Percent

		NPS 2014–15		
		Nonpoor	Poor	
NPS 2010–11	Non-poor	60%	13%	73%
	Poor	16%	11%	27%
		76%	24%	100%

13% entered poverty (new poor)

16% exited poverty (new non-poor)

Source : NPS 2010/11 and 2014/15.

It is hard for the poor to achieve a better life because of a large number of dependents, low human capital, low-profile jobs, and limited access to basic services and assets.

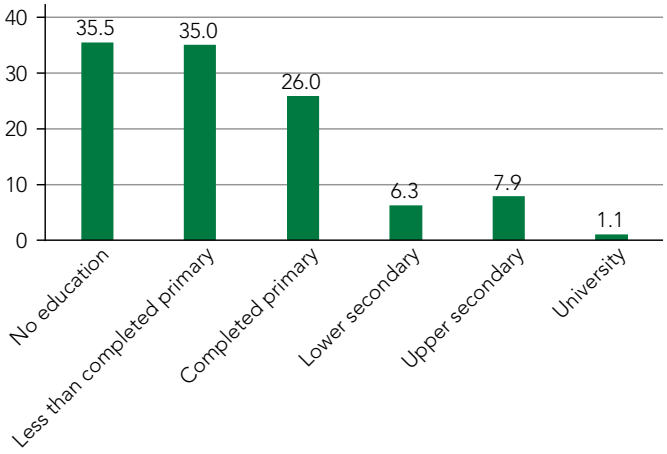
Poor households are burdened by large numbers of dependents and disadvantaged by too little education. The number of children under 15 in poor households is almost double the number in nonpoor households. Poor households also have significantly higher dependency ratios. About 44 percent of households with five or more children under 15 are poor, 18 pp higher than the national average and 28 pp more than the poverty rate for households with just one or two children. About 29 percent of household heads have no education and 19 percent did not complete primary school, with rates being highest among poor rural households. Only 3.4 percent of the heads of poor households (and 1.3 percent of rural ones) went beyond primary education, compared to 20 percent for nonpoor households. Of households whose heads have no education or did not complete primary, about 35 percent live in poverty. The poverty rate drops to 26 percent for those who completed primary schooling and to just 6 percent among households with lower secondary education and above (Figure ES.17). While education is still the best shield against poverty, primary education seems no longer sufficient to open up opportunities.

Poverty seems to be more prevalent among women. It is difficult to understand poverty by gender because household surveys assume equal distribution of consumption between members of a household, and because of the status of women who head households. However, there are indications that poverty is more prevalent among women. Particularly in urban areas, more women-headed households are poor (20.3 percent) than men-headed ones (14 percent). Some types of women-headed households are particularly vulnerable to poverty—single and divorced women are poorer than men by about 11 pp. The gap is high in both rural and urban areas, but particularly in the latter and among divorced households, where it exceeds 22 pp. Urban widows are also poorer than urban widowers by about 14 pp. Ownership of assets, especially mobility and communication equipment, is also significantly lower among women-headed households, which indicates the limited access of women to productive assets.

Less human capital and limited access to basic services limit opportunities for the poor to access productive jobs. About 80 percent of the heads of poor households work on their own farms or to a lesser extent as unpaid family farm helpers. In these households the poverty rate is more than double that of those in other employment categories. Households whose head is an entrepreneur with others or self-employed in nonfarm sectors are less likely to be poor. Similarly, poverty rates are lowest among households whose head works in trade and services (Figure ES.18). Although so many poor households are engaged in agriculture, about 18 percent of them fear almost every month that they will run out of food, compared to 10 percent of nonpoor ones; another 37 percent of poor households estimate they might run out in at least some months. In all, 50 percent of poor households ran out of food if not every month in at least some, compared to 32 percent of nonpoor households.

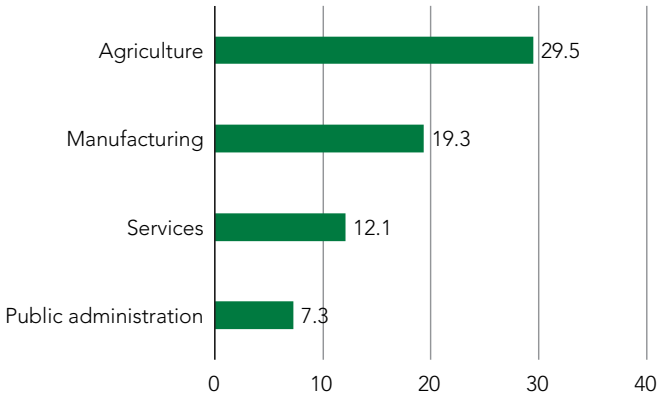
Human capital and access to productive jobs are lower for women than men, particularly in poor households.

FIGURE ES.17: Education Level of Household Head and Poverty, 2018, Percent



Source: HBS 2017/18.

FIGURE ES.18: Sector of Employment of Household Head and Poverty, 2018, Percent



Source: HBS 2017/18.

Nationally, 23 percent of women have no education and 19 percent more did not complete primary school, compared to 13 percent of men with no education and 24 percent who completed less than primary. The gender gap is larger in poor households, where 32 percent of women have no education compared to 19 percent of men. As a result, more women than men are in unpaid household work and low-paying jobs. The gaps are particularly large among poor households, where they exceed 7 pp. However, the gender gaps in education and employment are significantly lower in the younger generation, suggesting that gender differentials are starting to shrink and that policies to enhance girls' education and empower women are beginning to bear fruit.

Poor households suffer from less access to infrastructure and community services, which minimizes their opportunities. Social and community services, such as electricity, water supply, health facilities, roads, markets, and communication networks, are the backbone of household development; they structure the household environment and promote emergence of opportunities. Moreover, the existence of essential services and infrastructure often exposes the serious shortfalls in services for poor households, which are more likely to live in underserved communities, which perpetuates their dire lack of both cash and access to opportunities. Only 7 percent of poor households are connected to the electrical grid and 28 percent use solar energy; the rest rely on inefficient energy sources for lighting. Over 90 percent of poor households use firewood and charcoal for cooking. About 30 percent of poor households still have access only to unsafe sources of drinking water and over 90 percent rely on unimproved sanitation facilities or none at all. Only about 13 percent of poor households have access to tarmac roads; 44 percent lack any source of access. Among nonpoor households, the corresponding rates are 22 percent with good access and 32 percent without any. Also, 41 percent of households have no access to a health center, dispensary, or hospital, whether public or private. Here, poverty status makes very little difference.

For many, access to the Productive Social Safety Nets (PSSN) program is essential for meeting basic consumption needs, but its coverage is limited. The program is managed by Tanzania Social Action Fund (TASAF), which reports that the program covers 1.2 million households, of which 250,000 benefit from public works program. HBS 2018 found that about 1 million households and 4.9 million people benefit from the PSSN cash transfer program, of whom 291,000 households (1.4 million people) also benefit from the public work program. PSSN reached 15 percent of extremely poor households, 14 percent of poor households, and 8 percent of nonpoor ones. In line with the national distribution of the poor, the beneficiaries are mostly rural, constituting 78 percent of households benefiting; coverage reaches 11 percent of all rural and 5 percent of all urban households. The fact that the PSSN benefit is mainly used to purchase food underscores the high food stress in Tanzania, especially for the poorest households. About 66 percent of beneficiaries reported using PSSN income support to cover their food needs, 13 percent to cover education and health expenses, and 21 percent to invest in productive assets and improve housing (8 percent). Of the poorest beneficiary households, only 4 percent invest

in productive assets. While most nonpoor beneficiaries also use the funds mainly for food, about 10 percent invest in productive assets.

PSSN may have helped many beneficiaries to escape poverty. PSSN is intended to target the poorest Tanzanians. According to HBS 2018, after the program had been in operation for three years, about 57 percent of PSSN beneficiaries were in the two poorest consumption quintiles. However, about 69 percent of the households interviewed that reported benefiting from PSSN were above the poverty line, though still receiving PSSN support. For some this could be a temporary change of status; that is, for households that were close enough to the poverty line, the income support from the PSSN cash transfer may allow them to afford consumption above the poverty line but they would likely fall back into poverty if PSSN support is removed. For about 25 percent of them the average consumption was only 20 percent higher than the poverty line; these households are at high risk of falling back into poverty if income support is taken away. In other cases, the PSSN may have allowed some households to move sustainably above the poverty line. About 23 percent of current beneficiary households are in the two upper consumption quintiles (15 percent in the 4th quintile and 8 percent in the 5th), which makes them 7 percent of all households in the 4th quintile and 3 percent of all in the 5th. Of PSSN beneficiaries, 10 percent of those in the 4th quintile and 18 percent in the 5th invested the PSSN cash in productive assets compared to only 4 percent of households in the poorest groups. Investing in productive assets may have helped these households to improve their living standards faster and graduate to higher income groups. More than six years since the program was designed, its targeting needs to be reviewed, but the process needs to be managed very carefully because some nonpoor beneficiaries may fall back into poverty if they are dropped from the program. Even households in the highest quintiles are at risk as their productive investments could be affected, something that would be even more problematic if these investments are used to support other poor households. The review of program targeting and recertification of beneficiary households needs thorough analysis to identify appropriate candidates, supported by measures to build the resilience of those who may no longer qualify so that they do not fall back into poverty. It needs also to be guided by processes that are objective and standardized.

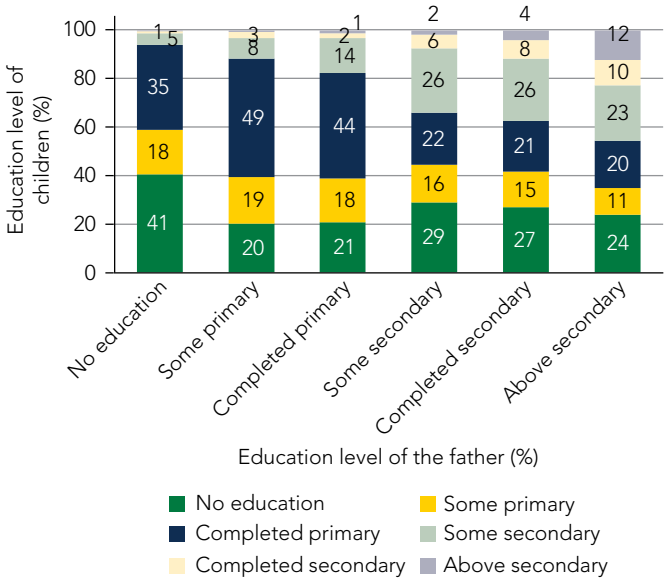
Without PSSN, basic needs and extreme poverty would have been higher. Without PSNN income support, poverty would have been about 2 pp higher, which translates to an additional 1 million poor people, and extreme poverty would also rise from 8 to 9.2 percent, equivalent to 700,000 more people. Expanding coverage of the program and its targeting would help to accelerate poverty reduction.

The drivers of poverty are mutually reinforcing and carry across generations.

The poor start life at a disadvantage, and many pass poverty on to their offspring. They are hobbled by, among other deficits, limited resources, malnutrition and health problems, poor access to social services and health care, and low education and skills. They lack income, can save little for the future, are vulnerable to shocks, and have limited coping strategies. Lacking the skills to take advantage of most work opportunities, they are generally limited to vulnerable and low-productivity jobs. These deficits limit the upward mobility of their children, perpetuating poverty for following generations. Tanzanians of less-educated parents are more likely to be less-educated themselves, and those with better-educated parents are more likely to achieve higher education (Figure ES.19). Educational mobility is lower among the poor and women, so that low human capital perpetuates vulnerability and gender inequality. Intergenerational mobility across economic sectors seems very limited; Tanzanians often have the same employment status and jobs in similar sectors as their parents.

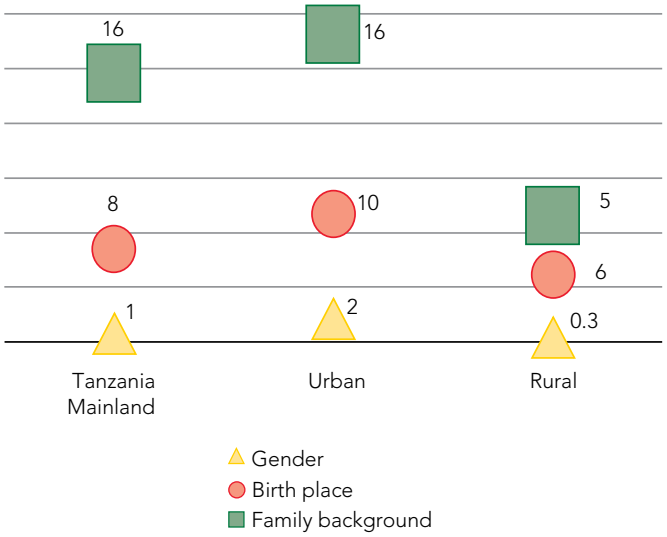
Estimates of inequality of opportunity have found that about 20 percent of total inequality in consumption is due to circumstances outside the individual's control and about 16 percent is explained by family background. Parents' education and father's employment have the most influence on their children's outcomes and opportunities for economic mobility (Figure ES.20). This is a much larger share than in other Sub-Saharan African countries, where inequality of opportunity is significantly lower. Without additional policy actions, future generations of the poorest Tanzanians will likely be trapped in persistent poverty.

FIGURE ES.19: Intergenerational Mobility in Education, 2018, Percent



Source : HBS 2017/18.

FIGURE ES.20: Contributions of Individual's Circumstances to Inequality, 2018, Percent



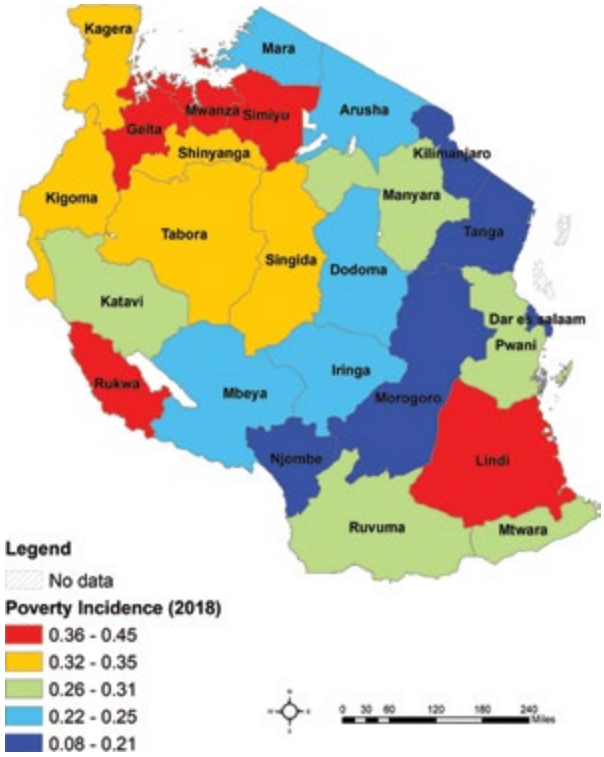
Source : HBS 2017/18.

Inequality of opportunity is two times higher in urban areas than in rural ones. The share of inequality of opportunity in total inequality is 25 percent in urban areas compared to 11 percent in rural zones. This reflects two facts: (1) Family background variables have more influence on households and individuals who have more education and are engaged in more diversified occupations and jobs as it is the case in urban sectors. (2) To the extent that unobserved circumstances and institutional measures (e.g., family composition, parental financial situation, supply and quality of schooling, and labor and land market institutions) shape opportunities for rural Tanzanians, estimates of inequality of opportunity that do not take these circumstances into account are significantly biased downward.

Beyond the urban-rural divide, geographic disparities in poverty are substantial.

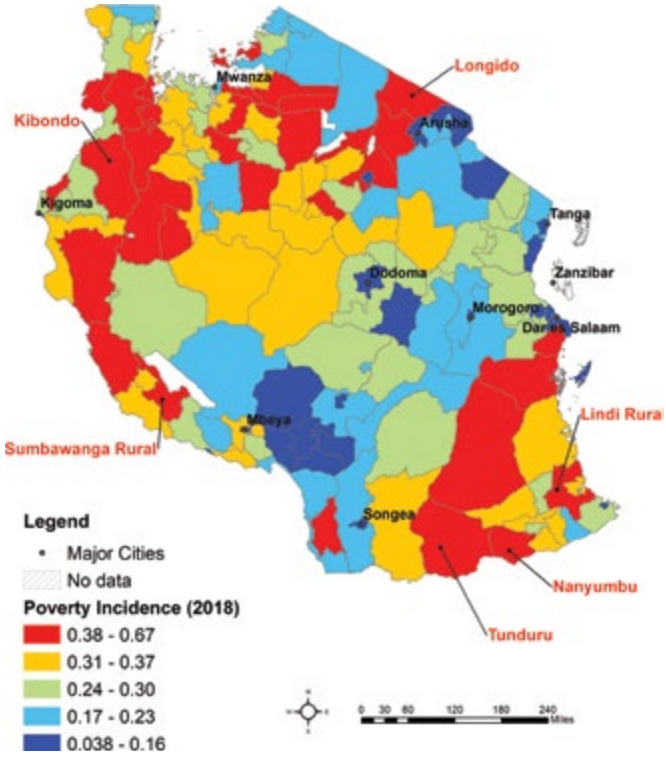
There are major disparities in the incidence of poverty and the distribution of poor people across the country. By region, poverty ranges from as high as 45 percent in Rukwa to as low as 8 percent in Dar es Salaam (Figure ES.21). Overall, about 33 percent of the poor are concentrated in the highly rural lake zone, where less-productive and subsistence activities are common. In the lake zone, 4.6 million live in poverty and 1.3 million in extreme poverty; in the northern and eastern zones, less than 1.4 million live in poverty and 420,000 people in extreme poverty. Estimates for districts reveal broad pockets of poverty in the north, west, and south. Poverty was most pervasive in Longido in the Arusha Region to the north, followed by Kibondo in Kigoma Region and Sumbawanga Rural in Rukwa Region to the west, where poverty exceeds 50 percent (Figure ES.22). Generally, regions with the highest poverty rates also host the largest numbers of poor, particularly in the area around Lake Victoria and Simiyu region in the north; Kigosi, located between Shinyanga and Tabora regions;

FIGURE ES.21: Poverty Incidence by Region, 2018



Source: HBS 2017/18 and auxiliary variables.

FIGURE ES.22: Poverty Incidence by District, 2018



Source: HBS 2017/18 and auxiliary variables.

and Moyowosi in Kigoma region. However, there are also significant numbers of poor people in Lushoto district in Tanga and Ilala district in Dar es Salaam because their populations are larger. Conversely, Longido district in Arusha region and Nanyumbu district in Mtwara region, where poverty is high, are sparsely populated and therefore have fewer poor people.

Urbanization and its associated structural transformation led poverty to drop faster in leading areas and gaps to widen in lagging ones. For the past decade, urban growth has averaged 5.5 percent—higher than the national average of 3 percent population growth. In 2018, 32 percent of all Tanzanians lived in urban areas and by 2045 this share is expected to reach 50 percent. Poverty is lower in larger and more densely populated districts and in areas with a greater concentration of lights at night, which demonstrate both greater urbanization and more economic activity. In general, successful urbanization translates into poverty reduction through the structural transformation in which workers shift from low-productivity agricultural activities to higher-productivity urban jobs. In large cities, more productive jobs are available, and the productivity gains come partly from the benefits of agglomeration economies, such as resource-sharing, quicker and more accurate job matching, and greater knowledge spillovers. Tanzania is no exception.

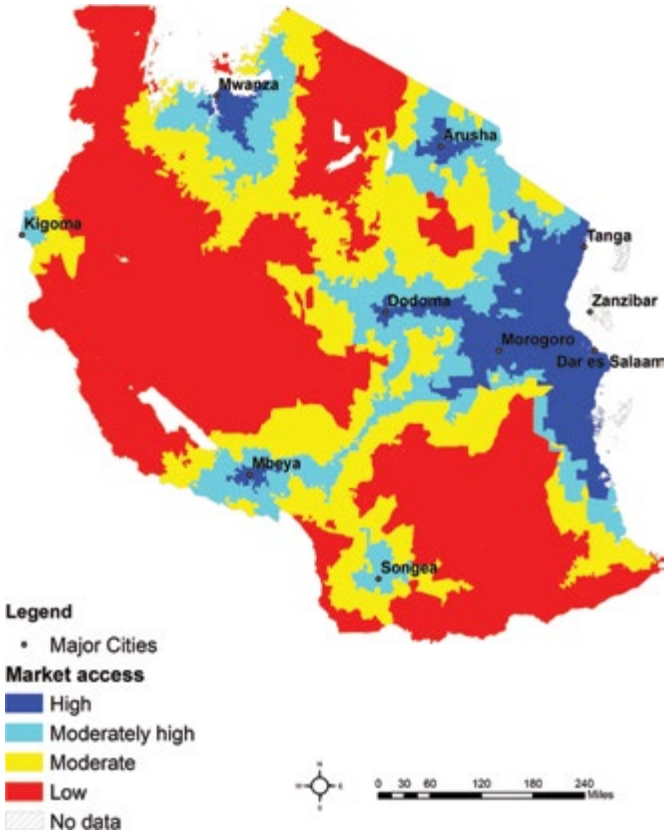
Access to markets is limited, particularly in the northwest and southeast, areas typically characterized by severe poverty. Farmers in rural areas with limited market access suffer from relatively higher prices for fertilizers because of higher transportation costs and fewer product options (Figure ES.23). These farmers also have little access to output markets and must take less competitive prices. Lack of market access thus traps rural farmers in poverty and exacerbates inequalities between rural and urban areas.

Road infrastructure and transport services also affect access to markets. The poor quality of rural roads deters connectivity between rural areas and urban markets. Rural roads tend to be rudimentary, and transport services and facilities are unreliable and inadequate; in many remote parts of the country high post-harvest losses are an estimated 35 percent of total production. Thus, few and poorly maintained rural roads are a serious deterrent to the development of commercial agriculture.

Areas surrounding Dar es Salaam, the commercial and economic center of the country, tend to have better access to markets. The region's road network is wide and dense, which allows people living near the city to benefit from its agglomeration economies. The positive economic dividends of access to jobs and trade opportunities are hard to overstate. While the Dar es Salaam administrative region accounts for only a small fraction of mainland Tanzania's land area (0.16 percent) and only about 8 percent of its population, the region accounts for about 40 percent of its manufacturing jobs and 53 percent of manufacturing value. Dar es Salaam also handles 95 percent of its port traffic, dwarfing the importance of other cities as sources of imported goods.

Across the country, climate is also a driver of geographic inequalities in welfare and poverty. In Tanzania, poverty is more pronounced in tropical savannah zones, which are dominant in the northwest and southeast. Agriculture in the tropical zones tends to be less productive due to poor soil quality because of high temperatures and heavy rain. These zones are not suitable for producing wheat, which grows only in temperate climates, or maize and rice, which prefer temperate and subtropical climates. Thus, production of maize, the most productive crop and a critical driver of poverty

FIGURE ES.23: Market Access to Major Urban Centers



Source: World Bank's estimates based on OpenStreetMap.

Notes: The Open Source Routing Machine (OSRM) algorithm is used to compute travel time between each village and major cities.

reduction in Tanzania, is concentrated in the southern highlands (e.g., Iringa and Mbeya); the southwest (e.g., Shinyanga and Rukwa); and Arusha, where the climate is nontropical and the land is most fertile. The fact that tropical zones also host a variety of agricultural diseases, particularly the vector-borne diseases prevalent in tropical countries, has serious implications for health and labor productivity.

The climate also has a major influence on the vulnerability of the poor to natural disasters. Although there is no direct correlation between poverty and natural disaster risks, many of the pockets of poverty in Tanzania are repeatedly subject to such risks. Drought is the most frequent natural disaster in poverty-stricken areas. Parts of Tanzania that were previously highly productive, such as the southern and northern highlands, will increasingly become tropical areas because of declining rainfall, frequent droughts, and significantly more spatial and temporal rainfall variability. In Tanzania drought has significantly worsened food insecurity, livestock and crop losses, and transmission of infectious diseases. Drought is more common now in parts of Arusha, Manyara, Shinyanga, Simiyu, and Dodoma regions. Among the most drought-stricken districts is Longido in Arusha region, where poverty is also estimated to be high.

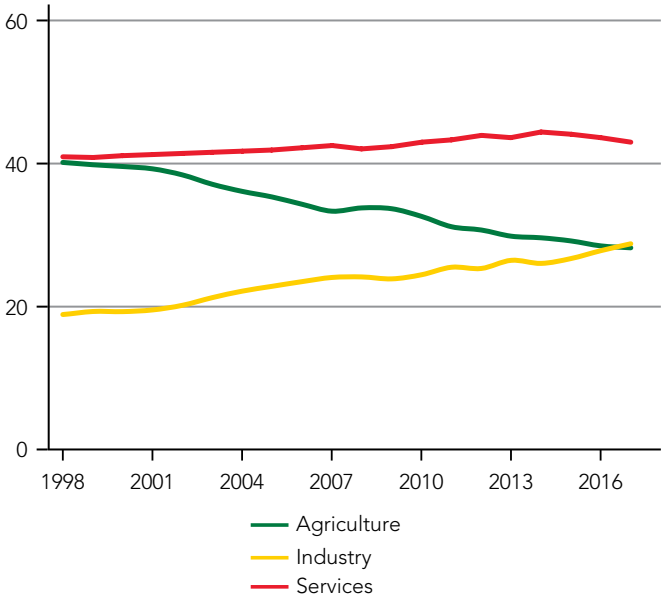
Structural transformation of the economy can help reduce poverty faster, but at the micro level the transformation is slow.

Structural transformation, an integral part of the development process, will determine whether Tanzania can pull itself out of poverty. A central aspect of any policy for curbing poverty and reducing the absolute number of poor would be creation of enough productive jobs to absorb the emerging young generation of workers. The need for more—and more productive—jobs is even more pressing in Tanzania given rampant demographic expansion and the fast-growing workforce. Structural transformation, which is at the core of this process, is a dynamic process that refers to both reallocation of labor from less to more productive sectors, and the productivity and job gains associated with this move. The larger the productivity gap between sectors—especially between agriculture and manufacturing and services—the greater the opportunity to achieve large gains as labor shifts across sectors.

National accounts show that agriculture is contributing far less to value-added than services and industry. In 1998, agriculture accounted for 40 percent of GDP; in 2017, it accounted for 28 percent. Meanwhile, industry accounted for 29 percent and services for 43 percent. Although services account for the largest share of GDP, in the past two decades its contribution to the economy went up by just 3 pp. Since 2016 industry has grown much faster; since 2000 its contribution to GDP has gone up by more than 50 percent (Figure ES.24). While micro data show similar trends, people are shifting more slowly from agriculture to services and industry. Integrated Labor Force Surveys (ILFS) show that between 2006 and 2014, employment in agriculture fell from 76 to 67 percent. Labor appears to be slowly shifting to services, where employment went up by 9 pp, and to a lesser extent industry, up by 1.2 pp. HBS 2012 and 2018 indicate similar trends: a decline of employment in agriculture from 75 to 58 percent and increase of employment in services and industry by, respectively, 12 pp and 4 pp. But while the participation of labor in agriculture remains very high, people tend to supply more hours to services, followed by industry (Figure ES.25).

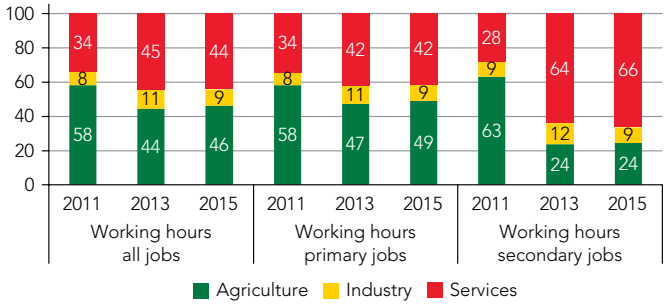
Because of the slow transition of labor, the enormous potential of structural change for productivity growth has yet to be realized. There are sizable productivity gaps between economic sectors. Compared to agriculture, in services productivity measured by value of output per worker is an estimated 9.5 times higher and in industry it is 5.6 times higher (Figure ES.26). When productivity is measured by value of output per hour worked, compared to an hour worked in agriculture, one hour worked in services is estimated to be on average 3.2 times as productive, and one hour worked in

FIGURE ES.24: Contribution of Economic Sectors to GDP, 1998–2017, Percent



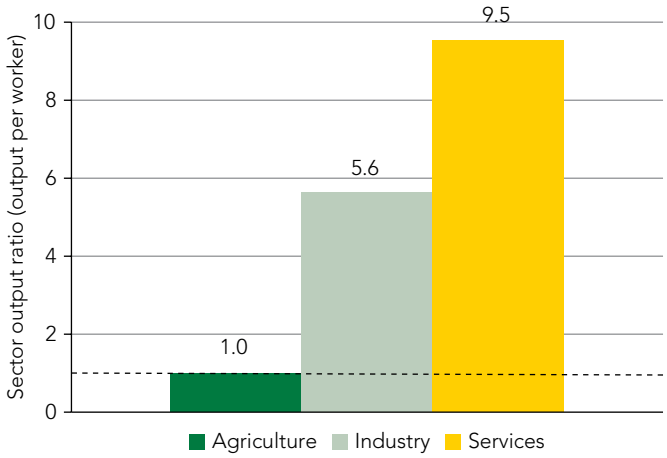
Source: National Accounts, 2019.

FIGURE ES.25: Working Hours, Primary and Second Jobs, 2010–15, Percent



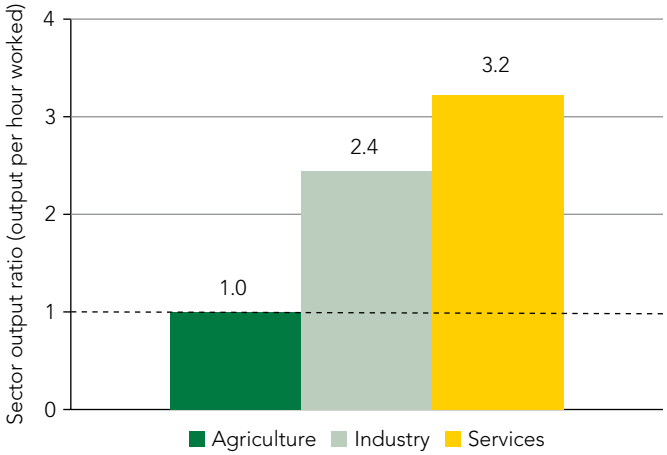
Source: NPS 2010/11, 2012/13, and 2014/15.

FIGURE ES.26: Productivity Differences Across Sectors, Per Worker, 2015



Source: NPS 2014/15.

FIGURE ES.27: Productivity Differences Across Sectors, Per Hour Worked, 2015



Source: NPS 2014/15.

industry about 2.4 times (Figure ES.27). Clearly, if there was a faster transition of labor away from agriculture, the productivity gains would be enormous. However, the transition of labor is low because of both worker capacity and skills limitations and the limited capacity of service and industrial firms to absorb the large and fast-growing workforce.

In a more granular disaggregation, mining, transport, and trade are the most productive sectors. On average, a mining worker is 8 times more productive than an agricultural worker, a manufacturing worker 4.8 times, and a worker in construction or utilities 5.4 times. When productivity is measured in terms of output per hour worked, the gaps are smaller and less varied: for example, one hour of mining is 3.1 times more productive than one hour of farming, and manufacturing is just 1.7 times more productive.

Industry consists primarily of micro and informal enterprises, operating in precarious sectors and relying on unskilled labor.

About 96 percent of Tanzanian firms have fewer than 10 workers and only 1 percent have more than 50. Among the smallest firms, 60 percent have only one or two workers. Because nearly half of the firms are not registered anywhere, they are considered informal. Tanzanian firms tend also to be fairly young, with a median age of four years. In general, particularly in wholesale and retail trade and manufacturing, micro and small firms are likely to be informal and younger. Their small startup capital is financed essentially from personal income. Meanwhile, large businesses tend to be older and mainly engaged in formal nonmarket services such as education or health (many are State owned); it may be that formal firms operating in public services have higher chances of surviving and growing.

Two-thirds of Tanzanian firms are in manufacturing and trade. About 35 percent are in manufacturing and 34 percent in wholesale and retail trade. Manufacturing firms primarily produce food and beverages (39 percent); textiles, wearing apparel, and leather (30 percent); and furniture (14 percent). Only 1 percent are in high-value-added and knowledge-intensive industries. The rest operate essentially in services, especially nonmarket services. Less than 1 percent are in agriculture; most people working in that sector run their own farms without creating a business.

Less than 30 percent of the workers in industry are skilled. About 13 percent of industrial firms cite shortage of qualified labor as their main problem; for medium and large firms, the proportion rises to 33 percent. This suggests that as firms grow, they engage in more sophisticated production that requires higher-skilled workers, who are rare in the local market. This shortage of qualified labor severely undermines the performance of large industries, particularly mining, utilities, and more technically advanced machinery, electric equipment, and medical and pharmaceutical industries. However, nearly 40 percent of large manufacturers of furniture also consider the shortage of qualified labor to be a major concern.

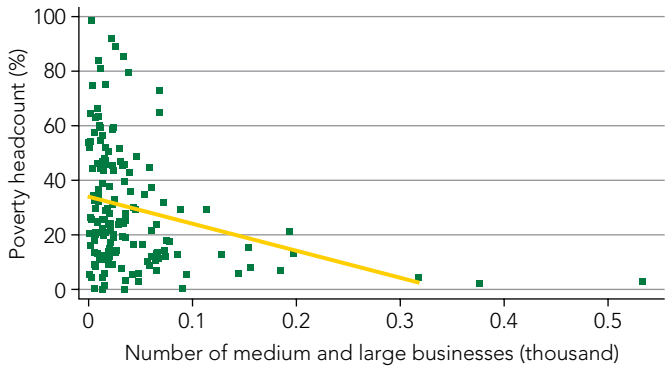
As with poverty, the distribution of firms and employment nationally is uneven.

There are pronounced disparities in where firms are located. The highest number are in the eastern zone, 27 percent, and the lake zone, 17 percent. In contrast, the southern and western zones each have no more than 5 percent of Tanzanian businesses. Regional disparities are even more pronounced; nearly 20 percent of firms are based in Dar es Salaam.

The geographic distribution of firms resonates with the distribution of poverty. There seems to be a negative and statistically robust correlation by region and district between the incidence of poverty and the number of businesses:

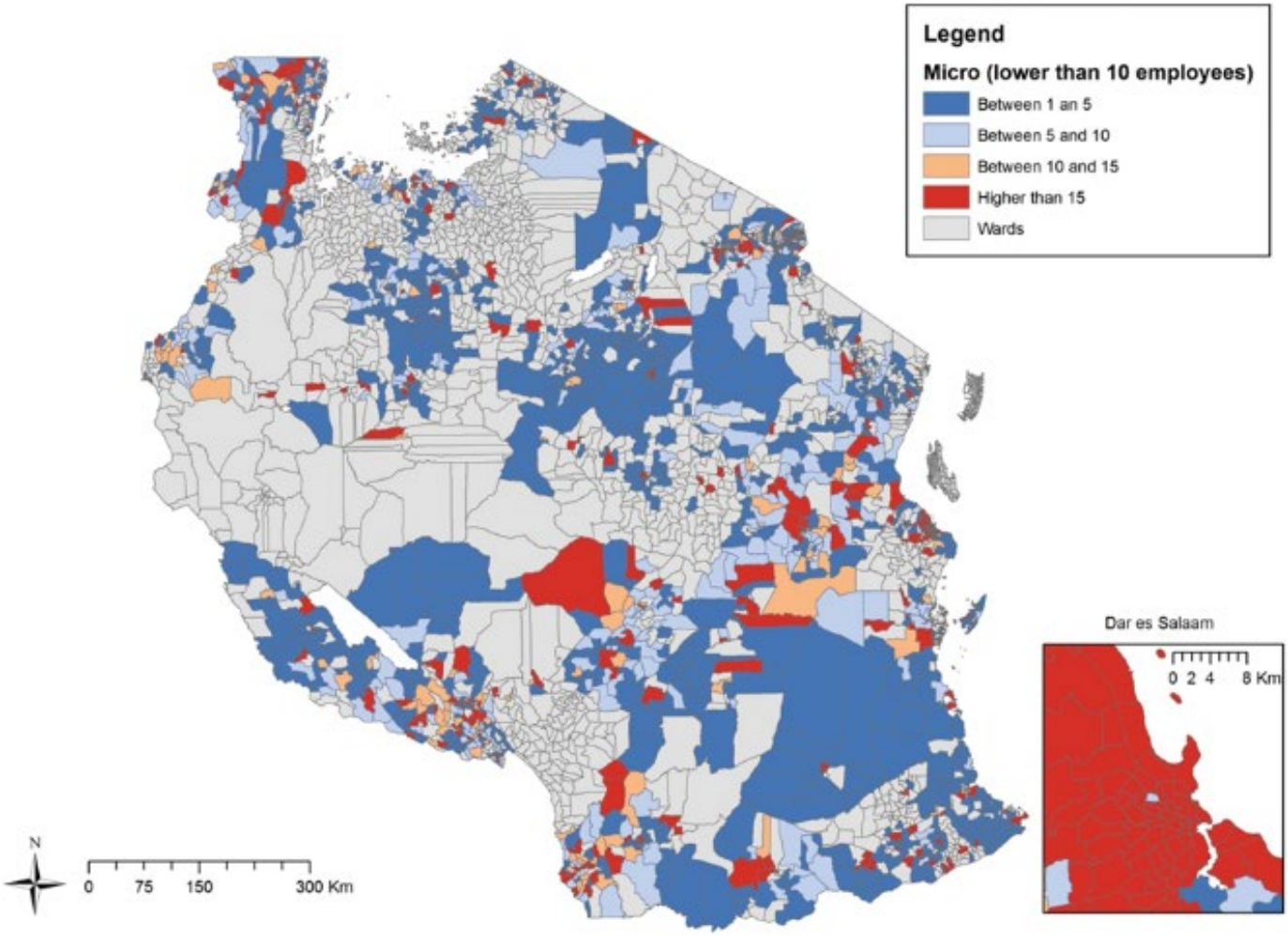
The more businesses in a district or region, of any type, the less poverty there is. Although micro and small firms are known to not pay well, their presence nevertheless contributes considerably to improving living standards and reducing poverty. However, poverty declines more when there are more medium and large businesses (Figures ES.28 and ES.29). The results are supported by the 2015–16 DHS findings, which show that in the eastern zone, which has most of the businesses, 7 in 10 people are in the two highest wealth quintiles. Conversely, in the southern and western zones, which have the fewest businesses, around half of the population is the two lowest wealth quintiles.

FIGURE ES.28: Relationship Between Poverty and the Number of Firms



Source: Statistical Business Register 2014/15, HBS 2017/18, and Tanzania Jobs Diagnostic (2017).

FIGURE ES.29: Geographic Distribution of Firms



Source: Statistical Business Register 2014/15, HBS 2017/18, and Tanzania Jobs Diagnostic (2017).

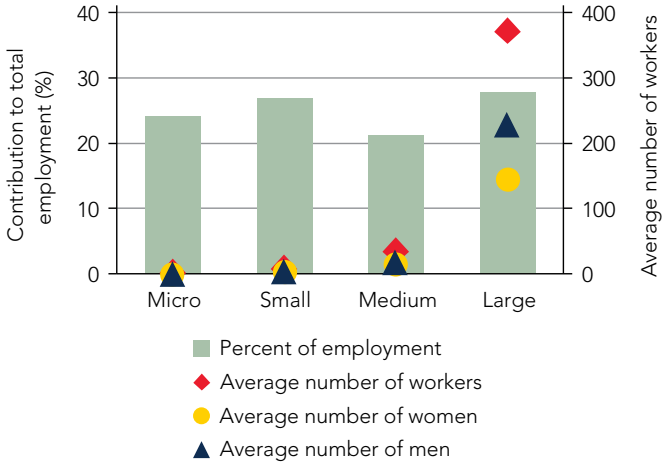
Although small firms dominate the economy and provide most of the jobs, medium and large firms could create jobs fast.

Despite the predominance of micro firms in the economy, they account for just 24 percent of employment; large firms account for 28 percent. About half of Tanzanian jobs (49 percent) are in medium and large firms, which account for about 4 percent of all businesses (Figure ES.30). Thus, even though fewer than 0.5 percent of all firms employ more than 100 workers, they account for about 28 percent of all employment—their average number of workers is over 370, compared to no more than 2 in micro firms and 9 in small ones. New firms in business for less than 5 years account for less than 25 percent of jobs, compared to 36 percent in firms that have lasted more than 20 years. Though only 50 percent of firms are formal, they account for over 80 percent of jobs. In general, firms tend to employ twice as many men as women; the gender discrepancy is slightly higher in small and young firms. The average number of men is two times higher than that of women in these firms, while it is 1.6 times higher in larger and older firms.

In industry large firms contribute the highest proportion of value-added. In 2013, total industrial value-added was TZS 8,220,560 million, 84 percent of it from large firms (Figure ES.31). Value-added per worker in large firms is double that of medium firms and about 20 times higher than in micro-firms. Apparently, over time firms that manage to grow become markedly more productive. Yet they account for only 0.5 percent of industrial firms; that may explain why industry in general is persistently unproductive.

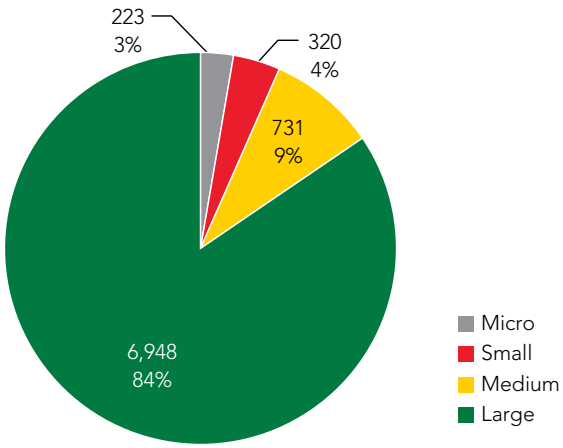
Net job creation is mostly attributable to larger, older firms. In 2010–13, small firms created 34 percent of new jobs and medium and large firms about 67 percent. However, micro firms lost jobs; they were down by about 1 percent. Firms in business less than 5 years created 8 percent of new jobs. Firms more than 15 years old accounted for more than 50 percent of the jobs created.

FIGURE ES.30: Employment by Gender and Firms Size



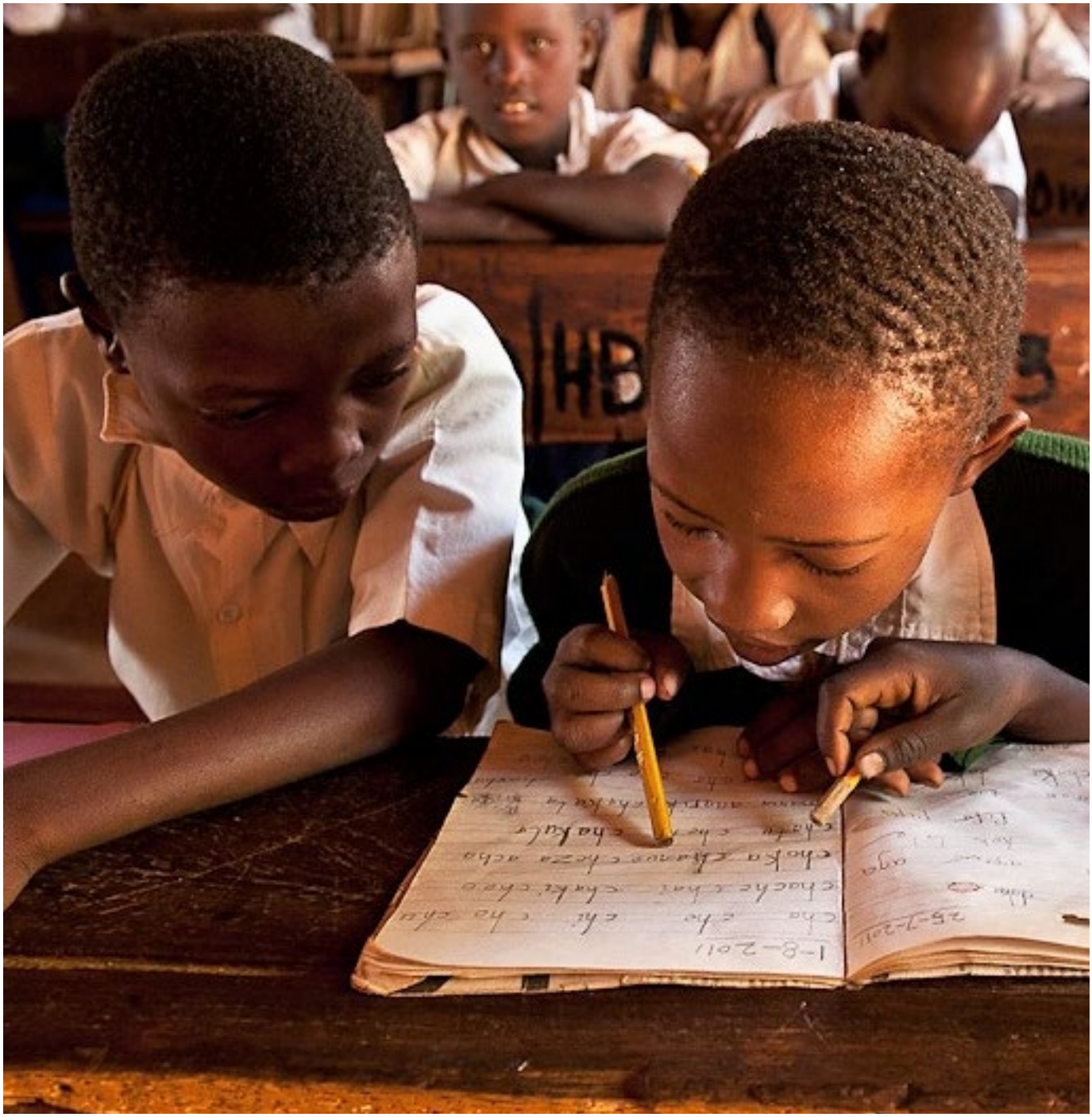
Source: Census of Industrial Production 2013.

FIGURE ES.31: Value Added by Firm Size, Billion TZS and Percent



Source: Census of Industrial Production 2013.

Small firms are hemmed in by the economic environment and the lack of support for entrepreneurs, large firms by factors related to competitiveness. Both small and large firms perceive the high cost of production as the leading barrier to better performance. However, they differ in their perception of the importance of other problems. More than 30 percent of micro- and small firms cite the uncertain economic environment, inadequate technology, lack of support to the private sector, and insufficient demand and production capacity as major concerns. However, more than 30 percent of medium and large enterprises report inadequate physical infrastructure, currency fluctuations, unfair competition, and lack of raw materials and qualified labor as their main problems. Inadequate financial services also rank high as a challenge to industry, but the problem affects small firms more than large ones.



Limited access to finance and the need to rely heavily on family networks and informal funding are barriers to emergence of a vibrant private sector.

Tanzania's formal firms perceive access to finance as a major and increasingly important obstacle. In the 2013 Enterprise Survey, about 70 percent of respondents identified access to finance as an important problem for their current operations, far higher than in 2006, when about 54 percent of respondents identified access to finance as a moderate or major obstacle.

The larger the firm, the less is access to finance a constraint. In 2013, only 28 percent of Tanzanian companies with fewer than 10 employees saw access to finance as either not an obstacle or only a minor one, but 69 percent of companies with more than 200 employees were not at all concerned about it. Similarly, only 23 percent of large companies saw access to finance as a major or severe obstacle, compared to 39 percent of micro and 52 percent of small firms.

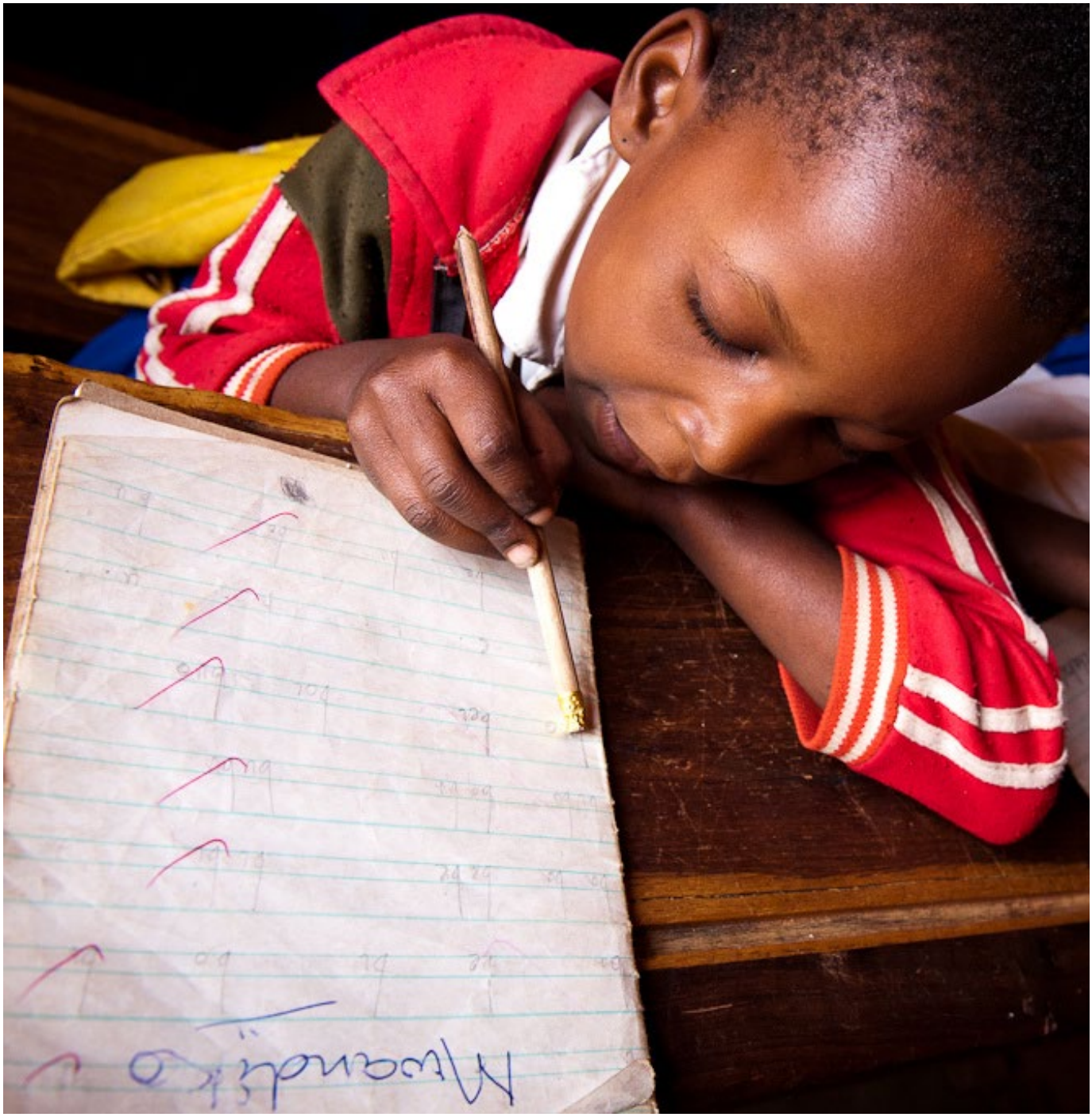
Financial constraints do not seem to be suppressing the growth of Tanzanian firms. Even though a majority of Tanzania's firms are perceived as financially constrained, from the results of the 2006 and 2013 Enterprise Surveys, lack of access to finance does not seem to be a major determinant of growth: as firms grow larger, access to finance tends to be less of an obstacle—perhaps because larger firms tend to have more access to evolved financial tools, such as overdraft facilities and credit lines in formal financial institutions.

Informal household enterprises have very little access to loans. Only 10 percent secured a loan to develop or support business operations. The rate rises to 12 percent for urban household enterprises and household services businesses. The credit comes mostly from micro-credit entities or informal credit channels like SACCOS, private money lenders, or informal microcredit institutions. About 40 percent of the household enterprises that borrowed used the micro- and informal credit channel; just 18 percent secured loans from a traditional bank. Most household enterprises are financed from personal savings or income, or from other households as gifts or loans.

Financial inclusion is only moderate; many Tanzanians lack formal financial relationships. Owning a bank account, having formal savings, and being able to access credit from a financial institution are the three main indicators for measuring an individual's access to basic and critical financial tools. According to the 2017 Findex survey, 47 percent of the population had a formal bank account, just 6 percent had formal savings, and 5 percent had access to formal credit. HBS 2018 found that in the previous 12 months, 12 percent of household members had savings or current accounts and only 2 percent took out loans.

Financial inclusion is heavily determined by socioeconomic characteristics: Older, better-off, and educated men are more likely to be financially included than young, uneducated, and poor women. Education and living standards are thus very significant in explaining financial inclusion, which suggests that financial literacy matters to the choices individuals make with regard to saving income. The better-off individuals are, the more likely they will have a formal account,

formal savings, and access to formal credit. According to 2017 Findex, only 32 percent of individuals in the lowest wealth quintile had a formal bank account, compared to 63 percent of those in the richest quintile. The differences are similar for formal savings and formal credit. Similarly, the more education Tanzanians have, the more likely they are to have access to major financial tools; for instance, all respondents who had a tertiary education had a formal bank account, compared to only 41 percent of those who had completed no more than primary education. HBS 2018 found significantly lower rates: only 1.4 percent of individuals in the poorest quintile had a savings or current account compared to 35 percent of those in the richest.



Implications for Policy.

This report provides a comprehensive analysis of poverty in Tanzania. The analysis compares data from the 2017/18 HBS with those of the 2007 and the 2011/12 HBSs. It also incorporates information from such other sources as waves 1 to 4 of the NPS, the 2006 and 2013 Enterprise Surveys, the 2013 CIP, the 2014/15 SBR, the rebased GDP statistics, the 2006 and 2014 ILFSs, the 2015/16 DHS, the 2017 Findex, the 2012 Population and Housing Census and satellite data. Drawing on all these sources gives a truly comprehensive picture of poverty in Tanzania, addressing issues that could not be captured from a single source. The rich analysis illustrates the diverse, multisectoral nature of poverty and its dynamics—useful information for prioritizing poverty reduction strategies. The report identifies areas where concerted efforts by the government and other stakeholders would yield the highest payoffs for poverty reduction and more sustainable and inclusive development. The policy pointers that follow are focused on making growth more inclusive through continued development of human capital, furthering structural transformation, and promoting growth of labor-intensive firms and creation of more productive jobs.

Tanzania has solid fundamentals for combatting poverty. With its rich and diverse resources, strategic location, effective planning, and political will, Tanzania is well-positioned to use a variety of policy tools to promote productive job creation and reduce poverty and inequality. Besides strategies to accelerate growth to transform Tanzania into a middle-income, semi-industrialized economy and to strengthen human capital, the government has initiated reforms to build up infrastructure, strengthen fiscal management, and improve the business environment. In recent years the government has also done a great deal to support the poorest Tanzanians: it has opened access to free primary education; increased incomes and reduced vulnerability through productive social safety nets; and expanded delivery and coverage of basic social and community services. Although these efforts have indeed helped to reduce poverty, they need to be intensified if they are to bring about sustained improvements in the lives of Tanzanians.

Policy now needs to be directed to ending the vicious cycles of unequal opportunity and vulnerability and putting in place mutually reinforcing interventions to build capacity and foster better livelihoods. The basic commitments should be to improved service delivery and infrastructure for all; expanded employment opportunities and higher productivity; investments in human capital to help people develop the skills they need; and protection for the most vulnerable. The design of priority interventions should take into account the specifics of Tanzania's poverty.

Use a well-targeted life-cycle approach to enrich human capital.

Invest in human capital and increase skills to heighten productivity and incomes and sustainably reduce poverty. Improvement in human capital is among the factors that helped ease poverty. However, the reduction in poverty has been quite slow compared to Tanzania's remarkable economic growth—which was driven by sectors that are not always open to the poor and mainly benefited those with higher education and more endowments. Building human capital is critical to ensure more inclusive growth and faster poverty reduction. Because such investments are structural, they are likely to be long-term interventions. Meeting the goals will require a four-pronged reform strategy: (1) expand provision of early childhood development services to build the foundational capabilities, cognitive and noncognitive, of tomorrow's workers; (2) empower vulnerable families; (3) invest more in education and education quality; and (4) improve the capability of those new to the labor market and upgrade the skills of current workers. The first prong has a long-term agenda, but the second through fourth can be accomplished in the short to medium term. The reforms should be part of a cohesive and sequenced policy agenda, guided by economic development needs, that addresses current and coming needs for skills. They should be complemented by interventions to improve the quality and accessibility of primary health care and social services so as to raise labor productivity and empower poor people. Evidence from the report points to the following priorities throughout the life-cycle:

- **By investing in their early years, move children to high-development trajectories.** Poor children under 5 suffer from acute malnutrition, manifested by high stunting, particularly in rural areas. Deprivations not only in nutrition but also in such basic amenities as safe water and sanitation impair their current and future learning and development and will have long-lasting effects on their socioeconomic achievements. While some losses are irreversible, others can be partly mitigated by early stimulation. Preventing stunting for new generations is possible with a sound combination of targeted social services (nutrition, income support), community monitoring, and parental education. An additional priority for early childhood development is advancing government efforts related to maternal and infant health. Essential interventions are expanding access to health care; universal provision of safe water and adequate sanitation; and mainstreaming health and nutrition interventions. Investments in the supply and quality of both pre-school and basic education will also help to build cognitive skills in early childhood, enhance abilities and motivation for learning, and sustain learning throughout schooling and beyond.

- **Draft and apply a policy to empower families that have a large number of dependents and strengthen the resilience of vulnerable populations.** Poverty is significantly higher among households with a large number of children and dependents. Improving human capital in these households could eventually lower the number of children and dependents. The policy should incorporate factors that promote the education of girls and the participation of women in the labor force, both of which have implications for fertility and poverty. The PSSN program has had impact in strengthening resiliency and reducing poverty; without the program both the proportion and number of poor people would have been much higher. However, only 14 percent of poor households and 9 percent of total households benefit from PSSN. Today, several years since the program was designed, targeting of the cash transfer program needs to be revisited, but a mechanism should also be put in place to strengthen the resilience of those who graduated from the program to ensure that they do not fall back into poverty.

- **Provide universal access to education beyond the primary level, particularly for girls.** Currently, 18 percent of Tanzanians have no education and of those with some schooling, 60 percent did not go beyond primary school; and the rates for women are 23 and 58 percent. Enrollment in lower secondary and beyond is very low generally and strikingly so among poor families. This suggests that deficiencies in education will perpetuate over time. Because those with secondary or higher education were better able to benefit from the returns of economic growth and escape poverty, a policy that expands access to secondary and higher education could ultimately open up job opportunities in more productive sectors. Policies need to give special attention to expanding access to higher education for girls, particularly girls in rural areas and in poor families.

- **Build the capacity of current workers and bridge skills gaps through technical training.** In expanding access to higher education, it is essential that technical and vocational tracks provide graduates with the solid general skills the labor market demands. Technical and vocational schooling could also be a fast way to train mid-level skilled workers for the immediate needs of the labor market but might not equip graduates with a solid foundation of general skills that allow them to adapt as labor market requirements change. It is also probable that young graduates from the general track who do not enter tertiary education lack many job-relevant skills. It is important that all tracks provide the right skill-mix and that tracks are permeable enough to ensure that graduates have a range of paths for continuing to acquire skills. Improving the access and relevance of technical and pre-employment training is the most direct way to build the skills of the current workforce. Better coordination with private employers is necessary to design market-relevant curricula and course offerings and to provide financial and technical support that better responds to the needs of growing sectors of the economy. It is also important to incorporate gender equity into development programs and projects to ensure that all citizens have equitable access to human development efforts. This could open up job opportunities in sectors where women do not traditionally work and help to empower them.

Take advantage of the momentum created by investments in basic services to expand service delivery.

Investment in social and community services could make these services more accessible in rural areas, which would maximize their impact on poverty reduction. Access to electricity, safe water, sanitation, and roads has helped reduce poverty, but services in rural areas and for the poor are still inadequate. Access to electricity is still low, but in rural areas use of solar energy as a source of lighting is expanding. Access to safe water has doubled in urban areas but there has been limited changes in rural areas, which also suffer from minimal change in access to improved sanitation. Most rural roads are still rudimentary. It is therefore necessary to:

- **Increase coverage and access to basic services.** For instance, expand the electricity grid to reach more rural households; promote solar energy as a source of lighting; expand the water system to improve access to safe drinking water and bring water closer to users to minimize the time and distance required to access it; and expand sanitation systems.
- **Expand the road network and improve the quality of roads and their links to better link rural farmers to urban markets.** Access to roads has been identified as crucial if rural incomes are to grow. Better rural roads will reduce the costs of moving agricultural products and promote agricultural marketing and commercialization.

Accelerate creation of productive jobs by boosting the benefits of structural transformation and promoting opportunities for small firms to grow.

Tanzania's economy is transforming, but too slowly. The decrease in agriculture's contribution to GDP and the shift of labor from agriculture to services and industry suggest that the structure of the economy is being transformed, but the large productivity gaps between sectors suggest that faster transformation would provide significant productivity gains. Skills shortages are a formidable barrier to transformation, but so are other factors, such as the small size of Tanzanian firms and the difficulty they have in surviving and growing; the prevalence of informality; the lack of productive capacity; their limited access to financial resources and technology; and the general low value-added of small firms. Micro- and small enterprises need to be empowered to further structural transformation and increase creation of productive jobs. Because agriculture remains the mainstay of the vast majority of the poor, it needs to be made more productive. The following could help address these issues:

- **Boost the productivity of agriculture.** Despite the continuing transition of agricultural workers to services and industry, the livelihoods of a significant number of Tanzanians still depend on agriculture. Among efforts to make agriculture more productive that should continue are supplying farmers with the inputs necessary to increase fertilization and improve irrigation and soil management; and providing credit, transport, and marketing facilities. Efforts should also be directed to supporting a transition to cash crops and commercial agriculture, where productivity and economic returns are higher.
- **Build the capacity of micro- and small enterprise to survive and grow in order to support income growth and creation of better jobs.** For some poor workers, self-employment is the most viable way out of unemployment and poverty. Targeted interventions to improve returns to self-employment by, e.g., facilitating access to productive assets, frequent and sustained coaching, pre- and post-business creation advisory services for entrepreneurs, and specific social support measures could help push up their profitability and economic returns.
- **Remove barriers to accessing finance.** If private businesses are to grow and poor households to generate income to break the cycle of poverty, both need external financing.
- **Promote financial literacy.** Besides expanding access of the poor and microenterprises to credit, inclusion may depend on empowering them by educating them on the best available financial options, how to save for life events, and how to use insurance or similar products to prepare for the unexpected.
- **Improve the general business environment, which is crucial to private sector growth and job creation.** Since job creation is the most immediate avenue to promoting pro-poor growth, and the private sector employs most of Tanzania's workforce, accelerating growth and promoting shared prosperity will depend on significant improvements in the national business environment.

CHAPTER 1

Poverty and Inequality Patterns

I. Progress in Reducing Poverty

Tanzania has seen a progressive decline in poverty over 2007–2018.

The proportion of Tanzanians living below the national basic needs poverty line, set at Tanzanian shilling (TZS) 49,320 per adult per month based on the 2018 Household Budget Survey (HBS), declined from 34.4 percent in 2007 to 26.4 percent in 2018. The reduction was faster between 2007 and 2012 than thereafter (Figure 1.1). The basic needs poverty headcount fell nationwide but most dramatically in rural areas. In the past decade the proportion of Tanzanians who are extremely poor and cannot afford to buy basic foodstuffs to meet their minimum nutritional requirements of 2,200 kilocalories (Kcal) per adult per day also declined from approximately 12 percent to 8 percent (Box 1.1).

Not only was the proportion of the population living in poverty reduced, but so was the depth and severity of poverty. From 2007 to 2018, the depth of poverty (or poverty gap) decreased from 10 to 6 percent and the severity of poverty was more than halved, from 5 to 2 percent. This implies that in 2018 poor households would require an average of TZS 3,058 per adult equivalent per month to escape poverty. The amount averages TZS 3,650 in rural areas and TZS 1,726 in urban areas. Furthermore, the severity of poverty index indicates limited inequality in consumption between poor households.

FIGURE 1.1: Poverty Trends, at the National Poverty Line, 2007–18, Percent

A. Basic Needs Poverty Headcount

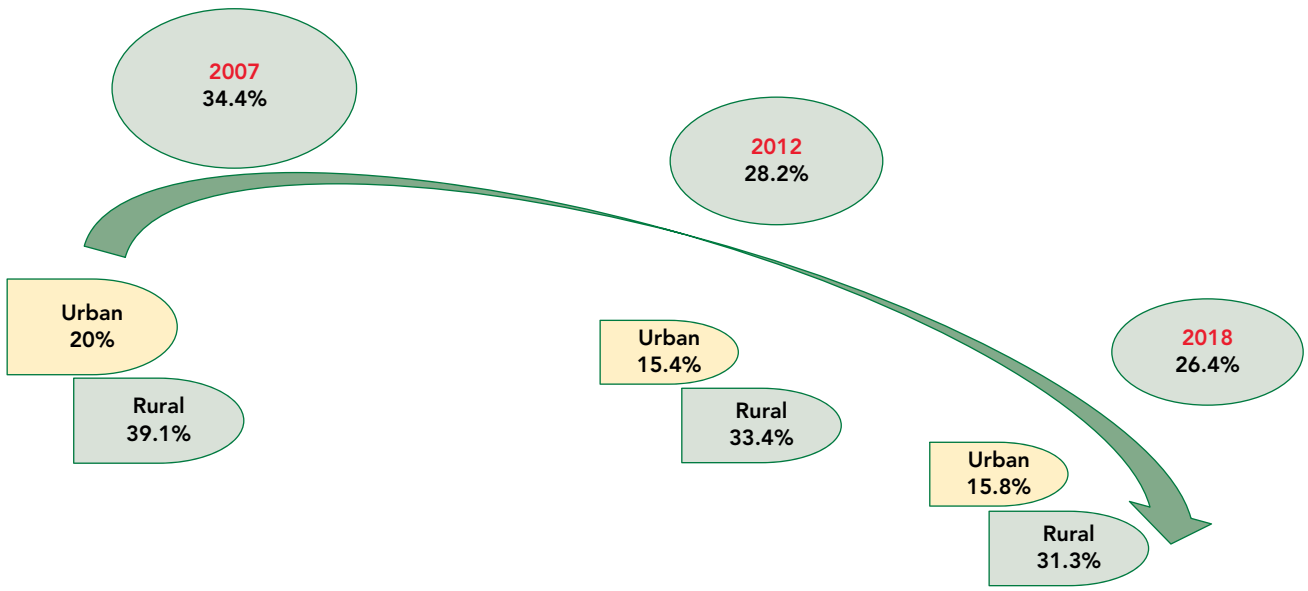


FIGURE 1.1B. Extreme Poverty Headcount

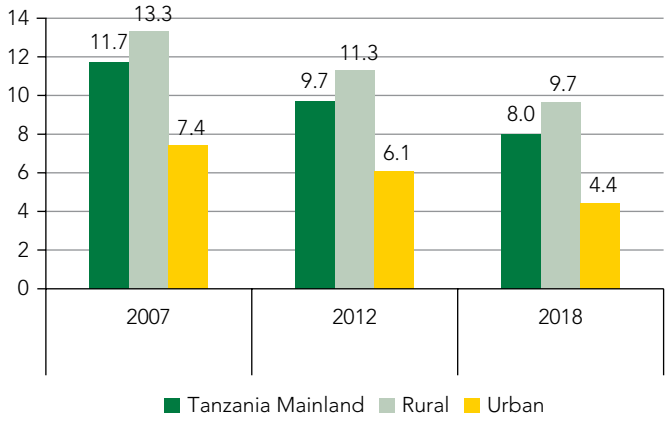
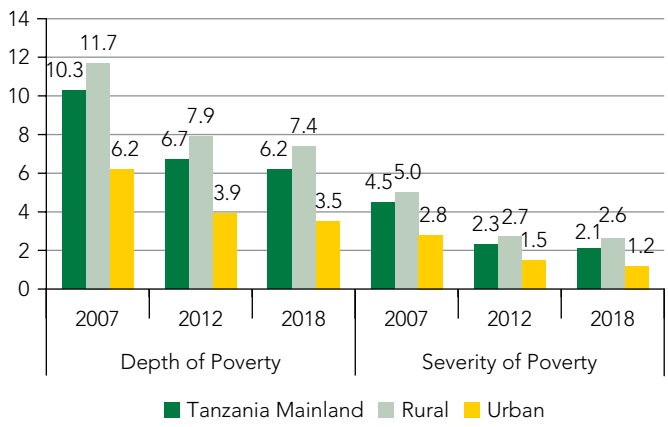


FIGURE 1.1C. Poverty Depth and Severity



Sources: HBS 2007, 2011/12 and 2017/18.

BOX 1.1 Poverty Measures

In Tanzania, poverty is measured by comparing a household's consumption per adult equivalent with the national poverty line using Household Budget Survey (HBS) data. The consumption aggregate comprises food, including food that households produce themselves, and expenditures on a range of other goods and services (e.g., clothing, utilities, transportation, communication, health, education). It excludes rent and other housing-related expenditures and spending on exceptional events (e.g., marriages, funerals) and larger consumer durable items (e.g., cars, TVs). Price deflators are used to adjust consumption per adult equivalent for price differences in different locations and over the course of the HBS fieldwork. *Poverty lines* are based on the cost of basic needs: The food poverty line (TZS 33,748 per adult per month in the 2018 HBS) is based on the cost of a food basket containing 2,200 calories per adult per day given consumption patterns in a reference population. The basic needs poverty line (TZS 49,320 per adult per month) adds an allowance for basic nonfood necessities to the food poverty line.

The following four measures are commonly used to assess poverty. The basic needs headcount poverty rate ("poverty rate" in the text) measures the proportion of the population whose monthly spatially- price-adjusted total household consumption per adult equivalent is below the basic needs poverty line. The extreme headcount poverty rate ("extreme poverty rate") measures the proportion of the population living below the food poverty line. The depth of poverty (or poverty gap) indicates how far, on average, poor households are from the poverty line. Capturing the mean consumption shortfall relative to the poverty line across the whole population, it is measured as the sum of the consumption deficit from the poverty line for the poor (the nonpoor have a shortfall of zero) divided by the total population. The depth of poverty shows the total resources needed per adult equivalent to eliminate poverty, assuming that all poor individuals have exactly the same shortfall between their consumption and the poverty line. The severity of poverty (or squared poverty gap) captures both how far the poor are from the poverty line and consumption inequality among the poor.

Rural poverty declined steadily over 2007-18, but urban poverty outside Dar es Salaam did not really begin to fall until 2012. The reduction of urban poverty between 2007 and 2012 was driven entirely by a plunge in the proportion of poor people in Dar es Salaam, from 14 to 4 percent; in other urban areas the drop was marginal, from 22.7 to 21.5 percent. In contrast, between 2012 and 2018, poverty fell to 19.2 percent in urban areas outside the metropolitan city, whereas it increased in Dar es Salaam, to 8 percent, although this increase is questioned (Box 1.2).

BOX 1.2 Change in Poverty in Dar es Salaam

Is the recent increase in poverty real? Poverty in Dar es Salaam declined from 14 percent to 4 percent from 2007 to 2012 but seems to have increased to 8 percent in 2018. Changes in sampling methods or overestimation of the reduction in poverty in 2012 may be behind this increase. The survey-to-survey imputation results do not support these results and indicate a decline in poverty from 14 to 8 percent from 2007 to 2012 and stagnation since then.

Changes in living conditions do not point to an increase in poverty from 2012 to 2018. Access to safe drinking water, improved sanitation, efficient cooking fuels, and electricity increased during this period, although to a lesser extent than in other parts of the country. Human capital outcomes improved, as did employment in more productive sectors. All these changes support the fact that poverty may have not increased during this period.

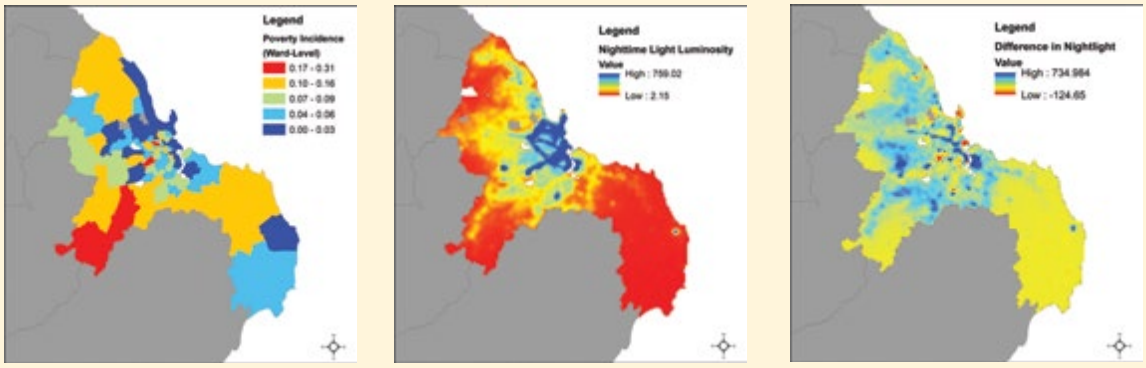
Deterioration of returns to education in poor households may have aggravated poverty. With the expansion of education, opportunities for well paid jobs for individuals with primary education and lower decreased, resulting in deterioration of returns for poorer households. Although this offset the improvements in living conditions, it cannot explain the observed doubling of poverty from 2012 to 2018.

Migration patterns do not indicate substantial changes that could explain a substantial variation in poverty. Nearly 80 percent of heads of households in Dar es Salaam migrated from other regions—a slight increase from 74 percent in 2012. According to the data, the poverty rate increased slightly among migrants from 2012 to 2018 but to a lesser extent than the increase in poverty among nonmigrants. Overall, the poverty rate was lowest in individuals who migrated over the past five years, followed by those who migrated during the past 5-15 years, and highest in those who migrated over 15 years ago or those who did not migrate.

Changes in economic activity and disparity in poverty across the city do not support a potential doubling of poverty between 2012 and 2018. There are large variations in poverty across the districts and wards in Dar es Salaam. The least impoverished wards include Kivukoni, Upanga Mashariki, Kurasini, Kawe, and Upanga Magharibi, which all have a poverty rate of less than 1 percent (Figure 1.2).[2] These wards are clustered around the central business district of Dar es Salaam and the vicinity. Among the most impoverished areas are Chanika, Msongola, Makurumla, Vingunguti, and Kivule, with poverty rates greater than 20 percent. These areas are clustered around the southwestern part of Ilala District.

FIGURE 1.2: Poverty and Demographic Dynamics in Dar es Salaam, 2018

A. Poverty Incidence at Ward Level **B.** Nighttime Lights in 2018 **C.** Changes in Nighttime Lights, 2013–18



Sources: World Bank estimates based on 2018 HBS and auxiliary variables. Nighttime lights are based on Visible Infrared Imaging Radiometer Suite (VIIRS) Version 1.

Notes: The nighttime light data are all downloaded from: ngdc.noaa.gov. Fig. 1.2 B. shows the sum of monthly nighttime light luminosity for 2018. The nighttime light data for June 2018 are not available and were excluded from the analysis. Fig. 1.2C. shows the differences in the sum of nighttime light luminosity between 2013 and 2018.

continued

[2] See Appendix G for details on the estimation method of ward-level poverty rates in Dar es Salaam. Numbers should be treated with caution, as they are less precise than district-level poverty estimates (coefficient of variation exceeds 20).

BOX 1.2 *(Continued)*

Urbanization and growth patterns of Dar es Salaam, as measured according to intensity of nighttime light and its changes over time, suggest that the poorest areas in Dar es Salaam (mainly in the southeastern part of Ilala district) have seen only marginal growth in economic activity; growth appears to be most pronounced in peri-urban and suburban areas, including Gongolamboto, Kinyerezi, Chamazi, Ukonga, and Vijibweni. There are some signs that growth is spreading outward beyond the city core, although it remains to be seen to what extent the agglomeration effects of urbanization benefit the poorest within Dar es Salaam, who seem still to be disconnected from such benefits.

Tanzania's record of poverty reduction is robust and is not affected by changes in survey methodology. Assessments of changes in poverty over time are subject to problems with comparability stemming from changes in design and methodological improvements in the 2007, 2012, and the 2018 HBS (see Appendix A for details). These challenges were addressed using survey-to-survey imputation procedures based on the small-area estimation approach of Christiaensen et al. (2012). The results support the finding of declines in poverty and extreme poverty over the past decade. Although the imputed results support the observed reduction in both rural and urban poverty, they suggest that, in Dar es Salaam, poverty declined at a slower pace (than that observed from original data) between 2007 and 2012, whereas the poverty rate stagnated at approximately 8 percent between 2012 and 2018.

Greater access to basic services and to productive assets is the main cause of the reduction in poverty.

Tanzanian households have seen a marked increase in access to basic services and infrastructure, which has accelerated since 2012. The analysis of the drivers of poverty reduction is based on the decomposition described in Box 1.3. The results indicate that poverty reduction was entirely explained by improvements in the endowments of households in poorer income groups in both 2007–12 and 2012–18 (Figure 1.3). The endowments rose much higher in the second period, primarily due to improved access to basic services and infrastructure, which accounted for about 60 percent of consumption growth.

BOX 1.3 Decomposition of Poverty

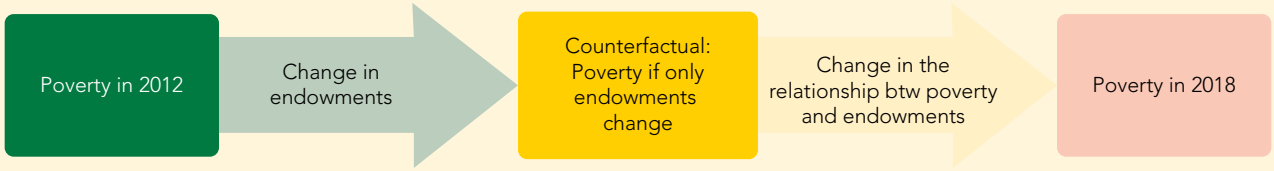
To explore the basic factors behind the decline in poverty, changes in household consumption have been decomposed into (1) improvements in household characteristics or *endowments,* such as more education of the head of the household, ownership of assets, and access to employment opportunities and basic services; and (2) changes in the rewards or *returns* that they get for those characteristics like returns to education, assets productivity, and return or profit to business. The two components have themselves been decomposed to identify specific attributes that contribute to changes in consumption, and the decomposition has been applied to each decile of the consumption distribution to understand differences in the patterns of change for different income groups.

The approach is based on the Recentered Influence Function (RIF) and unconditional quantile regression method proposed by Firpo, Fortin, and Lemieux (2009), in which traditional Oaxaca-Blinder decompositions are applied to the consumption distribution by percentile. This makes it possible to assess the amount of poverty reduction attributable to changes in the endowments of households and the amount due to changes in the Tanzanian economy and economic returns to people's endowments:

$$\hat{Q}_\theta^{i} - \hat{Q}_\theta^{i'} = \left\{\hat{Q}_\theta^{i} - \hat{Q}_\theta^{*}\right\} + \left\{\hat{Q}_\theta^{*} - \hat{Q}_\theta^{i'}\right\}$$
$$= \left(\bar{X}^{i} - \bar{X}^{i'}\right)\hat{\beta}_\theta^{i} + \bar{X}^{i'}\left(\hat{\beta}_\theta^{i} - \hat{\beta}_\theta^{i'}\right)$$

where $\hat{Q}_\theta$ is the θ^{th} unconditional quantile of log real per adult monthly household consumption, $\bar{X}$ the vector of characteristics averages, and $\hat{\beta}_\theta$ the estimate of the unconditional quantile partial effect. Superscripts i, i' and * designate respectively the final year (2018 or 2012), initial year (2012 or 2007), and counterfactual values.

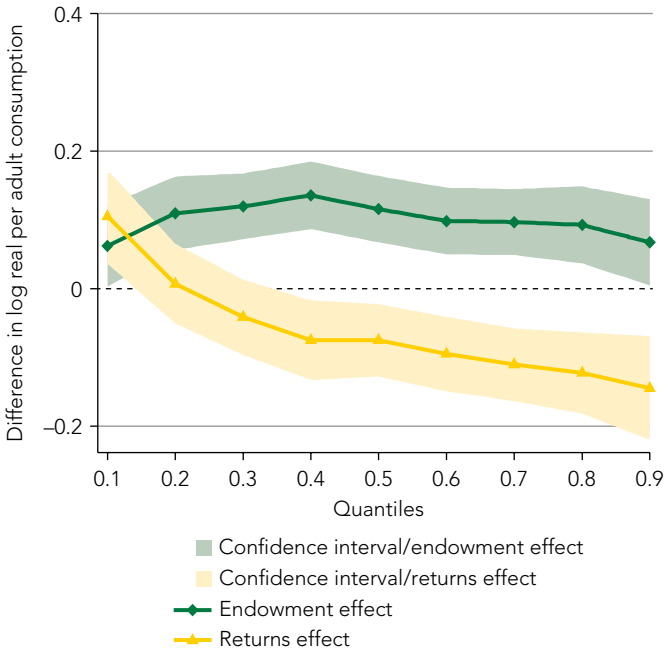
$\hat{Q}_\theta^{*} = X^{i'}\hat{\beta}^{i}$ is the counterfactual quantile of the unconditional counterfactual distribution; it represents the distribution of welfare that would have prevailed if the relationship between endowments and consumption had remained constant over time. It is used to determine which changes in endowments could have helped to reduce poverty, and how poverty reduction could have changed as a result of a changing relationship between consumption and endowments. Changes in return to endowments represents the variation of the conditional correlation between a given endowment and consumption over time. The decomposition works as follows:



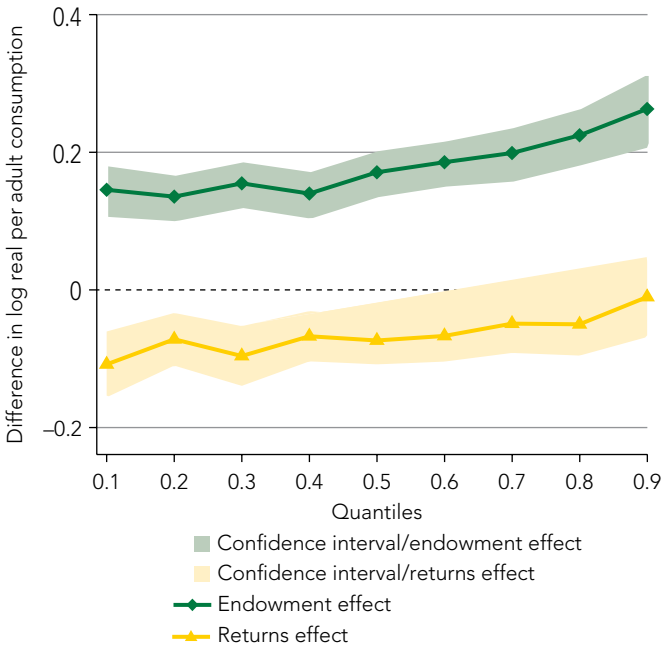
Expansion of access to improved lighting sources followed by greater access to roads, markets, and public transportation accounted for the increase in household endowments and consumption. The most significant contributor to the increase in access to basic services is the use of solar energy, which since 2012 has expanded particularly in rural areas and in poorer households. For instance, between 2012 and 2018, use of solar energy in rural areas soared from less than 2 to over 30 percent. Use of electricity for lighting, improved cooking fuels, safe drinking water, and basic sanitation went up for both rural and urban poor households, but the increase was faster in urban zones other than Dar es Salaam. Access to roads, public transportation, and markets expanded throughout the country, but especially in rural areas and for poorer households. Access to cell phone signals and, to a lesser extent, health centers and banks also expanded among the poor, especially in urban areas other than Dar es Salaam.

FIGURE 1.3: Drivers of Poverty Reduction in Mainland Tanzania, 2007–18

A. Endowment and Return Effects, 2007–12



B. Endowment and Return Effects, 2012–18



C. Estimates of Endowment and Return Effects, 2007–18

	EXTREME POOR		POOR		MIDDLE CLASS		RICHEST	
	2007–12	2012–18	2007–12	2012–18	2007–12	2012–18	2007–12	2012–18
Total	**0.167*** **	**0.038*** **	**0.078*** **	**0.059*** **	**0.040*** **	**0.097*** **	**-0.077*** **	**0.253*** **
Endowments	**0.062** **	**0.145*** **	**0.120*** **	**0.155*** **	**0.116*** **	**0.171*** **	**0.067***	**0.263*** **
Access to basic services	0.040***	0.108***	0.080***	0.115***	0.067***	0.095***	0.055***	0.02
Education of head	0.00	0.003*	0.004**	0.005***	0.004**	0.010***	0.010***	0.029***
Assets	0.114***	0.037***	0.093***	0.029***	0.089***	0.047***	0.056***	0.177***
Head nonfarm employment	-0.023**	0.005**	-0.02*	0.005*	-0.01	0.009***	-0.03	0.017***
Demographic structure	-0.016***	0.001*	-0.024***	0.002*	-0.025***	0.003***	-0.016***	0.004***
Returns	**0.105*** **	**-0.108*** **	**-0.041***	**-0.096*** **	**-0.075*** **	**-0.073*** **	**-0.144*** **	**0.01**
Access to basic services	0.055*	-0.141	0.05***	0.025*	-0.177***	0.018*	-0.140***	0.09
Education head	-0.086***	-0.08***	0.014	-0.093***	0.012	-0.024	0.006*	0.014***
Assets	-0.166***	0.023	-0.069***	0.022*	-0.156***	0.055**	-0.201***	0.049**
Head nonfarm employment	0.123**	0.005*	0.062**	-0.013**	-0.011	0.004**	0.012	0.014**
Demographic Structure	0.257***	0.031**	-0.014	0.038**	0.115*	-0.003	0.292***	-0.02

Sources: HBS 2007, 2011/12, and 2017/18.

Note: Extreme poor are population groups in the bottom 10 percent of the distribution; the *poor*, in the third decile; *middle class*, in the fifth decile, and the *richest*, in the top decile.

Ownership of communication and transportation assets also helped reduce poverty. In general, rural and poor households added fewer assets than urban and better-off ones (Appendix B, figures B.1-B.4). The increase was also slower in 2012–18 than in 2007–12. However, in the second period ownership of assets like mobile phones, motorcycles and motorbikes rose significantly faster for rural households in lower-income groups than for the rest of the population; and these increases were higher compared to the previous period. Meanwhile, ownership of more sophisticated assets (e.g., cars, computers, satellite dishes, TV, or fridges) rose faster in urban and better-off households.

Greater access to basic services and infrastructure has helped to heighten the productivity of poorer households. Greater access to roads and public transportation significantly increased the productivity and economic returns of poorer households, especially those in secondary urban centers, followed by those in rural areas. The latter also benefitted from more productive livestock. Investments in road maintenance, access to local and regional markets, and expansion of agricultural production through, for example, irrigation schemes and credit for small producers and businesses seem to have helped expand household endowments and their economic returns in some regions, especially Dodoma, Kilimanjaro, Tanga, Iringa Mbeya, and Kigoma. Although access to microfinance such as Savings and Credit Co-Operative Society (SACCOS) and other informal financial institutions has not changed much since 2012, these institutions have had an increasingly positive effect on the consumption of urban poor households other than in Dar es Salaam and to a lesser extent of rural households. Better hospital services may also have enhanced the productivity of the poor.

Better education and demographic changes have helped increase consumption, but only slightly. The expansion of access to education in Tanzania brought about an increase in educational attainment, particularly among the younger generation, but the improvements benefited primarily better-off households whose heads are younger. Although primary and lower secondary education increased noticeably for the poor in urban and rural areas, improvements in upper secondary and university education were significantly greater for the richest urban households. The size and composition of households has not changed in recent years, but although having many children seems to be a continuing constraint on household well-being, the negative effect seems to have diminished. These changes are particularly important among poorer households, as is apparent from the positive variations in the returns to demographic structure. This may be the result of the decisions to grant free access to primary education and improved health conditions.

A shift to more productive employment encouraged consumption, but mainly in urban areas and among the richest groups. The shift out of agriculture seems to have accelerated since 2012 and was coupled with more jobs and higher returns to employment, especially in services and to a lesser extent industry. However, these positive changes were more apparent among moderately poor households and those already better-off. Poor rural households saw only a slight increase in engagement in self-employment and, while remaining positive, their returns declined over recent years. Poor urban households outside Dar es Salaam saw a slight increase in wage employment and in private businesses, essentially self-employment, coupled with a modest improvement in returns. Better-off households in Dar es Salaam saw a marked rise in the returns to their education and employment, especially among public employees and the self-employed. These households, which have higher education and endowments in productive assets, may have been better positioned to take advantage of the opportunities generated by economic growth.

Lack of opportunities for meaningful increases in productivity and economic returns have partly offset efforts to curb poverty.

The changing relationship between endowments and consumption was the main drag on consumption growth and on the speed of poverty reduction. Except for the highest decile, changes in that relationship, holding endowments constant, was negative across the consumption distribution. This suggests a general deterioration in economic returns over the past decade, which seems to have accelerated since 2012.

While the reduction in returns was slower than the increase in endowments—which explains higher consumption and less poverty—it seems to have interfered with efforts to diminish poverty. On average, for 2012–18 the reduction of poverty would have been about 6 percentage points (pp) higher if the benefits from greater household endowments had not been partly offset by the deterioration of economic returns.

Only the returns for urban households at the top of the consumption distribution seem to have marginally gone up.

In 2018, means of basic transportation, ownership of a mobile phone, and access to markets no longer generated the same increase in consumption as before. As more people have mobile phones and access to mobile signals and the Internet, the value they add to consumption lessens. Increasingly used for business purposes and fund transfers, mobile phones continue to positively affect the livelihoods of the poor, but their marginal benefits have narrowed since 2012, especially in urban areas and in moderately poor households, for whom ownership of these assets has expanded rapidly but opportunities to foster their productive use have not. Similarly, returns from greater access to markets have been declining, especially in rural areas. The possession of modern transportation assets like motorcycles and cars has brought about a significant decline in returns to bicycles and other basic alternatives, which are still quite prevalent among the poor.

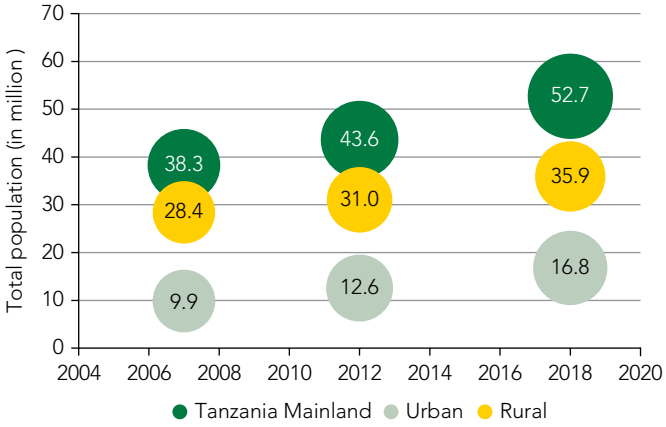
As more people have become educated, the correlation between educational attainment and poverty has fallen. Expansion of access to education and increases in educational attainment in the general population have occurred alongside changes in labor market requirements so that the rewards for fewer years of schooling than a certain level have declined. In particular, the gains in income and consumption associated with primary education are no longer as large as they had been. Consequently, households in the poorest groups, whose heads are generally older and cannot increase their education, experienced a marked decline in returns to their years of schooling. This decline, although apparent in rural and urban areas, was significantly larger in the latter, especially Dar es Salaam, where educational levels in general have increased faster. However, the correlation between consumption and postsecondary education increased significantly, again benefitting the richest urban households.

The slow reduction of poverty resulted in an increase in the number of poor people.

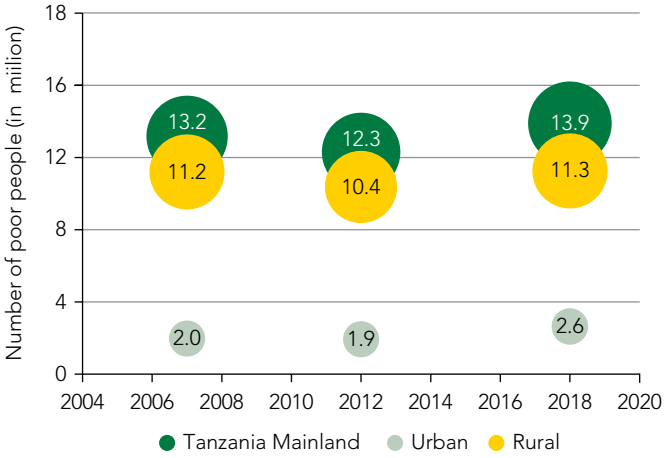
Poverty declined more slowly than the population grew, so the absolute number of poor Tanzanians went up. Poverty declined annually by about 3.6 percent in 2007–12, when population growth averaged 2.8 percent, and by 1.2 percent in 2012–18, when it averaged 3.5 percent.[2] Although poverty declined slightly more than the population increased during the first period, leading to a slight reduction in the number of poor people from 13.2 to 12.3 million, in 2018 the situation was reversed and the number of poor reached about 14 million (Figure 1.4). However, from 2007 to 2018 the number of Tanzanians who were extremely poor did decline, though very slowly, from 4.5 to 4.2 million.

FIGURE 1.4: Total Population and Number of Poor People, 2007, 2012 and 2018

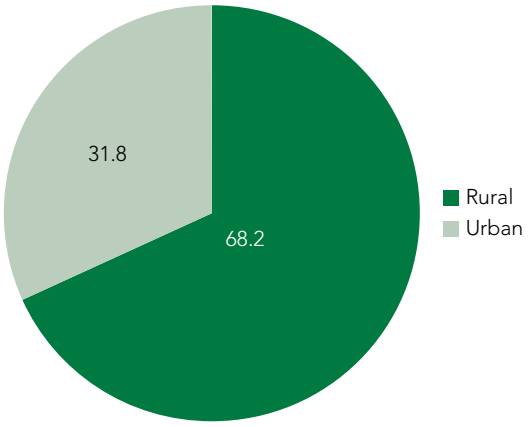
A. Population Size (million)



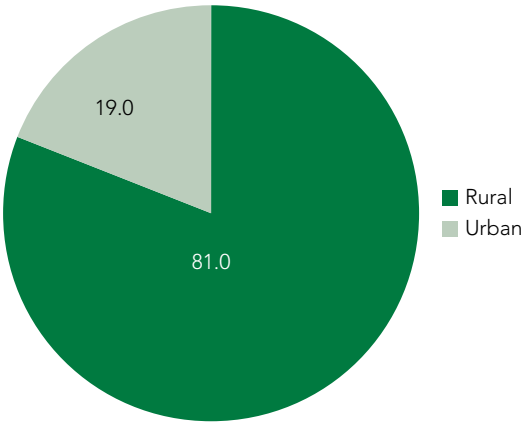
B. Poor Population (million)



C. Distribution of the Total Population by Geographic Area, Percent



D. Distribution of the Poor Population by Geographic Area, Percent



Sources: HBS 2007, 2012 and 2018.

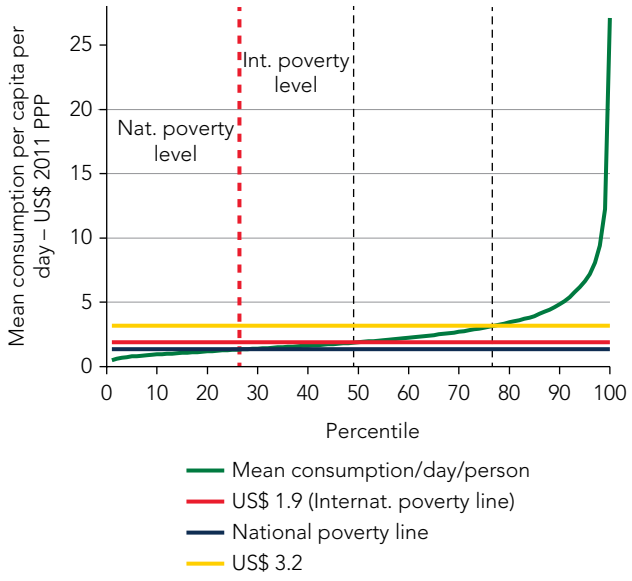
[2] These figures are based on estimates from HBS 2007 to 2018 and projections from the 2012 census.

Urbanization has been accompanied by a faster increase in the urban population, and consequently the number of urban poor, but most of the poor are still rural. During 2007-18, the urban population increased by about 7 million (70 percent) and the number of urban poor grew by 0.6 million (34 percent). The increases are the result of both urbanization and the dilatory pace of urban poverty reduction.[3] Most of the changes occurred outside Dar es Salaam, where the population has gone up by nearly 5 million (72 percent) and the number of poor by nearly 0.7 million (45 percent). In rural areas, the total population went up by only 26 percent, the number of poor people was almost unchanged, and the number of extremely poor declined. However, over 80 percent of the poor (11.3 million) continue to live in rural areas, where 3.5 million of them suffer from extreme poverty; in urban areas, 2.6 million live in poverty and 745,000 in extreme poverty (Figure 1.4).

Many Tanzanians are clustered around the poverty line.

Given the large proportion of the population at or near the poverty line, economic shocks or policy interventions could quickly push the poverty rate either up or down. The curve of average consumption by percentile in figure 1.5 appears relatively flat at the bottom end of the distribution, which implies that many people are very near the national poverty line. For instance, increasing the daily consumption of poor households by just TZS 350 per adult equivalent would lift about half of the poor out of poverty. Meanwhile, a quite important proportion of Tanzanians live just above the poverty line, which underscores their vulnerability. Around 20 percent of the nonpoor have consumption levels that are no more than TZS 550 per adult equivalent per day above the poverty line and are at risk of falling back into poverty if they experience unexpected economic shocks. The pattern in 2012 was similar, but in 2018, concentration around the poverty line seems to have intensified. Numerous initiatives to empower the poor seem to have brought them closer to fulfilling their basic consumption needs, but as yet there has been no huge leap out of poverty.

FIGURE 1.5: Consumption Density around the Poverty Line in 2018 (2011 PPP)



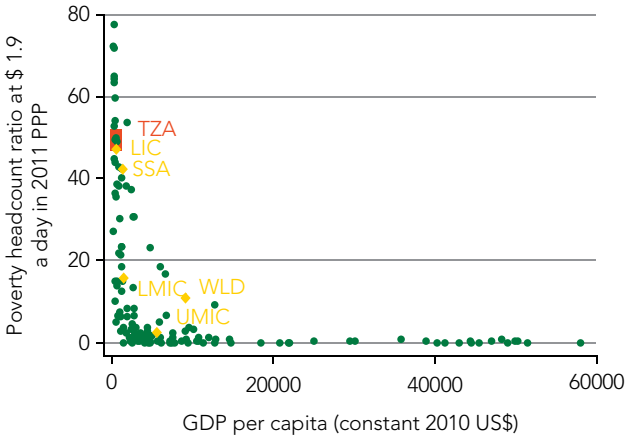
Source: HBS 2017/18.

Notes: Fig. 1.5 plots the average consumption (per capita per day at US$ 2011 PPP) for each percentile of the consumption distribution. The national poverty line is converted in per capita per day terms (at US$ 2011 PPP). The national poverty line is equivalent to $1.35 PPP per day per capita.

The concentration of the population around the poverty line translates into a significantly higher level of poverty according to international standards. Tanzania's national poverty line is lower than the international line of US$1.90 per person per day in 2011 Purchasing Power Parity (PPP) exchange rate. Using the international line, about 49.1 percent of the population were living in poverty in 2018—25.9 million Tanzanians, among the largest numbers of poor people in Africa (Figure 1.6). The share of the poor in Tanzania's population is also significantly higher than would be expected given the country's per capita Gross Domestic Product (GDP). There is a 22.7 pp difference between the international and national poverty rates, which represents around 12 million people because of the large share of the population clustered around the national poverty line.

[3] The urban population increased by about 70 percent from 2007 to 2018 and the urbanization rate rose from 26 to 32 percent.

FIGURE 1.6: International Poverty Headcount Ratio at $ 1.9 a day and GDP per capita (2011 PPP)



Sources: HBS 2017/18 and WDI 2019.

Notes: Fig. 1.6: TZA, LIC, LMIC, UMIC, SSA, WLD stand respectively for Tanzania, Low Income Countries, Lower Middle-Income Countries, Upper Middle-Income Countries, Sub-Saharan Africa and World.

Households close to the poverty line are highly likely to transition in and out of poverty. Based on data from the National Panel Survey (NPS), between 2010 and 2015 only about 16 percent of Tanzanians significantly improved their economic status and moved out of poverty; and 13 percent of middle-class households fell back in. Nearly 12 percent of those at the bottom of the consumption distribution are trapped in chronic poverty. Movements into and out of poverty appear to be higher in rural than in urban areas, suggesting that rural residents are more vulnerable to transitory (as well as chronic) poverty. These dynamics are explored more in depth in the second chapter of this report.

II. The Incidence of Growth and Patterns of Inequality

The patterns of consumption growth and distribution have changed considerably since 2012.

Considering Tanzania's remarkable economic growth, its reduction in poverty is very slow. In February 2019, Tanzania released the revised GDP figures with a base year of 2015. From 2007 to 2017 GDP growth averaged 6.3 percent per year, dropping to 3.3 percent when adjusted by population size. The new series showed that after 2012, GDP growth accelerated slightly and was less volatile.[4] The previous rebasing, released in December 2014 with 2007 as a base year, showed quite similar trends, with GDP growth averaging 6.3 percent per year and GDP per capita growth averaging 3.5 percent for 2008–13. However, the persistence of that growth rate had only a modest impact on poverty reduction. The growth elasticity of poverty was estimated at –1.02 for 2007–12 and dropped (in absolute value) to –0.45 in 2012–17. Thus, a 10 percent increase in GDP growth per capita can be expected to produce a 4.5 percent decrease in the proportion of the poor. This is very low compared to estimates for other developing countries, which show poverty can be expected to decline by over 20 percent when per capita GDP growth goes up by 10 percent.

For 2007 to 2012, the pattern of growth in household consumption diverged significantly from GDP growth because of the discrepancy between price deflators. How much poverty reduction responds to economic growth depends on whether economic growth is defined based on changes in GDP per capita in the national accounts or measured directly from the household surveys on which poverty estimates are based. Economic growth estimated using changes in mean household consumption per capita calculated from HBS 2007 and 2012 was only 0.9 percent annually, significantly lower than growth in GDP per capita. Using survey-based mean consumption to measure growth shows an estimated growth elasticity of poverty of –4.0, which indicates that household consumption affected poverty reduction more than GDP per capita did. The difference between the estimates of the growth elasticity of poverty found using the different measures of economic growth is due to the discrepancy between the price deflators used to convert nominal GDP and household consumption values into real terms. The first measure uses the GDP deflator, which indicates a much slower rate of inflation than the consumer price index (CPI) or price indices based on survey unit values.[5] This resulted in a significantly higher growth rate in real GDP per capita than in survey real mean household consumption and thus a lower response of poverty to per capita GDP growth.

This difference resolved during 2012 to 2018, indicating that poverty responded slowly to growth no matter how economic growth is defined. During this period, GDP and CPI deflators showed relatively similar inflation rates of approximately 38 percent, resulting in more comparable growth rates, whether based on household consumption per capita (1.5 percent) or GDP per capita (3.3 percent), than during the previous period.[6] Consequently, no matter how growth is measured, the response of poverty to economic growth remains very low (–0.73 using survey mean figures and –0.45 using GDP figures).

Worsening inequality partly offset the beneficial effects of economic growth on poverty. The slow response of poverty to growth will be discussed in more detail later in the report,

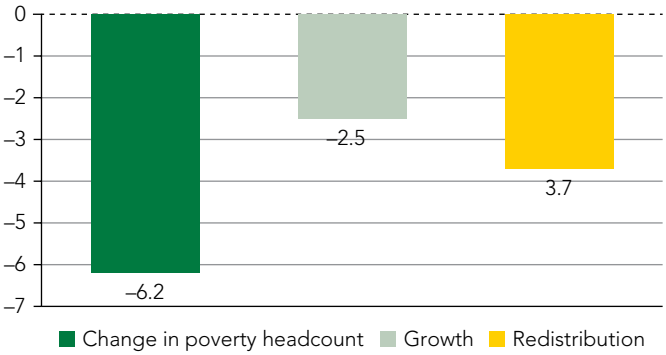
[4] During 2007 to 2012 GDP growth averaged 6 percent with a standard deviation of 1.1, compared with 6.3 percent growth and a standard deviation of 0.9 during 2012 to 2017.
[5] From 2007 to 2017, inflation was approximately 70 percent based on the GPD deflator but more than 90 percent based on the CPI or survey unit values.
[6] This is only slightly higher than the inflation rate from the survey price deflator, estimated at 35 percent.

but one important cause may have been deterioration in the distribution of household consumption from 2012 to 2018. As is apparent from figure 1.7, the poverty headcount decreased more from 2007 to 2012 than in subsequent years, despite a much smaller increase in mean household consumption. From 2012 to 2018, the increase in inequality (redistribution effect) seems to have largely offset the positive effect of growth in household consumption on poverty reduction (growth effect), as the deterioration in the Gini coefficient, which after having declined in 2012, rose to levels slightly higher than in 2007, indicates. Throughout the region, inequality remained lower than its initial levels in rural areas but increased significantly in urban areas, essentially in Dar es Salaam, where the Gini coefficient fell from 40 percent in 2007 to 36 percent in 2012 and then grew to 43 percent in 2018.

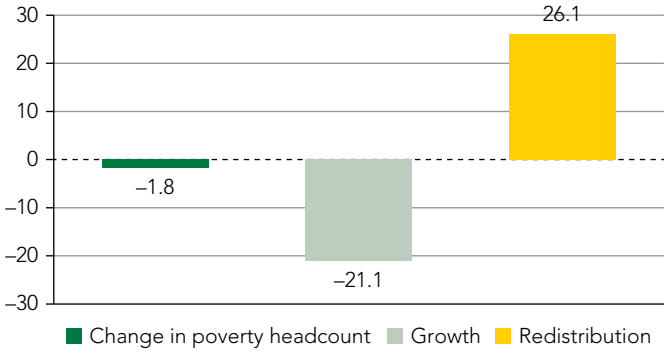
Signs of pro-poor growth observed in 2012 seem to have reversed thereafter. The rate of consumption growth from 2012 to 2018 was significantly lower for Tanzanians at the bottom of the consumption distribution than for those who were better off, indicating that poorer people benefitted less from economic growth (Figure 1.8). This pattern is similar to that of 2001 to 2007 but contrasts with that of 2007 to 2012, when the country's poorer groups benefited most. The patterns for rural and urban areas were similar (Appendix C, figures C.1 to C.4), with on average a larger increase in consumption for the urban than the rural poor from 2012 to 2018 but also more volatility in consumption changes among the urban poor.

FIGURE 1.7: Consumption Growth and Inequality 2007-2018

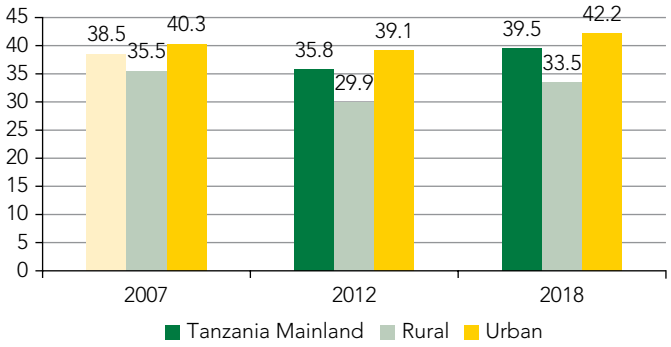
A. Growth and Redistribution Effects on Poverty Reduction in 2007-2012 (in percentage points)



B. Redistribution Effects on Poverty Reduction 2012–2018 (in percentage points)



C. Gini Coefficients 2007–2018

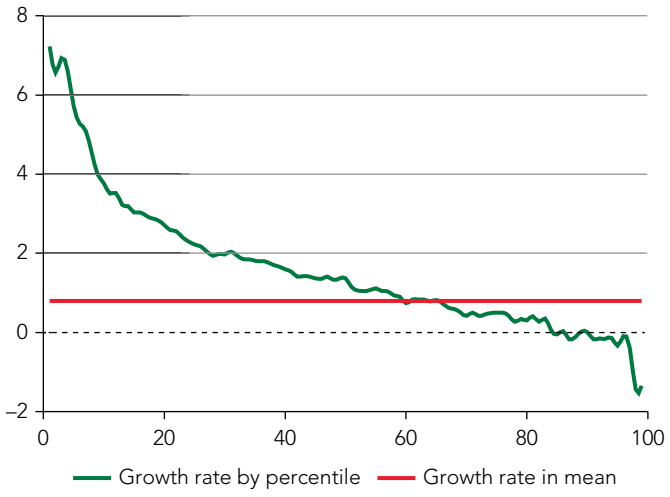


Sources: HBS 2007, 2011/12 and 2017/18.

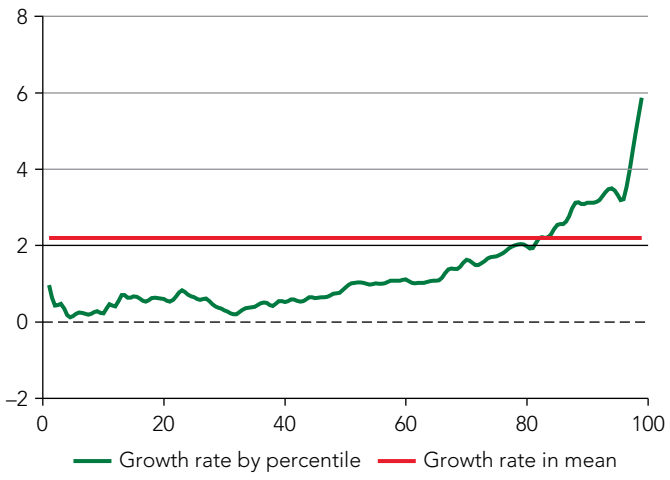
Note: The contribution of growth and redistribution to poverty reduction is based on the decomposition method of Datt and Ravallion (1992).

FIGURE 1.8: Growth Incidence Curves, Percent

A. 2007– 2012



B. 2012–2018



Sources: HBS 2007, 2011/12 and 2017/18.

III. The Structure of Inequality

Widening gaps between groups in education and employment were the primary cause of the increase in inequality.

Over time inequality between households sorted according to the educational attainment of their head rose to more than one-fifth of total inequality.[7] The shares of inequality explained by the differences between population subgroups according to individual household attributes are summarized in Table 1.1.[8] Households whose head had completed post-secondary education were best able to benefit from opportunities generated by economic growth. Their mean real consumption increased significantly faster (about 27 percent) during 2012–18 than that of households whose head completed only lower secondary school (16 percent). Households whose head had primary education or less experienced only a minimal increase in their consumption, supporting the argument that labor market requirements have been changing. More productive jobs and more sophisticated occupations (e.g., in public administration and manufacturing, and senior and professional occupations) are becoming open only to households with higher education attainment, while those with education levels lower than secondary school are trapped in low-productivity jobs.

TABLE 1.1: Decomposition of Inequality by Household Attributes

	SHARE OF INEQUALITY EXPLAINED BY (%)					
	2007		2012		2018	
	THEIL-L	THEIL-T	THEIL-L	THEIL-T	THEIL-L	THEIL-T
Education of head	14.70***	15.40***	20.80***	21.10***	22.60***	21.60***
	(0.010)	(0.012)	(0.015)	(0.014)	(0.016)	(0.016)
Gender of head	0.000	0.000	0.001	0.001	0.04	0.03
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
Age of head	1.19***	1.04***	1.32***	1.08***	0.50	0.39
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)
Empl. sector of head	12.60***	12.10***	13.70***	12.60***	20.90***	17.70***
	(0.010)	(0.010)	(0.010)	(0.009)	(0.017)	(0.01)
Family type	10.50***	11.20***	10.60***	10.30***	11.70***	11.40***
	(0.008)	(0.009)	(0.008)	(0.009)	(0.014)	(0.014)
Urban/rural status	8.69***	8.27***	19.10***	17.40***	16.70***	14.60***
	(0.007)	(0.007)	(0.012)	(0.012)	(0.015)	(0.014)
Regional location	11.50***	10.50***	18.40***	16.60***	16.20***	14.0***
	(0.010)	(0.009)	(0.011)	(0.011)	(0.015)	(0.014)

Sources: HBS 2007, 2011/12 and 2017/18.
Note: Significance: * At the 10 percent level; ** at the 5 percent level; *** at the 1 percent level. Numbers in parentheses are bootstrap standard deviations based on 100 replications.

Because rewards to wage employment and self-employment activities increased much faster in industry, followed by services, than for other work, inequalities between employment sectors widened. Households running their own economic activity are gradually operating more in services and industry and less in agriculture, and the transition seems to have helped push up their economic returns.[9] In 2012-18 their average consumption went up by over 60 percent, especially for those in industry and, to a lesser extent, services. Average consumption of wage employees in public administration and other services also went up by about 15 percent. Households employed in other sectors and jobs experienced only marginal changes in average consumption. This widened the gaps in consumption between employment groups and accounted for nearly 20 percent of inequality in 2018, compared to 13 percent and less, earlier.

Inequality between geographic regions persisted in 2018. Consumption gaps between urban and rural areas and between geographic regions widened substantially in 2012, despite the general decline in inequality up to then, and by 2018 it had declined marginally. Differences between urban and rural areas and between geographic locations accounted

[7] The analysis of the contribution of households' characteristics to overall inequality is based on the method described in Box D.1 in appendix D.
[8] Seven household attributes are considered: the gender, age, educational level, and sector of employment of the household head, and regional location, urban/rural status, and household demographic composition.
[9] These changes occurred mainly in households whose head was an entrepreneur working with others.

for about 16 percent of inequality in the most recent survey, compared to around 18 percent in 2012 and about 10 percent in 2007.

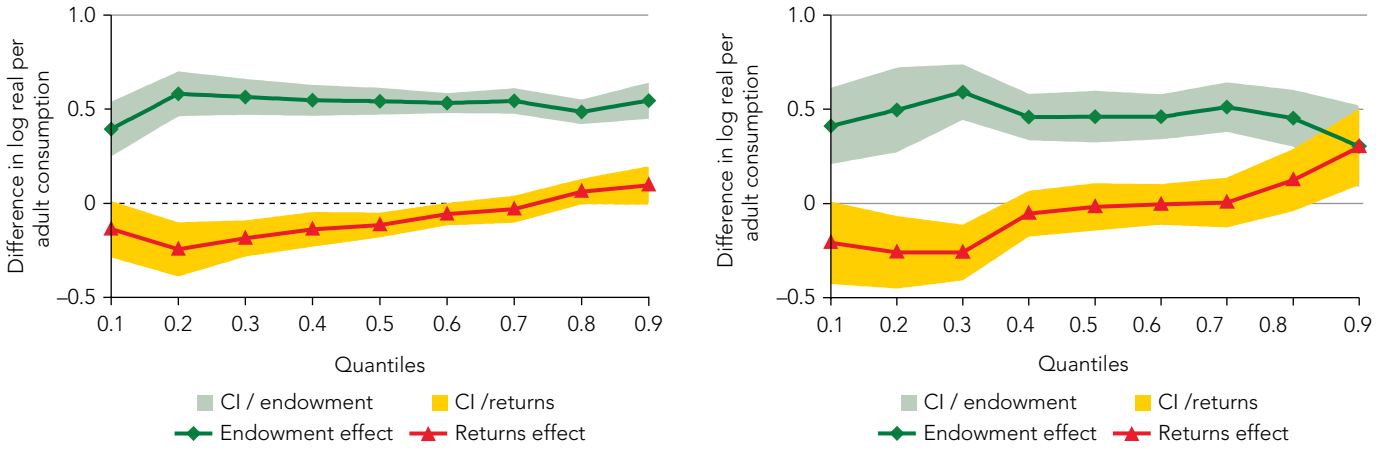
Differences in household demographic composition account for a relatively important share of total inequality. The share has held steady over the past decade at about 11 percent, due to the persistent gaps between households whose members are all over 14 years old, and those with large numbers of dependents. The explanatory powers of the gender and age of the household head barely exceed 1 percent. Total consumption inequality is overwhelmingly a matter of inequality within household groups. The low share of gender in these decompositions can be explained by the low proportion of woman-headed households in the sample, less than 20 percent, and the particular status of women who head their own households, who benefit from wide family support.

Differences in endowments are the primary cause of inequality between urban and rural households.

Urban households are better off and consume more than their rural counterparts because they have more human and physical assets. As shown in figure 1.9, the urban-rural gap in consumption is lower among households in lower-income groups than among those in richer groups, but the inequality in endowments is larger among poorer households. These patterns have persisted for the past 20 years (World Bank, 2015).

Inequality between urban and rural poor households declined slightly in 2018, but gaps in access to productive jobs and basic infrastructure remain large. Efforts to expand electricity and improved lighting sources, safe drinking water, and improved sanitation to rural poor households have begun to pay off, helping the poorest people access basic services. Differences in education between the poorest groups according to location also declined, although the differences increased for those in lower-middle- and upper-income groups (third decile and above). Nevertheless, more-productive jobs and sectors (e.g., wage jobs, employment in industry and services) are significantly more available to urban than to rural poor households. Access to markets and informal financial services increased faster for the rural than the urban poor, reducing the differences between the two areas, but differences in access to roads, health centers, and secondary schools persist. Rural-urban inequality in ownership of modern assets (e.g., mobile phones, cars, refrigerators) declined significantly for poor households but increased markedly for households in median and richer groups.

FIGURE 1.9: Determinants of Inequality Between Urban and Rural Areas



	2012			2018		
	POOREST QUINTILE	MEDIAN HOUSEHOLD	RICHEST QUINTILE	POOREST QUINTILE	MEDIAN HOUSEHOLD	RICHEST QUINTILE
Total Consumption Gap	0.289***	0.470***	0.560***	0.238***	0.443***	0.603***
Endowments Gap	0.505***	0.470***	0.478***	0.497***	0.461***	0.303***
Returns Gap	-0.216***	-0.072***	0.082**	-0.259***	-0.018*	0.300***

Sources: HBS 2011/12 and 2017/18.

Note: * Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Numbers in parentheses are bootstrap standard deviations based on 100 replications.

Inequality in economic returns matters mostly for better-off households. The difference between urban and rural areas in economic returns to household characteristics does not seem to be important for poorer households engaged in activities that pay only slightly above subsistence level. However, moderately poor urban households employed in wage jobs or working in industry and trade have significantly higher economic returns to their activities than their rural counterparts who work in the same sectors. These differences make it difficult for rural households to catch up with their urban counterparts and to overcome spatial inequalities. Urban-rural inequality in economic returns is significantly wider among households in upper quantiles than poorer ones, indicating that even though all urban households continue to have superior endowments compared to their rural counterparts, the contribution of differences in returns to households' attributes to inequality is gaining importance for most well-off households. The gap among urban and rural poor households is narrowing over time, while it is widening among the better-off, driven mainly by larger differentials in economic returns to households attributes for the wealthiest.

Some investment programs to enhance the capacity of the poor have more impact in rural areas, others in urban areas. Investments in maintenance and construction of schools and roads, irrigation and rainwater harvesting schemes, credit and savings schemes for small producers and businesses such as SACCOS, and cash transfer and public work schemes all improve both the capacity and productivity of the poor, whether rural or urban. But investment in local agricultural production, services to improve livestock production and food storage, and contract farming schemes all contribute to higher economic returns and profits for rural than urban poor. Yet their positive impact on the endowment or capacity of the rural poor was limited. Surprisingly, while a larger proportion of households in rural areas benefit from the Productive Social Safety Nets (PSSN) program managed by Tanzania Social Action Fund (TASAF), more urban poor households than rural ones seem to benefit from the program.[10] Yet in general the program has a larger positive impact on the returns and productivity of the rural poor. Other services, such as community heath schemes, have more impact on the productivity of the urban poor, and likewise, investment programs

[10] Overall, 11 percent of rural households (13 percent of rural poor households) and 6 percent of urban households (17 percent of urban poor households) benefit from the PSSN program.

to facilitate access to local and regional markets tend to be more prevalent in areas where the urban poor are located and contribute more to raising their economic returns.

Efforts to empower the poor have begun to bear fruit and help narrow the gaps between urban and rural vulnerable households. However, poor households in rural areas find it difficult to access better job opportunities or obtain higher returns for their work and assets. Although productive employment and profit opportunities are still low for the urban, they are expanding faster than in rural areas. Urban households that were initially better- educated and had more assets than rural households were better positioned to take advantage of opportunities to expand their endowments and leverage their returns. Investment programs and local initiatives to empower the poor may help to close the gaps, but more efforts will be necessary to enhance real diversification and the economic transformation of local communities.

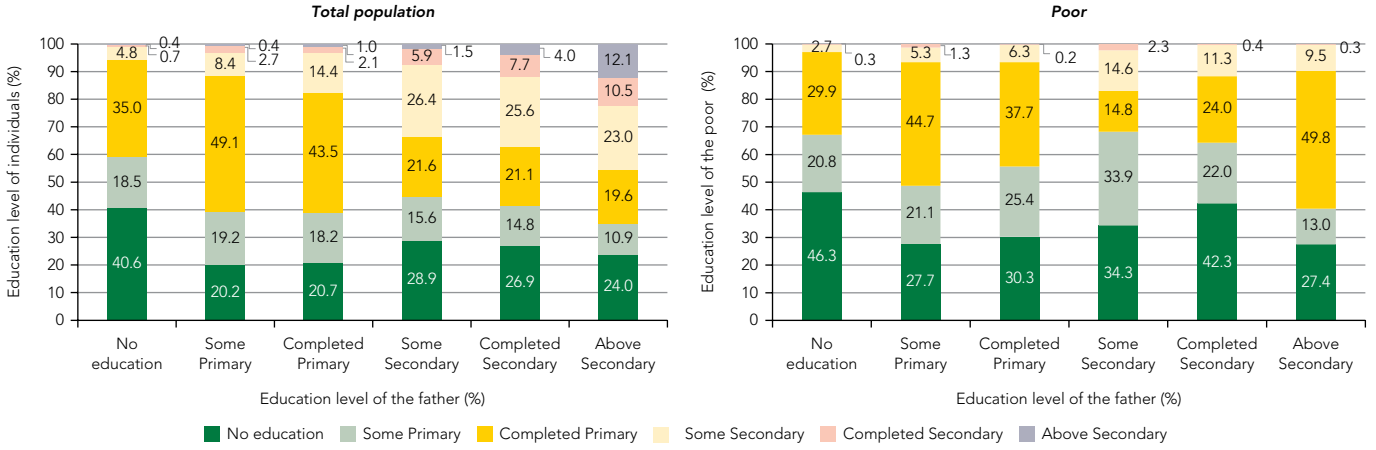
Characteristics of the poor affect economic mobility across generations.

Intergenerational transmission of parental educational attainment limits the upward mobility of their children. Tanzanians of less-educated parents are more likely to be less educated and those of better-educated parents are likely to have more education, suggesting relatively low intergenerational education mobility (Figure 1.10A and Appendix D). Education mobility is lower among the poor and among women; it appears that low human capital perpetuates vulnerability and gender inequality in future generations. Only 7 percent of Tanzanian adults, and less than 3 percent of the poor, achieve education beyond primary when the father has no education. This rate drops to less than 2 percent for daughters of poor mothers who had no education but is nearly 4 percent for boys. Individuals whose father is educated beyond primary school have more education; 62 percent in the general population, and 21percent in poor households, have some secondary schooling or more.

Parental economic status seems to severely constrain the employment of their children – intergenerational mobility across economic sectors seems very limited. The vast majority of individuals whose father is a farmer are also farmers – 65 percent of the general population and 82 percent of the poor. When the father is self-employed, children tend also to work on their own farm but around 25 percent (and 15 percent among the poor) are also self-employed in the nonfarm sector (Figure 1.10B). Employment of fathers in, for example, trade, transport, and accommodation, generally increases the chances that their children will be employed in more productive sectors, although more than 20 percent are engaged in agriculture even though their father works in the nonfarm sector (Figure 1.10C).

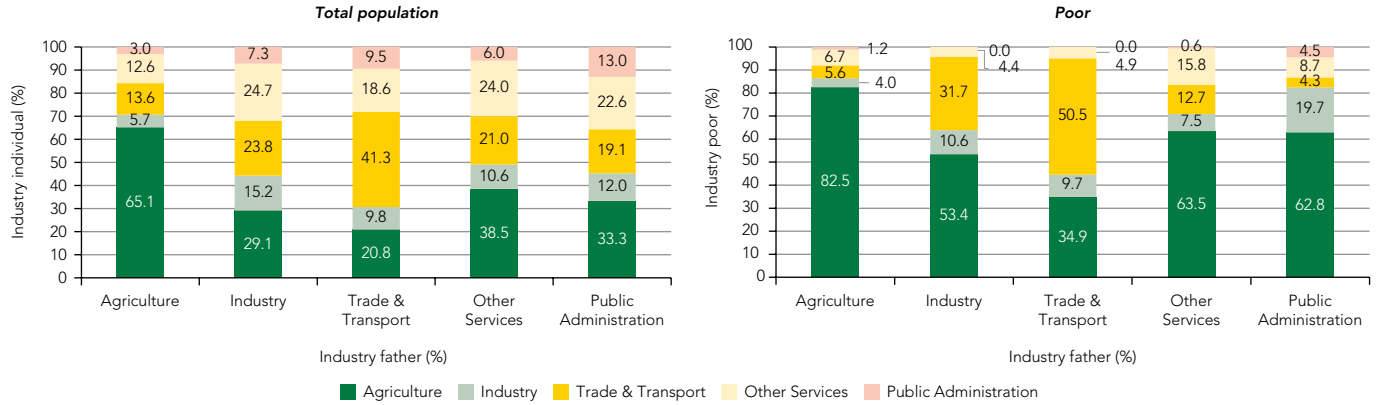
FIGURE 1.10: Intergenerational Mobility among the Total Population and the Poor, 2018, Percent

A. Educational level of individuals vs father



B. Employment status of individuals vs father

C. Employment status of individuals vs father



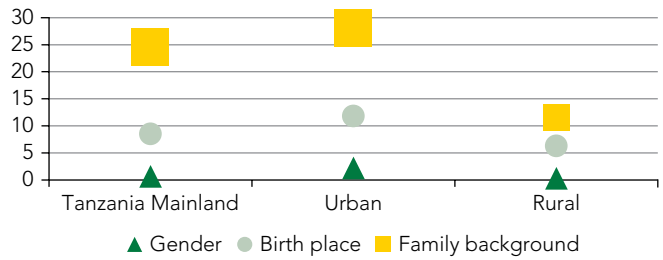
Source: HBS 2017/18.

The family background of poor households contributes to the intergenerational persistence of poverty and inequality. Inequality of consumption or income reflects differences in effort and in circumstances that may be beyond an individual's control. The circumstances may include both family background, such as parental education and economic status, and such other factors as gender and region of birth. Strategies for directly equalizing outcomes may come at the cost of weakening incentives for individual effort, investment, and innovation. However, inequality in opportunities due to circumstances beyond an individual's control perpetuates the lack of capabilities and opportunities for large parts of society, wastes productive potential, and contributes to institutional frailty. In Tanzania, individual circumstances explain approximately 20 percent of total inequality in consumption, and family background explains approximately 16 percent (see Appendix D for the methodology). Parental education and father's employment have the most influence on their children's prospects and opportunities for economic mobility (figures 1.11 and 1.12). This is a more sizable share than in other countries in sub-Saharan Africa (SSA), where inequality of opportunity is lower.[11] Unless action is taken, it is likely that future generations of the poorest Tanzanians will be trapped in persistent poverty.

Inequality of opportunity is two times higher in urban areas than in rural ones. This reflects two facts: (1) Family background variables have more influence on households and individuals who have more education and are engaged in more diversified occupations and jobs as it is the case in urban sectors. (2) To the extent that unobserved circumstances and institutional measures (e.g., family composition, parental financial situation, supply and quality of schooling, and labor and land market institutions) shape opportunities for rural Tanzanians, estimates of inequality of opportunity that do not take these circumstances into account are significantly biased downward. This is supported by how little parental employment and education affect rural consumption. Although these factors are significant determinants of inequality compared with the observed circumstances, their role is very weak in rural areas, where more than 83 percent of the population have their fathers employed in agriculture and nearly 50 percent have parents with no education.

FIGURE 1.11: Overall Inequality and Inequality of Opportunity in Consumption, 2018, Percent

FIGURE 1.12: Contributions of Individual's Circumstances to Inequality, 2018, Percent



	TANZANIA MAINLAND	URBAN	RURAL
Overall inequality	25.7***	29.7***	18.4***
Opportunity inequality	5.5***	7.3***	2.1***
Opportunity share	21.4***	24.6***	11.3***
Gender	0.7***	2.2***	0.3***
Mother education	6.7***	7.7***	0.7
Father education	6.0***	7.6***	1.9**
Mother employment status	1.0	2.2	0.13
Father employment status	1.7	0.4	0.1
Mother industry	1.5	2.7	0.01
Father industry	2.0	0.8	0.01
Mother sector of employment	3.1	4.5	0.02
Father sector of employment	2.6*	3.3	0.4
Birth place	7.9***	9.6***	6.0***
Family Background	16.1***	16.3***	5.2***

Source: HBS 2017/18.

Note: * Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Numbers in parentheses are bootstrap standard deviations based on 100 replications.

[11] Inequality of opportunity is 18 percent in Comoros, 12 percent in Ghana, 15 percent in Ivory Coast, and 21 percent in Madagascar.

CHAPTER 2

Moving Up and Out of Poverty: From Vicious to Virtuous Cycles

I. Poverty Transitions from 2008 to 2015

The analysis of poverty transitions is based on panel data to identify households that remained poor or nonpoor and households that moved into or out of poverty. In addition to HBS, Tanzania has a second survey series that collects consumption data and is hence suitable for poverty analysis, NPS, with four rounds so far (2008/09, 2010/11, 2012/13, 2014/15). NPS is a longitudinal survey (tracking individuals) conducted every two years. Unlike the HBS, which only covers mainland Tanzania, NPS is representative of the whole United Republic of Tanzania (including Zanzibar), although it has a smaller sample size than HBS. Although HBS is used to produce official poverty estimates, the panel nature of NPS data makes it a particularly attractive survey for studying poverty dynamics and transitions. Differences in the methodology and estimation procedures between HBS and NPS resulted in differences in poverty levels and trends. Harmonization of estimation methods helped partially address the mismatches, but some differences in poverty estimates remain because of differences in survey instruments and other idiosyncrasies that are difficult to adjust.[1] Moreover, although the first three rounds of NPS are real panel data, the last round (2014/15) was implemented as a cross-sectional survey based on a new redrawn sample and was therefore converted into a synthetic panel to estimate poverty dynamics. More technical details about surveys methods and estimation approaches are in Appendix I.

High mobility between poverty states was observed during 2008 to 2012. The first three rounds of NPS reveal that approximately 27 percent of Tanzanians transitioned into and out of poverty between 2008 and 2012 and that 12 percent remained poor (Table 2.1),[2] indicating that poverty in Tanzania is largely transient, as opposed to chronic (Box 2.1). In addition to providing a dynamic picture of poverty, these estimates help make sense of the small change in the overall poverty rate between 2008 and 2012, which is presumably linked to similar shares of Tanzanians escaping (13 percent) and entering poverty (14 percent) during this period.[3]

The increase that resulted from those who entered poverty between 2008 and 2012 offset the reduction in poverty that resulted from those who exited poverty. Transitions conditional on initial poverty status show that more than half of the poor in 2008 escaped poverty by 2012 and that one-fifth of the nonpoor became poor (Table 2.2). Even though the conditional exit rate from poverty was much higher than the conditional entry rate into poverty, the smaller population size of the poor than of the nonpoor in 2008 moderated the effect on overall poverty: 24 percent of the sample was poor in 2008, and 52 percent of this group exited poverty by 2012.4 In isolation, this decreased the poverty rate by approximately 13 percentage points (pp). But 76 percent of the sample was nonpoor in 2008, and 19 percent of them became poor in 2012.

TABLE 2.1: Transition Matrix, 2008–2012

		ROUND 3		
		NON-POOR	POOR	
Round 1	Non-poor	61.9	14.1	**75.9**
	Poor	12.5	11.6	**24.1**
		74.4	**25.6**	**100**

Source: NPS 2008/09 and 2012/13.
Note: The transition matrix compares the poverty status of individuals in the base period and the final period. The cells of the matrix indicate the proportion of the population in each poverty state at the base and final period. The diagonal shows the proportion whose poverty status did not change between the two periods, and the off-diagonals show the proportion that transitioned into and out of poverty. The bold numbers at the end of each row and column are the poverty and non-poverty rates in each round.

[1] The harmonized methodology shows slightly lower poverty estimates based on NPS than on HBS. When using cross-sectional weights, NPS data show a consistent declining trend in poverty since 2010, whereas when using panel weights, the data show a marginal increase in poverty in 2012/13 of 1 pp, followed by a decline of approximately 3 pp in 2014/15.
[2] This underestimates the true amount of movement into and out of poverty over five years, with households (or individuals) who were not poor in NPS1 (2008/09) and NPS3 (2012/13) possibly experiencing multiple episodes of poverty between the two rounds. This is investigated in the following sections.
[3] This results in a marginal increase of 1 pp in the overall poverty rate from 2008 to 2012, although this increase is observed only when panel weights are used. When using cross-sectional weights, poverty appears to have marginally declined.

BOX 2.1 Defining Chronic and Transient Poverty

Several approaches to distinguishing chronic from transient poverty have been proposed. Two of the most commonly found are the spells approach (McKay and Lawson 2003) and the components approach (Jalan and Ravallion 1998).

The spells approach defines chronic poverty according to how many times (or how long) a household or individual has been below the poverty line over a given period of time. For instance, a household could be defined as being in chronic poverty if it was poor in at least two of the three rounds of the National Panel Survey (NPS).

The components approach involves estimating the chronic and transient components of some measure of permanent welfare. The fluctuating nature of household welfare over time is thought of as containing transient and permanent components. Variability in household consumption levels generates the transient component, and the permanent component gives the long-run average of consumption.

One application of the components approach is to think about classification of poverty into chronic and transient over three rounds of data by using four characterizations (adapted from Hulme and Shepherd 2003):

- Always poor: Consumption expenditures below the poverty line in all three NPS rounds.
- Usually poor: Average of consumption expenditures over the three NPS rounds below poverty line, but household or individual is not poor in at least one round.
- Occasionally poor: Average of consumption expenditures over the three NPS rounds of above poverty line, but household or individual is poor in at least one round.
- Never poor: Consumption expenditures above poverty line in all three NPS rounds.

In this chapter, households and individuals who are always or usually poor are considered to be chronically poor, and those who are occasionally poor are considered to be transiently poor.

TABLE 2.2: Transition Matrix: 2012 Poverty Status Conditional on 2008 Poverty Status

		ROUND 3		
		NON-POOR	POOR	
Round 1	Non-poor	81.5	18.5	100
	Poor	51.9	48.1	100

Source: NPS 2008/09 and 2012/13.
Note: The transition matrix shows end-year poverty status conditional on initial-year poverty status. For example, the Figure in the right upper corner indicates that 18.5 percent of those who were non-poor in 2008/09 became poor in 2012/13.

TABLE 2.3: Poverty Dynamics based on Synthetic Panels, 2010–2015, Percent

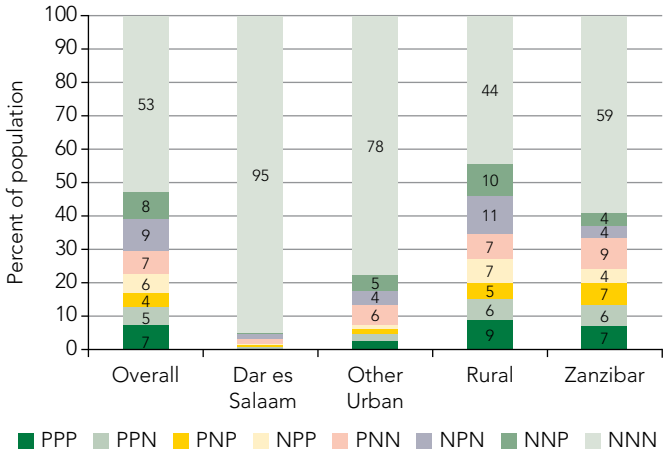
JOINT PROBABILITIES		CONDITIONAL PROBABILITIES	
POVERTY STATUS	ESTIMATE	POVERTY STATUS	ESTIMATE
NP / NP	59.6	NP / NP	81.5
P / NP	16.4	P / NP	60.8
NP / P	13.5	NP / P	18.5
P / P	10.5	P / P	39.2

Source: Synthetic panel of NPS 2010/11 and 2014/15 using Dang and Lanjouw (2013) methodology.
Predictions are obtained using population weights. N=3,529 for NPS 2010/11; N=3,066 for NPS 2010/11. The sample includes household heads aged 20 to 75 by the time of NPS 2010/11. Estimations used Model 1, BM calibration (adapted for residual weights) and simulation procedure to address residuals (with 1,000 simulations in the simulation step), and ρ_y from the NPS 2008/09 and 2012/13 panels. P, poor; N, nonpoor.

The synthetic panel analysis supports the high mobility into and out of poverty during 2010 to 2015 but suggests more poverty exits than entries. Table 2.3 presents the joint and conditional probabilities of poverty transitions between 2010 and 2015 using the synthetic panel data. Overall poverty mobility was slightly higher during 2010 to 2015 (30 percent) than during 2008 to 2012 (27 percent). The poverty exit rate was also higher during 2010 to 2015 than in the previous period. Conditional on being poor in 2010, the probability of transitioning out of poverty in 2015 was 61 percent. This is significantly higher than the transition rate obtained using the actual panel of 2008 to 2012 (52 percent). At the same time, transitions into poverty conditional on being nonpoor in the initial period are similar (~19 percent) for 2008 to 2012 and 2010 to 2015, irrespective of whether an actual or synthetic panel is used. The higher rate of exit from than entry into poverty during 2010 to 2015 led to a decline in poverty of approximately 3 pp. Overall, 16.4 percent of the population escaped poverty during 2010 to 2015, and 13.5 percent fell into it.

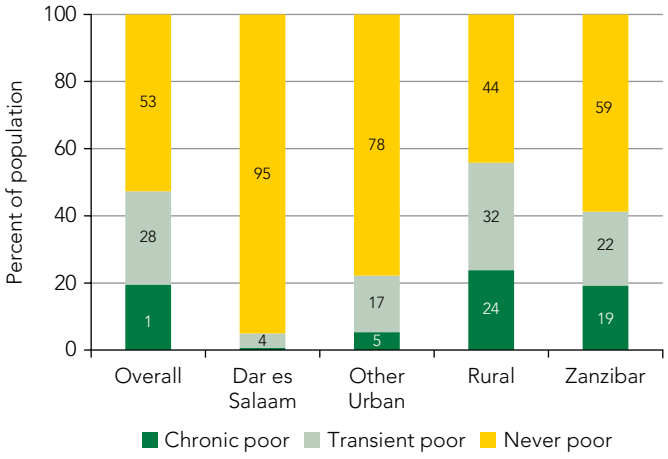
Rural areas account for the majority of the poor and the large movements into and out of poverty. Movements into and out of poverty are significantly higher in rural

FIGURE 2.1: Poverty Transitions Across Three NPS Rounds by Location, 2008–2012, Percent



Sources: NPS 2008/09, 2010/11 and 2012/13.
Notes: Geographic locations refer to household locations in NPS 2008/09. P, poor; N, nonpoor. For example, NPN means nonpoor in 2008/09, poor in 2010/11, and nonpoor in 2012/13.

FIGURE 2.2: Chronic and Transitory Poverty Over Three NPS Rounds



Source: NPS 2008/09, 2010/12 and 2012/13.

areas (47 percent), which host a majority of the population, followed by Zanzibar (34 percent), and lowest in Dar es Salaam (5 percent) (Figure 2.1).[4] Approximately 30 percent of rural dwellers were poor in at least two of the three rounds between 2008 and 2012, compared with 25 percent in Zanzibar and fewer than 2 percent in Dar es Salaam. Because of the large share of the rural population, 92 percent of those who were always poor lived in rural areas. That said, more than half of those who were never poor also resided in rural areas.

Who are the chronically poor, transiently poor, and never poor?

Almost half of the Tanzanian population was transiently or chronically poor between 2008 and 2012. Based on the definitions of poverty in box 2.1, the share in transient poverty was higher (28 percent) than the share in chronic poverty (20 percent), which means that 48 percent of the population was classified as being in chronic or transient poverty during 2008 to 2012 (Figure 2.2). This is much higher than the cross-sectional snapshot poverty estimates and highlights the value of having longitudinal data for investigating poverty. There are important differences in poverty dynamics according to geographic area (Appendix I, Figure I.18). Transient poverty was highest in mainland rural areas (32 percent vs 22 percent in Zanzibar, 17 percent in other urban areas, 4.4 percent in Dar es Salaam). Chronic poverty was also highest in rural mainland areas (24 percent, vs 19 percent in Zanzibar, 5 percent in other urban areas, in Dar es Salaam). Given that three-quarters of Tanzanians live in rural areas on the mainland, these areas also host the largest number of chronically and transiently poor individuals.

Differences in asset possession contributed the most in distinguishing chronically poor from transiently poor households. The asset index is lowest for households in chronic poverty, followed by those in transient poverty (Table 2.4).[5] This index is three times as high, on average, for the never poor than for the chronically poor. That said, chronically poor households tend to own land for cultivation, and many own their dwellings, but their inability to escape poverty may be because of the lower quality or marketability of their assets. Chronically poor households are generally engaged in less-productive agricultural activities with limited returns

[4] Eight possible combinations over three rounds of data are used (PPP, PPN, PNP, NPP, PNN, NPN, NNP, NNN) (P=poor; N=nonpoor).
[5] The asset index is estimated by multiplying an indicator variable of asset ownership (e.g., household owns a refrigerator) by the proportion of households that own the asset and then summing these products for all assets at the household level to generate the share index. The index includes assets such as refrigerator, sewing machine, computer, radio, bicycle, car, cellphone, television, and stove.

TABLE 2.4: Profiles According to Poverty Status

	(1) CHRONICALLY POOR	(2) TRANSIENTLY POOR	(3) NEVER POOR	(1) VS (2)	(1) VS (3)
Household					
Household size, n	6.4	5.4	4.7	***	***
Children, n	3.4	2.6	2.0	***	***
Adults, n	2.8	2.7	2.6	*	**
Older adults, n	0.3	0.3	0.2		
Income earners, n	2.6	2.4	2.0	**	***
Rural, %	94.4	88.7	63.5	***	***
Own dwelling unit, %, %	94.4	89.4	74.3	***	***
Own land for cultivation	91.6	88.4	73.2		***
Asset index	0.4	0.6	1.2	***	***
Piped water, %	15.1	16.3	30.1		***
Electricity, %	0.3	2.8	20.8	***	***
Flush toilet, %	0.5	2.3	8.7	**	***
Household head					
Age	47.6	47.2	45.1		***
Female, %	26.4	27.2	23.2		
No education, %	34.9	32.4	17.6		***
Primary, %	62.0	62.1	62.9		
Secondary, %	0.9	2.5	10.0	**	***
University, %	0.0	0.1	0.8		***
Other, %	2.2	2.9	8.7		***
Main household income source, %					
Food crop sales	68.6	63.7	37.4		***
Cash crop sales	8.9	9.5	7.7		
Livestock sales	2.2	3.4	2.9		
Business income	6.2	7.9	22.6		***
Wages	7.1	8.7	20.9		***
Remittances	2.9	4.5	5.5		***
Other	4.1	2.3	3.1		

Source: NPS 2008/09, 2010/12 and 2012/13.
Notes: *** p<0.01, ** p<0.05, * p<0.1. The last two columns provide a test of the statistical significance of the difference between chronically and transiently poor people, and chronically and never poor people, respectively.

and may not have the ability to move to areas with more-productive employment opportunities. In contrast, an important proportion of transiently poor people live in urban areas outside Dar es Salaam, where they can work in the nonfarm sector, exploiting more-productive employment opportunities because they are not limited by being attached to the land.

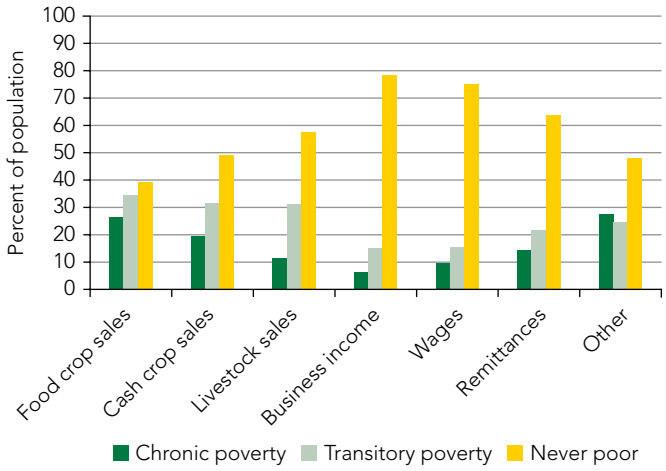
Chronically poor households are less likely to earn an income than those who are transiently poor or have never been poor. Chronically poor households have on average 6.4 members, compared with 5.4 for transiently poor and 4.7 for never poor households. The average number of children, which is 1 more in chronically poor households than in other households, is the source of most of this difference. Although the average number of income earners is highest in chronically poor households (2.6), the ratio of earners to household members is lowest in these households. On average, there are 0.41 income earners per household member in chronically poor households, 0.44 in transiently poor households, and 0.42 in never poor households. The closeness of the ratios suggests that one critical factor distinguishing households according to poverty state is job quality and returns to employment rather than overall employability and number of dependents. This is further explored under the discussion on the main economic activity of the household head.

Chronically poor households have the poorest access to water, sanitation, and hygiene (WASH) infrastructure and other basic services than those who are transiently poor or never poor. Access to better WASH facilities and electricity is limited in Tanzania, especially for the poor; for the chronically poor, access to basic services is virtually zero. In the case of WASH services, for instance, 0.5 percent of chronically poor households report having a flush toilet, compared with 2 percent of transiently poor and 9 percent of never poor households. Similarly, 15 percent of chronically poor and transiently poor households reported having access to piped water, which is half the access rate for the never poor. None of the chronically poor households reported having access to electricity. Transiently poor households did not fare much better, with 3 percent having access to electricity, compared with 20 percent for the never poor.

Educational attainment and source of household income play a crucial role in determining poverty status over time. The chronically poor have lower educational endowments than the never poor. One percent of chronically poor households are headed by someone with secondary education, compared with 10 percent of never poor households. Similarly, 35 percent of chronically poor household heads have no education, compared with 18 percent of never poor household heads. There are no differences in the share of household heads with primary education between these groups, which suggests that access to primary education may not be enough to lift people out of poverty. The chronically poor also rely more on agricultural sources of income than the never poor, who rely more on business and wage income. Approximately 80 percent of chronically poor households report sales of crops or livestock as their main source of income, compared with 48 percent of never poor households; 13 percent of chronically poor households report business income or wages as their main source of income, compared with 44 percent of nonpoor households.

Households for which the sale of agricultural produce was the primary income source were more likely to be transiently or chronically poor. In 2008, more than 54 percent of individuals lived in households in which sale of food crops was the main source of income. Approximately 35 percent of these people were transiently poor, and an additional 26 percent were chronically poor (Figure 2.3). Similarly, for the 10 percent of individuals living in households that depended on cash crop income in 2008, there was a high incidence of transient and chronic poverty, although fewer were chronically poor. For the 30 percent of people living in households that depended on business or wage income, there was a low incidence of transient or chronic poverty; more than 75 percent were never poor. Only 3.7 percent of individuals lived in households in which remittances were the main source of income: Of these, 22 percent were transiently poor, and 14 percent were chronically poor.

FIGURE 2.3: Poverty Status According to Main Source of Household Income, 2008-12, Percent



Source: NPS 2008/09, 2010/12 and 2012/13.

II. Correlates and Determinants of Poverty Entry and Exit

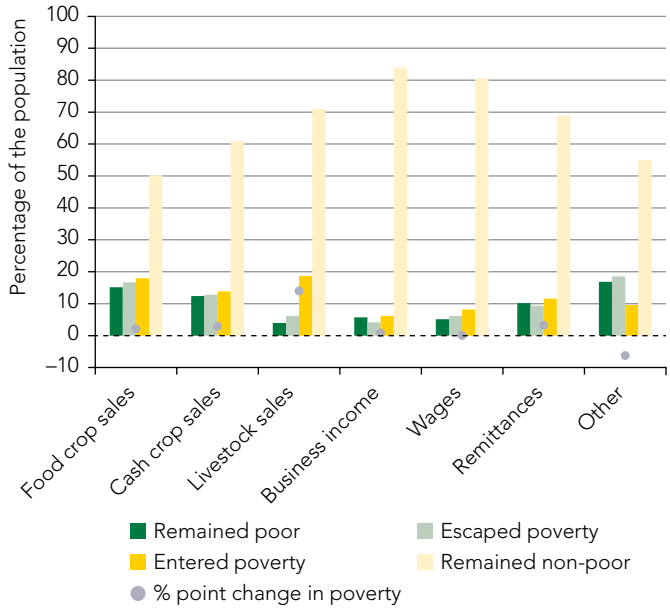
To examine the correlates and determinants of poverty entry and exit between 2008 and 2012, this section defines groups according to their poverty transition status between two rounds. Instead of classifying households and individuals according to their poverty status over three rounds—chronically, transiently, and never poor—they are classified as "remained poor" if they were poor in 2008 and 2012 and remained nonpoor if they were not poor in both periods. Those who were poor in 2008 and became not poor in 2012 "escaped poverty," and those who were not poor in 2008 and became poor in 2012 "entered poverty."

Poverty transitions are highly correlated with the main source of household income and the level of education of household heads.

Households that depend on agricultural or livestock income move frequently into and out of poverty. Poverty rates for households relying on agricultural or livestock and cash crop sales as their main source of income increased more than 2.9 pp between 2008 and 2012. Rates of entry into poverty were significantly higher than rates of exit from poverty for these households than for those relying on other sources of income (Figure 2.4). The difference between entry and exit rates was highest for households that depend on agricultural or livestock sales. Households relying on food crop sales witnessed high entry and exit rates, although they accounted for the largest share of those who remained poor throughout 2008 to 2012. In contrast, households that depend on business or wage income were less likely to move into and out of poverty, approximately 1 and 3 pp, respectively. Eighty percent of individuals in households whose main source of income was business or wages remained nonpoor throughout 2008 to 2012.

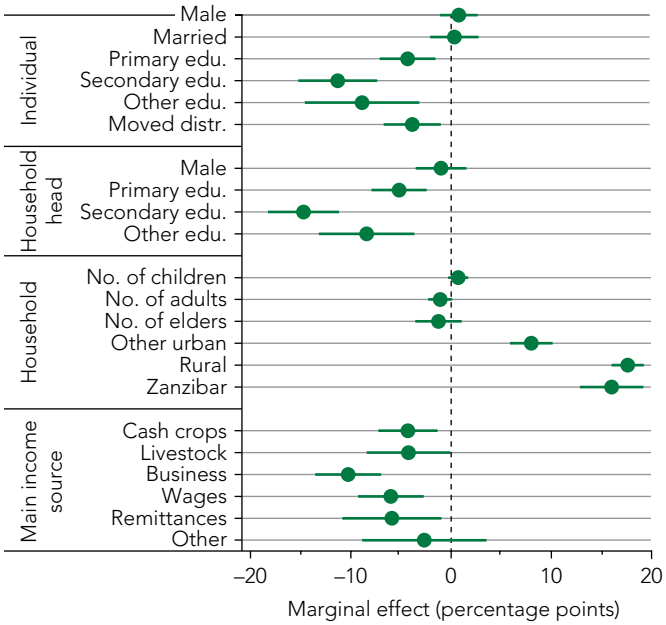
Households that depend on agriculture are least likely to exit poverty and most likely to enter poverty over time. Probit estimates show that households whose main income was derived from the sale of cash crops were less likely to enter poverty than households relying on food crop sales (Figure 2.5). The largest effect can be seen in households with business income as the main source of income; their

FIGURE 2.4: Poverty Transitions According to Main Source of Household Income, 2008–2012, Percent



Source: NPS 2008/09 and 2012/13.
Note: The composition of the poverty groups in this Figure focuses on transitions from NPS1 to NPS3 and is different from the composition in Figure 2.3, which focuses on poverty status over all three rounds.

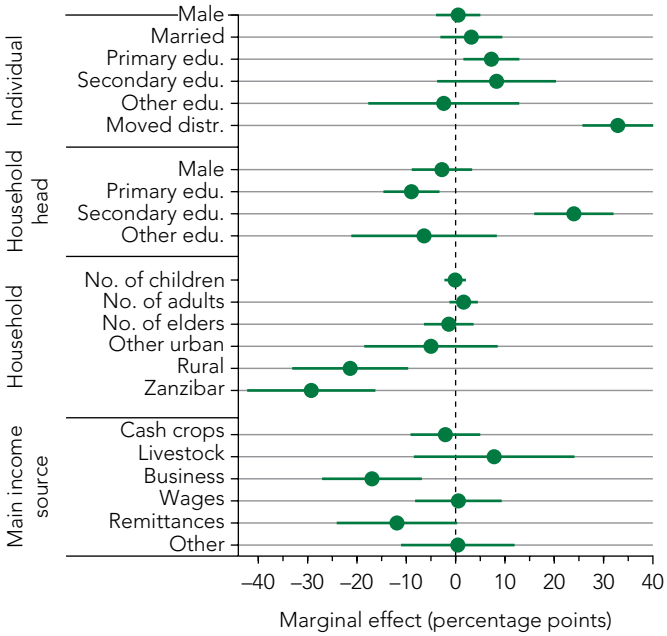
FIGURE 2.5: Marginal Effects Associated with Poverty Entry, 2008–2012



Base categories: No education; Did not move in last 5 years; Household head has no education; Dar es Salaam; Main source of income is food crop sales.

Source: NPS 2008/09 and 2012/13.
Note: Marginal effects (dots) are presented along with their 95 percent confidence intervals (lines). Marginal effects to the left of the dashed vertical line are associated with lower probabilities of poverty exit or entry, and those to the right are associated with higher rates of exit or entry.

FIGURE 2.6: Marginal Effects Associated with Poverty Exit, 2008–2012



Base categories: No education; Did not move in last 5 years; Household head has no education; Dar es Salaam; Main source of income is food crop sales.

Source: NPS 2008/09 and 2012/13.
Note: Marginal effects (dots) are presented along with their 95 percent confidence intervals (lines). Marginal effects to the left of the dashed vertical line are associated with lower probabilities of poverty exit or entry, and those to the right are associated with higher rates of exit or entry.

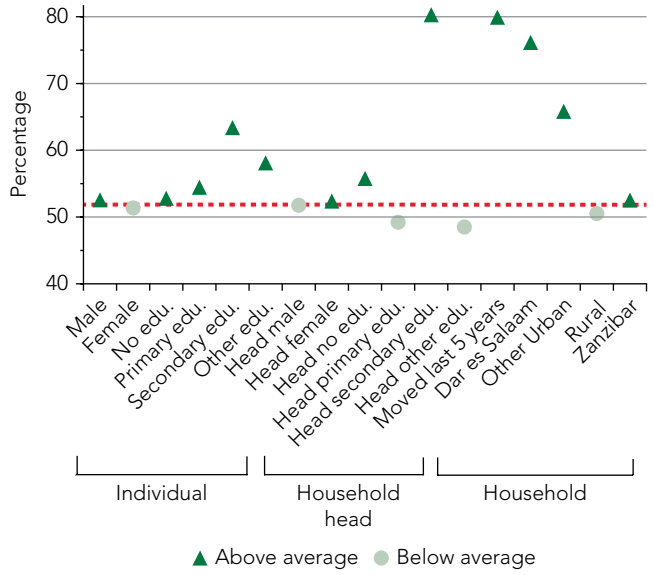
household members were approximately 10 pp less likely to enter poverty than those in food crop or agricultural households, although households that depend on business income may also get stuck in low productivity enterprises. Members of households for which the main source of income was from businesses were also, on average, less likely to exit poverty than those in households with the sale of food crops as the main source of income (Figure 2.6). In contrast, households that reported wages as the main source of income were no more likely to exit poverty than agricultural households, holding all else constant.

Higher education and migrating for better economic opportunities are strong correlates of poverty exit.[6] This positive correlation holds at the individual level and for the household head (Figure 2.7). Individuals whose household heads attained secondary education and individuals who moved districts were 25 pp more likely to exit poverty than those with no schooling and those who had not moved. Overall, living in urban settings, including Dar es Salaam, and moving districts within the five years before being surveyed were associated with higher probability of transitioning out of poverty. Probit estimates show that the probability of exiting poverty for those living in Dar es Salaam was significantly higher than for those in rural areas and in Zanzibar. Given that most of the economic growth in Tanzania has been concentrated in urban centers, these seem to have provided more economic opportunities than rural areas.

Lack of education and location in certain areas are strong correlates of poverty entry. Overall, individuals with secondary education entered poverty at a much lower rate (4 percent) than those without any schooling (25 percent) (Figure 2.8). Probit estimates show that individuals with secondary education are 11 pp less likely to enter poverty than those with no schooling, while those

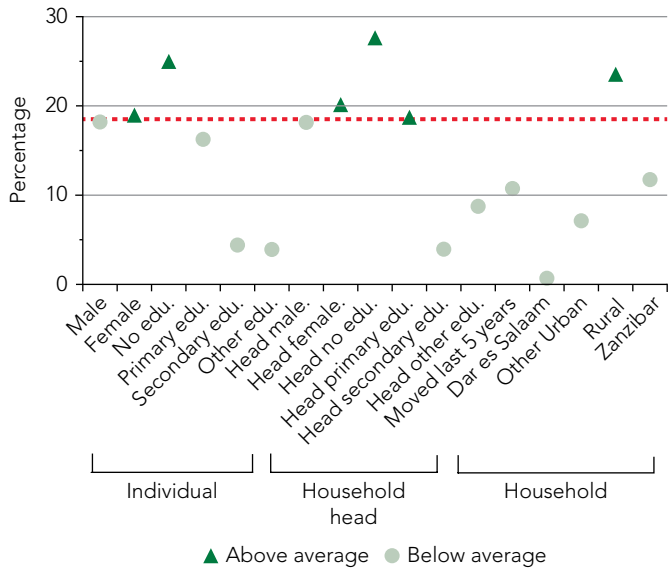
[6] Useful insights can be drawn from plotting different correlates together and can help uncover their ordering of importance. The major challenge is the potential overlap between groups; those with more education, for instance are more likely to live in Dar es Salaam. See Dang et al. 2017 for details.

FIGURE 2.7: Poverty Exit and Unconditional Transition Rates by Individual and Household Characteristics, 2008–2012



Source: NPS 2008/09, 2012/13.
Note: Dashed line represents average poverty exit and poverty entry rate of 51.9 percent, corresponding to transition matrices presented earlier. Dark green triangles above the dashed line indicate above-average probability of transition, and Light green dots below the dashed line indicate below-average probability of transition.

FIGURE 2.8: Poverty Entry and Unconditional Transition Rates by Individual and Household Characteristics, 2008–2012



Source: NPS 2008/09, 2012/13.
Note: Dashed line represents average poverty exit and poverty entry rate of 18.5 percent, corresponding to transition matrices presented earlier. Dark green triangles above the dashed line indicate above-average probability of transition, and Light green dots below the dashed line indicate below-average probability of transition.

with primary education were 4 pp less likely to enter poverty on average.[7] The protective effect of living in a household whose head has secondary schooling is even larger (~15 pp). The correlation between poverty entry and location is also high; fewer than 1 percent of individuals living in Dar es Salaam entered poverty, compared with 7 percent in other urban areas and 12 percent in Zanzibar. In contrast, rural households had a poverty entry rate of 23.5 percent—5 pp higher than the overall average poverty entry rate of 18.5 percent.

Transiently poor people remain very close to the poverty line.

Poor people who remained poor and those who escaped poverty had comparable levels of average consumption in the initial year, highlighting their closeness to the poverty line and suggesting that a strong downward push can be exerted on poverty with the right policies. Figure 2.9A compares the real monthly consumption expenditure per adult equivalent for those who remained poor and those who escaped poverty. The average level of consumption for those who escaped poverty (TZS 22,941) was only slightly higher than the average for those who remained poor (TZS 22,270). The similar levels in mean consumption, the considerable overlap in consumption distributions, and the clustering just under the poverty line suggest that those trapped in long-term poverty remain close to the poverty line and can be moved out of poverty with the right support.

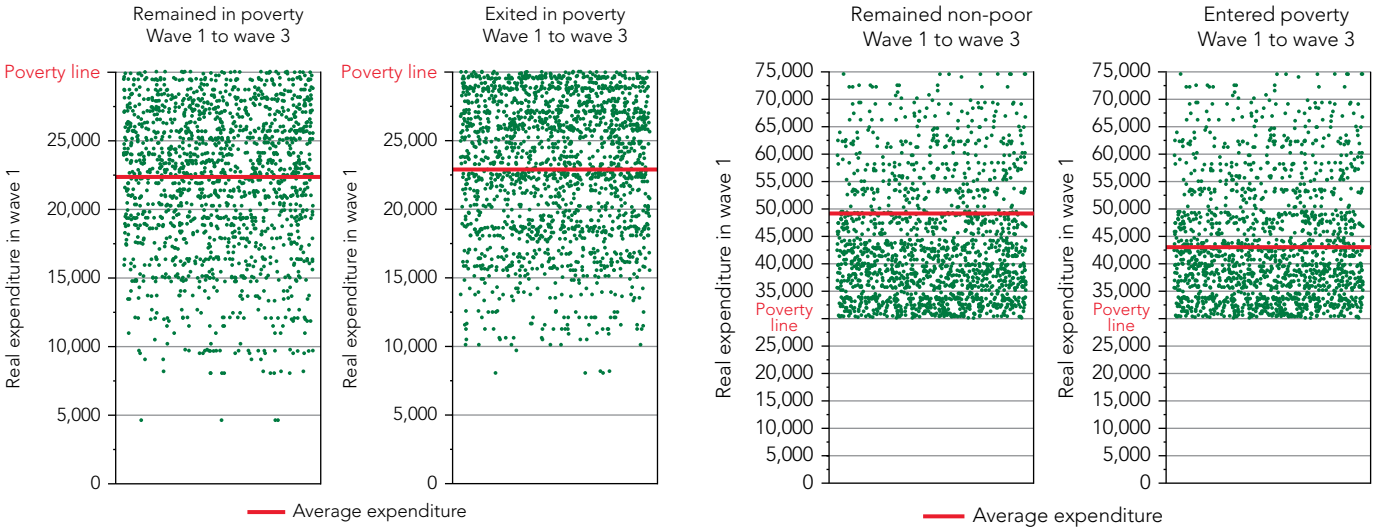
The prevalence of vulnerability, as the clustering of a large share of nonpoor population right above the poverty line demonstrates, indicates the need for safety nets to build resilience. This can be seen in the differences in average consumption of various groups between the two periods. Overall, the difference between the average consumption of those who remained nonpoor and those who entered poverty was

[7] Full results can be found in the Appendix I along with corresponding estimates for transitions between NPS1 (2008/09) and NPS2 (2010/11).

much larger (Figure 2.9B) than the difference between the mean consumption of those who remained poor and those who exited poverty (Figure 2.9A), suggesting the prevalence of vulnerability among the nonpoor. Those who entered poverty in 2012 had an average consumption level just above the poverty line in 2008. Those who escaped poverty in 2012 saw only a small increase in their average consumption level and remained right above the poverty line, remaining at risk of falling back into poverty, which suggests that measures to prevent people falling into poverty combined with measures to improve welfare could help keep millions of Tanzanians out of poverty.

FIGURE 2.9: Real Monthly Consumption Expenditure Per Adult Equivalent According to Poverty State

A. Those Who Remained Poor Versus Those Who Exited Poverty **B.** Those Who Remained Nonpoor Versus Those Who Entered Poverty



Source: NPS 2008/09 and 2012/13.
Note: The top of each panel indicates the poverty line, and each dot represents the adult equivalent consumption of a panel member who was (A) poor and (B) nonpoor in 2008.

III. Poverty Dynamics and Transitions Between Economic Sectors

Economic growth over the last decade combined with rural-to-urban migration has led to changes in the sectoral composition of Tanzania's labor force. The three economic sectors **(industry, services, agriculture)** experienced positive real GDP growth between 2008 and 2013. Industry grew the fastest (7.8 percent per year), followed by services (6.6 percent per year) and agriculture (4.2 percent per year) (World Bank 2015). The most recent projections show that industry will keep growing at 11 percent, services at 6 percent, and agriculture at 3.5 percent per year over the medium term (World Bank 2018). This section examines sectoral mobility over time and the effect on poverty of these changes between 2008 and 2015. The analysis focuses on the sector of employment of the household head and changes in the household's primary income source.[8] Because of data limitations, only sectoral changes from 2010 onward can be presented, whereas changes in the main source of income can be presented for all NPS rounds.[9] It is easier to include the contributions of household members to household welfare in the latter, which therefore may also reflect some of the underlying sectoral shifts and attachment to the labor market within the household.

The relationship between employment sector and household poverty status is explored from various vantage points in each subsection below: descriptive statistics regarding the cross-sectional composition of the household heads' occupational status and households' main source of income during 2010 to 2015, analysis of the relationship between the sectoral composition of households and their welfare, decompositions of the overall change in the poverty rate according to changes between sectors versus changes within sectors, and analysis of sectoral transitions and their implications for the longitudinal welfare of the household. Additional information on the data used and assumptions made are shown in Appendix I.

Poverty status and main occupation of household heads.

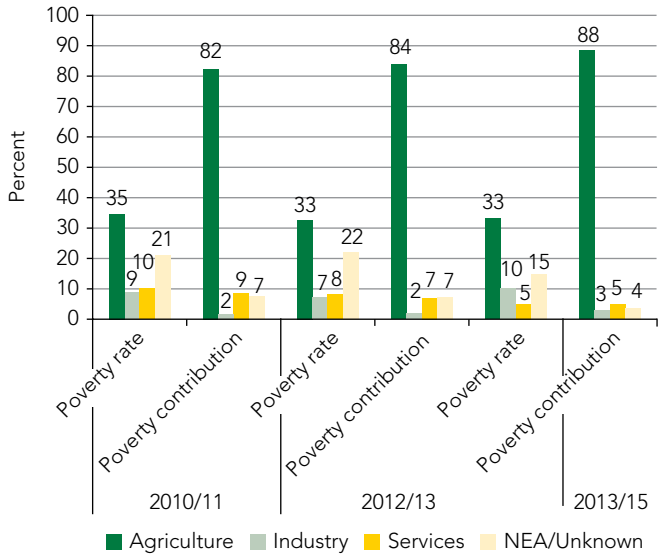
With the decline in the national poverty rate from 2010 to 2015, poverty became more concentrated in agricultural households and less concentrated in households in the services sector. Overall, approximately two-thirds of households depended on agriculture in 2015, and one-quarter were engaged in services.[10] In 2015, those living in agricultural households accounted for 88 percent of the poor, up from 82 percent in 2010 (Figure 2.10). From 2010 to 2015, the poverty rate declined from 35 percent to 33 percent for agricultural households and from 10 percent to 5 percent for households engaged in services and stayed at approximately 9 percent for households working in industry. Because of the small share of households engaged in industry (7 percent), those living in these households accounted for only approximately 3 percent of the poor in 2015, and those living in households working in services accounted for 5 percent.

[8] Viewing dynamics in this way may underestimate the true amount of movement into and out of sectors over a period of several years. For example, a household head who was recorded as being occupied in the agricultural sector in consecutive rounds of data could have experienced episodes of formal or informal employment in industry or services over the period.

[9] The scale of missing data on the main occupation of the household head in NPS1 is so large as to prevent meaningful analysis.

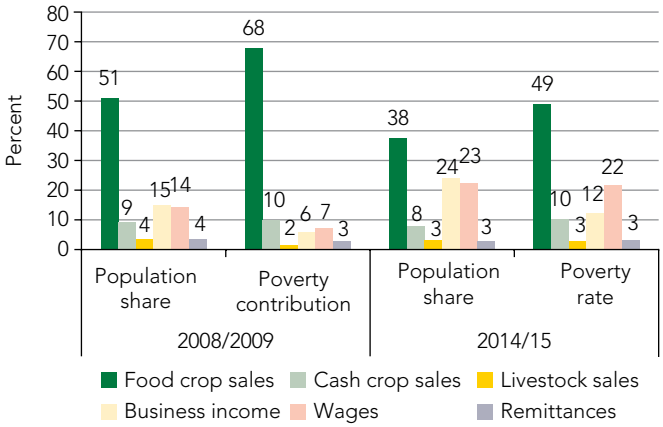
[10] Where possible, each household is defined as being primarily in agriculture, industry, or services in NPS2, 3, and 4. This variable reflects the sector of employment of the household head in his or her primary occupation. Mining, manufacturing, utilities, and construction are grouped into the industry category. The services category comprises retail and trade; transport, storage, and communications; finance; and general services.

FIGURE 2.10: Poverty Rates and Contribution of Households Occupation Sectors to Poverty: 2010, 2012 and 2015, percent



Source: NPS 2010/11, 2012/13 and 2014/15.

FIGURE 2.11: Population Shares and Poverty Contributions According to Main Source of Household Income, 2008–2015, percent



Source: NPS 2008/09 and 2014/15.

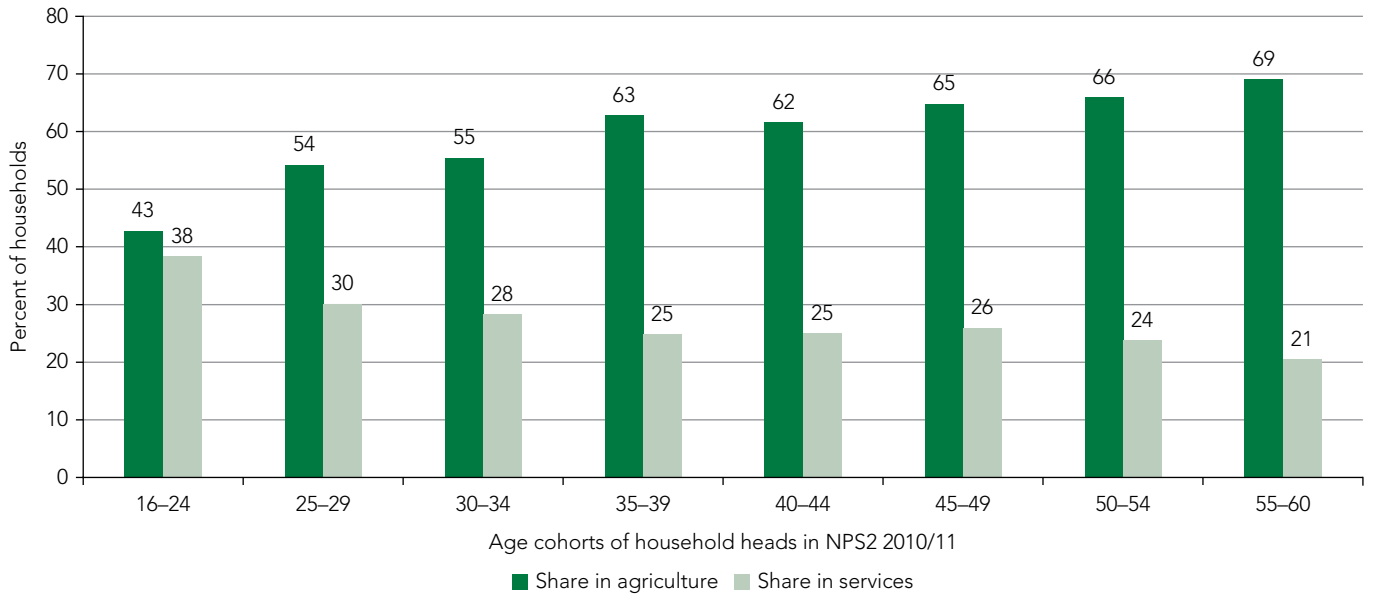
There was a sharp decline in the share of households whose primary income was food crop sales, combined with an increase in the share of households that primarily depended on business income or wages.[11] In 2008, 51 percent of the population was in households that earned their main income from the sale of food crops, and 29 percent were in households that earned their main income from business income or wages (Figure 2.11). By 2015, the share with income from the sale of food crops declined to 38 percent, and the share with business or wages income increased to 47 percent. These significant compositional shifts induced changes in the contributions of these groups to the proportion of poor people. In 2008, more than two-thirds of the poor were in households that earned income from food crop sales. By 2015, this share had declined to half. In contrast, the share among the poor of people living in households that depended on wages rose from 7 percent to 22 percent. The contribution to overall poverty of business income households increased but not as sharply as in wage income households. These households include small businesses that are possibly informal and operating in retail and services.

The difference in the share of households that depend on income from food crop sales is related to the age and main occupational sector of the household head. Younger household heads are far less likely to be engaged in agriculture than older household heads (Figure 2.12). Of the oldest cohort, 69 percent reported agriculture as their main occupational sector, compared with 43 percent of the youngest cohort. Younger household heads were more likely to be engaged in the services sector than older household heads, although their overall share of employment in services was lower than their share in agriculture. For the youngest cohort, aged 16 to 24, the share in agriculture was 5 pp higher than the share in services (43 percent vs 38 percent). This contrasts with a gap of approximately 40 pp or more for the oldest three cohorts.

Sectoral composition of household heads varied significantly according to consumption decile. Approximately 80 percent of households in the bottom 40 percent of the consumption distribution were engaged primarily in agriculture in 2010, whereas fewer than 10 percent were primarily engaged in services (Figure 2.13). Moving up the consumption distribution, the share of households engaged in agriculture decreases steadily while the share in the services sector increases. Of the richest 10 percent of households, fewer than 20 percent were primarily engaged in agriculture, and 60 percent were primarily working in services. There were also some relatively large changes in the sectoral composition of households between 2010 and 2015.

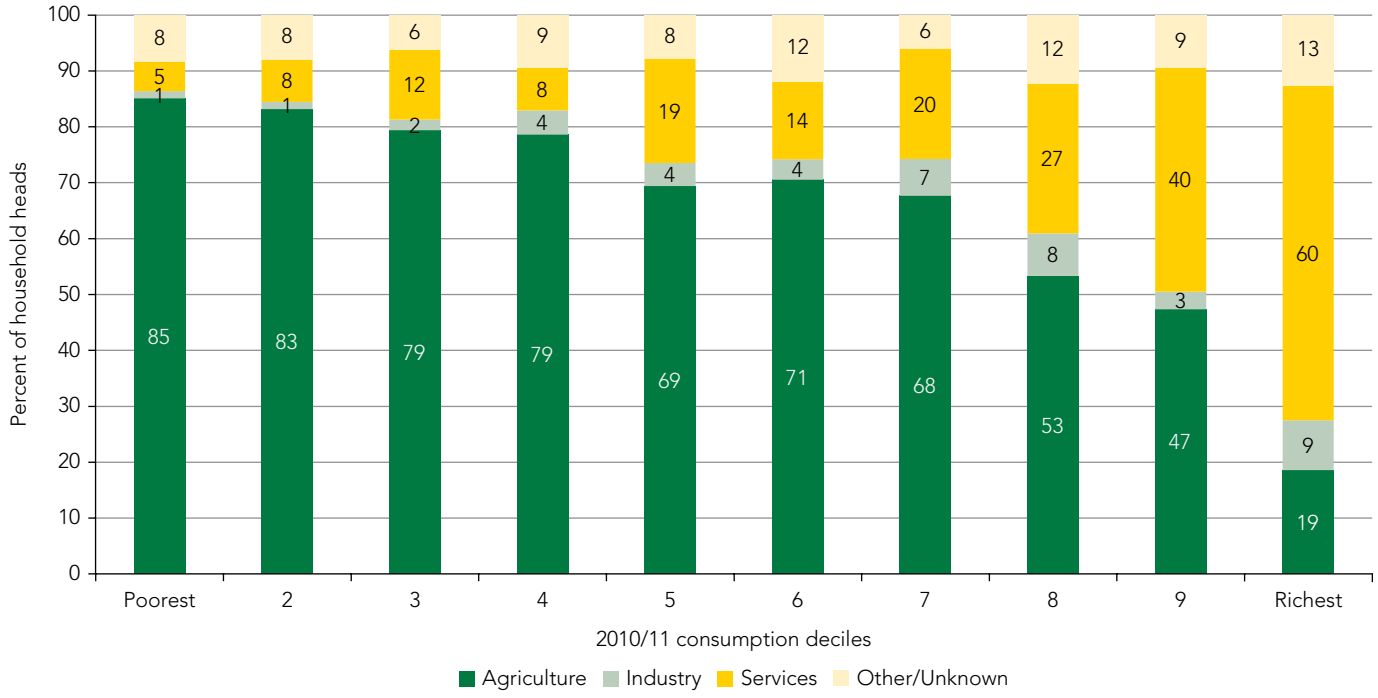
[11] In the module on finance in the household questionnaire, the responding sample member was asked what the main source of cash income for the household was. Options included food crops, cash crops, livestock and livestock products, business income, wages and casual cash earnings, remittances, and fishing.

FIGURE 2.12: Share of Household Heads Engaged Primarily in Agriculture or Services by Age Cohorts, 2010



Source: NPS 2010/11.

FIGURE 2.13: Sectoral Composition by Consumption Deciles, 2010



Source: NPS 2010/11.

Sectoral structure and poverty decompositions.

This section investigates the role that shifts within and between sectors play in determining changes in the overall poverty rate. As shown earlier, the national poverty rate fell by about 3 pp between 2010 and 2015. This time interval is relevant for poverty decompositions as it is the longest period for which we have data for both consumption and occupational sector. In addition, the change in the poverty is large enough that it can be meaningfully decomposed.

The decomposition method most suited to attributing changes in poverty to intra-sectoral versus population shift effects is based on Ravallion and Huppi (1991). This approach exploits the additive decomposability of the standard Foster-Greer-Thorbecke (FGT) measures of poverty to generate the decomposition (Box 2.2). The aim is to decompose changes in poverty into an intra-sectoral effect (changes in poverty within each sector, holding the size of the sector unchanged from baseline), and a population shift effect (changes in the distribution of the population across sectors between the baseline and end period). Decomposing poverty changes in this way allows us to determine which of the two factors was more responsible for driving poverty changes over a given period.

Decompositions based on primary occupation sector of the household head shows that intrasectoral effects rather than movements between sectors caused most of the poverty decline between 2010 and 2015. The intrasectoral

BOX 2.2 Poverty Decompositions and Sectoral Changes

The poverty decompositions used here are based on Ravallion and Huppi (1991). The decompositions will reflect changes in the poverty headcount rate but extend naturally to the poverty gap and poverty gap squared measures. Poverty at time t is given as P_t. The change in poverty between t and $t+1$ is composed of the following effects:

$$P_{t+1} - P_t = \sum_{s=1}^{n} \alpha_{st} \left(P_{s,t+1} - P_{s,t} \right) \text{ Intra-sectoral effect}$$

$$+ \sum_{i=1}^{n} P_{st} \left(\alpha_{s,t+1} - \alpha_{s,t} \right) \text{ Population shift effect}$$

$$+ \sum_{i=1}^{n} \left(P_{s,t+1} - P_{s,t} \right) \left(\alpha_{s,t+1} - \alpha_{s,t} \right) \text{ Interaction effect}$$

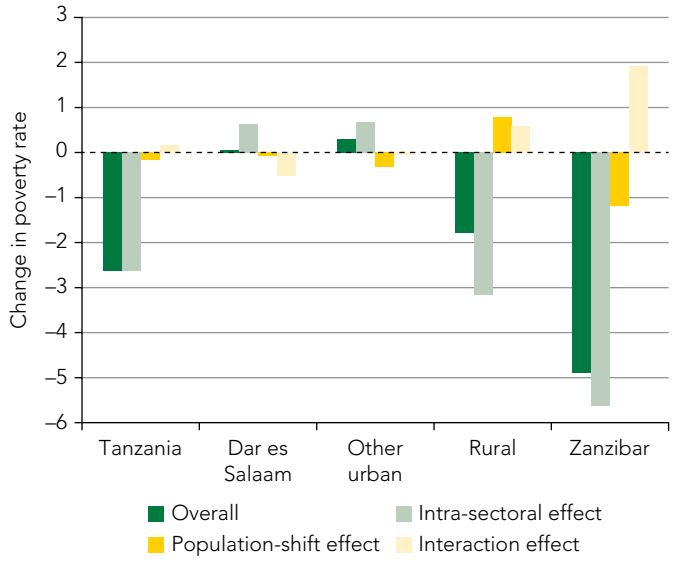
where s represents the specific sector, and n is the number of sectors. In this case, there are three main sectors: agriculture; industry; and services. A fourth sector and unknown, may include not economically active, or unemployed. $P_{s,t}$ is the poverty rate of sector s in period t. $\alpha_{s,t}$ is the population share of sector s in period t.

Poverty is defined at the household level, so we use the occupational characteristics of the household head as the characteristics of the entire household. Finally, the decomposition is purely a statistical exercise that should be used to understand past changes, rather than a tool that can be used to estimate future trends in poverty.

A generalized example adapted from Valderrama and Viveros (2014) explains the decomposition as relevant to sectoral shifts in Tanzania. Consider that, in period 1, the household head is employed in one of the three main sectors—primary, secondary, and tertiary. The poverty rate in each of these sectors is different, with the highest poverty rate in the primary sector and the lowest poverty rate in the tertiary sector. Suppose a group of households shifts from the primary sector to the tertiary sector. If, after the shift, the within-sector poverty rates remain the same, it must be that the national poverty rate went down. This is a pure population shift effect, with the population shift from the primary to the tertiary sector causing the entire decline in national poverty. Consider now a situation in which the poverty rate in the primary sector falls, but no households change sectors.[1] Again, the national poverty rate would decrease, but in this situation, the intrasectoral effect would have caused the entire decrease. In practice, as shown later, the overall poverty change will be a combination of the population shift effect and the intrasectoral effect, along with an interaction effect to balance the accounting exercise.

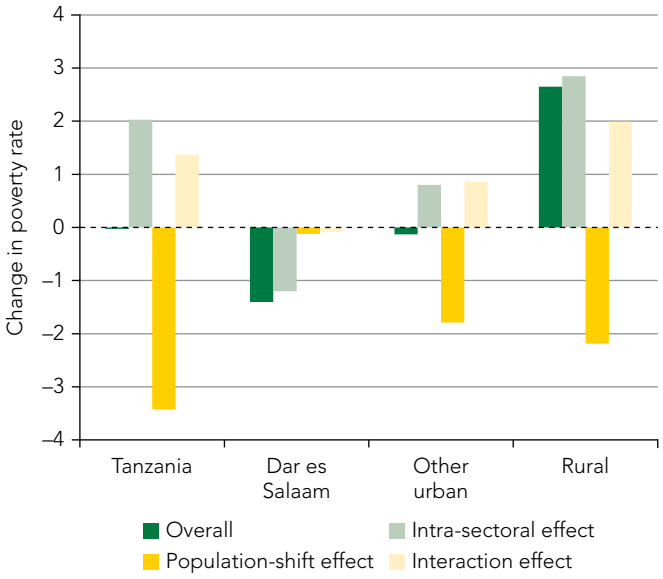
[1]This could also be the case if the poverty rate decreased in one sector, but there was no net mobility between sectors.

FIGURE 2.14: Sectoral Decomposition of Poverty Change, 2010–2015, percent



Source: NPS 2010/11 and 2014/15.

FIGURE 2.15: Decomposition According to Main Source of Household Income, 2008–2015, percent



Source: Authors' calculations based on NPS 2008/09 and 2014/15.

effect is far higher in absolute terms than the population-shift effect nationally and in each geographic area (Figure 2.14). If there had been no mobility between sectors, the national poverty rate would have fallen approximately 3 pp anyway. Zanzibar had the greatest reduction in poverty (almost 5 pp). The reduction in poverty in mainland rural areas was also significant. Even where a very small increase in the poverty rate was observed, as in Dar es Salaam and other urban areas, the overall effect of population shifts between sectors was always smaller than the intrasectoral effect.

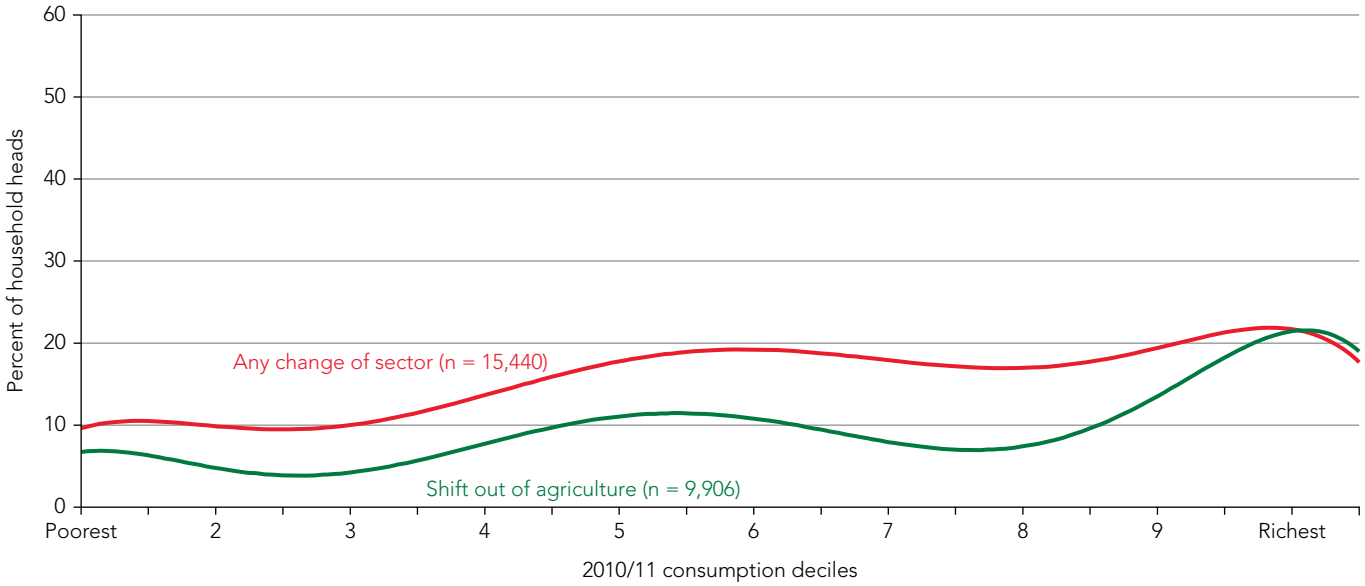
Decompositions based on main source of household income show that intrasectoral and population-shift effects accounted for the poverty change between 2008 and 2015. In contrast to the sectoral decomposition presented earlier, the main driver in the income source decomposition is the population-shift effect (Figure 2.15).[12] Shifts between sectors were significantly poverty reducing in urban areas other than Dar es Salaam and in rural areas. As shown above, a shift from food crops to wages and business income was the primary cause of this population-shift effect in rural areas, although poverty-increasing intrasectoral effects offset the population-shift effect, particularly in rural areas.

Sectoral mobility and poverty between 2010 and 2012.

Sectoral transitions according to consumption decile show that richer household heads were more likely to transition between sectors than poorer household heads. Exploiting the longitudinal nature of the NPS, the relationship between sectoral mobility and poverty between 2010 and 2012 is explored. Occupational sector of the household head could only be tracked in two consecutive rounds between 2010 and 2012. A larger share of rich households switched occupational sectors than of poor households, particularly those that started in agriculture. Approximately one-fifth of the richest household heads initially employed in agriculture transitioned into services or industry, although their initial share of employment in agriculture was minimal (figures 2.13 and 2.16). In the bottom 40 percent, a very small

[12] Decompositions based on primary household income allow for a slightly longer period of analysis—starting from 2008 instead of 2010. One drawback is that the national poverty rate was stagnant during 2008 to 2015, with an increase in rural areas offsetting the decrease in Dar es Salaam. Thus, intersectoral and intrasectoral effects generally cancelled each other out at the national level.

FIGURE 2.16: Share of Household Heads Changing Sectors Between 2010 And 2012 Across The 2010 Consumption Distribution, percent



Source: NPS 2010/11 and 2012/13.
Note: The upper line shows the share of the 15,440 household heads that switched sectors regardless of initial sector of employment. The bottom dotted line shows the share of household heads that shifted out of the agricultural sector.

proportion of agricultural households transitioned out of agriculture between 2010 and 2012. Fewer than 10 percent of household heads in the bottom 40 percent transitioned between sectors—which is half of the share of the top 20 percent.

All of the household heads that were poor in 2010 started in agriculture and remained there. Three-quarters of initially poor households remained engaged in agriculture in 2010 and 2012, whereas 8.5 percent moved out of agriculture while 6.5 percent moved in (Table 2.5A). Among the initially poor who transitioned out of poverty, about 7.3 percent moved in agriculture and 9.4 percent moved out by 2012. Almost as many initially nonpoor households transitioned into agriculture as transitioned out (Table 2.5B). However, the proportion of households that were initially nonpoor and remained in agriculture throughout 2010 to 2012 was significantly lower (46 percent) than the proportion of households that were initially poor and remained in agriculture during the same period (74 percent), whereas the proportion of the initially nonpoor who remained engaged in services in both periods was significantly larger (20 percent) than that of the initially poor (4 percent).

Agricultural households tend to remain locked in agriculture over time, regardless of their initial poverty status. Sectoral transitions conditional on the initial sector of employment show that transitions out of agriculture are relatively uncommon (Table 2.6). This complements what was presented in table 2.5, in which each cell represents the total share of households in each category; 90 percent of initially poor and 86 percent of initially nonpoor households stayed in agriculture over time. The crucial difference between the groups was the higher proportion of poor than of nonpoor households engaged in services that transitioned into agriculture. Approximately 41 percent of poor households engaged primarily in services in 2010 transitioned into agriculture by 2012, compared with 15 percent of initially nonpoor households.

Transitions based on household head's primary income source also show higher dependence on crop income of the poor than of the nonpoor but large transitions into food crop, business, or wage income for both groups. Approximately 41 percent of the initially poor relied mainly on income from food crop sales, compared with 27 percent of the initially nonpoor (Appendix I, table I.32). Almost 60 percent of food crop households continued to earn income from the sale of food crops, and 25 percent transitioned to wage or business income, with no significant difference according to initial poverty status (Appendix I, table I.33). Most households earning income from other sources transitioned into

TABLE 2.5: Inter-Temporal Sectoral Composition and Transitions, 2010–2012, Percent

A. INITIALLY POOR IN 2010

		2012/2013			
		AGRIC.	IND.	SERV.	N/A
2010/11	Agric.	74.4	2.0	2.3	4.2
	Ind.	0.6	0.7	0.0	0.6
	Serv.	3.5	0.5	4.1	0.6
	N/A	2.4	0.3	1.0	3.0

B. INITIALLY NON-POOR IN 2010

		2012/2013			
		AGRIC.	IND.	SERV.	N/A
2010/11	Agric.	46.4	1.6	2.9	3.4
	Ind.	1.1	3.7	1.8	0.5
	Serv.	4.3	2.2	19.7	2.7
	N/A	3.8	0.9	2.0	3.1

Source: NPS 2010/11 and 2012/13.

TABLE 2.6: Sectoral Transition Matrices Conditional on Initial Sector of Employment, 2010–2012, Percent

A. INITIALLY POOR

		2012/2013				
		AGRIC.	IND.	SERV.	N/A	
2010/11	Agric.	89.8	2.4	2.8	5.0	*100*
	Ind.	31.3	36.1	0.0	32.7	*100*
	Serv.	40.6	6.2	46.7	6.4	*100*
	N/A	35.7	3.9	14.7	45.8	*100*

B. INITIALLY NON-POOR

		2012/2013				
		AGRIC.	IND.	SERV.	N/A	
2010/11	Agric.	85.6	2.9	5.4	6.2	*100*
	Ind.	15.5	52.2	25.5	6.8	*100*
	Serv.	15.0	7.7	68.0	9.4	*100*
	N/A	39.3	9.2	20.1	31.4	*100*

food crop sales regardless of initial poverty status, although initially nonpoor households reliant on wages or business income were far less likely to transition to other income categories than initially poor households, indicating that the latter may have experienced employment and income volatility. The importance of having a connection to the labor market is clear; 18 percent of the initially nonpoor had wages or business income as their main income source in both periods, compared with 5 percent of the initially poor.

Most households that escaped poverty remained in the same sector but increased their participation in paid employment and worked more hours. As stated earlier, approximately 90 percent of poor households in 2010 were engaged primarily in agriculture. The majority of households that escaped poverty by 2012 remained in agriculture. At the same time, there was a positive net movement out of agriculture (Table 2.7). In comparison, the net movement out of agriculture was negative for households that entered poverty. As for employment status, those who escaped poverty increased their participation in paid employment and reduced their participation in unpaid work within nonagricultural employment (Table 2.8). Those who entered poverty appear to have significantly increased their participation in unpaid agricultural work while reducing their participation in self-employed agricultural work. There was also mobility between paid and unpaid agricultural work for those who escaped and those who entered poverty. In addition, those who escaped poverty worked on average longer hours than those who entered poverty (Table 2.9), and those who fell into poverty worked fewer hours than those who remained poor between periods.

TABLE 2.7: Sectoral Transitions for Households Between 2010 and 2012, Percent

		2012/13				
		AGRICULTURE	INDUSTRY	SERVICES	NEA/UNKNOWN	TOTAL
A. Escaped poverty						
2010/11	Agriculture	70.6	2.5	2.8	4.1	79.9
	Industry	1.0	1.2	0.0	0.4	2.7
	Services	4.1	0.4	5.0	0.9	10.4
	NEA/Unknown	2.2	0.1	1.2	3.5	7.0
B. Entered poverty						
2010/11	Agriculture	68.1	0.8	3.0	5.3	77.2
	Industry	2.3	1.1	1.2	0.0	4.6
	Services	3.8	0.0	5.1	1.3	10.2
	NEA/Unknown	4.3	0.2	1.3	2.2	8.0

Source: NPS 2010/11 and 2012/13.

The locking-in effect of the agricultural sector is corroborated in the cross-sectional probit regressions, which indicate that agricultural households were more likely to be poor in all NPS rounds. Controlling for household characteristics, probit regressions show that agricultural households were between 12 and 17 pp more likely to be in poverty than households engaged in industry or services (Appendix I, table I.34).

TABLE 2.8: Transitions in Employment Type Between 2010 and 2012, Percent

	2012/13						
2010/11	PAID EMPLOYEE	NON-AG SELF EMPLOYED	NON-AG UNPAID WORKER	AG SELF-EMPLOYED	AG UNPAID WORKER	UNPAID APPRENTICE	TOTAL
A. Escaped poverty							
Paid Employee	1.7	0.6	0.2	1.9	0.9	0.0	5.3
Non-Ag Self Employed	0.7	2.8	0.1	1.3	2.3	0.0	7.0
Non-Ag Unpaid Worker	0.5	0.3	0.0	1.5	5.2	0.2	7.8
Ag Self-Employed	4.1	2.4	0.2	19.6	10.9	0.0	37.2
Ag Unpaid Worker	5.6	3.5	0.8	10.7	21.7	0.3	42.7
Total	12.7	9.6	1.3	35.1	40.9	0.5	100.0
B. Entered poverty							
Paid Employee	2.5	0.8	0.0	2.2	2.1	0.0	7.6
Non-Ag Self Employed	0.6	2.7	0.6	1.7	2.8	0.0	8.3
Non-Ag Unpaid Worker	0.8	0.9	0.6	0.9	4.0	0.1	7.3
Ag Self-Employed	4.9	2.5	0.3	24.2	11.4	0.0	43.3
Ag Unpaid Worker	3.7	0.8	1.3	7.4	20.3	0.0	33.5
Total	12.4	7.7	2.8	36.4	40.6	0.1	100.0

Sources: NPS 2010/11 and 2012/13.
Note: NPS 2010/11 did not solicit information on unpaid apprenticeship, thus the missing category for 2010/11.

TABLE 2.9: Poverty Transition and Change in Annual Hours Worked by Sector

	A. ESCAPED POVERTY				B. ENTERED POVERTY		
SECTOR	2010/11 MEAN HOURS	2012/13 MEAN HOURS	CHANGE	SECTOR	2010/11 MEAN HOURS	2012/13 MEAN HOURS	CHANGE
Agriculture and Fishing	533	669	137	Agriculture and Fishing	545	657	111
Mining	530	1449	919	Mining	96	1689	1593
Manufacturing	1123	1684	561	Manufacturing	997	577	-420
Electricity & utilities	1540	1920	380	Electricity & utilities	1103	1506	403
Construction	2086	664	-1422	Construction	1474	2326	853
Commerce	726	1442	716	Commerce	1288	1440	152
Transport, storage	2191	2519	328	Transport, storage		224	224
Finance, insurance	0	2806	2806	Finance, insurance	1305	2037	732
Other Services	1026	1827	801	Other Services			
Total	575	801	226	Total	608	747	139

Source: NPS 2008/09, 2010/11, 2012/13.

Initially poor household heads who changed their sectoral occupation were 18 pp less likely to be living in poverty in 2012 than those who did not. Exploiting the panel dimension of the data, the marginal effects of a household changing sectors on the probability of the household being poor in 2012 were also strong (Appendix I, table I.35). Changing sectors significantly increased the probability that a household would exit poverty between 2010 and 2012. For the initially nonpoor, there was no statistically significant poverty effect associated with the household head changing his or her main sector of occupation. Another interesting effect is that of physical mobility between districts between NPS rounds. Although the overall effect is statistically insignificant, it is large in absolute terms for initially poor households. On average, households that relocated, in many cases probably in response to better perceived or actual economic opportunities, were 21 pp less likely to remain in poverty than households that did not relocate between 2010 and 2012. Finally, initially nonpoor household heads with some education were less likely than those with no education to be poor. The fact that very few initially poor households were headed by someone with a higher than primary education was the main reason for this effect.

IV. Summary and Policy Action

Understanding poverty dynamics and their drivers is crucial in designing and implementing effective, targeted, sustainable antipoverty programs and policies. Such policies and programs can reduce the risk of people falling into poverty, end the cycle of long-term poverty, and increase opportunities for upward mobility. For those living in chronic poverty, a comprehensive set of interventions may be needed to address systemic challenges preventing them from upward mobility. For those who recently fell into poverty, temporary assistance may be needed. An appropriate policy response to chronic poverty could focus on increasing the attainment of and returns to physical and human capital of the poor, whereas transient poverty would be better addressed through initiatives that focus on insurance and income stabilization (Lipton and Ravallion 1995).

Panel data analysis reveals important mobility between poverty states in Tanzania, largely driven by transitions in rural areas. Almost 88 percent of the transiently poor and 93 percent of the chronically poor resided in rural areas in 2012. One-fifth of panel members were estimated to be in chronic poverty, 29 percent were in transient poverty, and 53 percent were never poor over three consecutive survey rounds between 2008 and 2012. Households are defined as being in chronic poverty when their average level of consumption expenditure was below the national poverty line in all three rounds.

The chronically poor resemble the transiently poor except for having slightly larger families, a lower ratio of income earners to family size, fewer assets, and less access to basic services. Furthermore, the average per-adult-equivalent consumption of those who remained poor between 2008 and 2012 is similar to that of those who exited poverty, suggesting opportunities for upward mobility, although chronically, transiently, and never poor households had very large differences in access to WASH and basic services. Approximately 15 percent of the chronically and transiently poor had access to piped water, which is half of the never poor. Slightly more than one-fifth of never poor households had access to electricity in the main dwelling, compared with virtually none of the chronically poor. Access to a flush toilet was generally very low across the country; 0.5 percent of chronically poor households, 2 percent of transiently poor households, and 9 percent of never poor households reported access.

Regression analyses show that poverty exit is largely associated with higher education of the household head and migration to a new district. The probability of exiting poverty for those living in other urban areas was not significantly different from the base case of Dar es Salaam, but those living in rural areas and in Zanzibar were significantly less likely to exit poverty over the period. Households in which the main source of income was from businesses were 17 pp less likely to exit poverty than households with the sale of food crops as their main income source. In contrast, holding all else constant, households that reported wages as their main source of income were no more likely to exit poverty than agricultural households.

Poverty changed primarily because of *within*-sector mobility, as opposed to *between*-sector mobility. The Ravallion-Huppi sectoral decomposition of poverty suggests that, even if there had there been no mobility between economic sectors, the national poverty rate would have fallen approximately 3 pp between 2010 and 2015. Changes in the composition of employment within the agricultural sector explain almost all of the poverty dynamics. Those who exited poverty participated more in paid employment and worked more hours, whereas those who entered into poverty shifted toward unpaid agricultural work rather than agricultural self-employment.

The key to sustainable poverty and vulnerability reduction in Tanzania is addressing rural poverty and focusing on the welfare of the population clustered around the poverty line. Large sections of the population in Tanzania are clustered around the poverty line, offering hope that many can be lifted out of poverty with the right policy prescriptions. With most transiently poor living in rural areas and household welfare primarily based on agricultural output, household welfare can be prone to volatility stemming from weather-related shocks and shocks to agricultural input and output markets. This would suggest two policy prescriptions for those clustered around the poverty line.

First, safety nets and agricultural insurance could prevent millions of Tanzanians from falling into poverty. Because agriculture is the largest source of employment in Tanzania, providing agricultural insurance could help Tanzania by protecting farmers against loss of or damage to crops and livestock. Social safety nets targeted to vulnerable people and linked to employment could help them avoid unpaid work and offer them more hours of paid employment.

Second, more economic opportunities and greater mobility could help many poor Tanzania move out of poverty. Increasing opportunities for more stable employment opportunities in agriculture and increasing mobility to urban areas through improvements in infrastructure could help increase opportunities for employment outside agriculture.

There is also hope for lifting Tanzanians out of a vicious cycle of poverty. There were few differences in the characteristics of the chronically poor and the transiently poor. The critical differences were low levels of educational attainment, physical endowments, and access to services. Improving the physical and human capital endowments of the poor can push them out of the poverty trap and help break the vicious cycle of poverty. This requires not only helping the poor attain more education, but also facilitating their school-to-work transitions such that they can access more-productive employment opportunities. In addition, increasing access to basic infrastructure and universal services, especially in rural areas, can improve the welfare of poor people who do not have the resources to pay for these services.

CHAPTER 3

Profile of the Poor

I. Sociodemographic Characteristics of the Poor

Heads of poor households tend to be independent farmers who are older and less educated.

Poverty in Tanzania is overwhelmingly rural, and location has significant effects on consumption. About 33 percent of the poor are concentrated in the lake zone, which is rural and where less-productive and subsistence activities are common. In the lake zone, 4.6 million live in poverty and 1.3 million in extreme poverty; in the northern and eastern zones, fewer than 1.4 million live in poverty and 420,000 in extreme poverty.

The more children and other dependents a household has, the poorer it is. Poverty is significantly correlated with more children younger than 15 in the household.[1] Poor households tend to have nearly twice as many children as nonpoor households and thus have higher dependency rates than the national average (Table 3.1). Approximately 44 percent of households with five or more children younger than 15 are

TABLE 3.1: Sociodemographic Characteristics of Tanzanian Households, 2018

	TANZANIA	AREA		POVERTY				
		RURAL	URBAN	NONPOOR	POOR	RURAL POOR	URBAN POOR	EXTREME POOR
Household size, %	4.6	4.9	4.2	4.3	6.1	6.2	5.6	6.6
<15 years	2.0	2.3	1.5	1.7	3.0	3.2	2.4	3.4
15–64 years	2.4	2.4	2.5	2.3	2.9	2.8	3.0	3.0
>64 years	0.2	0.2	0.1	0.2	0.2	0.3	0.2	0.2
Dependency ratio	1.03	1.17	0.77	0.94	1.36	1.45	1.04	1.44
Age of household head	46.5	47.6	44.5	46.1	48.1	47.8	48.1	47.8
Gender of household head, %								
Men	71.8	73.2	69.1	71.6	72.3	77.6	71.0	74.7
Women	28.2	26.8	30.9	28.4	27.7	22.4	29.0	25.3
Highest level of education completed by household head, %								
No education	19.9	26.0	8.7	17.8	28.5	34.2	19.2	29.4
Less than completed primary	13.9	17.1	8.0	12.8	18.5	18.7	15.6	19.5
Completed primary	49.6	48.1	52.3	49.6	49.6	45.9	59.1	49.2
Lower secondary	11.4	6.6	20.2	13.6	2.5	1.2	5.2	1.7
Upper secondary	3.4	1.6	6.6	4.0	0.8	0.1	0.6	0.0
University	1.8	0.5	4.2	2.2	0.1	0.0	0.4	0.1

Source: HBS 2017/18.
Note: The dependency ratio is calculated as the ratio of dependents (younger than 15 and 65 and older) to the nondependent population (15–64 years old).

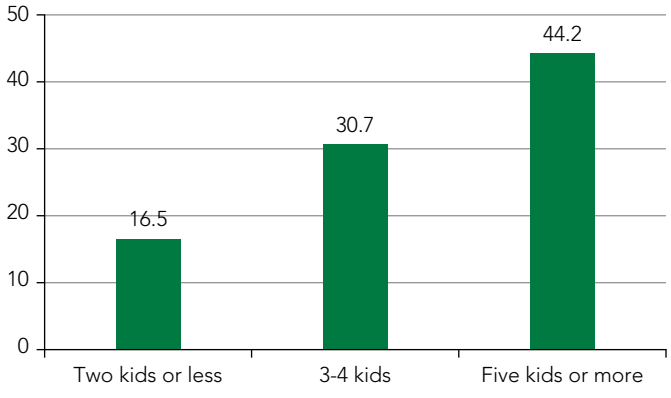
[1] Appendix E describes regression analyses used to examine the main factors affecting household consumption and poverty status. Although the direction of causality is sometimes difficult to establish, the results allow for identifying variables closely related to levels of consumption and the likelihood of poverty. Results are in tables E.1 and E.2.

poor, four times as high as the poverty rate for households with no children (estimated at 10.6 percent). It is also 18 percentage points (pp) higher than the national average poverty rate and 28 pp higher than the poverty rate for households with one or two children (Figure 3.1). The interaction between family size and poverty is bidirectional; the more children and dependents in a household, the less the household can cover basic consumption needs and move out of poverty, but poor households tend to have more children to compensate for their inability to invest in other forms of human capital and as insurance against infant mortality, trapping them in a vicious circle of poverty.

Household size and number of dependents are in part functions of the rural-urban poverty split. On average, rural families have 2.3 children younger than 15, compared with 1.3 in Dar es Salaam and 1.6 in other urban centers (Table 3.1). Thus, the dependency ratio of rural households is 50 percent higher than that of urban households; poor and rural households must support more unproductive members than urban households.

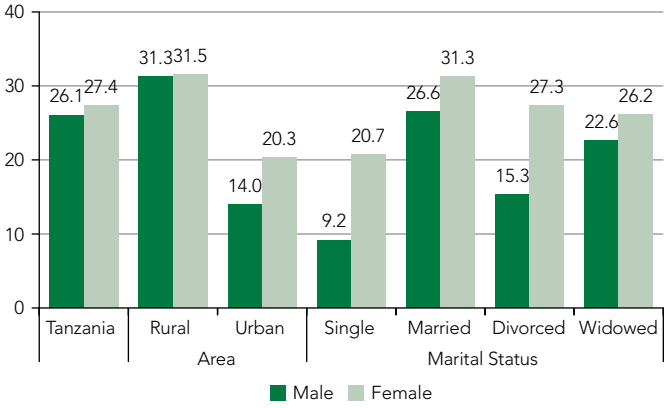
Poverty seems to be more prevalent among women. It is difficult to study poverty according to gender because household surveys assume equal distribution of consumption between members of a household and because of the status of women who head households, but there are indications that poverty is more prevalent among women, particularly in urban areas, where the poverty rate reaches 20.3 percent of women-headed households, compared with 14 percent of male-headed households (Figure 3.2). Some types of women-headed households are particularly vulnerable to poverty; single and divorced women are more than 11 pp poorer than men. The gap is high in rural and urban areas but particularly

FIGURE 3.1: Poverty Headcount According Number of Children, 2018 , Percent



Source: HBS 2017/18.

FIGURE 3.2: Poverty Headcount According to Gender of Household Head, 2018, Percent

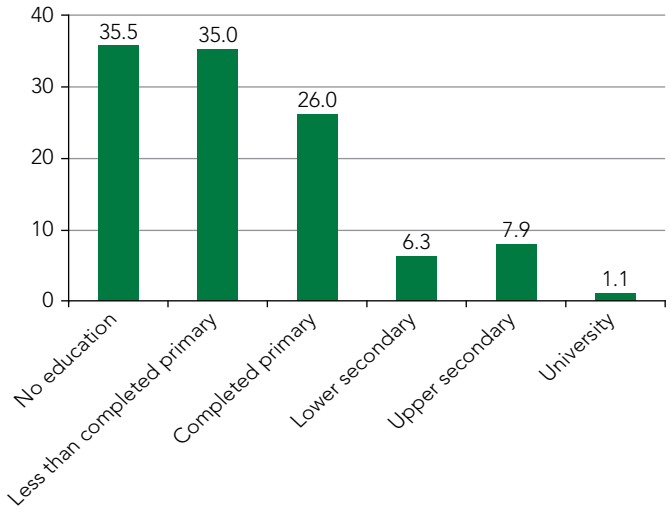


Source: HBS 2017/18.

in urban areas and in divorced households, where it exceeds 22 pp. Urban widows are also approximately 14 pp poorer than urban widowers. Ownership of assets, especially transportation and communication equipment, is also significantly lower in women-headed households, which illustrates the limited access of women to productive assets.

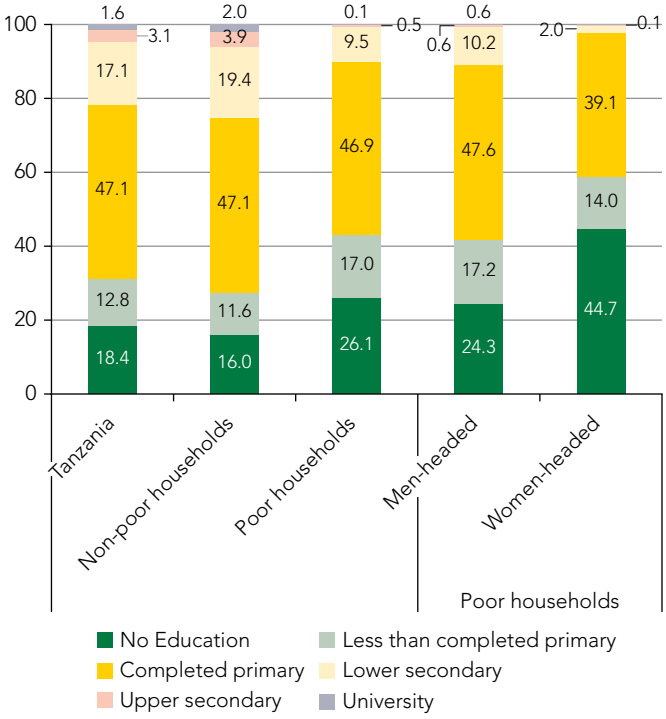
How much schooling the head has is closely related to the incidence of poverty. This suggests that education is closely linked to income generation. Households whose head has completed lower secondary or more are less likely to be poor. The poverty rate for households whose heads have no education or did not complete primary school is approximately 35 percent, compared with 26 percent for those whose head completed primary school and 6 percent for those whose head has lower secondary education and above (Figure 3.3). Poor households tend to have less-educated heads and members, especially women-headed households. Approximately 29 percent of heads of poor households have no education, and 19 percent did not complete primary school; for women-headed households, these rates are 45 percent and 14 percent, respectively (Table 3.1). Only 3.4 percent of heads of poor households (2.2 percent of women-headed ones) have more than a primary education, compared with 20 percent of nonpoor households. Similarly, only a few poor household members have completed more than primary school; 43 percent have less than primary education, and another 47 percent have completed primary school only, compared with 28 percent and 47 percent, respectively, in nonpoor households (Figure 3.4). Almost half of the members of poor women-headed households have no education, compared with approximately one-fourth of members of poor male-headed households. Controlling for sociodemographic

FIGURE 3.3: Poverty Headcount According to Household Head Education, 2018, Percent



Source: HBS 2017/18.

FIGURE 3.4: Educational Level of Household Members and Poverty Status, 2018, Percent



Source: HBS 2017/18.

effects in the regression model, education appears to have a significantly positive relationship with consumption, and the returns to education rise meaningfully the more schooling the head has (Appendix E, tables E-1 and E-2). Similarly, the likelihood that a household will be poor drops significantly the more educated the head is. Education affects living standards and poverty reduction not only directly, but also through its effect on such things as health, productivity, and social integration. The association between more education and higher living standards is highly significant in rural and urban areas, accelerating with education beyond primary school, yet the results indicate that, although education is the best shield against poverty, primary education seems no longer sufficient to open up opportunities.

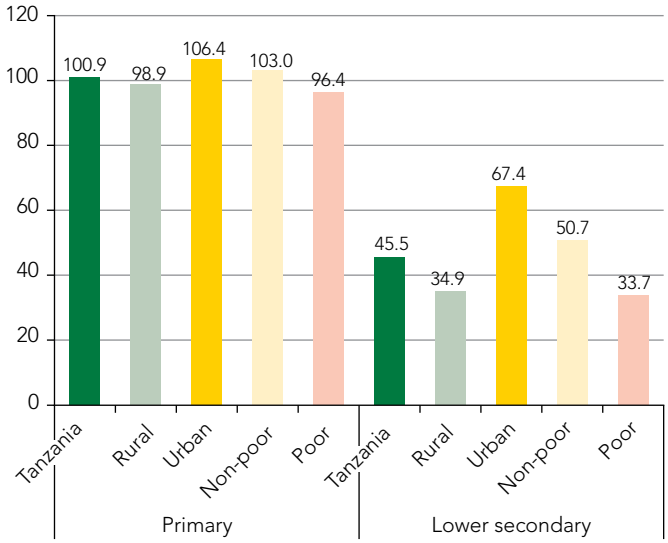
It may appear at first that households with younger heads fare much better than those with older heads—poverty is lower when the household head is 30 or younger. However, this is largely because younger heads are generally better-educated, have just started the household, and so have few children. Controlling for other household sociodemographic characteristics in a multivariate model, the effect of the head's age on poverty vanishes (Appendix E, tables E-1 and E-2)—it does not significantly affect living standards and poverty status.

Children from poor households are at a disadvantage—another illustration of the rural-urban and gender divide. Enrollment in both primary and lower secondary education is consistently lower for poor than nonpoor children (Figure 3.5A). Nearly 20 percent of children from poor households aged 7–13 are not in school, compared to 13 percent of children in wealthier households (Figure 3.5B). The primary net enrollment rate is more than 8 pp higher in urban than in rural areas. It is also significantly higher in men-headed households than in women-headed ones, with the gap being highest among poor households. Similarly, only 25 percent of poor children aged 14 to 17 years old are enrolled in lower secondary school, compared with 38 percent of other children. Overall, Tanzania has systematically lower enrollment of poor than of nonpoor children and low enrollment in lower secondary generally—34 percent for the whole country. For upper secondary school, enrollment drops to 2.4 percent generally and to 0.6 percent for poor young people aged 18 to 19 years.

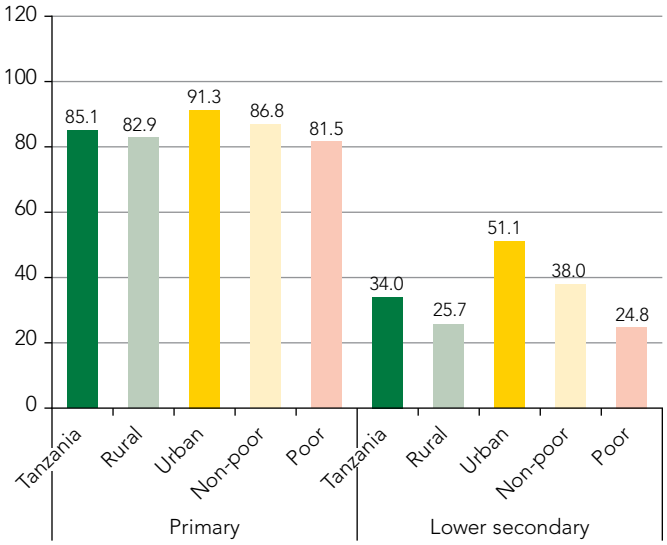
Households supported by agriculture are more likely to be poor. Nearly 30 percent of households whose head works in agriculture are poor, highlighting its subsistence character. In comparison, the poverty rate drops to 12 percent when the household head works in trade or services and 7 percent when the head works in public administration (Figure 3.6A). The labor market profile of the poor is heavily skewed toward agriculture: 76 percent of poor household heads work in agriculture, compared to 50 percent of non-poor ones (Figure 3.6B). Households whose head works in trade or services also have significantly higher consumption (see tables E-1 and E-2). The relationship is particularly

FIGURE 3.5: Gross and Net Rates of Enrollment in School, 2018, Percent

A. Gross enrollment rate



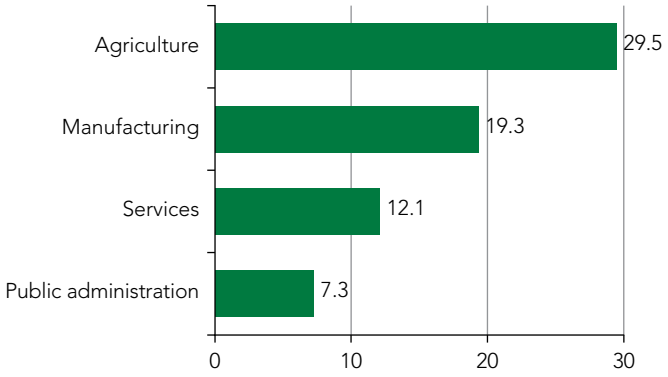
B. Net enrollment rate



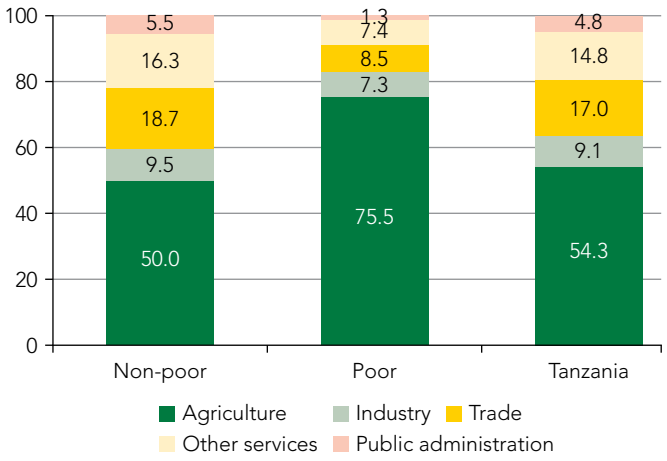
Source: HBS 2017/18.
Note: Age categories for the denominators of the gross and net enrollment ratios are defined as follow:
- Primary schooling: 7 to 13 years old.
- Lower secondary schooling: 14 to 17 years old.

FIGURE 3.6: Sector of Employment and Poverty, 2018, Percent

A. Poverty Rates by HH Sector



B. Sector of Employement by Poverty Status



Source: HBS 2017/18.

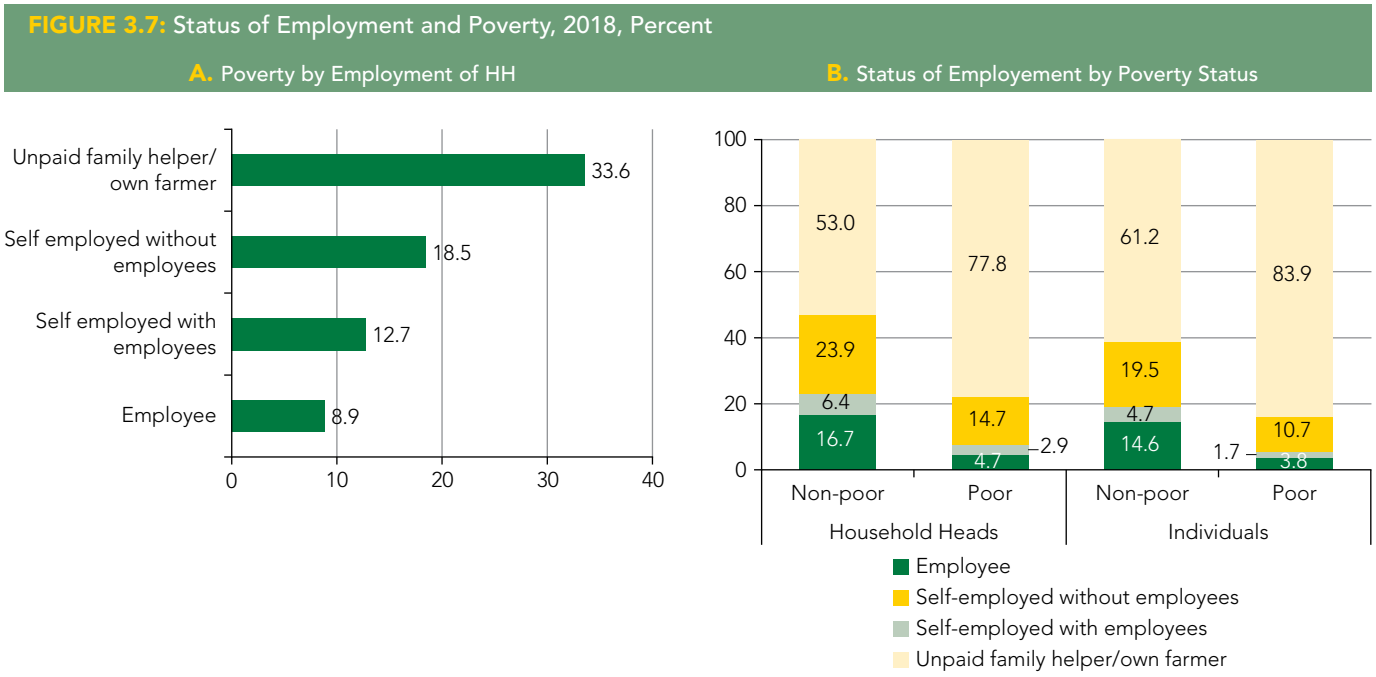
strong in rural areas. Nearly 80 percent of individuals in households identified as poor work in agriculture, compared to 15 percent in the services sector and 5 percent in manufacturing, mining and construction. Only 1 percent of working members of poor households are employed in public administration.

A higher-status job for the household head is associated with higher income and lower incidence and likelihood of poverty. The poverty rate for households operating their own farm or working as unpaid family helpers is more than double that of those self-employed in activities other than farming and almost quadruple the poverty rate of those in

wage employment (Figure 3.7A). Seventy-eight percent of poor household heads and 84 percent of household members work on their own farms or as unpaid family helpers (Figure 3.7B). In contrast, approximately 30 percent of heads of nonpoor households (and 25 percent of their members) are self-employed, and 17 percent (15 percent of their members) are wage employees. Regression results show that rural households whose heads own and manage nonfarm businesses and urban households whose heads work as paid employees are far less likely to be poor (tables E-1 and E-2), although rural household heads managing their own businesses may be less productive than urban heads who work with others, probably because they tend to hire family members as a form of social support rather than based on their skills.

Overall, human capital and access to productive jobs are low for the poor and women. Nationally, 23 percent of women have no education, and 19 percent more did not complete primary school, compared with 13 percent of men with no education and 24 percent who completed less than primary. The gender gap is larger in poor households, in which 32 percent of women and 19 percent of men have no education. As a result, more women than men are in unpaid household work and low-paying jobs. The gaps are particularly large in poor households, exceeding 7 pp, although the gender gaps in education and employment are significantly lower in the younger generation, suggesting that gender differentials are starting to shrink and that policies to enhance girls' education and empower women are beginning to bear fruit.

FIGURE 3.7: Status of Employment and Poverty, 2018, Percent



Source: HBS 2017/18.

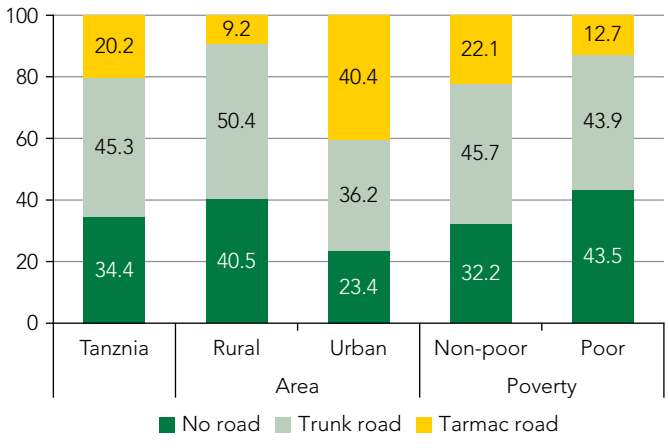
II. Community-Based Infrastructure and Services

Lack of access to infrastructure and community services leave poor households with fewer environment-based opportunities.

Beyond household-specific characteristics, access to community services and to shared infrastructure constitute critical dimensions of the profile of the poor. Community services and assets like health facilities, roads, markets, and communication networks are the backbone of household development because they structure the household environment and promote emergence of new opportunities. Moreover, provision of essential services and infrastructure often reveal serious shortfalls for poor households, which are more likely to live in underserved communities that perpetuate their dire monetary situation and lack of access to opportunities.

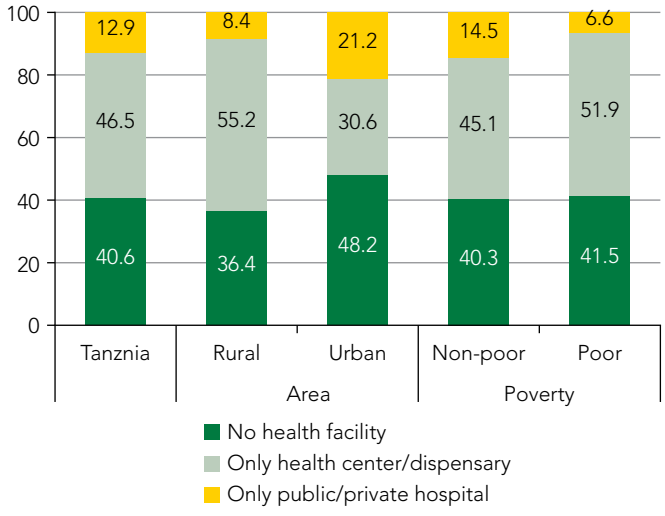
Poor households tend to have less access to the road network than others, although here Tanzania has made progress since 2012. Between 2012 and 2018, the share of communities served by the road network rose from 51 to 66 percent, driven by a larger increase in trunk roads. Access of poor households to roads went up from 47 to 57 percent, although the poor continued to be at a disadvantage in 2018 (Figure 3.8). For instance, only 13 percent of poor households were served by tarmac roads, compared with 22 percent of others. Conversely, 32 percent of wealthier households and 43 percent of poor households lack access to any roads. Developing the road network and ensuring that all households can access at least the most basic trunk roads will be critical given that, particularly in rural areas, households with road access are much less likely to be poor (tables E-1 and E-2).

FIGURE 3.8: Access to Roads, 2018, Percent



Many Tanzanians lack access to health care centers. Approximately 40 percent of Tanzanian households have no access to any type of health facility (e.g., health center, dispensary, hospital). That includes nearly 50 percent of urban households (Figure 3.9), even though the coverage of hospitals, both public and private, is higher for urban than rural households. Access to

FIGURE 3.9: Access to Health Facilities, 2018, Percent

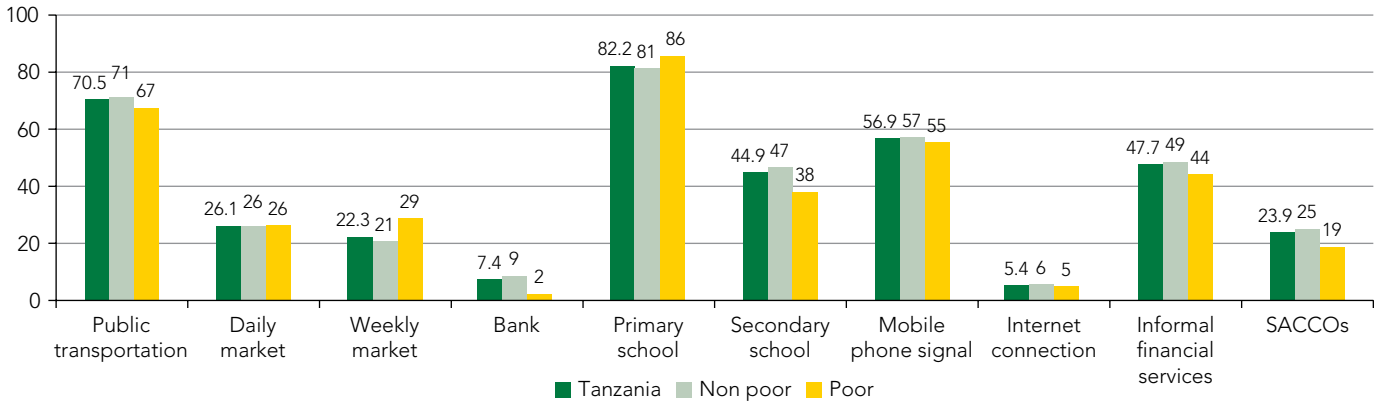


Source: HBS 2017/18.

public and private hospitals is also greater for nonpoor households than poor ones, who mostly have access to small health centers and dispensaries. The situation has not changed much since 2012, although access to health dispensaries increased slightly for poorer households in urban areas outside Dar es Salaam. Controlling for other sociodemographic factors, access to health facilities, especially hospitals, is significantly and positively correlated with higher consumption and less likelihood of being poor. The significance and extent of the relationship are particularly strong for urban households, from both consumption and poverty perspectives.

Poor households also suffer from less access to community-based infrastructure and other community services. The share of poor households benefiting from public transportation, banks, or daily markets is less than for better-off households (Figure 3.10). This is probably another example of the rural-urban split, rural areas being historically underserved. Access to primary schools may seem slightly higher for poor households, but only 38 percent of them have access to a secondary school, compared with 47 percent of other households. Access to community-based services is also systematically lower for poor households.

FIGURE 3.10: Access to Community Services and Infrastructure, 2018, Percent of Households



Source: HBS 2017/18.

III. Perception of Poverty

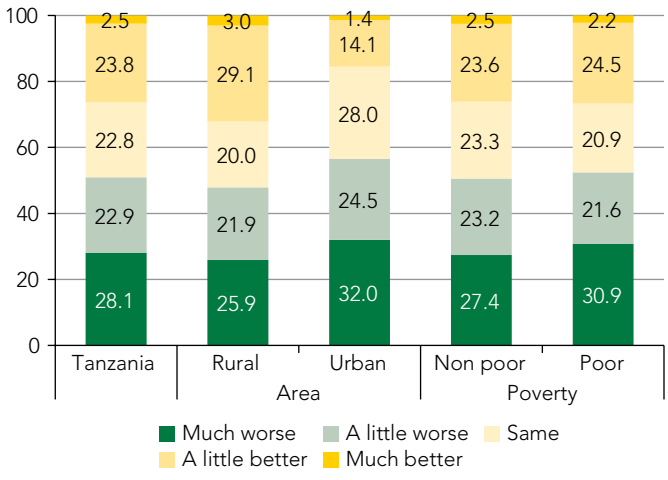
Household self-assessments of their economic situation reveal widespread subjective poverty.

Self-perception of the household situation reveals that household financial and economic wellbeing was severely degraded in 2018. Nationally, about half of households believed that their economic situation had worsened since the year before, and only 26 percent reported improvement. The trend was consistent in all areas and for all poverty statuses (Figure 3.11A), and was particularly acute in urban households, of which only 18.5 percent thought that their situation had improved since 2017. More than half of poor and nonpoor households thought that their economic condition had worsened; 31 percent of poor households assessed their economic situation as much worse, and another 22 percent considered it a little worse.

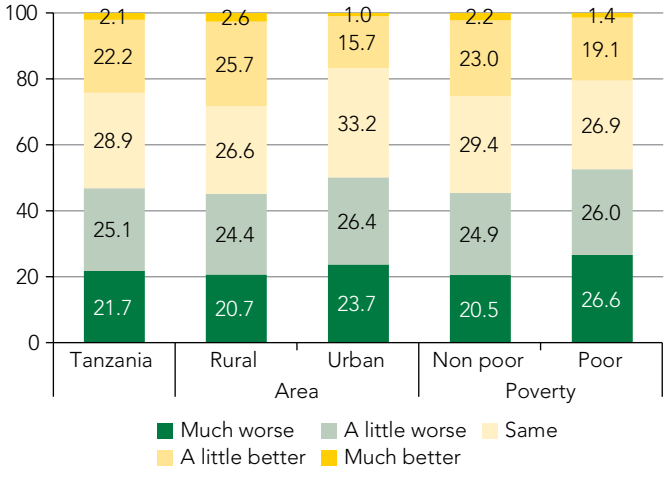
Self-assessment of their financial situation emphasizes that households tend to consider themselves poorer than their neighbors. Nearly 47 percent of Tanzania's households believed that they were worse off financially than other households in the same community, and only 26 percent felt that they were better off (Figure 3.11B). Forty-five percent of nonpoor households considered themselves worse off than other households in their community, and only 25 percent thought that their situation was better, reflecting large unmet aspirations. Self-assessment of economic conditions tends to be worse than monetary-based estimates because people tend generally to have higher monetary expectations than their estimated real basic needs.

FIGURE 3.11: Subjective Poverty and Self-Assessment, 2018, Percent

A. How do you compare the overall economic situation of the household with one year ago?

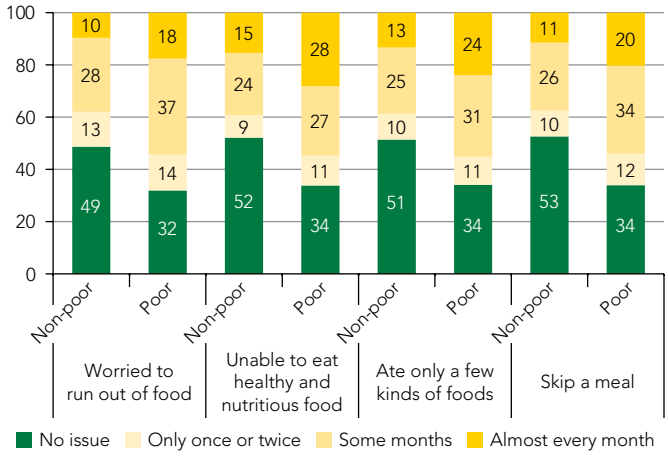


B. How does this household economically and financially compare with others in this community this year?



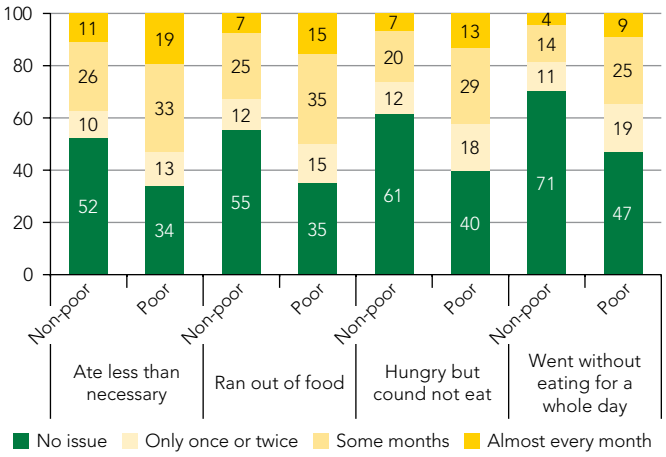
Source: HBS 2017/18.

FIGURE 3.12: Food Stress According to Poverty Status, 2018, Percent



Source: HBS 2017/18.

FIGURE 3.13: Food Shortfalls According to Poverty Status, 2018, Percent



Source: HBS 2017/18

Approximately 20 percent of Tanzania's households experience severe systematic difficulties in feeding their members.

A significant number of Tanzanians, especially those in poor households, faced high food stress, characterized by fear of not having enough food. Almost every month, 18 percent of poor households feared that they would run out of food, compared with 10 percent of nonpoor households, and another 37 percent of poor households estimated that this situation might occur during many months in the year (Figure 3.12). Lack of healthy food, as well as of adequate food also characterizes food stress; 28 percent of poor households believed they could not access healthy and nutritious food almost every month, and 24 percent had access to limited types of food.

For some households, high food stress translates into difficulties in feeding themselves and ultimately to food shortfalls. Nineteen percent of poor households reported having eaten less than necessary, and 15 percent ran out of food almost every month (Figure 3.13). Half of poor households ran out of food at least some months and sometimes every month, compared with 32 percent of nonpoor households. Furthermore, 13 percent of poor households reported facing situations every month in which their members were hungry because there was nothing to eat, and 9 percent of them went without eating for a whole day almost every month. Altogether, the share of households that experienced no food shortages ranged from one-third to one-half. In sum, for at least 20 percent of Tanzania's households, there is a systemic risk of not having food.

The Productive Social Safety Nets program contributes to support the poor but its impact could be increased through wider coverage and better targeting.

For many, access to the Productive Social Safety Nets (PSSN) program is essential for meeting basic consumption needs, but its coverage is limited. The program is managed by Tanzania Social Action Fund (TASAF), which reports that the program covers 1.2 million households, of which 250,000 benefit from public works program (Box 3.1). HBS 2018 found that about 1 million households and 4.9 million people benefit from the PSSN cash transfer program,

BOX 3.1 Tanzania Productive Social Safety Nets Program

Implemented by the Tanzania Social Fund (TASAF), the Productive Social Safety Nets (PSSN) Program is a flagship national social protection program that has been operational since 2012. The objective of PSSN is to enable poor households to increase incomes, opportunities, and consumption. It targets 15 percent of the total population of the United Republic of Tanzania, including all households living under the food poverty line (~650,000 households) plus those at risk of falling under the food poverty line if they experienced a shock affecting their income (~350,000 households).

After a massive expansion process to introduce the program nationwide, PSSN registered its intended beneficiary population of more than one million households by September 2015, ahead of target. Cash transfers have been provided for the past four years to more than one million households in close to 10,000 villages in all 161 project area authorities. These include a basic transfer for all targeted households, an additional unconditional transfer for households with children, and cash transfers with co-responsibility related to the uptake of health services for the youngest children and to school attendance for school-age children. In addition, public works have reached nearly 300,000 households in 44 project area authorities, completing 6,000 subprojects. Piloting of the productive inclusion and livelihoods component has started in eight project area authorities; more than 11,769 savings groups with 151,821 members (74 percent women) have been formed; and initial training on group organization, preparation of constitutions, savings mobilization, loan management, and record keeping has been provided.

The PSSN midline impact evaluation indicates that the project has had substantial human development and livelihood outcomes. Early results show that PSSN, through cash transfers, has had positive and statistically significant results:

- Households receiving cash transfers experienced an additional 10 percent reduction in poverty, accompanied by a 20 percent boost in monthly consumption.
- School enrollment increased by more than 10 percent, particularly for primary school age children. Higher enrollment rates also helped increase the literacy rate, particularly for primary school.
- Beneficiary households were 8 percent more likely to visit a health provider, even when not sick. Use of health services was 21 percent higher for beneficiary households than for nonbeneficiaries; the benefit was even greater for under-fives.
- Beneficiary households are 8 percent more likely to cultivate farm plots and 18.6 percent more likely to own or raise livestock. The incidence of input use, which tends to be very low, rose between 18 percent and 38 percent for agricultural inputs that are linked to higher productivity. PSSN beneficiaries shifted away from casual work into self-employment (which increased by 12.6 percent). Moreover, engagement of nonfarm enterprises owned by beneficiaries in productive sectors increased, 19 percent more in trade and 22 percent less in production.

Resistance to current and future shocks improved through increased savings, asset accumulation, improvement of housing conditions, and take-up of health insurance. Participating in the program reduced use of negative coping strategies (measured using a coping strategy index) by 19 percent. Beneficiaries improved their housing and living conditions by using better roof materials (3 pp more likely to use higher quality building materials) and improving drinking water sources (4.4 pp less likely to use unimproved sources). The likelihood of having any savings grew by 23 percent in treated households, which were 5.2 pp more likely to have transportation assets, 6.4 pp more likely to have communication assets including mobile phones and radios, and 6 pp more likely to have furniture and whose health insurance registration tripled.

of whom 291,000 households (1.4 million people) also benefit from the public work program. PSSN reached 15 percent of extremely poor households, 14 percent of poor households, and 8 percent of nonpoor ones (Figure 3.14A). In line with the national distribution of the poor, the beneficiaries are mostly rural, constituting 78 percent of households benefiting; coverage reaches 11 percent of all rural and 5 percent of all urban households.

Both poor and non-poor households report using PSSN income support mainly to buy food, though less poor households invest more in productive assets. Poor

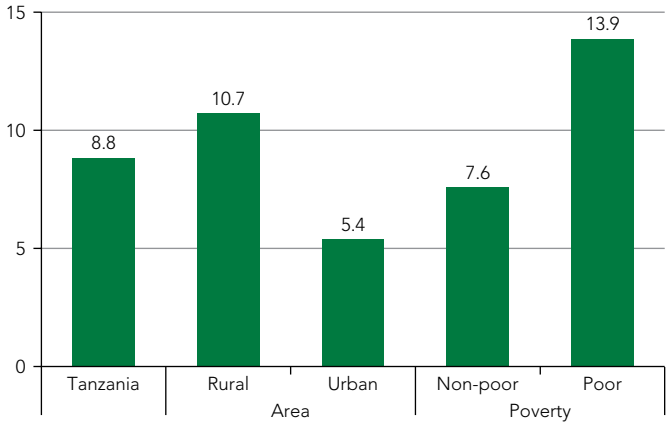
beneficiary households appear to receive slightly larger transfers than their non-poor counterparts, but both mainly use PSSN benefits to purchase food, underscoring the high food stress in Tanzania (figures 3.14 B and C). About 66 percent of beneficiaries reported using PSSN income support to cover their food needs 70 percent among poor households and 65 percent among non-poor ones, 13 percent to cover education and health expenses, and 21 percent to invest in productive assets, improve housing and cover other expenses. Of the poorest beneficiary households, only 4 percent invest in productive assets. While most non-poor beneficiaries also use the funds mainly for food, about 10 percent invest in productive assets.

PSSN is intended to target the poorest Tanzanians and may have helped many beneficiaries escape poverty. According to HBS 2018, after the program had been in operation for three years, approximately 57 percent of PSSN beneficiaries were in the two poorest consumption quintiles, although approximately 69 percent of the households interviewed that reported benefiting from PSSN were above the poverty line, even though they were still receiving PSSN support. For some this could be a temporary change of status; that is, for households that were close to the poverty line, the income support from the PSSN cash transfer may have allowed them to afford consumption above the poverty line, but it was likely that they would fall back into poverty if PSSN support were removed. For about one-quarter of them, average consumption was only 20 percent higher than the poverty line; these households are at high risk of falling back into poverty if income support is taken away. In other cases, PSSN may have allowed some households to move sustainably above the poverty line. Approximately 23 percent of current beneficiary households are in the two upper consumption quintiles (15 percent in the fourth quintile, 8 percent in the fifth), which makes them 7 percent of all households in the fourth quintile and 3 percent of all in the fifth. Of PSSN beneficiaries, 10 percent of those in the fourth quintile and 18 percent in the fifth invested the PSSN cash in productive assets, compared with only 4 percent of households in the poorest groups. Investing in productive assets may have helped these households improve their living standards faster and move to a higher income group. More than six years since the program was designed, its targeting needs to be reviewed, but the process needs to be managed very carefully because some nonpoor beneficiaries may fall back into poverty if they are dropped from the program. Even households in the highest quintiles are at risk because their productive investments could be affected, something that would be even more problematic if these investments are used to support other poor households. Program targeting and recertification of beneficiary households need to be thoroughly analyzed to identify appropriate candidates, supported by measures to build the resilience of those who may no longer qualify so that they do not fall back into poverty. Objective, standardized processes must guide the analysis.

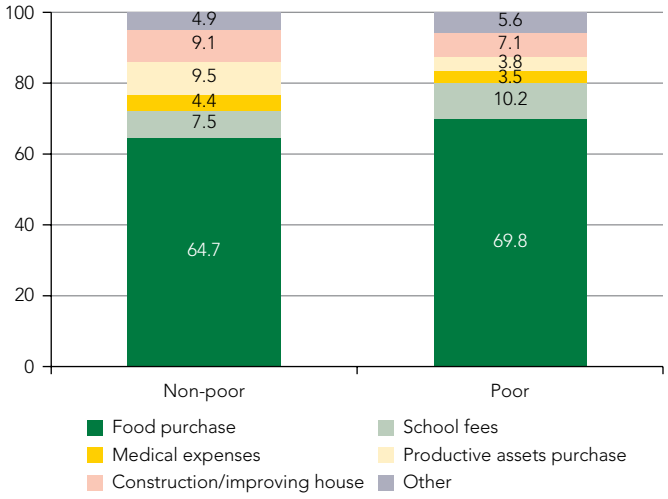
Without PSSN, basic needs and extreme poverty would have been higher. Without PSNN income support, poverty would have been about 2 pp higher, which translates to an additional 1 million poor people, and extreme poverty would have risen from 8 to 9.2 percent, equivalent to 700,000 more people. Expanding coverage of the program and better targeting it would help to accelerate poverty reduction.

FIGURE 3.14: PSSN Scheme, 2018, Percent

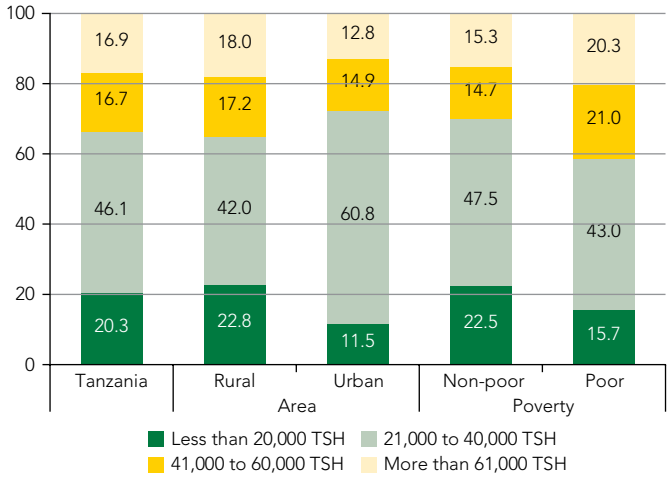
A. PSSN Coverage Rate



B. Use of Funds



C. Amount Received



Source: HBS 2017/18.
Note: Figures 3.14-A and B are calculated on the basis of the shares of households that benefited from TASAF transfers.


MMENC'ENYO
MZUNGUKO WA D
Moya
Arrow
GUARANTEED
HAND SEWN
NORTH
AMERICA
MEXICO
GULF OF
MEXICO
CENTRAL
AMERICA
SOUTH
AMERICA

CHAPTER 4

The Multiple Facets of Poverty

This chapter documents the progress that Tanzania has made in many aspects of well-being and the deprivations that the population continues to face. Because poverty is not solely about consumption deficits, this chapter examines whether improvements in nonmonetary dimensions of well-being, such as housing conditions, assets, community infrastructure, and human capital, have accompanied improvements in living standards. Tanzanian households have achieved better dwelling conditions, greater access to electricity, better sanitation facilities, and greater access to water. Similarly, they have greater access to education, with net enrollment in lower secondary rising and slowly improving the educational profile of the population.

Despite progress in many well-being dimensions, levels achieved in some areas are still low. In particular, what is clear from anthropometric measures is the persistence of chronic malnutrition throughout the country, particularly in rural communities. Similarly, although many Tanzanians have access to better sanitation, more than 70 percent of households have only unimproved sanitation facilities to rely on, with many still practicing open defecation. Many still lack efficient lighting and cooking energy sources, particularly in rural areas, where conditions in many households are still grim.

I. Living Conditions and Assets Ownership

Housing conditions and access to basic services have improved over the past decade in both urban and rural areas but remain low.

Improvements in housing conditions since 2007 are evidence that living standards have been rising even for rural and the poorest households. For instance, in 2007–12, there was considerable improvement in dwelling material, which continued, though more slowly, through 2018 (World Bank, 2015). Nationally, the share of households with better wall, roof, and floor material went up respectively by 6, 16, and 11 pp (Figure 4.1). The share of poor households with

FIGURE 4.1: Housing Conditions, 2012 and 2018, Percent

Source: HBS 2011/12 and 2017/18.
Note: *Improved wall material:* stone, cement bricks, sun-dried bricks, and baked bricks. *Improved roof material:* iron sheets, tiles, concrete, and asbestos. *Improved floor material:* cement, ceramic tile, wood, and palm or bamboo.

improved roofs went up 24 pp, from 50 percent in 2012 to 74 percent in 2018. Nevertheless, 20 percent of Tanzanian households still suffer from pitiable wall and roof conditions, and 50 percent do not have adequate flooring.

Housing conditions improved faster in rural than in urban areas, but rural dwellings are smaller and made of lower-quality material than their urban counterparts. Eighty-five percent of rural households own their dwellings, compared with approximately half of urban ones. Home ownership is particularly high among the poor, although their dwellings are, on average, much smaller and made of lower-quality material than urban ones. The floors are made of earth or sand in 66 percent of rural houses, compared with 14 percent of urban houses; for poor households, 80 percent of rural houses and 42 percent of urban ones have dirt floors. Similarly, roofs are made of grass and leaves in 20 percent (25 percent for poor households) of rural dwellings and 2 percent (6 percent for the poor) of urban ones. Many houses that rural and poor families own are self-built and do not have property titles and thus cannot be used to alleviate the household's poverty, such as for collateral to obtain loans, investment against inflation, or intergenerational transfer of assets.

Access to electricity is problematic, particularly in rural areas and for poor households. Only about 29 percent of Tanzania's households have access to the electric grid, a share that drops to 10 percent for rural and 7 percent for poor households (Figure 4.2A). Progress since 2012 has been modest; electrification increased by 11 pp nationally—not enough to ensure adequate electrification of the whole country, particularly in rural areas, where it increased only by 7 pp. Most of the progress was in secondary cities, where electrification went up by more than 20 pp, compared to just 12 pp in Dar es Salaam. Energy sources for cooking illustrate the shortage of electrical access: most households still rely on firewood and animal residuals (Figure 4.2C); 85 percent of rural and 83 percent of poor households use these inefficient sources of energy for cooking.

Tanzania's plan to diversify toward solar energy to increase access to electricity is starting to bear fruit, particularly in rural areas. The share of households using solar energy as a source of lighting jumped from 2 percent in 2012 to 26 percent in 2018 (Figure 4.2B). The increase was particularly marked in rural areas, where only 10.4 percent of households are connected to the grid: In 2018, one-third of rural households used solar power for light up from 2 percent in 2012.

Many households lack adequate access to safe drinking water. Although this has decreased from 35 percent in 2012, approximately 26 percent of Tanzanian households lacked access to safe drinking water in 2018, with 8 percent having access only to unprotected surface water (Figure 4.3A). Most of the improvement was in rural areas, where the share of households using safe water sources, whether basic or limited, increased from 55 percent in 2012 to 66 percent in 2018. The Sustainable Development Goal (SDG)-based definition

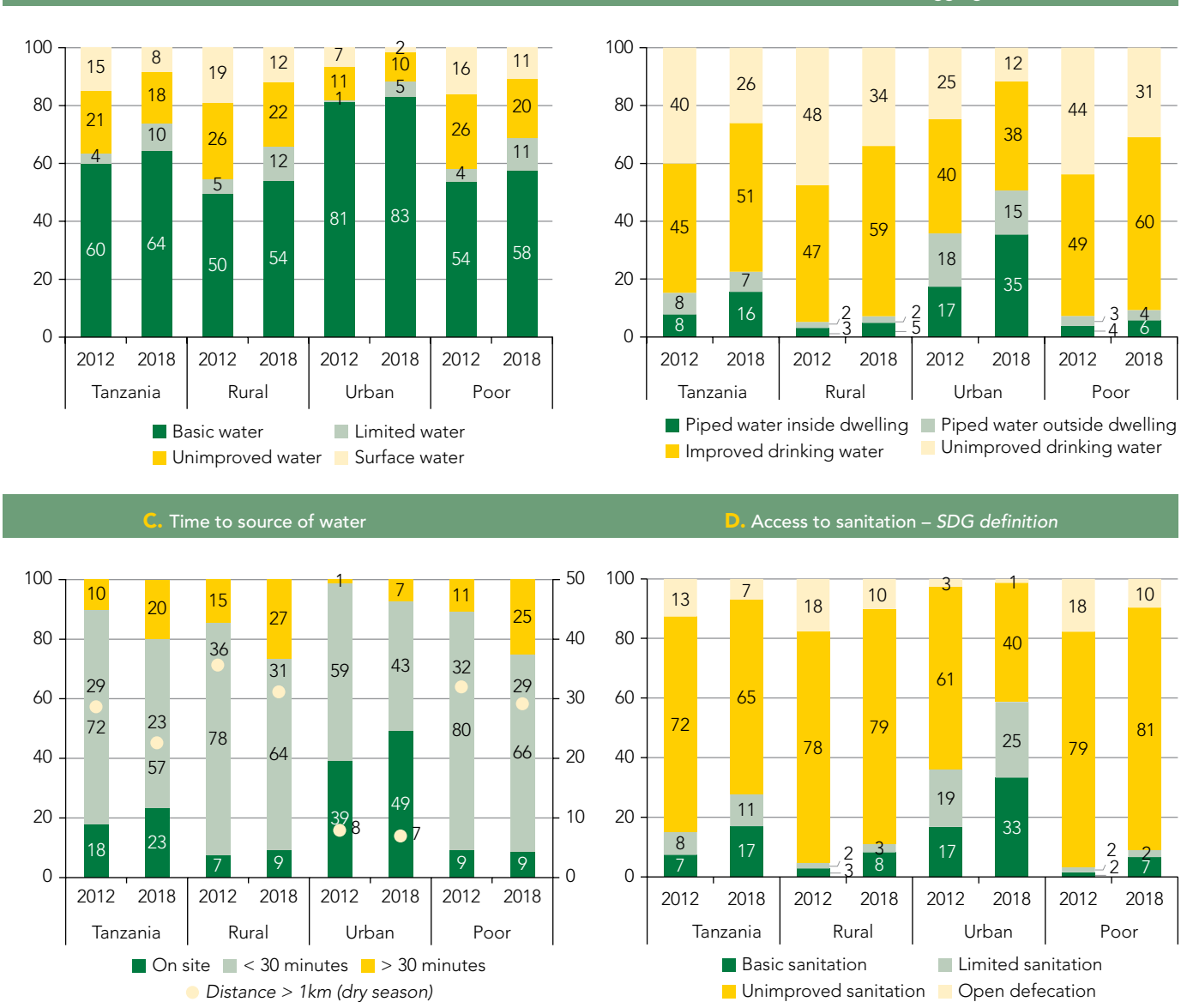
FIGURE 4.2: Access to Electricity, 2012 and 2018, Percent

Sources: HBS 2011/12 and 2017/18.

of *safe or basic water access* includes several types of access. Disaggregating the data based on the World Health Organization (WHO) classification gives a more detailed picture. For instance, access to private piped water is rare: nationally, 22 percent of households have access to piped water, ranging from 51 percent in urban areas to 7 percent in rural areas (Figure 4.3B). Most SDG-based *safe and basic water access* therefore consists of protected community-dug wells and public taps located within the community or at a neighbor's.

The distance to the main source of water has declined, contributing to the slight improvement in access to water. Installation of piped water systems and connection of households, primarily urban, to the water network has increased the share of households accessing water directly on site; between 2012 and 2018, this share rose 5 pp nationally and 10 pp in urban areas (Figure 4.3C). The proportion of households that are more than 1 kilometer away from the nearest source of water fell from 29 percent to 23 percent, although the

FIGURE 4.3: Access to Water and Sanitation, 2012 and 2018, Percent



Sources: HBS 2011/12 and 2017/18.
Notes:
Figure 4.3A: *Basic water:* Drinking water from an improved water source located on the premises or that can be reached in no more than a 30-minute round trip. *Limited water:* Drinking water from an improved water source that requires longer than a 30-minute round trip to reach. *Unimproved water:* Drinking water from an unprotected spring or dug well. *Surface water* is from a river, dam, lake, pond, stream, canal, or irrigation canal.
Figure 4.3B: *Improved drinking water:* From tube wells, boreholes, protected dug wells, protected springs, and rainwater collection. *Unimproved drinking water:* From unprotected springs or dug wells, surface water, and alternative methods, such as carts with small tanks or tanker-trucks. Classification is based on World Health Organization definition.
Figure 4.3D: *Basic sanitation:* Nonshared flush toilets or ventilated improved pit latrines. *Limited sanitation:* Flush toilets or ventilated improved pit latrines shared with at least one other household. *Unimproved sanitation:* unimproved pit latrines, with or without slabs, open, etc.

proportion of households located more than 30 minutes away from their source of water increased in rural areas.

Meanwhile, access to sanitation is still very problematic, particularly in rural areas. Improvements in the sanitation systems of urban households led to most of the progress between 2012 and 2018; the share of these with SDG-based *basic sanitation* (ventilated pit latrine and flush toilets) increased nearly 17 pp, and the share of households relying on *limited sanitation* rose 6 pp (Figure 4.3D).

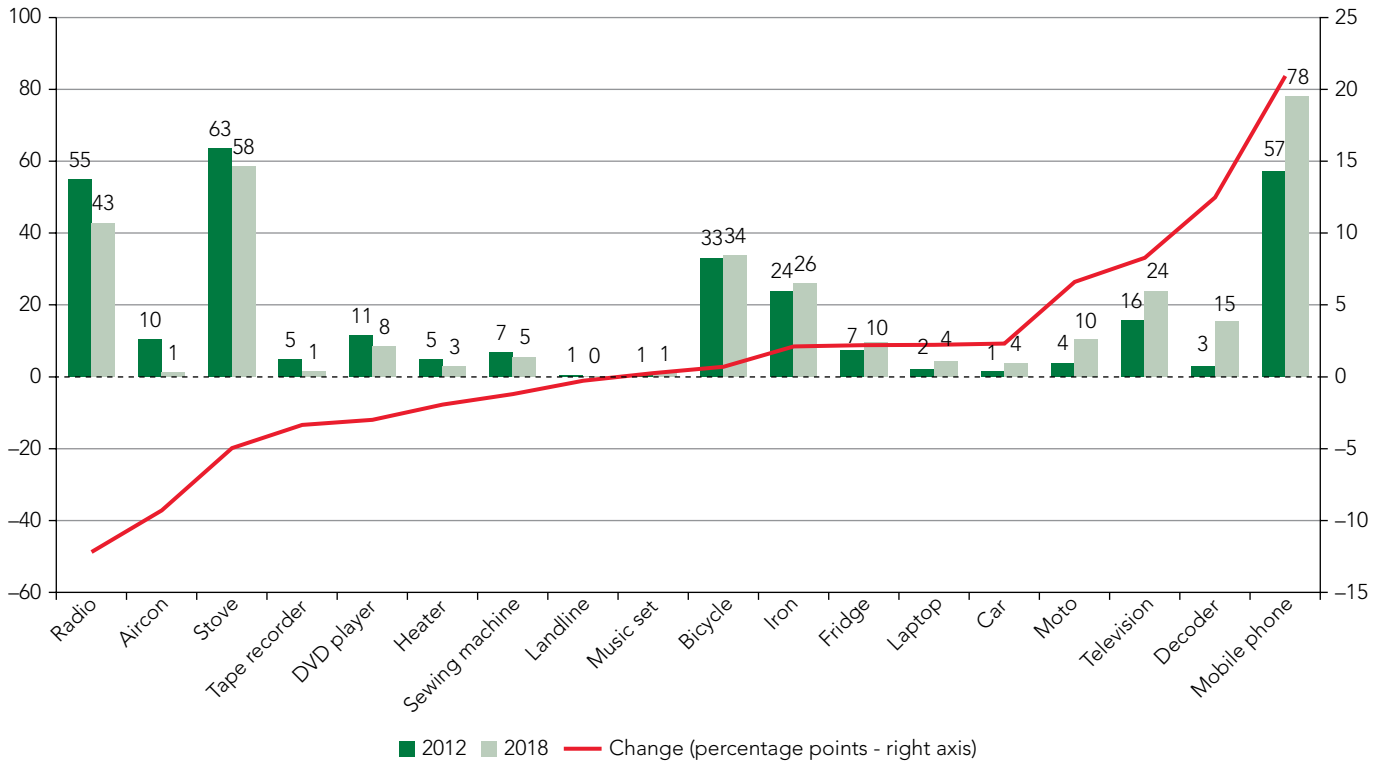
Nevertheless, approximately 7 percent of Tanzanian households lack any sanitation facility, and 65 percent have access only to unimproved traditional pit latrines. The problem is particularly acute in rural areas, where 10 percent of households have no sanitation facilities, and another 79 percent rely on unimproved facilities. These rates increase to 10 percent and 81 percent, respectively, for poor households.

Ownership of modern assets has risen; ownership of more traditional assets is falling.

Tanzanian households have experienced some improvements in ownership of mobile phones, televisions, motorcycles, cars, and other modern assets. In 78 percent of households, up from 57 in 2012, at least one member owns a mobile phone. For poor households, ownership of a mobile phone has gone up by 28 pp and for rural households by 30 pp. In Dar es Salaam, more than 90 percent of households are so equipped, as are 85 percent in other urban areas. Similarly, though still very low for poor households, ownership of motorcycles has more than doubled, going up 7 pp in both rural and urban areas outside Dar es Salaam, and 8 pp in non-poor households. In general, non-poor and Dar es Salaam households recorded the highest increases in modern assets like televisions (+8 pp in Dar es Salaam), fridges (+4 pp), decoders (+39 pp), and laptops (+9 pp). Meanwhile, ownership of such traditional items as radio sets or tape recorders has declined (Figure 4.4 and Table 4.1). Both the rising and

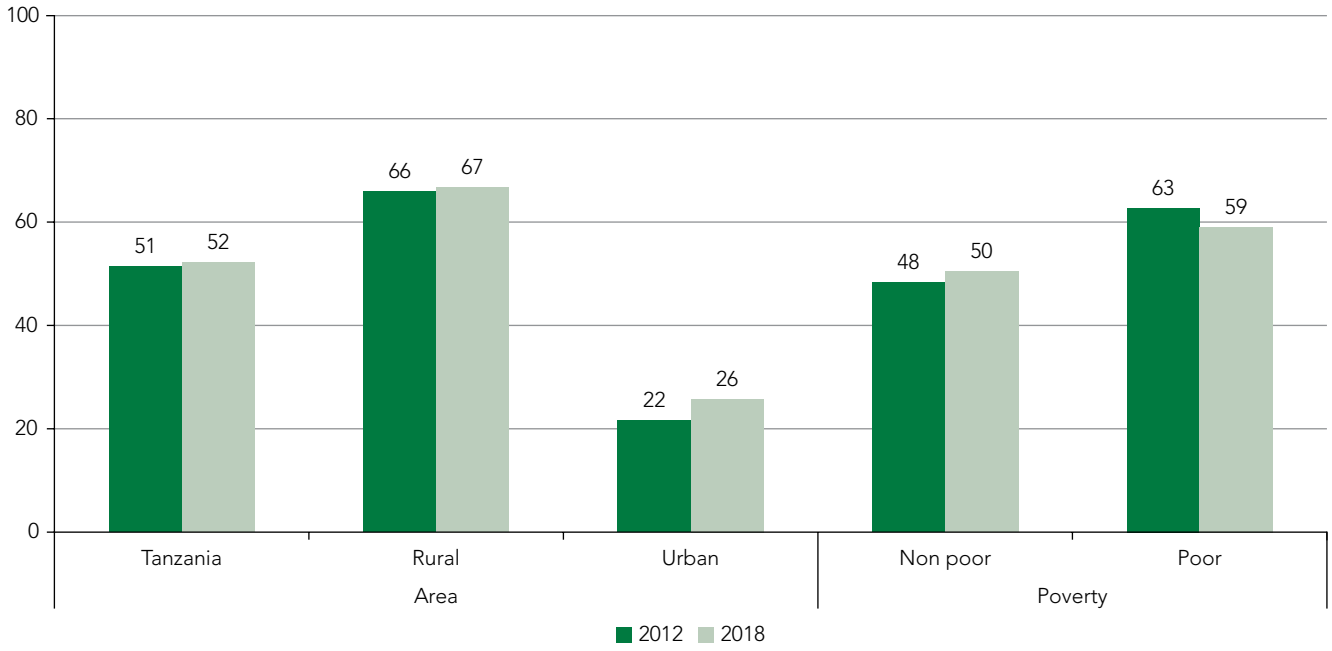
FIGURE 4.4: Ownership of Assets, 2012 and 2018, Percent

A. Households' asset ownership



Sources: HBS 2011/12 and 2017/18.

FIGURE 4.4B: Livestock ownership



Sources: HBS 2011/12 and 2017/18.

TABLE 4.1: Change in Asset Ownership, 2012 and 2018, Percentage Points

		TANZANIA	AREA		POVERTY	
			RURAL	URBAN	NON-POOR	POOR
	Refrigerator	2.2	0.6	3.7	2.7	-0.3
	Heater	-1.9	-2.0	-2.3	-2.0	-1.7
	Stove	-5.0	-9.1	0.0	-4.1	-9.0
Large appliances	Aircon	-9.3	-2.7	-22.9	-10.9	-3.1
	Mobile phone	20.9	27.6	6.0	18.5	29.6
	Decoder	12.5	4.2	27.2	15.0	2.4
	Television	8.3	5.3	11.0	9.4	3.1
	Laptop	2.2	0.5	4.9	2.8	-0.2
	Iron	2.1	0.1	3.5	2.7	-1.3
	Music set	0.3	-0.1	0.8	0.3	0.0
	Landline	-0.3	0.0	-0.9	-0.4	0.0
	Sewing machine	-1.2	-0.8	-2.4	-1.4	-0.7
	DVD player	-3.0	-0.6	-9.2	-3.8	-0.4
	Tape recorder	-3.3	-2.6	-5.0	-3.9	-1.2
Small appliances	Radio	-12.2	-12.0	-13.3	-11.6	-14.9
	Moto	6.6	7.1	5.6	7.9	1.5
	Car	2.3	1.1	4.3	2.9	0.0
Transportation assets	Bicycle	0.7	0.5	2.0	0.1	3.2

Sources: HBS 2011/12 and 2017/18.

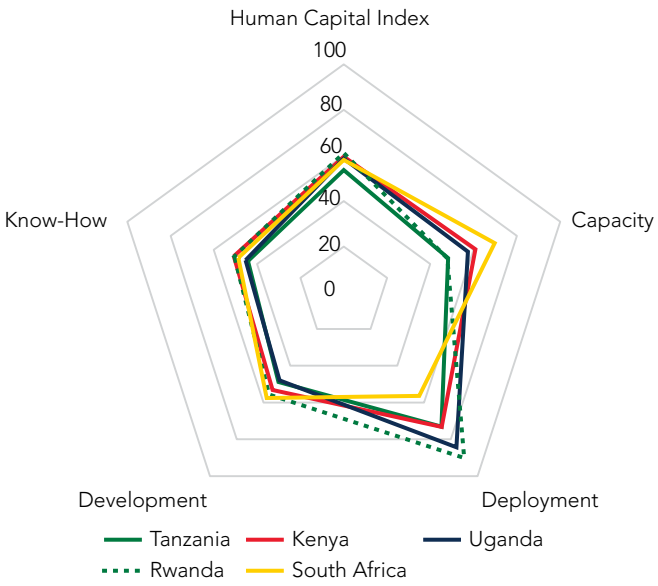
falling trends are similar to the asset ownership trends seen in 2007–12 (World Bank, 2015).

Ownership of livestock rose slightly. Between 2012 and 2018, the share of households owning livestock rose by 1 pp nationally, and by 4 pp in urban areas. It also decreased slightly for poor households, from 63 to 59 percent. Meanwhile, ownership of land plots seems to have plunged dramatically. However, the changes observed may be attributable to a change in data collection methods that makes it difficult to usefully compare 2012 and 2018 data.

II. Human Capital

Tanzania's Human Capital indicators are quite low. Tanzania was ranked 128 of 157 countries in the 2018 World Bank Human Capital Project with a low Human Capital Index (HCI) score of 0.4. Low expected years of schooling is among the main limiting factors to the HCI. The World Economic Forum Global Human Capital Report of 2017 also ranked Tanzania 106 of 130 countries in HCI.[1] Tanzania trails countries with similar income levels, underperforming particularly in the know-how sub-index (109th) due to the very low share of high-skilled employment, limited availability of skilled employees, and low economic complexity (Figure 4.5).

FIGURE 4.5: Human Capital Index



Source: World Economic Forum Global Human Capital Report, 2017.

Rising secondary education enrollment rates are slowly transforming the educational profile of Tanzanians.

Gross and net enrollment rates in primary and lower secondary education rose slightly between 2012 and 2018, but enrollment in lower secondary is still low. Between 2012 and 2018, net primary enrollment increased by 14 pp (Figure 4.6B) (15 pp in rural areas; 9 pp in urban areas). The combination of stagnant or slipping gross enrollment rates in primary and lower secondary education and rising net enrollment rates (Figure 4.6A and B) suggests improvement in education quality and a drop in the number of children repeating classes and therefore being enrolled in classes not for their age.

Gross and net enrollment in upper secondary classes and beyond are very low. In Tanzania, education is free until age 15, which corresponds to the second class in lower secondary. As a result, most students complete only half of lower secondary and do not move on to upper secondary or higher education. Net enrollment in upper secondary school is 2 percent, with a peak of 5 percent in urban areas.

Because class repetition compounds itself over the course of the curriculum, many students are older than would be expected for their placement. The discrepancies between gross and net enrollment rates suggest that class repetition might be a cause. About 15 percent of all students report that they have failed a class, 16 percent for primary pupils, 10 percent for lower secondary, and 9 percent for upper secondary (Figure 4.7A). In primary school, 12 percent of enrolled pupils are already older than 13 years and in upper secondary,

[1] The components of the HCI in the World Bank Human Capital project are different from those of the HCI in the World Economic Forum Global Human Capital Report.

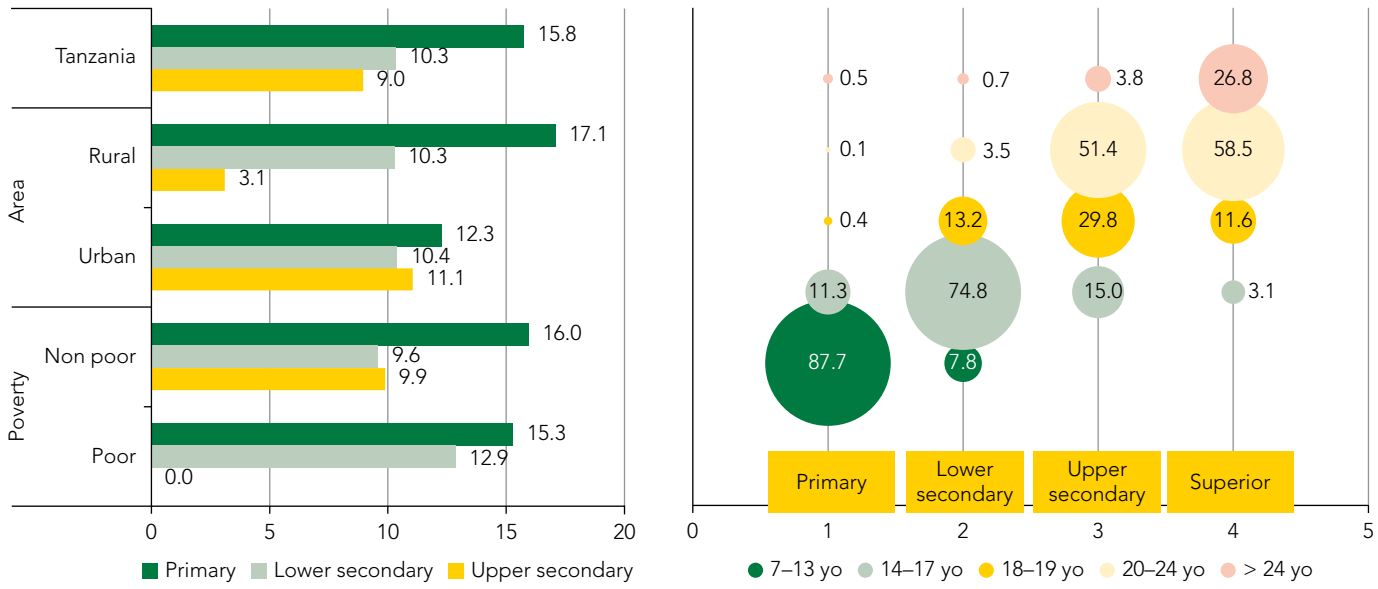
FIGURE 4.6: Gross and Net Enrollment Rates, 2012 and 2018, Percent

Sources: HBS 2011/12 and 2017/18.
Note: Age categories for the denominators of the gross and net enrollment ratios: primary, 7–13; lower secondary, 14–17; upper secondary, 18–19.

more than 55 percent are older than 19, suggesting that class repetition persists over the course of education (Figure 4.7B).

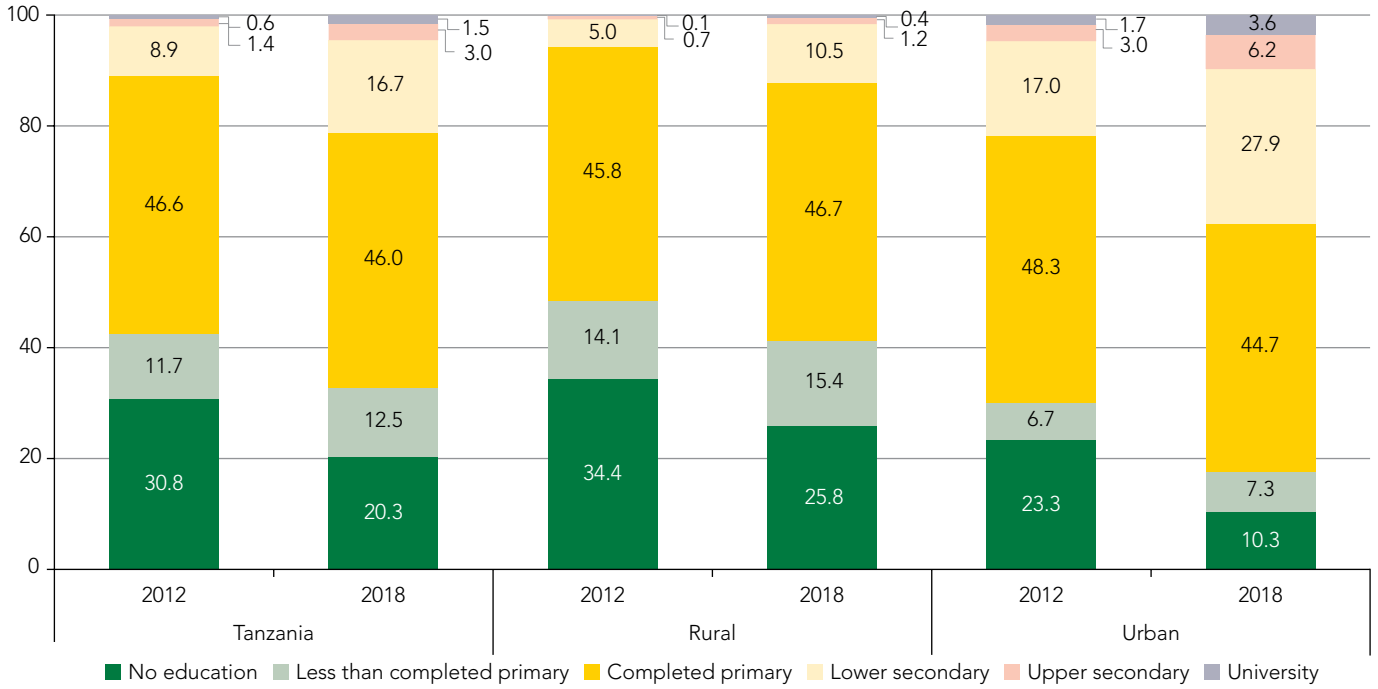
More adults are now attaining lower secondary education. Nationally, between 2012 and 2018, the share of adults aged 15 and older with no education dropped 10 pp and the share with some lower secondary increased almost 8 pp (Figure 4.8). The improvement was particularly remarkable in urban areas, where the proportion of adults without any formal education decreased 13 pp and the proportion with some lower secondary rose 11 pp. Moreover, the educational profile is improving across generations; 11 percent of Tanzanians aged 15 to 29, 17 percent of those aged 40 to 49, 23 percent of those aged 50 to 59, and 48 percent of those 60 and older have no formal education. Similarly, 29 percent of individuals aged 15–29, 7 percent of those aged 40 to 59, and 5 percent of those older than 60 have lower secondary education.

FIGURE 4.7: Repetition of Classes, 2018, Percent



Source: HBS 2017/18.

FIGURE 4.8: Educational Achievements of Adults 15+, 2012 and 2018, Percent



Sources: HBS 2011/12 and 2017/18.

While there seems to have been progress in adult and maternal mortality, many under-5 children still suffer from chronic malnutrition.

Over the last decade the total fertility rate (TFR) has declined as a result of public family planning policies and increased education of women. The TFR has gone down by nearly one child over the past two decades (Figure 4.9A). For rural women the TFR has followed the same declining trend but for urban women it has gone up slightly, from 3.6 to 3.8 children, since 2005. In general, it seems that more education for women helps to bring down the TFR. For instance, women with no education have a TFR of 6.9, compared with 5.3 for women with complete primary education and 3.6 for women with lower secondary education and beyond.

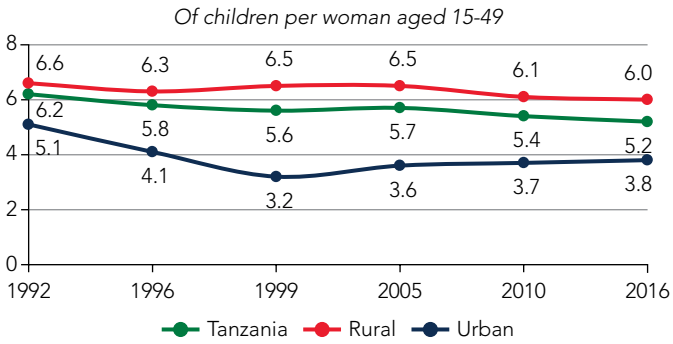
The maternal mortality ratio has not changed significantly over the last decade. In the 2016 Demographic and Health Survey, there were 556 maternal deaths per 100,000 live births for the 10-year period before the survey (Figure 4.9B). The confidence interval is large and overlaps with those of previous years, indicating no significant differences.

Meanwhile, over the last decade, adult mortality, including the probability of dying before age 50, has decreased. Between 2010 and 2016, adult mortality fell from 5.1 to 4.6 deaths per 1,000 population in women and from 5.0 to 4.3 in men. Between 2015 and 2016, the probability of a 15-year-old dying before age 50 also declined: for women from 23.6 percent to 18.1 percent (Figure 4.9D) and for men from 24.2 percent to 17.4 percent.

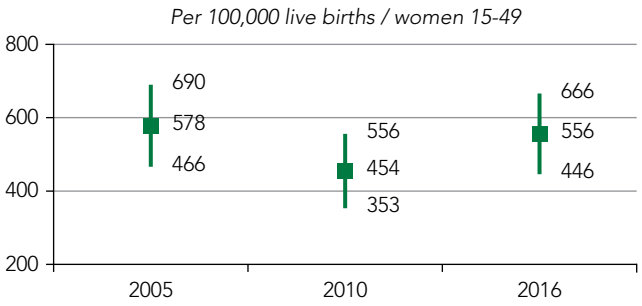
Anthropometric indicators for under-five children have improved over the last decade, but chronic undernutrition remains severe, particularly in rural areas. For the last 20 years, the share of under-five children with nutritional deficiencies has been decreasing (Figure 4.9C), although the fact that too many under-five children are still stunted indicates that chronic malnutrition is a structural problem. Nationally, 35 percent of under-five children are stunted, 12 percent severely, which means that they are considered short for their age, highlighting problems with cumulative growth deficits (Figure 4.9E). The problem is particularly acute in rural areas, where nearly 40 percent of under-five children are stunted.

FIGURE 4.9: Health and Anthropometric Indicators, 2016

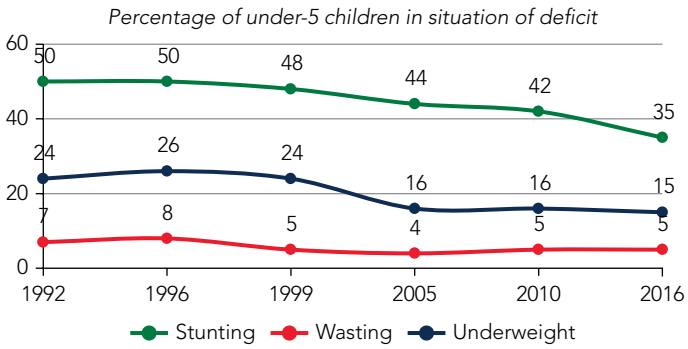
A. Trend in total fertility rate



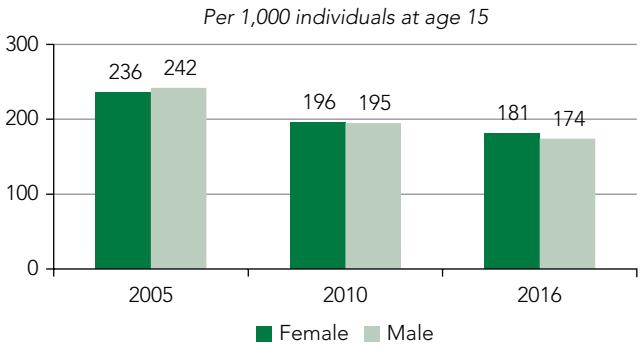
B. Maternal mortality rate with confidence interval



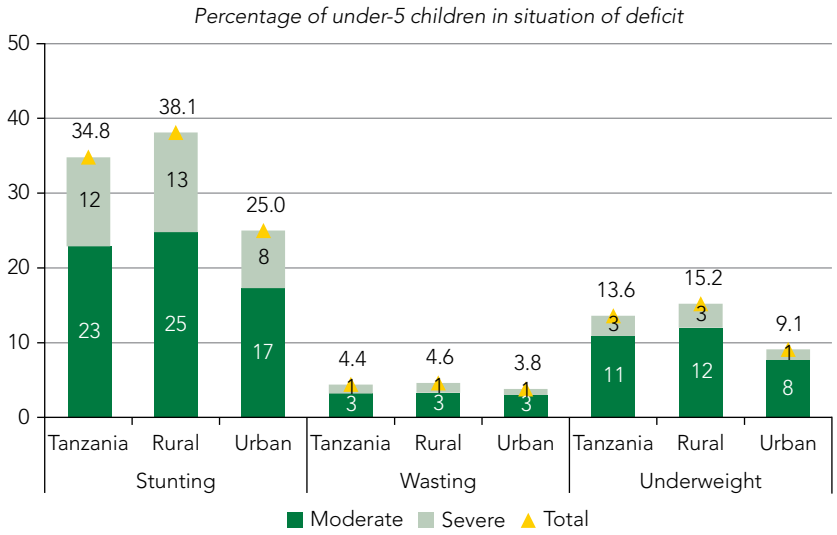
C. Trend in anthropometric indicators



D. Adult mortality (15+)



E. Anthropometric indicators



Source: DHS 2015/16.

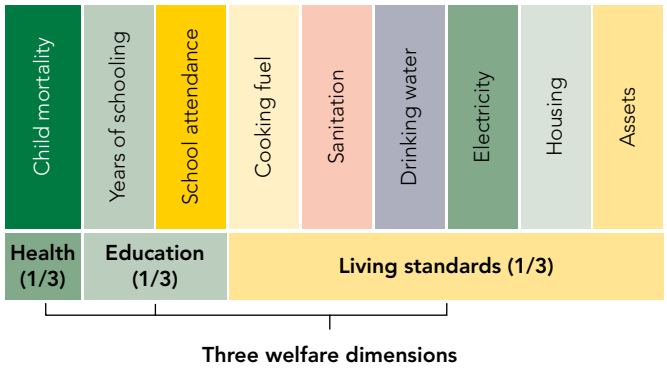
Note: Deficiencies in anthropometric indicators are measured for each indicator for which the Z-score is more than two standard deviations below (–2 SD) the median of the World Health Organization reference population. *Stunting* (height-for-age ratio) is a measure of linear growth retardation and cumulative growth deficits, identifying children who are short for their age (stunted) or chronically undernourished. *Wasting* (weight-for-height ratio) measures body mass in relation to body height or length and describes current nutritional status, identifying children who are thin (wasted) or acutely undernourished. *Undernourishment* (weight-for-age ratio) is a composite index of height-for-age and weight-for-height that takes into account acute and chronic undernutrition.

III. Multitude of Deprivations in Well-Being

The Tanzania National Bureau of Statistics is currently developing a National Multidimensional Poverty Index. The approach is based on the principle that not only severe shortfalls in consumption and income, but also deficits in many other dimensions of living conditions can jeopardize the well-being of the population. This is part of the government's effort to sustainably address poverty by going beyond the proximate causes of deficits in consumption and understanding the different forms of deprivation that the population faces to address the numerous underlying causes of poverty and vulnerability. Determining the multitude of dimensions in which people are deprived and the complicated ways these dimensions are enmeshed involved several consultations with national stakeholders and international experts to define the National Multidimensional Poverty Index estimation methodology. (See appendix F for a brief overview of the technical underlying model). The process has been completed, and the National Bureau of Statistics will publish the National Multidimensional Poverty Index soon.

This chapter assesses the extent of deprivation in three main dimensions of well-being, considering nine indicators of health, education and living standards (Figure 4.10). We considered individuals who were deprived in at least one-third of these indicators to be multidimensionally deprived.

FIGURE 4.10: Well-being Dimensions to Assess the Multitude of Deprivations



Source: Tanzania National Bureau of Statistics and OPHI 2019, preliminary steps to estimate the National Multidimensional Poverty Index.
Note: Indicators within each dimension were equally weighted. Deprivation criteria are defined in appendix F, table F.1

One-third of Tanzanians are multidimensionally deprived, with the rate being much higher in rural areas. Approximately 34 percent of the population is deprived in at least one-third of the well-being indicators mentioned above. Deprivations are distributed unequally in terms of location; 46 percent of the rural population and 10 percent of the urban population is multidimensionally deprived (Table 4.2).

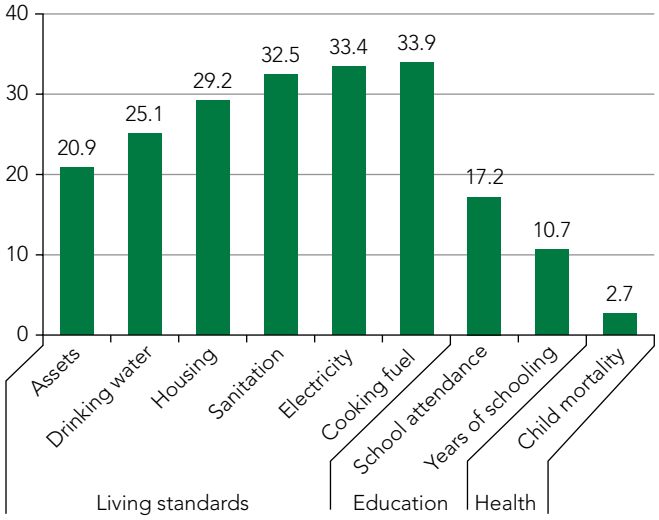
Deprivation tends to be greatest in the *living standards* dimension. More than 30 percent of the population is deprived in *sanitation*, *electricity*, and *cooking fuel* (Figure 4.11); 29 percent in *housing*; 25 percent in *drinking water*; and 21 percent in *assets*. Only 2.7 percent of the population is deprived in the *health* dimension.

TABLE 4.2: Multidimensional Deprivations, 2018, Percent

	HEADCOUNT
Tanzania	34.2
Rural	45.6
Urban	9.9

Source: HBS 2017/18, Tanzania National Bureau of Statistics, and OPHI (2019).

FIGURE 4.11: Deprivation Levels According to Welfare Dimension, 2018, Percent



Source: HBS 2017/18, Tanzania National Bureau of Statistics, and OPHI (2019).

CHAPTER 5

Geographic Dimensions of Poverty

This chapter examines geographic disparities in poverty in mainland Tanzania. It is divided into two parts: The first section presents new poverty estimates for 2018 at the regional and district levels, and the second section examines the extent to which geographic disparities in poverty are related to measures of urbanization, market access, human capital, public services, and agro-climatic conditions. The district level poverty estimates are generated based on the 2018 HBS, combined with a battery of village-level indicators that, with one exception, were derived from publicly available satellite imagery and remote-sensing data.[1] These new estimates are not comparable with either of the two sets of district-level estimates generated previously based on the 2012 Population Census (World Bank 2017; Kilama and Windeboom 2016).[2] This is primarily because of differences in survey methodology between the 2012 and 2018 HBSs, which led to distorted estimates of poverty trends in many districts.[3]

[1] The one exception is building counts, which were obtained from a development partner and are not publicly available. According to administrative boundaries defined in the 2012 Population Census, Tanzania contains 169 districts (of which 159 are on the mainland), which are subdivided into approximately 16,000 villages on the mainland. Combining the survey data with estimates derived from satellite indicators for villages that the survey does not cover increases the precision of the estimates sufficiently to make reporting district-level estimates feasible. See appendix G for methodological details

[2] The methodology used to derive the World Bank estimates are described in Rascon and Audy (2016).

[3] In particular, the 2011/12 HBS was based on the 2002 census sample frame. The change in the sample frame between 2002 and 2012 has large effects on estimated poverty rate in certain districts; for example, estimated poverty rose significantly in Longido district because of greater inclusion of settled Maasai in the 2012 sample frame. In several other districts, estimated poverty rates rose 20 to 30 pp between 2012 and 2018, which we believe stems more from methodological differences than deteriorating economic conditions.

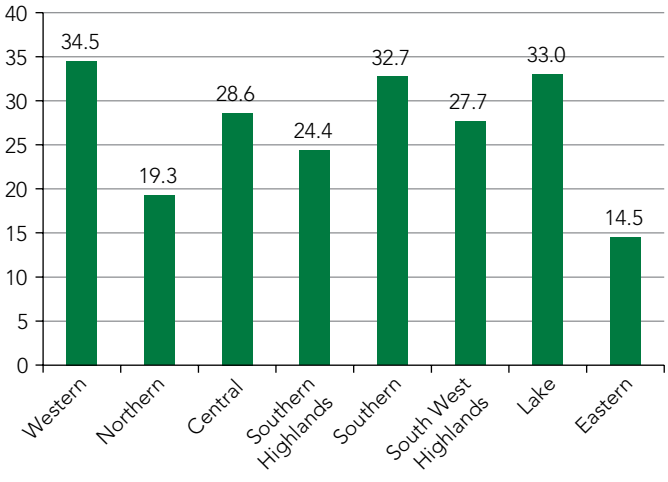
I. Geographic Disparities in Poverty

Geographic inequalities in poverty are large.

There are important disparities in poverty between geographic zones. The poverty rate varies from 14.5 percent in the eastern zone to 34.5 percent in the western zone (Figure 5.1). Poverty is also prevalent in the lake and southern zones (>30 percent). Because the distribution of the population is uneven across geographic zones, zones where poverty is highest do not necessarily contain the most poor people. Approximately one-third of the poor are located in the lake zone, where approximately one-fourth of Tanzania's mainland population lives and the poverty rate is the second highest (Figure 5.2). Most households in this zone work in subsistence agriculture on their own farms or as unpaid family helpers. Maternal and child mortality, fertility rate, and prevalence of malaria are among the highest in this zone (DHS 2015/16). The southern and western zones also have high poverty rates and a high prevalence of health problems, but because population density is low in these zones, there are fewer poor people. The eastern and northern zones have the lowest poverty rates, but because a substantial fraction of the population lives there (18 percent and 12 percent, respectively), they contain a large share of poor people.

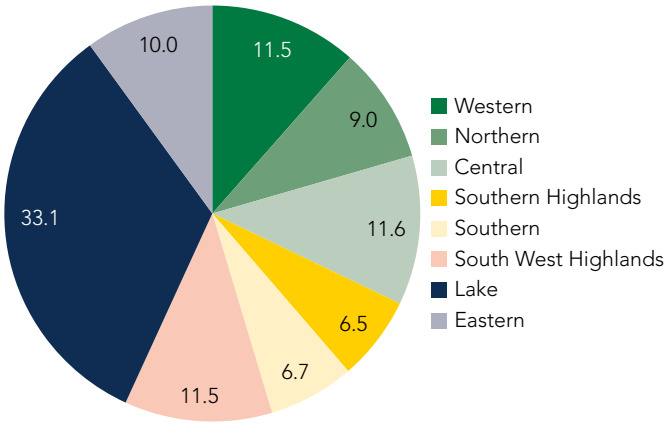
The analysis also reveals major geographic inequalities in poverty across regions and districts. The standard deviation

FIGURE 5.1: Poverty Headcount by Geographic Zone, 2018, Percent



Source: HBS 2017/18.
Note: To estimate geographic differentials in poverty, Tanzania mainland was divided into eight geographic zones. These are not official administrative areas, they are based on DHS 2015/16 classification. They group administrative regions as follows: *Western zone:* Tabora, Kigoma; *Northern zone:* Kilimanjaro, Tanga, Arusha; *Central zone:* Dodoma, Singida, Manyara; *Southern Highlands zone:* Iringa, Njombe, Ruvuma; *Southern zone:* Lindi, Mtwara; *South West Highlands zone:* Mbeya, Rukwa, Katavi, Songwe; *Lake zone:* Kagera, Mwanza, Geita, Mara, Simiyu, Shinyanga; and *Eastern zone:* Dar es Salaam, Pwani, Morogoro.

FIGURE 5.2: Distribution of the Poor Population by Geographic Zone, 2018, Percent



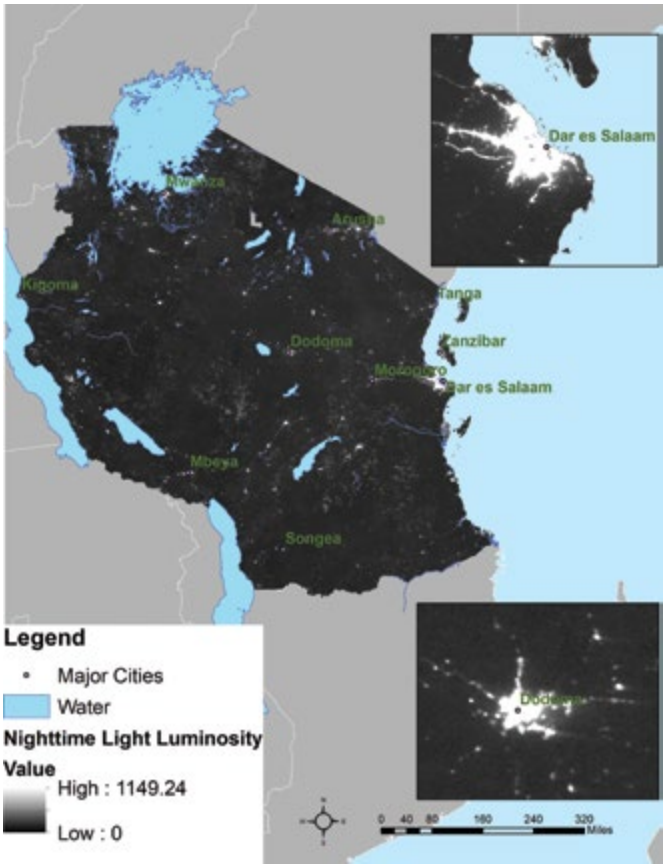
Source: HBS 2017/18.
Note: To estimate geographic differentials in poverty, Tanzania mainland was divided into eight geographic zones. These are not official administrative areas, they are based on DHS 2015/16 classification. They group administrative regions as follows: *Western zone:* Tabora, Kigoma; *Northern zone:* Kilimanjaro, Tanga, Arusha; *Central zone:* Dodoma, Singida, Manyara; *Southern Highlands zone:* Iringa, Njombe, Ruvuma; *Southern zone:* Lindi, Mtwara; *South West Highlands zone:* Mbeya, Rukwa, Katavi, Songwe; *Lake zone:* Kagera, Mwanza, Geita, Mara, Simiyu, Shinyanga; and *Eastern zone:* Dar es Salaam, Pwani, Morogoro.

of the head count poverty rate across districts is 13 percentage points (pp). More than one-fifth of total inequality in economic welfare, proxied by household consumption per adult, is due to geographic inequalities across districts, although it is likely that this figure underestimates the true share of economic inequality between districts, to the extent that household consumption is measured with error.

Tanzania's recent growth and poverty reduction may have disproportionately benefited certain locations. For example, anecdotal evidence suggests that the administrative capital of Dodoma has developed rapidly in recent years, in anticipation of the long-awaited move of the national government there, which was officially announced in April 2019. Furthermore, Tanzanian tourist arrivals have doubled since 2006, raising the question of whether this has boosted poverty reduction in areas near tourist attractions such as Mt. Kilimanjaro and the Serengeti National Park in northern Tanzania.

Patterns of night-time lights show expanding urbanization. Nighttime lights, which have long been used as a proxy for urbanization and economic development, can give a rough indication of geographic patterns in economic development and urbanization (Elvidge et al. 2001; Henderson et al. 2012). Judging from the growth in nighttime lights between 2013 and 2018 (figures 5.3 and 5.4), urbanization has significantly expanded the economic footprint of Dar-es-Salaam and secondary cities and towns such as Dodoma, Arusha, Mwanza, and Tarime. There has also been scattered growth in nighttime lights in the southern portion of the country and along the main north-south road corridors in the center of the country. The darkest areas, and those with modest growth in light, are in the west of the country near the border with Burundi, the Democratic Republic of the Congo, and Zambia, near Lake Tanganyika, indicating that economic development and urbanization have stagnated in those areas, although patterns of nighttime lights tend to reflect settlement patterns more strongly than poverty.

FIGURE 5.3: Nighttime Lights, 2018



Source: World Bank calculation based on Visible Infrared Imaging Radiometer Suite (VIIRS), Version 1; ngdc.noaa.gov.
Notes: Nighttime light data from June 2018 are not available and are thus excluded from the analysis.

FIGURE 5.4: Changes in Nighttime Lights, 2013–18

Source: World Bank calculation based on VIIRS.
Notes: Inserts show areas around Dar-es-Salaam and Dodoma.

Pockets of poverty are concentrated in the northern and western parts of the country, although some are also found in the southern parts.

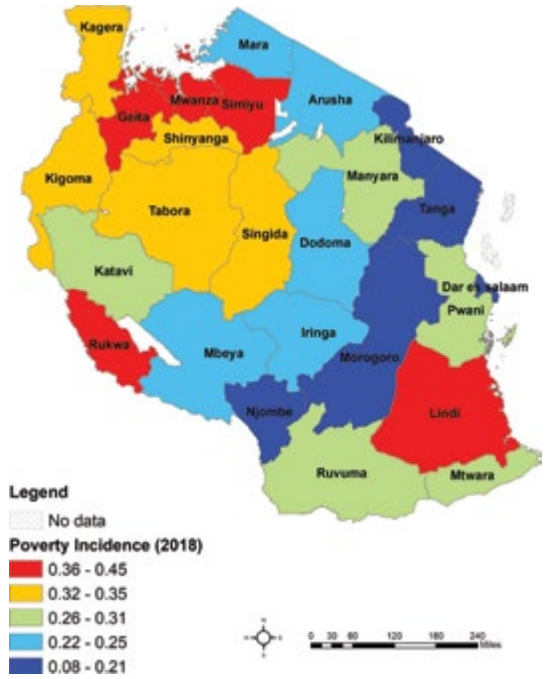
Poverty is highest in regions in the west and northwest. Figure 5.5A shows region-level poverty estimates derived from the 2018 HBS. The poorest regions are Rukwa (45 percent), Simiyu (39 percent), Lindi (38 percent), Geita (37 percent), and Mwanza (35 percent). The least impoverished regions are Dar es Salaam (8 percent), Kilimanjaro (11 percent), Njombe (13 percent), and Morogoro (19 percent).[4]

Although these regional disparities are revealing, they fail to capture significant variations in living standards and poverty within each region. Figure 5.5B shows estimated district poverty rates, which are derived based on the 2018 HBS and a variety of geospatial information that helps predict the poverty rate in each district.[5]

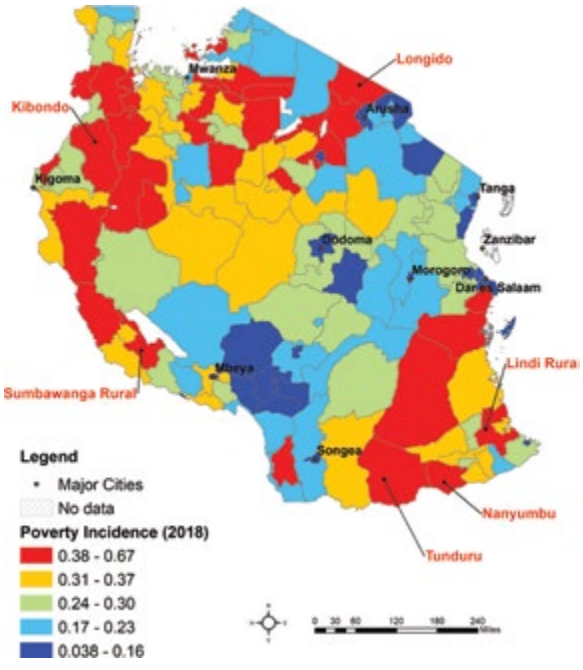
The district-level poverty map reveals four broad pockets of poverty. The first is in the north and northeast part of the country. Poverty is most pervasive in Longido district, which is just north of Arusha and just west of Mt. Kilimanjaro near the Kenyan border and is estimated to have a poverty rate of greater than 60 percent. Longido is home to a large community of Maasai pastoralists, and a recent "ruby rush" at and around Mundarara mine has yet to create meaningful poverty reduction for residents. On the west side of the Serengeti is Itilima district and the neighboring Kwimba district, which are also among the most impoverished areas in the country. In sum, many of the country's poorest districts lie roughly in a horizontal line from Longido in the east to Kwimba in the west.

FIGURE 5.5: Estimated Poverty Rate

A. According to Region



B. According to District



Source: World Bank estimates based on 2017/18 HBS and auxiliary variables.

[4] For visualization in figure 5.5A, we used a shapefile constructed based on district and regional boundaries at the time of the 2012 Population Census. Therefore, Songwe, a new region that split from Mbeya in 2016, is not mapped, and the poverty rates for Mbeya (20.7 percent) and Songwe (21.4 percent) are similar.

[5] See appendix G for details on the methodology used to derive district-level poverty estimates.

TABLE 5.1: Poverty District Estimates, 2012 and 2018

SPEARMAN RANK CORRELATION	2018	2012 (WORLD BANK)
2018 poverty estimate	1.00	0.20
2012 poverty estimate (World Bank)	0.20	1.00
Average district household size in 2012	0.53	0.03
Average district literacy rate in 2012	−0.61	−0.14
District share of children aged 12 to 15 attending school	−0.59	−0.08

Source: 2012 census and World Bank staff estimates.
Note: The 2018 district estimates are more strongly correlated with census-based welfare indicators than the 2012 estimates.

A second pocket of poverty lies slightly further to the west in the northern region, in parts of the Kigoma, Kagera, and Geita regions near the Kigosi and Moyowosi game reserves. Poverty in this area is most prevalent in Kibondo district, which is on the Burundi border and hosts large numbers of refugees, many of whom arrived during unrest in neighboring countries in the mid-1990s. Just north and east of Kibondo are four other districts with high poverty rates: Chato, Biharamulo, Bukombe and Ngara. Buhigwe (south of Kibondo) and Kaliua and Urambo, approximately 300 km east of Buhigwe in the Tabora region, are also quite poor, with a poverty rate greater than 40 percent.

A third pocket of poverty lies in the western part of the country, near the borders of the Democratic Republic of Congo and Zambia. Sumbawanga Rural is a small, particularly poor district in the Rukwa region, between Lake Tanganyika and Lake Rukwa. Bordering Sumbawanga Rural to the north is Nkasi district, which also has a high rate of poverty.

The other main pocket of poverty is in the southeast, in parts of the Ruvuma, Mtwara and Lindi regions bordering Mozambique. Among the poorest districts in these regions are Tunduru and Mbinga in the Ruvuma region, Nanyumbu and Newala in the Mtwara region, and Lindi Rural and Liwarle districts in the Lindi region.

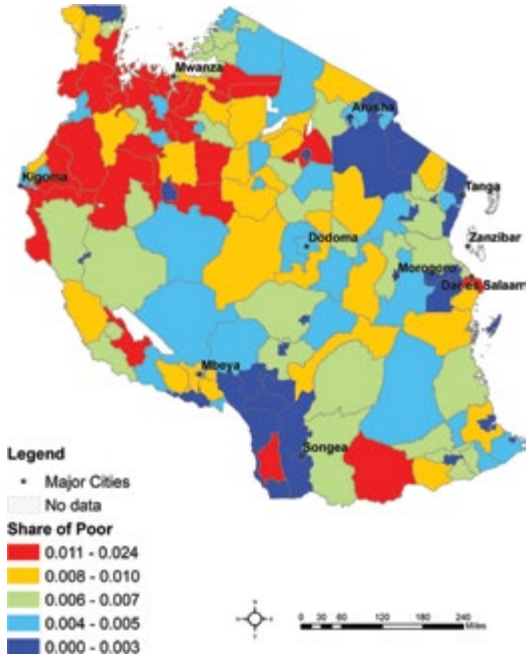
These geographic patterns of poverty in 2018 should not be compared with the 2012 district estimates to analyze changes in district poverty rates. The rank correlation between the 2018 district estimates and the 2012 estimates that the World Bank (2016) published is only 0.20 (Table 5.1). This correlation is too low for local economic shocks or growth patterns to explain, as two concrete examples illustrate. In 2018, Kaliua district was very poor, with an estimated poverty rate of greater than 50 percent. This contrasts starkly with the 2012 estimate of 3 percent. Second, Longido district was estimated to have a poverty rate higher than 60 percent in 2018, compared with 32 percent in 2012. Large increases in poverty in these districts cannot explain these differences, which must be due to changes in the methodology and source data that make the 2012 and 2018 estimates incomparable.

The new district poverty estimates for 2018 appear to be more consistent with indicators from the 2012 census than the previous 2012 district estimates. For example, according to the census, Kaliua had the fifth-lowest literacy rate in 2012, which is more consistent with the high estimated poverty rate in 2018 than the low poverty rate reported for 2012. Similarly, only 46 percent of 12- to 15-year-old children in Kaliua reported attending school in 2012, the lowest ratio of all districts in the country, further suggesting that it is a very poor district. Table 5.1 shows that the 2018 poverty estimates are much more strongly correlated with measures of school attendance, literacy, and household size available in the census than the 2012 estimates. This confirms that the 2018 estimates are reasonably consistent with indicators from the 2012 census and that the 2012 and 2018 estimates are not comparable.

Districts with high poverty rates tend to have many poor people.

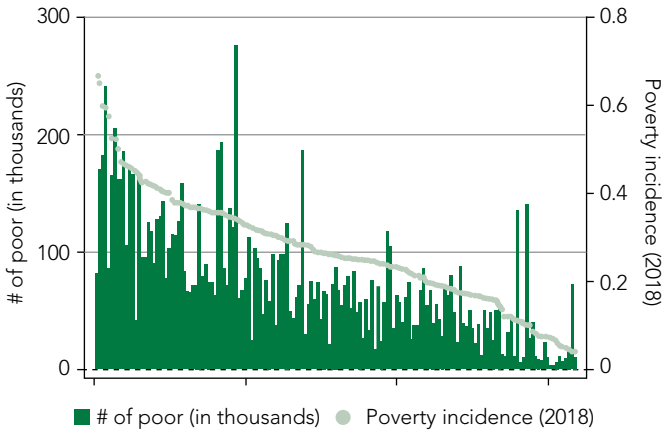
Although poor people tend to reside in districts with high poverty rates, there are also populous districts with lower poverty rates where many poor people live. Policymakers may wish to target provision of public goods to areas where large numbers of poor people live. Figure 5.6 shows the share of the country's poor people according to district, and figure 5.7 shows the relationship between poverty rate and number of poor for 159 districts. The number of poor is lower in areas with lower rates of poverty, and the regions with the highest poverty rates also have the most poor people, particularly the area around Lake Victoria and Simiyu region in the north and around the Kigosi and Moyowosi game reserves in the west. Districts such as Kwinba and Kaliua host a large population of poor people because they have large populations and high rates of poverty, although there are also a significant number of poor people in Lushoto district in Tanga and Ilala district near Dar es Salam, which have lower poverty rates but large populations. Conversely, Longido and Nanyumbu districts, despite high poverty rates, are sparsely populated and therefore have fewer poor people.

FIGURE 5.6: Estimated Share of Poor by District



Source: World Bank estimates based on 2017/18 HBS and auxiliary variables. The number of poor is derived based on the 2012 Population Census.

FIGURE 5.7: Number of Poor and Poverty Rates in Districts

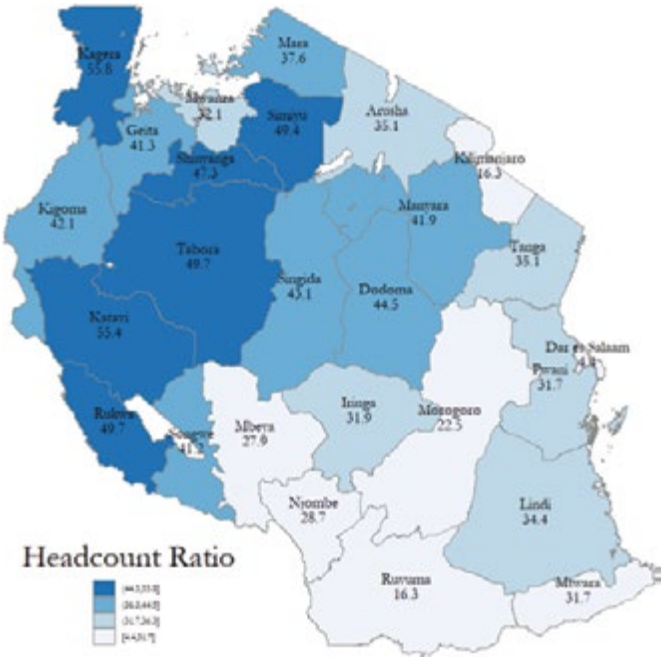


Source: World Bank estimates based on 2017/18 HBS and auxiliary variables. The number of poor is derived based on the 2012 Population Census.

Monetary poverty accompanies lack of human capital and access to basic public services.

Multidimensional deprivation is a measure of poverty based on an index of access to services and human capital indicators. The index combines educational attendance and attainment, child mortality, and several indicators of asset ownership and housing quality into three components, which are then combined into a single index. Because the Multidimensional Deprivation Index (MDI) is derived entirely from the 2018 HBS, it is available only at the regional level.[6] Regional patterns in the MDI provide further evidence of large geographic disparities in poverty (figures 5.8 and 5.9).

FIGURE 5.8: Multidimensional Deprivation Rate by Region, 2018, Percent

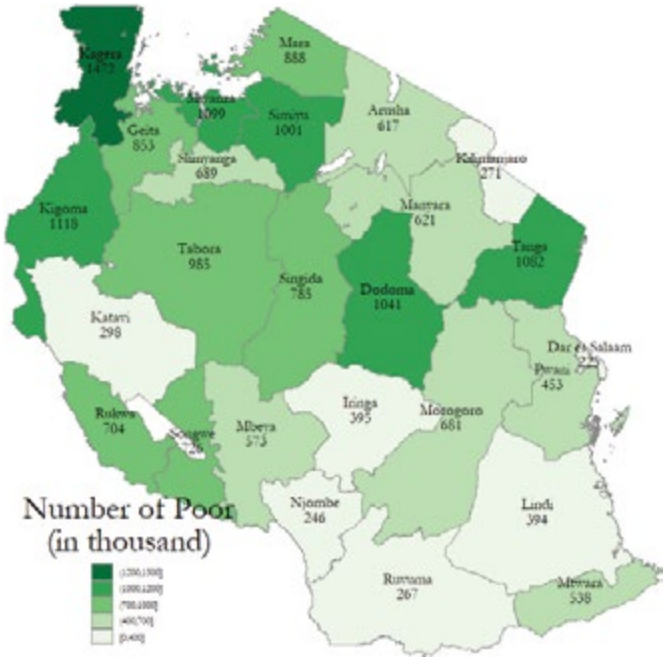


Source: Estimates based on OPHI and NBS (2019) and 2017/18 HBS.

Although the geographic pattern of multidimensional deprivation is broadly consistent with that of monetary poverty, there are important differences. Multidimensional deprivation appears to be pronounced in the western part of the country, particularly in Kagera, Katavi, Tabora, Rukwa, and Simiyu regions, which are also among the most impoverished in terms of monetary poverty, but the detailed geographic patterns of multidimensional deprivation differ considerably from those of monetary poverty. For example, the pockets of monetary poverty in the south (e.g., Ruvuma region) are not as poor in a multidimensional sense. The MDI may be failing to fully capture recent growth and development in particularly areas. For example, Dodoma region is the seventh poorest of the 26 regions, according to the MDI, but ranks 18th in monetary poverty. In this case, the MDI may not be capturing

[6] The MDI is similar to the Multidimensional Poverty Index (MPI). It was estimated in collaboration with the National Bureau of Statistics and the Oxford Poverty and Human Development Initiative (OPHI) during the preliminary steps for the calculation of the National Multidimensional Poverty Index.

FIGURE 5.9: Number of Multidimensional Deprived by Region, 2018, Thousand

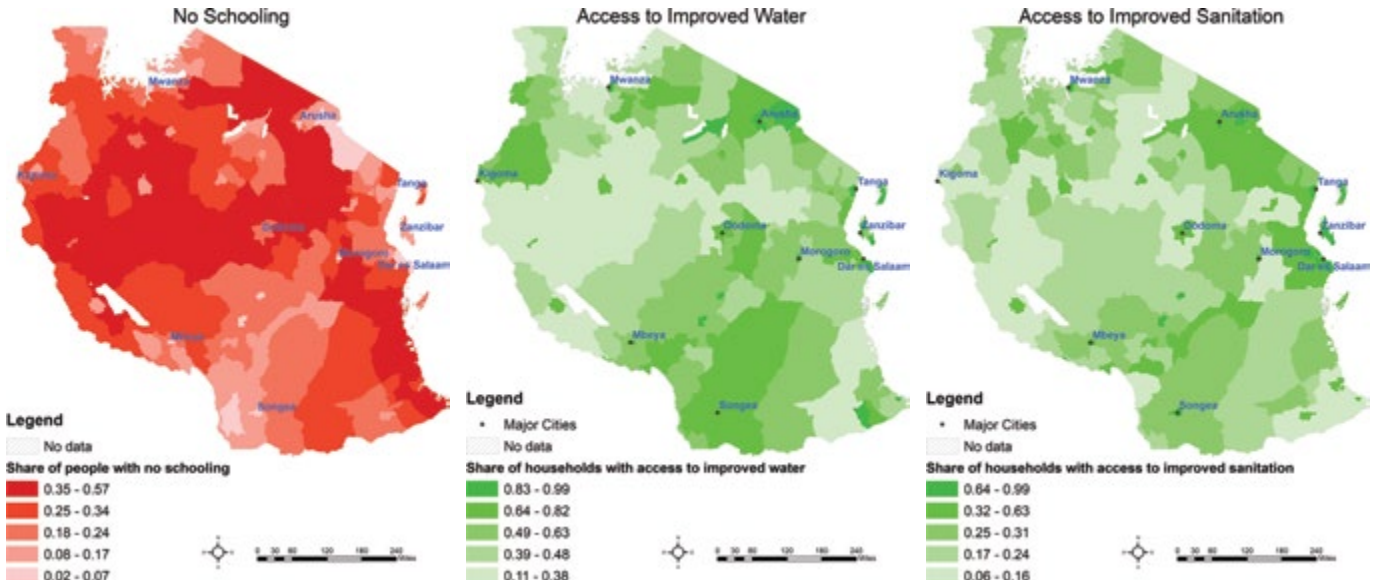


Source: Estimates based on OPHI and NBS (2019) and 2017/18 HBS.

the rapid recent growth in Dodoma, visible in the nighttime lights shown in figure 5.4, due to the anticipated movement of the national government administration. Similarly, the western region of Katavi is the second poorest region according to the multidimensional index but only the 14th poorest of the 26 regions according to the monetary measure.

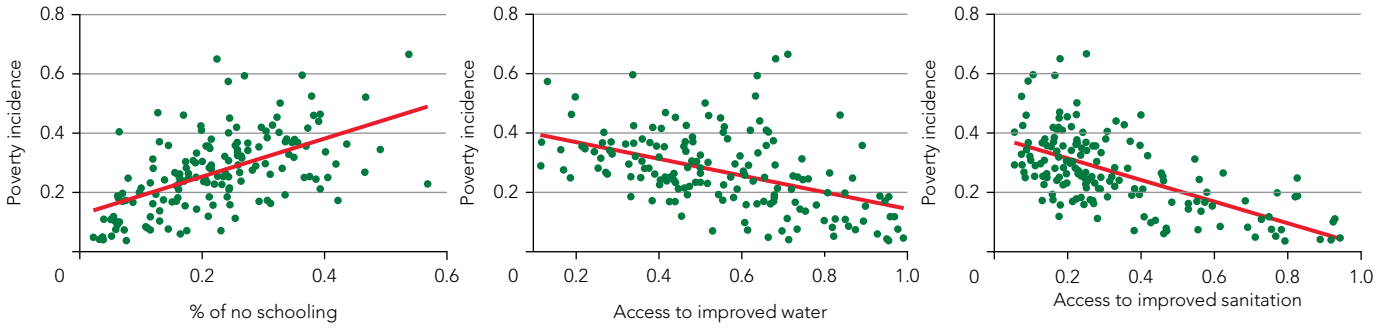
Areas with a higher level of poverty also tend to have significantly less human capital and poorer access to public services such as water and sanitation. Figure 5.10 shows district-level geographic disparities in education attainment and access to basic services (e.g., improved water and sanitation), which are derived from the 2012 Population Census. Figure 5.11 depicts how these nonmonetary measures of welfare are correlated with poverty incidence. There is a strong correlation between poverty incidence, education, and access to improved water and sanitation. Urban-rural inequalities are partially the source of these geographic disparities in human capital and public services, because urban residents on average tend to have more education and a denser network of public services. Education and access to basic public services are two of the most critical drivers of poverty reduction in Tanzania, and addressing such geographic disparities is a crucial step toward reducing geographic inequalities in monetary poverty.

FIGURE 5.10: Access to Education and Public Services, 2018



Sources: 2017/18 HBS and 2012 Population Census.

FIGURE 5.11: Relationship Between Poverty, Education and Public Services



Sources: World Bank estimates based on the 2017/18 HBS for poverty incidence and the 2012 Census for district-level share of people with no schooling and share of households with access to improved water/sanitation.

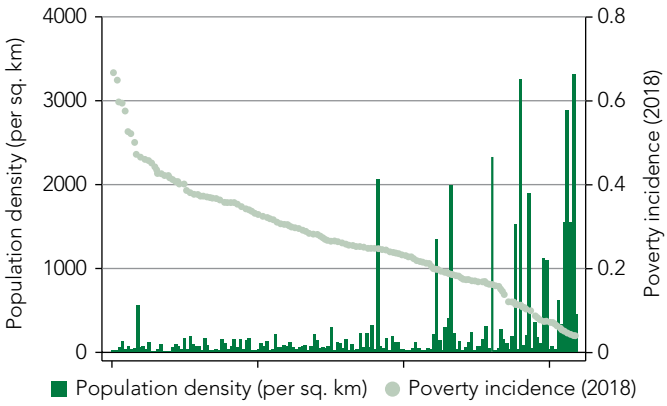
II. Drivers of Geographic Disparities in Poverty

Urbanization and structural transformation provide Tanzania with an opportunity to make further strides toward poverty reduction. Although Tanzania's population is growing slightly faster than 3 percent a year, for the last decade, the urban population has grown an average of 5.5 percent a year. In 2012, approximately 30 percent of the population was living in urban areas; by 2045, this share is expected to reach 50 percent. Dar es Salaam is the third-fastest-growing city in Africa (United Nations 2014).

Successful urbanization typically translates into poverty reduction through a structural transformation from low-productivity agricultural employment into more-productive urban jobs in manufacturing and services (Lewis 1954). In large cities, more-productive jobs are available, and these productivity gains come partly from the benefits of agglomeration economies, such as resource sharing; quick, accurate matching; and knowledge spillovers (Duranton 2013).

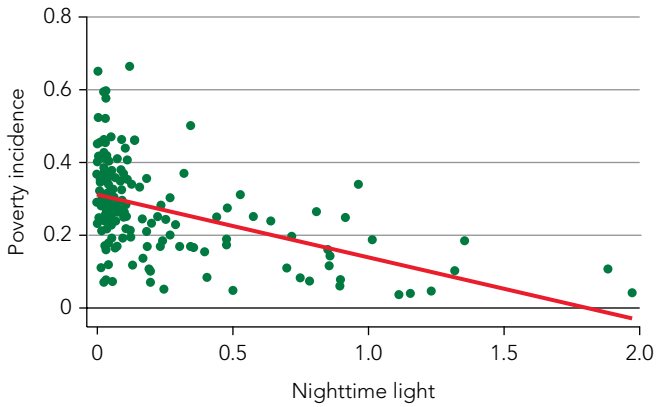
As in many other developing countries, urbanization has been a critical driver of geographic disparities in poverty in Tanzania. Poverty rates are lower in larger and more densely populated districts (Figure 5.12). Poverty incidence is also less pronounced in districts with a greater level of nightlights, which reflects their greater levels of urbanization and economic activity (Figure 5.13). Among the least impoverished areas are the districts that house major urban cities, such as Dar es Salaam, Arusha, and Tanga.

FIGURE 5.12: Poverty According to Population Density



Sources: Population from 2012 Census; poverty from 2017/18 HBS.

FIGURE 5.13: Poverty According to Nighttime Lights



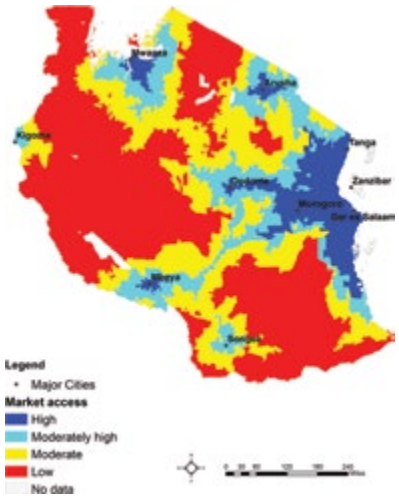
Sources: 2017/18 HBS and VIIRS.
Note: Intensity of nighttime light is based on the natural log of maximum nighttime luminosity (2015) at the district level.

Lack of access to urban centers limits the benefits of urbanization to a few urban centers and their immediate vicinity.

The benefits of agglomeration economies can trickle down to other semi-urban and rural areas with good access to markets for products, labor, and ideas (Mayer 2008). Those regions or districts with greater accessibility to major cities will attract more economic activities, investments, and labor, which in turn will allow them to reinvest in market access and reinforce their agglomeration advantage. Research confirms such beneficial spillover effects from urban to neighboring rural areas, as seen in the cases of India and Nepal (Cali and Menon 2013; Fafchamps and Shilpi 2005). Conversely, poor areas with limited access to urban centers are more likely to remain trapped in poverty, worsening geographic inequalities (World Bank 2009; Page and Pande 2018).

In Tanzania, a large swath in the north, northwestern, and southeastern parts of the country have particularly limited access to markets, and these areas typically have higher levels of poverty. Areas surrounding Dar es Salaam—the commercial and economic center of the country—tend to have greater access to markets because they have a wide, dense road network system, which allows people living near the city to benefit from its agglomeration economies. This is reflected in the varying levels of market accessibility displayed in figure 5.14, which is measured using the weighted sum of population in major cities that are accessible from each village within a certain travel time. (See appendix H for more details). The analysis also reveals that areas with limited market access are more likely to have a higher rate of poverty (Figure 5.15A);

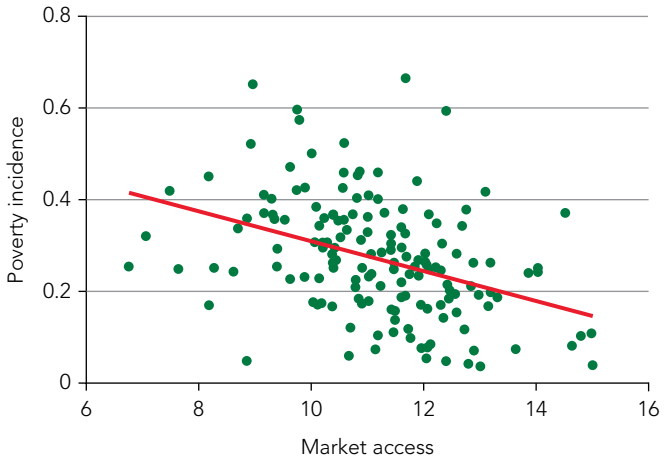
FIGURE 5.14: Market Access to Major Urban Centers in Tanzania



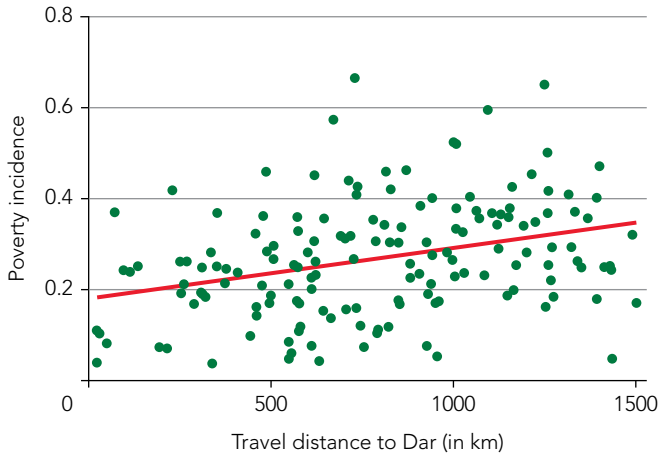
Sources: World Bank's estimates based on OpenStreetMap
Notes: The Open Source Routing Machine (OSRM) algorithm is used to compute travel time between each village and major cities. "High" corresponds to areas in the top quartile of the market accessibility index; "Moderately high" the second top quartile; "Moderate" the 2nd lowest quartile; and "Low" the lowest quartile.

FIGURE 5.15: Poverty by Market Access and Distance to Dar es Salaam

A. Poverty by Market Access



B. Poverty by Distance to Dar es Salaam



Sources: World Bank's estimates based on OpenStreetMap.
Note: The Open Source Routing Machine (OSRM) algorithm is used to compute travel time between each village and major cities. In the scatterplot, market access refers to the natural log of the market access index.

travel distance to Dar es Salaam is also positively correlated with poverty incidence (Figure 5.15B), which means that the farther away an area is from the country's commercial hub, the greater the incidence of poverty it has.

The positive economic dividends of access to jobs and trade opportunities in Dar es Salaam are hard to overstate. Although the Dar es Salaam administrative region accounts for a small fraction of mainland Tanzania's land area (0.16 percent) and total population (~10 percent), the region accounts for approximately 40 percent of its manufacturing employment and 53 percent of its manufacturing value. The region also contains 55 percent of the country's manufacturing establishments (66 percent excluding food, beverages, and tobacco). One study indicated that firms located near Dar es Salaam tend to be larger, offer better wages, and have higher value added (Petracco et al. 2018). Dar es Salaam also accounts for a disproportionate share of the country's port traffic (~95 percent), dwarfing the importance of other cities as sources of imported manufactured goods (Storeygard 2016).

The lack of market access significantly constrains rural farmers in Tanzania. For instance, farmers in rural areas with limited market access pay higher prices for fertilizers because of higher costs of transportation and fewer options of products available. These farmers also have limited access to output markets, so they receive lower prices for their harvest (Aggarwal et al. 2017). The lack of market access traps these rural farmers in poverty while exacerbating existing geographic inequalities between rural and urban centers.

Regional disparities and income divergences are widening because of a lack of connective infrastructure that facilitates the flows of goods, services, ideas, and people. Lack of market accessibility stems partly from the poor quality of roads, which undermines connectivity between rural areas and urban markets (World Bank 2017). Insufficient roads limit farmers' access to input and output markets. Only 5 percent of rural households live less than 2 kilometers from a paved road in poorer districts, and most trunk and tertiary roads are in poor condition and are inaccessible during the rainy season (World Bank 2012). In addition, because these roads are unreliable and inadequate, in many remote parts of the country, post-harvest losses are high—an estimated 35 percent of total production. Limited and poorly maintained rural roads place a severe constraint on development of commercial agriculture (World Bank 2017).

Poverty is more pronounced in tropical savannah zones, where agricultural productivity is low and tropical disease prevails.

Climatic factors play an important role in determining geographic inequalities in welfare and poverty. In Tanzania, poverty is more pronounced in the tropical savannah zones, which are dominant features of the northwest and southeast of Tanzania (Figure 5.16A). Although it is difficult to disentangle factors that explain geographic inequalities in poverty between the tropical and non-tropical zones, researchers have shown that the tropical climate zones are unfavorable to growth and poverty reduction for several reasons.[7]

Tropical zones tend to have lower agricultural productivity than temperate zones. For instance, major crops such as maize, rice, and wheat tend to grow better in temperate and subtropical climates than in tropical zones. High temperatures, which mineralize organic materials, and heavy rainfall, which leaches them out of the soil, reduce soil quality (Sachs et al. 2001). These unfavorable factors in tropical zones partly explain why maize production—which accounts for the largest share of crop production and is deemed a critical factor for poverty reduction in Tanzania—is concentrated in the southern highlands (e.g., Iringa and Mbeya), the southwestern region (e.g., Shinyanga, Rukwa), and Arusha, which all have a largely nontropical climate and are home to the country's most fertile land (Luhunga 2017).

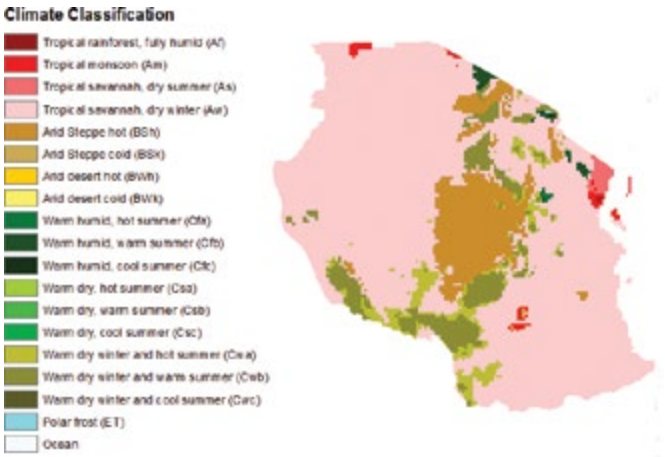
Tropical zones are also prone to various diseases, with important implications for health and labor productivity. Although there has been a rapid decrease in the prevalence of malaria in Tanzania, primarily due to sustained high immunization coverage and malaria prevention initiatives, it remains one of the leading causes of death in children and mothers, with an estimated 10 million cases reported in 2010 (World Bank 2017).

Malaria, which decreases human capital and productivity, is particularly common in the tropical savannah zones. Figure 5.16B shows geographic disparities in the rate of

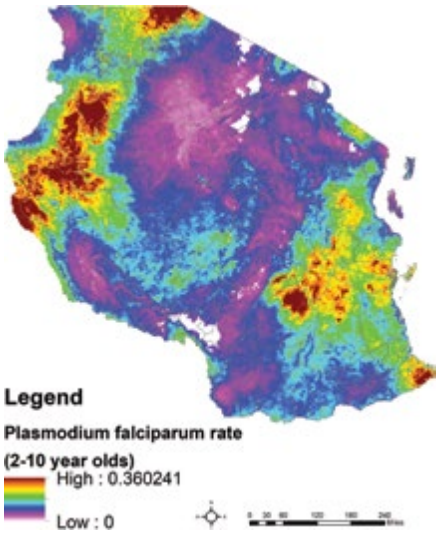
[7] Hausmann (2001) shows that, on average, annual economic growth rates in tropical nations are 0.5 percent to 1 percent lower than in temperate countries.

FIGURE 5.16: Poverty vs. Tropical Climate and Diseases

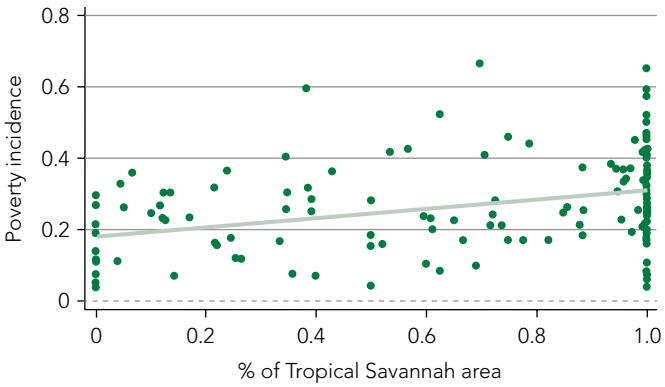
A. Köppen Climate Classification



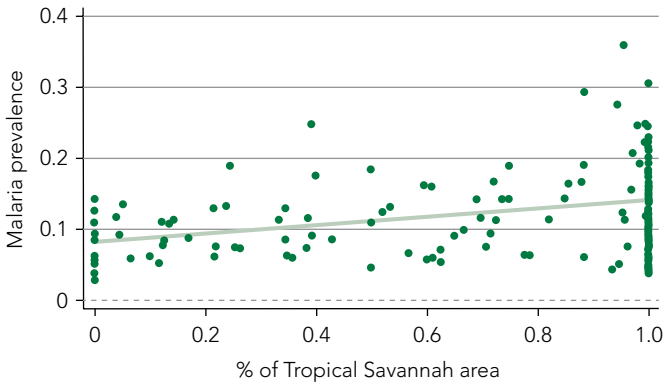
B. Plasmodium falciparum parasite



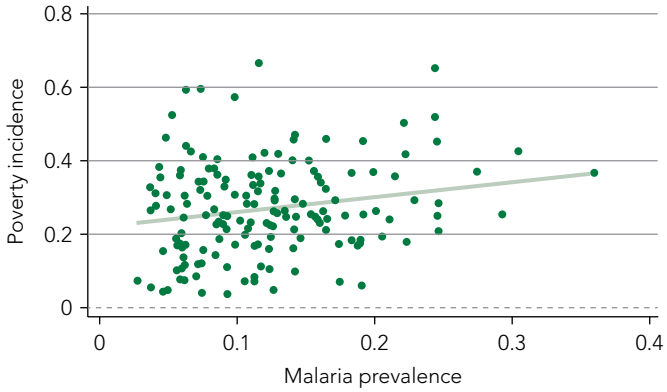
C. Poverty and Tropical Savannah Incidence



D. Malaria Incidence and Tropical Savannah Incidence



E. Poverty and Malaria Incidence



Sources: Köppen Climate Classification data from Kottek et al. (2006); poverty estimates from the 2018 HBS; the Malaria Atlas Project.
Notes: Figure 5.16B shows the proportion of the population aged 2 to 10 found to carry asexual blood-stage parasites calculated for the period 2000 to 2015. In figure 5.16E, malaria prevalence in the scatterplot corresponds to the maximum grid value of *Plasmodium falciparum* parasite rate in each district.

infection with the *Plasmodium falciparum* parasite—a commonly used index of malaria transmission intensity that refers to the proportion of the population aged 2 to 10 found to carry asexual blood-stage parasites. Tropical areas have higher rates of malaria (Figure 5.16D), which is positively correlated with poverty incidence (Figure 5.16E). The economic and welfare effect of malaria is substantial in Tanzania. Malaria decreases learning capacity of individuals aged 5 to 25 and undermines economic productivity of those aged 15 to 55 (Mboera et al. 2007). More than 1 percent of GDP is devoted to the disease (US$ 2.20 per capita), accounting for 39 percent of total national health expenditures (Sicuri et al. 2013).

The most impoverished areas are also prone to significant natural disaster risks such as drought.

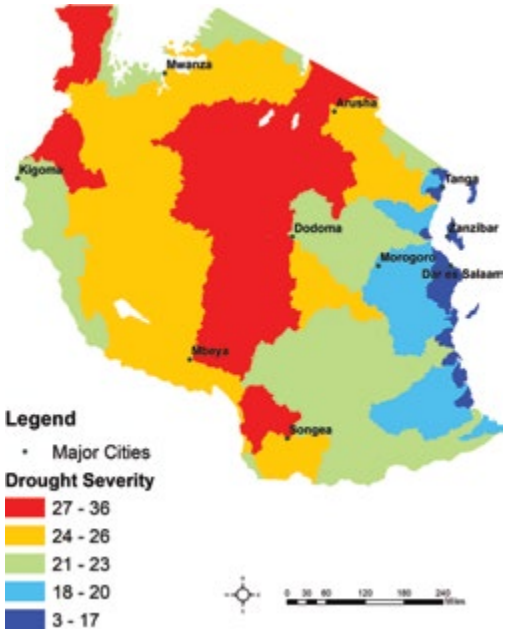
The climate has important implications for the poor's vulnerability to natural disaster risk. Although this analysis does not directly examine the correlation between poverty and natural disaster risk, many of the pockets of poverty in the country are vulnerable to such risk. Among the most frequent disasters that hit these poverty-stricken areas is drought, which has significantly contributed to food insecurity, livestock and agricultural loss, and infectious disease transmission in Tanzania.

Drought conditions are frequently observed in the northern (Arusha, Tanga, Manyara, Kilimanjaro, Mara), central (Dodoma, Morogoro), and southeastern (Mtwara, Lindi) regions. These geographic disparities in drought risks are depicted in figure 5.17, which shows the average level of drought severity measured using a composite index of drought length and dryness (with higher numbers indicating greater drought severity). Among the most drought-stricken areas is Longido district in Arusha, which is also estimated to have the highest poverty rate in the country. For instance, drought that hit the district in 2008/09 resulted in severe food insecurity and a significant loss of livestock (Bowen et al. 2010).

Climate change exacerbates damage due to drought. Some of the previously highly productive areas of Tanzania such as the southern and northern highlands are expected to experience declining rainfall, frequent droughts, and significant increases in geographic and temporal variability of rainfall. These climatic risks will directly affect agricultural productivity because greater volatility in rainfall and prolonged droughts make cropping patterns unpredictable and induce ecological changes that encourage pests and diseases. Climate change will also result in shifts in agro-ecological zones, whereby particular crops will become unsuitable. Prolonged dry episodes may result in food shortages, which damage people's health and productivity (Irish Aid 2017).

Geographic inequalities in Tanzania remain a major challenge. Images of lights at night suggest expansions in settlements and economic activity in Dar es Salaam, Dodoma, and other secondary cities since 2012, but poverty rates across districts remain highly unequal, and when examining district-level estimates, four major pockets of poverty remain. Urbanization is the primary driver of differences in welfare across districts, although climatic conditions, natural disasters, and travel infrastructure play significant roles. Educational attainment is also strongly correlated with poverty across districts. Overall, efforts to build human capital and increase access to urban areas would help the poorest districts reap more benefits from the country's growth.

FIGURE 5.17: Drought Hotspots



Source: Aqueduct Global Maps 2.1 (Gassert et al. 2014).
Note: Drought severity is the average length of drought times the dryness of the droughts from 1901 to 2008. Drought is defined as a continuous period when soil moisture remains below the 20th percentile. Length is measured in months, and dryness is the average number of percentage points by which soil moisture drops below the 20th percentile (Sheffield and Wood 2007).

CHAPTER 6

Agricultural Households and Nonfarm Enterprises

I. Overview

More people are engaged in nonfarm enterprises (NFEs). Between 2012 and 2018, the percentage of people who reported having run a business in the previous 12 months increased from 17.5 percent to 19.7 percent, and the percentage of individuals engaged only in NFEs increased from 6.2 percent in 2012 to 10.5 percent in 2018.[1] This suggests that working-age Tanzanians are shifting away from agriculture as their sole economic activity and increasingly diversifying into NFEs (Table 6.1).

Despite an overall increase in the percentage of working-age individuals running businesses, the proportion of women involved in farm enterprises and NFEs decreased over time. In 2012, 54.4 percent of employed working-age individuals who engaged only in farming were women. This fell to 48.6 percent by 2018 (Table 6.2). The proportion of women engaged in NFEs also fell across the country, except in rural areas, where the percentage of women engaged in NFEs increased from 37.2 percent in 2012 to 43.6 percent in 2018. In contrast, in urban areas, female participation in NFEs decreased from 56.6 percent to 50.7 percent.

Nonfarm households are smaller and have fewer dependents, higher education, and higher living standards.

Households that operated NFEs had fewer children and fewer household members. The average size of a household that operated an NFE in 2018 was 4.9, considerably smaller than the average household size for those involved in NFEs and farming (5.4 members) and those that rely on farming only (6.3 members) (Figure 6.1A). NFE-only households had fewer children on average than other households, an average of 2, compared with 2.5 in households primarily engaged in farming supported by NFE and 2.9 in households that engaged only in farming (Figure 6.1B). Nevertheless, because farming is a labor-intensive activity (especially in areas with limited resources) that relies heavily on unpaid household labor, households with fewer children and thus less access to a pool of unpaid labor may find it feasible to operate only NFEs as their main economic activity. That said, it seems like, in Tanzania, operating NFEs is more a function of higher living standards than of scarcity of cheap labor.

Households that solely operated NFEs had more-educated heads. In 2018, heads of households that only operated businesses had the highest lower secondary school completion rates (17 percent, compared with the national average of 11 percent for all household heads) (Figure 6.1D). In contrast, households that participated primarily in farming activities while also operating businesses had mostly completed only primary school; their primary school completion rate was 57 percent in 2018 (Figure 6.1C). This suggests that better-educated individuals are more likely to operate NFEs than to engage in agricultural activities, underscoring the role of secondary education in accessing productive employment opportunities and escaping poverty in Tanzania.

Households that operated NFEs in urban areas were the best off. They consumed 2.5 times as much as households with the lowest average monthly consumption—households in rural areas that engaged only in farming (Figure 6.1F). In rural and urban areas, households that participated primarily in farming but also operated NFEs had higher levels of consumption than households that participated only in farming, suggesting a positive correlation between income and likelihood of operating an NFE, although it is not clear whether NFEs help boost household incomes or those with higher income and consumption level are better able to engage in NFEs.

[1] NFE ownership is defined as operation of an NFE involved in the provision of nonagricultural services; processing, production, and sale of agricultural by-products; trade; professional services; mining; and agricultural services. An individual is considered to be operating an NFE if they report operating a business at any point in the 12 months before the survey.

TABLE 6.1: Participation in Farm and Nonfarm Activities, 2012–18, percent

	2012			2018		
	FARM ONLY	FARM WITH NONFARM COMPLEMENT	NONFARM ONLY	FARM ONLY	FARM WITH NONFARM COMPLEMENT	NONFARM ONLY
Tanzania mainland						
Households	46.4	11	9.4	37.3	9.6	14.4
Individuals	57.7	8	6.2	37.8	7.3	10.5
Rural						
Households	60.3	14.6	2.4	52.7	13	8.7
Individuals	69	10	1.6	51.9	9.6	6
Urban						
Households	25	4	22.6	12.4	4.1	23.6
Individuals	36.5	3.1	16.8	12.2	3.3	18.7

Sources: HBS 2011/12 and 2017/18.

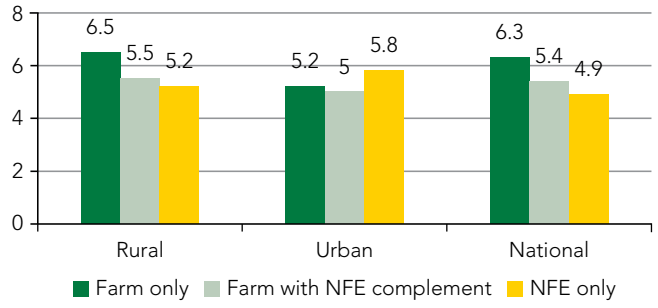
TABLE 6.2: Participation in Farm and Nonfarm Activities, 2012–18, percent

	2012			2018		
	FARM ONLY	FARM WITH NONFARM COMPLEMENT	NONFARM ONLY	FARM ONLY	FARM WITH NONFARM COMPLEMENT	NONFARM ONLY
Tanzania mainland						
Women	54.4	50.1	51.9	48.6	48.9	48.1
Men	45.6	49.9	48.1	51.4	51.8	51.9
Rural						
Women	54.1	49.6	37.2	48.7	46.6	43.6
Men	45.9	50.4	62.8	51.3	53.4	56.4
Urban						
Women	56.4	55.1	56.6	48.3	56.3	50.7
Men	43.6	44.9	43.4	51.7	43.7	49.3

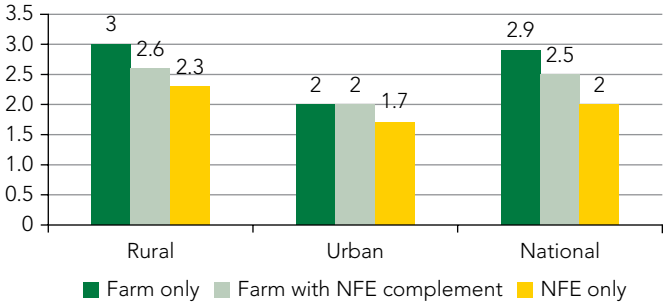
Sources: HBS 2011/12 and 2017/18.

FIGURE 6.1: Socio-economic Status of Farm and Nonfarm Households, 2018, percent

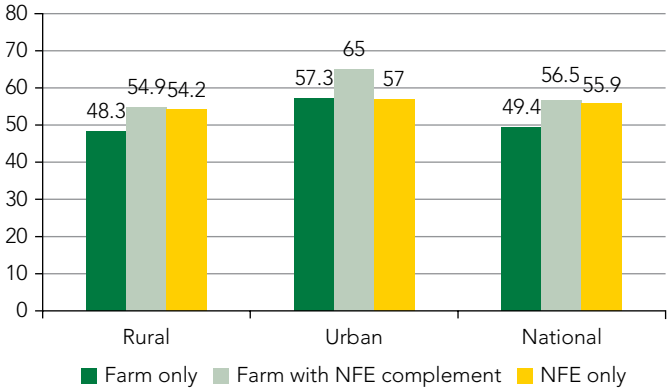
A. Average Household Size of Farm and NFE Households



B. Average Number of Children Younger than 15 in Farm and NFE Households



C. Household Heads Completing Primary Education



D. Household Heads Completing Lower Secondary Education

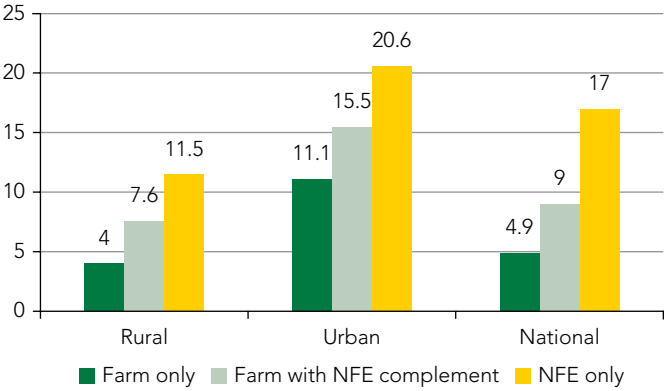


FIGURE 6.1E Literate Household Heads

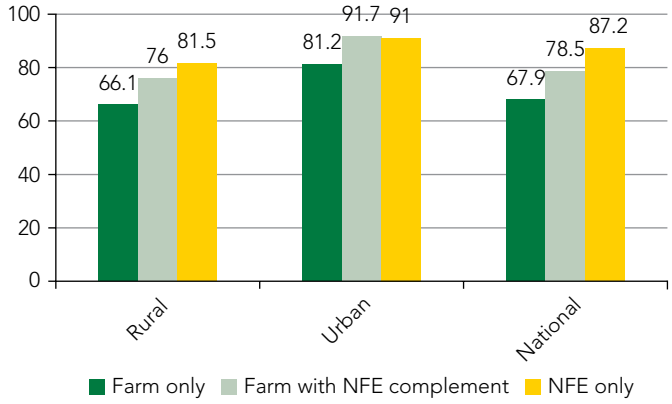
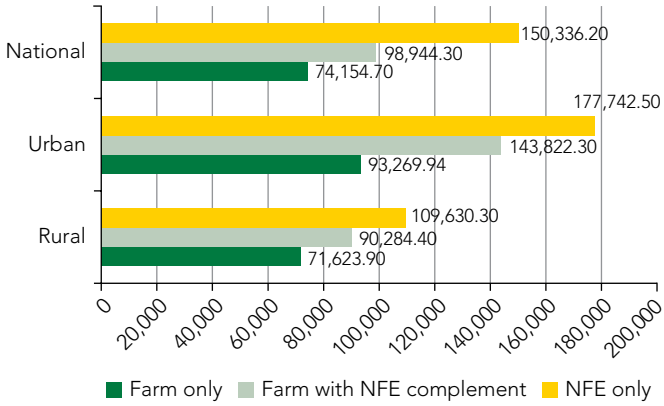


FIGURE 6.1 F Average Monthly Household Consumption (TZS)



Source: HBS 2017/18.

II. Farm Households

Overview of cash and staple crops.

Between 2012 and 2018, the overall sale of cash crops fell approximately 10 percentage points, and the proportion of farmers growing any of the top five cash crops fell 3.3 percentage points. A crop is defined as a "cash crop" when more than half of the farmers who grow it sell it; otherwise, the crop is considered a staple (Guirkinger et al. 2015). In 2012, farming households in Tanzania were selling an average of 72 percent of their total production of cash crops; by 2018, that had fallen to 62 percent. In 2012, approximately 56 percent of farming households were growing one or more of the top five cash crops. By 2018, this fell to 52.6 percent. Together these suggest a contraction in the larger market for cash crops, with some farming households exiting the market and those who continued to operate selling a smaller share of their output.

The constitution of top five cash crops changed significantly between 2012 and 2018, except for paddy rice, which retained its position as the second-most-important cash crop over these years. The top five cash and staple crops for each year are determined according to the proportion of farmers growing and selling them. In 2012, the top five cash crops were beans, paddy rice, sesame, cotton, and coffee (Table 6.3). By 2018, cassava had become the most prevalent cash crop, followed by paddy rice, groundnuts, sunflowers, and bananas. Of staples, maize was the most grown crop in 2012 and 2018. Although some farmers sold maize, it was considered a staple crop because fewer than 40 percent of farms were selling it in 2012 and 2018. In 2012, approximately 80 percent of farms were growing maize, and 37 percent were selling it, these proportions decreased to 61 percent and 30 percent, respectively, in 2018. The reduction in the percentage of farmers selling maize dropped it from the second most sold to the least sold crop of the top five staples sold in the market.

As the proportion of cash crop sales declined, the overall value of the crops sold also declined. In 2012, the value of the top five cash crops sold was almost six times that of the crops consumed, indicating that farming households considered it more profitable to sell those crops than to consume them; by 2018, the value of the top five cash crops sold was only about twice as much as the value of cash crops consumed (Table 6.4). This suggests that, although they were still

TABLE 6.3: Top Five Cash and Staple Crops, 2012 and 2018, percent

2012			2018		
CROP	PERCENTAGE OF FARMERS GROWING CROP	PERCENTAGE OF GROWING FARMERS SELLING CROP	CROP	PERCENTAGE OF FARMERS GROWING CROP	PERCENTAGE OF GROWING FARMERS SELLING CROP
Staple crops					
Maize	79.6	36.9	Maize	61	30.2
Cassava	20.7	24.9	Beans	27.9	39.3
Sweet potatoes	12.4	14.0	Sweet potatoes	17.7	45.9
Groundnuts	13.4	43.9	Sorghum	8.9	37.4
Sorghum	9.4	20.8	Cowpeas	6.5	37.8
Total (all five crops)	**135**		**Total (all five crops)**	**115**	
Cash crops					
Beans	30.6	50.3	Cassava	18	60.1
Paddy rice	20.1	57.0	Paddy rice	15.5	62.3
Sesame	6.8	90.1	Groundnuts	14.3	50.1
Cotton	6.7	90.5	Sunflowers	9.7	66.2
Coffee	5.3	87.9	Bananas	6.9	61.1
Total (all five crops)	**67.8**		**Total (all five crops)**	**49.7**	

Sources: HBS 2011/12 and 2017/18.
Note: percentage may be greater than 100 percent because some farmers farm multiple crops and may have multiple farms.

selling the cash crops, farming households had begun to consume a larger share. Farmers may have been selling more of lower-value crops in 2018 than in 2012, but they were essentially consuming a larger share (and selling a smaller share in the market) of their cash crops.

Cash crops in Tanzania are on average more labor intensive than staple crops, requiring more paid and unpaid labor.

TABLE 6.4: Average Value Sold and Consumed of Top Five Cash Crops, 2012 and 2018, TZS

	AVERAGE VALUE SOLD	AVERAGE VALUE CONSUMED	VALUE SOLD AS SHARE OF TOTAL CROP HARVESTED (%)
2012			
Beans	96,686.9	63,519.1	58.9
Paddy rice	333,207.5	200,253.9	57.8
Sesame	353,693.2	12,560.7	96.4
Cotton	622,179.6	48,805.4	98.5
Coffee	603,611.9	15,760.5	96.1
Total	**2,009,379.1**	**340,899.5**	**62.1**
2018			
Cassava	283,406.3	254,172.3	59.4
Paddy rice	759,522.8	251,860.6	51
Groundnuts	103,453.9	58,745.4	59.9
Sunflowers	147,663.5	77,898.2	81.5
Bananas	258,570.7	174,168.5	54
Total	**1,552,617.2**	**816,845.0**	**31.3**

Sources: HBS 2011/12 and 2017/18.

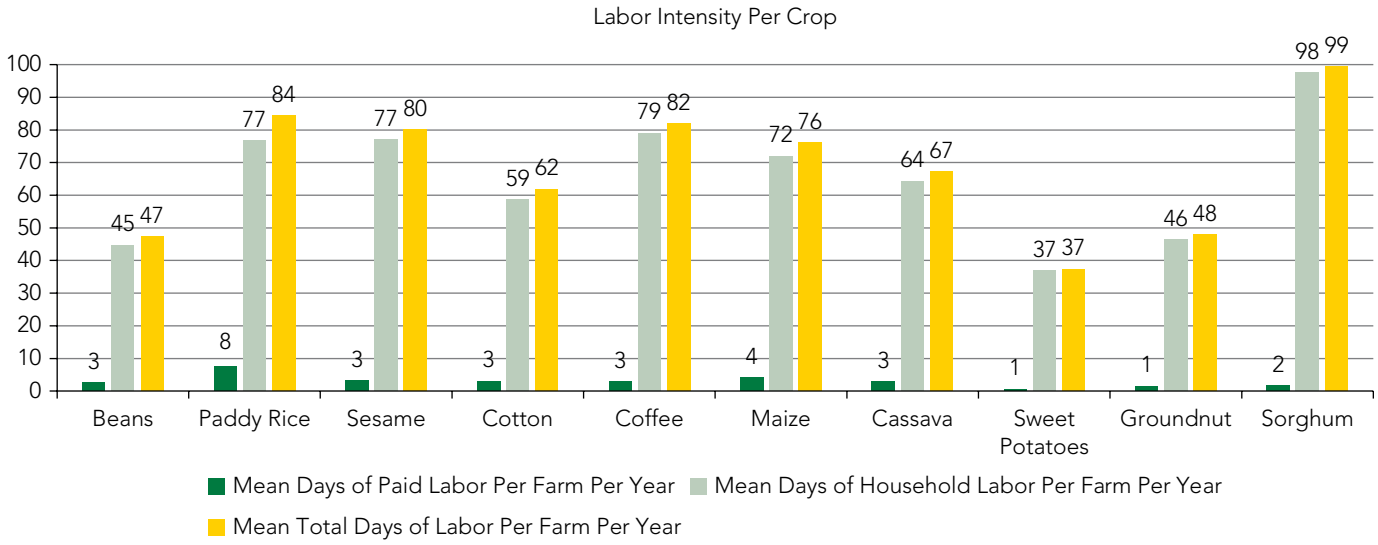
In 2012, most of the labor for cash and staple crops came from household members, with hired labor brought on during the harvest season and other times of intense activity on the farm.[2] Sorghum is the most labor-intensive crop overall, and sweet potatoes are the least (Figure 6.2, Table 6.5), although not all cash crops are more labor intensive than all staple crops (Table 6.5); on average, the top five cash crops require 71 total days of labor per year, and the staple crops require 66 total days of labor.

TABLE 6.5: Mean Days of Labor According to Crop, 2012

	MEAN DAYS PER FARM PER YEAR		
CROPS	PAID LABOR	HOUSEHOLD LABOR	TOTAL LABOR
Cash crops			
Beans	2.6	44.7	47.3
Paddy rice	7.6	76.8	84.4
Sesame	3.1	77.0	80.1
Cotton	3.1	58.7	61.8
Coffee	3.0	79.1	82.0
Total (all five crops)	**3.88**	**67.26**	**71.12**
Staple crops			
Maize	4.1	71.9	76.1
Cassava	3.0	64.4	67.3
Sweet potatoes	0.6	36.8	37.4
Groundnuts	1.5	46.4	47.8
Sorghum	1.8	97.6	99.5
Total (all five crops)	**2.2**	**63.42**	**65.62**

Source: HBS 2011/12.

FIGURE 6.2: Labor Intensity According to Crop, 2012



Source: HBS 201/12.

[2] Data on labor according to crop were not available in HBS 2017/18.

Characteristics of farming households

Households that farm cash crops tend to be slightly more educated than farming households that farm staple crops. Approximately 68 percent of cash crop–farming household heads had completed up to primary education, compared with 66 percent of staple crop–farming household heads. This suggests that the level of education of the household head does not play a significant role in whether a household chooses to farm cash crops.

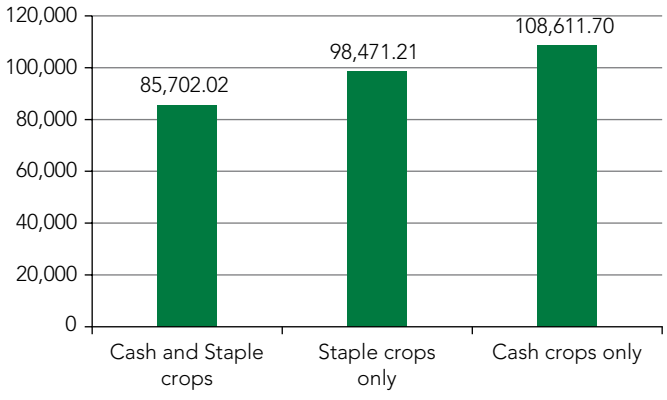
Poor households tend to produce more staple crops and are less likely to sell their crops in the market. In 2018, 70 percent of poor households farmed staple crops, and poor farmers were selling on average only 22 percent of their crops. This is a reduction from 2012, when 95 percent of poor farmers grew staple crops, suggesting that, over time, poor farmers started to grow more cash crops. Similarly, in 2018, 82 percent of cash crop–farming households were classified as nonpoor, compared with 77 percent of staple crop–farming households. Nevertheless, it is difficult to conclude whether households became less poor as a result of growing cash crops, or if they choose to grow cash crops because they were better off.

Households that farmed only cash crops had higher average monthly consumption rates than those who grow staple crops. The average monthly consumption level of households that farmed only cash crops was nearly 30 percent higher than that of staple crop–farming households (Figure 6.3). This supports the idea that households that are growing and selling the majority of their crops are better off than households that farm for subsistence.

Access to infrastructure and farming households.

Access to weekly or daily markets is limited for cash– and staple crop–farming households. In 2018, 52 percent of farming households with access to a daily market, and 53 percent of farming households with no access to a daily market produced cash crops. The similarity of these figures suggests that proximity to a market is not the main factor in the decision of farming households to produce cash crops. Access to a daily market does not seem to affect the decision of farming households to produce staple crops either (Table 6.6). In 2018, 89 percent of farming households with access to a daily market and 90 percent of farming households with no access to a daily market produced staple crops.

FIGURE 6.3: Average Monthly Household Consumption According to Grown Crop Type, 2018, TZS



Source: HBS 2017/18.

Similarly, access to a road does not seem to significantly increase the proportion of farming households that grow cash crops. In 2018, 51 percent of farming households with access to a road and 54 percent of those with no access to a road produced cash crops. Likewise, access to a road seems not to strongly affect decisions to farm staple crops (Table 6.6). In 2018, 89 percent of farming households with access to a road and 92 percent of those with no access to a road produced staple crops.

This does not mean that access to infrastructure does not matter. The figures need to be interpreted with caution, because households could grow more-profitable crops or increase their productivity and revenues if they had better access to markets and roads. Other factors (e.g., experience, knowledge, production) may have influenced the decision to grow cash crops in situations of overall limited access to infrastructure, but profitability and productivity would have been higher with better infrastructure.

TABLE 6.6: Prevalent Types of Farming Households in Areas with Markets and Roads, 2018, percent

CROPS	NO DAILY MARKET	DAILY MARKET	NO WEEKLY MARKET	WEEKLY MARKET	NO TARMAC OR TRUNK ROAD	TARMAC OR TRUNK ROAD
Cash only	52.9	51.5	51.4	55.9	54.4	51.4
Staple only	90.5	89.1	89.8	90.9	91.9	88.9

Source: HBS 2017/18.

III. Nonfarm Enterprise Households

NFE sectors

Because of a change in the survey questionnaire and methodology, comparison of NFE sectors in 2012 and 2018 is not feasible. The International Standard Industrial Classification shows that, in 2012, the most prevalent NFEs specialized in retail sale of nonfood items that were not available in stores, stalls, or markets (Table 6.7). The Central Product Classification shows that, in 2018, the most widespread NFEs were engaged in the sale of agricultural, horticultural, and market gardening products. This includes the sale of cereals, vegetables, fruits and nuts, tubers, and pulses. The second most widespread NFE sector in 2018 was the processing of grains, tubers, and other products, indicating that the agro-processing industry is active in Tanzania.

The most common NFE sectors varied considerably depending on whether the NFE owners were in rural or urban areas. Although NFEs related to the production, processing, and sale of agricultural products were most prevalent in both urban and rural areas, retail trade services and the sale of meat and fish products were two of the top five NFE sectors in urban areas (Figure 6.4). A smaller share of urban NFEs were engaged in the sale of agricultural, horticultural, and market gardening products.

Characteristics of NFEs

The majority of NFEs in 2018 were mobile, with no fixed location, or were set up in the owner's house with a designated space for conducting business activities. Of the 24 percent of NFEs that had no fixed location, 17 percent provided business and production services. Of the 23 percent of NFEs whose activities took place at homes with a separate space, 32 percent provided agricultural, forestry, and fishing products.

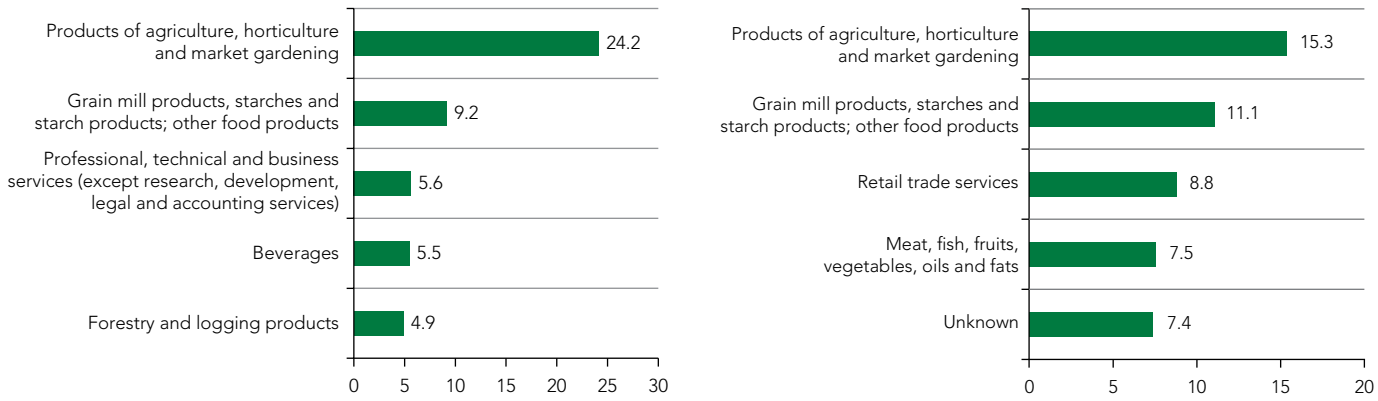
TABLE 6.7: Top Five Sectors of Nonfarm Enterprises, 2012 and 2018, percent

SECTOR	%
2012	
Other retail sale not in stores, stalls, or markets	13.3
Other retail sale in nonspecialized stores	11.7
Retail sale of food in specialized stores	9.9
Retail sale in nonspecialized stores with food, beverages, or tobacco predominating	9.7
Retail sale via stalls and markets of food, beverages, and tobacco products	6.8
Total	**51.5**
2018	
Agricultural, horticultural, and market gardening products	20.3
Grain mill products, starches and starch products, other food products	10.0
Meat, fish, fruits, vegetables, oils, and fats	5.9
None	5.8
Retail trade services	5.0
Total	**47.1**

Source: HBS 2011/12 and 2017/18.

In 2018, savings from agricultural sales were the most popular source of start-up funds for NFEs. There was a considerable difference in the sources of start-up funds for NFEs in rural and urban areas. NFEs in rural areas relied on proceeds from agricultural activities for start-up funds, whereas most of those in urban areas were initially funded from owner's savings. The share of NFEs funded by owner's savings fell between 2012 and 2018, and the share of NFEs funded by SACCOS loans, bank loans, and loans from family and friends grew. The proportion of funds from loans from financial institutions in total NFE start-up funds increased from 2.2 percent in 2012 to 3.2 percent in 2018 (Table 6.8). Although the share remains marginal, it suggests that investors are relying less on their own income and savings and increasingly using available sources of credit.

FIGURE 6.4: Top Five Nonfarm Enterprises Sectors, 2018, percent



Source: HBS 2017/18.

TABLE 6.8: Most Predominant Sources of Start-Up Funds for Nonfarm Enterprises, 2012 and 2018, percentage of Total Funding

	2012			2018		
	TANZANIA	RURAL	URBAN	TANZANIA	RURAL	URBAN
Income from agricultural production	32.3	46.5	9.5	33.2	48.5	12.9
Own savings	36.3	23.7	56.4	33.1	22.7	47.0
Other	8.7	10.9	5.1	9.9	9.4	10.5
Loan from family of friends	5.4	4.8	6.4	9.5	6.6	13.2
Gift from family or friends	10.3	7.7	14.3	5.1	5.5	4.6
Income from nonagricultural production	1.9	2.7	0.7	2.9	3.6	1.9
Inheritance	2.0	2.1	1.9	2.6	1.8	3.6
Loan from Savings and Credit Co-Operative Society	1.2	0.5	2.3	2.0	1.1	3.3
Sale of assets owned	0.8	0.7	0.9	0.5	0.6	0.5
Bank loan	1.0	0.3	2.2	1.2	0.3	2.5

Sources: HBS 2011/12 and 2017/18.

The share of NFEs funded by loans from SACCOS increased slightly. Despite limited overall use, the share of funds from SACCOS loans in NFE start-up funds increased from 1.2 percent in 2012 to 2 percent in 2018. The use of SACCOS loans was slightly higher for female NFE owners in urban areas (3.2 percent in 2012, 2.8 percent in 2018).

The presence of a daily or weekly market did not have a strong influence on type of NFE in 2018. Table 6.9 highlights the effect of daily markets, weekly markets, and roads on the incidence of NFEs in rural and urban areas. In areas with no daily markets, 29 percent of NFEs were engaged in production of agricultural, forestry, and fishing products, compared with 32 percent of NFEs in areas with a daily market. This difference of 3 pp suggests that the presence of a daily market does not significantly affect the incidence of NFEs. Areas with weekly markets also showed similar trends, and there was no appreciable difference in the types of NFEs in areas with and without weekly markets.

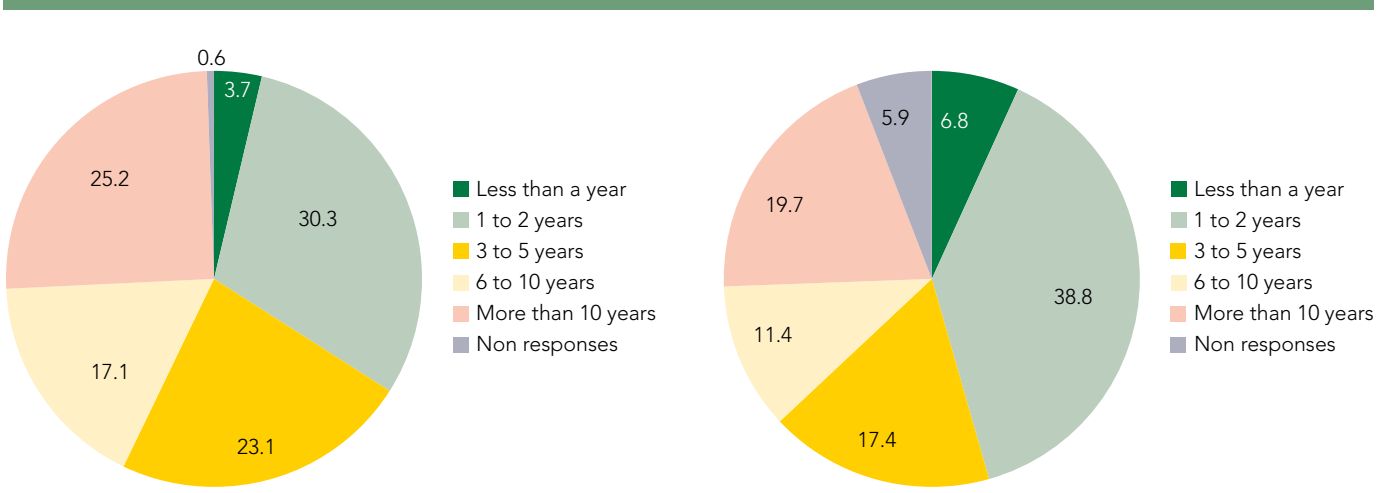
NFEs have little effect on other households because only a few NFEs employ workers that are not members of their own households. NFE workers tended to be the owner of the business themselves or the owner's household members. In 2018, 26.5 percent of NFEs were working proprietorships, meaning that the business owners and partners were actively engaged in the work of the business, and 25.2 percent of NFEs reported having unpaid household members working in their business. Only 7 percent of NFEs hired paid labor in the form of non-household members.

TABLE 6.9: Incidence of Nonfarm Enterprises in Communities with and without Markets and Roads, 2018, percent

	NO DAILY MARKET	DAILY MARKET	NO WEEKLY MARKET	WEEKLY MARKET	NO TARMAC OR TRUNK ROAD	TARMAC OR TRUNK ROAD
Agriculture, Forestry and Fishery Products	29.4	32.1	29.1	34.1	34.9	28.1
Ores and Minerals; Electricity, Gas and Water	1.3	1.6	1.4	1.3	1.5	1.3
Food Products, Beverages and Tobacco...	22.2	22.4	21.9	23.4	17.9	24.2
Other Transportable Goods, Except Metal Products, Machinery and Equipment	1.7	1.3	1.8	1.0	1.5	1.7
Metal Products, Machinery and Equipment	1.1	1.6	1.0	2.0	1.4	1.1
Constructions and Construction Services	2.7	1.8	2.6	1.8	2.1	2.6
Distributive Trade Services; Accommodation	9.5	6.1	10.1	3.0	6.8	9.3
Financial and Related Services...	0.9	0.2	0.8	0.1	0.6	0.7
Business and Production Services	14.8	19.2	15.4	18.6	18.4	15.0
Community, Social and Personal Services	7.3	7.4	7.1	8.0	6.2	7.8
None	6.2	4.3	6.1	3.9	5.0	5.9

Source: HBS 2018.

FIGURE 6.5: Age of Nonfarm Enterprises, 2012 and 2018, percent



Source: HBS 2011/12 and 2017/18.

In 2018, only 11 percent of NFEs were registered with the Business Registrations and Licensing Agency in Tanzania—a slight decrease from 2012, when 11.7 percent of NFEs were registered with the agency. This may suggest the persistence of informality among businesses.

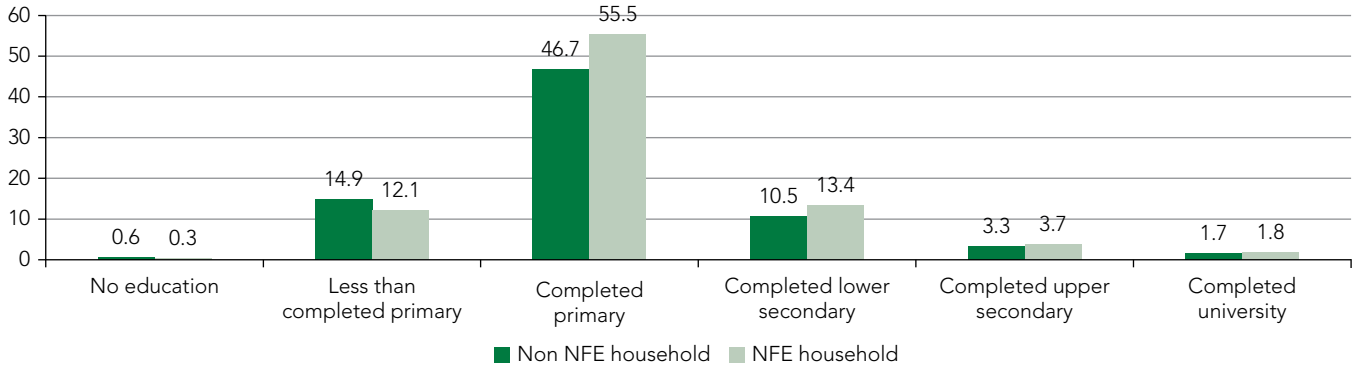
In 2012 and 2018, the majority of NFEs were approximately one to two years old. Between 2012 and 2018, the share of NFEs that had been established for six years or longer before the survey fell from 42 percent to 31 percent (Figure 6.5). Although this change may be because of the increase in businesses established between 2016 and 2018, it is also possible that many of the businesses established in 2012 were not functional in 2018. This raises concerns regarding the sustainability and longevity of businesses in Tanzania.

Characteristics of NFE households and owners

Heads of NFE households were on average younger, more likely to be married, and more educated than heads of farming households. In 2018, heads of households that operated NFEs were three years younger on average than those not operating NFEs (45 vs 48). In addition, the proportion of married heads in NFE households was 7 percent higher than in households that did not operate an NFE. Moreover, a higher proportion of NFE-operating household heads had completed secondary education, whereas farming household heads tended to have less education (Figure 6.6).

Gender, education, and location of the NFE owner affected average monthly revenue from NFEs considerably.[3] Female NFE owners earned on average less than half of what male NFE owners earned, and NFE owners who had completed lower secondary school had average monthly revenues more than two and a half times those of NFE owners who had completed only primary school (Figure 6.7A). NFEs in rural areas earned the lowest average monthly revenue, highlighting the effect of location on NFE income.

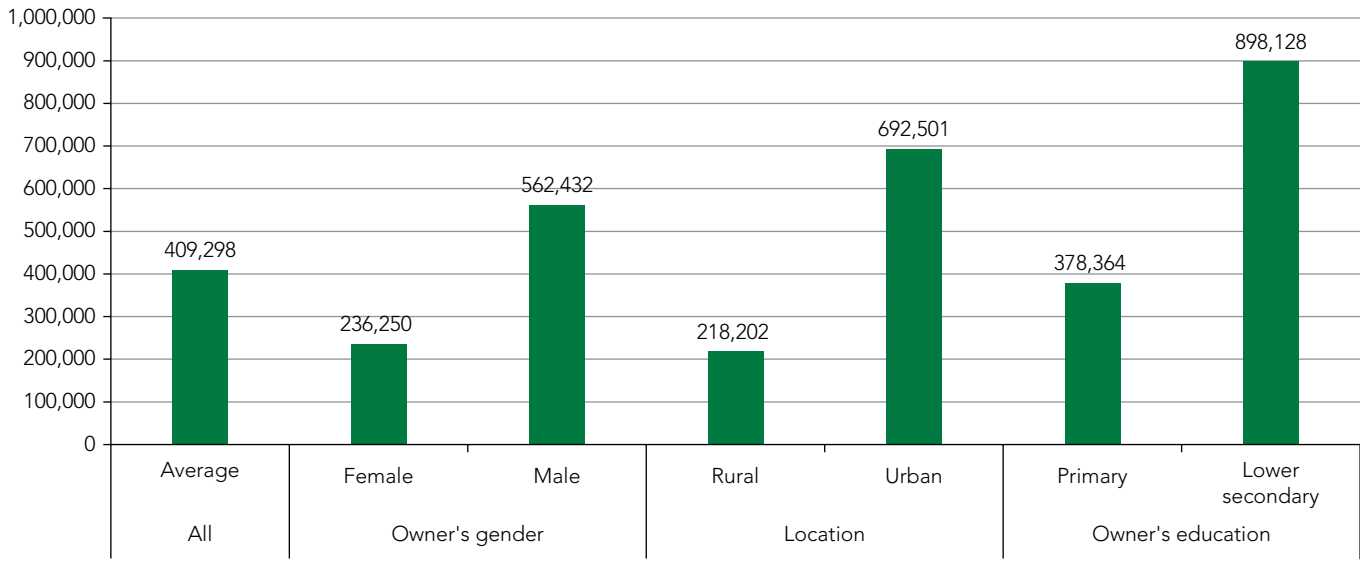
FIGURE 6.6: Highest Level of Education Completed by Household Head, 2018, percent



Source: HBS 2017/18.

FIGURE 6.7: Average Monthly Nonfarm Enterprise Revenue According to Owner Characteristics, 2018, TZS

A. Demographic characteristics



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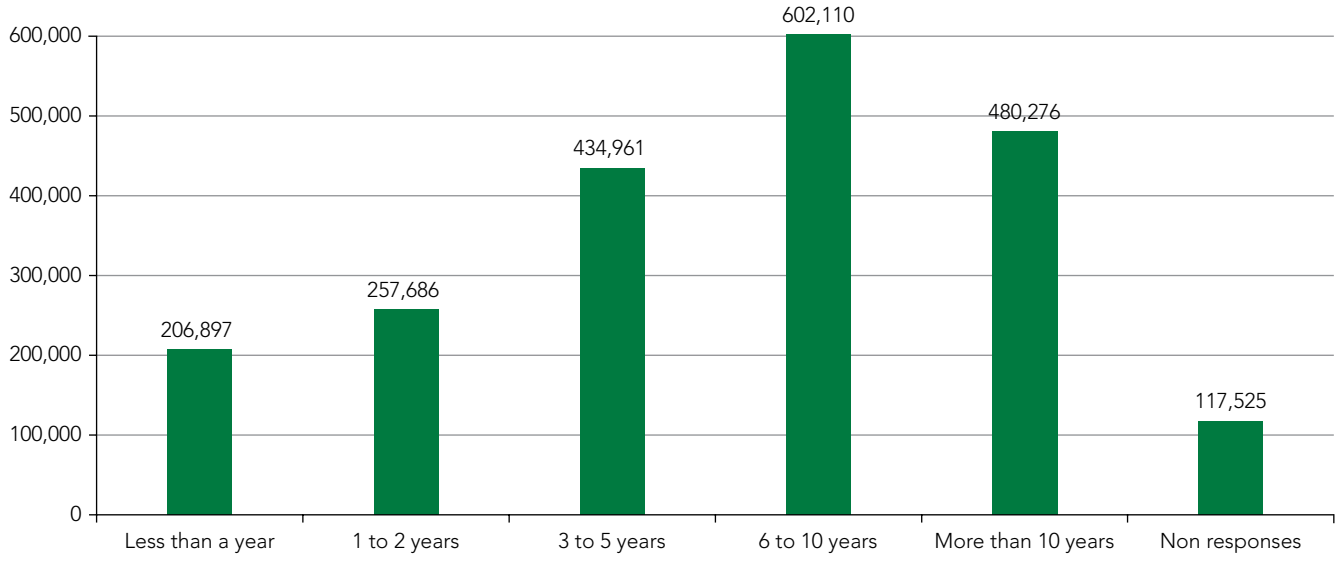
[3] Monthly NFE revenue includes revenue from the sale of products and goods, construction work, and services.

FIGURE 6.7B: NFE age



Source: HBS 2017/18.

NFE monthly revenues generally increased with age. NFEs that were 6 to 10 years old recorded the highest average monthly revenue, although revenues were lower for NFEs that had been in operation for longer than 10 years (Figure 6.7B). This suggests that NFEs that survive become more profitable up to a certain age after which profitability starts to decline.

APPENDIX A

Survey Description

Official estimates of poverty in (mainland) Tanzania are based on the Household Budget Surveys (HBS), which go back to the early 1990s. The HBSs are a series of repeated cross-sectional surveys conducted by the Tanzania National Bureau of Statistics (NBS). As shown in Table 1.A-1 there have been four HBS rounds so far - 1991/92, 2000/01, 2007, 2011/12 and 20117/18. All HBS collect data on household consumption, demographics (including education and health), asset ownership, housing, etc. The most recent 2011/12 and 2017/18 HBSs also contained a detailed labor force and agricultural module.

There exists a second survey series suitable for poverty analysis, the National Panel Survey, which has had four rounds so far (2008/09, 2010/11, 2012/13 and 2014/15). The NPS is a longitudinal survey (tracking individuals) conducted every two years by the NBS and has a smaller sample size than the HBS. However, the panel nature of the data makes it a particularly attractive survey for studying poverty dynamics and transitions. Due to differences in the way the HBS and NPS surveys capture consumption we follow the NBSs approach in that we draw (mainly) on the HBS data to measure poverty trends over time, though we make use of the NPS to analyze poverty movements and dynamics.

The 2007, 2011/12 and 20117/18 HBSs were implemented during 12 months (HBS 2017-18 collected data from December 2017 to November 2018). They use 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 28 days for the first two and 14 days for the latter, including consumption of self-produced items.

Enumerators visited the households regularly to check and code the individual records. The HBSs further included a recall module for non-food expenditures, particularly (semi-)durables and other irregularly purchased items.

The HBS instrument has evolved over time and there were significant changes between the HBS 2007, HBS 2011/12 and HBS 2017/18. The first two used paper method for data collection and the latter used Computer Assisted Personal Interviewing (CAPI) method, expect for diary which was based on paper. While the 2007 HBS recall module for non-food consumption was designed mainly to capture expenditures on semi-durable and durable goods and only probed for a limited number of item categories, the 2011/12 HBS included a much more detailed and broader recall module. The recall module was further expanded for HBS 2017/18. There is some evidence of better supervision over time, which could have affected the capture of food consumption in the diary. Finally, the 2007 and 2011/12 were representative at only Dar es Salaam, other urban, and rural levels while the 2017/18 HBS was representation at the regional (26 regions) level despite maintaining the sample size at around 10,000 households. This was the result of significant improvement of the sampling procedure.

Poverty line

It was decided in consultations with the Tanzania National Bureau of Statistics (NBS) that a new poverty line (food and basic needs) will be estimated for HBS 2017/18 due to major changes in the survey methodology compared to HBS 2011/12 in terms of sample design, methodology of data collection (CAPI for nonfood recall and nonmonetary dimensions and paper (PAPI) for diary food, 14 days diary). Other changes include: coverage of food and nonfood basket items, which are larger in 2017/18 HBS; and changes in the COICOP coding of food basket items, using a more disaggregated and detailed coding.

Price changes over time

Two methods can be used to adjust for price changes over time and estimate the real changes in consumption. The first is based on unit values and the second on official Consumer Price Index (CPI);

i) Unit values: fisher and Paasche price indices were estimated respectively in HBS 2012 and 2018 based on unit values (value/quantity) of a food basket of over 160 items. These items represent over 95 percent of total food

consumption. Survey based deflators generally better reflect the spending behavior, particularly of the poor, as well as temporal and regional changes/differences in the cost of living. Based on this deflator, price increased by about 26 percent between 2012 and 2018.

ii) Food CPI. This deflator has two major shortcomings. First, it only includes food prices collected in main urban markets. Second it is based on a different coding of food items than those in the HBS. This indicator shows a higher inflation (around 55 percent) than survey food unit values. This can be due to the fact that inflation is higher in urban centers than rural areas. It may also not reflect the spending behaviors at the national level and in particular in rural areas- where food consumption share and poverty are the highest.

iii) Official CPI. This deflator includes food and nonfood items. While nonfood CPI suffers less shortcomings than food one, given that nonfood urban prices are less biased, the coverage of main urban markets only remain problematic.

Robustness check

In order to check the robustness of the methodology for estimating poverty levels and changes of welfare over time, two methods were used:

i) Estimate the ratio of the food poverty lines of 2018 and 2012 and compare the changes with food prices changes. The indicator shows an increase of the food line of 29 percent, which corresponds to the inflation rate based on food unit values. While this inflation rate is lower than the one based on CPI food price, it reflects better the evolution of food prices as it has a better coverage of food items consumed in both urban and rural areas.

ii) Estimate the ratio of basic needs poverty lines of 2018 and 2012 and compare the changes with inflation rate based on CPI. Both indicators show an increase of prices of respectively 35 percent and 38 percent during this period, which supports the robustness of the new estimates of the poverty line.

Post-stratification

Population and household weights in the survey were post-stratified based on the 2018 population projection. Population weights for Dar es Salaam were adjusted by a factor of 1.2 (=5147070/4273781). Population weights for all other strata (including regional strata) were adjusted by a factor of 1.010189. Household weights were post-stratified by dividing the population by household size.

APPENDIX B

Drivers of Poverty Reduction

FIGURE B.1: Drivers of Poverty Reduction in Rural Areas From 2012 to 2018

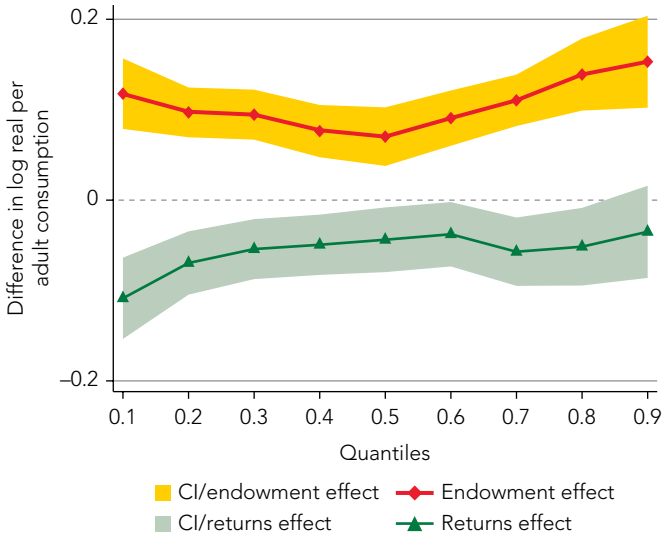
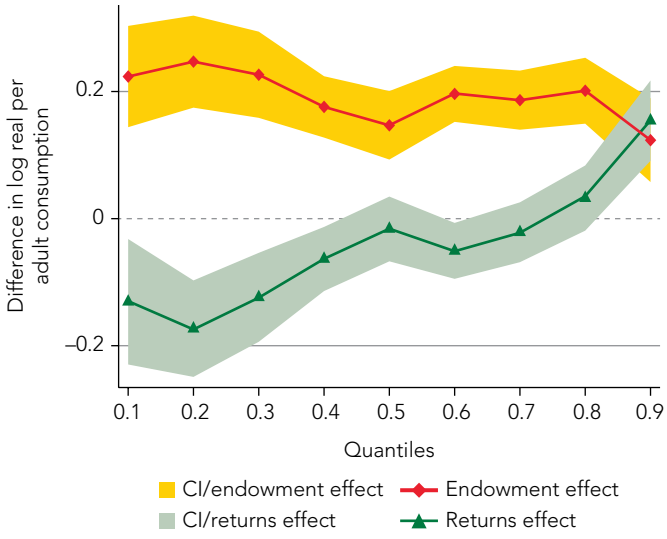


FIGURE B.2: Drivers of Poverty Reduction in Urban Areas From 2012 to 2018



	EXTREME POOR		POOR		MIDDLE CLASS		RICHEST	
	RURAL	URBAN	RURAL	URBAN	RURAL	URBAN	RURAL	URBAN
Total	**0.009**	**0.093*** **	**0.04*** **	**0.103*** **	**0.026** **	**0.131*** **	**0.118*** **	**0.278*** **
Endowments	**0.118*** **	**0.224*** **	**0.095*** **	**0.226*** **	**0.07*** **	**0.147*** **	**0.153*** **	**0.123** **
Access to basic services	0.092***	0.187***	0.076***	0.125***	0.05***	0.017	0.058**	-0.073
Education	0.002	0.003*	0.005***	0.011**	0.005***	0.017***	0.011***	0.028***
Assets	0.017	0.079***	0.012***	0.095***	0.016***	0.113***	0.041**	0.157***
Head nonfarm employment	0.001*	−0.004*	0.004**	0.005*	0.004***	0.005**	0.009***	0.015*
Demographic Structure	0.002	0.016**	0.001	0.001	0	0.001	0.01***	0.001
Returns	**−0.109*** **	**−0.131*** **	**−0.054*** **	**−0.124*** **	**−0.044** **	**−0.016**	**−0.035**	**0.154** **
Access to basic services	−0.015	0.004	0.024**	0.036**	0.036*	0.041	0.019	0.06
Education	−0.049*	−0.186***	−0.064***	−0.095**	−0.013	0.004**	0.007*	0.015***
Assets	0.001	0.016	0.006*	−0.038*	0.008*	−0.004	0.007*	0.072**
Head nonfarm employment	−0.003*	0.018**	−0.012**	0.015*	0.007***	0.005*	0.007*	0.035**
Demographic Structure	0.016	0.081***	0.044**	0.021*	0.001	0.051**	−0.005	0.066**

Source: HBS 2007, HBS 2011/12 and HBS 2017/18.
Note: Extreme poor are population groups in the bottom 10 percent of the distribution; the poor are in the third decile; middle class are in the fifth decile, and the richest are in the top decile.
* Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Numbers in parentheses are bootstrap standard deviations based on 100 replications.

FIGURE B.3: Drivers of Poverty Reduction in Dar es Salaam From 2012 to 2018

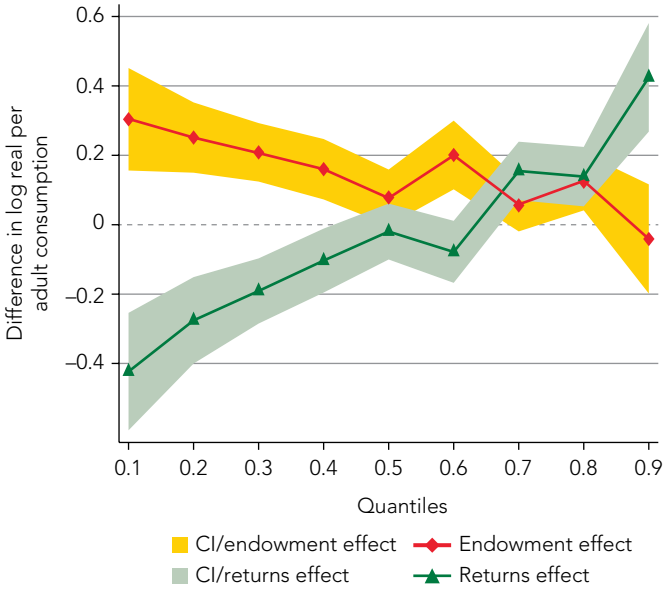
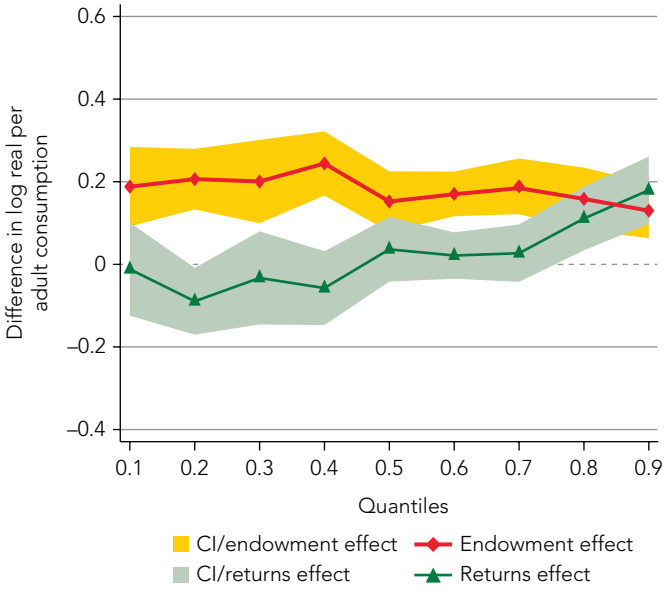


FIGURE B.4: Drivers of Poverty Reduction in Other Urban Areas From 2012 to 2018



	EXTREME POOR		POOR		MIDDLE CLASS		RICHEST	
	DAR ES SALAAM	OTHER URBAN	DAR ES SALAAM	OTHER URBAN	DAR ES SALAAM	OTHER URBAN	DAR ES SALAAM	OTHER URBAN
Total	**−0.120****	**0.176*****	**0.017**	**0.167*****	**0.059***	**0.188*****	**0.383*****	**0.309*****
Endowments	**0.304*****	**0.188*****	**0.208*****	**0.200*****	**0.079**	**0.152*****	**−0.041**	**0.130***
Access to basic services	0.191**	0.130**	0.093*	0.106**	-0.036	0.032	−0.023	0.028*
Education	−0.008	0.008*	0.007	0.011**	0.10*	0.038**	0.052***	0.015**
Assets	0.011*	0.103***	0.134***	0.102***	0.169***	0.136***	0.277***	0.076**
Head nonfarm employment	−0.029*	0.017**	0.002	0.006*	−0.001**	0.013**	0.003**	0.012*
Demographic Structure	-0.01	0.022**	−0.001	0.001	−0.022*	−0.003	0.026	0.002
Returns	**−0.423*****	**−0.012**	**−0.191*****	**−0.033**	**−0.020**	**0.036**	**0.425****	**0.179****
Access to basic services	0.14	0.082***	0.055	0.089***	0.035	0.077**	−0.032	0.09
Education	−0.860***	−0.172**	−0.019**	−0.018*	0.063**	0.07*	0.044**	0.015***
Assets	0.007	0.003*	−0.002*	0.019**	0.101	−0.049*	0.124*	0.098
Head nonfarm employment	−0.025*	0.034**	0.021*	0.013*	0.172**	0.011*	0.262**	0.023***
Demographic Structure	0.113*	0.089*	0.134**	0.018*	0.0033	0.004	0.046	0.072*

Source: HBS 2007, HBS 2011/12 and HBS 2017/18.
Note: * Significant at the 10 percent level; ** significant at the 5 percent level; *** significant at the 1 percent level. Numbers in parentheses are bootstrap standard deviations based on 100 replications.

APPENDIX C

Distributional pattern of Growth in Urban and Rural Areas

FIGURE C.1: Growth Incidence Curves in Rural Areas, 2007–2012

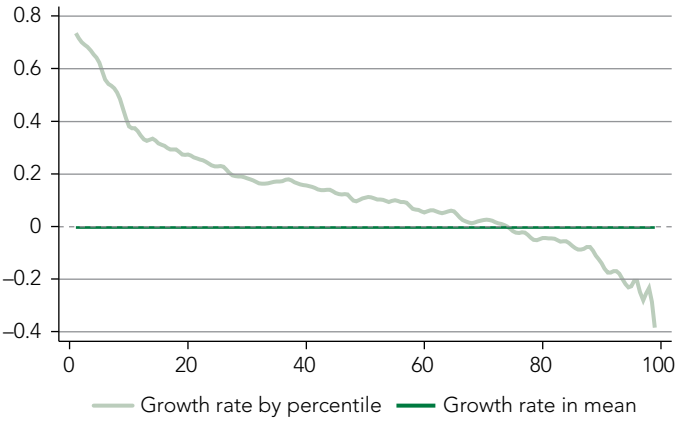


FIGURE C.2: Growth Incidence Curves in Rural Areas, 2012–2018

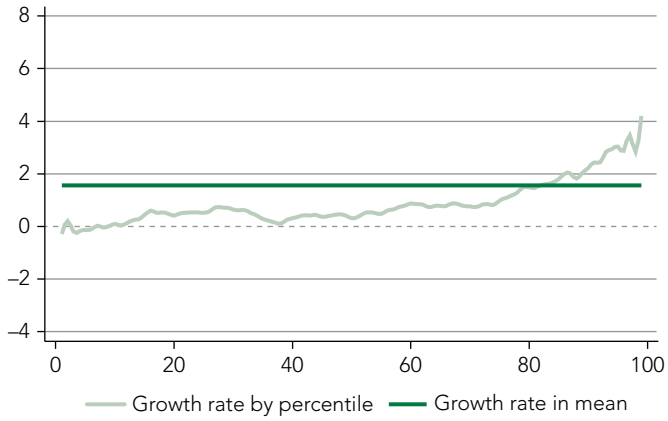


FIGURE C.3: Growth Incidence Curves in Urban Areas, 2007–2012

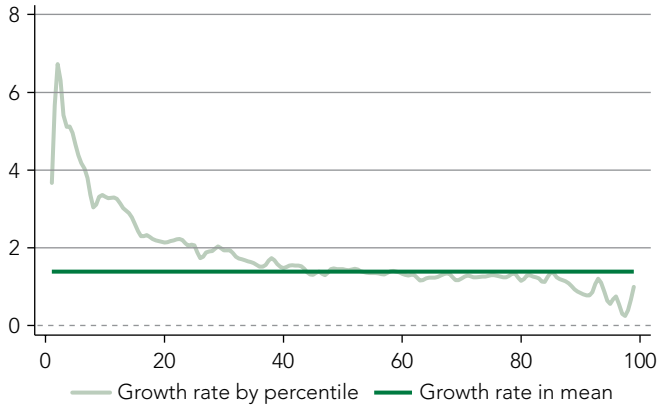
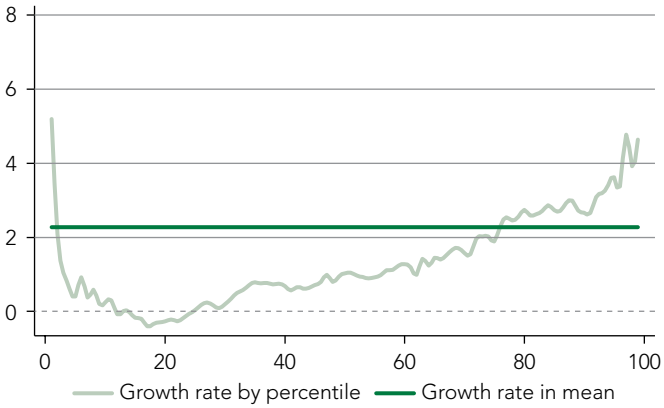


FIGURE C.4: Growth Incidence Curves in Urban Areas, 2012–2018



Sources: HBS 2007, HBS 2011/12 and HBS 2017/18.

APPENDIX D

Structure of Inequality

Decomposition of Inequality

The static decomposition of inequality enables one to explore how the differences in households' characteristics affect the level of inequality and provide important clues for understanding the underlying and changing structure of real per capita consumption distribution in Tanzania.

The decomposition follows the approach of Cowell and Jenkins (1995) and consists of separating total inequality in the distribution of consumption into inequality between the different household groups in each partition, I_{Betw}, and the remaining within-group inequality, I_{Within}. As the most commonly decomposed measures in the inequality literature come from the General Entropy class, mean log deviation (Theil_L) and the Theil_T indices in real per capita monthly consumption expenditure are used to identify the contribution of between-group differentials to total inequality. The General Entropy inequality measures allow total inequality to be equal to $I_{Betw} + I_{Within}$ and the amount of inequality explained by households attributes (or group of attributes) is measured by I_{Betw}/I_{total}, where between and within group inequalities are defined, respectively, for Theil_L and Theil_T indices as

$$I_{Betw} = \left[\Sigma_{j=1}^{k} f_j \log\left(\frac{\mu}{\mu_j}\right)\right] \qquad I_{Within} = \Sigma_{j=1}^{k} f_j \, GE_0^j$$

$$I_{Betw} = \left[\Sigma_{j=1}^{k} f_j \left(\frac{\mu_j}{\mu}\right)\log\left(\frac{\mu_j}{\mu}\right)\right] \qquad I_{Within} = \Sigma_{j=1}^{k} \upsilon_j \, GE_1^j$$

with f_j the population share, υ_j the consumption share, and μ_j the mean consumption of subgroup j; μ total mean consumption, GE_0^k Theil_L index, and GE_1^k Theil_T index of subgroup j.

with:

$$Theil\_L = 1/n \, \Sigma_{i=1}^{n} \log\left(\frac{\bar{y}}{y_i}\right) \text{ and } Theil\_T = 1/n \, \Sigma_{i=1}^{n} \left(\frac{y_i}{\bar{y}}\right)\log\left(\frac{y_i}{\bar{y}}\right).$$

y_i: is real monthly per capita consumption expenditure for household i and $\bar{y}$ is mean real monthly per capita consumption expenditure.

Inequality of opportunity

The approach to estimate the degree of opportunity inequality associated with the distribution of both consumption and income is based on the framework of Bourguignon *et al.* (2007). The method is based on the separation of the determinants of household's outcome (consumption or income), y_i, into a set of circumstances variables, denoted by the vector C_i ; efforts variables, denoted by the vector E_i and unobserved factors, represented by υ_i. The outcomes function can be specified as:

$$y_i = f(C_i, E_i, \upsilon_i) \qquad i{:}1 \ldots N \qquad (1)$$

The circumstances variables are economically exogenous since they are outside the individual's control but effort factors may be endogenous to circumstances as an individual's actions may be influenced by its gender, parental background etc.

Equality of opportunity occurs, in the Roemer's (1998) sense, when outcomes are independently distributed from circumstances. This independence implies that circumstances have no direct causal effect on outcomes and no causal impact on efforts. The degree of opportunity inequality can therefore be determined by the extent to which the conditional distribution of outcomes on circumstances, $F(y|C)$, differs from $F(y)$.

Inequality of opportunity can be estimated as the difference between the observed total inequality in the distribution of consumption or income and inequality that would prevail if there were no differences in circumstances. Let $\tilde{F}(\tilde{y})$ be the counterfactual distribution of outcomes when circumstances are identical for all individuals. The opportunity share of inequality can be defined as:

$$\Theta_P^r = 1 - \frac{I\left(\tilde{F}(\tilde{y})\right)}{I\left(F(y)\right)} \qquad (2)$$

The first step for computing Θ_P consists on estimating a specific model of (1), which can be expressed in the following log-linear form:

$$\ln(y_i) = C_i\alpha + E_i\beta + \upsilon_i \qquad (3)$$

$$E_i = AC_i + \varepsilon_i$$

where α and β are two vectors of coefficients, A is a matrix of coefficients specifying the effects of the circumstance variables on effort and ε_i is an error term. Model (3) can be expressed in reduced from as:

$$ln(y_i) = C_i\delta + \eta_i \quad (4)$$

where $\delta = \alpha + \beta A$ and $\eta_i = \upsilon_i + \varepsilon_i\beta$.

Inequality of opportunity can be measured using equation (2) where the counterfactual distribution is obtained by replacing y_i with its estimated value, from equation (4), and which can be expressed as: $\tilde{y}_i = \exp(\bar{C}\hat{\delta} + \hat{\eta}_i)$. In this decomposition, the variation in $\tilde{y}_i$ can be interpreted as the influence of effort because circumstances are set to be equal for all households, and inequality of opportunity is measured as a residual.

Inequality of opportunity can also be measured directly by eliminating the contribution of effort to outcomes, using the *smoothed* distribution, obtained from the predicted values of outcomes based on circumstances in equation (4) while ignoring the remaining variation in the residuals:

$$\tilde{z}_i = \exp(C_i\hat{\delta}) \quad (5)$$

The share of inequality of opportunity can thus be measured by:

$$\Theta_P^d = \frac{I\left(\tilde{F}(\tilde{z})\right)}{I\left(F(y)\right)} \quad (6)$$

The subscripts *d* and *r*, in Θ_P, denote respectively that inequality of opportunity is estimated directly or residually by eliminating the contribution of effort or circumstances to outcomes. The direct and residual methods can yield different figures of opportunity inequality and the only inequality measure for which the two methods give the same results is the mean log deviation *(Theil_L)*, which has a path-independent decomposition when the arithmetic mean is used as the reference income or consumption (Foster and Shneyerov, 2000). By using the mean log deviation inequality index the residual and direct methods give the same opportunity inequality measures.

The parametric approach allows the estimation of the partial effects of one or some circumstance variables on outcomes, while controlling for the others, by simulating distributions such as: $\tilde{y}_i^j = \exp(\bar{C}^j\hat{\delta}^j + C^{h\neq j}\hat{\delta}^{h\neq j} + \hat{\eta}_i)$, where $\tilde{F}(\tilde{y}^j)$ is the counterfactual outcomes distribution obtained by keeping circumstance C^j constant.

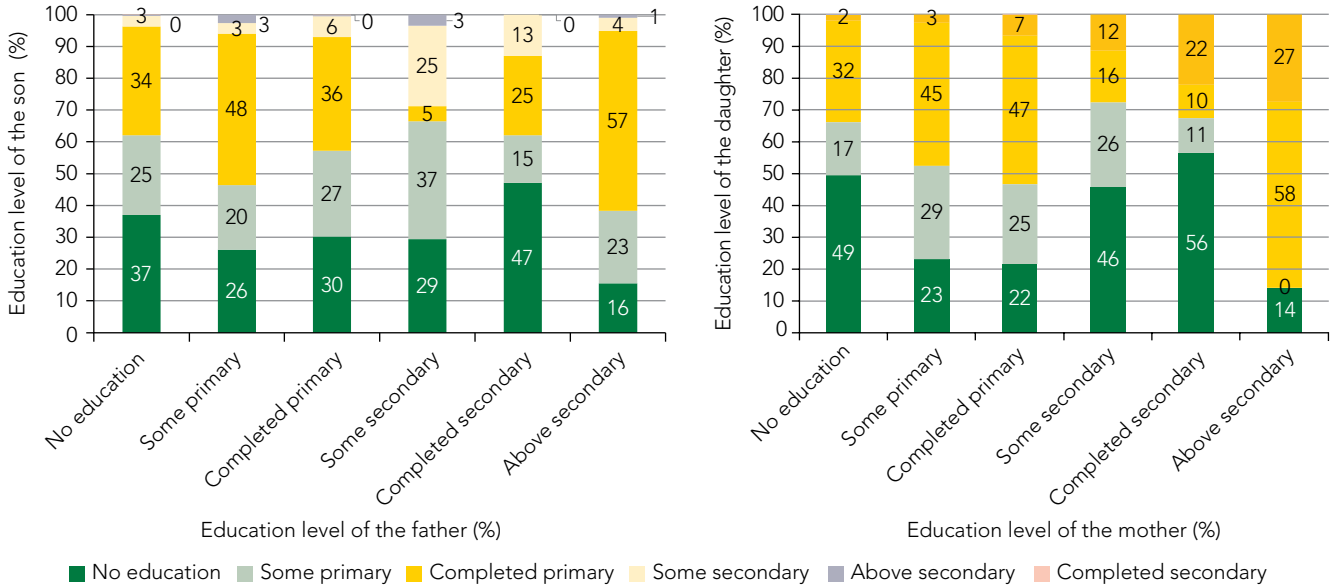
The inequality share specific to circumstance *j* can be computed residually by:

$$\Theta_P^j = 1 - \frac{I\left(\tilde{F}\left(\tilde{y}^j\right)\right)}{I\left(F(y)\right)}$$

Social mobility: Father vs Son and Mother vs Daughter

FIGURE D.1: Intergenerational Mobility Poor Population, Father vs Son and Mother vs Daughter, Percent

A. Education



continued

FIGURE D.1B. Employment Status

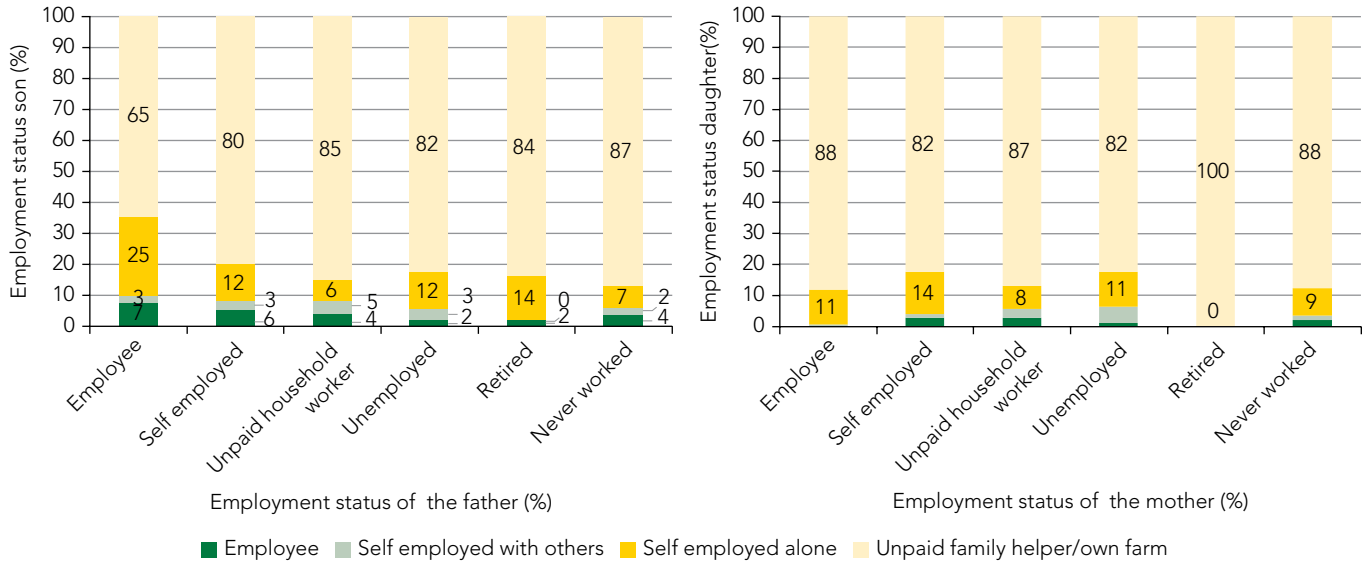
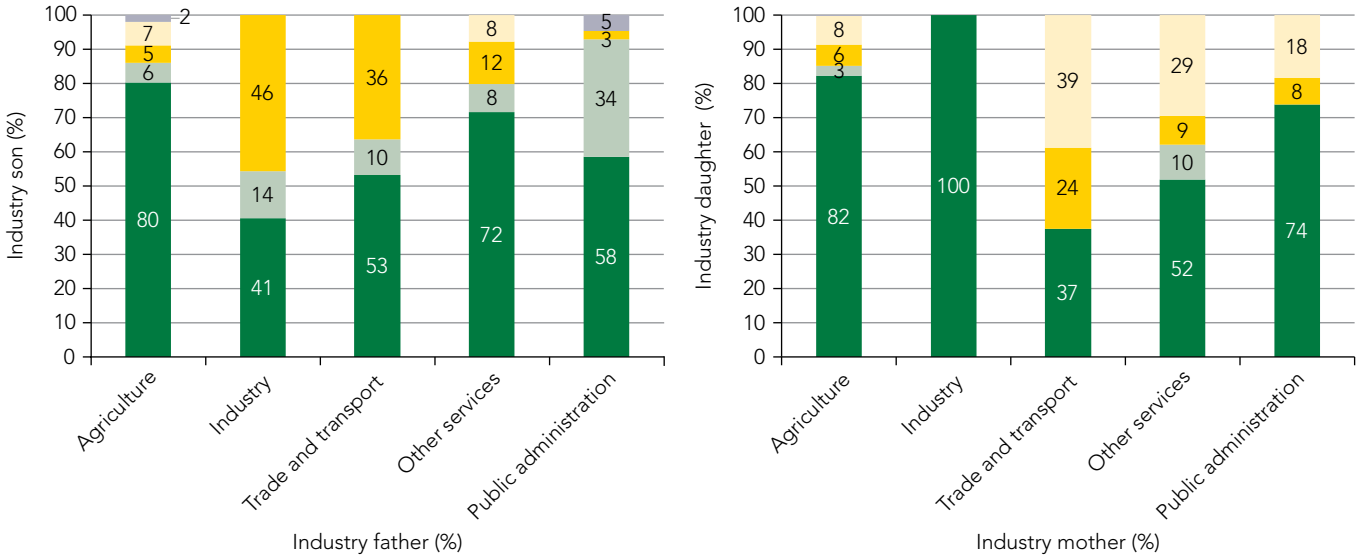


FIGURE D.1C. Industry



Source: HBS 2018.

APPENDIX E

Multivariate Regressions and Determinant of Consumption and Poverty

We perform a regression analysis to examine the main factors affecting households' consumption and poverty. This allows us to identify the main correlates of poverty. We use two regression models. The first examines the impact of the household socioeconomic characteristics on the logarithm of real per capita household consumption, and the second investigates the determinants of the probability of being poor. The first model is estimated using the Ordinary Least Square (OLS) method and the second using the probit model. The estimation results are reported respectively in Tables E-1 and E-2.

It is worth mentioning that the direction of causality is sometimes difficult to establish in these kinds of analysis. The results below allow the identification of variables closely related with poverty, but the direction of causation will necessitate analysis that is more sophisticated.

TABLE E.1: Correlates of Consumption, 2018

	TANZANIA	RURAL	URBAN
Household socio-demographic characteristics			
Household size	0.113***	0.107***	0.129***
	(0.00)	(0.00)	(0.01)
Share of members aged 0–14 years	−0.207***	−0.154***	−0.372***
	(0.03)	(0.04)	(0.07)
Share of members aged 65+ years	−0.347***	−0.403***	−0.179
	(0.04)	(0.05)	(0.09)
Age of household head	0.004***	0.003***	0.006***
	(0.00)	(0.00)	(0.00)
Gender of household head	−0.048**	−0.047**	−0.039
	(0.02)	(0.02)	(0.03)
Education of the head (omitted: no education)			
Incomplete primary	0.043*	0.039	0.086
	(0.02)	(0.02)	(0.06)
Primary completed	0.167***	0.145***	0.249***
	(0.02)	(0.02)	(0.05)
Lower secondary	0.372***	0.358***	0.457***
	(0.03)	(0.04)	(0.05)
Upper secondary	0.559***	0.394***	0.685***
	(0.05)	(0.05)	(0.08)
University	0.842***	0.788***	0.910***
	(0.07)	(0.11)	(0.09)
Head of household migrant	0.026	−0.001	0.109***
	(0.02)	(0.02)	(0.03)
Household economic activity			
Sector of employment of the head (omitted: agriculture)			
Manufacturing	0.065*	0.059	0.082
	(0.03)	(0.04)	(0.05)
Services	0.108***	0.172***	0.094**
	(0.02)	(0.03)	(0.03)
Public administration	0.098	0.129*	0.045
	(0.05)	(0.05)	(0.08)
Status of employment of the head (omitted: unpaid family helper/own farm)			
Employee	0.169***	0.159***	0.220***
	(0.03)	(0.04)	(0.04)
Self-employed with employees	0.311***	0.195***	0.432***
	(0.04)	(0.05)	(0.06)
Self-employed without employees	0.092***	0.092**	0.137***
	(0.02)	(0.03)	(0.04)

(Table Continued on next page)

TABLE E.1: Correlates of Consumption, 2018 *(Continued)*

	TANZANIA	RURAL	URBAN
Has any agricultural plot	0.103***	0.092***	0.121***
	(0.01)	(0.02)	(0.03)
Has any livestock	0.169***	0.205***	0.046
	(0.02)	(0.02)	(0.03)
Housing characteristics			
Access to sanitation (omitted: open defecation)			
Basic sanitation	0.329***	0.315***	0.413***
	(0.03)	(0.04)	(0.12)
Limited sanitation	0.174***	0.297***	0.256*
	(0.04)	(0.05)	(0.12)
Unimproved sanitation	−0.007	−0.006	0.100
	(0.03)	(0.03)	(0.12)
Other sanitation	−0.082	−0.048	−0.163
	(0.06)	(0.06)	(0.18)
Access to water (omitted: unimproved water)			
Basic water	0.021	0.046*	−0.218***
	(0.02)	(0.02)	(0.07)
Limited water	−0.034	0.002	−0.389***
	(0.02)	(0.02)	(0.08)
Other water	0.031	0.059*	−0.213*
	(0.02)	(0.02)	(0.08)
Daily market	−0.025	−0.030	−0.016
	(0.02)	(0.02)	(0.03)
Access to road (omitted: no road)			
Trunk road	0.049***	0.053***	0.049
	(0.01)	(0.02)	(0.03)
Tarmac road	0.059**	0.020	0.081*
	(0.02)	(0.03)	(0.04)
Mobile phone signal	0.037**	0.022	0.083**
	(0.01)	(0.01)	(0.03)
Access to health facility (omitted: no health facility)			
Only health center/dispensary	−0.030*	−0.015	−0.027
	(0.01)	(0.02)	(0.03)
Only public/private hospital	0.209***	0.097	0.359***
	(0.04)	(0.06)	(0.05)
Health center/dispensary and public/private hospital	0.058*	0.071*	0.133***
	(0.03)	(0.03)	(0.04)
Geographic location (omitted: rural)			
Other urban centers	0.023		
	(0.02)		
Dar es Salaam	0.315***		
	(0.03)		
Constant	11.432***	11.446***	11.372***
	(0.05)	(0.05)	(0.15)
Observations	(0.03)	6,675	2,788
R-squared	0.476	0.430	0.467

Source: HBS 2017/18.

TABLE E.2: Correlates of Poverty, 2018

	TANZANIA	RURAL	URBAN
Household socio-demographic characteristics			
Household size	0.120***	0.111***	0.162***
	(0.01)	(0.01)	(0.02)
Share of members aged 0–14 years	0.486***	0.612***	0.153
	(0.10)	(0.11)	(0.21)
Share of members aged 65+ years	−0.357**	−0.395**	−0.236
	(0.13)	(0.15)	(0.33)
Age of household head	0.001	0.003	−0.005
	(0.00)	(0.00)	(0.00)
Gender of household head	0.023	−0.044	0.147
	(0.05)	(0.05)	(0.12)
Education of the head (omitted: no education)			
Incomplete primary	−0.007	−0.054	0.191
	(0.06)	(0.06)	(0.18)
Primary completed	−0.177***	−0.179***	−0.143
	(0.05)	(0.05)	(0.15)
Lower secondary	−0.763***	−0.859***	−0.592**
	(0.11)	(0.12)	(0.20)
Upper secondary	−0.470*	−0.746**	−0.288
	(0.21)	(0.25)	(0.29)
University	−1.556***	−1.050*	−1.755***
	(0.33)	(0.46)	(0.41)
Head of household migrant	−0.034	0.038	−0.255**
	(0.05)	(0.05)	(0.10)
Household economic activity			
Sector of employment of the head (omitted: agriculture)			
Manufacturing	−0.093	−0.136	−0.061
	(0.10)	(0.11)	(0.17)
Services	−0.270***	−0.363***	−0.220
	(0.08)	(0.09)	(0.13)
Public administration	−0.227	−0.545*	−0.008
	(0.27)	(0.25)	(0.38)
Status of employment of the head (omitted: unpaid family helper/own farm)			
Employee	−0.219*	−0.052	−0.362*
	(0.11)	(0.12)	(0.18)
Self-employed with employees	−0.235	−0.189	−0.326
	(0.12)	(0.16)	(0.21)
Self-employed without employees	−0.146	−0.233**	−0.078
	(0.08)	(0.08)	(0.14)
Has any agricultural plot	−0.167***	−0.193***	−0.104
	(0.04)	(0.04)	(0.11)
Has any livestock	−0.211***	−0.261***	−0.024
	(0.05)	(0.05)	(0.11)

(Table Continued on next page)

TABLE E.2: Correlates of Poverty, 2018 *(Continued)*

	TANZANIA	RURAL	URBAN
Housing characteristics			
Access to sanitation (omitted: open defecation)			
Basic sanitation	−0.490***	−0.661***	−0.530
	(0.11)	(0.12)	(0.35)
Limited sanitation	−0.746***	−0.877***	−0.800*
	(0.11)	(0.19)	(0.34)
Unimproved sanitation	−0.002	0.019	−0.136
	(0.07)	(0.07)	(0.33)
Other sanitation	0.081	0.007	0.311
	(0.19)	(0.17)	(0.65)
Access to water (omitted: unimproved water)			
Basic water	−0.006	−0.014	0.351
	(0.05)	(0.05)	(0.20)
Limited water	0.015	0.022	0.337
	(0.06)	(0.06)	(0.27)
Other water	−0.052	−0.116	0.469
	(0.07)	(0.07)	(0.26)
Daily market	0.098*	0.148**	−0.028
	(0.05)	(0.05)	(0.10)
Access to road (omitted: no road)			
Trunk road	−0.125**	−0.138**	−0.168
	(0.04)	(0.04)	(0.11)
Tarmac road	−0.058	0.109	−0.224
	(0.07)	(0.08)	(0.12)
Mobile phone signal	−0.007	0.028	−0.093
	(0.04)	(0.04)	(0.09)
Access to health facility (omitted: no health facility)			
Only health center/dispensary	0.045	0.010	0.126
	(0.04)	(0.04)	(0.11)
Only public/private hospital	−0.376*	−0.208	−0.867**
	(0.15)	(0.19)	(0.31)
Health center/dispensary and public/private hospital	−0.288***	−0.318**	−0.332*
	(0.08)	(0.10)	(0.14)
Geographic location (omitted: rural)			
Other urban centers	0.122		
	(0.07)		
Dar es Salaam	−0.151		
	(0.11)		
Constant	−1.091***	−1.070***	−1.183*
	(0.14)	(0.14)	(0.46)
Observations	9,463	6,675	2,788

Source: HBS 2017/18.

APPENDIX F

Multidimensional Deprivation and Multidimensional Poverty Index (MPI)

Alkire and Foster (2011) propose a simple methodology for the measurement of multidimensional poverty, which employs a generalization of the conventional Foster-Greer-Thorbecke (FGT) poverty measures to account for multidimensionality. The approach builds on the work on multidimensional poverty and deprivation developed by the Oxford Poverty & Human Development Initiative (OPHI) and introduces an intuitive approach to identify the poor using two forms of cutoff: one within each of the relevant dimensions of the welfare to determine whether a person suffers shortfalls in that dimension, and a second across dimensions that delineates how widely deprived a person must be in order to be considered poor and identifies the poor by 'counting' the dimensions in which an individual is deprived. They propose an adjusted FGT measure that is particularly suitable for use with ordinal data and informs on the breadth of multiple deprivations of the poor.

Consider a number of relevant dimensions of well-being, d ≥ 2, for a population of *n* individuals. The well-being dimensions might relate to education, living standards, or access to basic services, etc. The individuals achievements are denoted by the $n \times d$ matrix $y = [y_{ij}]$, where $y_{ij} \geq 0$ is the achievement of individual *i* in dimension *j*.

The first step is to determine a threshold or *deprivation cutoff*, $z_j > 0$, for each dimension, according to which individuals can be considered as deprived in that dimension. Then, construct the $n \times d$ matrix of deprivations $g^0 = [g^0_{ij}]$, where $g^0_{ij} = 1$ when $y_{ij} < z_j$ *(deprived)* and $g^0_{ij} = 0$ if $y_{ij} \geq z_j$ (*non-deprived*). A vector *C* of deprivation scores is constructed from the matrix g^0, where the deprivation score for each individual *i* is defined by the following weighted sum:

$$c_i = \sum_j w_j g^0_{ij}$$

where w_j is the weight associated with each dimension *j*, and summing to *d*.

The second step consists in identifying the poor, and is based on the selection of a cutoff level for the deprivation scores and a definition of an identification function. Let $k \leq d$ is the poverty cutoff and $\rho_k(y_i ; z)$ is the identification function defined as follows:

$$\rho_k (y_i; z) = 1 \text{ if } c_i > k \qquad \textit{(i is poor)}$$

and

$$\rho_k (y_i; z) = 0 \text{ if } c_i < k \qquad \textit{(i is nonpoor)}$$

$\rho_k(y_i ; z)$ identifies individual *i* as poor when the number of dimensions in which he/she is deprived is at least *k*.

Incidence or headcount ratio

Based on ρ_k, the headcount ratio, which measures the proportion of people identified as multidimensional poor, can be defined as:

$$H(y,z) = \frac{\sum_{i=1}^{n} \rho_k(y_i, z)}{n} = \frac{q}{n}$$

This is analogous to the conventional income headcount ratio which measures the incidence of poverty, but in a multidimensional setting.

The headcount ratio has two main shortcomings: first, it remains unchanged if a poor individual becomes deprived in a new dimension. Second, it does not allow the evaluation of the contribution of each dimension to poverty.

Intensity of multidimensional poor's deprivation

To address these shortcomings, Alkire and Foster (2011) suggest an additional measure that assesses the breadth of deprivation experienced by the poor:

$$A = \frac{\sum_{i=1}^{n} c_i(k)}{dq}$$

where *A* measures the average proportion of deprivations in which the poor are deprived, through calculating the percentage of total deprivations each poor person has ($c_i(k)/d$) and calculating the average of those percentages across the poor (dividing by the number of poor only, *q*).

Construction of the MPI

The Multidimensional Poverty Index (MPI) is then defined as a combination of the headcount and the average proportion of deprivation to inform on the prevalence of poverty and the average extent of a poor individual's deprivation. It is given by the simple product of *H* and *A: MPI = HA*. MPI represents the proportion of weighted deprivations experienced by the poor relative to the maximum potential deprivations that could be experienced by the whole population.

The contribution of each dimension to poverty, CD_j, can be calculated using MPI as:

$$CD_j = \frac{\left(w_j / d\right)\sum_{i=1}^{n} w_j g_{ij}^0(k)}{w_j n MPI}$$

The multidimensional deprivation index (MDI) used in chapters 4 and 5 is very similar to the MPI.

FIGURE F.1: Welfare Dimensions and Deprivations Criteria

DIMENSIONS	INDICATORS	WEIGHT	DEPRIVATION CRITERIA
Education (1/3)	Years of schooling	1/9	No household member age 10 years or older has completed at least five years of schooling.
	School attendance	1/9	Any school-age child (6 to 15 years old) is not attending school.
Health (1/3)	Child mortality	1/9	Any child has died in the family in the five-year period preceding the survey.
Living Standards (1/3)	Housing	1/9	The household has unimproved wall, floor and/or roof housing material
	Electricity	1/9	The household has no electricity.
	Sanitation	1/9	The household has no improved sanitation facility.
	Drinking water	1/9	The household does not have access to improved drinking water.
	Cooking fuel	1/9	The household cooks with dung, wood, or charcoal.
	Assets	1/9	The household does not own at least two of the following assets: radio, TV, telephone, bicycle, motorbike or refrigerator.

Source: Authors definitions based on Tanzania National Bureau of Statistics and OPHI (2019).

APPENDIX G

Methodology for Generating Small-Area Poverty Estimates

Obtaining accurate and reliable estimates of local poverty is difficult due to the high costs of collecting welfare data that allows for such analysis. Household surveys – from which poverty estimates are derived – are typically too small to produce reliable estimates below a certain geographical level, such as provinces or districts. The 2018 HBS is no exception, and is not considered to be representative below the provincial level.

Methodology

Traditionally, poverty mapping methods estimate a random effect regression model using survey data containing per capita income or consumption data and use the estimated parameters to simulate welfare in a contemporaneous census. Because there is no recent census in Tanzania, however, applying this method would produce biased estimates. (Lange, Pape, and Putz 2018). To overcome this challenge, we combine the household sample data with remote sensing indicators at the village level, linking the source and auxiliary data geographically through village identifiers. To combine these two data sources, we employ the Empirical Best Prediction (EBP) Method (Molina and Rao 2010, Battese, Harter, and Fuller 1988). The EBP modifies the traditional ELL method (Elbers, Lanjouw, and Lanjouw, 2003) in two main ways. First, random effects are introduced at the level of the district instead of the enumeration area. Second, these district random effects are conditioned on the sample data. This method therefore efficiently combines household level information on per capita consumption, which are only available in sample villages, with an exhaustive set of village level prediction based on indicators derived from satellite data.

In the EBP method, the two-level nested error regression model is first estimated:

$$y_{id} = x_{id}\beta + u_d + \varepsilon_{id}, \quad i = 1, \ldots, N \quad d = 1, \ldots, D$$
$$u_d \sim N\left(0, \sigma_u^2\right), \ \varepsilon_{id} \sim N\left(0, \sigma_\varepsilon^2\right) \qquad (1)$$

where y_{id} corresponds to log per capita consumption for household *i* in district *d*. u_d and ε_{id} are district-specific and household-specific random errors. The EBP estimates of FGT0 are obtained by estimating the nested-error model (Equation 1); generating district-level effects $u_d^* \sim N\left(0, \hat{\sigma}_u^2\right)$ and unit-level effects $\varepsilon_{id}^* \sim N\left(0, \hat{\sigma}_\varepsilon^2\right)$; and then calculating population welfare values through micro-simulation based on the sample and non-sample values of explanatory variables as specified in Equation 1. To estimate the Means Squared Errors (MSE) of FGT0, we follow Molina and Rao (2010), which proposes a parametric boostrap MSE estimator following the bootstrap method for finite populations of González-Manteiga et al. (2008).[1] Alternative estimates generated using a village level model, a variant of the sub-area estimator proposed by Torabi and Rao (2014), yielded similar results.

The specification of the consumption model in Equation 1 affects the district-level poverty rates. The set of variables included in each specification was chosen from the list of candidate variables using the stepwise selection process (with a significance level threshold of 0.01 for removal). This mitigates the potential for over-fitting the model to the sample, which would make the resulting poverty estimates less precise. The stepwise selection process yielded a model with 40 right hand side variables (including regional dummies) as reported in Table G.1. The model achieved a reasonably high R^2 of 0.23 despite the fact that the explanatory variables are at the village level whereas consumption is measured at the household level.

Finally, we apply a rescale factor for each region to ensure that our regional averages of EBP estimates match the regional rates of poverty based solely on the HBS 2018, which is regionally representative.[2]

[1] The R "sae" package has been used to implement this estimation.
[2] This is the simple ratio or pro-rata benchmarking considered in Pfefferman, et al (2014). That analysis evaluates several benchmarking procedures in cross-sectional simulations. In the simulations considered, the simple ratio benchmarking performs at least as well as several more complex benchmarking procedures proposed in the literature.

Data

Geospatial data on the right-hand side of equation are drawn from a number of different sources: which are categorized into four different groups – urbanization, market access, agro-climate, and natural disaster shocks and summarized as below:

Urbanization:

- **Night-time light data** from the Visible Infrared Imaging Radiometer Suite (VIIRS) at a spatial resolution of 15 arc-seconds. We used the annual composite measure of nighttime light from 2015 and monthly composite measures from December 2017 through December 2018.
- **Global human settlement layer (GHSL) data** contain information on built-up areas on a global scale for the following years: 1975, 1990, 2000, 2014. It is published by the Joint Research Center (JRC) of the European Commission and is derived from data collected by Landsat satellites. We compute the percentage of total built-up area observed in 2014 that was constructed prior to 1975 or during 1975-1990, 1975-1990, and 2000-2014.
- **Population data** from WorldPop Africa provide 2015 estimates of numbers of people per pixel available at a spatial resolution of 0.000833333 decimal degrees (or approx. 100m at the equator); and from Global Human Settlement dataset, which also provides the grid-level population estimate of 2015, informed by the distribution and density of built-up as mapped in the Global Human Settlement Layer (GHSL) global layer per corresponding epoch.
- **Agglomeration Index provided** by the World Bank's Geospatial Operations Support Team (GOST) based on Uchida and Nelson (2009) is an composite index of urbanization, which takes into account population density, the population of a "large" urban center, and travel time to that large urban center.
- **Building footprints provided** by GOST based on data shared by Ecopia and Maxar offers various indicators of building areas, counts, and densities using different measurement scales. The characteristics of building densities are computed based on the sizes of or distance to 5 or 25 nearest buildings around each building point and compute the minimum, maximum, mean, sum, and standard deviation of those statistics for each village.

Agro-climate:

- **Rainfall and temperature data** from Willmott and Matsuura (2018) capture the monthly estimates of precipitation and temperature at 0.5° resolution. Values are interpolated for each grid node from an average of 20 different weather stations, with corrections for elevation. The annual average of precipitation and temperature for each village between 2010 and 2017 are included.
- **Elevation data** from AidData's GeoQuery (Goodman et al., 2019) provides gridded data on elevation (in meters) at a 500m resolution, which are based on Jarvis et al. (2008).
- **Climate data** from Kottek et al. (2006) offer a world map of the Köppen-Geiger climate classification, which divides climates into five main climate groups (tropical, dry, temperate, continental, and polar), with each group being divided based on seasonal precipitation and temperature patterns. The raster version of the map is available at 0.5° resolution.
- **Crop yield data** from IFPRI HarvestChoice Dataverse (Wood-Sichra et al. 2016) capture the estimated yield of various crops (ton/km) at 0.5° resolution. In our analysis, three major crops in Tanzania – maize, sorghum and rice – are considered.
- **The net primary productivity (NPP) and the Normalized Difference Vegetation Index (NDVI),** which are commonly used as indicators to characterize vegetation health and vigor. These data are available at a resolution of 0.1 degree.

Market Access:

- See Appendix H for more details

Natural Disaster Risks:

- **Flood and drought data from UNEP/DEWA/GRID-Europe** measure the estimated size of GDP (economic) and population (physical) that are exposed to flood and drought events per 10km grid.

Results

This section discusses the reliability and accuracy of the poverty map estimates. We use the average coefficient of variation across districts as the main criteria to judge how the precision and reliability of our estimates compare with the direct estimates obtained from the 2018 HBS. The coefficient of variation for each district is defined as the standard error of the district poverty estimate divided by the estimated district poverty rate. The consumption model – the model used to predict consumption as a function of spatial covariates (Equation 1) – has a reasonably high R^2 of 0.23, which means that the geospatial variables explain 23 percent of variation in household consumption in the first stage. This is impressive given that the geospatial variables are only capable of explaining variation in household consumption across villages. The results from the consumption model are presented in Table G.1.

Figure G.1 also presents a comparison of the Coefficients of Variation (CVs) of direct estimates of FGT0 at the district level with comparable small area estimates. We see that the average CV of the small area estimates (18%) achieves about a 50% reduction in the CV compared to direct estimates (35% or 38% depending on the method used).[3] Coincidentally, the average CV of the small area district estimates is approximately equal to the average CV of the direct estimates of the routinely published provincial poverty rates, which is also 18%.

This method was validated using data from the 2012 population census. To do the validation, we constructed a "welfare index" comprised of the first principal component of several household welfare indicators present in the census. These welfare indicators include the household's size and dependency ratio, whether the household is a beneficiary of the main social protection program, whether the household contains a disabled member, the education and age of the head, and whether the head was engaged in agricultural work. The correlation between the mean value of this welfare index and mean consumption is 0.6 across districts. We then added a constant of five to the first principal component index and defined a welfare deprivation line of approximately 4, which classified approximately 20 percent of the population as deprived. We then drew a "synthetic sample" consisting of the same villages sampled in the 2018 HBS, and drew a sample of households to mimic the structure of the 2018 survey. Finally, we used the same remote sensing indicators listed above, pertaining in some cases to earlier years, to predict welfare deprivation rates at the district level using the EBP method.

TABLE G.1: Beta Model Results (Variables Selected through Stepwise Process)

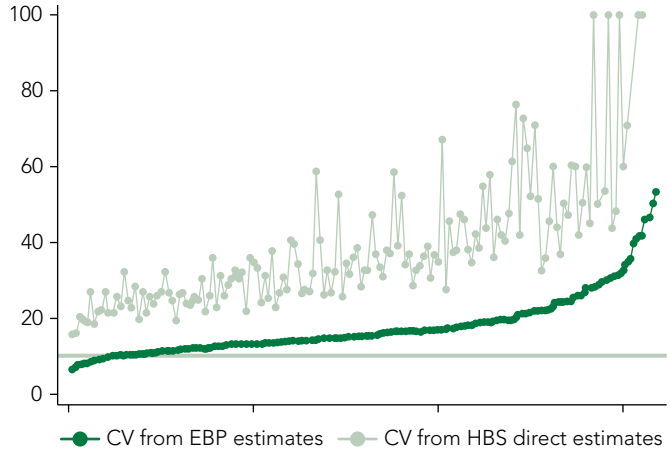
VARIABLES	COEF.	STD. ERROR	T-STATISTICS
Agglomeration index (sum)	−0.036	0.007	−5.413
Air temperature in 2013	−0.038	0.004	−8.717
Annual nighttime light 2015 (sum)	0.075	0.01	7.729
Building density (mean of building areas for 5 nearest neighbors)	0.067	0.014	4.913
Building density (mean of distance to 25 nearest neighbors)	−0.275	0.047	−5.806
Building density (mean of distance to 25 nearest neighbors)	0.184	0.043	4.267
Building density (standard deviation of distance to 5 nearest neighbors)	0.066	0.011	5.802
Elevation (district-level)	−0.119	0.019	−6.134
Flood economic shocks (2018)	0.012	0.002	5.512
Flood economic shocks (2018)	−0.022	0.005	−4.364
NDVI max (2018/11) (1km resolution)	0.624	0.133	4.705
NDVI mean (2018/07) (1km resolution)	1.668	0.322	5.18
NDVI mean (2018/07) (1km resolution)	−1.834	0.341	−5.376
NDVI standard deviation (2017/1-2018/3) (70m resolution)	0.041	0.006	7.003
NDVI standard deviation (2017/1-2018/3) (30m resolution)	0.016	0.002	7.107
NDVI standard deviation (2017/1-2018/3) (50m resolution)	−0.055	0.008	−7.088
NDVI sum (2017/1-2018/3) (50m resolution)	0	0	5.228
NDVI sum (2018/07) (1km resolution)	−0.011	0.002	−6.817
NDVI sum (2018/07) (1km resolution)	0.011	0.002	6.132
NDVI sum (2018/07) (1km resolution)	0	0	−6.974
Nighttime light mean (2018/07)	0.18	0.027	6.618
Nighttime light mean (2018/09)	−0.151	0.024	−6.206
Nighttime light min (2018/08)	−0.05	0.013	−4.025
Nighttime light sum (2018/03)	0	0	5.719
Population estimate (mean)	−0.098	0.017	−5.9
Precipitation in 2013	−0.005	0.001	−4.213
Precipitation in 2014	−0.008	0.002	−4.678
Precipitation in 2017	0.011	0.002	7.127

N = 9465, RMSE = 0.547, Adjusted-R2 = 0.235.

Notes: Original raster data are available at the pixel level and aggregated by village and district levels before being used for the consumption model. The minimum, maximum, mean, and total values of those pixels at the village or district levels are computed and used to explain variation in consumption. Region dummies are excluded from the table for brevity.

[3] The CV of 35% is based on the standard method of clustering standard errors by enumeration areas (PSUs), which accounts for correlation between households in the same enumeration area. This overstates the precision of the survey estimate by ignoring correlation between hosueholds in different enumeration areas within the same district. Partly for this reason, Molina and Marhuenda (2015) recommend using a Horwitz-Thompson estimator to estimate standard errors from survey data. Using this method gives an estimated average CV of 38 percent. This is also a fairer comparison to the 18 percent average CV yielded by the small area estimation model, since both allow for welfare to be correlated for all households within a district.

FIGURE G.1: CV of Direct vs. Small Area Estimates of Poverty Rates at the District level



Notes: This figure shows the value of coefficients of variation (CV) for each district-level poverty estimates from SAE method and direct estimates based on the 2018 HBS only.

The results of this validation test were encouraging. The correlation between estimated and actual census deprivation rates was 0.86. The average standard error and coefficient of variation fell by more than half compared to the survey alone. Furthermore, the estimated 95% confidence intervals from the EBP procedure contained the actual census deprivation rates in 72 percent of the districts. This is the same percentage of districts contained within the 95% confidence intervals obtained from taking district means in the synthetic survey, which underestimates standard errors by assuming that poverty rates are independent across enumeration areas. Overall, the validation procedure provides evidence that, in this case, combining survey data with an exhaustive set of village-level remote sensing indicators generates district estimates that are sufficiently precise to publish.

APPENDIX H

Market Accessibility

Definition

In this report, we define market access as a measure of accessibility from one origin to all destinations based on travel distance (or travel time). More formally, market access for a given location (or origin) *i* can be expressed as follows:

$$MA_i = \sum_j P_j e^{-\lambda \rho_{ij}}$$

where P_j refers to the population of a location (or destination) *j*, ρ_{ij} is travel time between locations *i* and *j*, and λ is a trade elasticity or decay parameter. In other words, market access is the weighted sum of population in all the destinations, which are weighted by travel time/distance.

A priori, there is no agreement on what the value of λ should be. For the purpose of this study (and for simple interpretation), we set it such that the market potential (or attractiveness) of a location *j* to a location *i* decays in half for every additional 60 min of travel time. Travel time is computed based on how long people need to travel by car to get from an origin *i* to a destination *j* given the existing road network system in Tanzania, as recorded in *OpenStreetMap*. Travel time is computed based on the OSRM algorithm.[1] In this study, destinations are defined as all major cities in Tanzania and origins are points on the road network that are closest to the centroid of each village.[2] The market potential of those destinations are measured based on the size of city population, which is derived based on the 2012 Census.

Data

The calculation of market access requires the following information: 1) census population and geographical coordinates (e.g., longitude and latitude) of all major cities; and 2) road network data. We use the census population and geographical locations of the cities from Brinkoff (2010). For road network information, we rely on *OpenStreetMap*.

[1] The Stata command "osrmtime" is used to compute travel time between the centroid of each village and major cities.
[2] The cities that are taken into account for the calculation of market access include: Dar es Salaam, Mwanza, Arusha, Mbeya, Morogoro, Tanga, Kigoma, Dodoma, and Songea.

APPENDIX I

Poverty Dynamics

A Cautionary Note on Comparing HBS Poverty Estimates with Non-Harmonized NPS Poverty Estimates

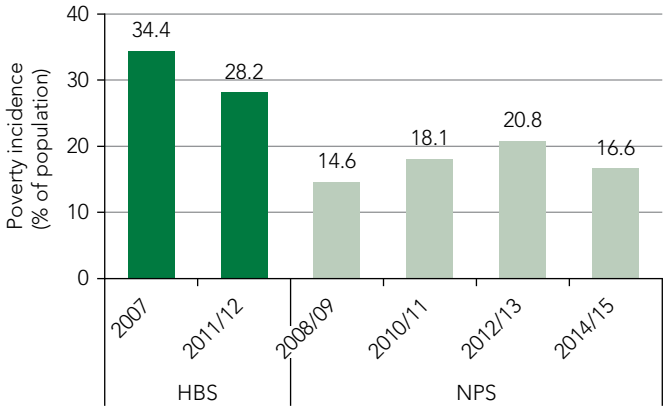
Tanzania has two surveys from which it solicits consumption data suitable for poverty analysis; the Household Budget Survey and the National Panel Survey. Both surveys are integrated household surveys which, in addition to consumption, also solicit information on a broad range of topics that allow for determinants of outcomes to be assessed and linkages to be made across sectors. The National Panel Survey is a series of nationally representative household panel surveys with four rounds (2008/09, 2010/11, 2012/13, and 2014/15). The data are collected every two years from smaller sample sizes whose representation is at the national level (Mainland and Zanzibar) and four sub-national domains—Dar es Salaam, other urban areas, rural areas, and Zanzibar.

While both the HBS and NPS provide the data to track the evolution of aggregate poverty numbers, the NPS also provide data to analyze the poverty dynamics.[1] NPS also provide data to analyze micro-level determinants of poverty reduction at the household level. Though the key purpose of NPS is enable detailed study of poverty dynamics, few researchers have exploited the data for such purposes.

The non-harmonized estimates of poverty using the NPS reveal relatively lower levels of poverty and an opposite poverty trend to the estimates produced using the HBS. Since HBS and NPS are nationally representative surveys collecting consumption data over relatively similar periods, in principle they ought to provide a similar—although not an identical—picture of the evolution of poverty. Figure I.1 shows the non-harmonized poverty trend for Mainland using the National Panel Survey and the poverty trend using the HBS. Poverty trends using HBS 2007 and HBS 2011/12 revealed a decline in poverty headcount of six percentage points from 34.4 percent to 28.2 percent, while poverty estimates from the first three rounds of the NPS revealed lower levels of poverty and an increasing poverty trend.

Three main ingredients underlie the differences in levels and trends: (i) consumption aggregate, (ii) poverty line, and (iii) intertemporal deflators. Regarding consumption, there are key methodological differences between the

FIGURE I.1: Levels and Trends of Poverty in Tanzania Mainland using HBS and NPS (Non-Harmonized), Percent



Sources: HBS and NPS.
Note: NPS estimates in graph are based on a non-harmonized methodology.

surveys that make direct comparisons of consumption unadvisable. First, while HBS requests households to maintain a diary to collect data on food consumption data, NPS requests a key household member to recall consumption of the past seven days. Second, to measure food consumption of home-produced food, HBS solicits self-reported monetary values from home producers while NPS uses the unit values of households that purchased those food items in the same locality. Third, the level of commodity detail on food and non-food consumption solicited through HBS is greater than that of NPS due to a more comprehensive and disaggregated list. These methodological differences affect the level and distribution of the consumption aggregate, even if the information is solicited from the same sample.

The construction of the poverty line differed in several areas making direct comparisons also potentially misleading. A common approach for estimating poverty lines is the cost of basic needs approach, which measures the cost of acquiring enough food to provide adequate daily nutrition per person (food line) plus the cost of some non-food essentials (non-food component). This is the method used for both the HBS and the NPS with some variation. In addition to the

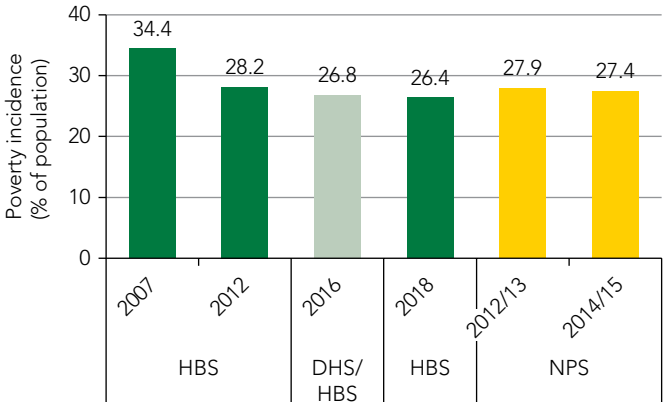
[1] The main purpose of NPS is to provide data to monitor national development objectives, evaluate specific policies and programs, and better understand the determinants of poverty reduction in Tanzania.

impact differences in the consumption measurement methods have on the poverty line, differences in the reference period, reference population and cost per calorie method played a role in the mismatch. HBS derives the cost of buying 2,200 calories per adult per day based on the food consumption patterns prevailing in a population whose per adult nominal consumption fell between the 2nd and 5th decile (reference population) during a period of 30.4 days (reference period) valued at national median prices. In contrast, NPS derived the cost of buying 2,200 calories per adult per day based on the food consumption patterns prevailing in a population whose per adult real consumption is below the median during a period of 28 days valued at prices faced by the reference population. The non-food component of the basic needs poverty line uses the average food consumption share of the population whose total consumption is close to the food line. For HBS, these people are those whose total consumption per adult is between the food line and 1.2 times the food line. For NPS, they are those whose total consumption per adult is in the bottom 25 percent.

Finally, adjustments in differences cost of living comparisons across survey years differed in important ways. Both HBS and NPS use the Fisher price index calculated by geographic stratum and survey quarter to adjust for within-year and spatial price differences. Both surveys rely on household expenditure data for information about price levels rather than market prices. While HBS price index is a weighted average of food and non-food indices, the NPS price index uses a food index only. A Fisher price index is also used to adjust for inter-year differences, with the HBS index based on the weighted average of food and non-food indices and the NPS index based on the food index only. While there were no significant differences in the intra-year and spatial deflators between the surveys, there were important differences in the inter-year deflators. For instance, HBS revealed a higher rate of inflation between 2007 and 2011/12 (over 100 percent for food and 90 percent overall) compared to NPS which estimated food inflation to be 21 percent between 2008 and 2010 and 34 percent between 2010 and 2012.

In conclusion, differences in the poverty levels between the two surveys were mainly attributed to differences in the methods for constructing the poverty line and differences in trends were mainly attributed to differences in the temporal deflator.

FIGURE I.2: Comparison of Basic Needs Poverty Rates Across Survey Rounds, Mainland, Percent



Sources: Authors' calculations based on HBS 2007, 2011/12 and 2018, NPS 2012/13 and 2014/15, DHS 2015/16.
Note: The NPS consumption aggregate includes clothing and footwear.

Progress in Poverty, Inequality and Shared Prosperity

The evolution of poverty in Tanzania since 2007 is explored using all available nationally representative surveys in Tanzania. We complement the poverty estimates from the HBS using nationally-representative surveys – whether they are consumption or non-consumption surveys—to successfully monitor trends in poverty since 2007. Where non-consumption surveys are available – as was with the DHS—survey-to-survey imputations were used to derive estimates of consumption, and thus poverty. Where consumption surveys were available – as was with the NPS—poverty estimation methodologies were harmonized with the methodology used with the HBS. While methodological harmonization addressed most of the mismatches, some variations in estimates between the two surveys remain due to differences in the survey design, survey instrument, and other idiosyncrasies that are more difficult to adjust.

The purpose of this section is to evaluate the poverty trends in Tanzania using alternative nationally representative surveys. The Household Budget Survey, which is used to produce the official poverty estimates, is conducted approximately once every 6 years and is very expensive to implement. In the interim, there are other surveys that are less costly and conducted more frequently that can be exploited for more

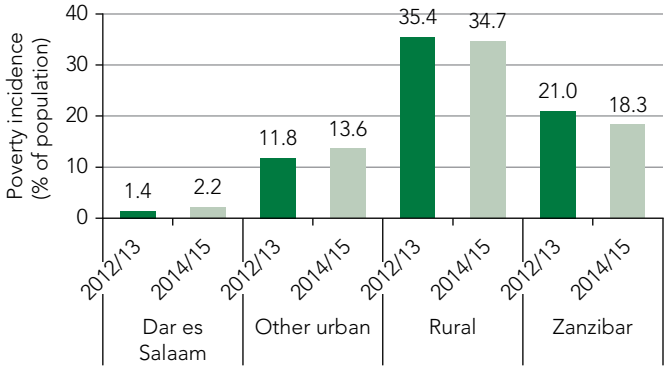
up to date poverty estimates. Together with medium term forecasting, we show how poverty can be monitored in the absence of a recent HBS.

Poverty in Tanzania Mainland has been declining in the last decade, resulting in 1 in 4 people living in poverty in 2018 compared to 1 in 3 a decade earlier. Poverty has declined about 8 pp in one decade from 34.4 percent in 2007 to 26.4 percent in 2018. The harmonized NPS poverty estimates also reveal similar levels and a declining trend of similar magnitude to the HBS.[2]

Spatial disparities in poverty remain high but progress in poverty reduction and shared prosperity were made in rural areas and Zanzibar, where poverty is highest. These areas recorded declines in poverty from a high base, while Dar es Salaam and other urban areas recorded slight increases (Figure I.3). The decline in national poverty was coupled by some progress towards shared prosperity between 2012 and 2014, much of which was concentrated in rural areas and Zanzibar. In Dar es Salaam and secondary cities, the middle class seem to have benefitted the most from growth. The spatial distribution of food poverty also mirrors that of basic needs poverty, with rural areas having the most elevated levels of food poverty, followed by Zanzibar, other urban areas and Dar es Salaam.

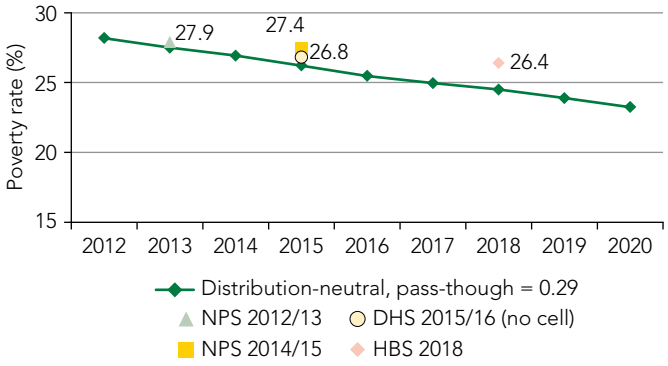
The positive growth outlook for Tanzania is expected to keep the country on a downward poverty trend, but Tanzania may still not reach the twin goals. Assuming sustained economic growth in Tanzania, the proportion of people living in poverty is expected to fall (Figure I.4). Using the Tanzania HBS as the underlying micro-data for poverty projection calculations, projections based on the neutral-distribution approach with the empirical pass-through of 0.29 reveal a decline in poverty. The empirical pass-through rate of 0.29 applied to the projections suggests that GDP per capita growth is transmitted into welfare growth at a 3:1 ratio. At this pace of poverty reduction, the poverty will be about 9 percentage points above the goal in 2030 and the absolute number of poor is expected to either remain constant or to increase as the population continues to grow rapidly.[3]

FIGURE I.3: Comparison of Basic Needs Poverty Rates Across Survey Rounds by Geographic Domain, Percent



Sources: Authors' calculations based on HBS 2007, 2011/12 and 2018, NPS 2012/13 and 2014/15, DHS 2015/16.
Note: The NPS consumption aggregate includes clothing and footwear.

FIGURE I.4: Projected HBS Poverty Rates with NPS (Harmonized) and DHS (Imputed) Rates



Sources: Authors' calculations using HBS 2011/12, HBS 2017/18, DHS 2010, DHS 2015/16, NPS 2012/13, NPS 2014/15.
Note: Actual poverty rate in 2012. Projection is from 2013 to 2020. Projections use a neutral distribution with empirical pass-through = 0.29 based on GDP per capita in constant LCU. GDP per capita is drawn from MFMod and adjusted by population growth.

[2] The harmonized methodology constructed the poverty lines using the same methodology as the HBS. The harmonized methodology also used the CPI to adjust for price differences across time. Expenditures on clothing and footwear are also included in the NPS consumption aggregate beginning with the 2012/13 survey, which was the first year the information was solicited in the NPS.

[3] The limitations of tools and assumptions used to generate poverty projections must be recognized. The distribution-neutral approach can predict poverty rates relatively well if the distribution of the welfare aggregate (or inequality) remains the same over time. However, assuming growth with no distributional changes can be a strong assumption since widening (narrowing) distributions tend to attenuate (hasten) poverty reduction.

Harmonizing the NPS Poverty Measurement Methodology

The harmonized methodology constructed poverty lines using the same methodology as that used for the HBS and deflated consumption temporally using the CPI. The CPI rather than the NPS inflation figures is used for adjusting consumption variation over time. Because the harmonization process is detailed in Belghith, Lopera et al. (2018), the focus here is on the more recent adjustments that have been made for the purposes of this study.

Zanzibar is incorporated into the analysis. Because the motivation of Belghith, Lopera et al. (2018) was to compare Mainland poverty estimates for HBS and NPS, estimate for Zanzibar were not included. The inclusion of Zanzibar in this analysis implies that spatial price index, consumption aggregate and poverty line will be affected, thus estimates will vary slightly from those reported in Belghith, Lopera et al. (2018).

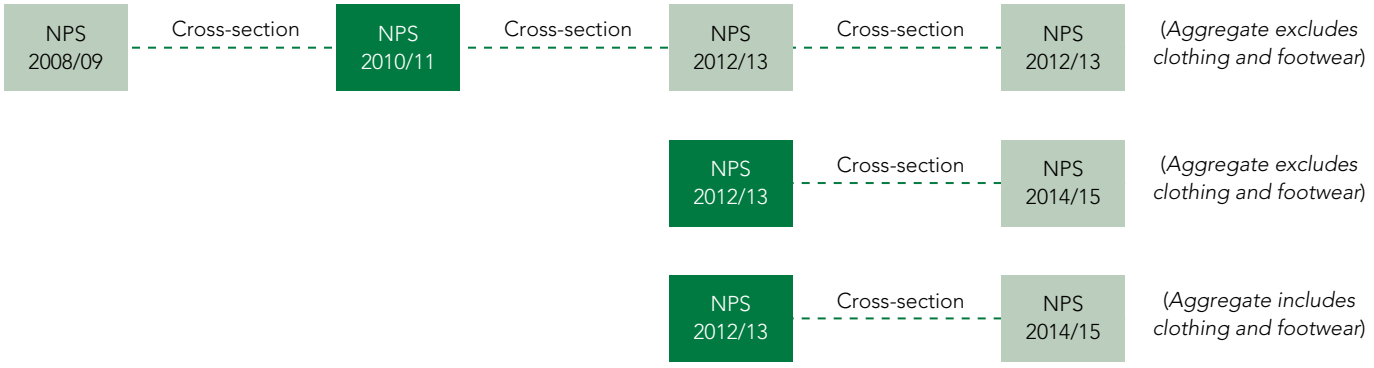
Expenditures on clothing and footwear are included in the consumption aggregate beginning with the 2012/13 survey. The HBS measurement methodology has traditionally included expenditures on clothing and footwear but this information was not solicited in the first two rounds of NPS. NPS began soliciting information of expenditures on clothing and footwear for men, women and children using a seven-day recall in NPS 2012/13. Because information on clothing and footwear was not solicited in the first two rounds of NPS, the consumption aggregate and consequently the poverty line used in Belghith, Lopera et al. (2018) excluded this component. The construction of the harmonized poverty line also considers clothing and footwear. Thus, poverty trends generated from 2012/13 onward account for clothing and footwear, unless otherwise indicated.

To perform sensitivity analyses on the poverty estimates and offer a longer-term perspective on the poverty trends, clothing and footwear is excluded for estimates starting in 2008/09 to 2014/15 and the base year for the poverty threshold is changed to the year 2010 so that the harmonized estimates can be compared to the non-harmonized estimates. Figure I.5 is a visual of the data and assumptions for the proceeding analysis.

Finally, to evaluate poverty trends, the panel data are treated as a series of cross-sectional data. To do so, cross-sectional weights are used instead of panel weights to estimate the trends. No adjustments were made to the NPS 2008/09 weights as this was the baseline survey and no adjustments were made to the NPS 2010/11 weights as there was very little attrition between the first round and second round. A cross-sectional weight for round 3 was constructed.

The final step in the cross-sectional weight calculation process is to apply a post-stratification adjustment. The post-stratification (or calibration) adjustment weights the total population generated from the survey weights to a known population total. In general, this adjustment should be made at the lowest level of administrative disaggregation for which population totals are available and for which at least one cluster has been selected into the survey. In Tanzania, this level would normally be the region. In the case of the 2012, however, it is not possible to use the region

FIGURE I.5: Data and Assumptions Used for Analyzing NPS Poverty Trends



Note: Darker boxes reflect the base year under consideration.

TABLE I.1: New Administrative Divisions

NEW REGION	ORIGINATED FROM
Geita	The region was created from Bukombe district in Shinyanga region, Chato from Kagera region and Geita from Mwanza region
Katavi	Mpanda district from Rukwa region
Njombe	Ludewa, Makete, and Njombe districts from Iringa region
Simiyu	Formed by taking Bariadi, Meatu, and Maswa districts from Shinyanga region and Busega district from Mwanza

Source: www.statoids.com/utz.html

TABLE I.2: Total Population Before and After Stratification

	TOTAL NUMBER OF HOUSEHOLDS		TOTAL NUMBER OF INDIVIDUALS	
	PROBABILITY WEIGHTS	POST-STRATIFIED (FINAL) WEIGHTS	PROBABILITY WEIGHTS	POST-STRATIFIED (FINAL) WEIGHTS
Dar es Salaam	1,062,462	1,083,381	4,181,107	4,299,458
Other urban – Mainland	1,706,152	1,888,763	7,080,161	7,095,990
Rural – Mainland	6,179,499	6,054,641	31,872,998	32,432,820
Zanzibar	239,212	250,212	1,279,012	1,334,143

because the original sample was selected prior to the creation of four new districts (Table I.1). Additionally, the sample was selected using the 2002 population census as a sampling frame and the information for post-stratification is sourced from the newer 2012 population census. This is an issue because certain clusters, particularly those near urban areas, where reclassified from rural to urban, or sub-divided and reclassified.

Based on the above issues with using the region as the level for post-stratification, instead the country was divided into four "areas": Dar es Salaam, other mainland urban areas, rural mainland areas, and Zanzibar. Post-stratification was then performed at this level. See Table I.2 for total number of households and individuals following the post-stratification adjustments.

Harmonized NPS Trends in Food and Basic Needs Poverty

i. Comparing consumption per adult equivalent

A consumption-based measure of welfare is used to obtain poverty indicators. The consumption aggregate provides a summary measure of living standards based on households' expenditures on goods and services. Table I.3 compares the average monthly per adult expenditures in Tanzania Shillings (TZS) across NPS surveys. The expenditures are expressed in (i) nominal terms, (ii) real terms adjusted spatially and seasonally within the survey, (iii) real terms adjusted temporally using survey-based deflators, and (iv) in real terms adjusted temporally using the consumer price index (CPI). The survey-based deflator is a Fisher price index constructed from the unit values in the NPS and is based on food values only.

Three sets of estimates are provided to highlight the evolution of the consumption aggregates as the base year changes and an additional consumption item is included to the aggregate. The first set of estimates are the consumption aggregates from all 4 rounds *excluding* clothing and footwear (method 1). The base year for the temporal price adjustments is NPS 2010/11. Similarly, the second set of consumption aggregates excludes clothing and footwear but uses NPS 2012/13 as the base year for temporal adjustments. The third set of consumption aggregates *includes* clothing and footwear (method 2) and uses NPS 2012/13 as the base year. Overall, the temporally adjusted real consumption aggregate increases when the base year changes from 2010/13 to 2012/13 and when clothing and footwear is included. The increase resulting from shifting the base year up is to be expected as prices in 2012/13 are higher than in 2010/12.

Since 2010/11, real consumption per adult has been rising nationally and across geographic domain, with the exception of Dar es Salaam. This is consistent regardless of the temporal deflator used except in 2014/15 where there is a more moderate change when the CPI is used. This is due to the relatively higher level of inflation between 2012/13 and 2014/15 when using the CPI (13 percent) than using the survey-based deflator (5 percent). Despite the decline between 2012 and 2014, Dar es Salaam fairs significantly better than other urban areas and rural areas on Mainland in terms of higher levels of consumption. Residents in Dar es Salaam consume 1.5 times than resident in other urban areas and almost 3 times more than residents in rural areas. The levels of consumption for residents in Zanzibar are closer in magnitude to those of rural residents on Mainland than to residents in urban areas on Mainland.

Consumption regained a positive trajectory for all consumption groups, with the middle-income groups benefitting most. The positive trajectory follows a decline in consumption between 2008 and 2010 likely resulting from the global financial crisis. The middle-income groups (third and fourth quintile) benefited most with their total consumption

TABLE I.3: Comparison of Consumption Per Adult Per Month in Tanzania

	METHOD 1				METHOD 1		METHOD 2	
	2008/09	2010/11	2012/13	2014/15	2012/13	2014/15	2012/13	2014/15
NATIONAL								
Nominal consumption	48,140	**55,817**	78,012	85,389	**78,012**	85,389	**80,781**	89,015
Real consumption	49,032	**56,512**	80,033	87,722	**80,033**	87,722	**82,867**	91,441
Real consumption, temporally adjusted (survey-based)	59,887	**56,512**	58,751	62,151	**80,033**	84,698	**82,867**	86,950
Real consumption, temporally adjusted (CPI)	58,595	**56,512**	63,233	61,618	**80,033**	77,988	**82,867**	81,294
DAR ES SALAAM								
Nominal consumption	124,702	**138,145**	177,747	181,540	**177,747**	181,540	**184,747**	189,810
Real consumption	109,086	**123,403**	161,638	161,461	**161,638**	161,461	**168,000**	168,776
Real consumption, temporally adjusted (survey-based)	133,237	**123,403**	118,656	114,396	**161,638**	155,896	**168,000**	160,487
Real consumption, temporally adjusted (CPI)	130,362	**123,403**	127,709	113,413	**161,638**	143,544	**168,000**	150,048
OTHER URBAN								
Nominal consumption	69,006	**74,314**	103,889	118,069	**103,889**	118,069	**107,487**	122,848
Real consumption	66,957	**72,978**	106,927	120,404	**106,927**	120,404	**110,638**	125,283
Real consumption, temporally adjusted (survey-based)	81,781	**72,978**	78,493	85,307	**106,927**	116,254	**110,638**	119,130
Real consumption, temporally adjusted (CPI)	80,016	**72,978**	84,482	84,574	**106,927**	107,043	**110,638**	111,381
RURAL								
Nominal consumption	37,186	**42,704**	58,524	63,297	**58,524**	63,297	**60,488**	65,946
Real consumption	40,294	**45,522**	62,559	68,774	**62,559**	68,774	**64,662**	71,660
Real consumption, temporally adjusted (survey-based)	49,214	**45,522**	45,924	48,727	**62,559**	66,404	**64,662**	68,141
Real consumption, temporally adjusted (CPI)	48,152	**45,522**	49,428	48,308	**62,559**	61,143	**64,662**	63,708
ZANZIBAR								
Nominal consumption	44,103	**54,171**	65,876	74,433	**65,876**	74,433	**69,202**	77,932
Real consumption	41,805	**54,304**	72,755	81,474	**72,755**	81,474	**76,412**	85,293
Real consumption, temporally adjusted (survey-based)	51,061	**54,304**	53,409	57,725	**72,755**	78,666	**76,412**	81,104
Real consumption, temporally adjusted (CPI)	49,959	**54,304**	57,483	57,229	**72,755**	72,433	**76,412**	75,829

Source: Authors' calculation based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: The highlighted year represents the base year.

per adult varying by 10 to 15 percent between 2010/11 and 2014/15. Food and non-food consumption growth was also strongest among this group at about 11 percent and 14 percent respectively. Between the same period, the richest quintile experienced an increase in total consumption per adult of 8 percent, while the bottom 40 experienced only a 4 percent increase. Table I.4 presents the average real consumption per adult per month across surveys for total consumption, food consumption and non-food consumption and their distribution by quintile. The disaggregation by quintile provides a snapshot of the welfare from the poorest to the richest population groups and the evolution of their welfare.

ii. Poverty lines

The food line reflects the cost of acquiring a food basket that delivers 2,200 calories per adult per day. A food line of TZS 23,371 per month is estimated should one wish to estimate poverty starting with round 1 using an aggregate that excludes clothing and footwear. A food line of TZS 32,339 per month is estimated should one wish to estimate poverty starting from round 3 using a more comprehensive consumption aggregate. Table I.5 shows the food lines per month for all four rounds of the NPS. The first major set of columns shows the food lines when consumption excludes clothing and footwear and NPS 2010/11 is assumed as the base year. The second major column shows the poverty lines when consumption excludes clothing and footwear and NPS 2012/13 is assumed as the base year. The final set of columns shows the poverty lines when consumption includes clothing and footwear and NPS 2012/13 is assumed as the base year. Note the inclusion or exclusion of an item to consumption, even a non-food one, will affect the food lines because the reference population is chosen from the distribution of total consumption.

To make food lines comparable across time, inter-year adjustments in cost of living are made. Rows (b) and (c) show the food line of the base year converted to the survey year prices using the survey-based price deflators and the CPI respectively. In general, inflation using the CPI is lower for the first three rounds of NPS, with prices increasing by 19 percent and 26 percent, compared to the 22 percent and 34 percent increase using the Fisher food index. However, between NPS

TABLE I.4: Comparison of Total, Food and Non-Food Consumption Per Adult Per Month in Tanzania

	AGGREGATE *EXCLUDES* CLOTHING AND FOOTWEAR BASE YEAR = NPS 2010/11				AGGREGATE *EXCLUDES* CLOTHING AND FOOTWEAR BASE YEAR = NPS 2012/13		AGGREGATE *INCLUDES* CLOTHING AND FOOTWEAR BASE YEAR = NPS 2012/13	
	2008/09	2010/11	2012/13	2014/15	2012/13	2014/15	2012/13	2014/15
Mean total consumption per adult equivalent per month, adjusted by inter-year price variation (CPI)								
National	58,595	**56,512**	63,233	61,618	**80,033**	77,988	**82,867**	81,294
Poorest Quintile	21,443	**20,310**	20,800	20,846	**26,326**	26,385	**27,278**	27,625
2nd Quintile	33,471	**32,071**	33,808	33,777	**42,789**	42,750	**44,317**	44,588
3rd Quintile	45,193	**43,718**	47,644	48,248	**60,302**	61,066	**62,425**	63,707
4th Quintile	63,350	**60,803**	69,981	70,099	**88,573**	88,723	**91,563**	92,572
Richest Quintile	129,652	**125,790**	144,001	135,262	**182,258**	171,198	**188,822**	178,210
Mean food consumption per adult equivalent per month, adjusted by inter-year price variation (CPI)								
National	41,065	**38,546**	43,201	41,919	**80,033**	77,988	**82,867**	81,294
Poorest Quintile	16,183	**14,952**	15,796	15,366	**26,326**	26,385	**27,278**	27,625
2nd Quintile	25,621	**23,767**	25,791	25,325	**42,789**	42,750	**44,317**	44,588
3rd Quintile	34,321	**32,136**	35,177	35,154	**60,302**	61,066	**62,425**	63,707
4th Quintile	46,359	**43,531**	49,379	48,806	**88,573**	88,723	**91,563**	92,572
Richest Quintile	82,953	**78,431**	89,939	85,050	**182,258**	171,198	**188,822**	178,210
Mean non-food consumption per adult equivalent per month, adjusted by inter-year price variation (CPI)								
National	17,530	**17,963**	20,032	19,698	**25,354**	24,932	**28,189**	28,238
Poorest Quintile	2,835	**2,796**	2,662	2,857	**3,369**	3,616	**4,301**	4,873
2nd Quintile	5,438	**5,813**	5,638	5,946	**7,136**	7,525	**8,736**	9,385
3rd Quintile	9,099	**9,758**	9,920	10,914	**12,555**	13,813	**14,708**	16,333
4th Quintile	16,692	**17,802**	19,663	20,651	**24,887**	26,137	**27,984**	30,004
Richest Quintile	53,957	**53,731**	62,288	58,164	**78,836**	73,617	**85,471**	80,618

Source: Authors' calculation based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: The highlighted year represents the base year.

TABLE I.5: Comparison of Food Lines Across NPS Survey Rounds in Tanzania

	Method 1				Method 1		Method2	
	2008/09	2010/11	2012/13	2014/15	2012/13	2014/15	2012/13	2014/15
(a) Survey-specific food line in survey year prices	18,027	**23,371**	32,339	33,729	**32,339**	33,729	**32,286**	33,689
Adjusted for inter-year variation in cost of living using survey-based deflators								
(b) Base year food line in survey year prices	19,135	**23,371**	31,373	32,986	**32,339**	34,009	**32,286**	33,438
Food price index	0.82	**1**	1.34	1.41	**1**	1.05	**1**	1.05
Adjusted for inter-year variation in cost of living using the CPI								
(c) Base year food line in survey year prices	19,557	**23,371**	29,580	33,272	**32,339**	36,376	**32,286**	36,316
CPI ratio	0.84	**1**	1.26	1.42	**1**	1.13	**1**	1.13

Source: Authors' calculation based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: The highlighted year represents the base year.

2012/13 and NPS 2014/15, prices rose by 13 percent using the CPI compared to 5 percent using the Fisher food index.

The basic needs poverty line reflects the food line and the cost of basic non-food essentials. The basic needs poverty line of TZS 30,053 in is estimated for 2010/11 when the aggregate excludes clothing and footwear and a poverty line of TZS 40,008 is estimated for a more comprehensive aggregate starting in 2012/13. As with the food lines, the poverty lines will vary based on whether the consumption aggregate includes/excludes clothing and footwear, the inter-year deflator used and the base year chosen. Inclusion of clothing and footwear will affect the poverty line more directly through the scaling factor. Table I.6 compares the basic needs poverty line across survey rounds.

iii. Trends in food and basic needs poverty

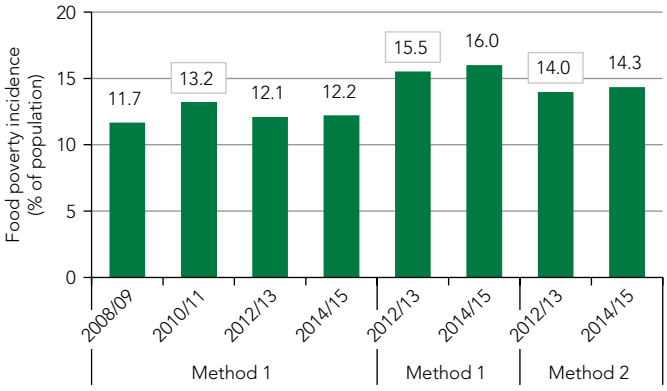
Overall, food poverty has been declining slightly since 2010/11. Figure I.6 shows the national trends for food poverty rates using the harmonized methodology and various assumptions on the consumption aggregate and the

TABLE I.6: Comparison of Basic Needs Poverty Lines Across NPS Survey Rounds in Tanzania

	METHOD 1				METHOD 1		METHOD2	
	2008/09	2010/11	2012/13	2014/15	2012/13	2014/15	2012/13	2014/15
(a) Survey-specific food line in survey year prices	22,470	**30,053**	40,008	42,913	**40,008**	42,913	**41,987**	44,936
Adjusting for inter-year variation in cost of living using survey-based deflators								
(b) Base year poverty line in survey year prices	24,605	**30,053**	40,343	42,417	**40,008**	42,074	**41,987**	43,486
Food price index	0.82	**1**	1.34	1.41	**1**	1.05	**1**	1.05
Adjusting for inter-year variation in cost of living using the CPI								
(c) Base year poverty line in survey year prices (CPI)	25,148	**30,053**	38,037	42,784	**40,008**	45,002	**41,987**	47,228
CPI ratio	0.84	**1**	1.26	1.42	**1**	1.13	**1**	1.13

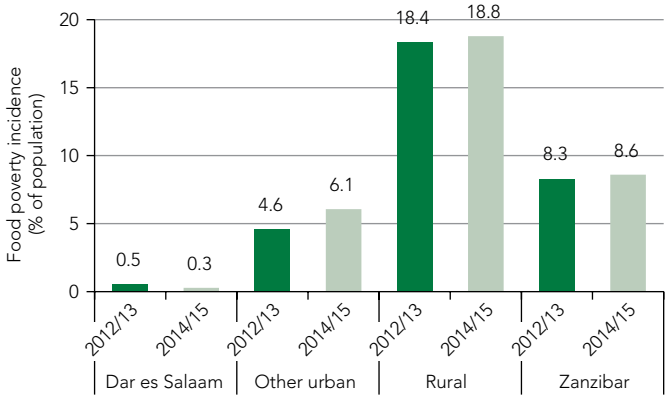
Source: Authors' calculation based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: The highlighted year represents the base year.

FIGURE I.6: Comparison of Food Poverty Rates Across NPS Survey Rounds, Percent



Source: Authors' calculations based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: Squares indicate the base year assumed for each method. Consumption aggregate includes clothing and footwear.

FIGURE I.7: Comparison of Food Poverty Rates Across Survey Rounds by Geographic Domain, Percent

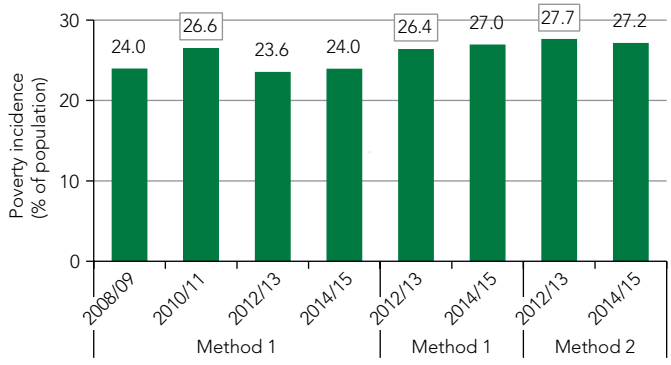


Source: Authors' calculations based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: Squares indicate the base year assumed for each method. Consumption aggregate includes clothing and footwear.

base year. While the different assumptions have little implication on the trends, the choices matter for the levels of food poverty. Changing the base year for method 1 from NPS 2008/09 to NPS 2010/11 elevates the rates.

Poverty estimates reveal that about one in four people in Tanzania lack the minimum resources to afford a basic standard of living. The harmonized methodology also suggests a decline in poverty since 2010/11 (Figure I.8). The influence of the base year and type of aggregate on the levels of poverty is more muted than on the levels of food poverty, offering estimates that are closer in range across the methodologies.

FIGURE I.8: Comparison of Basic Needs Poverty Rates Across Survey Rounds, Percent



Source: Authors' calculations based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: Squares indicate the base year assumed for each method.

BOX I.1 Poverty Lines

The food poverty line is the cost of a food basket that delivers 2,200 calories per adult per day. The basket of foods is derived from the food consumption patterns of the reference population—the 2nd to 5th decile of the total per adult consumption distribution. Quantities consumed are converted into calories and valued at the median unit values prevailing in the country. The daily food line is estimated as follows:

$$z^F = \frac{\sum_k q_k \ p_k}{\sum_k q_k \ c_k} \times 2{,}200$$

where q is the total quantity of food item k consumed in the reference population, p is the national median unit value of item k and c is the caloric conversion factor for item k.

The basic needs poverty line is based on the cost of attaining a basic standard of living. It consists of the cost of acquiring food for adequate nutrition and the cost of non-food essentials. The non-food component of the basic needs poverty line reflects the average non-food consumption of households with total consumption close to the poverty line. In this case, the reference households are those whose consumption lies between the food line and 1.2 times the food line. The basic needs poverty line is calculated by dividing the food line by the average proportion of total consumption devoted to food for the reference group.

iv. Shared prosperity

Tanzanians experienced positive consumption growth after an initial period of negative growth, but richer Tanzanians gained more. The first three panels highlight the consumption growth starting from 2008 to each successive round (Figure I.9). Between 2008 and 2010, consumption per adult shank for virtually all consumption groups, with significant declines for the poorest decile. Consumption fell by about 2 percent each year. The decline is likely related to the effects of the global financial crisis, which started to manifest in 2008 in the United States before spreading to the rest of the world. Between 2008 and 2014, consumption growth was positive though it showed signs of cooling off between 2012 and 2014. However, the poorest decile, appear not to have regained their 2008 levels of consumption. The fourth panel focuses on the period of growth between 2010 and 2014. It reveals that all consumption groups made positive gains in consumption, but that on average, those in the bottom 40 experienced lower rates of growth.

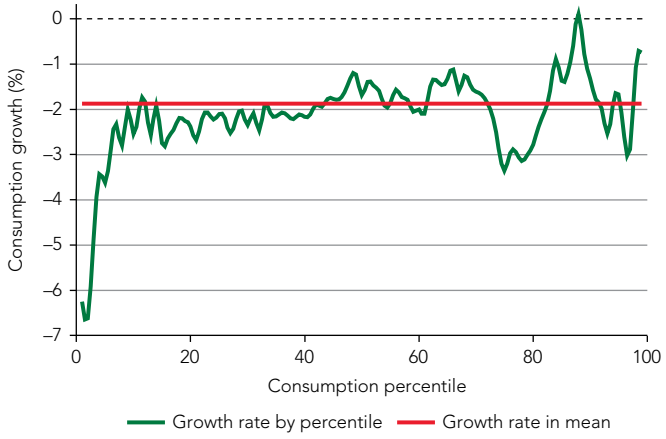
The 2010–2015 GICs reveals a period of pro-poor growth only for Dar es Salaam (Figure I.10). The slight rise in poverty and decline in inequality in Dar es Salaam thus suggests that while the city is becoming more equal, growth in consumption of the poor was not sufficient to reduce poverty. Rural areas, which experienced rising inequality amid declining poverty, saw a disproportionate positive growth in consumption for the top 60 percent. For urban areas and Zanzibar, those in the middle of the consumption distribution experienced much higher growth rates in per adult consumption than the rest of the population.

Growth became more pro-poor after 2012. Beginning in 2012, the consumption growth of poorer Tanzanian's began to exceed that of richer Tanzanians (Figure I.11). To evaluate whether a more comprehensive consumption aggregate provides a different picture of consumption growth, comparisons of consumption growth are made when the aggregate includes clothing and footwear versus when it excludes the aforementioned item. The inclusion or exclusion of clothing and footwear has little effect on the distributional pattern of growth.

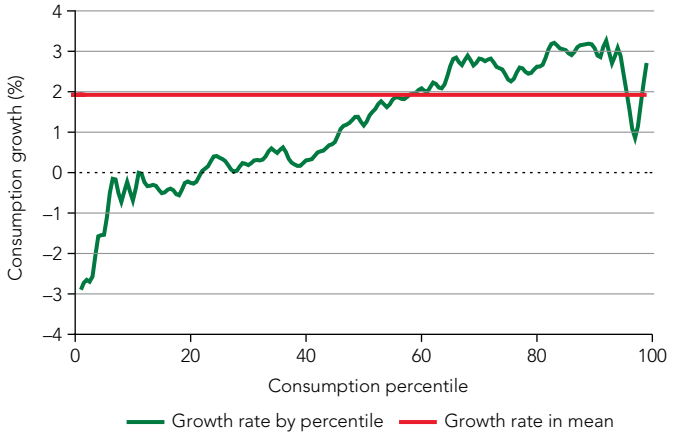
Consumption inequality is moderate and stable except for the increase in 2012. The Gini index of real per capita consumption per month – which measures the extent to which consumption is unevenly distributed in the population— is approximately 38 in round 1, 2 and 4. In 2012, inequality rose to about 40. Higher levels of inequality are observed on Mainland compared to Zanzibar. The relatively higher variability of income on Mainland is driven by the welfare differences between urban and rural areas. Secondary cities, which have the highest inequality, maintained a constant level of inequality. However, inequality declined in Dar es Salaam while it grew in rural areas, leading to a switch in ranking over the years. Inequality on Zanzibar was more volatile over the years, increasing in some and declining in others.

FIGURE I.9: Growth Incidence Curves, 2008–2015

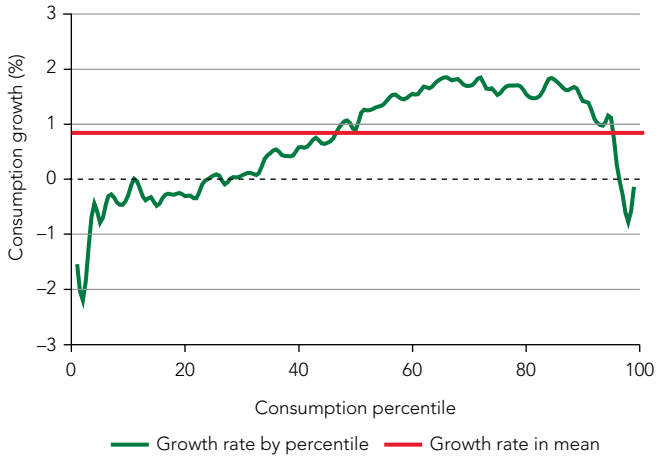
A. Growth incidence, Tanzania, 2008–2010



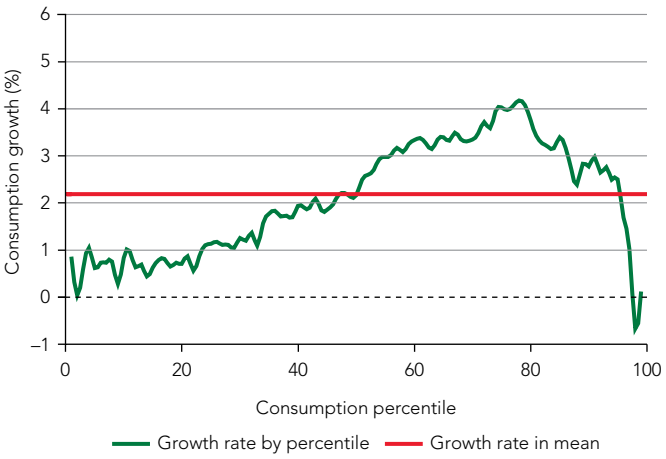
B. Growth incidence, Tanzania, 2008–2012



C. Growth incidence, Tanzania, 2008–2015



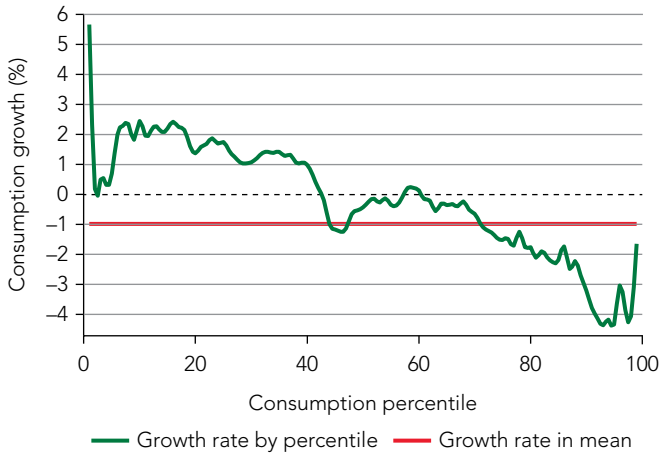
D. Growth incidence, Tanzania, 2010–2015



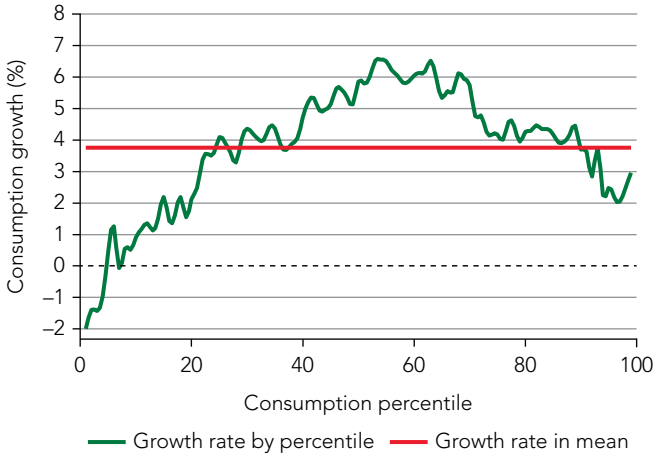
Source: Authors' calculations based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: Method 1 consumption estimates are used.

FIGURE I.10: Growth Incidence Curves by Geographic Domain, 2010–2015

A. Dar es Salaam, 2010–2015

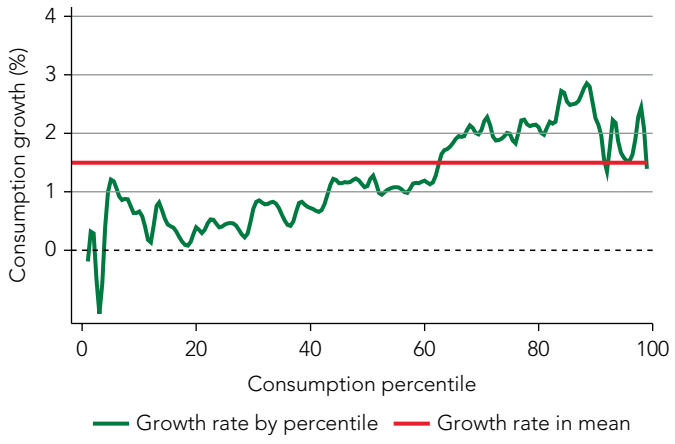


B. Other urban areas, 2010–2015

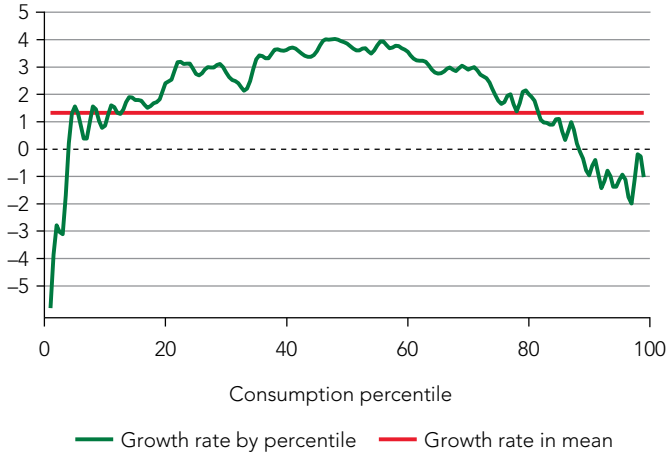


continued

FIGURE I.10 C. Rural areas, 2010–2015



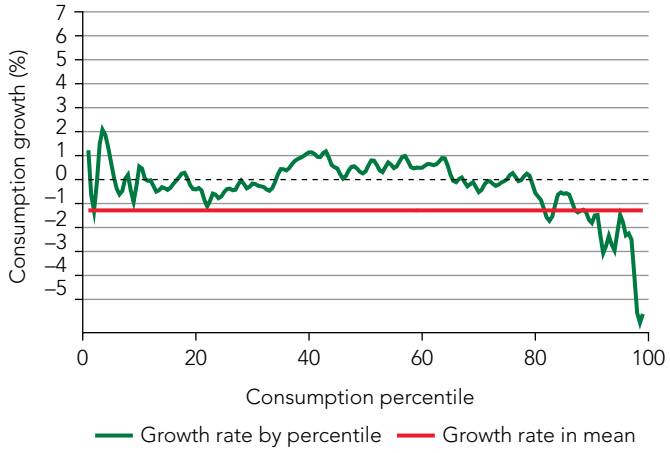
D. Zanzibar, 2010–2015



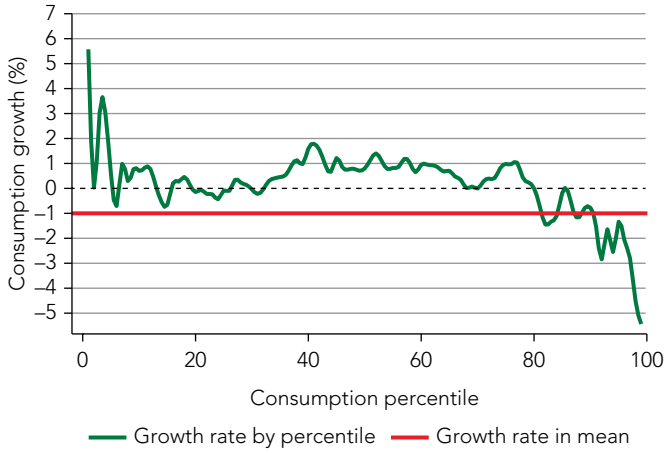
Source: Authors' calculations based on NPS 2010/11 and 2014/15.

FIGURE I.11: Comparison of Growth Incidence Curves of Consumption Excluding and Including Clothing and Footwear, 2012–2015

A. Tanzania, 2012–2015 (consumption excludes clothing and footwear)

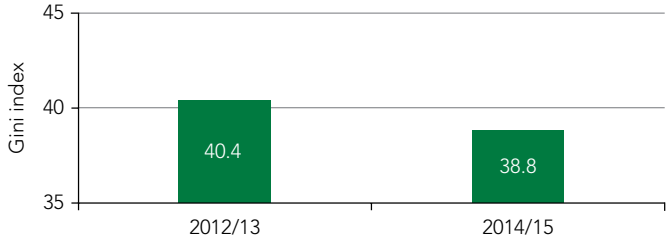


B. Tanzania, 2012–2015 (consumption includes clothing and footwear)



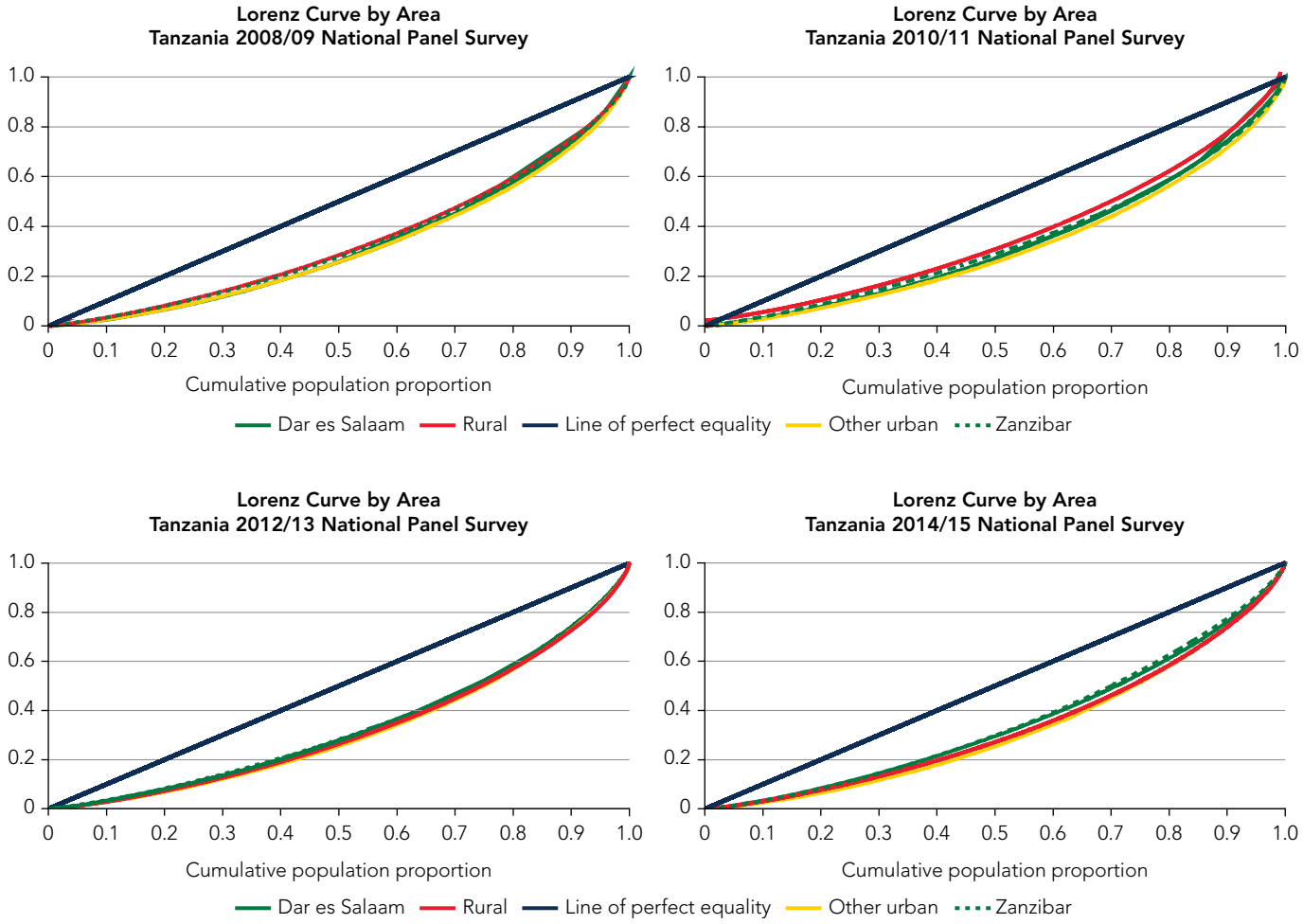
Source: Authors' calculations based on NPS 2012/13 and 2014/15.

FIGURE I.12: Gini Index of Monthly Real Consumption Per Capita, Mainland



Source: Authors' calculations based on NPS 2012/13 and 2014/15.

FIGURE I.13: Lorenz Curve and Gini Index by Geographic Domain



	2008/09				2010/11				2012/13				2014/15			
	GINI	P90/ P10	INCOME SHARES		GINI	P90/ P10	INCOME SHARES		GINI	P90/ P10	INCOME SHARES		GINI	P90/ P10	INCOME SHARES	
			LOW QUINTILE	TOP QUINTILE			LOW QUINTILE	TOP QUINTILE			LOW QUINTILE	TOP QUINTILE			LOW QUINTILE	TOP QUINTILE
Mainland	38.2	5.2	6.9	45.6	38.6	5.4	6.8	46.1	40.3	6.1	6.2	47.0	38.8	5.7	6.4	45.5
Dar es Salaam	35.7	5.4	6.7	42.1	33.4	4.5	7.8	41.4	33.4	4.2	8.0	41.7	30.3	4.0	8.5	38.9
Other urban	36.4	5.3	6.6	43.8	36.2	4.9	7.3	43.5	36.1	5.4	6.9	43.3	35.6	5.5	6.7	41.8
Rural	31.9	4.1	8.2	40.5	32.7	4.2	8.0	41.0	35.1	4.7	7.3	42.8	33.7	4.5	7.7	41.6
Zanzibar	32.8	4.3	8.1	41.1	31.8	3.9	8.8	41.0	33.5	4.3	8.2	42.1	29.2	3.8	8.4	37.1

Source: Authors' calculations based on NPS 2008/09, 2010/11, 2012/13 and 2014/15.
Note: To ensure comparability across all survey rounds, the consumption expenditure excludes clothing and footwear. However, the estimates are robust across methodologies. The inclusion of clothing and footwear does little to affect the 2012/13 and 2014/15 Gini, Income shares, p90/p10 ratio and Lorenz curve.

Poverty Projections

Frequent and timely consumption and income data needed for designing programs and policies to eliminate poverty are not always available often due to the costly and time-consuming nature of primary data collection. To facilitate poverty monitoring in situations of data scarcity or between surveys rounds, alternative techniques can be employed to estimate poverty. One technique involves projecting national poverty using a nationally representative consumption data. Another approach involves estimating poverty using a nationally representative non-consumption data into which consumption data is imputed. Both techniques avoid the associated costs and delays of collecting new data while allowing for more up-to-date and reliable poverty estimates.

The latest available data from the Household Budget Survey and macroeconomic forecasts is used to forecast changes in national poverty headcount over the medium term. This allows us to derive a picture of future outlooks, corroborate the forecasted poverty levels and trends with estimates obtained from survey instruments collected later, and to obtain prospective estimates where up-to-date poverty estimates are not available. Poverty is projected using two approaches; the distribution-neutral approach and the growth elasticity approach. The distribution neutral approach assumes everyone's consumption (income) grows at the same rate while inequality essentially remains unchanged. Growth elasticity approach assumes both growth and distribution effects influence poverty reduction.

For both projection approaches, growth in GDP per capita in constant local currency unit is assumed to drive the changes in consumption or poverty. Forecasts of GDP per capita growth are simulated through the World Bank's macroeconomic modelling tool, the Macro-fiscal model (MFMod) and are adjusted by population growth. Growth's relationship to poverty is more direct under the growth elasticity approach as it measures the percent change in poverty resulting from

BOX I.2 Distribution Neutral and Growth Elasticity Approach

The distribution-neutral approach uses the consumption distribution of HBS 2011/12 to project future poverty rates assuming consumption grows over time without inequality changing. The advantage of this approach is that poverty rates will reflect the curvature of the consumption distribution since the actual consumption distribution is used for the projections.

The growth elasticity approach determines how much economic growth contributes to poverty reduction and uses the poverty-to-growth elasticity to project future poverty rates. The poverty-to-growth elasticity is the ratio of a percent change in poverty rates to a percent change in consumption (or income). It is estimated by two different methods, one being the annualized method and the other being the point-to-point method. The annualized method is calculated as follows:

$$E_{annualized} = \frac{\left(\frac{P_B}{P_A}\right)^{\frac{1}{B-A}} - 1}{\left(\frac{G_B}{G_A}\right)^{\frac{1}{B-A}} - 1}$$

which is the ratio between annualized poverty growth and the annualized GDP growth between periods A andB. In this case, B is 2012 and A is 2007. P is the poverty rate and G is the GDP per capita in constant local currency unit (LCU). The point-to-point method is calculated as follows:

$$E_{point-to-point} = \frac{\left(\frac{P_B}{P_A}\right) - 1}{\left(\frac{G_B}{G_A}\right) - 1}$$

which is the ratio between poverty growth and the GDP growth between periods A and B.

a percent change in growth. Under the neutral-distribution approach, growth's impact on poverty is channeled through its effect on welfare. It is assumed there are factors that mitigate the effect of GDP per capita growth on welfare aggregate growth from household surveys. The pass-through can be understood as this factor of adjustment. The assumptions used for both projection approaches are highlighted in the table below.

While poverty's downward trend is expected to continue over the next years, Tanzania may not reach the twin goals. Projections based on a distribution-neutral approach shows more modest poverty reduction while national elasticities show a faster rate of decline suggesting a more optimistic trajectory of welfare.[1] The distribution neutral approach, which offers a more moderate outlook of poverty reduction, best reflects Tanzania's poverty reduction trajectory.

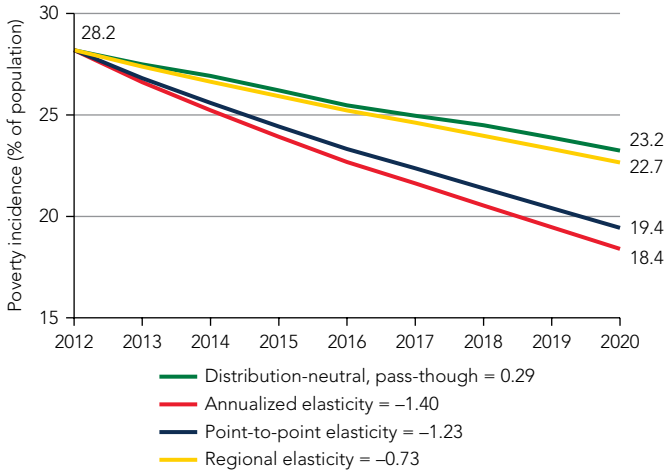
The growth elasticity approach is likely to underestimate poverty given the location of the poverty line relative to mean consumption and initial inequality. Elasticity approach provides optimistic results because it accounts for inequality at a lower level.[2] The curvature of the consumption distribution implies that the relationship between poverty reduction and growth is non-constant. This relationship changes with each successive shift in the consumption distribution and with changes in the distribution. The closer the poverty line is to the mean of the distribution, the higher the elasticity as is the case in Tanzania (see figure below). However, this relationship weakens with each successive upward shift in the consumption distribution assuming the poverty line is located below the mean. This implies the use of elasticity for

TABLE I.7: Growth Elasticities and Pass-Through Rates

TYPE OF PROJECTION	ELASTICITY TYPE	GROWTH-POVERTY ELASTICITY (2007–2012)	PASS-THROUGH
Distribution Neutral			0.29
Growth Elasticity	Annualized	–1.40	
Growth Elasticity	Point-to-point	–1.23	
Growth Elasticity	Regional†	–0.73	

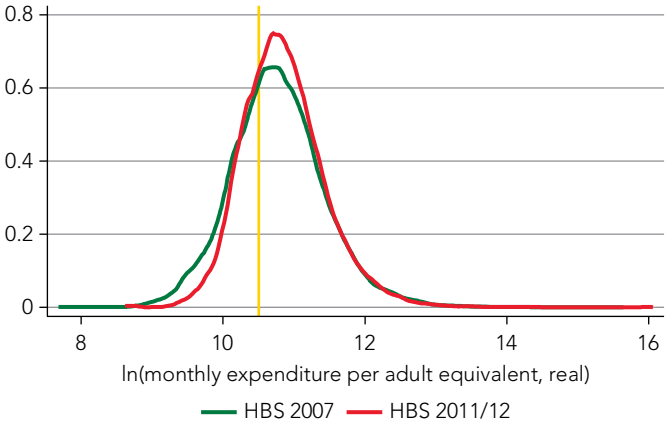
Source: Authors' calculations based on the HBS 2007 and 2011/12 and MFMod forecasts (March 2018 version).
† The regional elasticity reflects the growth-poverty elasticity for Sub-Saharan Africa for the period circa 1990–2012 based on poverty rates using the international poverty line of US$ 1.90 (2011 PPP). It is estimated using the point-to-point methodology.

FIGURE I.14: Actual and Projected Poverty Rates Using the Distribution Neutral and Growth-Elasticity Approaches



Source: Authors' calculations using HBS 2007, HBS 2011/12, and MFMod forecasts of GDP per capita in constant LCU adjusted by population growth (March 2018 version).
Notes:
Fig. I.14: Actual poverty rate in 2012. Projection is from 2013 to 2020. Projections use: a) neutral distribution with empirical pass-through = 0.29; b) annualized elasticity (2007–2012); c) point-to-point elasticity (2007–2012) and d) point-to-point elasticity at the regional level.
b) Fig. I.15: Vertical line is the logged HBS 2011/12 poverty line.

FIGURE I.15: Kernel Density Function of Log Real Monthly Consumption Per Adult



Source: Authors' calculations using HBS 2007, HBS 2011/12, and MFMod forecasts of GDP per capita in constant LCU adjusted by population growth (March 2018 version).
Notes:
Fig. I.13: Actual poverty rate in 2012. Projection is from 2013 to 2020. Projections use: c) neutral distribution with empirical pass-through = 0.29; b) annualized elasticity (2007–2012); c) point-to-point elasticity (2007–2012) and d) point-to-point elasticity at the regional level.
d) Fig. I.14: Vertical line is the logged HBS 2011/12 poverty line.

[1] Since the regional elasticity is lower than the national elasticities, it provides a more moderate forecast of poverty reduction. The lower regional elasticity relative to the national elasticities is expected since the regional poverty rates are higher than the national rates, thus they will produce a lower percent change in poverty than would national poverty rates.
[2] The survey-to-survey imputations suggest inequality increased slightly between 2012 and 2016.

poverty projections is likely to underestimate poverty rates. The distribution in consumption can also change. Between 2007 and 2011, the consumption distribution became more equal, which is incorporated into the growth elasticity. However, since the distribution of consumption appears to have increased since 2011, the poverty reduction impact from growth may have been attenuated, thus resulting in projections that underestimate poverty.

Poverty Imputations Using the Demographic and Health Survey

Survey-to-survey imputation (SSI) is a method that aims to facilitate poverty monitoring in situations where the available nationally representative survey does not contain consumption data. SSI uses an imputation model developed on consumption data from a representative survey to impute into non-consumption data sets. The imputed consumption data is then used to estimate poverty. The surveys utilized in this imputation exercise consist of a base survey on which a consumption model is developed and two complementary surveys—one implemented prior to the base survey and the other implemented after—on which imputed estimates of consumption are developed.

i. Data

The 2011/12 Tanzania Household Budget Survey (HBS) is used as the base survey to model consumption.[3] Household expenditures and consumption were collected using a diary that recorded both household purchases and consumption over a 28 days period (National Bureau of Statistics 2013). Using this expenditure and consumption data, the HBS reports a consumption-based poverty headcount index of 28.2 percent based on the national basic needs poverty line is TZS 36,482 per adult equivalent per month (World Bank 2015).

The Tanzania Demographic and Health Surveys (DHS) 2010 and 2014 is used to impute consumption and thus poverty. The DHS is a nationally representative survey that solicits information on fertility, family planning, childhood mortality, nutrition, maternal and child health, domestic violence, malaria, adult mortality, and HIV/AIDS-related knowledge and behavior. A nationally representative sample of women age 15–49 in all selected households and men age 15–49 in one-third of selected households were interviewed (National Bureau of Statistics and ICF Macro 2011).

ii. Comparability of HBS and DHS surveys

The accuracy of survey-to-survey predictions relies on key assumptions: (i) the two survey questions have variables in common that are solicited in a consistent manner, (ii) the variables in common between the two surveys explain a large share of the intertemporal change in household expenditure and poverty, and (iii) the sampling design between the two surveys is relatively similar (Newhouse, Shivakumaran et al. 2014).

Comparability in geographical coverage across the HBS and DHS surveys is ensured. First, the geographic scope of DHS 2010 and 2015/16 is restricted to Mainland. While HBS 2011/12 is based on a representative sample of Tanzania Mainland, the DHS 2010 and 2015/16 provides a representative sample for the United Republic of Tanzania (Mainland and Zanzibar). Second, new regions in the DHS 2015 are recoded to match the original regions in HBS 2011/12 since they did not exist during the implementation of HBS 2011/12 (Table I.8). As of the 2012 census, four new administrative regions—Geita, Katavi, Njombe and Simiyu—were created. No adjustment was made to DHS 2010 since the sampling frame was based on the 2002 Population and Hosing Census as was the HBS 2011/12. Finally, a sample for Dar es Salaam is identified for the DHS data. While HBS is representative of Dar es Salaam, other urban areas and rural areas on Mainland, DHS is representative of urban and rural areas on Mainland and on Zanzibar. Since DHS is not representative at the level of Dar es Salaam, the DHS sample size for Dar es Salaam is smaller than if a separate stratum had been created for it. The smaller DHS sample size for Dar es Salaam implies relatively less precise predictions for Dar es Salaam as compared to the other strata.

The time-period of the HBS and DHS should also match. The fieldwork of the HBS survey was conducted for one year

[3] The survey collects data on a wide range of individual and household characteristics, including: education, employment and health status; ownership of consumer goods and assets; housing structure and building materials; household access to services and facilities; ownership of non-farm businesses; and agricultural activities.

TABLE I.8: New Regions created in March 2012 and Correspondence to Original Regions and Districts

NEW REGION	ORIGINATED FROM
Geita	The region was created from Bukombe district in Shinyanga region, Chato from Kagera region and Geita from Mwanza region
Katavi	Mpanda district from Rukwa region
Njombe	Ludewa, Makete, and Njombe districts from Iringa region
Simiyu	Formed by taking Bariadi, Meatu, and Maswa districts from Shinyanga region and Busega district from Mwanza

Source: www.statoids.com/utz.html

during October 2011–October 2012. The DHS 2010 was carried out December 2009–May 2010 and the DHS 2015 carried out August 2015–February 2016. Given the overlap between the DHS and the HBS, there was no need to restrict the period in the base survey where the consumption model is developed. However, to control for the seasonal factors, monthly dummies are included in the imputation model.

Variables used in the consumption models need to be available in both the HBS and DHS. The common variable set used to develop the consumption model consists of household demographics, dwelling characteristics, ownership of durables, ownership of land, characteristics of the household head and his/her spouse, location variables, and indicators of month of interview. The stability of the variables ensures that the consumption model developed in the base survey can reasonably be used to impute consumption into the non-consumption survey.

iii. Sample

The sample sizes used for the analysis are reflected in Table I.9.

TABLE I.9: Survey Sample Sizes

	HBS 2011/12	DHS 2010	DHS 2015
Dar es Salaam	3,016	383	700
Other Urban	3,040	1,856	2,934
Rural	4,130	7,384	8,929
Mainland	10,186	9,623	12,563

Sources: HBS 2011/12, DHS 2010 and 2015.

iv. Methodology

The imputation process consists of three stages: the first stage consists of choosing predictors for developing a model of log per capita consumption of a household using the HBS 2011/12 consumption survey. Two automated variable selection methods—lasso and backwards stepwise—are utilized to select a subset of predictors from the set of common variables in the HBS 2011/2012 and DHS 2010 and 2015/16. A final selection step involves the manual inspection of the sensibility of results.

The second step is choosing a model to estimate the coefficients for each predictor. Two types of models are tested—a linear regression and predictive mean matching. Sensitivity to the inclusion of cellphones as a possible predictor is tested. The regression considers sampling weights (pweight in STATA). Finally, to allow for differences across domains, a separate consumption model is developed for each of the strata: Dar es Salaam, other urban areas, and rural areas. The poverty estimates of the consumption models are compared with the poverty estimates from actual consumption data in the consumption survey.

The third step involves producing multiple imputations expenditure estimates for each household based in the non-consumption-survey. Based on the resulting imputed consumption estimates, poverty headcount and their standard errors are calculated.

The lasso (least absolute shrinkage and selection operator) is a shrinkage and selection method for linear regression. The method minimizes the sum of squared errors, but is subject to an extra penalty term that sets a bound on the sum of the absolute values of the coefficients, as can be seen in the following equation:

$$\sum_{i=1}^{n}\left(y_i-\beta_0-\sum_{j=1}^{p}\beta_j x_{ij}\right)^2+\lambda\sum_{j=1}^{p}\left|\beta_j\right|=\mathrm{RSS}+\lambda\sum_{j=1}^{p}\left|\beta_j\right|.$$

A model is fit using all predictors and the penalty term shrinks the coefficient estimates towards zero. If the tuning parameter λ preceding the penalty term is sufficiently large, some of the estimates are forced to be equal to zero. In this way, the lasso performs variable selection and yields models that involve only a subset of the variables. Therefore, selecting a good value of λ for the lasso is crucial and depending

on the value of λ, the lasso can produce a model involving any number of variables.

An optimal λ is chosen through cross-validation. A grid of λ values is created between the λ that results in a model with no parameters to one that results in the regular linear regression estimates and the cross-validation error for each value of λ is computed. The tuning parameter value for which the cross-validation error is smallest is selected. Finally, the model is re-fit using all of the available observations and the selected value of the tuning parameter. For this procedure, the glmnet and caret R packages are used (Kuhn 2008, Friedman, Hastie et al. 2010).

Lasso estimates can increase prediction accuracy in cases when the least squares estimates have excessively high variance. This reduction in variance comes at the expense of an increase in bias however (James, Witten et al. 2013). This has popularized the practice of post-lasso estimation– that is, using lasso regression as a pre-processing step, where the subset of non-zero variables selected is then subsequently used in an ordinary least squares (OLS) linear regression to generate non-biased coefficient estimates (Belloni and Chernozhukov 2013).

A further variable selection method one can use is backwards stepwise regression to iteratively drop non-significant coefficients. The post-lasso OLS coefficient estimates, based on the subset of non-zero variables selected by the lasso pre-processing step, may results in several non-significant coefficients. Backwards stepwise variable selection begins with the full least squares model containing all predictors (in this case the non-zero lasso subset), and while the least-significant term is "insignificant" at the specified significance level of 5 percent, removes it and re-estimates the model and repeats the procedure until all terms are significant at the 5 percent level (StataCorp 2017). Note that in both the lasso and stepwise routines, dummies of a categorical variables are treated as individual predictors and their significance are tested individually and not as a group, which could lead to different results. The final subset of significant predictors is then used in multiple imputation routine.

The predictors and their associated coefficients that results from the two automated procedures described above undergo one final manual check. Variables are removed if their coefficients exhibit a different sign than suggested by their bi-variate correlation with income, or if the sign of their coefficients are different across the different modeling strata since these situations can be an artifact of multi-collinearity and may affect the precision of the estimated coefficients.

Multiple imputation (MI) is a Monte Carlo simulation-based procedure that better reflects the uncertainty inherent in a given prediction model. Instead of predicting a single value for a target outcome variable, several cases (in this study 20) are predicted to better reflect sampling variability. The overall prediction for a given observation is then simply the average over the 20 estimates from the separate simulations while the final variance estimate reflects variation within and between simulation rounds.

For a continuous target variable, two typical multiple imputation methods are linear regression and predictive mean matching (PMM). The linear regression model relies on normality of the model and is superior to other methods when the underlying normality holds, but can be more sensitive than other methods, such as PMM, to violations of this assumption (StataCorp 2017). In the case of linear regression, we use the complete-data observations (this is the HBS 2011/12 for which we have consumption information) to estimate a linear regression with an associated set of coefficients β that relates the target variable y log per capita household consumption with the rest of the predictors. The model is defined as:

$$y_h = \alpha + X'_h\beta + \varepsilon_h \quad (1)$$

where y_h is log per capita expenditure, α is the intercept, X' is the vector of explanatory variables for household h, β is the vector of regression coefficients, and ε_h is a stochastic error term. We specify probability weights for each observation where each observation is weighted by the inverse of its probability of being sampled and use a robust White sandwich estimator to compute the variance-covariance matrix.

Multiple imputation by linear regression follows the following steps:

- Fit the weighted linear regression model (1) on the observed data to obtain estimates of the model parameters $\hat{\beta}$ and $\hat{\sigma}^2$.
- Simulate new parameters β_* and σ_*^2 from their joint posterior distribution under the conventional non-informative improper prior $\Pr\left(\beta, \sigma^2\right) \propto \frac{1}{\sigma^2}$.

TABLE I.10: Comparison of Means of Variables by Geographic Domain

OTHER URBAN

Comparison of Means of Variables (linearized standard errors in parentheses)

VARIABLE TYPE	VARIABLE	2010		2012		2015	
C	Total number of members living in the HH	4.7	(0.1)	4.7	(0.2)	4.6	(0.1)
C	Number of children aged 0-5 years	0.8	(0.0)	0.8	(0.1)	0.8	(0.0)
D	hcomp==single parent with kids	0.2	(0.0)	0.2	(0.0)	0.1	(0.0)
D	hcomp==couple with kids	0.6	(0.0)	0.6	(0.0)	0.6	(0.0)
D	floor==Ceramic tiles/marumaru	0.0	(0.0)	0.0	(0.0)	0.1	(0.0)
D	floor==Earth/sand/Dung	0.3	(0.0)	0.3	(0.0)	0.2	(0.0)
D	cook==Firewood	0.3	(0.0)	0.3	(0.0)	0.3	(0.0)
D	ttoilet_fc==Flush toilet	0.3	(0.0)	0.2	(0.0)	0.4	(0.0)
D	Radio and Radio Cassette	0.7	(0.0)	0.6	(0.0)	0.6	(0.0)
D	Telephone (land line)	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
D	Television	0.3	(0.0)	0.3	(0.0)	0.4	(0.0)
D	Iron (Charcoal or electric)	0.5	(0.0)	0.4	(0.0)	0.4	(0.0)
D	Motor Vehicles	0.0	(0.0)	0.0	(0.0)	0.1	(0.0)
D	Motor cycle	0.1	(0.0)	0.1	(0.0)	0.1	(0.0)
D	(Head) Gender	0.7	(0.0)	0.7	(0.0)	0.7	(0.0)
D	attain==incomplete secondary	0.2	(0.0)	0.2	(0.0)	0.1	(0.0)
D	Household head has no spouse (1) or has a spouse (0)	0.4	(0.0)	0.4	(0.0)	0.4	(0.0)
D	attainsp==incomplete secondary	0.1	(0.0)	0.1	(0.0)	0.0	(0.0)
D	Livestock	na.	na.	0.3	(0.0)	0.3	(0.0)
	C for continuous variable and D for dummy						

RURAL

Comparison of Means of Variables (linearized standard errors in parentheses)

C	Total number of members living in the HH	5.3	(0.1)	5.3	(0.1)	5.3	(0.1)
C	Number of children aged 0-5 years	1.1	(0.0)	1.1	(0.0)	1.0	(0.0)
C	Adult females over 18 years old	1.3	(0.0)	1.3	(0.0)	1.3	(0.0)
C	Adult males over 18 years old	1.2	(0.0)	1.2	(0.0)	1.1	(0.0)
D	hcomp==single parent with kids	0.1	(0.0)	0.1	(0.0)	0.1	(0.0)
D	hcomp==couple with kids	0.7	(0.0)	0.7	(0.0)	0.7	(0.0)
D	Number of sleeping rooms	2.3	(0.0)	2.1	(0.0)	2.2	(0.0)
D	floor==Earth/sand/Dung	0.8	(0.0)	0.8	(0.0)	0.8	(0.0)
D	wall==Timber	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
D	toilet==Shared toilet	0.2	(0.0)	0.2	(0.0)	0.2	(0.0)
D	cook==Firewood	0.9	(0.0)	0.9	(0.0)	0.9	(0.0)
D	cook==Kerosene	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
D	Radio and Radio Cassette	0.6	(0.0)	0.5	(0.0)	0.5	(0.0)
D	Iron (Charcoal or electric)	0.2	(0.0)	0.1	(0.0)	0.1	(0.0)
D	Motor Vehicles	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
D	Motor cycle	0.0	(0.0)	0.0	(0.0)	0.1	(0.0)
D	Bicycle	0.5	(0.0)	0.4	(0.0)	0.4	(0.0)
C	Head years of education	4.5	(0.1)	4.9	(0.1)	5.0	(0.1)
D	enrol==primary	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
D	attain==incomplete primary	0.2	(0.0)	0.2	(0.0)	0.2	(0.0)
D	attain==complete primary	0.4	(0.0)	0.5	(0.0)	0.5	(0.0)
D	attain==incomplete secondary	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
C	Number of spouses of household head	0.7	(0.0)	0.7	(0.0)	0.7	(0.0)
D	Household head has no spouse (1) or has a spouse (0)	0.3	(0.0)	0.3	(0.0)	0.3	(0.0)

(Table Continiued on next page)

TABLE I.10: Comparison of Means of Variables by Geographic Domain *(Continued)*

DAR ES SALAAM Comparison of Means of Variables (linearized standard errors in parentheses)							
VARIABLE TYPE	VARIABLE	2010		2012		2015	
C	Total number of members living in the HH	4.1	(0.2)	4.0	(0.1)	4.3	(0.1)
C	Adult females over 18 years old	1.2	(0.1)	1.3	(0.0)	1.3	(0.0)
D	hcomp==single parent with kids	0.1	(0.0)	0.1	(0.0)	0.1	(0.0)
D	hcomp==couple with kids	0.5	(0.0)	0.5	(0.0)	0.6	(0.0)
D	hcomp==elderly HH 65& above	0.0	(0.0)	0.0	(0.0)	0.0	(0.0)
D	cook==Firewood	0.1	(0.0)	0.0	(0.0)	0.0	(0.0)
D	ttoilet_fc==Traditional pit latrine	0.6	(0.1)	0.6	(0.0)	0.4	(0.0)
D	Refrigerator or freezer	0.3	(0.0)	0.3	(0.0)	0.4	(0.0)
D	Television	0.6	(0.0)	0.6	(0.0)	0.6	(0.0)
D	Iron (Charcoal or electric)	0.6	(0.0)	0.6	(0.0)	0.6	(0.0)
D	(Head) Gender	0.8	(0.0)	0.8	(0.0)	0.8	(0.0)
D	agehd==agehd 40-49	0.2	(0.0)	0.2	(0.0)	0.2	(0.0)
D	agehd==agehd 50-59	0.2	(0.0)	0.1	(0.0)	0.1	(0.0)
C	Head years of education	8.3	(0.4)	8.7	(0.2)	8.8	(0.3)
D	attain==higher	0.1	(0.0)	0.1	(0.0)	0.1	(0.0)
D	Household head has no spouse (1) or has a spouse (0)	0.4	(0.0)	0.4	(0.0)	0.3	(0.0)
D	agesp==agesp 50-59	0.0	(0.0)	0.0	(0.0)	0.1	(0.0)
C	First spouse years of education	4.5	(0.2)	5.0	(0.2)	5.7	(0.3)
D	month==November	0.0	(0.0)	0.1	(0.0)	0.0	(0.0)
D	month==December	0.1	(0.1)	0.1	(0.0)	0.0	(0.0)
D	Livestock	na.	na.	0.1	(0.0)	0.2	(0.0)

Source: DHS 2010, HBS 2011/12, DHS 2015/16.
Note: Linearized standard errors in parentheses. D=dummy, C=continuous.

- Obtain one set of imputed values y_m^1 by simulating from $N(X_m\beta_\star, \sigma_\star^2 I_{h_1 \times h_1})$ where $y = (y_1, y_2, \ldots, y_h)'$.
- Repeat steps 2 and 3 to obtain M sets of imputed values $y_m^1, \ldots, y_m^m$.

The predictive mean matching MI method combines the standard linear regression method above with a nearest-neighbor imputation approach. The imputed values are generated by modifying step 3 above:

- Let $\widehat{y_i}$ denote the predicted value of the rows with an observed y_i where $i = 1, \ldots, h_i$.
- Likewise, let y_j denote the predicted value of the rows with missing y_j where $y = 1, \ldots, h_o$.
- Find the d donor candidates for which $\left|\hat{y}_i - \hat{y}_j\right|$ is minimal, and randomly sample one of them. Usual values for d are 3, 5 and 10. We use $d = 5$. These constitute the cases' "closest neighbors".

The imputed values y_m^1 will be the observed y_i from the $y_{j\ \min}$ donor candidate identified above.

PMM is especially attractive for predictive variables that are not normally distributed since by drawing from the observed data, PMM preserves the distribution of the observed values in the missing part of the data, which makes it more robust than the fully parametric linear regression approach (StataCorp 2017). This procedure results in 20 imputed datasets which are then analyzed and combined using Rubin's rules for valid statistical inferences that properly reflect the uncertainty due to missing values (Rubin 1987).

v. Results

Table shows the mean values of the final selected variables. The results show little signs of volatility between the HBS 2011/12 and DHS survey rounds highlighting the consistency in which the questions were solicited and captured.

Two consumption models are compared; one with cellphone ownership and one without cellphone ownership as a predictor variable. The validity of an imputation model depends on the assumption of constant relative prices across time. Stifel and Christiaensen (2006) recommend excluding from the imputation models variables whose rates of return are likely to change markedly in the face of evolving economic conditions. Likewise, Harttgen, Klasen et al. (2013) argue for removing certain consumer durables since improvement in asset ownership that outpaces income growth can create "asset drift". In many developing countries, cellphones are among the assets for which ownership has expanded rapidly, and Tanzania is no exception (see Table I.11). This reflects the overall rapid reduction in cell phone prices and service fees and not so much of income growth. As a result, owning a cell phone may have a very different budgetary impact in 2015 than in 2010 (Newhouse, Shivakumaran et al. 2014Newhouse, Shivakumaran et al. 2014). The final models excluded cellphones for the reasons outlined above. All tested model specifications including cellphones in the imputation model resulted in more optimistic poverty trends.

Comparing the sensitivity of the distribution of imputed values to observed values for each stratum led to the linear regression MI method for the Dar es Salaam and other urban strata and PMM for the rural stratus to be chosen. In addition to variables with inconsistent coefficient signs, regional dummies were also dropped to decrease the effect of time-invariant variables.

TABLE I.11: Share of Cellphone Ownership

DHS 2010	HBS 2011/12	DHS 2015/16
46	57	78
(1.1)	(1.3)	(0.7)

Source: Authors' calculations based on HBS 2011/12, DHS 2010 and 2015/16.
Note: Standard errors in parentheses.

Final backwards and forwards imputation results into the 2010 and 2015 respectively, as well as the observed (direct estimation) values for 2012 are shown in Table I.12. Our imputation results suggest that the poverty rate decreased nationally approximately 1 percentage point between 2010–2015. This decrease was concentrated in Dar es Salaam - the capital saw a decrease of 2 percentage points, while Rural areas had a decrease of half a percentage point. Other Urban areas show an increase of approximately 1 percentage point. A note of caution about interpreting these results is in order. Given the magnitude of these estimated changes, as well as the width of their confidence intervals, it is perhaps more reasonable to assume that poverty has remained relatively stable in the period under analysis in Tanzania.

The Gini coefficient shows more pronounced changes during the same period. A national increase of three percentage points is observed while both other urban areas and rural areas had an increase of two percentage points. Along with the decrease in poverty, Dar es Salaam also saw a decrease in inequality with the Gini coefficient decreasing by one percentage point.

TABLE I.12: Poverty Estimates and Imputations

POVERTY HEADCOUNT (% OF POPULATION)	DHS 2010	HBS 2011/12	DHS 2015/16
Mainland	28.1	28.2	26.8
	(1.2)	(1.8)	(1)
Other Urban	18.9	21.5	20.1
	(2.7)	(4.5)	(2.1)
Rural	31.9	33.4	31.5
	(1.4)	(2.3)	(1.2)
Dar es Salaam	7.6	4.0	5.3
	(2.9)	(.7)	(1.7)

Source: Authors' calculations based on HBS 2011/12, DHS 2010 and 2015/16.

TABLE I.13: Gini Coefficient

GINI COEFFICIENT	DHS 2010	HBS 2011/12	DHS 2015/16
Mainland	0.33	0.34	0.36
Other Urban	0.36	0.37	0.38
Rural	0.30	0.29	0.32
Dar es Salaam	0.33	0.35	0.32

Source: Authors' calculations based on HBS 2011/12, DHS 2010 and 2015/16.

Using synthetic panel to explore movements in and out of poverty, 2010–2014.

This section presents results for poverty dynamics in Tanzania based on synthetic panel estimates for the 2nd and 4th round of the National Panel Survey (NPS). The results for the overall population are presented contain information on poverty profiles, i.e. movements in and out of poverty for different population subgroups, defined by characteristics of the household head. These tables contain results both for joint probabilities (i.e. the absolute probability of showing a particular type of poverty dynamics) and conditional probabilities (i.e. the probability of transitioning to or staying in a particular poverty status in 2014, given one´s poverty status in 2010). The main results presented in this document are obtained using the method outlined in Dang and Lanjouw (2013) [henceforth DL]. These results are much more accurate—in terms of getting the right poverty numbers in each of the rounds—than DL results from previous versions, which has been achieved by weighting the income regressions.

The work required synthetic panel estimation of mobility to be split into three parts, and in all of them it is necessary to make choices. The first is the choice of a good model for predicting consumption expenditure, the second is the estimation of the intertemporal correlation of residuals in those models, and the third is to join the pieces (combined with assumptions on error structure) to produce final estimates of transitions in and out of poverty. The choices taken in all of these steps are explained below.

TABLE I.14: Poverty Rates by Age, 2010 and 2014

NPS 2				
AGE RANGE	**MEAN**	**STD. ERROR**	**CONFIDENCE INTERVAL**	
All	26.51	1.26	24.03	28.99
25–70	26.56	1.28	24.05	29.07
20–65	24.53	1.32	21.93	27.14
NPS 4				
AGE RANGE	**MEAN**	**STD. ERROR**	**CONFIDENCE INTERVAL**	
All	23.93	1.36	21.25	26.60
25–70	24.03	1.40	21.27	26.78
20–65	24.57	1.50	21.62	27.51

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: The estimates account for complex survey design.

i. Technical choices and motivation

In the next lines, the choices made to construct the synthetic panel are detailed. The main criterion to decide between different options has been the successful prediction of the overall poverty rate in period 2. The results presented below show that the combination selected for obtaining the main results displayed does best at predicting poverty rates in period 2.

Income Model: The models to predict consumption expenditure must consist exclusively of variables that do not vary over time. "Model 1" includes only information on sex, marital status, literacy, education and big region of birth. "Model 2" additionally contains information on characteristics that are invariant as long as the household does not move, such as whether the household lives in a rural or urban area, and whether the household head is indigenous to the area she lives in, with particular dummies for those that migrated to the North or the East. The models include only significant variables, Model 1 has an R^2 of around 0.3 while Model 4 has an R^2 of around 0.4.

In addition to the income model, there is the additional choice whether to estimate the model with or without weights. This is mostly a practical question, as there is little theoretical guidance of why either option would be preferable. The Table below shows that the estimates are much better when population weights are used to estimate these income models. Then, results from Model 1 are considerably more accurate. This can be explained by the fact that households move from urban to rural areas and between regions, but Model 2 assumes that these characteristics are fixed. Therefore, predicting with characteristics from period 1, it misses those improvements and predicts slightly higher poverty rates.

Residual distribution: There are two main options in the literature: Dang and Lanjouw (2013)[1] suggest to assume bivariate normality, and Bourguignon and Moreno (2015)[2] [henceforth BM] put forward an alternative based on calibrating the parameters of a Gaussian mixture g(u) that best fits the distribution of innovations $u_i = \varepsilon_2 - \rho\varepsilon_1$, and then simulating from

[1] http://documents.worldbank.org/curated/en/967911468330016425/pdf/WPS6504.pdf
[2] https://editorialexpress.com/cgi-bin/conference/download.cgi?db_name=NEUDC2015&paper_id=301

that distribution in order to obtain synthetic expenditure for round 2. It is a priori not obvious to which extent the more involved and flexible BM procedure should be of advantage, it probably depends on the degree of violation of the bivariate normality assumption.

Given that the DL procedure has been used more widely until now and is therefore more consolidated, the team decided to prioritize it in this application. A comparison of tables shows that, when income models are estimated with weights, the fit obtained with the DL approach in terms of predicting correctly the poverty rates in periods 1 and 2 is very good, and comparable if not better to the performance of the BM* model that had emerged as the most accurate from the comparison of methodological choices with unweighted regressions (see Tables below).

An additional (maybe minor) degree of freedom when applying the DL method is whether to produce the estimates based on the households of round 1 or on those seen in round 2. Table 5 also shows that using round 1 characteristics leads to better estimates.

Age range: 20–75. The performance of synthetic panel methods is only slightly better than for the other pre-selected age range (25–60). Moreover, the evolution of the poverty rate for the broader range fits more closely the evolution of the overall population, with a certain (non-significant) decline in poverty between 2010 and 2014 (see Table below). In order to reflect that change in the synthetic panel estimates, the age range 20–75 is chosen.

Residual correlation ρ: This parameter, which measures the inter-temporal correlation of the part of income not explained by the prediction model for consumption expenditure, is essential in the construction of synthetic panels Dang and Lanjouw (2013) provide a formula to derive this inter-temporal correlation of errors in the models above from the inter-temporal correlation of income ρ_y, so that we just need to obtain the latter.

DL suggest using inter-temporal correlation of *mean cohort expenditure* (meaning average household expenditure for households with a head born in the same year(s)) as a proxy for household inter-temporal correlation of expenditure. An alternative to this approach would be to consider the household correlation coefficient as obtained from the panel for rounds 1 and 3 for the corresponding age range (see Table below).

TABLE I.15: Poverty Dynamics based on Synthetic Panels, Tanzania 2010–2014

JOINT PROBABILITIES		CONDITIONAL PROBABILITIES	
POVERTY STATUS	ESTIMATE	POVERTY STATUS	ESTIMATE
Poor, Non-poor	15.91	Poor -> Non-poor	57.91
Non-poor, Poor	12.79	Non-poor -> Poor	16.68
Non-poor, Non-poor	60.02	Non-poor -> Non-poor	83.32
Poor, Poor	11.29	Poor -> Poor	42.09

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: Predictions are obtained using population weights. N = 3529 for NPS2 and N =3066 for NPS4. The sample includes household heads that were between 20 and 75 years old by the time of NPS2. Estimations are based on income Model 1 (weighted regressions) and DL methodology (ρ_y estimated from cohort means, and normality assumed for residuals).

TABLE I.16: Characteristics Associated with Poverty Mobility, Synthetic Panel Estimates, Tanzania 2010–2015: Joint Probabilities

CHARACTERISTICS HHH	POOR, NON-POOR	NON-POOR, POOR	NON-POOR, NON-POOR	POOR, POOR
1. HOUSEHOLD CHARACTERISTICS				
SEX HHH				
Female	17.36	13.27	55.97	13.40
Male	15.52	12.65	61.12	10.71
Age HHH				
Younger than 35	12.02	13.13	66.41	8.43
Between 36 and 50	15.89	13.02	59.93	11.17
Older than 50	18.75	12.24	55.52	13.50
Literacy HHH				
Non-literate	20.09	18.00	39.56	22.35
Literate	14.57	11.11	66.58	7.74
Education HHH				
Lower than complete primary	19.75	16.25	45.59	18.41
complete primary	15.65	11.83	64.60	7.91
Higher than complete primary	4.12	5.03	89.78	1.06
Civil Status HHH				
Never married	7.83	6.61	82.68	2.88
Married - monogamous	15.10	12.06	62.90	9.94
Married - polygamous	17.09	14.04	55.38	13.49
Living together	17.33	14.05	55.40	13.22
Separated / Divorced	12.22	15.64	61.20	10.94
Widow	20.08	11.50	55.13	13.29
Education Father HHH				
Father never went to school	15.98	13.74	57.68	12.61
Father went to school	15.90	12.69	60.25	11.15
Education Mother HHH				
Mother never went to school	16.00	12.77	59.93	11.29
Mother went to school	15.10	12.91	60.76	11.22
Sector HHH				
All except agriculture/fishing	12.43	10.49	69.55	7.53
Agriculture or fishing	17.43	13.79	55.86	12.92
Employment type HHH				
Farmers and fishers (all)	17.64	13.74	55.50	13.11
Regular wage	12.24	10.88	68.82	8.06
Self employed	14.04	11.85	65.28	8.83
Others	16.59	12.37	59.58	11.46

TABLE I.17: Characteristics Associated with Poverty Mobility, Synthetic Panel Estimates, Tanzania 2010–2015, Joint Probabilities

CHARACTERISTICS HHH	POOR, NON-POOR	NON-POOR, POOR	NON-POOR, NON-POOR	POOR, POOR
2. LOCATION, DEMOGRAPHIC CHARACTERISTICS AND DWELLING OWNERSHIP				
Rural/Urban				
Urban	12.68	10.21	69.81	7.30
Rural	17.03	13.68	56.63	12.67
Migration				
Never migrated	16.85	13.56	57.13	12.46
Migrated more than 5 years ago	16.68	11.93	60.42	10.97
Migrated less than 5 years ago	12.64	11.43	67.58	8.35
Region				
West	15.81	19.22	46.80	18.16
North	14.90	9.26	69.33	6.51
Central	19.40	14.52	49.33	16.75
S Highlands	18.10	12.13	59.14	10.63
South	15.24	15.25	56.85	12.66
SW Highlands	18.65	12.22	57.80	11.33
Lake	16.33	14.31	56.89	12.46
East	10.57	7.59	77.52	4.32
Zanzibar	16.24	9.90	64.39	9.47
Household Size				
4 or less HH members	16.42	12.96	58.79	11.83
5 or more HH members	14.31	12.23	63.87	9.59
Female Share in HH				
Less than 50% women	15.88	12.59	60.40	11.13
50% women or more	15.95	13.05	59.51	11.50
Dependency Ratio				
No dependents	13.35	11.15	67.19	8.31
Below 25%	15.31	10.60	64.02	10.08
Between 25% and 50%	15.57	12.22	61.61	10.61
Between 50% and 75%	16.69	14.05	56.70	12.56
Above 75%	18.07	14.52	52.85	14.56
People per room				
Less than 2 people per room	15.14	12.40	62.07	10.39
2 people per room or more	16.57	13.12	58.25	12.06
Dwelling ownership				
Does not own	11.79	11.32	69.34	7.55
Owner	16.81	13.11	57.98	12.10
Benchmark:				
Overall Population	15.91	12.79	60.02	11.29

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: Predictions obtained using population weights. N = 3529 for NPS2 and N = 3066 for NPS4. The sample includes household heads between 20 and 75 years old by the time of NPS2. Estimations based on income Model 1 (weighted) and DL methodology.

TABLE I.18: Characteristics Associated with Poverty Mobility, BM* Synthetic Panel Estimates, Tanzania 2010–2015, Joint Probabilities

CHARACTERISTICS HHH	POOR, NON-POOR	NON-POOR, POOR	NON-POOR, NON-POOR	POOR, POOR
1. Sex HHH				
Female	20.50	12.27	54.74	12.49
Male	15.21	13.87	60.93	9.98
2. Age				
Older than 45	18.77	13.06	56.31	11.86
Younger than 45	14.18	13.94	62.56	9.32
3. Literacy				
Non-Literate	22.05	17.99	38.98	20.98
Literate	14.52	12.10	66.22	7.17
4. Education				
Lower than Compl. Primary	21.04	16.82	45.05	17.09
Compl. Primary	15.41	12.74	64.42	7.44
Higher than Compl. Primary	4.44	5.68	88.87	1.01
5. Civil Status				
Never Married	9.64	5.47	81.64	3.25
Married - Monogamous	14.69	13.35	62.76	9.19
Married -Polygamous	17.96	15.91	53.97	12.16
Living together	17.06	14.96	55.37	12.60
Separated / Divorced	14.87	12.69	63.23	9.21
Widow	23.30	11.05	52.29	13.36
Benchmark:				
Overall Population	16.35	13.53	59.61	10.52

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: Predictions are obtained using population weights. N = 3529 for NPS2 and N = 3066 for NPS4. The sample includes household heads that were between 20 and 75 years old by the time of NPS2. Estimations used Model 1, BM calibration (adapted for residual weights) and simulation procedure to deal with residuals (with 1000 simulations in the simulation step) and ρ_y from NPS1–3 panel

TABLE I.19: Characteristics Associated with Poverty Mobility, Synthetic Panel Estimates, Tanzania 2010–2015, Conditional Probabilities

CHARACTERISTICS	POOR -> NON-POOR	NON-POOR -> POOR	NON-POOR-> NON-POOR	POOR -> POOR
1. CHARACTERISTICS HOUSEHOLD HEAD				
Sex HHH				
Female	55.87	18.26	81.74	44.13
Male	58.57	16.28	83.72	41.43
Age HHH				
Younger than 35	57.93	15.72	84.28	42.07
Between 36 and 50	58.12	16.95	83.05	41.88
Older than 50	57.68	17.12	82.88	42.32
Literacy HHH				
Non-Literate	46.73	30.37	69.63	53.27
Literate	64.99	13.45	86.55	35.01
Education HHH				
Lower than Compl. Primary	51.19	25.33	74.67	48.81
Compl. Primary	66.20	14.55	85.45	33.80
Higher than Compl. Primary	79.09	4.76	95.24	20.91
Civil Status HHH				
Never Married	72.63	6.80	93.20	27.37
Married - Monogamous	59.70	15.23	84.77	40.30
Married -Polygamous	55.26	19.30	80.70	44.74
Living together	56.17	19.28	80.72	43.83
Separated / Divorced	51.73	19.56	80.44	48.27
Widow	59.83	16.27	83.73	40.17

(Table Continiued on next page)

TABLE I.19: Characteristics Associated with Poverty Mobility, Synthetic Panel Estimates, Tanzania 2010–2015, Conditional Probabilities *(Continued)*

CHARACTERISTICS	POOR -> NON-POOR	NON-POOR -> POOR	NON-POOR-> NON-POOR	POOR -> POOR
Education Father HHH				
Father never went to School	55.23	18.37	81.63	44.77
Father went to School	58.20	16.52	83.48	41.80
Education Mother HHH				
Mother Never went to School	58.05	16.68	83.32	41.95
Mother went to School	56.67	16.67	83.33	43.33
Sector HHH				
All except agriculture/fishing	61.62	12.34	87.66	38.38
Agriculture or fishing	56.87	18.85	81.15	43.13
Employment type HHH				
Farmers and fishers (all)	56.82	18.90	81.10	43.18
Regular Wage	59.53	12.92	87.08	40.47
Self employed	60.81	14.52	85.48	39.19
Others	58.64	16.32	83.68	41.36
2. LOCATION, DEMOGRAPHIC CHARACTERISTICS AND DWELLING OWNERSHIP				
Rural/Urban				
Urban	62.89	12.00	88.00	37.11
Rural	56.78	18.53	81.47	43.22
Migration				
Never migrated	56.90	18.26	81.74	43.10
Migrated more than 5 years ago	59.83	15.60	84.40	40.17
Migrated less than 5 years ago	59.52	13.70	86.30	40.48
Region				
West	45.67	28.30	71.70	54.33
North	69.40	10.93	89.07	30.60
Central	53.11	21.75	78.25	46.89
S Highlands	62.74	16.04	83.96	37.26
South	53.92	20.27	79.73	46.08
SW Highlands	61.95	16.46	83.54	38.05
Lake	56.16	19.18	80.82	43.84
East	70.58	8.22	91.78	29.42
Zanzibar	62.75	12.44	87.56	37.25
Household Size				
4 or less HH members	57.55	17.17	82.83	42.45
5 or more HH members	59.25	15.23	84.77	40.75
Female Share in HH				
Less than 50% women	58.22	16.37	83.63	41.78
50% women or more	57.51	17.10	82.90	42.49
Dependency Ratio				
No dependents	61.07	13.44	86.56	38.93
Below 25%	59.75	13.39	86.61	40.25
Between 25% and 50%	58.89	15.68	84.32	41.11
Between 50% and 75%	56.45	18.94	81.06	43.55
Above 75%	54.82	20.62	79.38	45.18
People per room				
Less than 2 people per room	58.73	15.79	84.21	41.27
2 people per room or more	57.29	17.48	82.52	42.71
Dwelling ownership				
Does not own	60.20	13.27	86.73	39.80
Owner	57.58	17.53	82.47	42.42
Benchmark:				
Overall Population	57.91	16.68	83.32	42.09

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: Predictions obtained using population weights. N = 3529 for NPS2 and N = 3066 for NPS4. The sample includes household heads between 20 and 75 years old by the time of NPS2. Estimations based on income Model 1 (weighted) and DL methodology.

TABLE I.20: Characteristics Associated with Poverty Mobility, BM* Synthetic Panel Estimates, Tanzania 2010–2015. Conditional Probabilities

CHARACTERISTICS HHH	POOR -> NON-POOR	NON-POOR -> POOR	NON-POOR -> NON-POOR	POOR -> POOR
1. Sex HHH				
Female	62.15	18.31	81.69	37.85
Male	60.38	18.54	81.46	39.62
2. Age				
Older than 45	61.27	18.83	81.17	38.73
Younger than 45	60.35	18.23	81.77	39.65
3. Literacy				
Non-Literate	51.24	31.58	68.42	48.76
Literate	66.95	15.44	84.56	33.05
4. Education				
Lower than Compl. Primary	55.18	27.18	72.82	44.82
Compl. Primary	67.45	16.51	83.49	32.55
Higher than Compl. Primary	81.51	6.01	93.99	18.49
5. Civil Status				
Never Married	74.81	6.28	93.72	25.19
Married - Monogamous	61.51	17.54	82.46	38.49
Married -Polygamous	59.63	22.77	77.23	40.37
Living together	57.51	21.28	78.72	42.49
Separated / Divorced	61.74	16.72	83.28	38.26
Widow	63.56	17.45	82.55	36.44
Benchmark:				
Overall Population	60.84	18.50	81.50	39.16

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: Predictions are obtained using population weights. N = 3529 for NPS2 and N = 3066 for NPS4. The sample includes household heads that were between 20 and 75 years old by the time of NPS2. Estimations used Model 1, BM calibration (adapted for residual weights) and simulation procedure to deal with residuals (with 1000 simulations in the simulation step) and ρ_y from NPS1–3 panel.

There are arguments in favor of each of the choices (compiled in B: Individual or cohort rho?). The authors would be inclined to use the individual 2008–2012 ρ_y, while others strongly favor the cohort 2010–2014 option. As long as we use the cohort ρ_y estimated with 1-year cohorts, which is the closest to the individual panel ρ_y, practical differences are going to be from negligible to inexistent. As a compromise, The authors use that cohort rho (0.541), as long as it is mentioned explicitly that it is very similar to the panel parameter from 2008–2012, which has been done in the DL estimates presented below.

TABLE I.21: Model Selection. DL, Weighted vs. Unweighted Regressions

MODEL	AGE RANGE	BASE ROUND	WEIGHTS	PRED. POVERTY R1	ACTUAL POVERTY R1	DIFF. R1	POVERTY R2	ACTUAL POVERTY R2	DIFF. R2	DIFF. TREND
1	25-60	1	No	20.96	24.76	3.80	18.78	24.45	5.67	−1.87
1	25-60	1	Yes	26.04	24.76	−1.28	23.94	24.45	0.51	−1.79
1	25-60	2	No	20.51	24.76	4.25	19.04	24.45	5.41	−1.16
1	25-60	2	Yes	25.42	24.76	−0.66	24.00	24.45	0.45	−1.11
1	20-75	1	No	22.04	26.87	4.83	18.80	24.11	5.31	−0.48
1	20-75	1	Yes	27.20	26.87	−0.33	24.07	24.11	0.04	−0.37
1	20-75	2	No	20.73	26.87	6.14	18.82	24.11	5.29	0.85
1	20-75	2	Yes	25.45	26.87	1.42	23.81	24.11	0.30	1.12
2	25-60	1	No	22.68	24.76	2.08	21.74	24.45	2.71	−0.62
2	25-60	1	Yes	25.94	24.76	−1.18	26.23	24.45	−1.78	0.60
2	25-60	2	No	19.72	24.76	5.04	20.14	24.45	4.31	0.73
2	25-60	2	Yes	23.00	24.76	1.76	24.20	24.45	0.25	1.51
2	20-75	1	No	23.54	26.87	3.32	21.47	24.11	2.64	0.68
2	20-75	1	Yes	27.12	26.87	−0.25	26.17	24.11	−2.06	1.81
2	20-75	2	No	20.05	27.87	7.82	19.87	24.11	4.24	3.58
2	20-75	2	Yes	23.41	27.87	4.45	23.98	24.11	0.13	4.32

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: All estimates using population weights. ρ derived from ρ_y estimated from NPS 2-4 1-year cohorts for the corresponding age range. DL estimates can be obtained using NPS2 (Rd. 1) or NPS4 (Rd.2) characteristics. The "benchmark" differs minimally from the poverty rates in Table 1 due to a few dropped observations because of missing observations for the variables in the prediction model. Standard errors for the (slightly different) benchmark poverty rates can be found in Table 1.

TABLE I.22: Model Selection. Unweighted Regressions, DL vs. BM

MODEL	AGE	METHOD	POVOUT	POVIN	NEVERPOOR	BOTHPOOR	POVERTY R2	BENCHMARK
1	25-60	DL (Rd. 1)	12.92	10.74	68.29	8.04	18.78	24.45
1	25-60	DL (Rd. 2)	12.37	10.90	68.59	8.14	19.04	24.45
1	25-60	BM	15.29	11.32	63.92	9.47	20.79	24.45
1	25-60	BM*	14.22	13.29	61.95	10.54	23.83	24.45
1	20-75	DL (Rd. 1)	14.29	11.05	66.91	7.75	18.80	24.11
1	20-75	DL (Rd. 2)	13.11	11.21	68.06	7.62	18.82	24.11
1	20-75	BM	17.65	11.23	61.90	9.22	20.45	24.11
1	20-75	BM*	16.35	13.53	59.61	10.52	24.05	24.11
2	25-60	DL (Rd. 1)	13.84	12.90	64.42	8.84	21.74	24.45
2	25-60	DL (Rd. 2)	12.12	12.54	67.74	7.60	20.14	24.45
2	25-60	BM	14.94	13.01	62.23	9.82	22.83	24.45
2	25-60	BM*	14.02	14.84	60.40	10.74	25.58	24.45
2	20-75	DL (Rd. 1)	15.14	13.06	63.39	8.41	21.47	24.11
2	20-75	DL (Rd. 2)	12.92	12.74	67.21	7.13	19.87	24.11
2	20-75	BM	17.31	12.76	60.37	9.56	22.32	24.11
2	20-75	BM*	16.16	14.92	58.21	10.71	25.63	24.11

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: All estimates using population weights. ρ derived from ρ_y from NPS1-3 panel for the corresponding age range. DL estimates can be obtained using NPS2 (Rd. 1) or NPS 4 (Rd.2) characteristics. BM estimates obtained based on Round 1 characteristics. BM* estimates differ from BM estimates by taking into account residual weights in the calibration step. The "benchmark" differs minimally from the poverty rates in Table 1 due to a few dropped observations because of missing observations for the variables in the prediction model. Standard errors for the (slightly different) benchmark poverty rates can be found in Table 1.

TABLE I.23: ρ_y for Different Age Ranges, Panel estimates

AGE RANGE	ρ_y HOUSEHOLDS, NPS 1–3		
	UNWEIGHTED	WEIGHTED	N
All	0.5136	0.535	4870
20–75	0.5361	0.554	4491
25–60	0.5596	0.5724	3482

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: All coefficients are significantly different from 0 at the 1% level (verified with pwcorr, sign).

TABLE I.24: ρ_y for Different Cohort Definitions. 20–75, Pseudo-panel estimates

COHORT DEFINITION	ρ_y HOUSEHOLDS, NPS 2–4		
	WEIGHTED	UNWEIGHTED	COHORTS
Year of Birth	0.5451	0.5458	56
2 Years of Birth	0.7851	0.7807	28
3 Years of Birth	0.7939	0.7767	19

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: All coefficients are significantly different from 0 at the 1% level (verified with pwcorr, sign).

TABLE I.25: ρ_y for Different Cohort Definitions. 25–60, Pseudo-panel estimates

COHORT DEFINITION	ρ_y HOUSEHOLDS, NPS 2–4		
	WEIGHTED	UNWEIGHTED	COHORTS
Year of Birth	0.6074	0.6398	36
2 Years of Birth	0.6999	0.7219	18
3 Years of Birth	0.8279	0.8404	12

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: All coefficients are significantly different from 0 at the 1% level (verified with pwcorr, sign).

TABLE I.26: ρ_y over 2 years in Different Periods, Panel estimates

AGE RANGE	ρ_y HH, NPS 1–2		ρ_y HH, NPS 2–3	
	WEIGHTED	UNWEIGHTED	WEIGHTED	UNWEIGHTED
All	0.593	0.6159	0.6256	0.6058
20–75	0.6006	0.6222	0.6332	0.6141
25–60	0.6113	0.6409	0.6489	0.6347

Source: Authors' calculations based on NPS 2010/11 and 2014/15.
Note: All coefficients are significantly different from 0 at the 1% level (verified with pwcorr, sign).

ii. Detailed description of models and some variables

Model 1: sex, marital status, literacy, education and big region of birth of the household head.

Model 2: Additionally, whether the household lives in a rural or urban area, and whether she is indigenous to the area he/she lives in, with particular dummies for those that migrated to the North or the East.

Marital status: Same as "detailed marital status" with the exception that separated and divorced households are merged into one category.

Region of birth of the household head: Information obtained from dist_born is in individual file. This is preferred to "region where the household lives" in the income models because it's more clearly time-invariant. Initial 25/30 regions merged to the 9 DHS Geographic zones (or "big regions"- see chapter 5 of this volume and 2015/16 DHS report for details about these geographic zones). Using "big regions" is convenient not only from reasons related to estimation (higher significance, parsimony), it is as well not obvious what would be the best way to deal with new regions in NPS4 if we would use the smaller ones.

Education: Categories merged to "below primary", "some primary" (up to 6th degree), completed primary ("7th or higher"), "some lower secondary", "completed lower secondary" (Form IV as highest education), "upper secondary" (if A) or "diploma" and "university". The decision is based on checking that grades within a category had similar coefficients in the regressions, and also on a superficial look on the structure of the education system (upper secondary is split into A-levels and diploma courses).

Migrant: Use information in res_dur on whether the household has always lived in the same "district"[3]. Authors add 2 dummies for households that have moved to either the East or the North, because they are highly significant in prediction of expenditures.

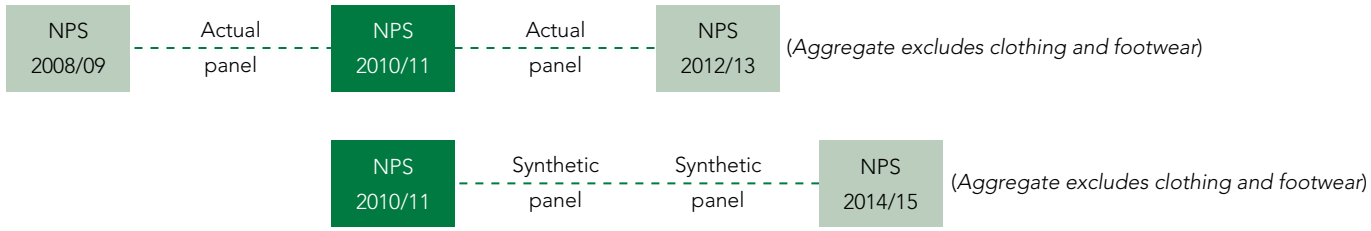
Additional material for analysis of poverty dynamics.

The first three rounds of the NPS are used to analyze poverty dynamics in Tanzania. Most of the analysis uses the balanced panel of individuals which is comprised of those who were successfully interviewed in NPS1, NPS2 and NPS3.[4] The first three rounds of the NPS tracked eligible household members between 2008 and 2012, and those who were successfully interviewed in multiple survey rounds comprise the "balanced panel" used in the analysis. The full balanced panel dataset comprises 14,464 individuals for whom there is consumption expenditure data in each of the first three rounds of the NPS. The number is slightly higher at 14,680 if the relevant restriction is that the respondent was in 2008 and 2012.[5]

Selective attrition is not a major concern when using the first three rounds of the NPS as a longitudinal dataset. Normally, one of the biggest concerns when modelling poverty dynamics using longitudinal data is selective attrition. If individuals and households exit the panel in a non-random way, then there is the possibility that results could be unreliable. Fortunately, the attrition rates in the NPS are very low

[3] Looking at the variable "district born", it seems to refer to what the household data file calls "region".
[4] This restriction is necessary for the analysis of three-round poverty status, and for the analysis of chronic versus transitory poverty.
[5] See, for example, the round 1 to round 3 transition matrices, and the regression results for poverty exit and entry between NPS1 and NPS3.

FIGURE I.16: Data and Assumptions used for Analyzing Poverty Dynamics

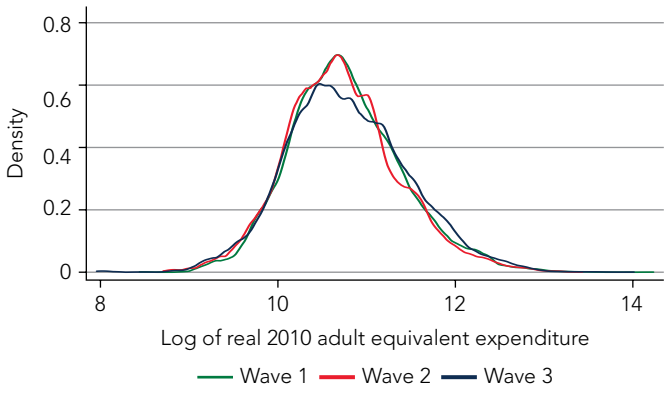


Note: Dark boxes reflect the base year under consideration.

and do not significantly bias estimates of the poverty headcount or poverty trends.[6]

NPS4, which was implemented in 2014/15, is a cross-sectional survey of households and individuals based on a new redrawn sample, and therefore cannot be used as part of a panel in the same way that 2008 to 2012 can. Figure I.16 presents a graphical description of the panel data used for the panel analysis (top graphic) and contrasts it to the structure of the data used in the NPS2 to NPS4 synthetic panel analysis (bottom graphic). There is, however, value in including NPS4 in the analysis because it can be used to provide the most recent poverty and sector cross-sectional decompositions for Tanzania. This chapter uses data following the outline in the top part of the figure – that is, households and individuals are directly linked through time.

FIGURE I.17: Kernel Density Distributions of Real Consumption Expenditure



Source: Authors' calculations based on NPS 2008/09, 2010/11, 2012/13.

Four rounds of NPS are used to analyze poverty dynamics in Tanzania. The number of rounds of data being used, and the kind of analysis being done (for example, longitudinal or cross-sectional) depends on the particular research question being addressed. In 2008 the proportion of missing data on the occupational sector of the household head is so high as to be unusable. As such, all analysis of occupational sectors uses a combination of NPS2, NPS3 and NPS4. In contrast, there is reliable data on the main source of income in the household for all four rounds of the NPS, and trends and transitions of this variable are presented over the longest possible time period.

A description of the poverty rates and population shares

Poverty rates increased significantly in rural areas, even though they were flat or fell in all other areas between 2008 and 2012. This was the case for both the full sample in each round of data, and for the 14,709 panel members who were present in the first and third rounds. Even though the share of the population living in rural areas decreased slightly from 2008 to 2012, the rise in the poverty rate in this group from 28.1 percent to 30.3 percent drove the overall aggregate increase in poverty over the period. As shown in Table I.27, the overall increase in the poverty rate was slightly higher for balanced panel members than it was for the full sample.[7]

The geographical differences in the extent of poverty were stark in 2008, and they had increased further by 2012. The poverty rate for panel members living in rural areas was 27.9 percent in 2008 and grew to 32.1 percent in 2012. This stands in contrast to a drop from 3.1 percent to 0.5 percent in Dar es Salaam, and from 29.5 percent to 21.8 percent in Zanzibar.

[6] The attrition rate between NPS1 and NPS2 was 3%, while the attrition rate between NPS2 and NPS3 was 4%.
[7] Balanced panel members are those respondents who were successfully interviewed in each of the first three rounds of the NPS.

TABLE I.27: Poverty Rates and Population Shares

	FULL SAMPLE				BALANCED PANEL MEMBERS ONLY			
	ROUND 1		ROUND 3		ROUND 1		ROUND 3	
	POV. RATE	POP. SHARE	POV. RATE	POP. SHARE	POV. RATE	POP. SHARE	POV. RATE	POP. SHARE
Dar es Salaam	3.3%	6.9%	1.0%	8.4%	3.1%	6.4%	0.5%	9.0%
	(0.003)		(0.001)		(0.003)		(0.002)	
Other Urban	11.6%	14.7%	11.8%	14.1%	11.8%	14.6%	11.1%	14.0%
	(0.007)		(0.006)		(0.008)		(0.008)	
Rural	28.1%	75.4%	30.3%	74.6%	27.9%	76.1%	32.1%	73.8%
	(0.005)		(0.004)		(0.005)		(0.006)	
Zanzibar	28.8%	2.9%	20.7%	2.9%	29.5%	2.9%	21.8%	3.2%
	(0.009)		(0.010)		(0.010)		(0.011)	
Overall	24.0%		24.9%		24.0%		26.0%	
	(0.004)		(0.003)		(0.004)		(0.004)	
N	**16 709**		**24 727**		**14 680**		**14 680**	

Source: Authors' calculations based on NPS.

TABLE I.28: Proportion of Panel Members Poor and Non-Poor, 2008 to 2010

		ROUND 2		
		NON-POOR	POOR	
	Non-poor	60.8	12.1	72.9
	Poor	14.6	12.5	27.1
Round 1		75.4	24.6	100

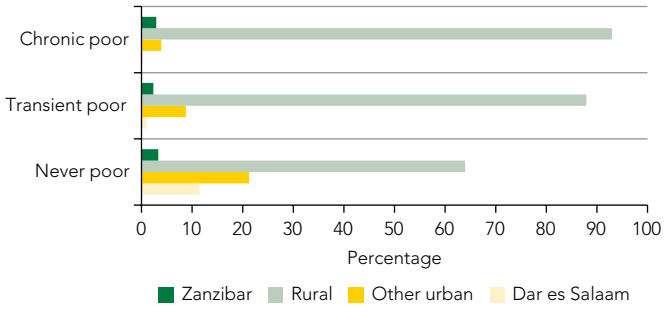
Source: Authors' calculations based on NPS.

TABLE I.29: Transition Matrix: 2010 Poverty Status Conditional On 2008 Poverty Status

		ROUND 2		
		NON-POOR	POOR	
	Non-poor	83.4	16.6	100
Round 1	Poor	53.7	46.3	100

Source: Authors' calculations based on NPS.

FIGURE I.18: Share of Chronic and Transitory Poverty by Place of Residence



Source: Authors' calculations based on NPS 2008/09, 2010/11, 2012/13.

TABLE I.30: Marginal Effects of Probit for Poverty Exit

	TRANSITIONS OUT OF POVERTY	
ROUND 1 VARIABLES	W1 TO W2	W1 TO W3
Individual		
Age	−0.000	0.001
	(0.001)	(0.001)
Male	−0.031	0.005
	(0.019)	(0.023)
Married	0.028	0.032
	(0.030)	(0.032)
Primary education	0.017	0.072**
	(0.021)	(0.029)
Secondary education	0.145**	0.083
	(0.057)	(0.061)
Other education	0.008	−0.024
	(0.059)	(0.078)
Moved district (NPS3)		0.329***
		(0.037)
Household Head		
Male household head	0.057**	-0.028
	(0.027)	(0.031)
Age of household head	−0.001	0.000
	(0.001)	(0.001)
Primary education	0.050**	−0.090***
	(0.024)	(0.029)
Secondary education	0.398***	0.240***
	(0.032)	(0.041)
Other education	0.166***	-0.064
	(0.063)	(0.075)
Household		
Number of children	−0.027***	−0.001
	(0.005)	(0.005)
Number of adults	−0.000	0.016**
	(0.006)	(0.007)
Number of elders	−0.067***	−0.014
	(0.021)	(0.026)
Other urban	−0.222***	−0.050
	(0.061)	(0.069)
Rural	−0.282***	−0.214***
	(0.051)	(0.060)
Zanzibar	−0.279***	−0.293***
	(0.056)	(0.066)

(Table Continiued on next page)

TABLE I.30: Marginal Effects of Probit for Poverty Exit *(Continued)*

	TRANSITIONS OUT OF POVERTY	
ROUND 1 VARIABLES	W1 TO W2	W1 TO W3
Main income source		
Cash crops	−0.018 (0.031)	−0.021 (0.036)
Livestock	0.303*** (0.070)	0.078 (0.083)
Business	0.135*** (0.043)	-0.170*** (0.052)
Wages	-0.056 (0.036)	0.006 (0.045)
Remittances	0.088* (0.053)	-0.119* (0.062)
Other	−0.143*** (0.050)	0.005 (0.059)
Observations	3,535	2,454

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Authors' calculations based on NPS 2010/11,2012/13 and 2014/15.

TABLE I.31: Marginal Effects of Probit for Poverty Entry

	TRANSITIONS INTO POVERTY	
ROUND 1 VARIABLES	W1 TO W2	W1 TO W3
Individual		
Age	0.000 (0.000)	−0.001* (0.000)
Male	0.002 (0.008)	0.008 (0.010)
Married	−0.023* (0.012)	0.003 (0.012)
Primary education	−0.033*** (0.010)	−0.043*** (0.014)
Secondary education	−0.071*** (0.018)	−0.113*** (0.020)
Other education	−0.086*** (0.020)	−0.089*** (0.029)
Moved district (NPS3)		−0.039*** (0.015)
Household Head		
Male household head	−0.037*** (0.011)	−0.010 (0.013)
Age of household head	0.001** (0.000)	-0.001 (0.000)
Primary education	−0.037*** (0.011)	−0.052*** (0.014)
Secondary education	−0.074*** (0.012)	−0.147*** (0.018)
Other education	−0.076*** (0.021)	−0.084*** (0.024)
Household		
Number of children	0.012*** (0.002)	0.007*** (0.002)

(Table continued on next page)

TABLE I.31: Marginal Effects of Probit for Poverty Entry *(Continued)*

	TRANSITIONS INTO POVERTY	
ROUND 1 VARIABLES	W1 TO W2	W1 TO W3
Number of adults	0.005** (0.002)	-0.011*** (0.003)
Number of elders	−0.021** (0.011)	−0.013 (0.012)
Other urban	0.062*** (0.010)	0.080*** (0.011)
Rural	0.194*** (0.009)	0.176*** (0.008)
Zanzibar	0.125*** (0.013)	0.160*** (0.016)
Main income source		
Cash crops	−0.034** (0.013)	−0.043*** (0.015)
Livestock	−0.041** (0.020)	−0.043** (0.021)
Business	−0.094*** (0.014)	−0.103*** (0.017)
Wages	−0.103*** (0.015)	−0.060*** (0.017)
Remittances	−0.106*** (0.024)	−0.059** (0.025)
Other	−0.037 (0.028)	−0.027 (0.032)
Observations	11,952	8,462

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Authors' calculations based on NPS 2010/11, 2012/13 and 2014/15.

Additional Material for Analysis of Poverty, Sectoral Mobility and Shocks

TABLE I.32: Inter-Temporal Household Income Source Composition and Transitions: 2008–2012

		INITIALLY POOR						
		2012/13						
		FOOD CROP SALES	CASH CROP SALES	LIVESTOCK SALES	BUSINESS INCOME	WAGES	REMITTANCES	OTHER
2008/9	Food crop sales	**41.1%**	6.3%	1.0%	8.1%	8.3%	1.4%	2.5%
	Cash crop sales	2.7%	**4.7%**	0.2%	1.0%	0.9%	0.0%	0.3%
	Livestock sales	0.7%	0.1%	**0.5%**	0.2%	0.0%	0.1%	0.0%
	Business income	1.4%	0.4%	0.1%	**2.7%**	0.8%	0.2%	0.4%
	Wages	2.5%	0.4%	0.4%	0.9%	**2.5%**	0.0%	0.1%
	Remittances	0.8%	0.2%	0.4%	0.5%	0.6%	**0.2%**	0.1%
	Other	1.0%	0.2%	0.0%	0.8%	0.7%	0.1%	**1.6%**
		INITIALLY NON-POOR						
		2012/13						
2008/9	Food crop sales	**27.1%**	4.9%	1.5%	5.2%	5.5%	1.5%	1.1%
	Cash crop sales	4.0%	**2.8%**	0.6%	0.9%	0.4%	0.2%	0.3%
	Livestock sales	1.3%	0.2%	**1.4%**	0.5%	0.5%	0.2%	0.0%
	Business income	3.3%	1.3%	0.1%	**8.9%**	2.6%	0.5%	0.5%
	Wages	2.2%	0.4%	0.0%	4.0%	**8.9%**	0.3%	0.3%
	Remittances	1.2%	0.1%	0.1%	0.9%	0.7%	**0.8%**	0.1%
	Other	0.4%	0.2%	0.1%	0.7%	0.7%	0.1%	**0.4%**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.33: Household Income Source Transition Matrices Conditional on Initial Poverty Status: 2008–2012

		INITIALLY POOR							
		2012/13							
		FOOD CROP SALES	CASH CROP SALES	LIVESTOCK SALES	BUSINESS INCOME	WAGES	REMIT.	OTHER	
2008/9	Food crop sales	**59.8%**	9.2%	1.4%	11.9%	12.1%	2.1%	3.6%	***100***
	Cash crop sales	27.7%	**47.3%**	2.4%	10.4%	8.8%	0.0%	3.4%	***100***
	Livestock sales	47.6%	3.3%	**31.9%**	9.8%	0.0%	7.4%	0.0%	***100***
	Business income	22.9%	6.5%	2.3%	**45.6%**	13.8%	2.5%	6.4%	***100***
	Wages	37.0%	5.6%	5.5%	13.0%	**37.9%**	0.0%	1.0%	***100***
	Remittances	29.0%	6.5%	13.6%	17.8%	21.8%	**7.5%**	3.8%	***100***
	Other	22.8%	4.4%	0.0%	18.6%	16.6%	1.1%	**36.4%**	***100***
		INITIALLY NON-POOR							
		2012/13							
2008/9	Food crop sales	**57.9%**	10.5%	3.3%	11.0%	11.7%	3.2%	2.4%	***100***
	Cash crop sales	43.8%	**31.0%**	6.0%	9.3%	4.5%	1.9%	3.5%	***100***
	Livestock sales	30.6%	4.4%	**33.4%**	12.7%	12.7%	5.6%	0.6%	***100***
	Business income	19.3%	7.4%	0.6%	**51.7%**	15.3%	3.0%	2.8%	***100***
	Wages	13.7%	2.6%	0.1%	24.7%	**55.3%**	2.0%	1.7%	***100***
	Remittances	30.4%	1.3%	2.5%	23.1%	18.1%	**21.2%**	3.4%	***100***
	Other	15.9%	8.2%	2.6%	26.1%	28.7%	4.0%	**14.5%**	***100***

Source: Authors' calculations based on NPS.

TABLE I.34: Marginal Effects of Probit Regressions on Poverty Status, 2010, 2012 and 2015

VARIABLES	(1) POOR NPS2	(2) POOR NPS3	(3) POOR NPS4
Industry	−0.138***	−0.167***	−0.116***
	(0.046)	(0.032)	(0.038)
Services	−0.132***	−0.147***	−0.162***
	(0.027)	(0.024)	(0.026)
Other/unknown	−0.111***	−0.050	−0.117***
	(0.030)	(0.035)	(0.036)
HHH age	0.000	−0.001	0.001
	(0.001)	(0.001)	(0.001)
HHH male	−0.089**	−0.036	−0.030
	(0.035)	(0.032)	(0.031)
HHH married	0.020	−0.016	0.008
	(0.036)	(0.032)	(0.033)
HHH primary	−0.097***	−0.035	−0.132***
	(0.026)	(0.023)	(0.027)
HHH secondary	−0.254***	−0.190***	−0.196***
	(0.033)	(0.031)	(0.041)
Number children	0.019***	0.024***	0.026***
	(0.005)	(0.005)	(0.005)
Number adults	0.011*	−0.001	−0.003
	(0.006)	(0.007)	(0.007)
Number elders	0.045*	0.018	−0.012
	(0.023)	(0.022)	(0.029)
Other urban	0.116***	0.150***	0.115***
	(0.030)	(0.026)	(0.037)
Rural	0.232***	0.231***	0.165***
	(0.024)	(0.016)	(0.030)
Zanzibar	0.231***	0.269***	0.111***
	(0.035)	(0.035)	(0.039)
Observations	3,828	4,687	3,276

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Authors' calculations based on NPS 2010/11, 2012/13 and 2014/15.
Base categories: Agricultural household, household head has no education, household is located in Dar es Salaam.

TABLE I.35: Marginal Effects of A Probit Regression on Poverty Status In 2012 Conditional On 2010 Baseline Variables

VARIABLES	(1) ALL	(2) INITIALLY POOR	(3) INITIALLY NON-POOR
HHH changed sector	−0.084***	−0.183**	−0.033
	(0.032)	(0.078)	(0.031)
HHH age	−0.001	−0.003	−0.000
	(0.001)	(0.002)	(0.001)
HHH male	0.016	0.097	0.017
	(0.040)	(0.084)	(0.042)
HHH married	−0.047	−0.139	−0.027
	(0.041)	(0.089)	(0.043)
HHH primary	−0.079***	0.001	−0.081**
	(0.029)	(0.054)	(0.032)
HHH secondary	−0.263***	−0.191	−0.205***
	(0.032)	(0.135)	(0.033)
HHH other edu	−0.188***	0.035	−0.171***
	(0.049)	(0.182)	(0.045)
Number children	0.021***	0.021*	0.016***
	(0.006)	(0.012)	(0.005)
Number adults	−0.017**	−0.035**	−0.015**
	(0.007)	(0.014)	(0.007)
Number elders	0.016	0.017	0.003
	(0.030)	(0.053)	(0.027)
Other urban	0.095***	0.016	0.063***
	(0.024)	(0.244)	(0.016)
Rural	0.260***	0.089	0.193***
	(0.017)	(0.221)	(0.014)
Zanzibar	0.280***	0.247	0.191***
	(0.039)	(0.239)	(0.035)
Moved district	−0.055	−0.212**	0.001
	(0.036)	(0.092)	(0.034)
Observations	2,920	587	2,333

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1
Source: Authors' calculations based on NPS 2010/11 and 2012/13.
Base categories: Agricultural household, household head has no education, household is located in Dar es Salaam.

i. Transitions in Employment Type

TABLE I.36: Transitions in Employment Type Between W2 and W3 (Whole Sample)

	WAVE 3						
WAVE 2	PAID EMPLOYEE	NON-AG SELF EMPLOYED	NON-AG UNPAID WORKER	AG SELF-EMPLOYED	AG UNPAID WORKER	UNPAID APPRENTICE	TOTAL
Paid Employee	6.7	1.7	0.2	1.8	1.2	0.1	11.6
Non-Ag Self Employed	2.0	7.0	0.4	2.3	2.0	0.0	13.6
Non-Ag Unpaid Worker	1.1	0.9	0.9	0.8	4.2	0.1	8.1
Ag Self-Employed	3.7	3.0	0.4	18.8	9.5	0.1	35.4
Ag Unpaid Worker	4.0	2.1	1.0	7.7	16.4	0.1	31.3
Total	**17.4**	**14.7**	**2.8**	**31.3**	**33.3**	**0.4**	**100.0**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.37: Transitions in Employment Type Between W2 and W3 (Escaped Poverty)

	WAVE 3						
WAVE 2	PAID EMPLOYEE	NON-AG SELF EMPLOYED	NON-AG UNPAID WORKER	AG SELF-EMPLOYED	AG UNPAID WORKER	UNPAID APPRENTICE	TOTAL
Paid Employee	1.7	0.6	0.2	1.9	0.9	0.0	5.3
Non-Ag Self Employed	0.7	2.8	0.1	1.3	2.3	0.0	7.0
Non-Ag Unpaid Worker	0.5	0.3	0.0	1.5	5.2	0.2	7.8
Ag Self-Employed	4.1	2.4	0.2	19.6	10.9	0.0	37.2
Ag Unpaid Worker	5.6	3.5	0.8	10.7	21.7	0.3	42.7
Total	**12.7**	**9.6**	**1.3**	**35.1**	**40.9**	**0.5**	**100.0**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.38: Transitions in Employment Type Between W2 and W3 (Entered Poverty)

	WAVE 3						
WAVE 2	PAID EMPLOYEE	NON-AG SELF EMPLOYED	NON-AG UNPAID WORKER	AG SELF-EMPLOYED	AG UNPAID WORKER	UNPAID APPRENTICE	TOTAL
Paid Employee	2.5	0.8	0.0	2.2	2.1	0.0	7.6
Non-Ag Self Employed	0.6	2.7	0.6	1.7	2.8	0.0	8.3
Non-Ag Unpaid Worker	0.8	0.9	0.6	0.9	4.0	0.1	7.3
Ag Self-Employed	4.9	2.5	0.3	24.2	11.4	0.0	43.3
Ag Unpaid Worker	3.7	0.8	1.3	7.4	20.3	0.0	33.5
Total	**12.4**	**7.7**	**2.8**	**36.4**	**40.6**	**0.1**	**100.0**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.39: Transitions in Employment Type Between W2 and W3 (Trapped in Poverty)

	WAVE 3						
WAVE 2	PAID EMPLOYEE	NON-AG SELF EMPLOYED	NON-AG UNPAID WORKER	AG SELF-EMPLOYED	AG UNPAID WORKER	UNPAID APPRENTICE	TOTAL
Paid Employee	1.5	0.1	0.2	0.8	1.6	0.0	4.1
Non-Ag Self Employed	0.8	1.1	0.1	1.3	0.5	0.0	3.7
Non-Ag Unpaid Worker	0.7	0.6	0.4	0.4	4.4	0.0	6.6
Ag Self-Employed	4.1	3.0	0.2	23.0	14.0	0.0	44.4
Ag Unpaid Worker	5.7	0.7	1.4	8.7	24.7	0.0	41.2
Total	**12.8**	**5.5**	**2.4**	**34.1**	**45.3**	**0.0**	**100.0**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.40: Transitions in Employment Type Between W2 and W3 (Never Poor)

	WAVE 3						
WAVE 2	PAID EMPLOYEE	NON-AG SELF EMPLOYED	NON-AG UNPAID WORKER	AG SELF-EMPLOYED	AG UNPAID WORKER	UNPAID APPRENTICE	TOTAL
Paid Employee	9.7	2.4	0.2	1.8	1.0	0.1	15.2
Non-Ag Self Employed	2.8	10.1	0.5	2.9	2.0	0.0	18.3
Non-Ag Unpaid Worker	1.3	1.2	1.3	0.7	4.0	0.1	8.6
Ag Self-Employed	3.1	3.3	0.5	16.7	7.8	0.1	31.5
Ag Unpaid Worker	3.3	2.3	0.9	6.9	12.9	0.1	26.4
Total	**20.3**	**19.2**	**3.4**	**28.9**	**27.8**	**0.5**	**100.0**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

ii. Sector Transitions

TABLE I.41: Transition Matrix for Sector of Employment Between W2 and W3 (Whole Sample)

WAVE 2	WAVE 3									
SECTOR OF EMPLOYMENT	AGRIC. & FISHING	MINING	MANUFAC-TURING	ELECT. AND UTILITIES	CONSTR.	TRADE	TRANSP., STORAGE, COM.	FINANCE, INSUR., REAL ESTATE	OTHER SERVICES	TOTAL
Agriculture & fishing	66.3	0.4	1.0	0.0	0.6	4.9	1.0	0.0	0.8	74.9
Mining	0.3	0.4	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.9
Manufacturing	0.7	0.0	1.0	0.0	0.1	0.5	0.2	0.0	0.1	2.6
Electricity and utilities	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2
Construction	0.4	0.0	0.1	0.0	0.2	0.1	0.2	0.0	0.1	1.0
Trade	4.1	0.3	0.5	0.0	0.2	4.7	1.0	0.0	0.6	11.5
Transport, storage, communication	0.6	0.0	0.1	0.0	0.1	0.8	1.8	0.1	0.2	3.7
Finance, insurance, real estate	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Other Services	1.5	0.0	0.2	0.0	0.1	0.5	0.2	0.1	2.5	5.2
Total	**73.9**	**1.1**	**2.9**	**0.1**	**1.4**	**11.7**	**4.3**	**0.3**	**4.4**	**100**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.42: Transition Matrix for Sector of Employment Between W2 and W3 (Escaped Poverty)

WAVE 2	WAVE 3									
SECTOR OF EMPLOYMENT	AGRIC. & FISHING	MINING	MANUFAC-TURING	ELECT. AND UTILITIES	CONSTR.	TRADE	TRANSP., STORAGE, COM.	FINANCE, INSUR., REAL ESTATE	OTHER SERVICES	TOTAL
Agriculture & fishing	77.5	0.7	2.0	0.0	0.4	5.3	0.7	0.1	0.9	87.5
Mining	0.7	0.6	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.4
Manufacturing	0.4	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.6
Electricity and utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3
Trade	4.7	0.2	0.0	0.0	0.1	1.3	0.2	0.0	0.0	6.5
Transport, storage, communication	0.5	0.0	0.1	0.0	0.0	0.3	0.3	0.0	0.0	1.1
Finance, insurance, real estate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Services	1.9	0.1	0.2	0.0	0.1	0.3	0.0	0.0	0.2	2.7
Total	**85.8**	**1.5**	**2.3**	**0.0**	**0.6**	**7.4**	**1.2**	**0.1**	**1.1**	**100**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.43: Transition Matrix for Sector of Employment Between W2 and W3 (Entered Poverty)

WAVE 2	WAVE 3									
SECTOR OF EMPLOYMENT	AGRIC. & FISHING	MINING	MANUFAC-TURING	ELECT. AND UTILITIES	CONSTR.	TRADE	TRANSP., STOR-AGE, COM.	FINANCE, INSUR., REAL ESTATE	OTHER SERVICES	TOTAL
Agriculture & fishing	82.7	0.0	0.6	0.0	0.8	2.9	0.2	0.0	0.6	87.7
Mining	0.2	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.4
Manufacturing	0.8	0.0	0.4	0.0	0.0	0.0	0.3	0.0	0.0	1.4
Electricity and utilities	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.9	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	1.1
Trade	3.4	0.0	0.1	0.0	0.2	3.3	0.0	0.0	0.0	6.9
Transport, storage, communication	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.6
Finance, insurance, real estate	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Other Services	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.4	1.6
Total	**89.2**	**0.0**	**1.3**	**0.0**	**1.1**	**6.4**	**0.6**	**0.2**	**1.3**	**100**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.44: Transition Matrix for Sector of Employment Between W2 and W3 (Trapped in Poverty)

WAVE 2	WAVE 3						
SECTOR OF EMPLOYMENT	AGRICULTURE & FISHING	MANUFACT.	CONSTR.	TRADE	TRANSPORT, STORAGE, AND COM.	OTHER SERVICES	TOTAL
Agriculture & fishing	87.7	0.3	0.7	4.0	0.6	0.2	93.6
Manufacturing	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Construction	0.3	0.0	0.0	0.0	0.0	0.0	0.3
Commerce	2.7	0.2	0.0	1.6	0.4	0.2	5.0
Transport, storage, com.	0.4	0.1	0.0	0.1	0.0	0.0	0.6
Other Services	0.4	0.0	0.0	0.0	0.0	0.0	0.5
Total	**91.6**	**0.6**	**0.7**	**5.7**	**1.0**	**0.4**	**100.0**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.45: Transition Matrix for Sector of Employment Between W2 and W3 (Never Poor)

WAVE 2	WAVE 3									
SECTOR OF EMPLOYMENT	AGRIC. & FISHING	MINING	MANU-FACTURING	ELECT. AND UTILITIES	CONSTR.	TRADE	TRANSP., STORAGE, COM.	FINANCE, INSUR., REAL ESTATE	OTHER SERVICES	TOTAL
Agriculture & fishing	56.1	0.4	1.0	0.0	0.5	5.3	1.2	0.0	1.0	65.6
Mining	0.3	0.4	0.0	0.0	0.0	0.2	0.0	0.1	0.0	1.1
Manufacturing	1.0	0.0	1.5	0.0	0.1	0.8	0.2	0.0	0.2	3.8
Electricity and utilities	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.2
Construction	0.3	0.0	0.1	0.0	0.4	0.1	0.3	0.0	0.1	1.2
Trade	4.3	0.5	0.7	0.0	0.3	6.5	1.5	0.0	1.0	14.9
Transport, storage, communication	0.8	0.0	0.1	0.0	0.1	1.3	2.8	0.1	0.3	5.6
Finance, insurance, real estate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Other Services	1.6	0.0	0.4	0.0	0.2	0.8	0.3	0.1	3.9	7.4
Total	**64.5**	**1.4**	**3.7**	**0.2**	**1.8**	**15.0**	**6.4**	**0.4**	**6.5**	**100**

Source: Authors' calculations based on NPS 2010/11 and 2012/13.

TABLE I.46: Poverty Transition and Change in Hours Worked by Sector

		WHOLE SAMPLE		
SECTOR	WAVE 2 MEAN HOURS	WAVE 3 MEAN HOURS	DIFFERENCE	
Agriculture & fishing	557	692	135	***
Mining	1328	2032	704	***
Manufacturing	1591	2041	450	***
Electricity and Utilities	2699	1954	-745	***
Construction	1318	1461	142	
Trade	1076	1857	781	**
Transport, storage, communications	1744	2512	768	
Finance, Insurance, real estate	1422	2737	1315	**
Other Services	1818	2295	477	***
Total	**739**	**1053**	**314**	
		POOR-POOR		
SECTOR	WAVE 2 MEAN HOURS	WAVE 3 MEAN HOURS	DIFFERENCE	
Agriculture & fishing	548	668	119	
Manufacturing	6	2040	2033	
Construction	523	605	82	
Trade	1061	1433	371	
Transport, storage	81	1860	1779	
Services	603	1736	1133	
Total	**561**	**738**	**177**	

(Table Continiued on next Page)

TABLE I.46: Poverty Transition and Change in Hours Worked by Sector *(Continued)*

NON-POOR - NON-POOR			
SECTOR	**WAVE 2 MEAN HOURS**	**WAVE 3 MEAN HOURS**	**CHANGE**
Agriculture & fishing	572	717	145
Mining	1594	2197	603
Manufacturing	1594	2091	497
Electricity & utilities	2702	1954	-748
Construction	1392	1689	297
Trade	1082	1970	888
Transport, storage	1717	2572	855
Finance, insurance	1580	2864	1285
Services	1902	2331	429
Total	**844**	**1236**	**392**
POOR-NON-POOR			
SECTOR	**WAVE 2 MEAN HOURS**	**WAVE 3 MEAN HOURS**	**CHANGE**
Agriculture & fishing	533	669	137
Mining	530	1449	919
Manufacturing	1123	1684	561
Electricity & utilities	1540	1920	380
Construction	2086	664	-1422
Trade	726	1442	716
Transport, storage	2191	2519	328
Finance, insurance	0	2806	2806
Services	1026	1827	801
Total	**575**	**801**	**226**
NON-POOR-POOR			
SECTOR	**WAVE 2 MEAN HOURS**	**WAVE 3 MEAN HOURS**	**CHANGE**
Agriculture & fishing	545	657	111
Mining	96	1689	1593
Manufacturing	997	577	-420
Construction	1103	1506	403
Trade	1474	2326	853
Transport, storage	1288	1440	152
Finance, insurance		224	224
Services	1305	2037	732
Total	**608**	**747**	**139**

iii. Transitions in Types of Agricultural Work

TABLE I.47: Transitions Between Types of Agricultural Work (Whole Sample)

WAVE 2	**WAVE 3**				
	CROP	**LIVESTOCK**	**MIXED**	**OTHER**	**TOTAL**
Crop	19.6	0.6	9.1	3.5	32.8
Livestock	0.8	0.8	1.2	0.4	3.2
Mixed	15.4	0.8	32.5	2.4	51.1
Other	6.2	0.7	3.0	3.0	12.9
Total	**41.9**	**2.9**	**45.8**	**9.4**	**100.0**

TABLE I.48: Transitions Between Types of Agricultural Work (Escaped Poverty)

WAVE 2	WAVE 3				
	Crop	Livestock	Mixed	Other	Total
Crop	18.9	1.4	9.4	3.8	**33.5**
Livestock	0.6	1.6	1.8	0.2	**4.2**
Mixed	14.9	0.6	30.2	1.9	**47.5**
Other	6.9	0.7	3.2	4.1	**14.8**
Total	**41.3**	**4.2**	**44.6**	**9.9**	**100.0**

TABLE I.49: Transitions Between Types of Agricultural Work (Entered Poverty)

WAVE 2	WAVE 3				
	CROP	LIVESTOCK	MIXED	OTHER	TOTAL
Crop	18.1	0.4	10.4	3.5	**32.4**
Livestock	0.6	0.6	0.4	0.4	**2.0**
Mixed	16.9	0.8	33.2	2.2	**53.0**
Other	6.9	0.5	3.0	2.3	**12.7**
Total	**42.5**	**2.2**	**47.0**	**8.4**	**100.0**

TABLE I.50: Transitions Between Types of Agricultural Work (Trapped in Poverty)

WAVE 2	WAVE 3				
	CROP	LIVESTOCK	MIXED	OTHER	TOTAL
Crop	27.4	0.1	7.5	3.9	**39.0**
Livestock	1.1	0.0	1.2	0.3	**2.7**
Mixed	16.8	0.6	24.8	3.5	**45.8**
Other	7.2	0.2	1.7	3.4	**12.5**
Total	**52.6**	**1.0**	**35.3**	**11.2**	**100.0**

TABLE I.51: Transitions Between Types of Agricultural Work (Non-poor Non-Poor)

WAVE 2	WAVE 3				
	CROP	LIVESTOCK	MIXED	OTHER	TOTAL
Crop	17.7	0.6	9.2	3.2	**30.7**
Livestock	0.7	0.8	1.3	0.5	**3.3**
Mixed	14.6	0.9	35.8	2.4	**53.6**
Other	5.4	1.0	3.2	2.8	**12.4**
Total	**38.4**	**3.2**	**49.4**	**8.9**	**100.0**

TABLE I.52: Shocks Experienced in Wave 2

POVERTY STATES	PERCENTAGE OF HOUSEHOLDS EXPERIENCING A SHOCK	MEDIAN NUMBER OF SHOCKS EXPERIENCED BY HOUSEHOLDS	MEAN NUMBER OF SHOCKS EXPERIENCED BY HOUSEHOLD
PP	86%	2.0	3.1
NN	85%	3.0	3.1
PN	84%	2.0	3.0
NP	87%	3.0	3.1
Total	**85%**	**3.0**	**3.1**

TABLE I.53: Shocks Experienced in Wave 3

POVERTY STATES	PERCENTAGE OF HOUSEHOLDS EXPERI-ENCING A SHOCK	MEDIAN NUMBER OF SHOCKS EXPERIENCED BY HOUSEHOLDS	MEAN NUMBER OF SHOCKS EXPERIENCED BY HOUSEHOLD
PP	84%	2	2.4
NN	79%	2	2.5
PN	83%	3	2.7
NP	79%	2	2.6
Total	**81%**	**2**	**2.5**

TABLE I.54: Poverty Transitions and Exposure to Shocks in Wave 2

SHOCK TYPE	PP	NN	PN	NP	TOTAL
Drought or flood	38%	27%	33%	31%	30%
Crop disease or crop pests	33%	27%	33%	32%	29%
Livestock died or were stolen	27%	24%	26%	28%	25%
Household business failure, non-agricultural	1%	7%	4%	3%	5%
Loss of salaried employment or non-payment of salary	0%	4%	2%	2%	3%
Large fall in sale prices for crops	32%	29%	29%	30%	30%
Large rise in price of food	50%	53%	47%	51%	52%
Large rise in agricultural input prices	23%	28%	23%	32%	27%
Severe water shortage	29%	33%	30%	34%	32%
Loss of land	5%	5%	4%	5%	5%
Chronic/severe illness or accident of household member	11%	7%	6%	9%	8%
Death of a member of household	16%	11%	15%	11%	12%
Death of other family member	28%	34%	32%	28%	32%
Break-up of household	5%	5%	5%	6%	5%
Jailed	0%	1%	0%	1%	1%
Fire	3%	2%	3%	2%	2%
Hijacking/robbery/burglary/assault	6%	10%	7%	5%	8%
Dwelling damaged, destroyed	0%	0%	0%	1%	0%
Other	1%	3%	1%	1%	2%
N	**898**	**5252**	**1163**	**904**	**8217**

TABLE I.55: Poverty Transitions and Exposure to Shocks in Wave 3

SHOCK TYPE	PP	NN	PN	NP	TOTAL
Drought or flood	35%	27%	37%	36%	31%
Crop disease or crop pests	20%	19%	22%	27%	21%
Livestock died or were stolen	16%	17%	19%	18%	17%
Household business failure, non-agricultural	2%	5%	2%	3%	4%
Loss of salaried employment or non-payment of salary	1%	3%	2%	1%	2%
Large fall in sale prices for crops	19%	20%	25%	23%	21%
Large rise in price of food	56%	47%	45%	50%	48%
Large rise in agricultural input prices	26%	21%	27%	24%	23%
Severe water shortage	18%	23%	27%	22%	23%
Loss of land	7%	3%	5%	4%	4%
Chronic/severe illness or accident of household member	6%	7%	7%	6%	7%
Death of a member of household	12%	8%	11%	9%	9%
Death of other family member	16%	31%	29%	27%	29%
Break-up of household	4%	5%	5%	3%	4%
Jailed	1%	0%	1%	0%	0%
Fire	1%	1%	1%	2%	1%
Hijacking/robbery/burglary/assault	3%	8%	5%	3%	6%
Dwelling damaged, destroyed	0%	1%	1%	0%	1%
Other	3%	5%	2%	2%	4%
N	**898**	**5,250**	**1,165**	**903**	**8,216**

TABLE I.56: Transitions across consumption quintiles

WHOLE POPULATION

WAVE 2 QUINTILE	WAVE 3 QUINTILE					
	1	2	3	4	5	Total
1	8.0	5.6	3.3	2.4	0.8	20.1
2	5.7	5.5	4.6	3.2	1.0	20.0
3	3.8	5.0	5.4	4.0	1.9	20.0
4	1.7	3.3	5.4	5.8	3.9	20.0
5	0.6	0.9	2.0	4.7	11.8	20.0
Total	**19.7**	**20.2**	**20.7**	**20.1**	**19.3**	**100.0**

PP

WAVE 2 QUINTILE	WAVE 3 QUINTILE					
	1	2	3	4	5	TOTAL
1	65.2	13.9	0.0	0.0	0.0	79.0
2	16.6	4.4	0.0	0.0	0.0	21.0
3	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0
Total	**81.7**	**18.3**	**0.0**	**0.0**	**0.0**	**100.0**

NN

WAVE 2 QUINTILE	WAVE 3 QUINTILE					
	1	2	3	4	5	Total
1	0.0	0.0	0.0	0.0	0.0	0.0
2	0.0	4.6	4.3	3.6	1.3	13.9
3	0.0	7.0	8.8	6.6	3.1	25.5
4	0.0	4.4	8.8	9.5	6.3	29.0
5	0.0	1.2	3.3	7.8	19.3	31.6
Total	**0.0**	**17.2**	**25.3**	**27.5**	**30.1**	**100.0**

PN

WAVE 2 QUINTILE	WAVE 3 QUINTILE					
	1	2	3	4	5	TOTAL
1	0.0	25.7	22.0	15.6	5.4	68.7
2	0.0	10.0	13.3	6.6	1.5	31.3
3	0.0	0.0	0.0	0.0	0.0	0.0
4	0.0	0.0	0.0	0.0	0.0	0.0
5	0.0	0.0	0.0	0.0	0.0	0.0
Total	**0.0**	**35.7**	**35.2**	**22.2**	**6.9**	**100.0**

NP

WAVE 2 QUINTILE	WAVE 3 QUINTILE					
	1	2	3	4	5	TOTAL
1	0.0	0.0	0.0	0.0	0.0	0.0
2	30.9	5.1	0.0	0.0	0.0	35.9
3	31.7	6.2	0.0	0.0	0.0	37.9
4	14.1	5.6	0.0	0.0	0.0	19.7
5	5.0	1.5	0.0	0.0	0.0	6.5
Total	**81.7**	**18.3**	**0.0**	**0.0**	**0.0**	**100.0**

TABLE I.57: Change in Consumption between Wave 2 and Wave 3

POVERTY STATE	MEAN CHANGE IN CONSUMPTION	MEDIAN CHANGE IN CONSUMPTION	MINIMUM	MAXIMUM	STANDARD DEVIATION
PP	5201	5227	−19223	29117	9328
NN	26812	16430	−452529	804593	62146
PN	41160	31582	8777	371165	33306
NP	−17762	−14102	−250715	6533	18835
Total	**21042**	**12782**	**-452529**	**804593**	**53465**

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