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BOTSWANA POVERTY ASSESSMENT

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Poverty Global Practice
Africa Region

BOTSWANA POVERTY ASSESSMENT

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ABBREVIATIONS AND ACRONYMS

AIDS	Acquired Immune Deficiency Syndrome
ASSP	Agriculture Services Support Project
BOTA	Botswana Training Authority
BPC	Botswana Power Corporation
BPOPF	Botswana Public Officers Pension Fund
CCT	Conditional Cash Transfers
CSO	Central Statistics Office
CWIS	Core Welfare Indicators Survey
EA	Enumeration Areas
EDD	Economic Diversification Drive
FSG	Family Support Grant
GDP	Gross Domestic Product
GER	Gross Enrollment Ratio
GHI	Global Hunger Index
GIC	Growth Incidence Curve
HIES	Household Income and Expenditure Survey
HIV	Human Immune-deficiency Virus
HPV	Human Papilloma Virus
IEA	International Energy Agency
IFPRI	International Food Policy Research Institute
ILO	International Labor Organization
ISPAAD	Integrated Support Programme for Arable Agricultural Development
LFS	Labor Force Surveys
LPG	Liquid Petroleum Gas
MESD	Ministry of Education and Skills Development
MOA	Ministry of Agriculture
MDG	Millenium Development Goal
MLGRD	Ministry of Local Government and Rural Development
MMR	Maternal Mortality Rate
MoESD	Ministry of Education and Skills Development
MTHS	Multi-Topic Household Survey
NCD	Non-Communicable Diseases
NCWI	National Core Welfare Indicators
NDP	National Development Plan
NER	Net Enrollment Rate
NIES	National Income and Expenditure Survey
OAP	Old Age Pension
OCP	Oral Care Program

PDL	Poverty Datum Line
PHC	Population and Housing Census
PMT	Proxy-Means Test
PMTCT	Prevention of Mother-to-Child Transmission
PPP	Purchasing Power Parity
PTC	Poverty Trace Curve
SACU	Southern African Customs Union
SB	Statistics Botswana
SSA	sub-Saharan Africa
SSU	Secondary Sampling Units
STEM	Science, Technology, Engineering and Mathematics
TEGER	Tertiary Education Gross Enrollment Rate
TR1	First Threshold
TICI	Transparency International's Corruption Index
TR2	Second Threshold
TR3	Third Threshold
TVET	Technical and Vocational Education and Training
UMIC	Upper Middle Income countries
UNDP	United Nations Development Program
USD	US Dollar
VDC	Village Development Committee
VGFP	Vulnerable Groups Feeding Program
VIP	Ventilated Improved Pit
WDC	Ward Development Committee
WDI	World Development Indicators
WEF	World Economic Forum
WHO	World Health Organization

Vice President	:	Makhtar Diop
Country Director	:	Asad Alam
Senior Director	:	Ana L. Revenga
Practice Manager	:	Pablo Fajnzylber
Task Team Leader	:	Victor Sulla

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Acknowledgements

This report was prepared by a core team comprising Victor Sulla (task team leader), Precious Zikhali, Alvin Etang Ndip, Aibek Uulu, Cornelia M. Tesliuc, Sheila Dutta, Edit V. Velenyi, Adana Chukwuma (consultant), Xiaonan Cao, Thomas Farole, Giovanni Vecchi (University of Rome, Italy), Nicola Amendola (University of Rome, Italy), Marina Sorrentino (National Institute of Statistics, Italy), Jann Lay (University of Goettingen), and Timothy Heleniak (University of Maryland).

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Executive Summary

Introduction

1. **Botswana's macroeconomic achievements are truly remarkable**. From independence in 1966 to the late 1990s, Botswana was one of the world's fastest-growing economies, comparable only to China, with average annual GDP growth above 10 percent. Although Botswana's economic growth slowed in the 2000s, stability has been maintained thanks to sustainable macroeconomic and fiscal policies. Botswana has repeatedly been the top African performer in the majority of the governance indicators produced by the World Bank and other international organizations.

2. **Despite its history of strong growth, the country remains highly reliant on diamonds.** Although the government of Botswana has invested diamond revenues with a view to improving infrastructure, health, and education, the country's private sector remains relatively weak, leaving the economy overly dependent on the state. Moreover, economic achievements have not been equally shared, and Botswana continues to be among the most unequal countries in the world. The high reliance on minerals and the public sector has made the economy vulnerable to external shocks, as exemplified by the impact of the recent global economic crises. Despite these challenges, however, Botswana has made impressive achievements in poverty reduction over the last decade. With adequate macro and social policies, and a strong focus on improving equity, Botswana has a historical opportunity to build on recent achievements and move towards eradicating extreme poverty within one generation.

3. **This report analyzes recent trends in the monetary and nonmonetary aspects of poverty in Botswana, based on two nationally representative household income and expenditure surveys conducted by Statistics Botswana in 2002/03 and 2009/10.** The study examines the drivers of poverty reduction by systematically looking at the demographic, labor, and human capital dimensions of poverty. The report also discusses cross-cutting policy issues relevant to reducing poverty in Botswana.

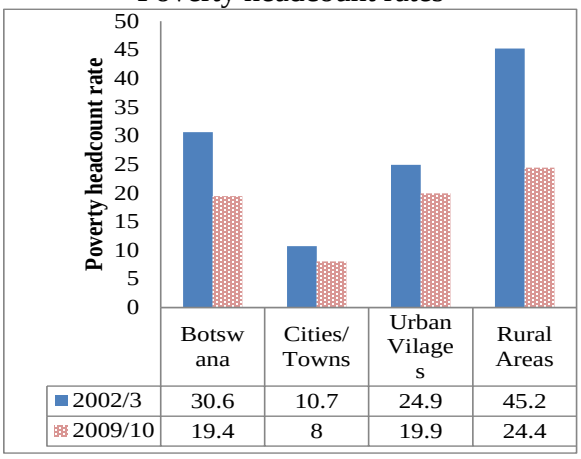
Key findings on poverty, inequality, and shared prosperity in Botswana

4. **Real consumption per capita increased 13.3 percent nationwide between 2002/3 and 2009/10**, **with much larger gains observed in rural areas.** Real consumption per capita rose 47.6 percent in rural areas, with the most significant increases in the rural North-East and South-West regions. Growth in real consumption per capita was only 2.5 percent in Gaborone and 6.3 percent in Francistown. In urban villages, it was 5.1 percent.

5. **During the past decade, living conditions have improved, and poverty has been reduced**. Between 2002/3 and 2009/10, the incidence of poverty using the national poverty line decreased from 30.6 percent to 19.4 percent. The incidence of extreme poverty or food poverty, using the respective national line, decreased from 22.7 percent in 2002/03 to 13.8 percent in 2009/10 (Figure 1, left chart).

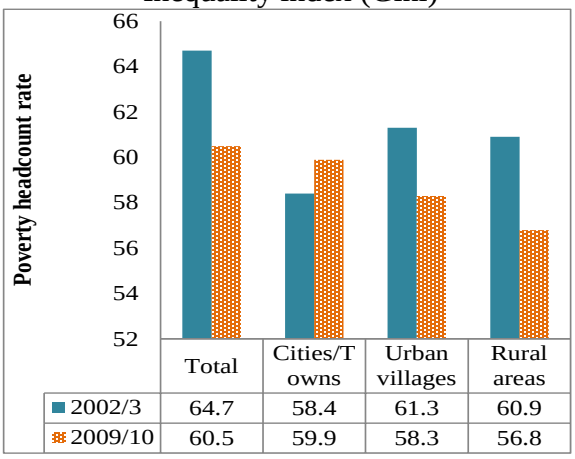
Figure 1: Poverty and inequality in Botswana

Poverty headcount rates



	Botswana	Cities/ Towns	Urban Villages	Rural Areas
2002/3	30.6	10.7	24.9	45.2
2009/10	19.4	8	19.9	24.4

Inequality index (Gini)



	Total	Cities/Towns	Urban villages	Rural areas
2002/3	64.7	58.4	61.3	60.9
2009/10	60.5	59.9	58.3	56.8

Source: Authors' estimates.

6. **The decrease in the incidence of poverty has been accompanied by a significant decline in both the depth and severity of poverty.**[1] The poverty gap eased from 11.7 percent in 2002/03 to 6.2 percent in 2009/10, indicating that consumption has improved among the poor.

7. **Rural areas led the drastic reduction in the number of people in poverty and extreme poverty.** The number of poor declined by nearly 180,000. In this period, 87 percent of the decrease in poverty occurred in rural areas, where 158,000 people rose out of poverty. Similar trends characterized the extreme poverty group. Although poverty is still largely concentrated in rural areas, it has become relatively more urban. In 2009/10, 54.3 percent of the poor resided in rural areas, compared to 65 percent in 2002/03. The share of the poor living in urban villages increased from 27.1 percent in 2002/03 to 37.0 percent in 2009/10, and the share of the poor living in the cities increased from 7.9 percent to 8.6 percent.

8. **Inequality is still high but has fallen significantly.** Between 2002/03 and 2009/10, inequality, measured by the Gini coefficient,[2] fell from 64.7 percent to 60.5 percent. Most of the decline occurred due to welfare improvements in rural areas, while inequality in cities increased (Figure 1, left chart). With a Gini of 60.5, Botswana remains one of the world's most unequal countries.

9. **Many factors are associated with Botswana's high level of income inequality, but regional convergence due to fast growth in rural areas and demographic changes explain most of the inequality reduction.** Demographic characteristics, such as household size and number of children, along with geographical location, levels of education, and labor participation, play a significant role in explaining inequality levels in Botswana. Regional

[1] The poverty gap measures the depth of poverty as reflected in the average distance of the poor from the poverty line.

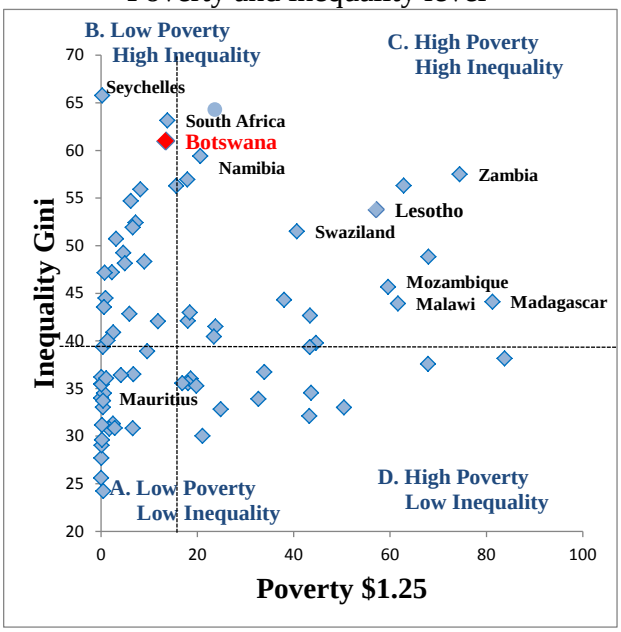
[2] The Gini index measures the extent to which the distribution of income or consumption expenditures among individuals or households within an economy deviates from a perfectly equal distribution. Based on the World Bank's Povcalnet database, the highest levels of income inequality were found, in the last decade, in countries such as South Africa, Seychelles, Botswana, Namibia, Central African Republic, Honduras, Angola, and Haiti.

convergence of consumption, reduction of household size, and returns on education are the main factors explaining the decline in Botswana's inequality between 2002/03 and 2009/10.

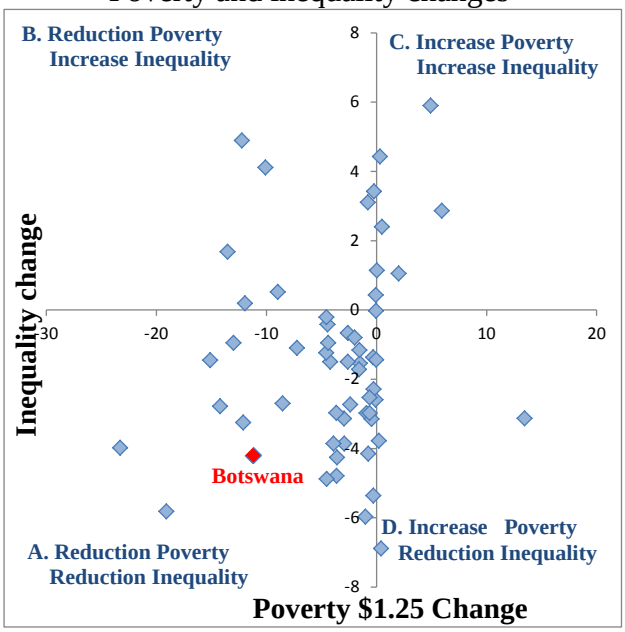
10. **Botswana remains one of the world's most unequal countries, with a high level of extreme poverty.** Despite significant improvements during the 2000s, striking disparities in income, wealth, and living standards remain among various socioeconomic groups. The level of inequality is the world's third highest, behind South Africa and Seychelles. Botswana is in the middle of the world distribution in terms of extreme poverty (Figure 2, left chart). On the positive side, progress toward reduction of extreme poverty and inequality was among the world's strongest in the second half of the 2000s (Figure 2, right chart).

Figure 2: International poverty and inequality in Botswana

Poverty and inequality level



Poverty and inequality changes

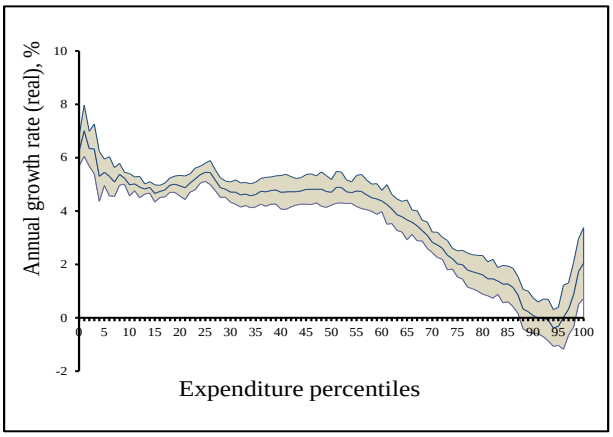


Source: POVCALNET and authors' calculation for Botswana. Selected low and middle-income countries.

11. **Poverty reduction has been accompanied by significant improvements in shared prosperity, and economic growth in the 2000s has been strongly pro-poor.** Both growth and redistribution have contributed to poverty reduction in Botswana. Growth Incidence Curve analysis shows that the growth rate of consumption per capita for the bottom 40 percentile of the population was 4.9 percent, significantly higher than the growth rate of the top 60 percentile. Botswana is one of the top performers in Africa when measured by annual growth for the bottom 40 percentile of the consumption distribution (Figure 3, right chart). However, despite being a regional leader, Botswana's performance was only in the middle of the worldwide shared-prosperity distribution.

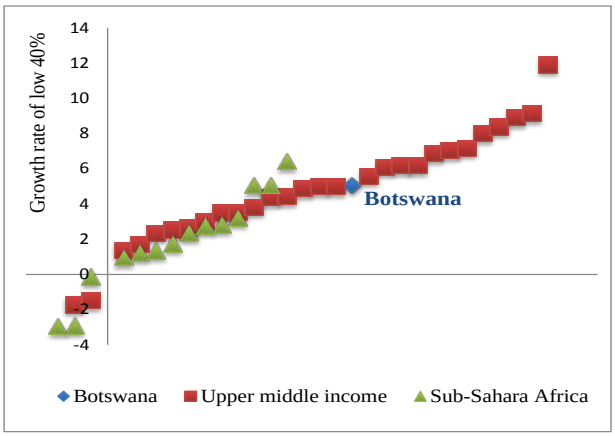
Figure 3: Shared prosperity in Botswana

Botswana Growth Incidence Curve (GIC) 2002/3-2009/10



Source: Authors' estimates.

Botswana shared prosperity



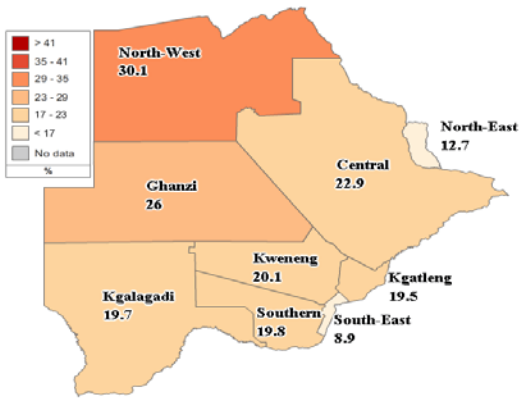
Consumption per capita annual growth of the bottom 40% of the population, 2002/03-2009/10.

Features of poverty in Botswana

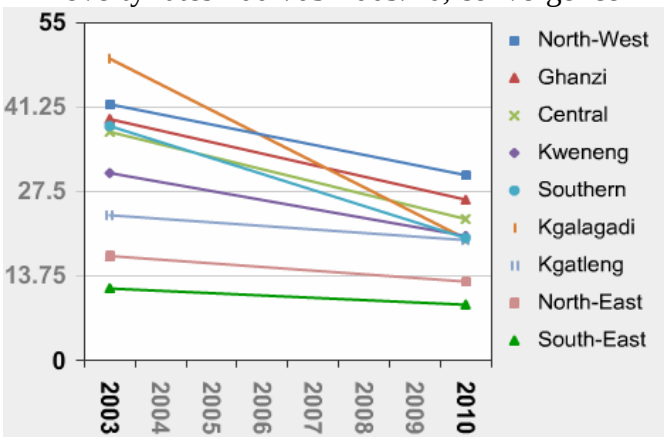
12. **There are strong regional and rural-urban dimensions in poverty.** The large majority of the poor live in the South-East and North-East. However, acute levels of poverty are found in more remote areas, most prominently in the far North-West (Ngamiland) around the Okavango and Chobe and in the west and southwest (Kgalagadi). Pockets of very high poverty are also found in the South-East, particularly in Kweneng and parts of the Central district.

Figure 4: Regional poverty convergence

Poverty rate 2009/10



Poverty rates 2002/03-2009/10, convergence



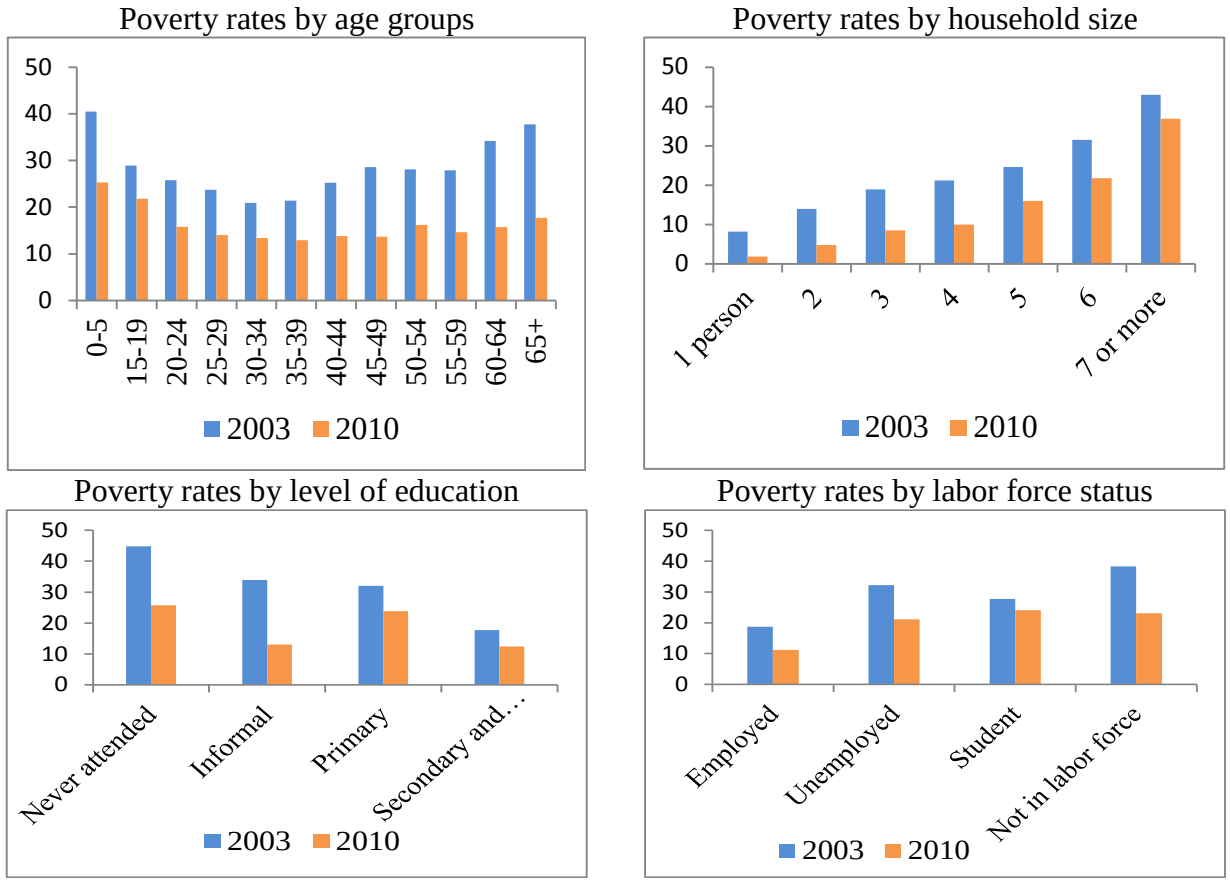
Source: Authors' calculations.

13. **Massive poverty and inequality reduction has been accompanied by significant regional convergence.** Between 2002/03 and 2009/10, a significant reduction in poverty occurred in all regions. Differences in poverty rates across regions have substantially narrowed. However, the highest poverty pockets are still found in the more remote regions, which are almost entirely rural.

14. **Poverty in Botswana has a young face, with children less than 15 years of age representing 46.2 percent of the poor in 2009/10.** Poverty by age follows a U-shaped pattern, with the young and old having highest percentages of poverty and those between the ages of 30 and 44 having the lowest poverty rates. Extreme poverty is also primarily a youth issue.

15. **Larger households with more children have higher rates of poverty.** Family structure is an important correlate of poverty; families with both parents have lower rates of poverty than single-parent families. Since Botswana has one of the world's highest HIV/AIDS rates, resulting in large numbers of deaths and AIDS orphans, there is a sizeable number of incomplete families, which are more likely to be poor.

Figure 5: Poverty rates by demographic, education, and labor characteristics, by decile of households consumption per capita, 2002/03 and 2009/10



Source: World Bank staff calculations.

16. **The level and quality of education are crucial factors in determining poverty.** Overall, educational attainment improved between 2002/03 and 2009/10; yet, large numbers of people still have little or no education. While income gaps by level of education are narrowing, higher levels of education are still strongly associated with lower levels of poverty.

17. **Poverty levels are highest among the unemployed and inactive**. In 2009/10, the poverty rate of households with an employed head of household was below 8 percent; the rate was above 19 percent for the unemployed. The big change over the decade was the massive

poverty reduction—from over 40 percent to 17 percent—among households with an inactive head. Employment is a buffer, but not a guarantee, against poverty. More than half of all poor Botswana households (and almost two-thirds of poor households in cities) are headed by employed individuals.

Drivers of poverty reduction in Botswana

18. **Botswana's rapid poverty reduction can be attributed mainly to a combination of increasing agricultural incomes, including subsidies, and demographic changes.**. Between 2002/03 and 2009/10, changes in agricultural incomes, including agricultural subsidies, accounted for 47.8 percent of poverty reduction, or 5.7 percentage points (Figure 10). Demographic changes associated with decreased dependency ratios contributed 24.3 percent to poverty reduction, or 2.8 percentage points. Increases in income among those employed in the non-agricultural formal labor market contributed 10.4 percent to poverty reduction, or 1.2 percentage points, while the rise in households' loans and access to financing accounted for 9.6 percent of poverty reduction, or 1.1 percentage points. Social transfers per se (excluding agriculture subsidies) were associated with 3.9 percent of the reduction, or 0.4 percentage points.

19. **Several factors were important sources of poverty reduction and welfare improvements.**

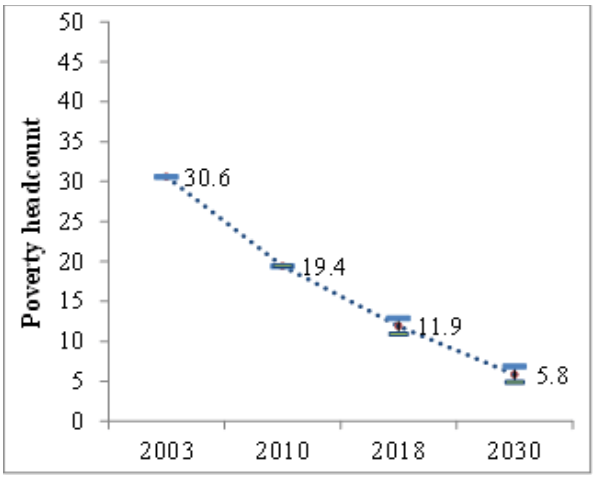
- Wages and all sorts of formal and informal labor-related incomes increased substantially, especially in rural areas.
- Other improvements in rural areas' labor market outcomes included reductions in unemployment and growth in labor market participation.
- Agricultural incomes and employment were supported in large part by government subsidies through programs like ISPAAD. Further analysis will be required to quantify the impact of these programs on poverty reduction and assess their sustainability.
- Substantial changes in the demographic structure included reductions in household sizes and dependency ratios.
- Access to education improved progressively from primary through secondary to university education.
- The amount of household loans increased, helping raise households' net incomes.

20. **Looking forward, economic growth and inequality reduction are equally important for future poverty reduction.** A micro-simulation exercise projects that poverty will fall below 12 percent by 2018 and below 6 percent by 2030 (*Figure 6*, left chart). However, inequality is not expected to fall significantly unless there is continued, broad-based employment growth. Without significant inequality reduction, it will be increasingly difficult to achieve further declines in poverty, and the eradication of poverty may remain a distant prospect. However, if

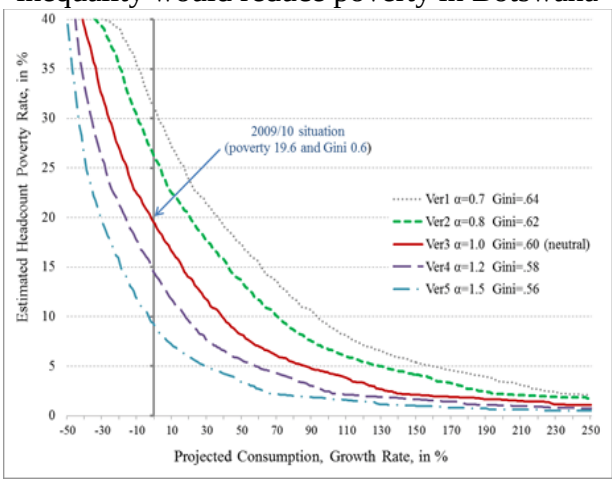
growth continues to be pro-poor and leads to further reductions in inequality, poverty could be reduced much faster (*Figure 6*, right chart).

Figure 6: Projecting poverty

Poverty projections, baseline scenario



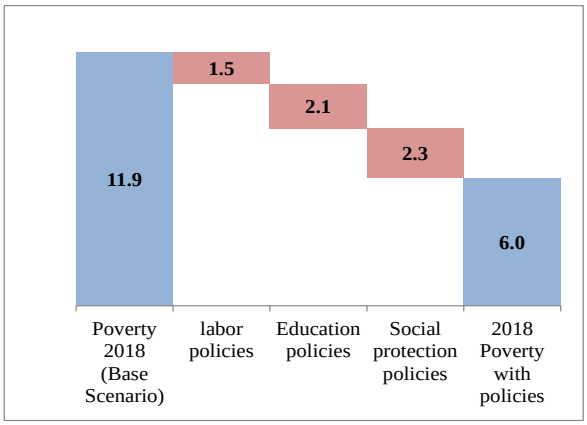
Poverty Trace Curve (PTC) – how falling inequality would reduce poverty in Botswana



Source: Authors' calculations. 2002/03 and 2009/10 are actual figures, 2018 and 2030 projections are based on the micro simulation approach.

21. **Investments in human capital and efficient safety-net targeting are key areas that could speed up poverty reduction and reduce inequality.** Eradicating poverty in the coming years will likely depend on raising worker productivity and participation in the labor market, together with improving the quality of human capital and improving the efficiency of social protection programs. Micro simulations show that these factors can significantly accelerate the pace of poverty reduction. The combined effect of employment increases, improvements in education, and improved targeting of social protection programs could halve projected poverty by 2018 and eradicate it by 2030 (*Figure 7*).

Figure 7: Poverty reduction, policy scenarios



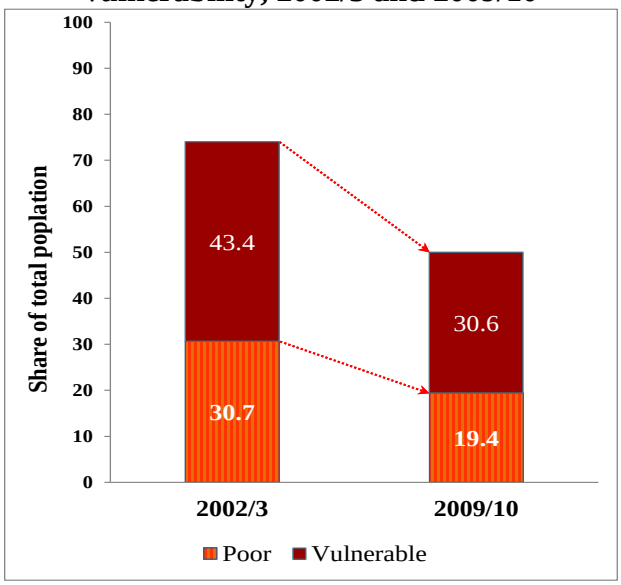
Source: Authors' calculations.

Challenges of poverty reduction in Botswana

- **A large fraction of the population remains either poor or vulnerable to a significant risk of falling back into poverty**

22. **Large numbers of people are still just marginally above the poverty line and at risk of falling back into poverty.**[3] Vulnerability was significantly reduced between 2002/03 and 2009/10 (*Figure 8*). However, half of Botswana's population remains either poor or vulnerable, with close to 31 percent classified as vulnerable. While the gaps between rural and urban areas declined, the risk of falling back into poverty is still higher among rural households that depend on small scale and subsistence farming.

Figure 8: Botswana poverty and vulnerability, 2002/3 and 2009/10



Source: Authors' estimations.

- **Further improvements in labor productivity would be needed to sustain income growth among the poor**

23. **Botswana is characterized by relatively low non-mining productivity growth, led mostly by the tertiary sectors.**[4] *Figure 9* shows that non-mining productivity contributed around 1.3 percentage points to annual (non-mining sector) growth between 1996 and 2010. Most of the growth in productivity can be attributed to the services sector. By contrast, the non-mining primary sector, mainly agriculture, contributed negatively to productivity growth. While productivity growth accelerated in 2008-2010, overall productivity growth is still held back by slow labor movement out of the primary sector and into the secondary and tertiary sectors.

[3] The definition of economic vulnerability is based on a probability model: it encompasses individuals with a probability of entry into poverty of at least 20 percent. The vulnerability threshold is approximately twice the national poverty line in Botswana (see Chapter 4 for additional details).

[4] Productivity analysis comes from the Botswana Systematic Country Diagnostic Report (SCD): Building productive, renewable assets for sustainable growth and poverty elimination. World Bank, 2015.

Figure 9: Decomposition of non-mining per capita value-added growth, by 5-year periods, 1996-2010

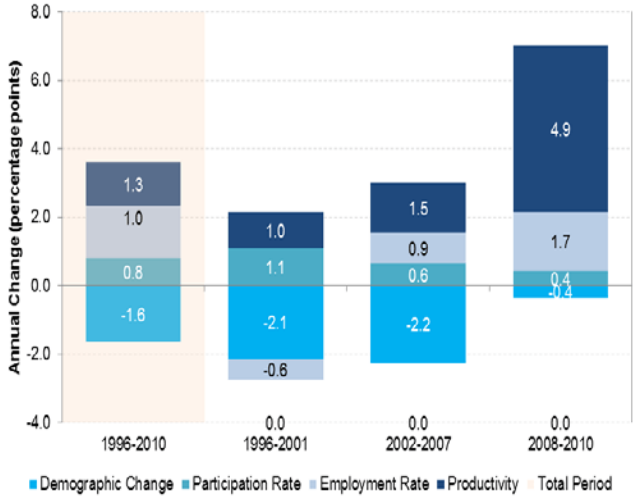
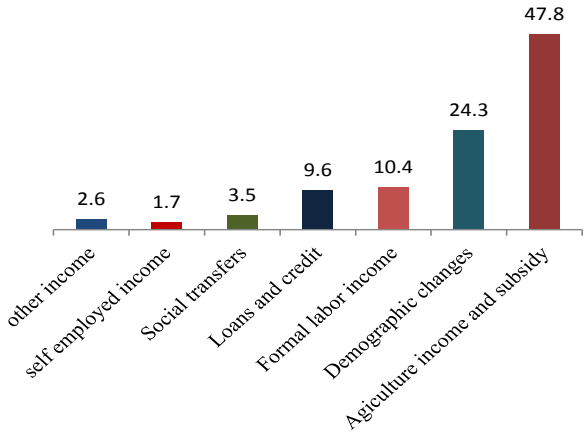


Figure 10: Contribution to poverty reduction in percentage points of poverty, 2002/03-2009/10



Source: Figure 9 Botswana Systematic Country Diagnostic (SCD): Building productive assets for sustainable growth and poverty elimination. 2014. Data sources: various, including WDI, Statistics Botswana (2014), MFDP, BoB. Figure 10: authors' calculations.

- **Services delivery has improved but remains unequal**

24. **Botswana significantly improved access to essential services, but quality and inequality problems persist.** The reduction achieved in monetary poverty between 2002/03 and 2009/10 is matched by overall gains in other measures of living standards, such as asset ownership, access to electricity and sanitation, literacy and access to education. Yet, the distribution of key assets and access to services is unequal (Figure 11). Disparities are most prevalent between the poor and non-poor, but they are considerable across geographic locations.

- **Quality and access to electricity are better than the average among African countries but remain below the country's own targets.** In 2009/10, Botswana's electrification rate was 45.4 percent, which is above the 31.8 percent sub-Saharan Africa average, but remains far below the 2016 target of 80 percent nationally and 60 percent in rural areas, set by the National Development Plan (NDP). Disparity in access to electricity is widespread and positively correlated with income. At 74.1 percent, connection rates among the richest decile are close to four times the 19.5 percent for the poorest decile (Figure 11).

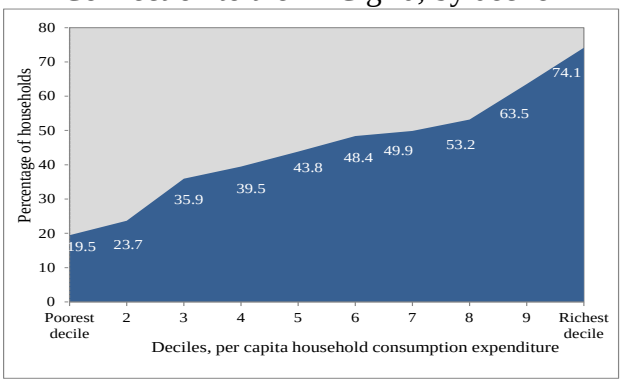
- **Sustainable access to improved water sources and sanitation remains uneven across income groups and affects socio-economic outcomes, such as health, worker productivity, income, and education.** The share of the population with access to improved sanitation facilities rose an impressive 25.7 percentage points—from 38.6 percent in 1990 to 64.3 percent in 2012. However, access to flush toilets remains significantly low among the poor. Use of flush toilets (both owned and communal) was a paltry 5.3 percent for the poorest 10 percent, compared with 64.6 percent for the richest 10 percent.

- **Botswana's public spending on education is relatively high, but educational outcomes remain uneven across consumption expenditure groups, favoring rich households.** Reading ability and numeracy rates are notably higher in urban areas than in rural areas. While there have been significant improvements in primary and secondary education, progress in tertiary education has been more muted. Challenges also remain with respect to educational quality, enrollment consistency, and student retention, especially in rural areas and among the poor..

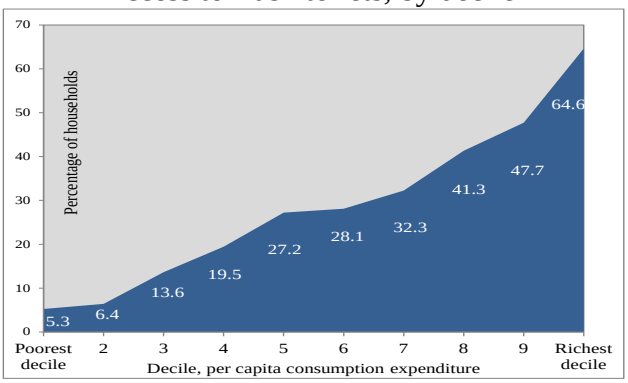
- **Overcrowding in housing conditions is strikingly high in Botswana**. Measured as more than two persons living per room in a dwelling unit, overcrowding has been linked to a worsening of health and education outcomes. The situation improved between 2002/03 and 2009/10, when 42.4 percent of the population faced overcrowding conditions. Overcrowding predominantly affects the poor. Households defined as poor had an overcrowding headcount rate of 70.7 percent, which is high relative to the 7.6 percent among the top decile.

Figure 11: Inequality in access to services and education, by decile, 2009/10

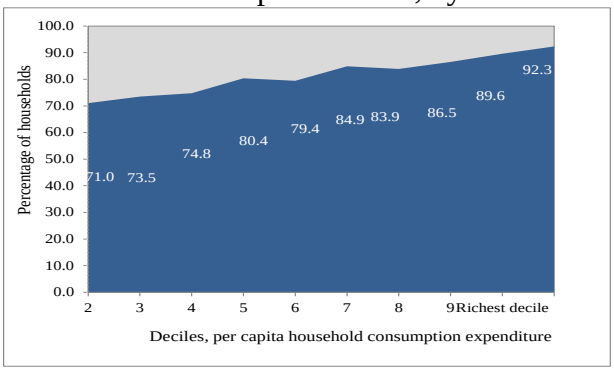
Connection to the BPC grid, by decile



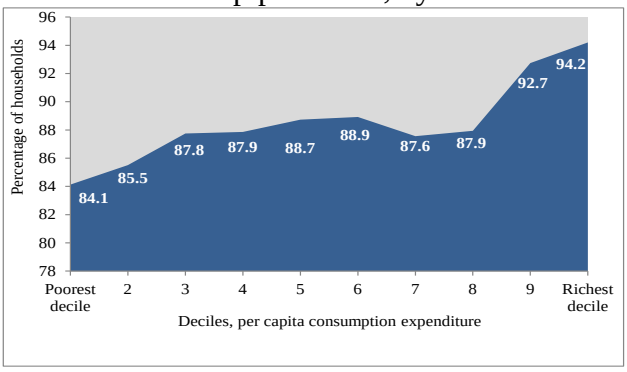
Access to flush toilets, by decile



Education completion rates, by decile



Access to piped water, by decile



Source: World Bank staff calculations.

- **Social protection is comprehensive, but efficiency could be improved**

25. **Botswana dedicates 4.4 percent of its GDP to social protection, and it is one of the few countries in Africa that fully funds social protection programs out of its own resources.** Social assistance spending in Botswana shows a countercyclical trend, playing an important role in mitigating crises by means of increasing benefits and/or expanding the number of beneficiaries during bad times. However, the distribution of social assistance spending is biased

toward programs that by design are not meant to target only the poor. If poverty targeting in social protection programs were to significantly improve, the total amount spent on social assistance annually in Botswana would be more than enough to completely close the consumption gap and eradicate poverty.

- **While health outcomes have improved considerably, HIV AIDS and equity issues remain an important challenge**

26. **Over the past four decades, the Government has consistently demonstrated that health is central to its development agenda.** Botswana possesses a strong primary health-care system and health service delivery infrastructure. Health expenditures were 6.3 percent of GDP in 2009/10—at the high end of the range for middle-income countries. Not surprisingly, a number of health indicators are quite favorable. For example, Immunization coverage (90 percent for measles) and antenatal service delivery coverage are very comprehensive. A notable exception, however, is the high HIV infection prevalence. Botswana has the world's second highest national HIV/AIDS prevalence at 18.5 percent for the general population. Crude mortality rates (deaths per 100,000 people) tripled between 1991 and 2003, resulting in unprecedented death rates among young adults across all social strata.

27. **Notable disparities across income groups remain in key health indicators.** Botswana's child malnutrition and mortality remain high, especially among the poor, and are not commensurate with national investments to improve child health and survival. More than half of all deaths of children under age five are a result of preventable diseases. There is an upward trend in the infant mortality. Malnutrition in children under age five remains a significant problem. Less than one in four newborn children are exclusively breastfed for the first three months. Diarrheal diseases continue to be a challenge and place formula-fed children at a particularly high risk of malnutrition and death. The high HIV prevalence is also contributing to problems of under-nutrition in children and household food insecurity.

28. **Chronic malnutrition constitutes a substantial challenge.** Stunting among children younger than age five averaged 30 percent, compared to 11.6 percent for wasting and 14 percent for underweight. Stunting is highly associated with poverty status, low education of the parents, rural and urban villages' location, and unemployment.

Implications for Public Policy

29. **The report is analytical in nature and detailed policy recommendations go beyond its scope.** Overall, the report's findings suggest that sustained poverty reduction will require multi-sector interventions aimed at achieving sustained income and labor productivity improvements while addressing remaining challenges in access to improved education and health among other basic services. In addition, to accelerate gains in poverty reduction, it would be important to consider revisiting the targeting of social protection programs and enhancing monitoring and evaluation systems through improved statistical data collection.

- **Income and labor productivity.** The development of a dynamic and productive private sector is fundamental to creating more and better jobs. Agricultural support programs were clearly a big part of the progress achieved during the past decade. Complementary programs

to promote sustainable livelihoods and increase agricultural productivity would appear to be key for protecting those gains and accelerating progress in poverty reduction.

- **Education.** The education sector will clearly be a strategic focus of reform in coming years given the country's objective of reducing its reliance on diamonds and shifting toward a knowledge-based economy. To this end, several major initiatives are needed so that the educational system is well aligned with the needs of the labor market and the nation. At the heart of the structural transformation agenda is the need to improve the quality of education, to raise skills levels, and to close the skills gaps that dampen labor demand. The World Bank's 2012 report "Botswana—Skills for Competitiveness and Diversification" sets out a detailed agenda for addressing many of these issues.

- **Health.** Botswana needs a greater focus on the most disadvantaged populations. Survey data consistently noted a peak in child malnutrition in the two poorest quintiles, which emphasizes the need to address vulnerability among both the poor and "near poor." In addition, the fact that national investments have not translated into more positive child nutrition outcomes and a substantial reduction in stunting points to the need for more in-depth analysis of the socio-cultural dynamics of infant and young child feeding practices in Botswana. Much of the illness burden and inefficient use of resources could potentially be avoided. To do so, however, the Government needs to prioritize building health systems dealing with the multiple health needs of the population (including the poor and most vulnerable groups), rather than only a few specific diseases.

- **Social protection.** Better targeting of social assistance programs and improving adequacy of benefits for the poor are core priorities. Introducing a Family Support Grant to provide a cash benefit to all families in absolute poverty—identified through a targeting system based on a proxy-means test—has been shown to be a cost-effective way to address absolute poverty. In addition, the impact of the program could be enhanced by linking access to benefits to certain desirable behavioral changes, such as making investments in the human capital of children.

- **Improvement of survey data collection.** The lack of well-established statistical monitoring and evaluation systems and the low frequency of household surveys are clear limitations to evidence-based policy making and assessing the effectiveness of social programs**.** Efforts to enhance the monitoring and analysis of labor market outcomes and poverty in Botswana could include the introduction of a multi-topic continuous household survey to improve the frequency and quality of survey data.

Chapter 1: Botswana's development and macroeconomic context

Botswana's macroeconomic achievements have been remarkable. From independence in 1966 to the late 1990s, Botswana was one of the world's fastest-growing economies, comparable only to China, with average annual GDP growth rates above 10 percent. The economy's growth and GDP are still dominated by natural resources, but their relative importance has gradually gone down. Botswana's performance has also been associated with sustainable macroeconomic and social policies. Botswana has repeatedly been the top sub-Saharan African (SSA) country on all governance measures. Government has heavily invested diamond revenues in infrastructure, health, and education. These policies, however, have created a heavy dependence on the state as the driver of the economy. Low productivity and private-sector job creation remain challenges. Employment creation and productivity gains were rated low.

A. Macro context for Botswana's fast economic development

30. **Botswana has experienced sustained growth.** From independence in 1966 to the late-1990s, it was one of the world's fastest-growing economies, comparable only to China, with average annual GDP growth rates above 10 percent.[5] In past decades, the impressive performance was driven mostly by diamond exports. At its peak in the 1980s, minerals (mainly diamonds) accounted for more than 50 percent of Botswana's GDP. In recent years, however, Botswana's growth trend has lagged. During 2002/03-2009/10, the period covered by our study, GDP grew at an annual average of 4 percent (*Figure 12*). The positive growth has raised overall incomes and delivered good economic outcomes.

31. **Growth and GDP are still dominated by natural resources, but their relative importance has gradually gone down.** A mining sector dominated by minerals, mainly diamonds, currently accounts for roughly 30 percent of Botswana's GDP, down from more than 42 percent in 2002/03[6] (*Figure 12*). Based on survey data, the mining sector employed only 2.5 percent of the working population in 2010. Government is the economy's second-largest sector at 15.8 percent of GDP, with public employment representing 16.5 percent of workers. Government, however, depends on the mining sector for a large though declining part of its revenue. Agriculture is much less important, comprising less than 2 percent of GDP, but the sector employed and provided livelihoods for 26.5 percent of all workers, including a large share of the predominantly poor rural population. Other important large and growing sectors include trade and tourism (11.4 percent of GDP in 2010) and finance and business services (9.5 percent of GDP). Diamond revenues have been channeled through the Government, financing large

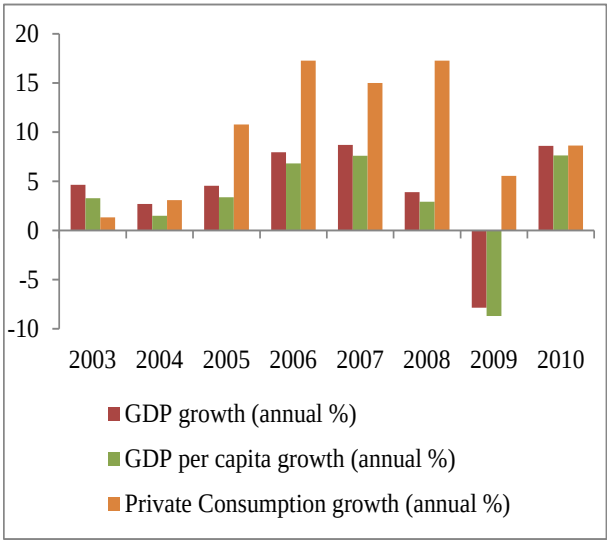
[5] Botswana's rapid growth in came off an extremely small base—at independence, Botswana's per capita GDP was just US$80 (around US$480 in 2005 prices).

[6] In 2010-13, diamonds contributed 23 percent of GDP, 32 percent of government revenue, and 72 percent of exports.

investments in infrastructure, health, and education. This spending has created a strong dependence on the state as the driver of the economy. However, it has been poor in generating jobs, contributing to high inequality.

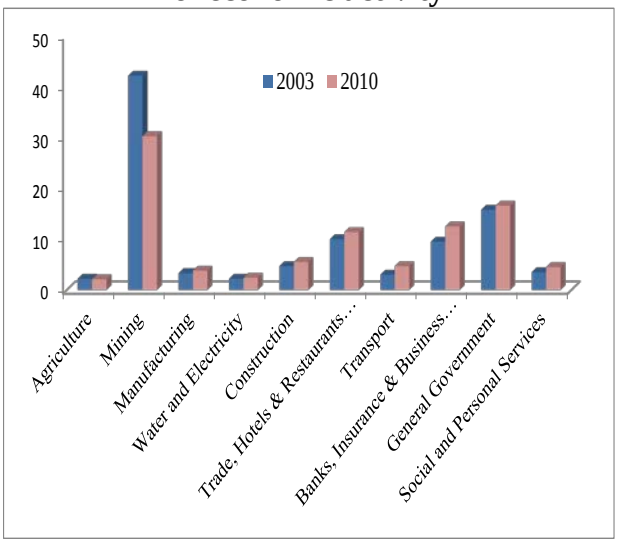
32. **Botswana's performance is associated with sustainable macroeconomic and social policies.** The Government has consistently maintained prudent monetary policies in recent years.[7] The economy ran fiscal and current account surpluses during the 2000s, mainly because of high revenues from minerals and the Southern African Customs Union (SACU) and the Government's prudent management of mineral revenues. Similarly, Botswana's external sector has performed well in recent years, with the current account showing surpluses, reflecting large transfers from SACU receipts and growth in services exports.

Figure 12: GDP an consumption growth rates 2002/03-2009/10



Source: WDI 2013.

Figure 13: Percentage of total GDP by type of economic activity



Source: Botswana National Accounts Unit.

33. **In Botswana, infrastructure investment was part of the formula for fast economic development and poverty reduction.** Good infrastructure—such as roads, information networks, and accessibility of water and sanitation—helps build capital formation, ease business development, and reduce poverty. According to an earlier analysis, government investment in infrastructure made a net contribution of more than 2.3 percentage points to increasing per capita growth in the first half of the 2000s.[8] Fast ICT sector development and advances in transportation and water systems substantially contributed to economic development and poverty reduction.

34. **Botswana's infrastructure spending is funded primarily from public resources.** In recent years, Botswana has made significant progress in developing its infrastructure, improving the transport, water and sanitation, power, and mobile telephone sectors. Despite its relatively strong economy and attractive investment climate, Botswana, like many other countries at

[7] IMF Article IV staff report, 2013.
[8] César Calderón, Infrastructure and Growth in Africa. Policy Research Working Paper 4914. The World Bank.

similar levels of economic development, has not succeeded in attracting much private financing for infrastructure. Public investment in infrastructure during the 2000s was significant, leading to substantial advancement in many areas.

35. **Botswana has repeatedly been the top sub-Saharan African (SSA) country on all governance measures.** It is the least corrupt SSA country, ranking as 64th worldwide according to Transparency International's Corruption Index (2013). The country ranks in the top quartile of various worldwide governance indices, and in most cases, it tops the African region. The World Economic Forum ranks Botswana 80th among 140 countries on a range of competitiveness indicators. One of the economy's key strengths is a high score on the quality of institutions. Botswana's political stability and relatively low level of corruption is an undeniable asset in attracting foreign investment. So, too, is the country's relatively strong fiscal position.

36. **The recent global economic crisis has revealed vulnerabilities in Botswana's domestic economy, pointing to the need for diversification.** The crisis led to an 8.7 percent contraction in Botswana's GDP per capita in 2009, one of the African region's largest hits. In the wake of the global economic downturn, it became apparent that Botswana's vulnerability to external shocks is associated with its very narrow economic diversification.

37. **The global financial crisis, which hit Botswana hard in 2009, might have had an adverse impact on the relatively better off segment of the population**. The crisis' distributional impact is difficult to measure in Botswana. Lack of survey data just prior to and after the crisis prevents a validation of this hypothesis. However, the experiences of other developing countries, where the crisis' impact was comparable, suggests it disproportionally affected the middle and rich segments of the population. If Botswana faced the same impact, the inequality and relative decline in consumption among the richer urban population could be attributed to the crisis. Because the 2000/10 survey was conducted during the crisis, this could be a plausible explanation. Long-term inequality trends can be assessed only after another survey that could potentially show a reverse in inequality trends.

38. **Botswana has been characterized by relatively low non-mining productivity growth, although the tertiary sectors performed relatively well.** *Figure 14* shows that non-mining productivity contributed around 1.3 percentage points to the sector' annual growth between 1996 and 2010. The contribution was fairly steady throughout the period. At the same time, demographic factors linked to declining fertility and HIV/AIDS were a significant stumbling block to growth. The non-mining primary sectors, mainly agriculture, contributed negatively to productivity growth. Most non-mining productivity growth was driven by the services sector (*Figure 15*). Productivity growth was robust in the tertiary sector, but overall productivity growth was held back by slow labor movement out of the primary sector and into the secondary and tertiary sectors.

Figure 14: Decomposition of non-mining per capita value-added growth, by 5-year periods, 1996-2010

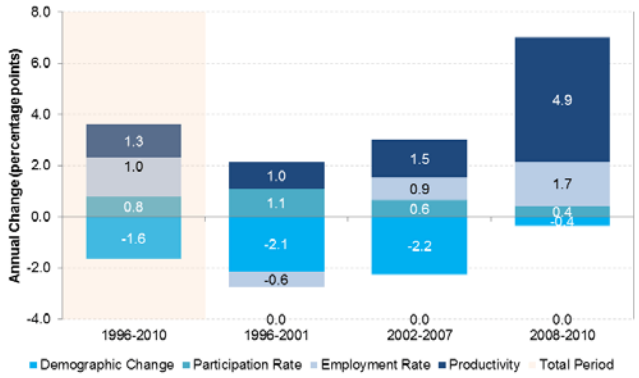
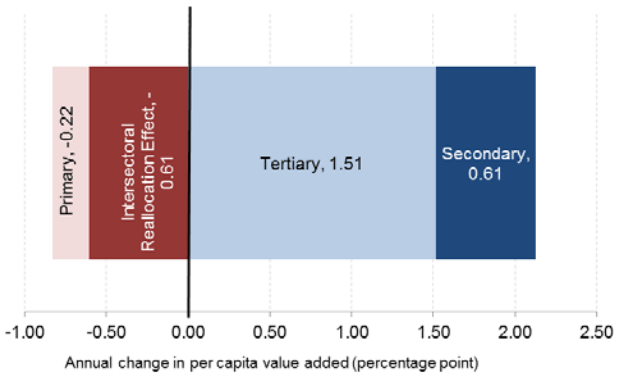


Figure 15: Decomposition of non-mining productivity growth by broad sector, 1996-2010



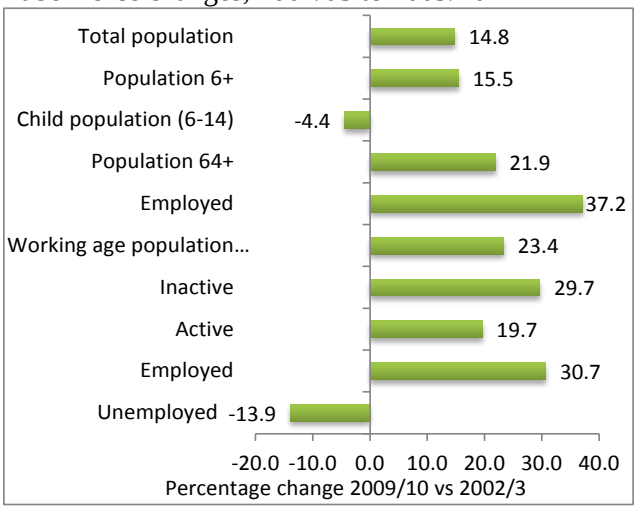
Source: Farole et al 2014. Botswana: Building productive assets for sustainable growth and poverty elimination Systematic Country Diagnostic. 2014. Data sources: various, including WDI, Statistics Botswana (2014), MFDP, BoB (Forthcoming).

B. Labor market outcomes

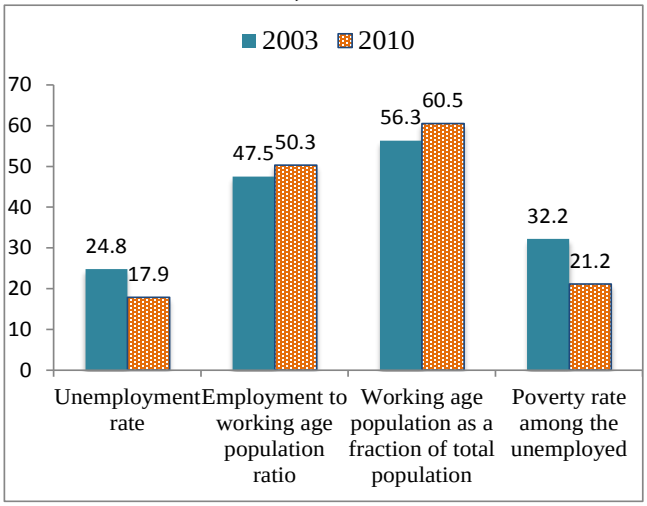
39. **Botswana has seen significant improvements in labor-market outcomes, including increases in the working-age population and the employed population and decreases in the unemployed.** Since 2002/03, total population has grown by almost 15 percent (*Figure 16*). More important, the working-age population has grown faster at 23 percent—due to a slowdown in the fertility rate. At the same time, the working-age population rose from 56 percent to 61 percent of total population. The employed population increased by 31 percent, and the unemployed population decreased by 14 percent. The employed population as a share of the total working-age population increased from 48 percent to 50 percent, and the poverty rate among the unemployed decreased from 32 percent to 21 percent. Collectively, the labor-market improvements were a key to the overall reduction in poverty. *Figure 17* describes the unemployment dynamics.

Figure 16: Selected labor market indicators

Labor force changes, 2002/03 to 2009/10



Main labor market ratios, 20020/3 and 2009/10



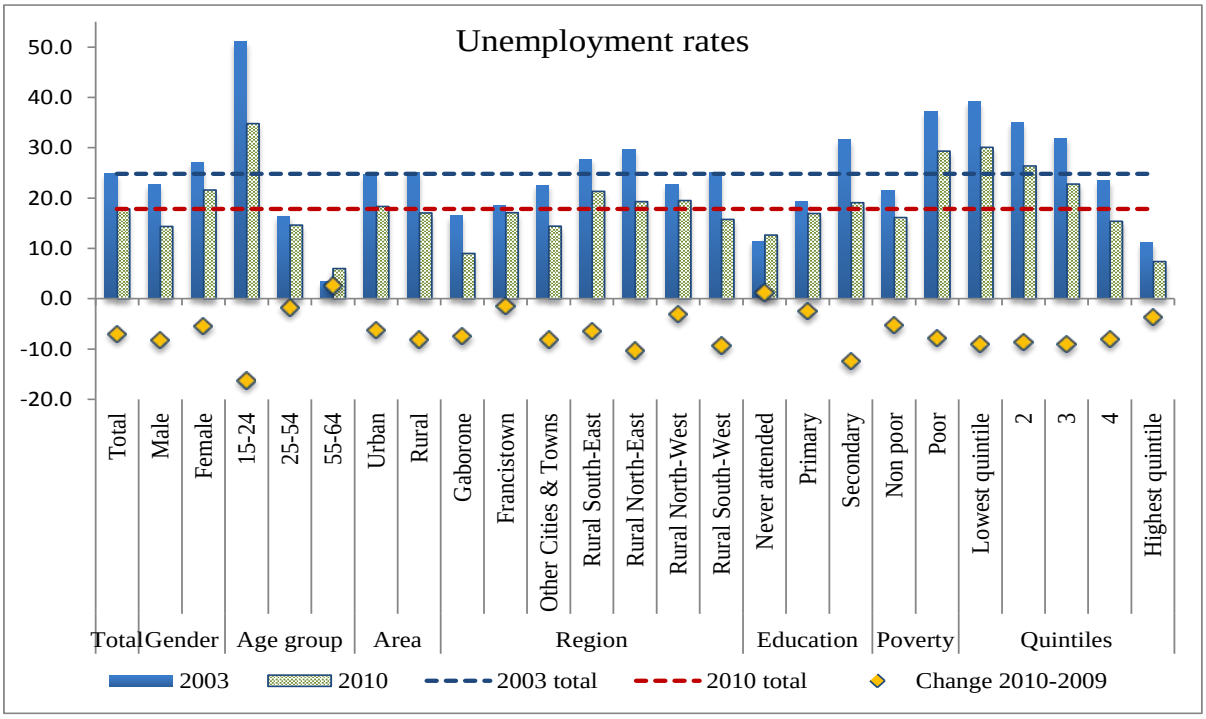
Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

Box 1: Unemployment trends and characteristics in Botswana

Unemployment is down but still high, especially among Botswana's youth. The country's age structure means large numbers of people are outside the labor force, including many students. In 2009/10, only 39 percent of the population was in the labor force (the sum of the employed and unemployed), 23 percent were students, and 38 percent were outside the labor force, mostly young people. Botswana faces an ongoing problem of high unemployment, especially among the young and the unskilled.[9] Unemployment in 2009/10 was estimated at 17.5 percent—19.7 percent for women, 15.3 percent for men. It was down considerably from 2002/03, when the unemployment rate was 23.8 percent.[10] Labor-force status, and especially unemployment, have important implications for poverty.

The decline in unemployment was greater for males, young people, those in rural areas, the better educated, and the poor. Between 2002/03 and 2009/10, the unemployment rate declined from 23.8 to 17.7 percent (Figure 17) Unemployment fell significantly with increased age. However, the spread narrowed for higher age cohorts because the largest unemployment declines were among those aged 15 to 24, whose jobless rate plunged from 51 percent to 35 percent. The decline was larger in rural areas than in urban areas; in fact, rural areas now have a slightly lower unemployment rate than urban areas. Those with a secondary education had the largest decline in unemployment, leaving rates slightly higher for this group than for the less education. The unemployment rate for both the poor and non-poor declined, but the poor still had a significantly higher unemployment rate (29 percent) than the non-poor (16 percent). All income quintiles had declines in unemployment, with the highest income quintile showing the smallest decrease. However, an inverse correlation remains between income quintile and unemployment rate, with the lowest income quintile having the highest unemployment rate.

Figure 17: Unemployment rates among selected groups



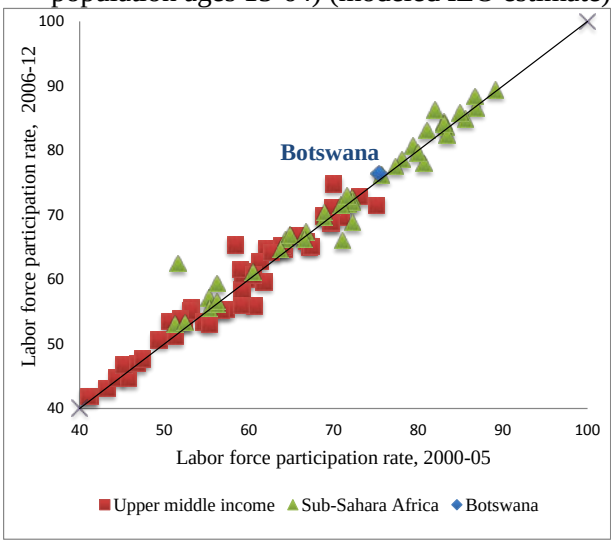
Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

[9] International Labor Organization, *Decent Work Country Programme for Botswana: 2011 to 2015*, February 2011.
[10] Central Statistics Office, *Household Income and Expenditure Survey 2002/03*. Main Report, Volume 1, December 2004.

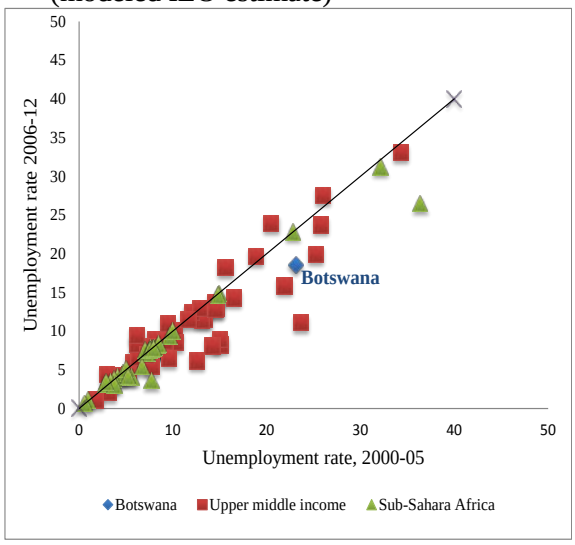
40. **Employment and labor-force participation are high and have been growing in Botswana, significantly contributing to economic growth and poverty reduction; high levels of unemployment persist.** Botswana has one of the highest labor-force participation rates among middle-income countries; this indicator increased from 76.7 percent in 2000 to 78.8 percent in 2012 (*Figure 18*). ILO estimates of labor-force participation and unemployment slightly differ from the national sources, but general trends are comparable and show an increase in labor-market activity and a reduction in Botswana's unemployment rates from 24.5 percent in 2000 to 17.7 percent in 2012. Botswana's unemployment is high compared to both SSA and middle-income countries. Putting unemployment rates in international perspective reveals some rigidity in Botswana's labor market. In Botswana, unemployment appears to persist in the context of a large public sector and structural changes in the labor market during past decade, with the share of employment declining in industry and increasing in services and agriculture.

Figure 18: Labor market indicators

Labor force participation rate, total (% of total population ages 15-64) (modeled ILO estimate)



Unemployment, total (% of total labor force) (modeled ILO estimate)



Source: World Development Indicators.

41. **The private sector has struggled to create jobs.**[11] One concern about the nature of growth in Botswana has been its weak employment-generating capacity. An assessment of the 2002/03 and 2009/10 household surveys[12] shows a mixed labor-market picture. While employment grew strongly and unemployment fell, more than half of all new jobs came in small-scale or subsistence agriculture (where the poor are concentrated), heavily subsidized through government programs. Outside agriculture, job creation has mainly come from the public sector. Job creation has been particularly weak in urban areas, where non-agricultural private sector employment grew by less than 1 percent annually between 2002/03 and 2009/10. And virtually all private-sector job creation has come in untraded (local) services. By contrast, manufacturing

[11] Farole et al 2014. Botswana: Building productive assets for sustainable growth and poverty elimination Systematic Country Diagnostic. 2014 (forthcoming).

[12] Statistics Botswana does not carry out regular labor-market surveys. It publishes quarterly estimates of formal employment, although the latest published was from September 2012. The most recent labor-market survey was carried out in 2005/06.

has shed jobs, and the construction sector has been stagnant. Opportunities for low- and mid-skilled Batswana have been limited.

Summary. The macro achievements of Botswana are truly remarkable. However, the economy's growth has been dominated by natural resources, and their relative importance has been gradually declining. Botswana's performance has been associated with sustainable macroeconomic and social policies, but it has not resulted in creation of a strong and diversified private sector. The country has repeatedly been the top SSA country on all governance measures, but it is not clear whether it has led to social equality. The Government has heavily invested diamond revenues in infrastructure, health, and education, but the social efficiency of this spending remains unclear. It is evident that these policies have created a strong dependence on the state as the driver of the economy, and private sector job creation remains a challenge in Botswana.

Chapter 2: Poverty, growth, and inequality

Botswana had substantial improvements in the consumption among the poorest segment of the population, poverty levels, and income inequality. Absolute poverty declined from 30.6 percent in 2002/03 to 19.4 percent in 2009/10, and consumption inequality, expressed in Gini coefficients, fell from 64 to 60 points. These results draw on the analysis of two successive rounds of the national Household Expenditure Surveys, conducted by Statistics Botswana in 2002/03 and 2009/10. By international standards, overall poverty has also fallen significantly, but extreme poverty remained high. Faster growth in rural areas reduced the gaps between rural and urban Botswana, reduced income inequality, and contributed to rapid poverty reduction. Massive poverty and inequality reduction has been accompanied by significant regional convergence. Botswana is one of Africa's top performers on the shared prosperity indicator, expressed as a yearly growth rate of the bottom 40 percentile of the consumption distribution. Botswana's economic growth was pro-poor, and both the economic growth and redistribution factors played important roles in poverty reduction. Economic growth and inequality reduction are equally important for future progress in bringing down poverty.

42. **Poverty measures in Botswana are used to formulate public policy at the national and regional levels.** This chapter documents trends in Botswana's living standards between 2002/03 and 2009/10, measured by per capita consumption, and it examines the steep reduction in poverty accompanied by economic growth and reduced inequality. The objective is to bring out the relationship between changes in poverty, household consumption growth, and distribution at the national, urban, and rural levels. This chapter includes nine sections: Section A discusses survey data quality and comparability; Section B discusses consumption per capita as a welfare aggregate for the analysis: Section C provides motivation for the choice of the poverty line methodology; Section D presents poverty at the national, rural, and urban levels; Section E presents inequality trends and decomposition; Section F looks at inequality; Section G analyses regional dimension of poverty and inequality; Section H discusses inclusiveness of growth and distributional changes; Section I links growth, inequality, and poverty reduction in the framework of forward-looking poverty projections.

A. A note on the design of household surveys in Botswana

43. **Poverty measures are used to formulate Botswana's public policy on eradicating poverty.** In collaboration with the World Bank and UNDP, Botswana's Central Statistics Office (CSO) adopted its official poverty methodology in 2004, based on the National Income and Expenditure Survey conducted in 2002/03. The methodology relied on an absolute poverty line grounded in a nutritionally based food basket, supplemented by an allowance for non-food needs. Official poverty estimates, published in 2013, were based on a similar methodology using the Core Welfare Indicators Survey, conducted in 2009/10. The new survey had similar core modules, ensuring conformity with earlier poverty estimates. The 2002/03 and 2009/10 household surveys undertaken by the CSO offer a consistent basis for welfare comparisons. Verifying the comparability of available household surveys is an important preliminary step in analyzing poverty trends (Lanjouw and Lanjouw 1997, 2002/03). This study is based on the two rounds of household surveys conducted in 2002/03 and 2009/10.

44. **Household Income and Expenditure Surveys (HIES) was used to estimate poverty in 2002/03.** The HIES was first implemented in 1985/86 and subsequently conducted in 1993/94 (CSO, 1995) and 2002/03 (CSO, 2004). The 2002/03 round served as the baseline for our analysis. Conducted from June 2002 to August 2003, this HIES was a nationally representative survey collecting information on 6,053 households and 23,843 individuals. The survey had a modular structure, collecting information on individual demographic characteristics, economic activity, education, and incomes. On the household level, the survey collected information on sources of income, all types of expenditures, possession of goods, and access to basic services. The survey was a standard undertaking concentrating on incomes and expenditures, with limited information on health, education, and labor.

Box 2: Purpose and methods HIES (2002/03) and CWIS Surveys (2009/10) [13]

The HIES and CWIS surveys had the objective of providing comprehensive data and updating information on expenditures, the poverty datum line, and other household characteristics needed for socio-economic monitoring and evaluation purposes. The CWIS survey also sought to determine household consumption and expenditure patterns for revising the weights of the CPI.

Table 1– HIES 2002/03 versus CWIS 2009/10

	HIES 2002-03	CWIS 2009-10
Sample Frame	2002/03 Population and Housing Census	2002/03 Population and Housing Census
Sample design	Two-stage stratified	Two-stage stratified
Strata	3 (cities/towns, urban villages, rural areas)	3 (cities/towns, urban villages, rural areas)
PSU	288 out of 4,114 enumeration areas	288 out of 4,114 enumeration areas
SSU	6,290 households	
Response rate (%)	96.2	
Actual sample size (hh)	6,053	7,731
Actual sample size (indiv)	23,823	27,211
Population (est.)	1,632,922	1,874,414
Households (est.)	394,272	541,593
Household size (est.)	4.14	3.46
Reference period	26 June 2002 – 18 August 2003	April 2009 – March 2010
Rounds	12	12
Representativeness	National, by stratum within each of 7 regions*	

Sources: Botswana Statistics. See Annex 1 for additional summary on the survey data.

In comparison to the HIES 2002/03, the CWIS 2009/10 covered additional welfare measures to enable a more comprehensive understanding of households' well-being. These indicators included a detailed health module, a nutrition and food-security module, and questions on self-assessment of well-being, personal security, and access to and satisfaction with services provided. Furthermore, the survey included community and school modules.

The CWIS and NHIE design called for a representative probability sample to produce estimates at the national, district and/or sub-district levels. Both surveys were conducted nationwide, using administrative district and sub-district boundaries. The target population covered all members of the household and visitors who spent the night in the households and would be staying for a period not less than 14 days. Only private dwellings were within the scope of the survey. Institutional dwellings (prisons, hospitals, army barracks, hotels, etc.) and places completely within industrial areas were excluded.

[13] The Box is taken from Statistics Botswana "Preliminary Results of the Botswana Core Indicators (Poverty) Survey 2009/10," November 11, 2011.

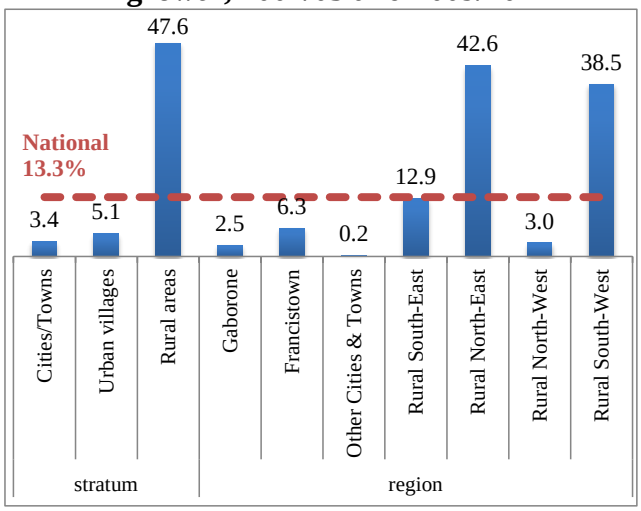
As indicated in the NHIEs and CWIS publications, standard two-stage sampling was introduced. The sampling frame for the first stage (PSU sampling stage) was based on the 2002/03 Population and Housing Census. The sampling frame was defined and constituted by all enumeration areas (EAs) found in three geographical regions: (i) cities and towns (ii) urban villages, and (iii) rural areas as defined by the 2002/03 Population and Housing Census, where PSUs were EAs. The sampling frame for CWIS consisted of 4,114 EAs. The secondary sampling units (SSUs) were occupied households. The sampling frame for the second stage was produced only from the selected EAs by listing of all private habitable dwellings/households in the EAs. Thus, the number of occupied households in the selected EA served as a sampling frame for that EA.

45. **The survey data have been found to be generally good for comparisons over time, although some income-related indicators were inconsistent.** We carried out consistency checks on data from the 2002/03 and 2009/10 surveys. To summarize, the main findings are: (i) price changes indicated by the series between 2002/03 and 2009/10 correspond well to trends in the overall price level reported by the CPI; (ii) the population covered in the two surveys is similar in terms of age and gender composition, family size, regional breakdowns, etc.—i.e. the two surveys are quite consistent in terms of demographic composition; and (iii) growth rates in labor and total income between the two surveys are generally similar to consumption per capita growth. The comparability study indicates the surveys are generally comparable. However, the quality of certain indicators, especially those related to the income sources, were poor. The ambiguity regarding the comparability of income aggregates from 2002/03 and 2009/10 calls for an appropriate degree of caution when studying welfare comparisons. Household consumption was chosen to be the main measure for poverty and distributional analysis, while incomes serve only as supplementary and explanatory measures.

B. Consumption per capita as a welfare aggregate for the analysis

46. **Real consumption per capita increased 13.3 percent nationwide, with the largest gains occurring in rural areas.** To compare poverty outcomes across households of different sizes and compositions, we use real per capita consumption as the main welfare aggregate, adjusting it over time using the national CPI index. *Figure 19* presents growth rates for real average monthly consumption per capita between 2002/03 and 2009/10. Monthly real per capita consumption increased 13.3 percent between 2002/03 and 2009/10, led by a gain of 47.6 percent in rural areas. The highest growth was in the rural North-East and rural South-West regions. Growth in real consumption per capita was only 2.5 in Gaborone and 6.3 percent Francistown. In urban villages, it was 5.1 percent. Other cities and towns experienced stagnation, with consumption hardly changing over the period.

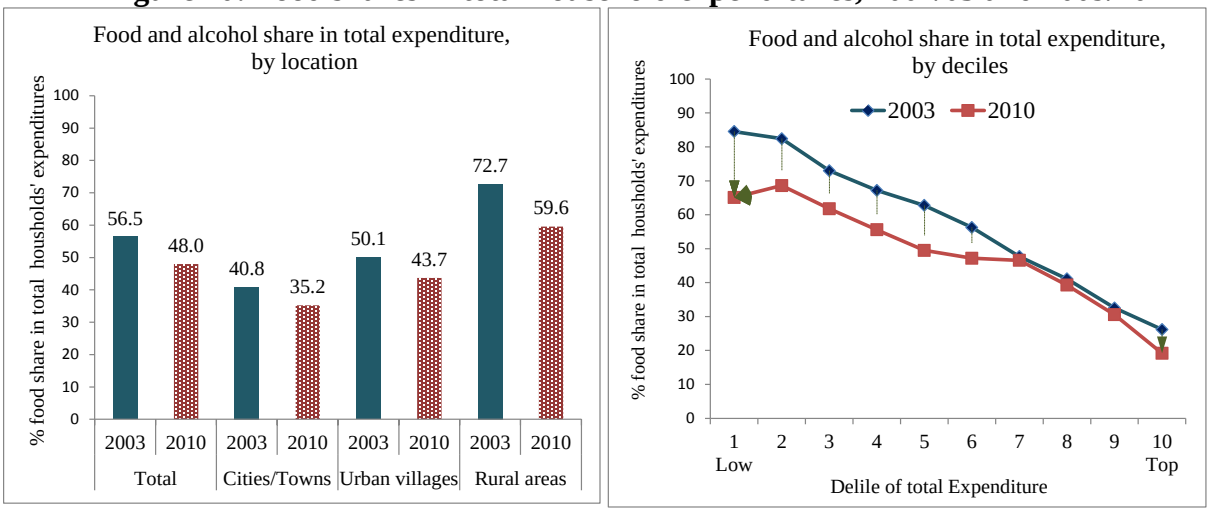
Figure 19: Real consumption per capita growth, 2002/03 and 2009/10



Source: Authors' calculation based on survey data for 2002/03 and 2009/10.

47. **Changes in consumption patterns correspond to the general improvement of households' welfare.** Understanding whether change has occurred in the allocation of household expenditures to such components such as food, education, or health provides important information for distributional analysis. Total food expenditure is generally used to measure households' well-being. In most cases, a decreasing share of food expenditure suggests improvement in welfare because households have more resources to spend on non-food components. Normally, richer households tend to have higher shares of non-food expenditures. This relationship, called Engel's law,[14] characterizes most countries worldwide, but the pattern of household consumption could differ significantly across the nations. Many factors play important roles in determining consumption patterns—consumer prices for various products and services, accessibility to services, the country's geographical and environmental settings, policies and regulations, and certainly cultural and personal preferences.

Figure 20: Food shares in total household expenditures, 2002/03 and 2009/10



Source: Authors' calculations based on the survey data for 2002/03 and 2009/10. Excluding the households with zero estimated food consumption. Food and alcohol consumption categories were combined.

48. **In Botswana, food shares declined nationwide and in all major areas, suggesting general improvement in overall well-being.** Figure 20 presents the budget share allocated to food commodities in 2002/03 and 2009/10. As indicated in the chart on the left, the share of food consumption declined from 56.5 percent in 2002/03 to 48.0 percent in 2009/10. In both periods, rural areas had a higher share of food consumption than cities and urban villages. In rural areas, the shares of the food consumption fell from 72.7 percent in 2002/03 to 59.6 percent in 2009/10. For cities and towns, food consumption's share declined from 40.8 percent in 2002/03 to 35.2 percent in 2009/10. The share in urban villages was close to the national average.

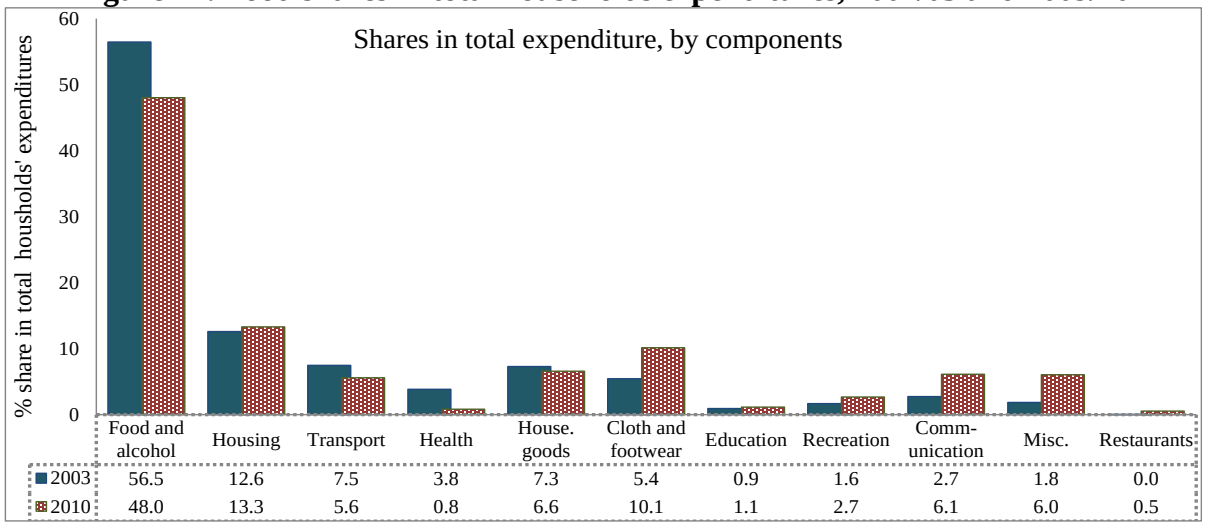
49. **Among the poorest group of the population, the share of food expenditures declined significantly, indicating considerable welfare improvement from 2009/10 to 2002/03.** Meanwhile, the share of food expenditures among the richest remained almost unchanged, suggesting stagnation in their welfare. In Figure 20, the right chart depicts the share of food (and

[14] Engel, Ernst (1857). "Die Productions- und Consumtionsverhältnisse des Königreichs Sachsen". Zeitschrift des statistischen Bureaus des Königlich Sächsischen Ministerium des Inneren 8–9: 28–29."

alcohol) expenditures disaggregated by deciles[15] of total household expenditures. Among the poorest group, the share of food expenditure declined from 84.5 percent in 2002/03 to 65.1 percent in 2009/10. The disparity in per capita food expenditure between the richest and the poorest fell between 2002/03 and 2009/10. However, the deviation between the poorest (decile 1 low) and richest (decile 10 top) remained wide. The richest households spent three times more on food than the poorest households. These results held for each location, suggesting that the differences are largely a function of the quantity and quality of food purchased rather than price differentials.

50. **The overall pattern of expenditures is broadly consistent with rising incomes and living standards.** In Figure 21, a considerable variation in growth rates and in shares of different components of expenditures was recorded between 2002/03 and 2009/10. As discussed above, total food expenditures decreased and total non-food expenditures increased over this period. Within non-food categories, expenditure shares increased for sub-categories like housing, footwear, recreation, clothing, communications, restaurants, and miscellaneous. Slight reductions were observed only in health and transport expenditures. The decline in food's share of spending suggests increases in the population's incomes and welfare. Indeed, average living standards improved during this period, overall expenditures on leisure items increased, and the share devoted to necessities declined.

Figure 21: Food shares in total households expenditures, 2002/03 and 2009/10



Source: Authors' calculations based on survey data for 2002/03 and 2009/10. Excluding households with food consumption estimated at 0. Food and alcohol consumption categories were combined. The results presented in the chart differ from estimates by Statistics Botswana due to the methodological differences. Our estimates exclude consumption of durable goods, such as purchases of vehicles, and calculate expenditure shares on the household level. Statistics Botswana, when publishing a similar table, uses the ratio of average expenditures for each component of consumption and includes purchases of durables. The method makes expenditures on transport components very high.

[15] To illustrate the differences in consumption patterns across income/expenditure groups, households were divided into deciles based on total expenditures. The households were ordered by total expenditures and divided into 10 equal groups, where the 1 decile represents to poorest group and 10 decile represents the richest group.

51. **The analysis of the survey data reveals the importance of housing and utilities in the household budget.** In Botswana, the share of expenditure on housing and utilities rose from 12.6 percent in 2002/03 to 13.3 percent in 2009/10. These results suggest that large energy price increases weigh heavily on household budgets. The share of expenditures on electricity increased markedly between the two surveys. As expected, automotive fuels' share of expenditures rose steeply due to increases in automobile ownership. The surveys indicate that low-income households consumed firewood and other cheaper forms of energy, but these products' relative importance declined over time, once again suggesting improving welfare of the population.

52. **Food consumption patterns remained mostly unchanged between 2002/03 and 2009/10**. In 2009/10, the average Botswana household consumed bread and cereals in the largest proportion (32 percent), followed by meat (13.2 percent), milk and milk products (9.6 percent), vegetables (8.3 percent), with the smallest proportions allocated to fruits (3 percent). This pattern did not considerably change between the surveys, which also found a slight, statistically insignificant increase in the share of high-value food items.

C. Decision on use of poverty lines for the analysis

53. **In this study, poverty incidence in Botswana is based on the official absolute poverty measurement developed in 2004 and updated for CWIS 2009/10.** Called the poverty datum line (PDL), the officially adopted poverty measurement methodology is defined by the CSO at the household level. According to the CSO, the PDL is based on the "cost of a basket of goods and services deemed to be necessary and adequate to meet basic needs for household members. This is based on the basic requirements for food, clothing, personal items, household goods and services, and shelter. The PDL basket components differ according to sex and age, consequently the household composition. The cost of the PDL basket, for a given household, is calculated on the basis of the households' demographic characteristics, including sex and age of members. The cost of this basket is then compared with the observed total consumption for the household."

Box 3: The formal definition of the official poverty line (PDL) in Botswana

CSO (2008) provides a clear account of the method used to estimate the poverty line in 2002/03. The first step consisted in identifying and pricing five main components: (1) a bundle of food items, (2) clothing, (3) personal items, (4) household goods, and (5) an allowance for housing. Details are reported in Appendix 1. The so-called "poverty datum line" (PDL) for household h in region r was defined as follows:

$$\text{PDL}_{h,r} = \underbrace{\sum_{p=1}^{11} (\mathbf{p}_r^F \mathbf{q}_p^F) n_{p,h}}_{(1)} + \underbrace{\sum_{p=1}^{7} (\mathbf{p}_r^C \mathbf{q}_p^C) n_{p,h}}_{(2)} + \underbrace{\sum_{p=1}^{5} (p_r^{PI} q_p^{PI}) n_{p,h}}_{(3)} + \underbrace{H_r}_{(4)} + \underbrace{S_{u,r}}_{(5)} \quad (1)$$

The first component is the minimum food expenditure, calculated as the product of q_r^F, a vector of food commodities that identifies a "basic need" food basket (in our notation p identifies age-gender groups—see Table A1 in the Appendix) and p_r^F, the corresponding minimum prices vector. The term $n_{p,h}$ denotes the number of members in household h belonging to the age-gender class p. The second and third components (clothing and personal items) are defined in a similar way. The last two components are the cost of household goods in region r (H_r), and the cost of housing for household

type u in region r ($S_{u,r}$). The method described in equation (1) amounts to saying that CSO produced a set of household-level poverty lines—3,465 for the 2002/03 survey and 3,803 for 2009/10.

54. **For each household, two poverty lines were estimated—the food poverty line or extreme poverty line and the total poverty line or PDL.** The food poverty line takes into consideration the minimum food expenditure necessary for the household to maintain good caloric requirements. The official food and PDL poverty lines are estimated at the household level. Box 3 formally describes the methodology used in deriving the poverty lines based on the households' characteristics and location. Table 2 and Table 3 illustrate the average poverty lines by region. The first column shows the so-called food poverty line, which is often interpreted as a threshold of extreme poverty. The last column identifies the official (total) poverty lines. On average, the food poverty line is 77.2 percent of the total poverty line at the national level. The ratio is higher in rural areas (81.1 percent) than in cities and towns (74.6 percent).

Table 2: Average Poverty Datum Lines (pula/household/month) by region, 2002/03

	Food	Clothing	Personal items	Household goods	Housing	PDL
Gaborone	339.1	31.7	14.4	31.4	120.7	537.4
Francistown	384.0	34.2	14.5	31.9	119.3	583.8
Other Cities & T	380.3	34.7	16.6	32.5	118.5	582.6
Rural South-East	439.6	43.4	18.9	41.7	10.6	554.2
Rural North-East	466.1	48.4	18.3	47.6	10.7	591.0
Rural North-West	447.6	43.8	19.0	42.2	9.9	562.5
Rural South-West	494.0	53.6	20.7	41.8	10.9	620.8
Cities/Towns	360.3	33.1	15.1	31.8	119.8	560.0
Urban villages	463.9	46.8	19.6	44.1	10.9	585.2
Rural areas	450.3	46.0	18.3	44.2	10.4	569.2
Rural	450.3	46.0	18.3	44.2	10.4	569.2
Urban	414.7	40.3	17.5	38.3	62.5	573.2
Botswana	429.5	42.7	17.8	40.7	40.9	571.6

Source: Authors' estimates based on HIES (2002/03) and CWIS (2009/10).

Table 3: Average Poverty Datum Lines (pula/household/month) by region, 2009/10

	Food	Clothing	Personal items	Household goods	Housing	PDL
Gaborone	570.5	36.5	21.9	62.6	179.3	870.7
Francistown	591.3	36.8	21.1	60.9	181.1	891.3
Other Cities & T	524.4	33.5	20.8	60.6	186.1	825.4
Rural South-East	699.6	47.8	27.3	67.1	17.5	859.3
Rural North-East	734.2	53.2	26.0	77.4	17.5	908.2
Rural North-West	749.0	50.4	28.9	70.3	17.4	915.7
Rural South-West	733.5	51.9	27.5	66.0	16.5	895.4
Cities/Towns	562.8	35.7	21.4	61.6	181.6	863.1
Urban villages	753.6	52.3	28.9	71.8	18.0	924.5
Rural areas	696.7	49.4	25.4	71.2	16.9	859.5
Rural	696.7	49.4	25.4	71.2	16.9	859.5
Urban	669.2	44.9	25.5	67.3	90.4	897.4
Botswana	680.7	46.8	25.5	68.9	59.8	881.6

Source: Authors' estimates based on HIES (2002/03) and CWIS (2009/10).

55. **Observed household consumption per capita served as the welfare aggregate for this study.** A standard Deaton and Zaidi (2002)[16] methodology for consumption aggregation was applied. The consumption aggregate is calculated by adding up total consumption expenditures, in-kind consumption, in-kind wages, gifts received, school meals, and unearned income in-kind. The in-kind components' values have been estimated based on the prices households face when purchasing similar items. If household-level prices cannot be estimated, local and regional price estimates are used. Households with total consumption per capita below the food poverty line will be defined as extremely poor, while households with per capita consumption below the PDL line are defined as generally poor. Household consumption expenditures include food and non-food components. Food consumption includes food consumed at home and outside the home—from purchases, self-production, gifts, and other transfers. Non-food consumption expenditures include alcoholic beverages and tobacco, clothing and footwear, household goods, transportation, utilities, recreation, and education. Expenditures on health and the rental value of durable goods are also included in the non-food component to create a broader measure of welfare. The non-food component also includes in-kind non-food consumption, such as goods and services received free of charge (i.e., non-food humanitarian aid, gifts, non-food goods, and services provided by the members of the household). The monetary values of in-kind non-food consumption are based on households' own assessments.

D. Poverty decreased between 2002/03 and 2009/10

56. **Between 2002/03 and 2009/10, the incidence of poverty in Botswana decreased from 30.6 percent to 19.4 percent.** Improvement in rural areas was a key driver. The estimates in Table 4, Table 5, and Table 6 show the largest decrease in poverty was observed in rural areas—-20.78 percentage points, compared to -11.2 percentage points at the national level. Poverty in cities and towns decreased -2.6 percentage points. Both poverty and extreme poverty have become less of a rural-only problem.

Table 4: Poverty rates by stratum, 2002/03-2009/10

	Poverty Headcount Rate			Poverty Gap			Squared Poverty Gap		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Botswana	30.6	19.4	-11.2	11.7	6.2	-5.4	6.0	2.9	-3.1
s.e.	(0.3)	(0.3)	(0.4)	(0.2)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)
Cities/Towns	10.7	8.0	-2.6	3.3	2.4	-0.9	1.5	1.0	-0.5
s.e.	(0.3)	(0.4)	(0.5)	(0.1)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)
Urban villages	24.9	19.9	-5.0	8.6	6.0	-2.6	4.0	2.6	-1.4
s.e.	(0.5)	(0.5)	(0.7)	(0.2)	(0.2)	(0.3)	(0.1)	(0.1)	(0.1)
Rural areas	45.2	24.4	-20.8	18.3	8.3	-10.0	9.8	4.0	-5.8
s.e.	(0.6)	(0.4)	(0.8)	(0.3)	(0.2)	(0.4)	(0.2)	(0.1)	(0.3)

Source: Authors' estimates based on HIES (2002/03) and CWIS (2009/10).

57. **The decline in the incidence of poverty has been accompanied by similar decreases in both the depth and severity of poverty.** The poverty gap measures capture both the size of the poor population (the headcount) and the average distance of the poor from the poverty line. The lower the measure, the less severe the poverty. The poverty gap measure eased from 11.7

[16] Deaton, A. and S. Zaidi (2002), A Guide to Aggregating Consumption Expenditures, Living Standards Measurement Study, Working Paper 135.

percent in 2002/03 to 6.2 percent in 2009/10. The decline in the poverty gap indicates that the consumption of the poor has improved. Most gains took place in rural areas.

Box 4: The main poverty indicators (FGT measures)

The poverty headcount (FGT0), or poverty incidence, measures the number of people below the poverty line, but it does not assess how far they fall below the poverty line. One way to gauge the depth of poverty is to look at other measures that are sensitive to the distance between the poor and the poverty line based on the welfare measure. Households close to the poverty line could be moved out of poverty with relatively less effort than those far below the line. What is commonly called the poverty gap (or FGT1) is the average shortfall of all households from the poverty line, treating the non-poor as having zero shortfall.

The headcount index (FGT0) measures the prevalence of poverty. It denotes the percentage of households who are poor—as defined by the poverty line—as a portion of the total population. This measure is insensitive to the distribution of the poor below the poverty line.

$$P0 = \frac{q}{n};$$

The poverty gap index (FGT1) measures the depth of poverty as the gap between poor households' observed consumption levels and the poverty line. Assuming perfect targeting of resources (transfers), this poverty gap index indicates the total amount needed to bring all households in poverty up to the poverty line.

$$P1 = \frac{1}{n}\sum_{i \in Q} \frac{(z - y_i)}{z};$$

The poverty severity index (FGT2) measures the degree of inequality in a distribution below the poverty line, giving greater weight to households at the bottom of the consumption distribution.

$$P2 = \frac{1}{n}\sum_{i \in Q} \frac{(z - y_i)^2}{z^2};$$

Where n = total population, q = number of those with consumption y_i less than the poverty line z.

58. **The severity of poverty also declined. Measured by the squared poverty gap, which is sensitive to both distance to the poverty line and inequality among the poor, it was estimated at about 6.0 percent in 2002/03 and 2.9 percent in 2009/10**. Poverty severity measures inequality among the poor, and the lower the measure the better. In conjunction with the decrease in poverty depth, the decline in poverty severity suggests an improvement of income distribution among the poor and more equitable distribution of consumption among the poor.

59. **Reductions in the poverty headcount, gap, and severity suggest a decline in general poverty and improved living standards among those below the poverty line, but the gains occurred mostly in rural areas, reducing the gap between rural and urban poor.** Between 2002/03 and 2009/10, all poverty measures (headcount, gap, and squared poverty gap) improved significantly more in rural areas than in cities and towns. Despite the narrowing, rural-urban differences in poverty remained considerable. The rural poverty gap in 2009/10 was 18 percent,

compared to 2.3 percent in the cities and towns. Similarly, the rural areas' squared poverty gap was four in 2009/10, compared with one in cities and towns.

60. **In line with general poverty at the national level, the incidence of extreme poverty in Botswana decreased from 22.7 percent in 2002/03 to 13.8 percent in 2009/10**. Similarly, substantial reductions in rates were observed in the other measures of extreme poverty (Table 5). Both the depth of extreme poverty, measured by the poverty gap index, and the severity of extreme poverty, measured by the poverty gap squared index, decreased significantly.

Table 5: Extreme poverty rates by stratum, 2002/03-2009/10

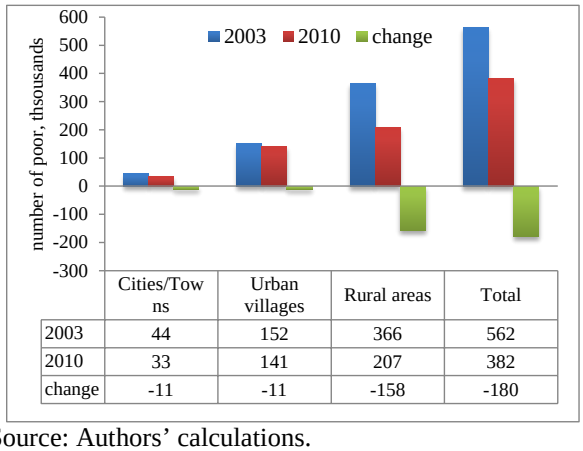
	Poverty Headcount Rate			Poverty Gap			Squared Poverty Gap		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Botswana	22.7	13.8	-8.9	7.8	4.1	-3.7	3.8	1.9	-2.0
s.e.	(0.3)	(0.2)	(0.4)	(0.1)	(0.1)	(0.2)	(0.1)	0.0	(0.1)
Cities/Towns	5.1	4.7	-0.4	1.6	1.1	-0.5	0.7	0.4	-0.3
s.e.	(0.2)	(0.3)	(0.4)	(0.1)	(0.1)	(0.1)	(0.1)	0.0	(0.1)
Urban villages	18.5	14.2	-4.2	5.5	3.9	-1.6	2.4	1.7	-0.7
s.e.	(0.4)	(0.4)	(0.6)	(0.2)	(0.1)	(0.2)	(0.1)	(0.1)	(0.1)
Rural areas	35.0	17.8	-17.2	12.8	5.7	-7.1	6.6	2.7	-3.9
s.e.	(0.6)	(0.4)	(0.7)	(0.3)	(0.2)	(0.3)	(0.2)	(0.1)	(0.2)

Source: Authors' calculations.

61. **The largest decrease in extreme poverty occurred in the rural areas.** Table 5 also indicates the decrease in extreme poverty was -17.2 percentage points in rural areas, while the reduction was -4.2 percentage points in the urban villages. For cities and towns, the decrease was an almost negligible -0.4 percentage point.

62. **The number of people in poverty or extreme poverty decreased significantly.** Between 2002/03 and 2009/10, the population below the poverty line declined by nearly 180,000, and individuals below the extreme poverty line fell by 146,000 (Figure 22 and Figure 23).

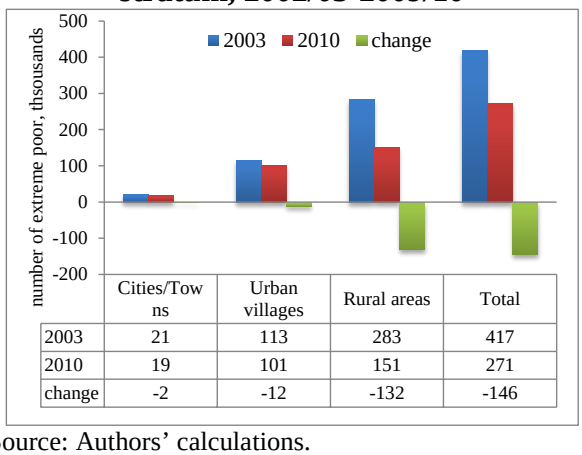
Figure 22: Number of the poor by stratum, 2002/03-2009/10



	Cities/Towns	Urban villages	Rural areas	Total
2003	44	152	366	562
2010	33	141	207	382
change	-11	-11	-158	-180

Source: Authors' calculations.

Figure 23: Number of the extreme poor by stratum, 2002/03-2009/10



	Cities/Towns	Urban villages	Rural areas	Total
2003	21	113	283	417
2010	19	101	151	271
change	-2	-12	-132	-146

Source: Authors' calculations.

63. **Among both the poor and the extreme poor, rural areas led the drastic reduction in the number of people in poverty.** Between 2002/03 and 2009/10, 87 percent of the fall in

poverty occurred in the rural areas, where 158,000 people rose out of poverty. Similar trends characterized the extreme poverty group.

64. **Although urbanization levels were unaltered between 2002/03 and 2009/10, poverty became more urban.** In 2009/10, 43 percent of Botswana's population lived in rural areas, a decrease of only 1 percentage point since 2002/03. Poverty is still relatively concentrated in rural areas at 24.4 percent, compared to the national mean of 19.4 percent. However, poverty became relatively more urban between 2002/03 and 2009/10. Table 6 shows that the share of poor people living in rural areas decreased almost 11 percent, while the share of the rural population unable to meet the food poverty line decreased 12 percent.

Table 6: Distribution of the poor and the population, 2002/03-2009/10

	Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change
Poverty line						
Cities/Towns	7.9	8.6	0.8	22.6	20.9	-1.8
Urban villages	27.1	37.0	9.9	33.4	36.1	2.7
Rural areas	65.0	54.3	-10.7	44.0	43.0	-0.9
Total	100.0	100.0	0.0	100.0	100.0	0.0
Food poverty line						
Cities/Towns	5.1	7.0	2.0	22.6	20.9	-1.8
Urban villages	27.2	37.3	10.1	33.4	36.1	2.7
Rural areas	67.7	55.6	-12.1	44.0	43.0	-0.9
Total	100.0	100.0	0.0	100.0	100.0	0.0

Box 5: Sensitivity analysis of poverty changes

Small shocks to the poverty line would affect large fractions of the population. Based on 2009/10 data, Table 7 shows a series of hypothetical shocks that reduce consumption among those now considered non-poor by 5 percent, 10 percent, and 20 percent. An additional 7.3 percent, 14.4 percent, and 31.3 percent of the population would fall into poverty. In other words, if the poverty line was 20 percent higher in 2009/10, the poverty rate would have been 25.4 percent, not 19.4 percent.

Table 7: Sensitivity of headcount poverty rate with respect to the choice of poverty line

	2002/03		2009/10	
	Poverty Headcount Rate	Change from actual (%)	Poverty Headcount Rate	Change from actual (%)
Actual	30.6	0.0	19.4	0.0
+5%	32.3	5.6	20.8	7.3
+10%	35.0	14.3	22.2	14.4
+20%	38.9	27.1	25.4	31.3
-5%	29.0	-5.3	17.7	-8.8
-10%	27.4	-10.6	16.2	-16.2
-20%	22.6	-26.1	12.8	-34.1

Source: World Bank staff estimates.

An opposite scenario projects increased consumption by 5 percent, 10 percent, and 20 percent among those who are now considered non-poor. Under these assumption, poverty would be lower by -8.8 percent, -16.2 percent, and -34.1 percent. This suggests that a 20 percent growth rate in per capita consumption would reduce extreme poverty in Botswana from 17.7 percent to 12.8 percent. It would require less than 5 percent annual growth in

total consumption for 10 years, assuming unchanged inequality.[17]

Trends in the poverty headcount are very sensitive to the location of the poverty line. The average consumption of the poorest population improved, shown by measures of the poverty gap, consumption gap, and squared poverty gap measures. This is demonstrated in the GICs and the welfare dominance analysis below. If the poverty line were somewhere slightly below the extreme poverty line, then the poverty headcount would have declined from 2002/03 to 2009/10.

Stochastic dominance analysis tests the sensitivity of poverty reduction to the choice of poverty line and poverty measures, and it raises the possibility that the results are not robust. Potentially different results could be obtained due to a choice of another poverty line and different conclusions can be drawn if poverty trends vary substantially.

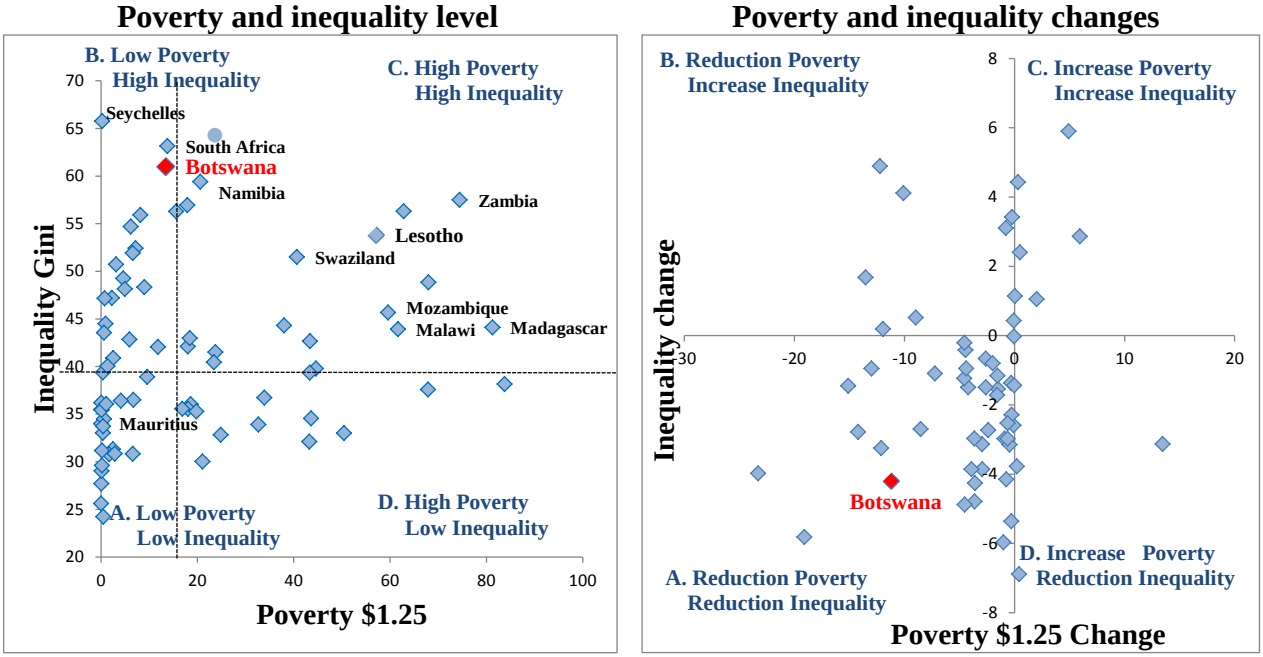
The stochastic dominance analysis for Botswana implies that national and rural poverty fell unambiguously, regardless of what poverty line is drawn. However, the urban areas' results are not robust.

Annex F provides a detailed discussion of the stochastic dominance sensitivity analysis. Clearly, poverty incidence points to an unambiguous decrease in poverty in the total economy—if the poverty line would be set lower or higher, we could get the same results. Similar results are obtained for rural areas, where the poverty incidence curves do not cross. In cities and towns, however, the results are less robust, crossing in the very low part of the distribution. The situation in the cities and towns is ambiguous. In addition, not all rural areas participated equally in the poverty reduction. Poverty declined less in western areas than in eastern areas.

65. **Compared to other low- and middle-income countries, Botswana international poverty rate can be found in the middle of the distribution, and the country is better off than other African countries**. Botswana is ranked 67th among 127 developing countries with POVCALNET data for 2010 (Figure 24). Only a few countries in Africa have lower international poverty rates than Botswana. While well positioned among African countries, Botswana still has relatively high poverty when compared to developing countries in other regions. Middle-income countries—such as Ukraine, Russia, Mexico, and Argentina—have $1.25-a-day poverty rates that are less than 1 percent—much lower than Botswana.

[17] Based on the same logic, the required growth to eradicate extreme poverty in Botswana is 700 percent, assuming that people receive the income proportionally. In other words, based on a purely hypothetical scenario, GDP should grow eight-fold to eradicate poverty, starting at its current measure in Botswana.

Figure 24: International poverty rates $1.25 and $2.00 a day, 2010



Source: Authors' estimates based on CWIS (2009/10), POVCALNET database for the rest of the countries. The international poverty figures are presented for 128 countries, but labels are shown for 64 countries.

Box 6: Measuring growth to poverty reduction elasticity

Traditionally, economists project the incidence of poverty as a function of economic growth, using the consumption to poverty elasticity, an empirically measured index that quantifies how much poverty reduction occurs for each 1 percent increase in per capita consumption. The responsiveness of poverty reduction to growth is the function of the number of people living just above poverty line. If the elasticity is high, poverty responds strongly to economic growth. If it is low, even high growth rates will be relatively ineffective in reducing poverty.

The impact of growth on poverty can also be captured by estimating the elasticity of growth to poverty, a measure of how poverty reacts to changes in average per capita expenditures. Following Duclos and Araar (2006), we used the following general formula for the elasticity η_G^α:

$$\eta_G^\alpha = \begin{cases} \dfrac{\alpha[P(\alpha) - P(\alpha-1)]}{P(\alpha)} & \text{if } \alpha \neq 0 \\ -\dfrac{zf(z)}{F(z)} & \text{if } \alpha = 0 \end{cases}$$

where $P(\alpha)$ is the Foster-Greer-Thorbecke poverty measure with parameter α, f(z) the probability density function, F(z) the cumulative density function of per capita expenditure, and z the absolute poverty line. Table 8 shows the non-parametric estimates of the elasticity for the two survey years. The absolute magnitude of elasticity is in line with estimates in studies for other countries (Ravallion and Chen, 1997).

Table 8: Elasticity to growth, 2002/03-2009/10

	Headcount		Poverty gap		Poverty gap squared	
	2003	2010	2003	2010	2003	2010
Botswana	-0.92	-1.45	-1.49	-1.88	-1.70	-2.02
Cities/Towns	-1.84	-1.11	-1.98	-2.15	-1.95	-2.44

Urban villages	-1.22	-1.81	-1.71	-2.03	-2.02	-2.19
Rural areas	-0.68	-1.26	-1.37	-1.76	-1.57	-1.87

Source: Authors' estimates based on HIES (2002/3) and CWIS (2009/10).

It is worth noting that elasticity increased noticeably between 2002/03 and 2009/10—nationwide and especially in rural areas As shown by Kakwani and Son (2004), the absolute value of the growth elasticity of poverty increases with the initial level per capita expenditure and decreases with the initial level of inequality. This implies that economic growth is more effective in reducing poverty in a rich country than in a poor one and in countries with low inequality levels. Between 2003 and 2009/10 Botswana experienced a positive growth rate and a reduction in inequality. The dynamic of growth elasticities is fully consistent with this picture.

E. Inequality analysis suggests sharp reduction in the consumption inequality

66. **Botswana remains one of the world's most unequal countries, although a significant reduction in inequality occurred between 2002/03 and 2009/10** The Gini coefficient in 2002/03 was estimated at 64.7 percent, and it fell to 60.5 percent in 2009/10. Despite this significant improvement, striking disparities remain among socioeconomic groups in income, wealth, and living standards. Botswana's inequality is among the highest in the world, trailing only South Africa and Seychelles.

67. **Other inequality measures support the trend in inequality, with a majority of the decline taking place in rural areas.** Similar results are observed based on other inequality measures show similar results; for example, the Theil inequality index fell from 89.6 to 82.3 (Table 11). The ratio of the top 10 to the bottom 10 percentiles of the distribution declined from 19.2 to 13.7. In rural areas, all the indicators suggest strong poverty reduction, with rural areas' Gini coefficient falling from 60.9 to 56.8. Trends in urban areas are not that clear, while inequality actually increased in cities.

Table 9: Inequality indices for 2002/3 and 2009/10

Index	Total		Urban		Rural	
	2002/03	2009/10	20020/3	2009/10	2002/03	2009/10
Gini	64.7	60.5	61.8	60.7	60.9	56.8
Theil	89.6	82.3	76.5	82.2	94.5	71.6
p90/p10	19.2	13.7	19.6	15.0	10.7	10.5

Source: World Bank staff calculations**.**

68. **Inequality increased in Gaborone and decreased in other regions and urban areas**. *Figure 25* shows that inequality increased by 3.6 percentage points in Gaborone. The reduction of inequality was concentrated in rural areas. Notably, the declines were -9.4 percentage points in the North-West and -6.7 percentage points the South-East (*Figure 26*).

Figure 25: Inequality rates by region, 2002/03-2009/10

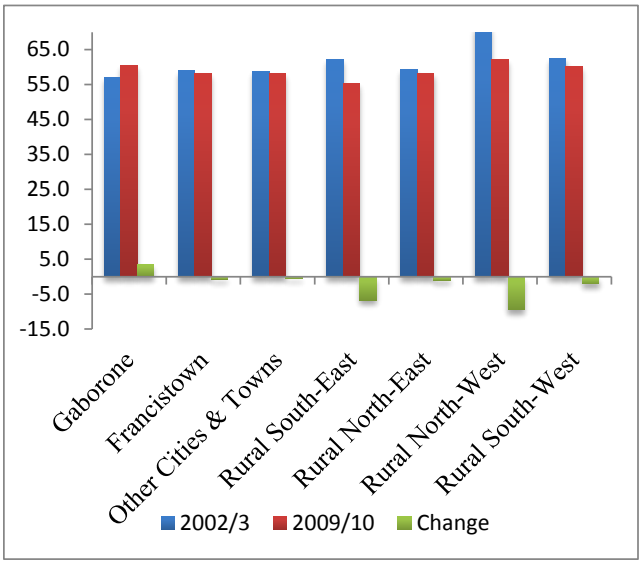
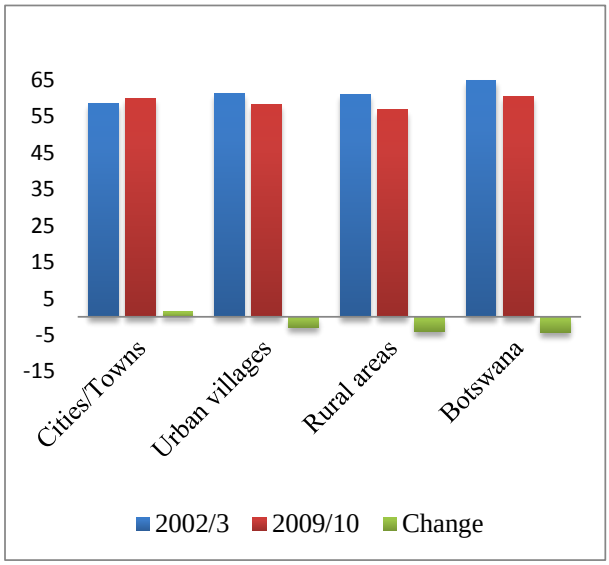


Figure 26: Inequality rates by location, 2002/03-2009/10

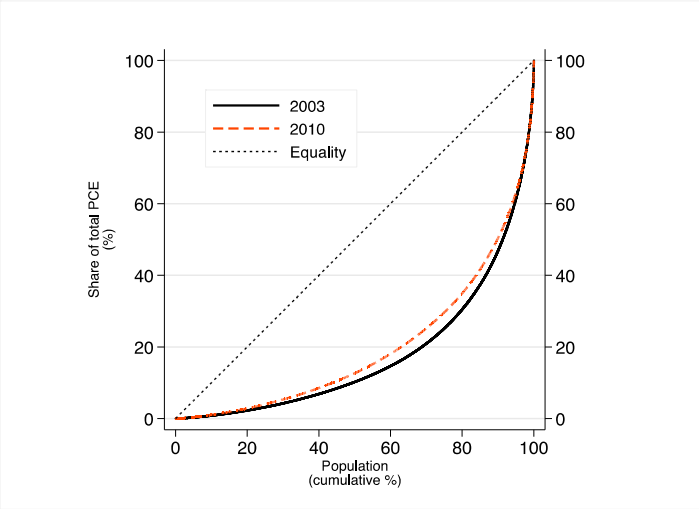


Source: Authors' estimates based on HIES (2002/3) and CWIS (2009/10).

69. **Lorenz curves clearly illustrate the reduction in the inequality between 2002/03 and 2009/10 (Figure 27).**[18] They show that the 2009/10 distribution uniformly dominates the 2002/03 one. The Lorenz curves for rural areas confirm the dominance of the 2009/10 distribution, but the results are more verified for cities and towns (*Figure 28*). In 2002/03, the distribution of the household consumption per capita was much further away from the diagonal line. The inward shift of the Lorenz curve for all households, and especially for rural ones, indicates that the bottom percentiles of the population had more of total consumption in 2009/10 than they did in 2002/03.

[18] The Lorenz curve plots the proportion of the welfare gained by the various portions of the population ordered by consumption levels. The 45 degree line represents total equality; the farther the curve from the diagonal, the higher the inequality.

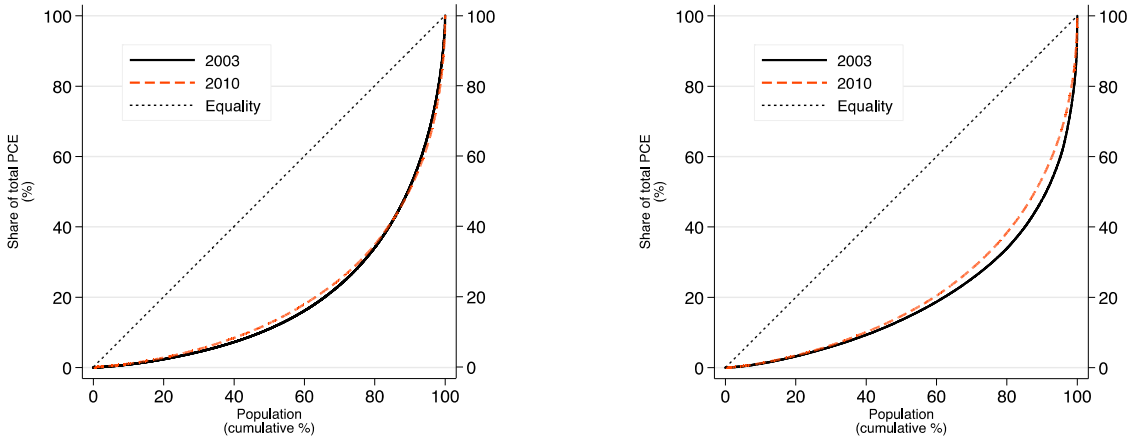
Figure 27: Lorenz curves, 2002/03-2009/10



Source: Authors' estimates based on HIES (2002/3) and CWIS (2009/10).

Figure 28: Lorenz curves by urban and rural areas, 2002/03-2009/10

Urban **Rural**



Source: Authors' estimates based on HIES (2002/3) and CWIS (2009/10).

70. **Many factors have contributed to Botswana's decline in inequality, with regional convergence playing the most important role**. Decomposing inequality into within group and between group components provides a partial explanation for inequality changes. Within-group inequality measures the contribution to total inequality from the within-group consumption distribution, without taking into consideration differences in the levels of variables. Between-group inequality measures the contribution to overall inequality of average consumption by sub-groups, assuming a homogenous distribution of consumption within each sub-group. Within-group and between-group inequality sum to total inequality, but they have very different interpretations. The decline in between-group inequality is generally associated with convergence between selected categories (such as regions, males and females, rural versus urban, etc.). Within-group inequality is a less informative measure. It reflects changes in inequality due to all other households and individual characteristics besides the selected category. We analyzed

between and within group inequality by main location, education attendance, labor, and demographic characteristics (Figure 29).

Figure 29: Shares of between and within inequality, 2009/10

(Theil inequality index)

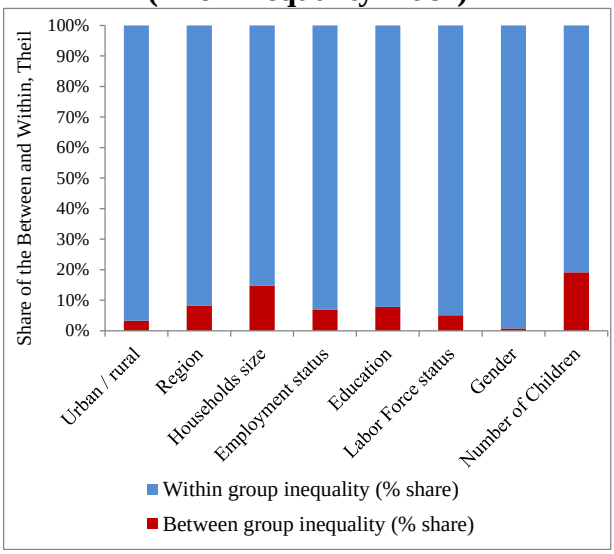
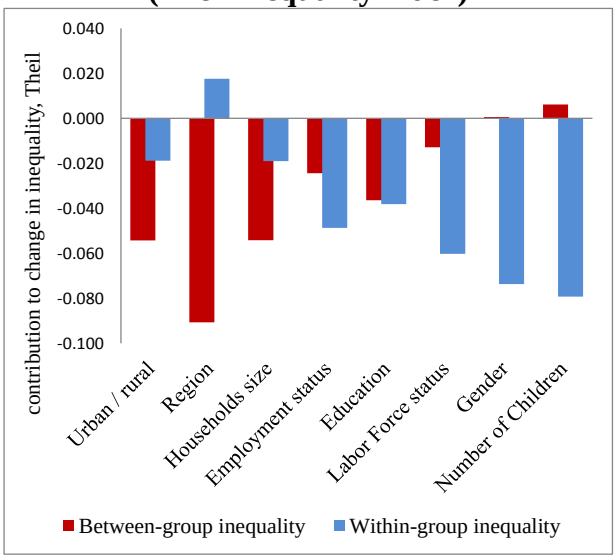


Figure 30: Absolute contribution of between and within to change in inequality 2009/10 vs 2002/03

(Theil inequality index)



Source: World Bank staff calculations.

71. **Demographic characteristics—including household size, number of children, changes in geographical location, level of education, and labor participation—play a significant role in explaining inequality**. As shown in Figure 29, between-group inequality's share was 14.8 percent by household size and 19.1 percent by the number of children, making those factors the major contributors to total inequality in 2009/10, measured by the Thiel inequality index. The region and education-level variables play less significant yet still important roles in determining inequality. Regional differences explained 8.3 percent of inequality, and education accounted for 7.8 percent. Clearly, gender and labor categories explain less of the disparities, having lower between-group components.

72. **Regional convergence of consumption and reduced inequalities in household size and education are the main factors explaining the decline in Botswana's inequality between 2002/03 and 2009/10.** Figure 30 shows the decomposition of between- and within-group inequality by location, demographic traits, education, and labor characteristics. Here again, the changes in the "between" group inequality are our main interest. Regional convergence, urban/rural convergence, reduction in household size, and reduction in returns to education are the main factors explaining changes in the inequality. Regional convergence, expressed in the reduction in the "between" component, had the most significant impact on the inequality. By contrast, the gender component had almost no effect on "between" inequality, suggesting that factors other than gender differences impact total inequality.

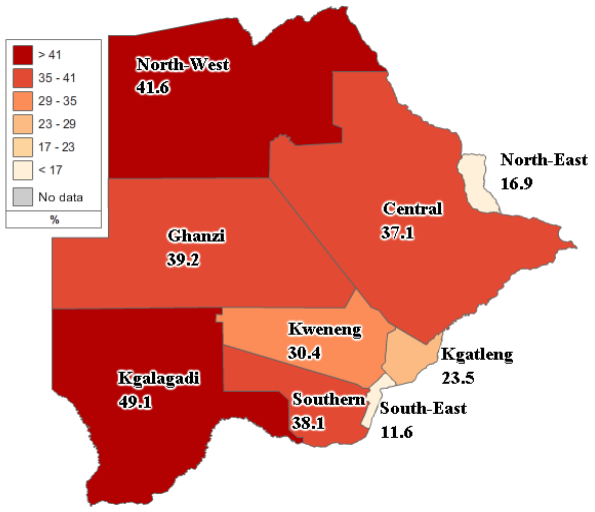
F. Regional dimension of poverty and inequality

73. **Poverty in Botswana has a clear regional dimension, characterized by higher poverty rates in the northern parts of the country; however, significant poverty reduction occurred in all regions between 2002/03 and 2009/10**. The maps in Figure 31 show that poverty rates vary across regions in Botswana. Regions with relatively low average poverty rates are traditionally located in the east and southeast, where most of the population lives. Northern parts of the country are characterized by relatively higher poverty rates. This general pattern remained unchanged over time, but the differences are much less prominent, and the regional picture has become much more homogeneous. The North-West is traditionally the poorest region in Botswana, with a poverty rate of 30.1 percent in 2009/10. The region with the least poverty is located exactly opposite on the map—the South-East region, with a poverty rate of 8.9 percent in 2009/10.

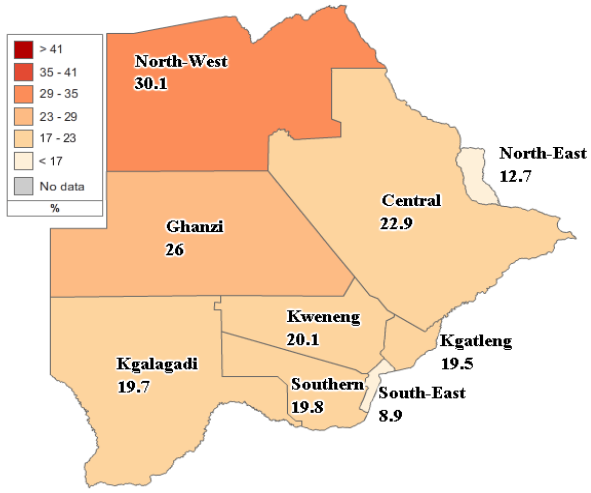
74. **The regional pattern of inequality generally follows the regional poverty distribution, with the highest inequality in the north and the South-West region and lower inequality in the Central and Southern regions.** In 2009/10, the highest income inequality was in the North-West and Kgalagadi regions in the west and North-East and South-East regions in the east. The lowest inequality was in Kweneng and Kgatleng. As with the poverty trends, a majority of the regions experienced reductions in Gini coefficient inequality rates; in addition, convergence in regional inequality has been observed. Despite the decreases in inequality, the lowest regional inequality in Botswana is higher than the inequality in any non-African country in the world. Inequality within regions is the main source of the inequality within the country.

Figure 31: Regional poverty and inequality in Botswana, 2002/03 and 2009/10

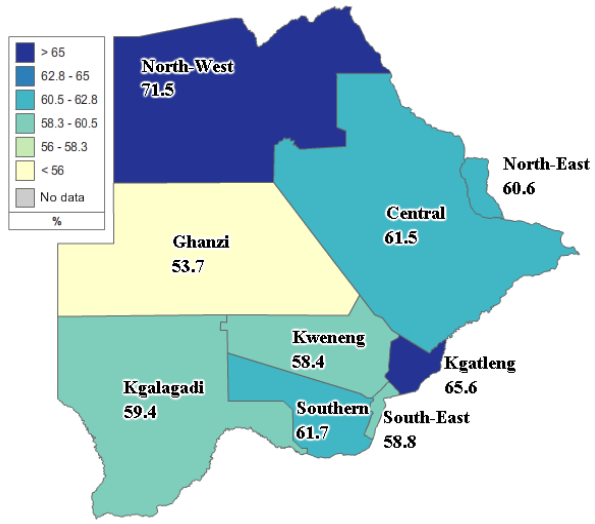
Poverty Rate 2002/03



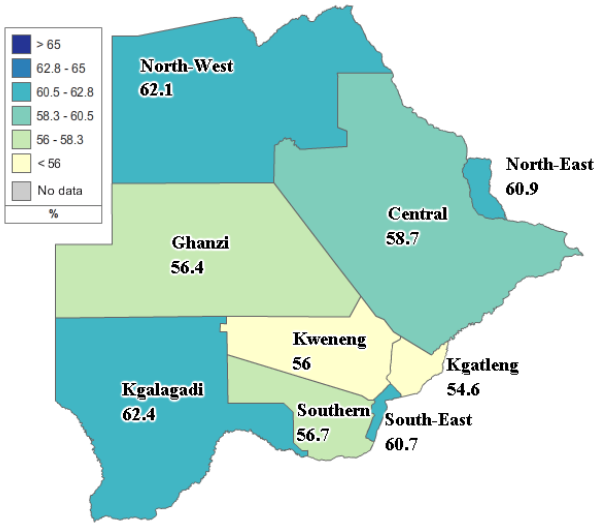
Poverty Rate 2009/10



Gini 2002/03



Gini 2009/10

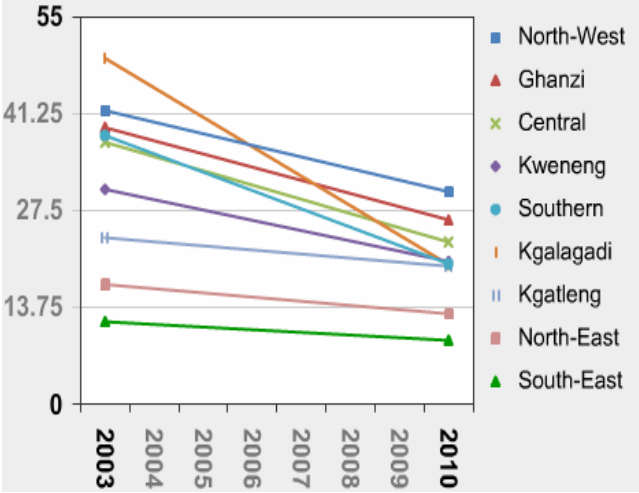


Source: Authors' calculations.

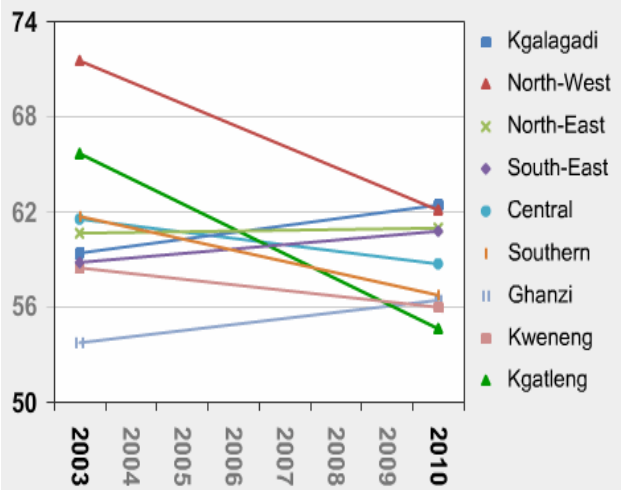
75. **Poverty rates fell in all regions between 2002/03 and 2009/10, leading to reduction in the regional income disparities and a convergence of regional poverty.** As shown in Figure 32, the range of the poverty rates and regional inequality has fallen drastically. In 2009/10, the regional poverty ranged between 8.9 percent (South-East) and 30.1 percent (North-West), compared with 11.36 percent (South-East) and 49.1 percent (Kgalagadi) in 2002/03. All told, the regional poverty gap fell 44 percent. The South-East region remained the richest region in Botswana, but the ranking of other regions has changed. The poorest regions were Kgalagadi (49.1 percent) in 2002/03 and the North-West (30.1 percent) in 2009/10.

Figure 32: Convergence in regional poverty and inequality in Botswana

Poverty rates 2002/03-2009/10, convergence



Gini 2002/03-2009/10, convergence

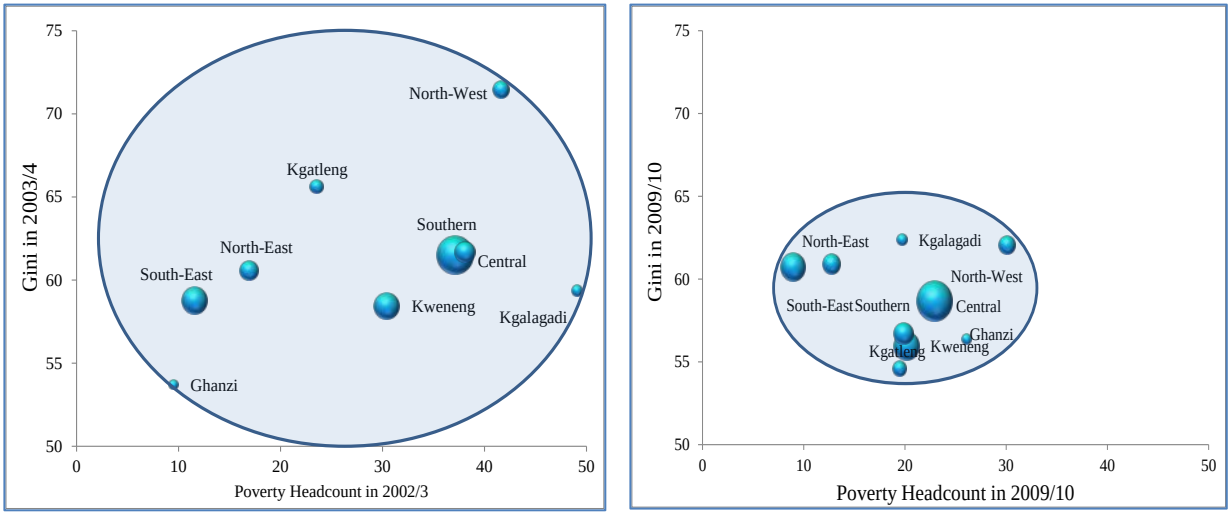


Source: Author's calculations.

76. **The trends in the regional inequality were ambiguous, but point to a lessening of regional differences or convergence.** A majority of the initially highly unequal regions recorded fast declines in inequality between 2002/03 and 2009/10; meanwhile, other regions with relatively low inequality recorded increases in inequality (Figure 32). This resulted in a narrowing of regional disparities and the convergence of regional inequality. The range of inequality rates has been reduced. In 2002/03, regional inequality was between Gini 53.7 (Ghanzi) and 71.5 (North-West); in 2009/10, the gap was 54.6 (Kgatleng) to 62.4 (Kgalagadi). Al told, the regional inequality gap fell 63 percent. The ranking of regions in terms of inequality has changed.

77. **Regional and urban/rural convergence was an important factor in reducing inequality in Botswana.** Between-group inequality declined in most of the selected variables. However, the magnitude of the impact was prominent for the regional and rural urban component. This suggests that regional and urban/rural convergence was the main factor reducing poverty and inequality in Botswana. Figure 33 clearly illustrates the convergence of regional poverty and inequality rates. Both regional poverty and inequality rates are much closer to each other in 2009/10 than in 2002/03. The circle around the regional poverty rates is much smaller in the most recent period, clearly showing convergence of the indicators.

Figure 33: Convergence in the regional poverty and inequality in Botswana



Source: Author' calculations.
'

G. Shared prosperity and inclusiveness of growth in Botswana

78. **Fast economic growth and favorable distributional changes contributed to reducing poverty in Botswana.** This is clearly shown by the pro-poor distribution of the per capita expenditure gains that come from economic growth as well as by the sensitivity of poverty measures to average per capita expenditure. The dynamics of all FGT poverty measures are affected by: (i) shifts of the expenditure distribution and (ii) changes in the shape of the expenditure distribution. Both effects can be interpreted as a consequence of unfolding economic growth. For analytical and policy purposes, however, it can be useful to disentangle the pure growth effect, represented by shifts in the distribution, from the distribution effect related to the inequality dynamic. In the next subsections, we quantify and qualify the effect of growth on poverty, showing how an expanding economy benefitted Botswana's poor households. We will also provide a measure of the sensitivity of poverty to growth and decompose the changes in poverty into growth and inequality components.

79. **Economic growth in Botswana has been strongly pro-poor.**[19] Between 2002/03 and 2009/10, the growth incidence curve (GIC), developed by Ravallion and Chen (2003), shows that per capita expenditure growth rates were high among households in the bottom PCE percentiles. It decreased among better off households. The poorest people gained more than those at the top of the distribution (Figure 34). The per capita consumption of the bottom three deciles of the consumption distribution increased significantly during 2002/03-2009/10, with average per capita consumption in the bottom quintile growing 4.9 percent a year and consumption in the

[19] Growth incidence curves analysis, proposed by Ravallion and Chen (2003), plot per capita expenditure growth rates between 2002/03 and 2009/10 against percentiles of per capita expenditure ranked from poorest to highest. The GIC provides an intuitive picture of how much growth has favored different population groups. The slope of the GIC curve is clearly negative. This indicates that overall average growth has been negative, but its structure across the distribution of households has been pro-poor.

upper two quintiles increasing 1.1 percent a year. GICs confirm that changes in the consumption distribution were progressive during 2002/03-2009/10; the poorest enjoyed higher growth than those in the middle and at the top of the distribution.

Figure 34: The growth incidence curve in Botswana, 2002/03-2009/10

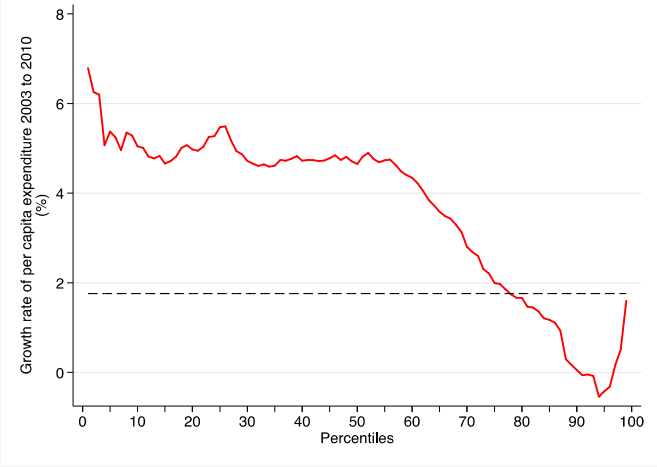
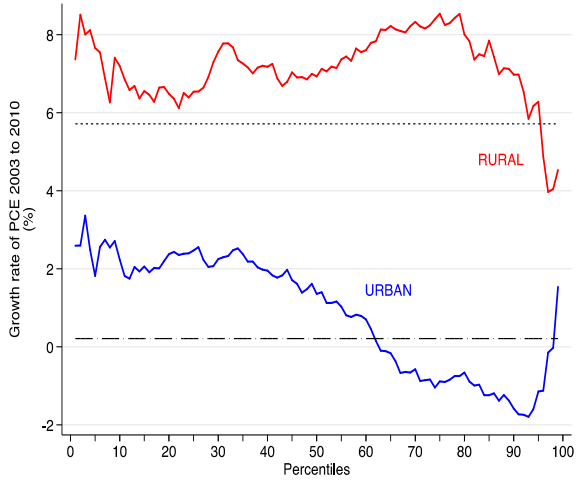


Figure 35: Growth incidence curves for urban and rural areas, 2002/03-2009/10



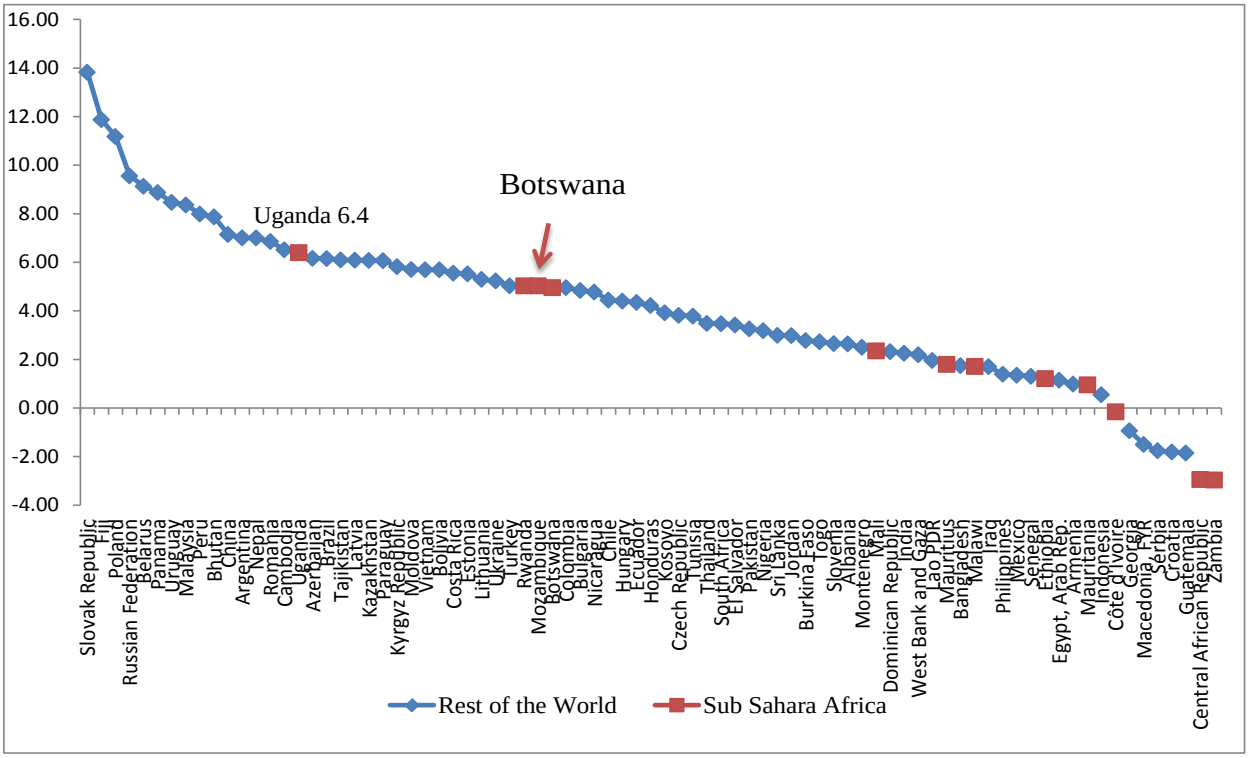
Source: Authors' estimates based on HIES (2002/3) and CWIS (2009/10).

80. **The pattern is different for rural and urban areas**. On average, consumption growth was positive in rural areas but negative for all people above the 50th percentile in urban areas. Figure 35 suggests why we observe poverty reduction in rural areas and stagnation in the urban areas. The growth rates for all deciles of incomes were much higher in rural areas than in urban areas. Clearly, poverty has decreased significantly in rural areas, while the impact on poverty was only mild in cities and towns.

81. **Botswana is one of Africa's top performers on the shared-prosperity indicator.** As presented in the GIC, Botswana's shared-prosperity indicator, expressed as the growth rate of consumption per capita among the bottom 40 percent of population, increased 4.9 percent in real terms between 2002/03 and 2009/10. Shared prosperity takes into consideration both the inclusiveness of growth and the magnitude of the growth among the poorest households. Clearly, distributional changes were prominent and progressive in Botswana. Although one of Africa's leaders, Botswana was in the middle of the worldwide shared-prosperity distribution (Figure 36). In fact, Botswana's shared-prosperity indicator was equal to the median for upper middle-income countries (UMIC). The UMIC group, however, has a large degree of heterogeneity, which underscores Botswana's achievement in sharing the benefits of growth with all income groups.

Figure 36: Shared prosperity in Botswana

Consumption per capita annual growth of the bottom 40% of the population, 2002/03-2009/10



Source: World Bank WDI for the rest of the countries. Authors' calculations for Botswana. Selected countries with available data for at least two surveys in early and late 2000s.

Box 7: World Bank's twin goals—end extreme poverty and promote "shared prosperity"

The World Bank Group has established ambitious goals to reduce international poverty and boost shared prosperity. These two goals and their respective indicators are summarized as:

1. **End extreme poverty:** the percentage of people living on less than $1.25 a day to fall to no more than 3 percent globally by 2030.
2. **Promote shared prosperity:** foster income growth of the bottom 40 percent of the population in every country.

In addition to income, ending poverty and promoting shared prosperity are unequivocally about progress in non-monetary dimensions of welfare, including education, health, nutrition, and access to essential infrastructure as well enhancing the voice and participation of all segments of society in economic, social, and political spheres. Ending extreme poverty within a generation and promoting shared prosperity must be achieved in ways that will be sustainable over time and across generations. This requires promoting environmental, social, and fiscal sustainability.

The shared-prosperity indicator implies a direct focus on the income of the less well-off, departing from the common practice of focusing only on growth of GDP per capita and implicitly relying on the "trickle down" impact of growth for progress among those on the bottom rungs of the distribution.

82. **The previous analysis shows that inequality fell significantly during 2002/03-2009/10, the GIC had a strongly progressive downward shape that suggests relative gains for the poorest people, and average consumption per capita increased.** The newly recalculated poverty datum line remains constant in real terms, adjusted by the CPI. All the outlined changes clearly work in a direction associated with the reduction of poverty. The remaining question is how much each component contributed to poverty reduction.

Figure 37: Growth inequality decomposition of poverty change, 2002/03-2009/10

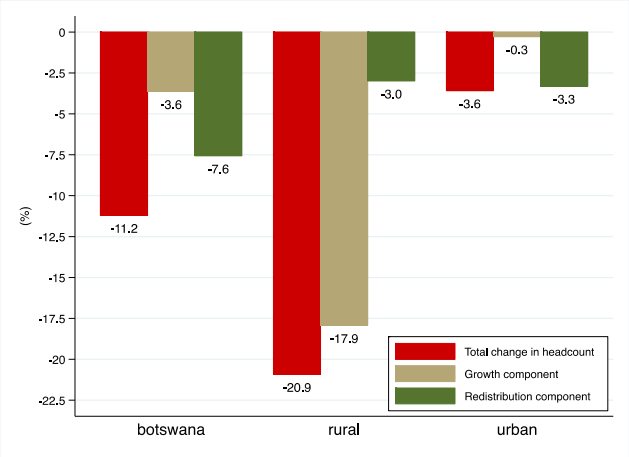
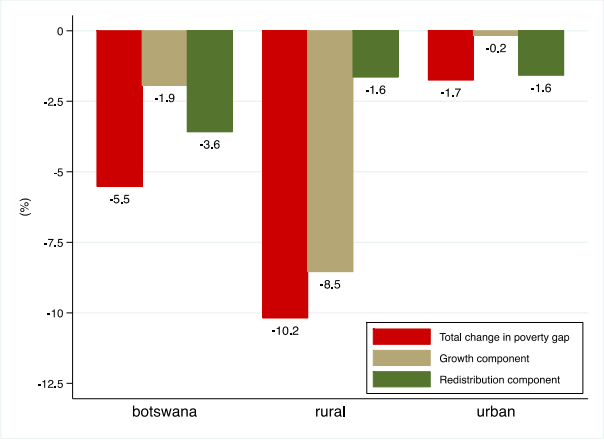


Figure 38: Growth inequality decomposition of poverty gap change, 2002/03-2009/10



Source: Authors' estimates based on HIES (2002/3) and CWIS (2009/10).

83. **Between 2002/03 and 2009/10, most of the decrease in estimated poverty headcount was attributable to changes in the inequality, or redistribution, component.**[20] Consumption growth was higher among the relatively poor than among the rich. Figure 37 indicates the redistribution component played the main role in poverty reduction. Poverty headcount declined 11.2 percent, and the redistribution component contributed 7.6 percentage points (68 percent) of the change. The growth component was significant, but it was less important, responsible for only 3.6 percentage points of poverty reduction. The redistribution component associated with the changes in inequality had a very strong positive impact on the poverty gap measures, overwhelming the positive impact of the growth component (Figure 38). The redistribution component was responsible for 65 percent of the poverty gap reduction.

84. **The growth effect was the main factor leading to poverty reduction in rural areas.** In the overall economy, the redistribution effect had a strong impact on poverty. However, a separate decomposition of rural and urban poverty suggests that the growth effect in rural areas

[20] We used growth-inequality decomposition introduced by Datt and Ravallion (1992). The method decomposes the observed changes in poverty into two components: (i) the growth component (GC), which identifies the poverty change due to the growth of mean per capita expenditure, and (ii) the inequality component (IC), which identifies the poverty change due to a more equal distribution of income. It is important to emphasize that the redistribution component is not necessarily associated with the expansion of government transfers. Instead, it measures the impact of general inequality changes on poverty. The redistribution component is a factor of social transfers, regional convergence, income mobility, and other factors. Many factors contributed the reduction in inequality, but disproportionally high growth of the rural sector played the main role in inequality reduction.

played the most significant role in poverty reduction in rural areas. In other words, fast growth in the rural areas reduced the gap between rural and urban Botswana, subsequently reduced income inequality, and contributed to the country's rapid poverty reduction.

85. **Fast rural growth pre-defined poverty reduction in Botswana.** The decomposition analysis suggests that the redistribution component had a very significant positive impact on Botswana's consumption distribution in 2002/03-2009/10—but it was the result of the disproportionally fast growth in rural areas. If agriculture growth were in line with urban growth, poverty changes would have been modest. In other words, if not for the economic growth in the rural areas, inequality wouldn't have significantly changed between 2002/03 and 2009/10, and the headcount poverty rate would have remained almost unchanged.

H. Linking growth, inequality and poverty changes—poverty trace analysis

86. **The Poverty Trace Curve (PTC) provides evocative graphical summaries of the projected poverty dynamics.** The method associates economic growth and changes in the income inequality to poverty reduction.[21.] The PTC analysis demonstrates how different combinations of economic growth and inequality reduction will affect poverty in Botswana. The PTC analysis provides a tool to gauge the effects that a proposed policy would have on poverty. It could also be used in various areas of distributional analysis. For example, PTC analysis in conjunction with micro simulations could measure the degree to which a proposed social assistance subsidy could reduce poverty.

Box 8: Poverty Trace Curve (PTC) analysis is an iso-poverty approach to the shared prosperity

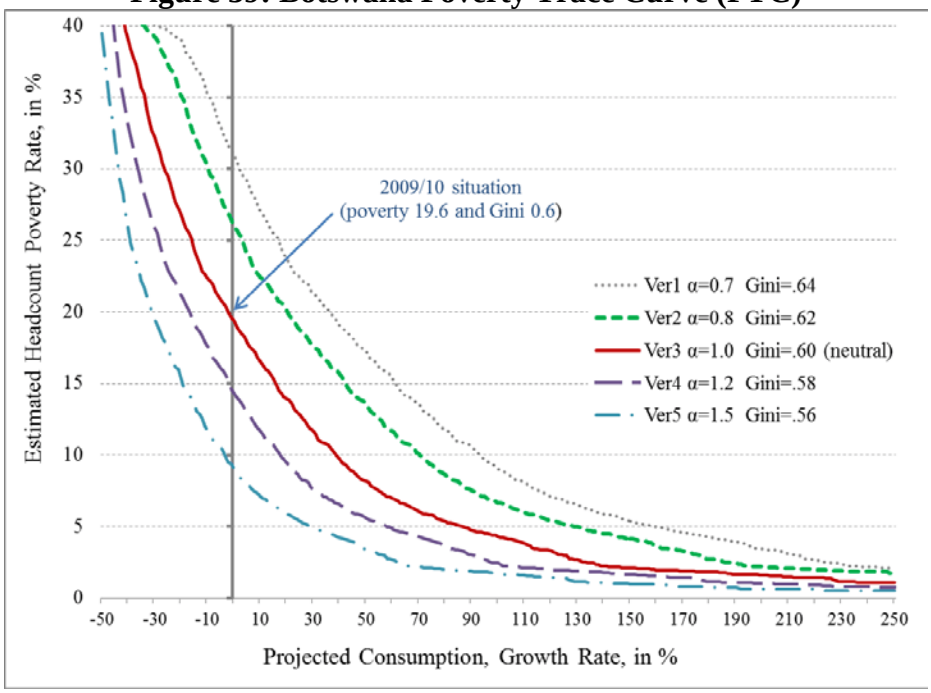
PTC analysis is based on the iso-poverty curve approach, linking changes in inequality to the shared-prosperity indicator (the growth rate of consumption among the bottom 40 percent). The common issue related to the iso-poverty is the specific mechanism linking the Gini index to the transformation of the income distribution. A particular reduction of the Gini index can be caused by different changes in the distribution. For example, the income transfers can take place between the extremes of the distribution or among the middle income groups. In the first case, the impact on poverty will be much greater than in the second. The PTC model implicitly postulates a strong relationship between changes in the Gini index and their impacts on poverty from changing the relative income of the bottom 40 percent of the distribution.

87. **Figure 39 presents PTCs for Botswana.** The lines illustrate how much the projected growth rate in consumption per capita will reduce poverty based on the different assumptions for distributional changes (Gini), which are associated with various growth rates for the lowest 40 percentile of the income distribution. The official poverty datum line was used for the analysis. On the chart, point A denotes 19.4 percent poverty and 0.6 Gini inequality—the current situation in Botswana. The PTCs are drawn based on the various inequality levels, and they are associated with the different growth rates for the bottom 40 percent of the income distribution. The central red line depicts poverty projections associated with the neutral growth scenario, consisting of cumulative changes in consumption per capita and constant inequality. The two lines below the

[21] PTC analysis is based on the widely used iso-poverty approach, a-statistical decomposition of the economic changes required to achieve a target poverty rate P*. The iso-poverty approach breaks down the required changes in mean growth (β) and inequality (α) to achieve poverty reduction.

neutral growth scenario are associated with reductions in inequality and pro-poor growth. The two lines above the neutral growth scenario are associated with inequality and anti-poor growth.

Figure 39: Botswana Poverty Trace Curve (PTC)



Source: World Bank Staff calculations. Where α is the disproportional ratio of consumption growth among the bottom 40 percentile of consumption distribution; α =1 suggests neutral growth, α<1 indicates increasing inequality, and α>1 suggests reduced inequality. The neutral growth scenario is depicted in the red line. The initial situation is 19.4 poverty rate and 0.6 Gini. Higher inequality shifts the PTC lines upward, while lower inequality pushes them downward. The higher the inequality, the more consumption growth required to reduce poverty.

88. **The PTCs indicate that economic growth and reduction in the inequality are equally important for poverty reduction and eradication in Botswana**. As presented in Figure 39, the distribution neutral (i.e., no change in the aggregate consumption distribution) annual growth rate of 4 percent would require eight to nine years to halve poverty—as red line suggests, cumulative growth of 40 percent cuts poverty from 19.4 percent to 10 percent. However, the relationship between distribution neutral growth and poverty is not linear, and it would take much longer to further to reduce and finally eradicate poverty. In fact, it would take close to 25 years to completely eradicate poverty under the distribution neutral growth scenario. If growth is pro-poor and associated with inequality reduction, poverty could be reduced at a much faster pace. Halving the poverty could be achieved in four years if growth is associated with a two point reduction in the Gini coefficient. Similarly, growth associated with increasing inequality has an adverse outcome for poverty reduction. If inequality were to increase by 2 percentage points, poverty would not fall even if cumulative growth were 30 percent.

89. **The actual changes in the economy largely corresponded to the pro-poor scenario in the PTC.** Between 2002/03 and 2009/10, inequality fell by 4 percentage points, and the poverty rate fell by 36 percent. The pro-poor growth scenario that characterized Botswana's economy is in line with the significant poverty reduction observed during this period.

90. **The PTC analysis' main conclusion is that the income distribution is enormously important in Botswana, and policies geared toward inequality reduction are required to eradicate poverty.** The extent of poverty reduction equally depends on changes in economic growth and inequality. The PTC analysis presented considerable evidence that the distribution of income has a significant influence on the poverty. More rapid poverty reduction requires more growth and a more pro-poor pattern of growth. Policies geared toward reduction in the income inequality will result in greater poverty reduction.

Summary. The previous chapter showed that Botswana has exhibited an impressive macroeconomic performance. This chapter showed that fast economic growth translated into significant social gains over the past decade. Botswana was successful in reducing absolute poverty from 30.6 percent in 2002/03 to 19.4 percent in 2009/10. Consumption inequality, expressed in Gini coefficients, declined from 64 to 60. When measured using international poverty lines, poverty also fell significantly. Massive poverty and inequality reduction were accompanied by significant regional and rural urban convergence. Going forward, it is clear that both economic growth and inequality reduction will be important for achieving further poverty reduction and making rapid progress towards poverty eradication.

Chapter 3: Causes of poverty reduction in Botswana

As described in the previous chapter, poverty in Botswana declined significantly due to fast economic growth and favorable pro-poor redistribution. The rapid poverty reduction can be attributed to a combination of factors related to demographic changes, favorable economic developments, and good redistribution policies. The most important contributor to the reduction in poverty was growth in labor-related income and incomes associated with agricultural subsistence work. Between 2002/03 and 2009/10, these changes accounted for 58.3 percent of poverty reduction, or 6.7 percentage points. Demographic changes associated with decreasing dependency ratios contributed 24 percent to poverty reduction, or 2.8 percentage points. A third factor was a gain in households' loans and access to financing, which accounted for 9.5 percent of poverty reduction, or 1.1 percentage points. Social transfers per se (excluding agriculture subsidies) were associated with 3.9 percent of poverty reduction, or 0.4 percentage points.

91. **The incidence of poverty and inequality fell in Botswana between 2002/03 and 2009/10.** We have used several methods to quantify the contribution of different factors toward poverty reduction. In Chapter 2, we used the Datt-Ravallion (1992) standard decomposition method, which showed redistribution factors playing an important role in poverty reduction. However, the usefulness of the decomposition methods is limited because the results are not explained by the causes and factors that led to the distributional changes. In this chapter, we analyze the forces behind the observed changes. Previous sections have shown that the reduction in both poverty rates and inequality were mainly driven by changes in rural areas' living standards. We already know that regional differences diminished and regional incomes converged.

92. **This chapter looks at the factors behind the observed poverty reduction and distributional changes.** Was the reduction in poverty a result of higher employment, higher earrings, or higher public transfers and remittances? Were these changes the result of improved human capital characteristics or higher returns to education? How are the results associated with changes in the sector composition of employment? Could the reduction in poverty and inequality be attributed to better job opportunities or to the expansion of more effective transfer policies? How have demographic changes affected income distribution in Botswana?

93. **Botswana's fast poverty reduction can be attributed to a combination of factors related to demographic changes, favorable economic developments, and good redistribution policies.** We focus on three main areas that predominantly led to poverty reduction. First, we explore demographic changes due to increases in the working-age population. Second, we look at labor-intensive growth and labor factors associated with the poverty reduction, analyzing the role of changes in returns and endowments that lead to changes in incomes. Third, we evaluate the role of access to financing and household loans in poverty reduction.

A. Drivers of changes in poverty—decomposing poverty reduction[22]

94. **The purpose of this section is to further analyze the observed poverty changes by applying decomposition techniques.** They separate the influence of demographic groups and changes in income sources and estimate how much of the poverty change observed at the national level can be attributed to different forces**.** There are several methods for an accounting of how much of the total change in poverty can be allocated to different groups or factors. We use income poverty decompositions to quantify the contribution of different factors to changes in welfare and inequality.

Figure 40: Contribution to poverty reduction in %, 2002/03-2009/10

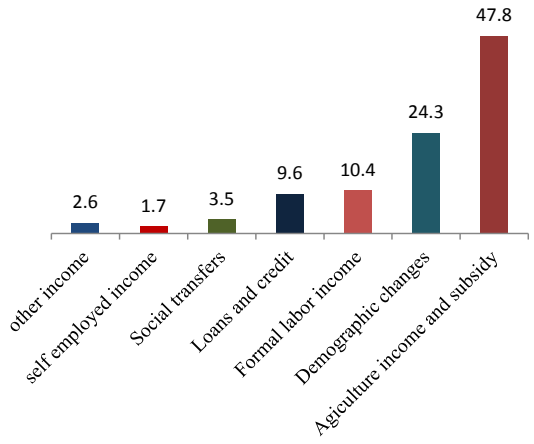
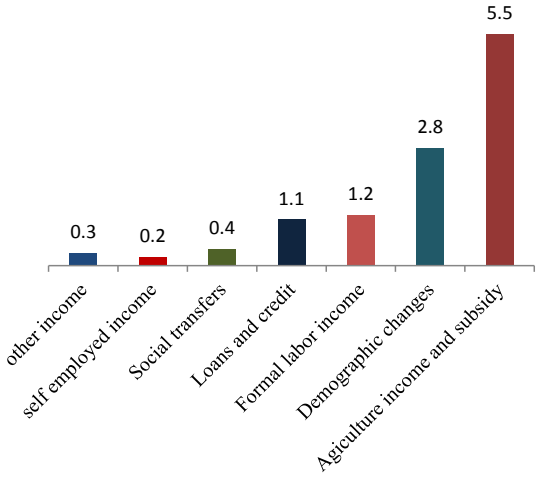


Figure 41: Contribution to poverty reduction in percentage points, 2002/03-2009/10



Source: Author's calculations based on micro-decomposition analysis (Azevedo et al.).

95. **Labor factors explain 58.3 percent of poverty reduction and demographic factors 24.0 percent; increasing loans and social transfers had a lower but significant impact on poverty reduction.** We used the income poverty decomposition methodology developed by Azevedo et al. to quantify the contribution of different factors to poverty reduction (Figure 40 and Figure 41). National poverty declined by 11.5 percentage points between 2002/03 and 2009/10. The most important contributor to the reduction was growth in informal agriculture incomes and agricultural subsidies, which contributed 47.8 percent to poverty reduction between 2002/03 and 2009/10, or 5.5 percentage points. Demographic changes associated with decreasing household size and reduction in the dependency ratios contributed 10.4 percent to poverty reduction, or 2.8 percentage points. Formal labor incomes contributed 24 percent, or 1.2 percentage points. Another important factor associated with poverty reduction was greater household loans and access to financing, which accounted for 9.5 percent of poverty reduction, or 1.1 percentage points. Social transfers per se (excluding agriculture subsidies) are associated to 3.9 percent of poverty reduction, or 0.4 percentage point. Other sources of income had almost no effect on poverty reduction.

[22] Azevedo at al. method was used in this study to decompose poverty changes.

96. **Factors' relative contribution to poverty reduction differs across urban and rural areas.** As presented in Figure 42 and Figure 43, loans and social transfer changes played a more important role in urban areas. In contrast, labor earnings and agricultural earnings, including subsidies, played an identical role in rural and urban areas. The "other income" category had a very significant adverse impact on poverty in urban areas.

Figure 42: Contribution to poverty reduction in %, rural, 2002/03-2009/10

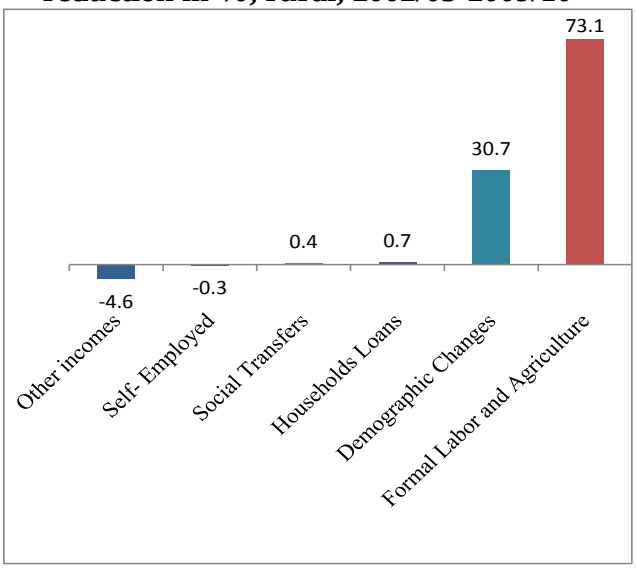
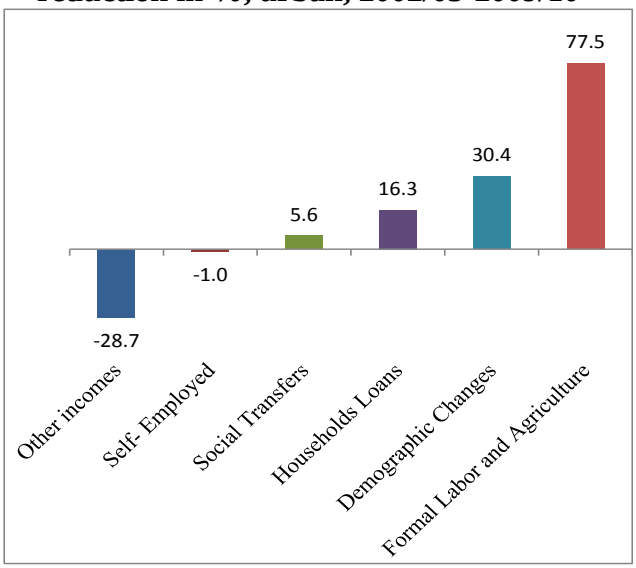


Figure 43: Contribution to poverty reduction in %, urban, 2002/03-2009/10



Source: Authors' calculations based on micro-decomposition analysis (Azevedo et al.). Formal labor and other agricultural incomes categories were combined. Disaggregation was impossible due to statistical imprecision.

B. Demographic changes' role in poverty reduction

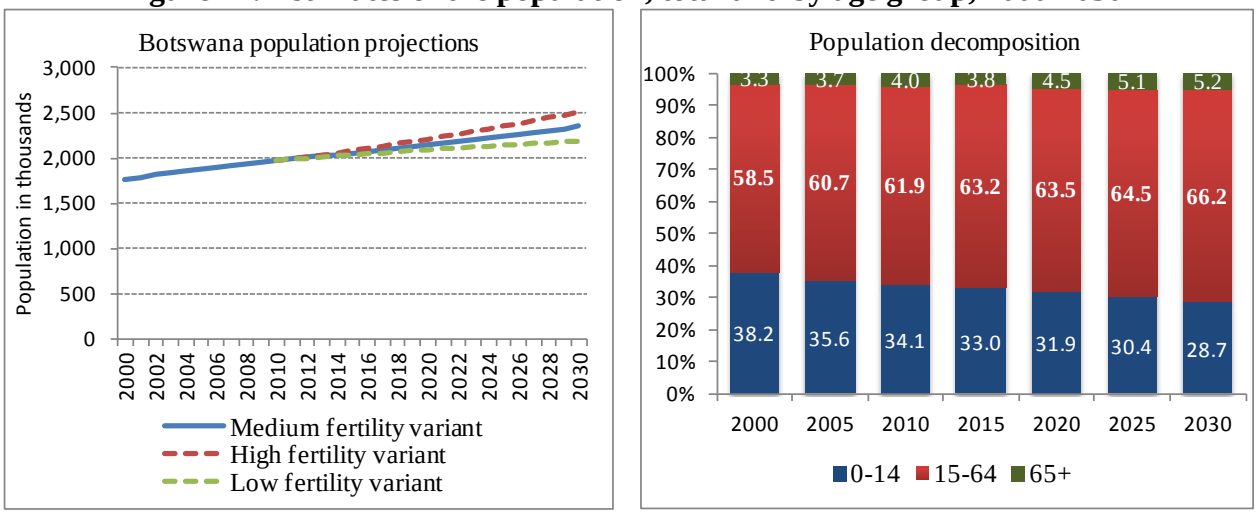
97. **Botswana's demographic position has been changing.** One explanation for the observed poverty reduction focuses on demographic changes associated with a reduction of dependency ratios. Population growth has slowed considerably. At the same time, the share of adults per household has been constantly growing, reducing dependency ratios.

98. **A growing working-age population and declining dependency ratios have played important roles in poverty reduction.** Based on the 2010 UN data, Botswana's population has a relatively young age structure, with 34.1 percent below 15 years of age and less than 5 percent aged 65 and older. The economically active age group is at 61.9 percent, placing Botswana among the countries with relatively high proportion of its people in the working-age group. The share of the population between 15 and 64 years old has been growing, while dependency ratios have been falling. The decrease in dependency ratios is associated with a sharp decline in fertility along with an oscillating mortality.

99. **Population growth slowed in recent years, but the young age structure will continue to grow into the future.** Population growth has declined steadily over the past decade, falling to 0.9 percent in 2009/10. Because of the country's young age structure, however, the population can be expected to continue growing into the future (Figure 44). The total fertility rate fell from

6.5 children per woman in 1971 to 3.2 in 2006.[23] This level is still far above replacement level and will contribute to continued population growth. According to UN medium fertility variant projections, this rate of growth is projected to continue into the future, and the population is projected to be 19 percent higher in 2030 than in 2010.

Figure 44: Estimates of the population, total and by age group, 2000-2030



Source: United Nations, Department of Economic and Social Affairs, Population Division (2013). World Population Prospects: The 2012 Revision, DVD Edition.

100. **Population aging is projected to continue, although Botswana will remain relatively young, with a large and growing working-age population.** Between 2000 and 2030, the percentage of youths in the population is projected to decline from 38 percent to 29 percent, while the elderly population is projected to increase slightly from 3 percent to 5 percent (Figure 44). The largest absolute and relative growth will be in the working-age population, projected to increase from 59 percent to 66 percent of the population, providing a demographic advantage for economic growth.

101. **The average household size and the dependency ratio have declined.** The slowdown in population growth was one factor behind reduced family size. The average household fell from 4.14 persons in 2002/03 to 3.46 persons in 2009/10 (Table 12). The overall dependency ratio declined from 0.34 to 0.29 children and elderly per household, largely due to a decline in the child dependency ratio. The elderly dependency ratio remained the same. As a result of the decline in fertility, the population aged slightly from an average of 24.7 years to 26.6 years.

[23] United Nations, Department of Economic and Social Affairs, Population Division (2013). World Fertility Data 2012 (POP/DB/Fert/Rev2012).

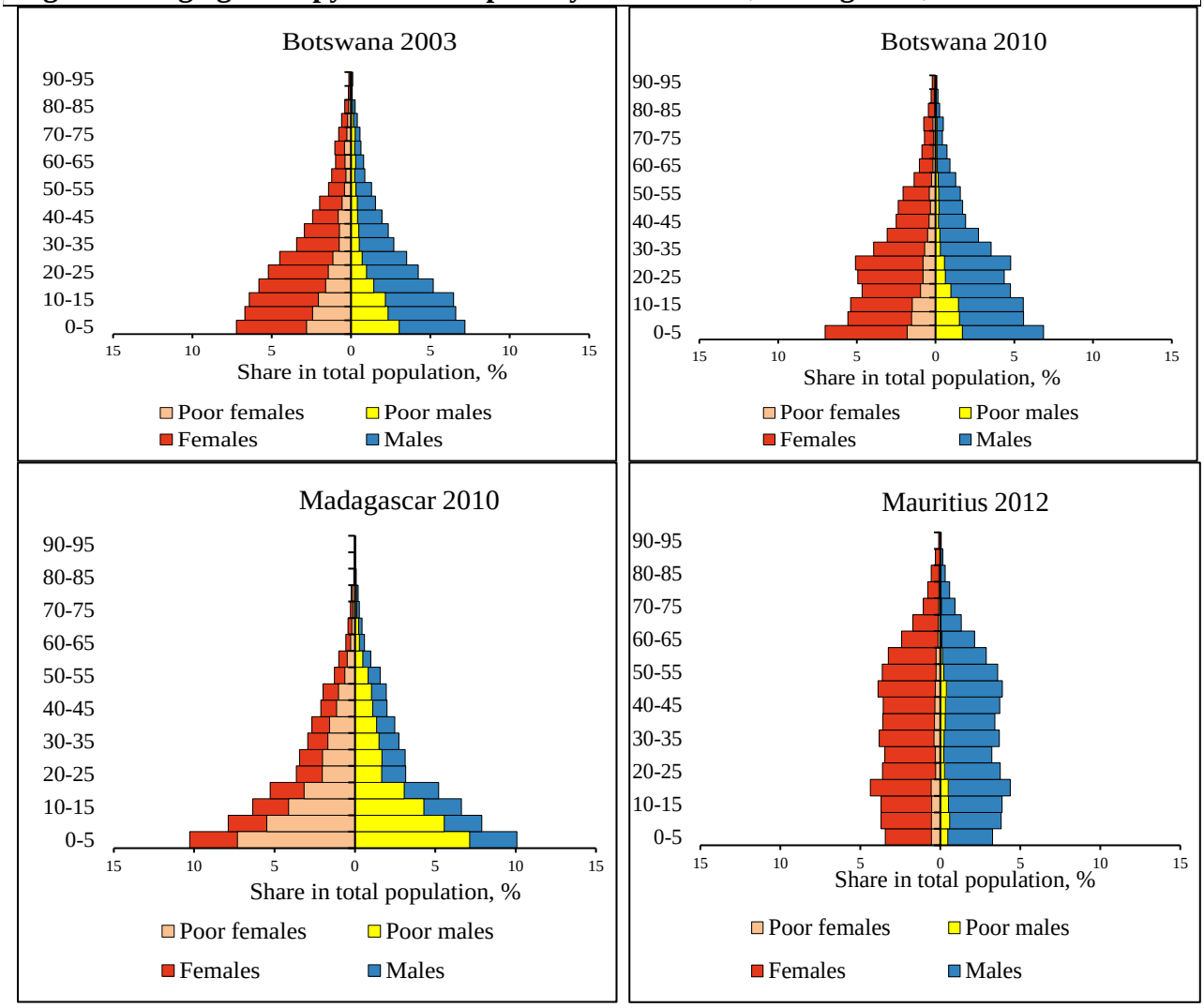
Table 10: Demographic characteristics of households in Botswana

	Poor (below poverty line)		Near poor (up to twice poverty line)		Up to 4 times poverty line		Above 4 times poverty line		Above 25 times poverty line		Total Population	
	2003	2010	2003	2010	2003	2010	2003	2010	2003	2010	2003	2010
Households to population ratio	0.17	0.16	0.21	0.19	0.31	0.29	0.37	0.47	0.48	0.60	0.24	0.29
Household size	5.79	6.23	4.66	5.17	3.21	3.42	2.70	2.11	2.08	1.67	4.14	3.46
Nr. of Children under 7	1.29	1.32	0.79	1.10	0.39	0.47	0.29	0.19	0.15	0.10	0.70	0.56
Nr. of Children under 15	2.66	2.87	1.87	2.14	0.96	1.04	0.71	0.41	0.39	0.24	1.59	1.17
Nr. of Adults 15-64	2.74	3.03	2.51	2.71	2.12	2.16	1.92	1.60	1.65	1.35	2.33	2.09
Nr. of Elderly 64+	0.38	0.33	0.28	0.32	0.13	0.21	0.07	0.11	0.05	0.08	0.22	0.20
Dependency ratio	0.48	0.47	0.40	0.45	0.26	0.31	0.19	0.16	0.12	0.12	0.34	0.29
Dependency ratio – children	0.39	0.41	0.32	0.36	0.19	0.22	0.16	0.10	0.10	0.07	0.27	0.22
Dependency ratio – elderly	0.09	0.06	0.08	0.09	0.07	0.09	0.03	0.06	0.02	0.06	0.07	0.07
Female Head of Household ratio	0.54	0.59	0.51	0.54	0.47	0.48	0.37	0.39	0.25	0.32	0.46	0.46
Households with Orphans ratio	0.04	0.05	0.06	0.03	0.02	0.02	0.00	0.01	0.00	0.00	0.03	0.02
Average Age of the Head, years	51.8	50.9	47.7	50.6	41.8	46.2	38.3	40.8	38.9	39.4	45.3	45.1
Average Age, years	23.2	22.7	24.3	24.5	26.1	27.7	26.5	30.7	30.3	32.9	24.7	26.6

* "Dependency ratio-children" is an average ratio of children under 15 years old. to total number of people in the household; "Dependency ratio-elderly" is an average ratio of elderly aged 65+ years old to total number of people in the household; "Dependency ratio" is the total number of children and elderly as ratio to total household size.

102. **Population growth and structure in Botswana is in the middle range of southern African countries.** The age structure of a country is an important contributor to poverty. In general, poor countries have broader base of the age-gender pyramid, with a larger share of children. For example, Madagascar's age-gender structure is a classic wide-base pyramid indicating a young, rapidly growing population (Figure 45). Many of these young people are poor. In contrast, the age-gender structure of Mauritius exemplifies a middle-income country with slow population growth, where the size of each age group is approximately equal to the one before it. The poverty rate in Mauritius is quite low, and it has become a middle-income country. The age-gender structure of Botswana falls between these two examples. Between the 2002/03 and 2009/10 surveys, the slowdown in population growth changed Botswana's age-gender pyramid from a classic pyramid with large bottom cohorts to one with smaller bottom cohorts.

Figure 45: Age-gender pyramid and poverty in Botswana, Madagascar, and Mauritius



Source: World Bank staff calculations.

103. **Household survey data can be used to analyze the impact of the reduction of Botswana's fertility rate on poverty.** A full accounting of the effects of fertility is a complicated process. This analysis considers only the first-order effects of lower fertility that leads to a decline in the number of household members. We consider two effects working in opposite directions. The first is related to a decline in earnings due to fewer children available for work in the households. The second is associated with the increase in per capita household consumption as income is spread across fewer household members. The magnitude of these two effects will determine the net effect of the demographic changes on per capita consumption and on poverty.

104. **It is estimated that from 22 percent to 26 percent of the 2.4 percentage point poverty reduction in 2002/03-2009/10 could be associated with changes in demographic structure.** The findings of this analysis correspond to the earlier decomposition results. Based on the summary statistics presented in Table 11, we know that share of children under 15 years of age fell 11.9 percent between 2002/03 and 2009/10. The share of the 15-64 age group increased 7.3

percent, and the share of the elderly (65 and above) increased 8.7 percent. We use a micro simulation method to assess the impact of the fertility rate and demographic changes on the poverty. We created counterfactual income distribution by changing the 2009/10 population structure to match the one in 2002/03. We used this new demographic structure to recalculate per capita household consumption and corresponding poverty levels. The experiment was repeated for subgroups of households based on their urban-rural residence and the household head's educational attainment. This allowed us to assess whether the changes in the fertility rates targeted at particular sub-groups yielded greater poverty reduction. The estimated effects of the demographic changes associated with the reduction in fertility add up to 2.4 percentage points, or 24 percent, of poverty reduction between 2002/03 and 2009/10. This effect does not consider the labor impact of a larger working-age population, but it does take into account the change in the share of elderly.

C. Role of labor market outcomes

105. **With more people in the labor force and fewer young people to support, Botswana could exploit a window of opportunity for rapid economic growth if it makes the right social and economic investments and pursues the right policies in health, education, governance, and the economy**. The pace of job creation must accelerate to keep up with the number of people seeking employment and to maintain high levels of economic growth. Has Botswana created enough jobs to support its growing working-age population, especially the increasing number of young people?

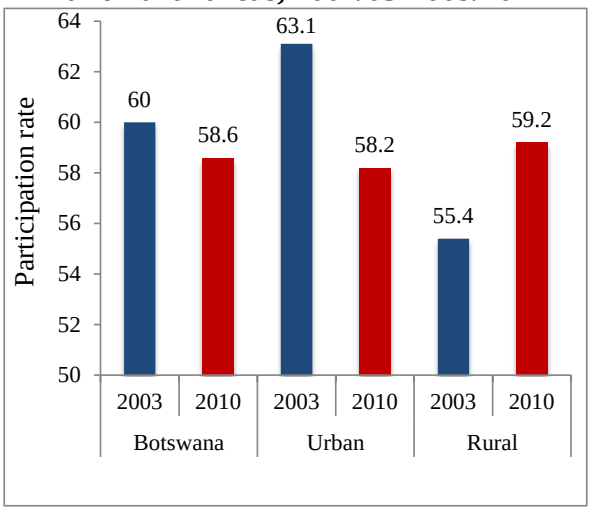
106. **In this section, we explore the role of the labor market as the main factor contributing to the poverty reduction between 2002/03 and 2009/10.** We identify three key labor channels affecting poverty in Botswana: (i) labor force participation rates increased, especially in rural regions, with a major contributor being the increased participation of women classified as poor in rural areas; (ii) employment rates increased in rural areas, particularly among the poor, while they barely changed in the urban areas; (iii) unemployment rates show improvement in both rural and urban areas.

107. **Labor force participation rates increased in rural areas and diminished in urban areas.** While overall participation rates remained fairly stable at around 59 percent between 2002/03 and 2009/10, patterns for urban and rural populations were quite different and implied a catch up in the countryside (Figure 46). The share of active population decreased by almost 5 percentage points in urban areas and increased by almost 4 percentage points in rural areas. In 2002/03, rural areas had participation rates that were 8 percentage points lower than urban areas; at decade's end, rural areas' participation rates were only 1 percentage point higher.

108. **The improvement in rural labor force participation rates was mainly driven by the female poor population.** In rural areas, participation rates increased by 5 percentage points among women, while remaining almost unchanged among men. Furthermore, this increase was concentrated among poor rural women: 7 percentage points, compared to 2 percentage points among non-poor rural women.

109. **Employment rates increased, driven by rural area dynamics.** Over all, the employment rate (i.e. the employed as a share of working-age population) grew by 2.8 percentage points from 45.7 percent in 2002/03 to 48.5 percent in 2009/10 (Figure 47). Rural areas saw a major growth in employment, gaining 7.5 percentage points over the decade—from 42.5 percent to 49.9 percent. At the same time, urban areas' employment rates remained virtually unaltered, allowing rural areas to significantly close the gap on cities and towns. Employment grew slightly more for females (2.7 percentage points) than for males (2.4 percentage points). As a result, the gap between female and male employment fell slightly from 15.4 to 15.1 percentage points (Figure 478). In addition to women, employment gains were achieved among other historically disadvantaged groups—the youth and the poor.

Figure 46: Participation rates by urban and rural areas, 2002/03-2009/10



Source: World Bank Estimates

Figure 47: Employment rates by location, 2002/03-2009/10

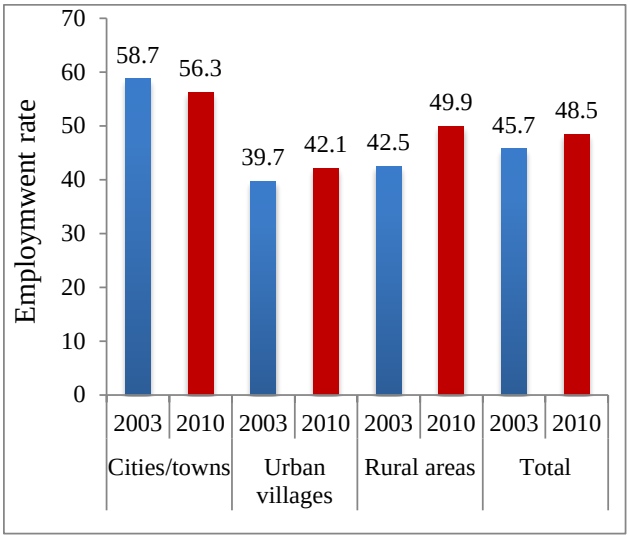
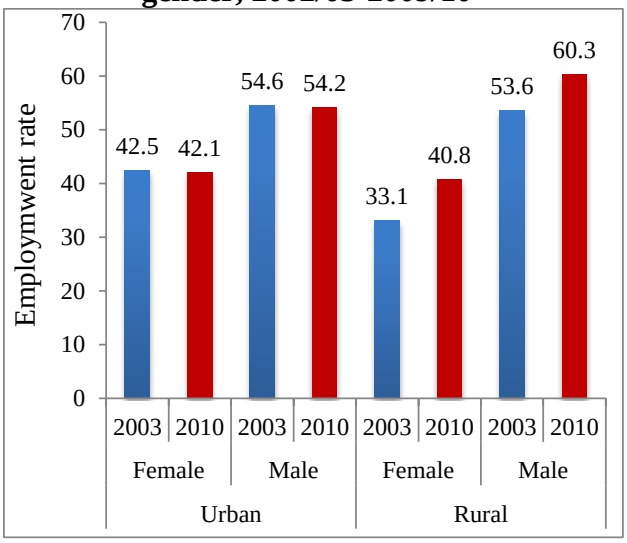


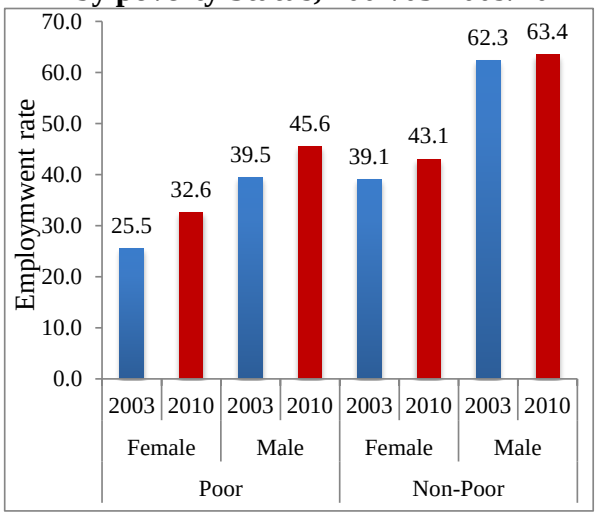
Figure 48: Employment rates by area and gender, 2002/03-2009/10



Source: World Bank estimates.

110. **The dynamic of employment rates has been pro poor.** Rural areas' share of the population employed rose evenly among men and women; for both groups, however, the gains were concentrated more among the poor (Figure 49). Poor rural female employment rates rose 7 percentage points, compared to 4 percentage points for non-poor rural females. The increase was 6 points among poor rural men, compared to 1 point for non-poor rural men. In sum, employment growth was primarily in rural areas, associated with the relatively poor population, and larger among females than the males.

Figure 49: Employment rates in rural areas by poverty Status, 2002/03-2009/10



Source: World Bank estimates.

111. **Agriculture was the main job-growth sector between 2002/03 and 2009/10.** While the rise in employment rates is good news, insight into the types of jobs created is also important. Employment in the agricultural sector grew by 5.6 percentage points. The corresponding numbers are 4.9 percentage points for "other services," 1.8 percentage points for the public sector, and 0.2 percentage points for the financial sector. It is not surprising that agriculture accounts for more than half the jobs in rural areas and contributes almost nothing in cities and towns. It is worth noting, however, that agricultural employment grew dramatically in urban villages. Indeed, agriculture has been second-largest job-creating sector after the services industry. Consistent with expectations, the manufacturing and services sectors have been more important by far in cities and towns than in rural areas.

112. **In rural areas, manufacturing was the only sector to experience a decline in employment between 2002/03 and 2009/10.**[24] Aside from manufacturing, rural areas saw broad employment growth, even in sectors where urban areas were losing jobs. Another major contributor to job growth in urban villages has been the public sector. For cities and towns, only "other services" and the public sector significantly created jobs.

[24] For all other sectors with declining employment between 2002/03 and 2009/10, the decline occurred in both urban and rural areas.

Figure 50: Distribution of employment by industry and location

Source: Author's calculations based on Farole (2014), "Employment dynamics in Botswana, assessing the jobs challenge and labor market trends over the past decade."

113. **Botswana's unemployment rate declined sharply between 2002/03 and 2009/10**. Unemployment rate, defined as the share of the working-age population actively seeking employment, fell from 23.9 percent in 2002/03 to 17.2 percent 2009/10 (Figure 51). All parts of the country saw lower unemployment, with rural areas showing the largest decline—from 23.3 percent to 15.7 percent. Unemployment in urban villages remained relatively high at 22.5 percent; this rate had fallen substantially between 2002/03 and 2009/10.

114. **The unemployment decline is also shared across gender.** Both males and females experienced declining unemployment rates (Figure 52). Between 2002/03 and 2009/10, unemployment declined by 7.7 percentage points for males (from 21.5 percent to 13.8 percent) and 5.5 percentage points for females (from 26.3 percent to 20.8 percent). The result was a widening of gap between female and male unemployment rates from 4.8 to 7.0 percentage points.

Figure 51: Unemployment rates by location, 2002/03-2009/10

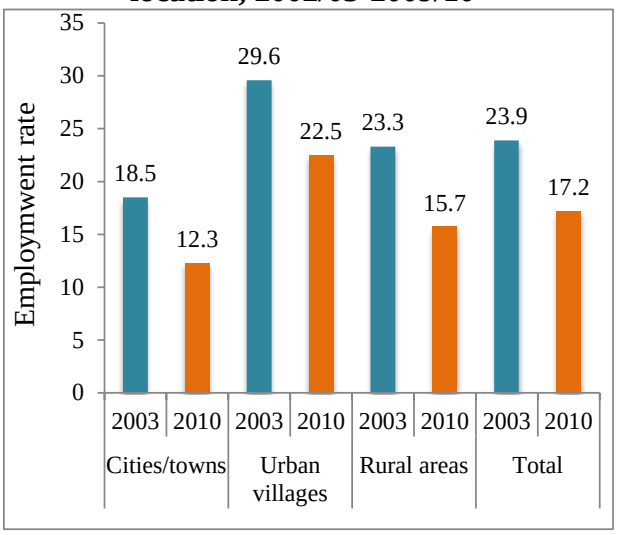
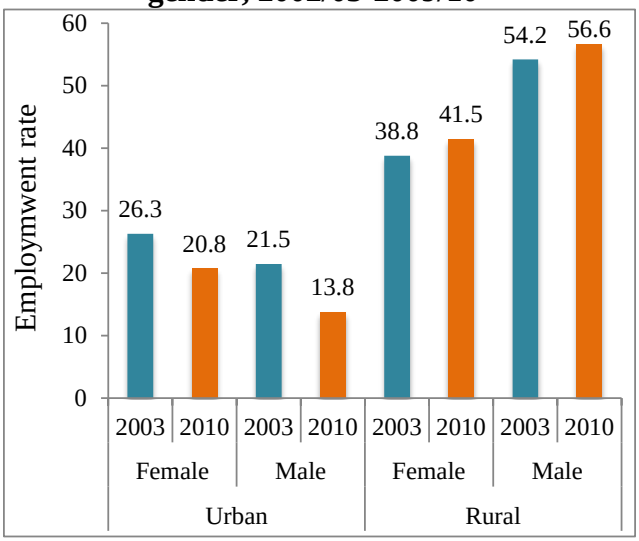


Figure 52: Unemployment rates by area and gender, 2002/03-2009/10

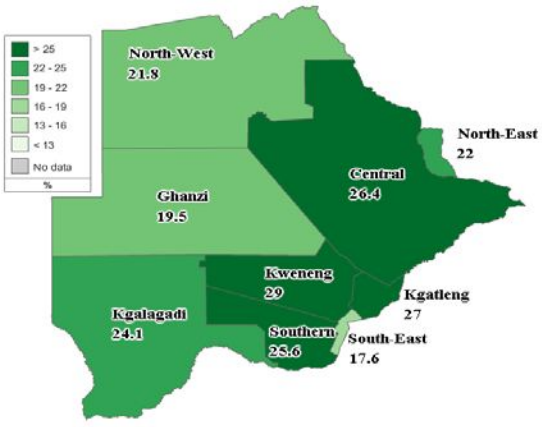


Source: World Bank estimates, Farole (2014).

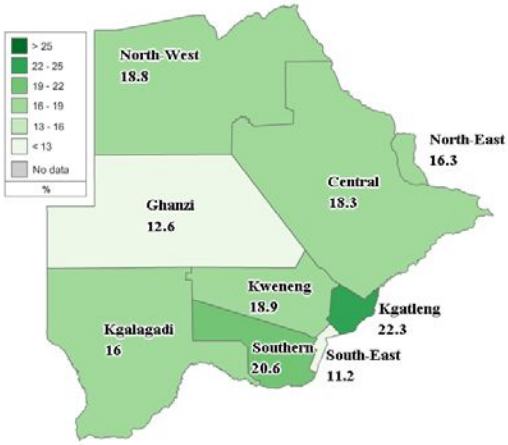
115. **All regions in Botswana experienced rapid reductions in unemployment rates, and the distribution of unemployment by regions was much more homogeneous in 2009/10 than in 2002/03**. The eastern part of the country had much higher unemployment rates than western regions in 2002/3. By 2009/10, there was no clear pattern in regional unemployment rates; i.e., the regions were largely homogeneous. Still, discrepancies in unemployment exist, ranging from 11.2 percent in South-East region to 22.3 percent in Kgatleng. However, the range is much lower in 2009/10 than it was in 2002/03.

Figure 53: Unemployment rates by regions 2002/03–2009/10

Unemployment rates 2002/03



Unemployment rates 2009/10



Source: Authors' calculations.

D. Educational attainment and returns

116. **We will examine educational attainment rates before looking at the critical role of education in labor-market outcomes and household wealth.** Table 11 shows trends in

educational attainment in the past decade. Note that the 2002/03 HIES did not ask about educational attainment beyond the secondary level. For comparisons, we will limit the 2009/10 data to secondary education.

117. **The percentage of people completing secondary school increased significantly between 2002/03 and 2009/10.** This result holds regardless of location, gender, and wealth quintile. It is also worth noting that a larger percentage of people are now undertaking informal education. Pre-school completions are also up. Over the past decade, the percentage of people completing secondary education increased with household consumption, and the wealthiest quintile had the highest completion rates. These results are consistent with reported increases in adult literacy over the past decade.[25] According to World Development Indicators, adult literacy rate increased from 81.2 percent in 2002/03 to 85.1 percent in 2011.

Table 11: Trends in educational attainment rate by location, gender, and wealth

	2002/03					2009/10				
	Never attended	Pre-school	Informal	Primary	Secondary	Never attended	Pre-school	Informal	Primary	Secondary
Total	24.78	1.29	0.96	39.67	33.3	25.72	1.35	1.38	30.98	40.57
Rural	35.36	0.74	1.29	43.09	19.53	34.9	0.69	1.98	35.98	26.45
Urban	16.61	1.71	0.71	37.03	43.94	18.79	1.84	0.93	27.2	51.23
Males	26.64	1.23	0.7	40.23	31.2	26.79	1.4	1.15	30.87	39.79
Females	23.17	1.34	1.18	39.19	35.13	24.75	1.3	1.6	31.08	41.28
Lowest quintile	40.44	0.47	1.19	40.53	17.37	35.21	0.87	0.9	37.94	25.08
2	29.35	0.63	1.11	45.16	23.74	32.67	0.71	1.57	35.56	29.49
3	25.21	0.8	1.1	43.39	29.51	26.77	1.29	1.82	32.64	37.48
4	19.77	1.55	0.88	40.44	37.36	20.47	1.78	1.49	29.15	47.12
Highest quintile	9.82	2.92	0.52	29.14	57.59	13.48	2.08	1.13	19.62	63.7

Source: Authors' calculations from HIES (2003) and CWIS (2010) data.

118. **Education matters in Botswana's labor market, and returns to education are high.** Figure 54 clearly shows that education has a positive effect on the probabilities of participating in the labor force and finding employment. Over two-thirds of workers with a tertiary or university education are employed. This compares to 47.5 percent for those with a primary education or less, and 44.4 percent for those with a secondary education. The trends are reversed when it comes to unemployment and being outside the labor force. This suggests that there are clear labor-market payoffs to education, particularly for tertiary and university education. Comparing employment rates by educational attainment for different age groups, Figure 54 shows that the payoff to secondary education declined from 2002/03 to 2009/10.

119. **The payoff from higher education is clearly associated with work experience.** In the 15-24 age cohort, individuals with primary education or less had slightly higher employment

[25] The adult (age 15+) literacy rate is the percentage of the population age 15 and above who can, with understanding, read and write a short, simple statement on their everyday life. Generally, "literacy" also encompasses "numeracy," the ability to make simple arithmetic calculations. This indicator is calculated by dividing the number of literates aged 15 years and over by the corresponding age group population and multiplying the result by 100.

rates than those with secondary or higher education. This was true in both 2002/03 and 2009/10 and could be simply due to many people still being educated (Farole, 2014). However, the gap was small and closing—3 percentage points in 2009/10, compared to 8 percentage points in 2002/03. The payoff from higher education was clearer in older age cohorts. In 2009/10, the employment gaps between workers with primary education or less and those with secondary education were almost 7 percentage points for the 25-34 cohort and 20 percentage points for the 35-44 cohort.

120. **Perhaps the most striking observation in Figure 55 is that secondary education may no longer be enough to boost employment.** For the 25-34 and 35-44 age groups, the employment gaps between workers with primary education and those with secondary or higher education closed significantly between 2002/03 and 2009/10. On the other hand, the employment gaps between secondary and tertiary educated workers were wide in 2009/10—12 percentage points for the 25-34 cohort and 15 percentage points for the 35-44 cohort.

Figure 54: Employment status by educational attainment, 2009/10

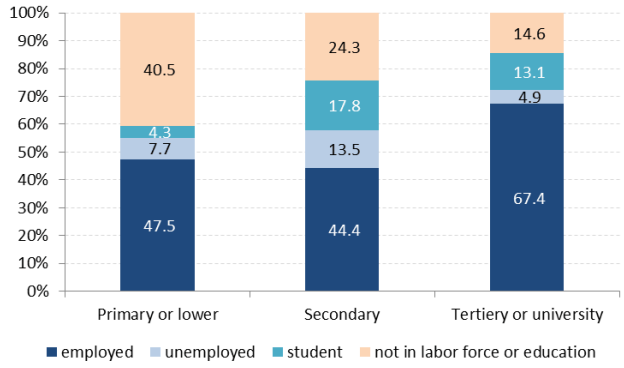
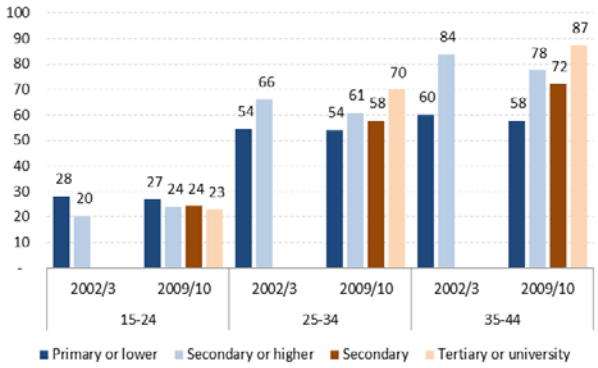


Figure 55: Employment rate by educational attainment and age cohort, 2002/03 and 2009/10



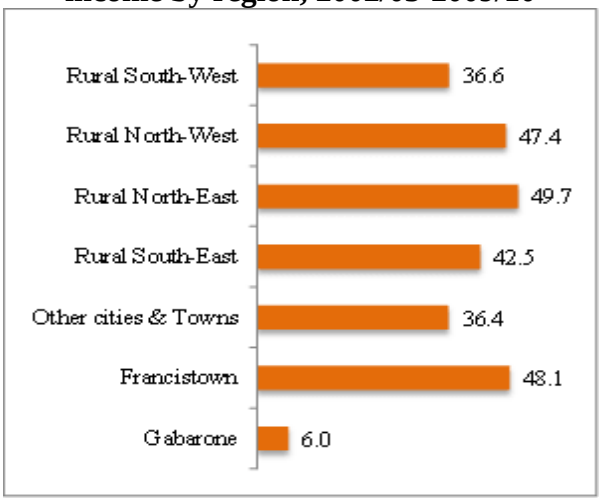
Source: Farole (2014).
Note on Figure 55: The 2002/03 HIES did not ask about educational attainment beyond the secondary level.

E. Sources of incomes and earnings analysis

121. **Between 2002/03 and 2009/10, real per capita income increased.** Four facts are worth highlighting: (i) per capita income rose in all regions, but poor rural areas benefited the most; (ii) the income sources driving the increases were self-employment and transfers; (iii) it is the poor, and particularly the rural poor, that most rely on these sources of income; (iv) earnings per employee in labor and self-employment increased in the rural areas.

122. **Per capita income rose in all parts of the country, but rural areas enjoyed the largest increases.** Nationwide, per capita income grew an average of 32 percent in real terms. From 2002/03 to 2009/10, the rural areas of North-East (49.7 percent) and North-West (47.4 percent) had the most significant gains (Figure 56).

Figure 56: Growth of real mean per capita income by region, 2002/03-2009/10



Source: Authors' calculation from CWIS (2010) data.

123. **The poor living in rural areas had the highest increases in per capita incomes.** From 2002/03 to 2009/10, gains among this group were 44 percent, compared to 26 percent for the non-poor living in urban areas.

124. **The increase in per capita income was mostly driven by changes in self-employment and transfers.** These sources rose 36 percent and 74 percent, respectively. Once again, these changes occurred largely in rural areas, exceeding the mean increase by 32 percentage points in self-employment and 13 percentage points in transfers (Figure 57).

Figure 57: Composition incomes by sources, by location

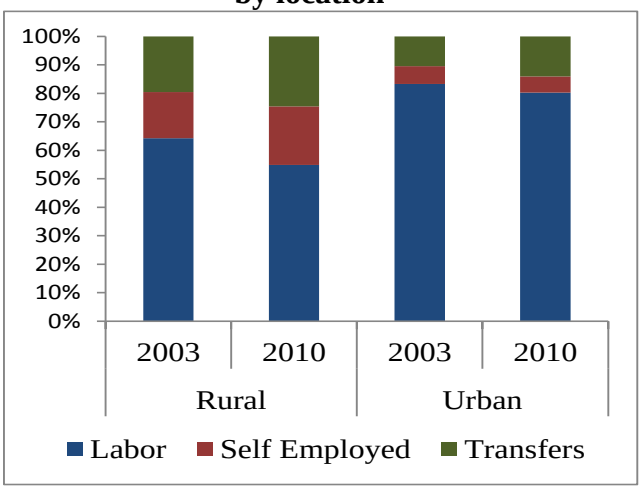
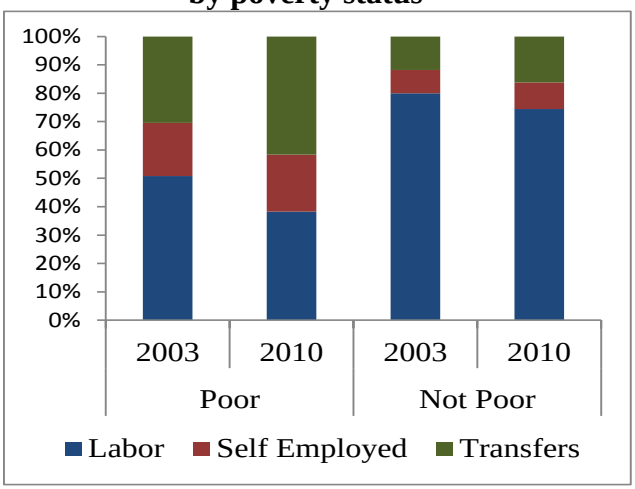


Figure 58: Composition incomes by sources, by poverty status



Source: World Bank estimates. Self -employment includes income from subsistence farming and agriculture.

125. **The rural poor rely the most on self-employment and subsistence agriculture and transfers as sources of income.** Figure 58 shows the share of per capita income from each of the following sources: labor, self-employment, and transfers. A clear divide arises in terms of their

relative importance to the poor and the non-poor. The non-poor received income from labor, plus a small share of transfers. The general picture remained fairly stable between 2002/03 and 2009/10. By contrast, the poor show a sharp change in the relative share of income sources. This group relied mainly on labor income in 2002/03, but transfers became equally relevant by 2009/10.

126. **Among the poor, the inhabitants of rural areas rely more on transfers and self-employment.** In fact, self-employment is more important than labor as a source of income by 6 percentage points. In 2009/10, transfers in poor rural areas accounted for the largest share of per capita income—46 percent. At the same time, we observe a sharp decrease in the share of income from pensions, with a decline of -8.9 percentage points.

Figure 59: Sources of income, real growth rates

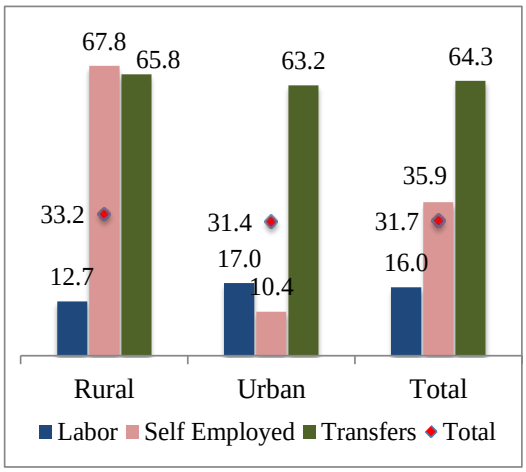
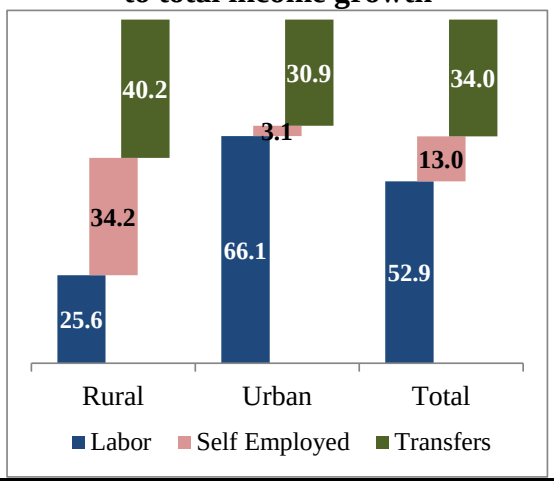


Figure 60: Contribution of the components to total income growth



Source: World Bank estimates.

127. **Earnings per employed increased in rural areas, leading to poverty reduction.** The evidence shows that the significant reduction in poverty rates came as a result of income increases, especially those stemming from sources more relevant to the rural poor, such as self-employment (or subsistence farming) and transfers. It remains unclear whether the income increases resulted from rising employment rates or increasing earnings per employee. Table 12 shows that both phenomena took place in rural areas, although earnings per employee seemed to take a leading role in the decline of poverty rates. Indeed, most rural areas saw participation rates increase 3 percent and 6 percent—the exception being the South-East region, where they decreased 1 percent. However, earnings per employee also rose for both the employed and the self-employed in almost all rural areas. The exceptions are the North-East region, where self-employment earnings per employee decreased 16 percent, and the South-West region, where labor fell by almost 19 percent. In the South-West, this decline was more than offset by a 211 percent increase in self-employment earnings per employee.

Table 12: Percentage change in participation rates, labor, and self-employment income per employee by region, 2002/03-2009/10

	Percent change 2002/03-2009/10			
	Participation rates	Employment rates	Labor Income per employee	Self-employment Income per employee
Gaborone	-15.9	-8.3	-0.6	-15.3
Francistown	-3.1	-1.4	-9.4	-38.9
Other cities & towns	-8.4	1.1	17.3	-69.4
Rural South-East	-0.9	7.0	8.9	25.4
Rural North-East	3.5	17.1	11.2	-16.0
Rural North-West	6.4	10.4	42.7	49.7
Rural South-West	5.6	19.6	-18.7	211.1
Total	-2.3	6.3	2.4	6.9

Source: World Bank estimates.

128. **Conversely, urban areas seem to have suffered reductions in both participation rates and earnings per employee (Table 12).** The largest decline in participation rates was 15.9 percent in Gaborone. Meanwhile, earnings of self-employed fell 38.9 percent in Francistown and 69.4 percent in "other cities." This was partly counterbalanced by a 17.3 percent increase in labor income per employee in the "other cities" category.

129. **Breaking up the analysis by poor/non-poor groups, we find consistent increases in earnings among the poor.** Table 13 shows that participation rates increased the most in rural areas, particularly among the poor. For labor and self-employment, the gains in earnings per employee were also concentrated in the poor group. In particular, self-employment showed significant increases in earnings per employee among the rural poor.

Table 13: Percentage change in participation rates, labor, and self-employment income per employee by urban/rural and poor/non-poor, 2002/03-2009/10

	Percent change 2002/03-2009/10							
	Participation rates		Employment rates		Labor Income per employed		Self-employment Income per employed	
	Non Poor	Poor	Non Poor	Poor	Non Poor	Poor	Non Poor	Poor
Rural	0.5	5.1	5.4	21.0	-12.9	2.7	2.9	23
Urban	-8.1	-11.7	-1.6	-5.2	1.2	4.9	-1.4	-1
Total	-5.3	-2.4	1.0	8.2	-5.8	11.1	3.0	12

Source: World Bank estimates.

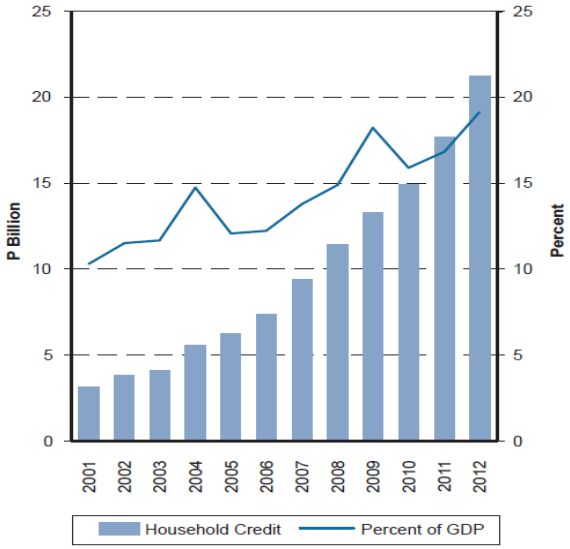
F. Access loans as a source for welfare improvement

130. **The financial system in Botswana has grown and became more diversified during the 2000s.** A large variety of financial institutions exists, with commercial banks and pension funds being the most important segments by asset size. According to a joint IMF and World Bank financial sector assessment, rapid growth is primarily a reflection of the substantial accumulation of national financial resources, and the associated high degree of liquidity remains

a distinctive feature of the domestic economy and the financial system.[26] Substantial growth has been reported in lending to households and mortgage credits.

131. **Bank of Botswana reports a rapid expansion in credit awarded to households.** In 2012, the total value of household credit reached 17 percent of GDP—up 70 percent from 2001 (Figure 61). Households have access to credit from various sources, including banks and other financial institutions, such as insurance companies. Households can also borrow in various forms, including loans for property or mortgage loans, vehicles loans, unsecured personal loans and credit cards. According to the IMF Article IV Staff Report 2013, the Botswana banking system's loan portfolio is heavily concentrated in the household sector, with the ratio of household credit to total private at around 60 percent.[27] Generally, loans to households have been growing at an accelerated pace in recent years.

Figure 61: Outstanding household credit value (left), percentage of GDP (right)



Source: Bank of Botswana, 2013 Annual report.

132. **Between 2002/03 and 2009/10, Botswana's households saw substantial increases in the amount of loans they received, and our analysis found this was an important source for welfare improvement and poverty reduction.** The decomposition analysis presented earlier in this chapter showed that the loans had a very clear positive association with poverty reduction. The total share of the loans in households' consumption was not very high—around 2 percent of average consumption. For those households receiving the loans, however, the share of loans in total households' consumption increased from 9.5 percent in 2002/03 to 36.7 percent in 2009/10.[28]

133. **Despite the fast growth in the public's access to financing, a major disparity still exists between the poor and better off or rich households in access to financing**. The share of loans among poor was only 2.6 percent in 2009/10; the shares were more substantial at 7 percent for the non-poor and vulnerable.

134. **The increase in credit could have both positive and negative sides.** Several channels that connect access to loans to poverty reduction are described in Box 9. However, increasing debt could have an adverse effect on households' vulnerability. Data limitations do not allow us to distinguish conclusively between these various channels, and further research and additional

[26] IMF, World Bank. Financial Sector Assessment, 2008.
[27] Notably, the ratio of households' unsecured lending to total private credit is significantly high in Botswana.
[28] Empirical evidence shows strong positive correlations between the depth of loan access and poverty rates at the macro level (Levine 1997; Honohan 2004), positive impacts from access to microfinance at the micro level (Pitt and Khandker 1998), and positive impacts from expansion of branch banking networks on aggregate poverty (Burgess and Pande 2005).

data sources are needed to assess the proper impact of these financial trends on Botswana's economy.

Box 9: How access to finance can help reduce poverty

Small businesses: Credit services can help people start or grow their small businesses, providing income generation and employment for themselves and their families.[29] More money becomes available to the household for consumption. Recent research utilizing firm-level data and survey information provides direct evidence on how access constraints affect firm growth. It has been argued that small firms complain about lack of access to finance for good reason: They actually have slower growth rates (Beck et al., 2005). With credit, for example, farmers are able to purchase capital that increases their productivity and income. Increased credit helps expand markets to rural areas, helping reduce poverty.

Self-employment: It is plausible that cash loans are a viable option for financing self-employment. Micro-entrepreneurial credit is scarce in Botswana, and the returns to microenterprises may be very high for the relatively poor and credit constrained in developing countries (de Mel, McKenzie and Woodruff 2007). The ability to acquire credit can encourage self-employment. Survey data from 2002/03 and 2009/10 show that self-employment has been one of the primary contributors to Botswana's job creation over the past decade. The country's recent aggregate employment gains have been associated with growing self-employment among less-educated women, especially in agriculture.

Consumption smoothing: Individuals rely on credit (as well as savings and transfers) to smooth the effects of fluctuations in income on consumption (Simler et al., 2004). Karlan and Zinman (2008) found that households randomly assigned a loan were significantly less likely to report hunger in the prior 30 days (their measure of consumption). This, in turn, has a multiplier effect on standards of living, enhancing basic household welfare, such as food security, nutrition, shelter, sanitation, health, and education services. This suggests that loans have an effect on consumption and may help prevent and extricate people from debt.

Investment in education: Loans can be used to cover educational expenses. Survey data show that educational attainment rates in Botswana have increased significantly between 2002/03 and 2009/10. We do not know if households used loans to finance education. Yet we cannot rule out that loans might have played a role in observed educational enrollments and attainments. Karlan and Zinman found that a substantial share of loans is used for educational expenses.

Access to agricultural resources: Having access to productive resources is a key requirement for any escape from poverty and hunger. For the rural poor, land and financial resources are of foremost importance, but technology, seeds, fertilizer, livestock, fisheries, irrigation, marketing opportunities, and off-farm employment are also essential. Consistent with this approach, the Government in 2008 launched ISPAAD, an agricultural development and support initiative to provide small farmers with free and subsidized seeds, fertilizer, fencing, plowing, and planting as well as subsidized loans. Using loans for these purposes might improve productivity and household income.

Paying off other debt: Karlan and Zinman (2008) conducted an impact evaluation of access to loans in South Africa and reported that the most common purpose for households' borrowing is paying off other debt. This suggests that marginal microloans may be used to economize on interest expenses and to maintain access to other credit sources by permitting timely repayment. In addition to debt repayment, households reported that they used loans to pay for transportation, school events (including cultural and religious ceremonies), to improve/build houses, buy/improve food, pay bills, purchase durable goods, meet health care needs, buy clothes, and run businesses. It is reasonable to think that most (if not all) of these reasons would be applicable to other African countries, including Botswana.

Maintain employment by smoothing or avoiding shocks that prevent getting to work: This theory is consistent with

[29] Credit can be used as working capital so that clients' efforts become more productive; for example, clients can buy rice or grains in bulk at wholesale prices and resell it at retail prices or buy a refrigerator to keep produce fresh. As clients become more productive, their income increases, and they are able to accumulate savings for other investments and emergencies. Savings serve as reserves for important household expenditures (such as school fees and funeral costs) and as insurance against sudden crises (such as illness, natural disasters, or theft) that can otherwise result in destitution for people already living at the poverty line.

work-related investments as many households reported that they use loans for transportation expenses, health care, and clothing. Karlan and Zinman (2008) also reported two other findings consistent with the story that marginal borrowers use loan proceeds to make investments in maintaining wage employment. Households who received loans were significantly less likely to report leaving jobs after entering the experiment, and significantly more likely to repair their cars in recent months.

G. Contribution of social protection (direct transfer) to poverty and inequality reduction[30]

135. **Social protection programs have contributed substantially to poverty alleviation in Botswana, but their impact cannot be easily quantified**. Survey data do not allow us to estimate the impact of all transfers and subsidies in Botswana. The social transfer data in the 2002/03 and 2009/10 surveys are not fully comparable. Major rural programs are not captured in either survey. The analysis below includes only the direct transfers available in the survey. Agricultural subsidies probably had a major impact on rural incomes, but it cannot be directly estimated.

136. **Available data suggests social protection programs have been important for poverty reduction in Botswana.** Without these programs, the poverty headcount would be 25 percent higher—24.3 percent rather than 19. 4 percent. The potential of the transfers on the poverty gap is even more pronounced. While the social protection transfers may not be able to raise most of poor people above the poverty line, they reduce significantly their consumption gap. In the absence of all social protection programs, the poverty gap would be 69 percent higher (Figure 63). School meals, old age pensions, and several forms of government aid, provided in kind or in cash, have the largest effect on reducing the poverty gap. Improved targeting of transfers could have a major impact on further poverty reduction in Botswana. A detailed discussions and policy recommendations in this area are presented in the social protection chapter of this report.

Figure 62: Poverty headcount: current and estimated in the absence of SP programs

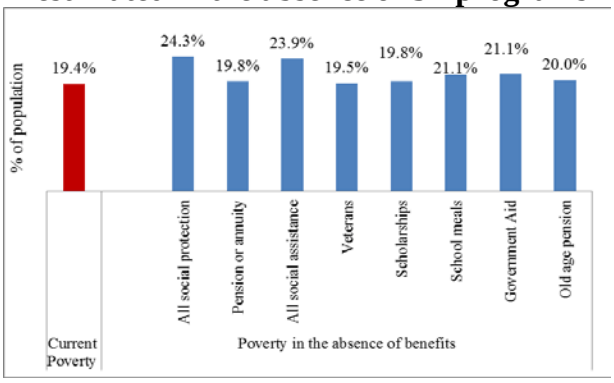
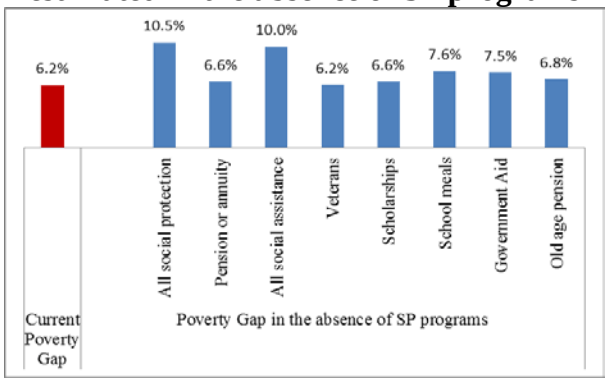


Figure 63: Poverty gap: current and estimated in the absence of SP programs



Source: WB SPAdept using 2009/2010 CIWS.
Note: The simulated impact is the change in poverty headcount due to transfers, assuming that household welfare will diminish by the full value of the transfers.

[30] A more detailed discussion on the various social protection programs in Botswana is found in the Chapter 7.

137. **Despite the importance of direct transfers in supporting the poor, the impact on poverty of the changes in transfers between 2002/03 and 2009/10 was rather small.** As discussed earlier, direct transfers only contributed a small portion to poverty reduction (Figure 40). The agricultural subsidies, however, probably had a tremendous impact on rural poverty reduction. The survey data did not capture these subsidies, and we cannot estimate their direct impact on poverty. The simulation results suggest that subsidies and self-employed incomes in the agriculture sector contributed more than half of Botswana's poverty reduction.

Summary. This chapter analyzed the main factors driving poverty reduction in Botswana. Substantial changes in the country's demographic structure, such as a reduction in household size and lower dependency ratios, contributed to poverty reduction. Improvements in labor market outcomes in the rural areas played a prominent role. Botswana achieved significant increases in rural employment rates. Wages and all kinds of formal and informal labor related incomes increased substantially, especially in rural areas. Access to education improved from primary through secondary and university levels. In an attempt to reduce poverty, the Government introduced a number of social assistance initiatives that also contributed to poverty reduction. The amount of household loans increased in Botswana, and it was a relevant source of poverty reduction. Despite significant achievements, however, substantial challenges remain in order to ensure their sustainability and accelerate progress in poverty reduction. The following chapters examine those challenges in more detail.

Chapter 4: Measuring economic vulnerability in Botswana

Botswana is characterized by a relatively high proportion of vulnerable households. Almost 31 percent of Botswana's population is vulnerable—or living above the poverty datum line but having a relatively high probability of becoming poor. Yet, vulnerability declined significantly during the 2000s. Vulnerability is lower in the cities than in other parts of the country, and both poverty and vulnerability have strong regional dimensions. At the same time, the gaps between rural and urban areas have declined. Poverty fell in all regions, and vulnerability has declined in most of them.

A. Introduction to the concept of vulnerability

138. **In recent years, the notion of economic vulnerability has been broadly discussed in socio-economic literature and policy debates.** Empirical evidence shows that countries with lower levels of vulnerability are associated with better governance, reforms, and better infrastructure. As people climb out of the vulnerable status, they tend to accumulate savings and acquire secondary and tertiary education—i.e., make investments in the future. They are likely to support accountable government, rule of law, and property rights as well as better infrastructure, education, and economic stability. Faster growth and poverty reduction are associated with the creation and growth of the middle class. Botswana has had considerable economic growth in recent decades. At the same time, it maintains one of the world's most unequal income distributions, leading to a significant and growing portion of the population being vulnerable to falling into poverty. To enhance the policy relevance of this analysis, more emphasis should be put on reducing economic vulnerability. This is especially true as Botswana approaches the income of developed economies. Sustained economic growth and shared prosperity should be associated with less economic vulnerability.

B. Introduction to the concept of economic vulnerability

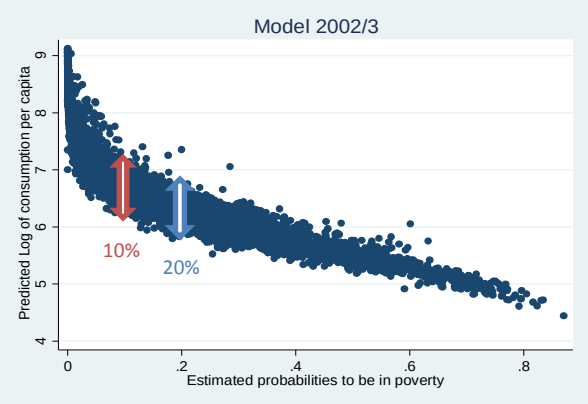
139. **To analyze vulnerability to poverty, we use a regression-based approach to estimate the income threshold associated with a low probability of falling into poverty**. Various approaches have been proposed to define and measure vulnerability. Some have adopted expected utility frameworks, constructing prediction models that define vulnerability as low expected utility, introducing the role of risk explicitly into welfare considerations (Ligon and Schechter, 2003; Elbers and Gunning, 2003). Others have adopted prediction models that give the probability of becoming poor in the future (Ravallion, 1988; Christiaensen and Boisvert, 2000; Pritchett et al., 2000; Chaudhuri et al., 2002; Chaudhuri and Datt, 2001 and others). We use this second approach in defining vulnerability in Botswana.

140. **The vulnerability threshold was set as double of Botswana's poverty datum line.** The vulnerability thresholds are defined by a fitted model outlined in the regression-based

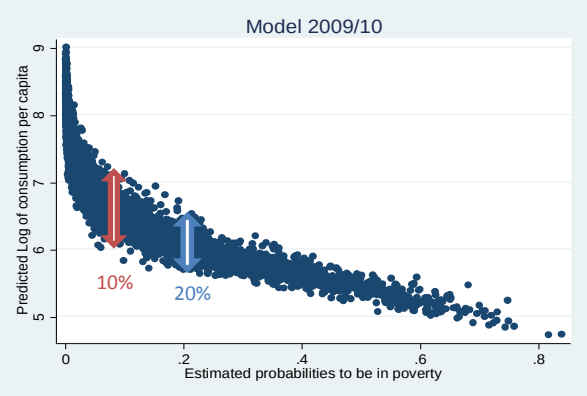
probability model.[31] Figure 64 presents the distribution of the estimated probabilities of falling into poverty next to the estimated log of household consumption per capita, based on the estimated models for 2002/03 and 2009/10. As discussed earlier in this chapter and presented in the charts, the probability of being poor is negatively correlated to the estimated log of household consumption per capita. The figures graphically illustrate the definition of the vulnerability (20 percent).[32] The estimated vulnerability threshold was 530.2 pula per capita in 2009/10 prices—approximately twice the official poverty datum line. Households with per capita consumption between the national poverty datum line and this higher line were defined as vulnerable.

Figure 64: Estimated probability and consumption, 2002/03 and 2009/10

Estimated probability and log consumption per capita, 2002/03



Estimated probability and log consumption per capita, 2009/10

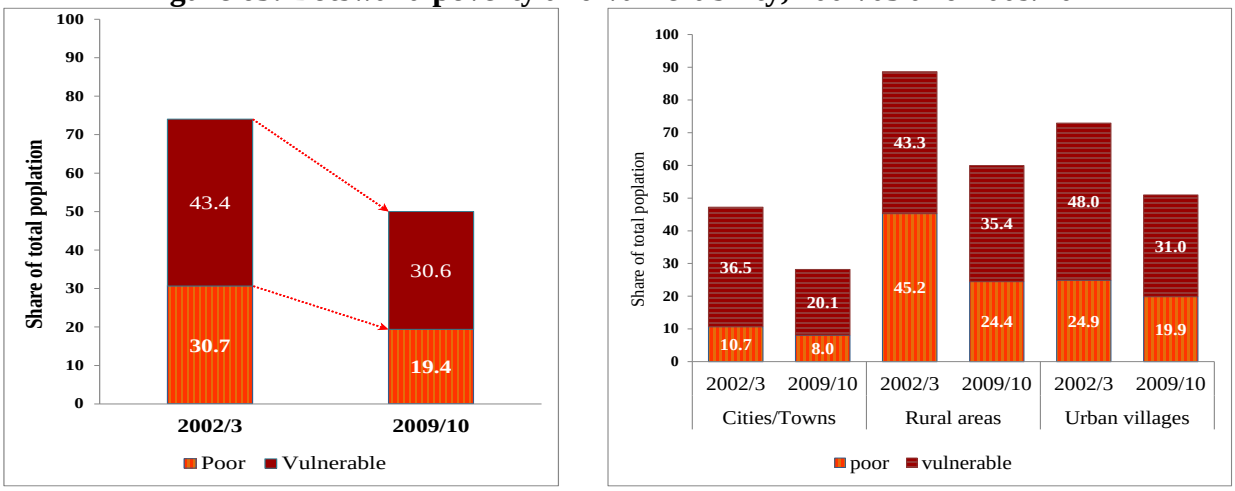


Source: Authors' estimates.

[31] Several model specification were tested that included assets ownership index, cattle ownership, and alternative household location variables. The sensitivity of the estimates based on the model specification is not reported in this document but may be shared upon request.

[32] To estimate consumption, we first estimated the average demographic characteristics for each population vintile based on the predicted probability of falling into poverty; we then estimated the average consumption per capita for each vintile. The 20 percent threshold is further calculated based on averaging predicted households' consumption per capita, with the predicted probability between 18 percent and 22 percent.

Figure 65: Botswana poverty and vulnerability, 2002/03 and 2009/10



Source: Authors' estimates. Vulnerable population is defined as the share of households with a relatively high probability of falling into poverty.

141. **Between 2002/03 and 2009/10, poverty and vulnerability both fell in Botswana**. Figure 65 shows a significant reduction in poverty from 30.7 of the population in 2002/03 to 19.4 percent in 2009/10. In 2002/03, 43.4 percent of the population was vulnerable, facing **a** relatively high probability of falling into poverty. By 2009/10, vulnerability had declined to 30.6 percent. Despite the improvement, economic vulnerability remains significant in Botswana. Very high vulnerability suggests wide polarization and inequality among the population.

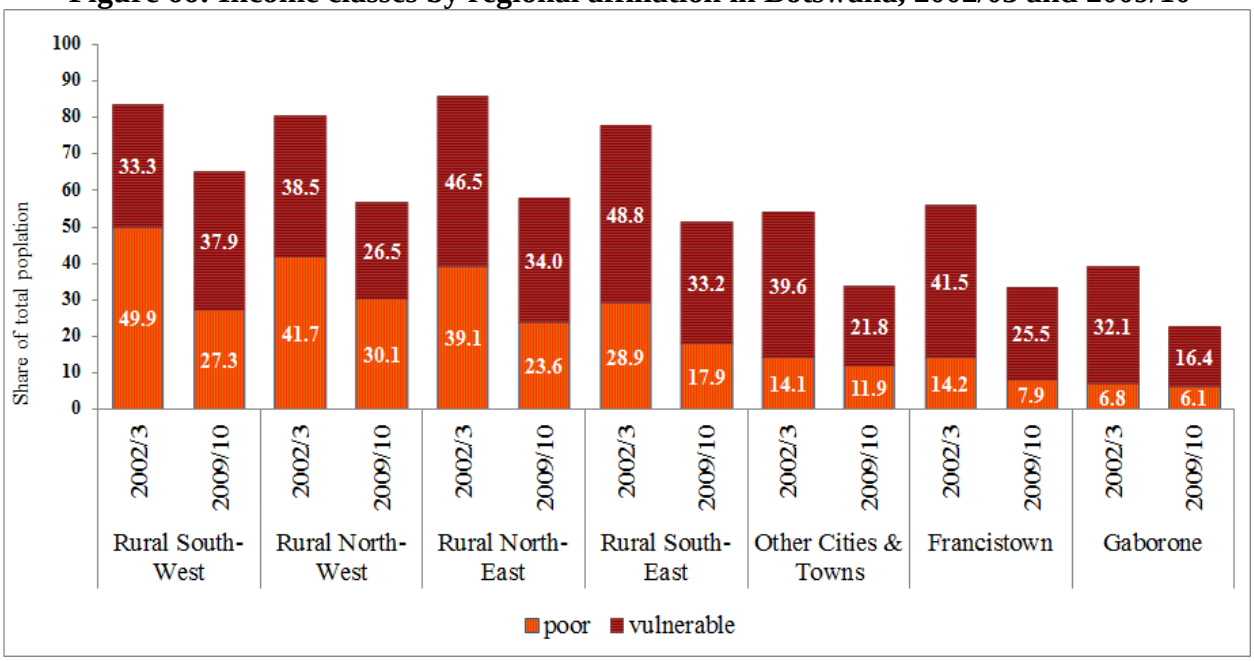
142. **Cities and towns have a much lower percentage of poor and vulnerable.** Due to the country's natural features, the population is very unevenly distributed, largely because of the Kalahari Desert. Much of the western part of the country is uninhabited, and the majority of the population is concentrated near the eastern border. The income distribution for urban villages is close to the country as a whole, but there are wide gaps between cities and towns and rural areas. The poverty rate in rural areas declined from 45.2 percent in 2002/03 to 24.4 percent in 2009/10. In rural areas, vulnerability fell from 43.3 percent to 35.4 percent.

143. **In Botswana, the clear gradient for the urban hierarchy starts with Gaborone, the capital, having the lowest percentages of poverty and vulnerability, followed in order by Francistown, other cities and towns, and various rural areas of the country. The rural North-West consistently had the highest shares of poor and vulnerable (Figure 66).** While this urban-rural income gradient is compelling, we urge caution in making too much of it because intra-regional inequality is higher than inter-regional inequality.[33] Between the 2002/03 and 2009/10 surveys, rural areas had the largest declines in poverty and vulnerability. The next largest decreases were in other cities and towns and Francistown. Gaborone had a smaller decline of the percent of poor or vulnerable.

[33] International Poverty Centre (UNDP) and Botswana Institute for Development Policy Analysis, *Poverty Status Report for Botswana: Incidence, Trends, and Dynamics*, September 2005, p. 32.

144. **While poverty rates have declined in all regions, vulnerability increased in the South-West.** As shown in Figure 66, poverty in the South-West declined sharply from 49.9 percent in 2002/03 to 27.3 percent in 2009/10. Vulnerability, however, increased from 33.3 percent to 37.9 percent during the period. In all other regions, both poverty and vulnerability have declined.

Figure 66: Income classes by regional affiliation in Botswana, 2002/03 and 2009/10



Source: Authors' calculations

Summary. In this chapter, we estimated the scope of economic vulnerability in Botswana. The country is characterized by a relatively high proportion of households with a high risk of falling into poverty. Close to 31 percent of the population is vulnerable, or living above the poverty datum line but having a probability of falling into poverty of at least 20 percent. On a positive note, the scope of economic vulnerability has been reduced by almost one-third—from 43.4 percent in 2002/03 to 30.6 percent in 2009/10.

Chapter 5: Profile of the poor

Poverty declined significantly between 2002/03 and 2009/10; however, progress was uneven among the various population groups. Botswana's poverty has a strong regional and rural-urban dimension. Massive poverty and inequality reduction have been accompanied by significant regional convergence. Poverty in Botswana has a young face, with children below 15 years of age representing 46.2 percent of the poor in 2009/10. While the elderly experienced a significant decline in poverty, a much smaller decline occurred for young people ages 6 to 19, who now have the highest poverty rates by age. Larger households with more children have higher poverty rates. Male-headed households have much lower rates of poverty than female-headed households, which are more likely to be single-parent. The country's high rate of HIV/AIDS has a significant impact on family structure and poverty, with large numbers of incomplete families and orphans. However, orphans find a good safety net in place, and they have lower poverty rates than other types of incomplete families. The level and quality of education are crucial factors in determining poverty. Poverty levels are highest among the unemployed and economically inactive.

This chapter systematically looks at the characteristics of the poor in Botswana. Section A analyzes demographic characteristics of the poor. Section B discusses education characteristics of the poor. Section C analyzes the labor force characteristics of the poor.

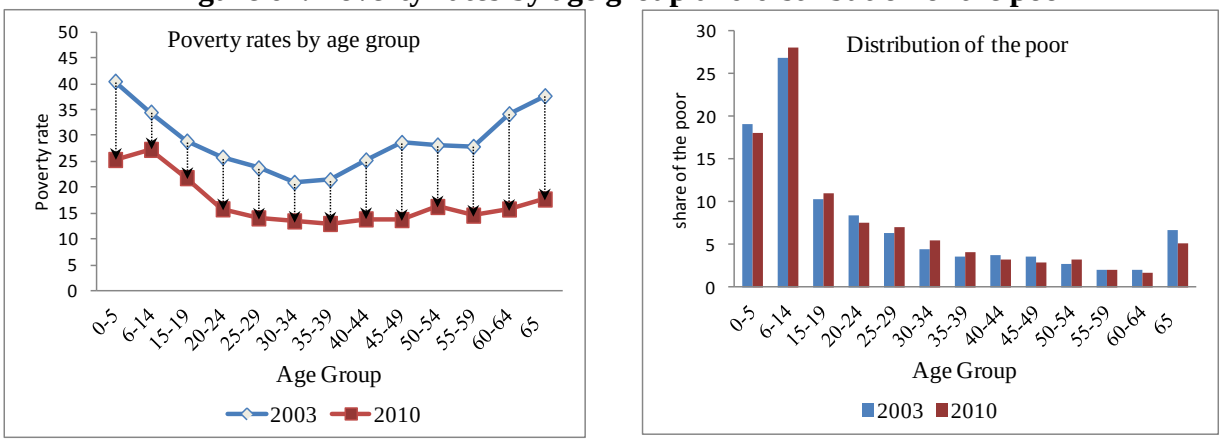
A. Demographic characteristics of poor households

i. Age and poverty

145. **Poverty by age followed a U-shaped pattern, with the young and old having the highest percent poor and those 30 to 44 years of age having the lowest poverty rates.** In 2002/03, children below age 5 had the highest poverty rates at 41 percent, followed by the 38 percent for elderly persons 65 and older (Figure 67). Young people ages 6 to 14 and older people ages 60 to 64 had the same percent poor (34 percent). Persons 15 to 59 years of age had poverty rates below the national average of 30.6 percent.

146. **Children are the poorest group in Botswana, and those below 15 years old represent 46.2 percent of the poor.** The share of children among the poor remains almost unchanged over time. In 2009/10, children between ages 6 and 14 had poverty rates higher than any other population group.

Figure 67: Poverty rates by age group and distribution of the poor



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

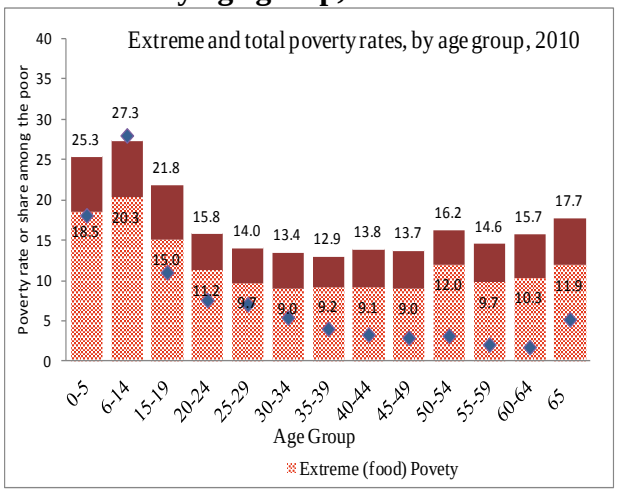
147. **Between the 2002/03 and 2009/10 surveys, older persons and children under 5 had above average reductions in poverty.** The 2009/10 survey found the same general U-shaped pattern of the earlier survey, with the young and old having the highest poverty rates. However, there were some signs of flattening because some of the youngest and oldest groups had larger declines in poverty. Between 2002/03 and 2009/10, overall poverty declined by 11 percentage points—from 31 percent to 19 percent. Older persons over 60 years of age had declines far above the national average, with their poverty rates falling below the national average in 2009/10. Children less than 5 years of age also had above-average poverty declines, although their poverty rates remained above the national average. A noticeable change involved children ages 6 to 19, who had the smallest declines in poverty between the two surveys. By 2009/10, this group had a poverty rate higher than children below age 5, deviating somewhat from a classic U-shaped pattern of poverty rates by age.

148. **Botswana's youth make up a disproportionate share of the poor, with especially large increases for young people ages 6 to 19.** In 2002/03, shares of the poor for young people under 14 years of age and people aged 65 and older were larger than their shares of the total population. With poverty reduction among the elderly, their share of the poor declined to less than their share of the total population. By 2009/10, only young poor people below age 19 exceeded their share of the total population. They made up 57 percent of the poor but only 44 percent of the population. This was especially pronounced among those 6 to 19 years of age, which saw their share of the poor increase.

149. **Young people below age 19 have largest gaps between overall and extreme poverty.** Extreme poverty (food poverty) by age shows the same general U-shaped pattern as overall poverty—with some differences (Figure 68). In 2009/10, overall poverty was 19.4 percent and food poverty was 13.8 percent. Young people below age 19 had the largest differences between overall and food poverty. Young people 6 to 14 years old had the highest rate of extreme poverty of any age group, eclipsing the extreme poverty rate for than young people below age 4. In 2002/03, the overall extreme poverty rate was 22.7 percent. Children below age 5 faced the highest extreme poverty rates (32 percent). Older persons aged 60 to 64 (28 percent) and 65 and older (27 percent) also had rates of extreme poverty above the national average. All other age

groups had rates of extreme poverty below the national average, with those aged 35 to 39 having the lowest rates.

Figure 68: Extreme and total poverty rates by age group, 2009/10



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

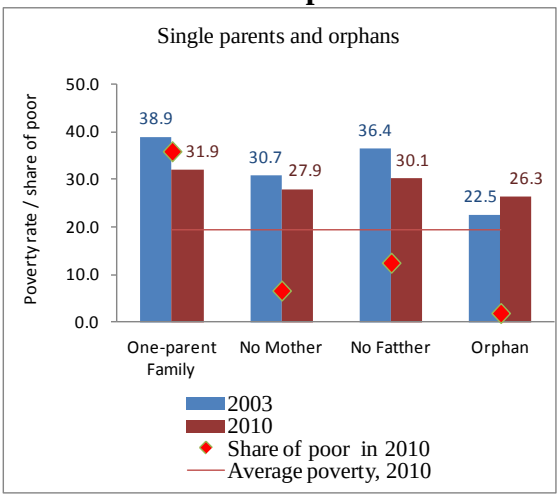
150. **Extreme poverty was primarily a youth issue in 2009/10, with those below age 19 having rates of extreme poverty above the national average.** Between 2002/03 and 2009/10, persons 55 and older had declines in extreme poverty that exceeded the national average, and their rates of extreme poverty were below the national average. With extreme poverty as with total poverty, young people under age 5 had larger than average declines, but their rate of extreme poverty remained above the national average. Once again like overall poverty, young people ages 6 to 14 had a smaller decline in extreme poverty, but their rate was the highest of any age group. Only young people below age 19 had extreme poverty rates above the national average, indicating that the issue has been primarily concentrated among Botswana's youth.

ii. Household composition and poverty

151. **Botswana shows large and widening differences in poverty between full and incomplete families.** The HIV/AIDS situation contributes to significant differences in income levels between full families and those missing one or both parents. In 2002/03, 28 percent of full families were poor, compared to 39 percent of families missing a parent. The poverty rate for full families fell to 16 percent in 2009/10; for families missing a parent, the decline was smaller to 32 percent.

152. **However, AIDS orphans seem well protected—they had the same poverty rate as those in households where neither parent had died.** In 2002/03, orphans had the lowers rate of poverty among incomplete families (23 percent), followed by families with no mother (31 percent), families with no father (36 percent), and single-parent families (39 percent) (Figure 69).

Figure 69: Poverty rates for single parents and orphans



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

153. **Orphans' low levels of poverty can be explained by the social protection programs in place for them as a result of Botswana's high HIV/AIDS rates.** Orphans make up less than 2 percent of all incomplete families. The poverty rate for orphans increased between 2002/03 and 2009/10, while it declined for all other types of incomplete families. Despite the increase, the poverty rate for orphans remained below that for other types of incomplete families.

iii. Gender and poverty

Figure 70: Household composition and poverty rates by gender of head of household

Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

154. **Poverty gender gaps are narrow but widened slightly in the past decade.** In terms of poverty, the differences between males and females are not very significant, although the gender gap widened slightly between the 2002/03 and 2009/10 surveys. Among females, 20.5 percent were poor in 2009/10, slightly higher than the 18.2 percent for males. The narrowness of the poverty gap between genders is not surprising because poverty is estimated at the household

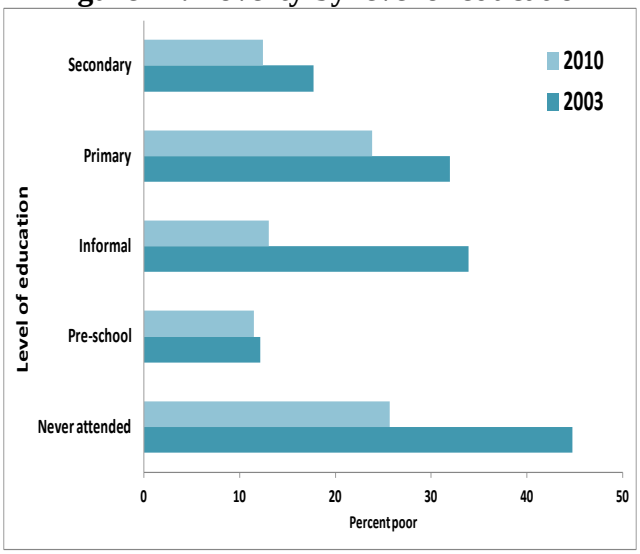
level. However, newer married, widowed, or divorced female were much poorer than their male counterparts.

155. **Female-headed households tend to be disproportionally poor.** Although gender gaps are not wide, there were larger differences by the gender of household head. Among poor households, 42 percent were headed by males and 58 percent by females. The gender gaps by head of household widened slightly between the 2002/03 and 2009/10 surveys.

B. Literacy, education, and poverty

156. **The overall educational level of the population improved, but gaps widened because of the large numbers of people at the bottom of the educational hierarchy with little or no schooling.** Although 76 percent of the population age 10 and older had attended some school in 2009/10 and 83 percent of the population was literate, significant differences remained in levels of schooling completed.[34] The share of the population that never attended school dropped significantly between 2002/03 and 2009/10. The share that completed primary school declined to 31 percent, compensated for by an increase to 41 percent for secondary school completion.

Figure 71: Poverty by level of education



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

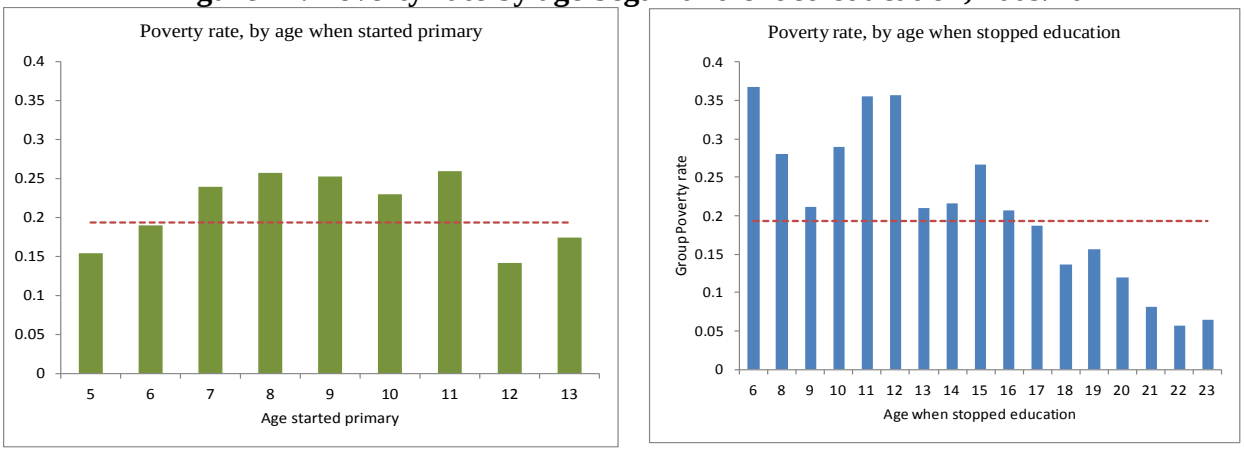
157. **Increased education was associated with lower poverty levels, but incomes gaps by level of education have been narrowing**. In 2002/03, poverty afflicted 45 percent of those who had never attended school, 34 percent of those with only informal schooling, and 32 percent of those with a primary education. Those with a secondary education had the lowest poverty rate at 18 percent (Figure 71). Between 2002/03 and 2009/10, those with no education or only a pre-school education saw the largest reductions in poverty, with both groups' rate declining by 20 percentage points. The poor with a primary education declined by 8 percentage points, and the poor with a secondary education had the smallest decline—5 percentage points. Those who had never attended school had roughly the same poverty level as those with a primary education, providing further evidence of the narrowing of poverty rates by level of education. Those with a secondary education actually increased their share among the poor from 20 percent to 26 percent.

158. **Poverty rates decline as length of education increases**. People who started school at age 5 had a poverty rate of 15 percent in 2009/10 (Figure 72). The poverty rate rose with the age

[34] In 2002/03, secondary and tertiary education were combined into one category, making it impossible to break out tertiary education and make comparisons between surveys.

of starting school, so that people who began at ages 7 to 11 had poverty rates slightly above the national average of 19.4 percent. Those who started at ages 12 and 13 had poverty rates below the national average. In general, however, poverty rates did not differ significantly by the age children started schooling. More important for poverty levels were the ages that they finished school, which determined how long they were in school and the highest grade they completed. In 2009/10, people of all ages who stopped their education before age 16 had poverty rates above the national average—some by a large margin. Starting with persons who completed their schooling at age 17, all ages had poverty rates below the national average, with gradually decreasing rates of poverty as age of school completion increased.

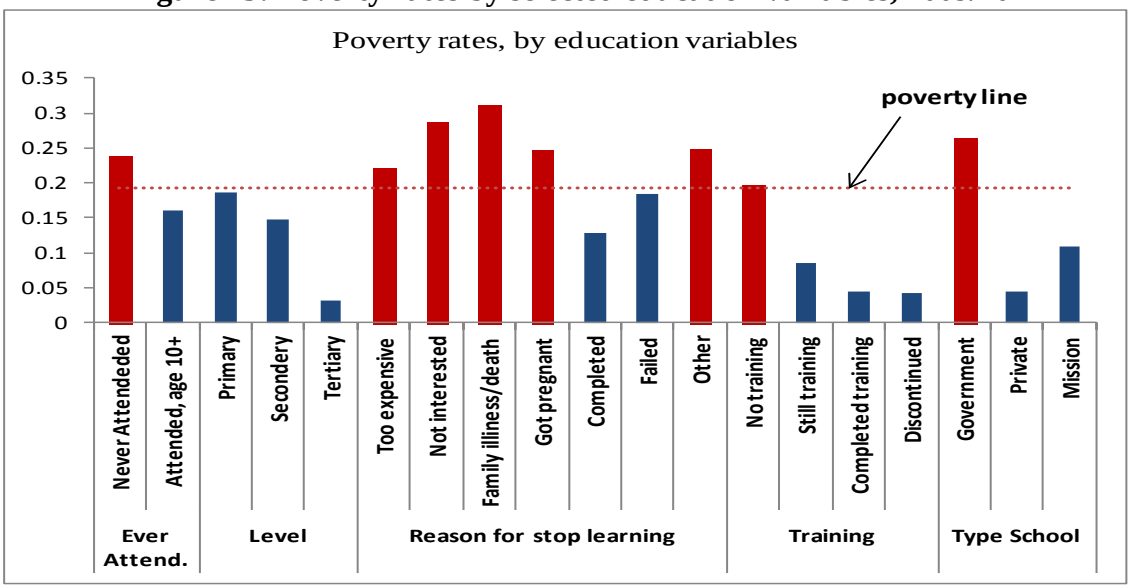
Figure 72: Poverty rate by age began and ended education, 2009/10



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

159. **In general, those who stopped school for reasons other than completing schooling or failure, had no training, or attended government schools had poverty rates above the national average.** In 2009/10, those who had never attended school had higher poverty rates than those who did, and poverty rates declined with higher levels of school completion (Figure 73). Those who did not finish school for reasons of affordability, lack of interest, family illness or death, or becoming pregnant had higher rates of poverty than those who finished school or stopped because they failed. Those with some training, even if they discontinued it, had lower rates of poverty than those with no training. Those who attended private or missionary schools had significantly lower rates of poverty than those who attended government schools.

Figure 73: Poverty rates by selected education variables, 2009/10

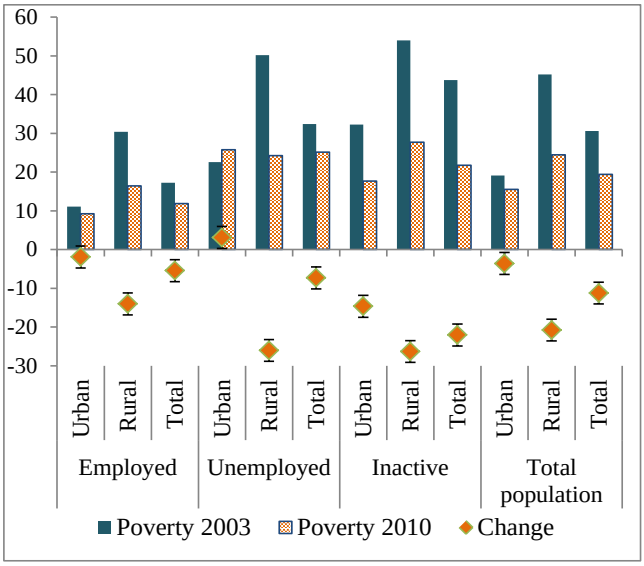


Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

C. Labor market characteristics and the poor

160. **Those in rural areas had the largest declines in poverty, and the decreases affected almost equally the employed, unemployed, and inactive.** Between 2002/03 and 2009/10, the decline in poverty of 21 percentage points for rural dwellers was much higher than the 4 percentage points for those living in urban areas (Figure 74). The employed and inactive in both urban and rural areas all had declines in poverty rates. Poverty among the employed declined 5 percentage points overall and 15 percentage points in rural areas. Poverty among the unemployed population declined 7 percentage points nationally and 26 percentage points among the rural unemployed. The urban unemployed were the only group not to experience a decline in poverty between 2002/03 and 2009/10.

Figure 74: Poverty rates by labor force status in Botswana, 2002/03 and 2009/10



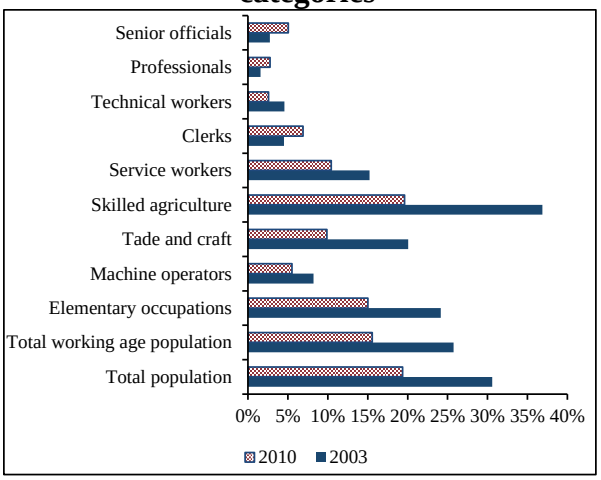
Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

i. Occupational structure and poverty

161. **A narrow occupational structure leads to wide income disparities.** Botswana has a quite narrow occupational distribution, with a small number of people in highly skilled occupations at the top and a large number of people in less-skilled occupations at the bottom. Senior officials make up 3 percent of occupations, professionals 7 percent, and technical workers 8 percent. Collectively, less-skilled

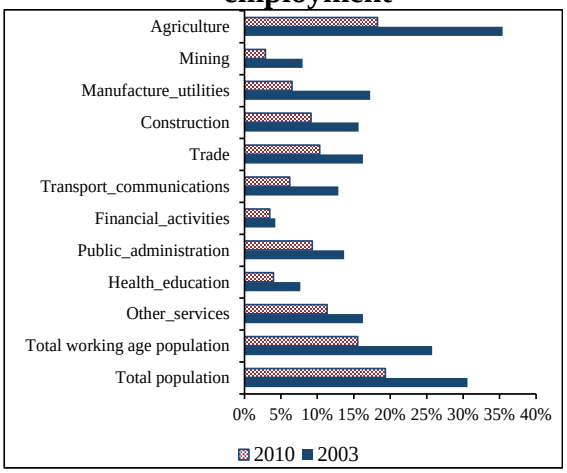
occupations make up 70 percent of the total employment—15 percent service workers, 14 percent skilled agriculture workers, 11 percent trade and craft workers, and 30 percent elementary occupations.

Figure 75: Poverty rates by occupational categories



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

Figure 76: Poverty rates by sector of employment



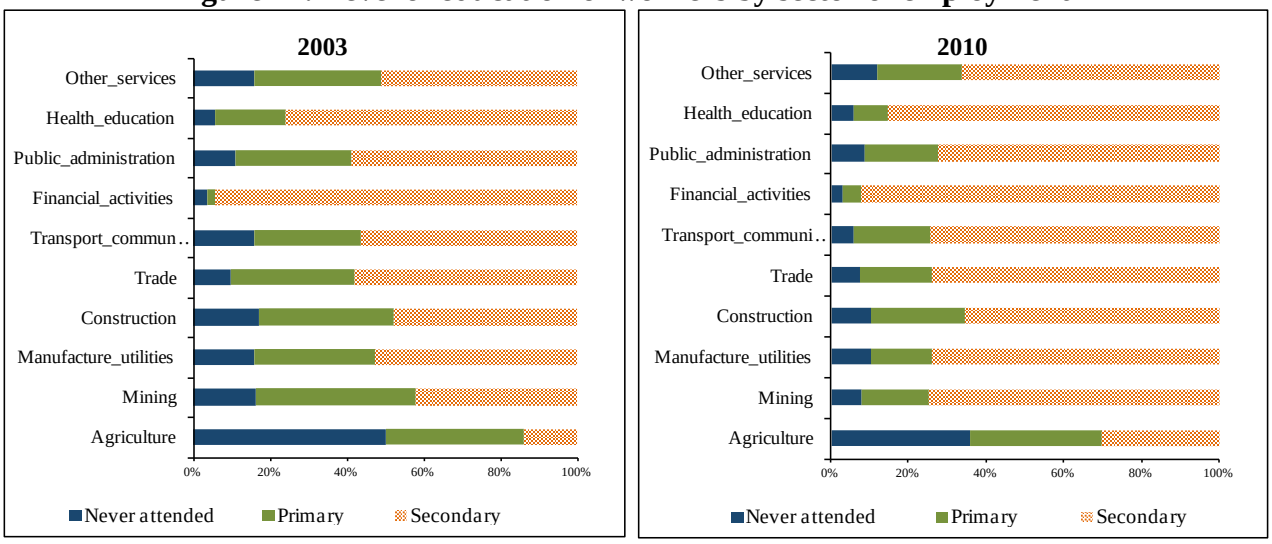
Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

162. **People in less-skilled occupations had the largest declines in poverty, but they still had rates above the national average**. Between the two surveys, the 30 percent of the population working as senior officials, professionals, technical workers, clerks, and machine operators saw their poverty rates either increase or decrease by small percentages (Figure 75). The 70 percent employed in less-skilled occupations—such as trade and crafts, elementary occupations, and notably skilled agricultural workers—had significant declines in poverty between 2002/03 and 2009/10. This occurred because of policies aimed at improving the well-being of people living in rural areas and affected both working and non-working segments of the population.

ii. Employment by sector

163. **There is a correlation between sectors with less-educated workers and high rates of poverty, though the gaps are narrowing.** In 2002/03, half of those working in agriculture, the economic sector with the highest poverty rate, had never attended school and only 15 percent had a secondary education (Figure 77). In financial activities, the sector with the lowest poverty rate, more than 95 percent of workers had a secondary education. By 2009/10, the gaps in educational levels by sector had narrowed. In agriculture, for example, the share who had never attended school declined to 38 percent and the share with a secondary education increased to 25 percent.

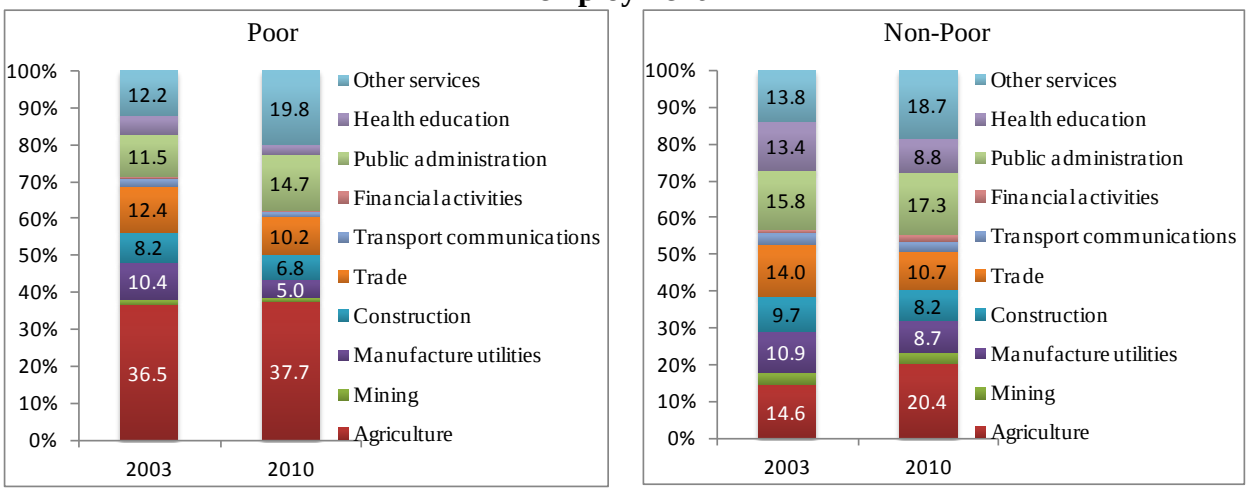
Figure 77: Level of education of workers by sector of employment



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

164. **Workers in agriculture make up a large segment of the poor and a large and increasing segment of the non-poor.** In 2002/03, agriculture workers made up 36.5 percent of the poor. The share increased slightly to 37.7 percent in 2009/10 (Figure 78). With the decline in rural poverty, however, agricultural workers' their share of the non-poor increased even more—from 14.6 to 20.4 percent. The only other sector where the share of poor exceeded the share of non-poor was in "other services," but the difference was small. In other services, the share of the poor rose from 12.2 percent to 19.8 percent, exceeding the increase among the non-poor from 13.8 percent to 18.7 percent. Public administration also stood out—its increased share of the poor from 11.5 percent to 14.7 percent outstripped its 15.8 percent to 17.3 percent increase in the non-poor.

Figure 78: Distribution of the working-age population by poverty and sector of employment

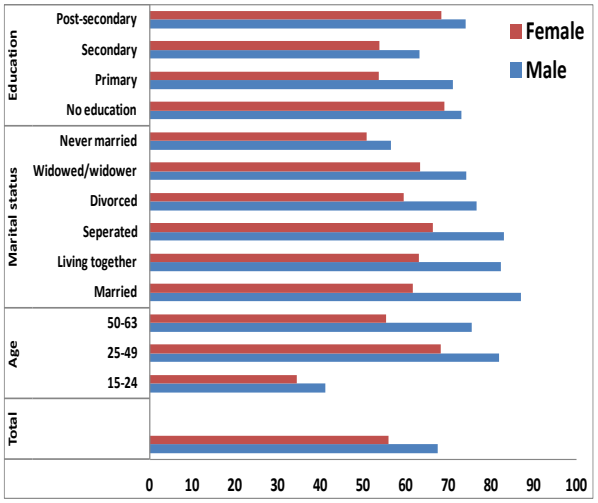


Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

iii. Gender aspects of the labor market

165. **In the labor market, men have a stronger position than women, with higher rates of labor force participation and employment and lower rates of unemployment and inactivity.** Males exceed females by 68 percent to 56 percent in labor force participation, and they top females by 37 percent to 28 percent on the employment rate (Figure 79). In percentage points, male-female gaps are similar in labor force and participation employment. Males have a lower unemployment rate—5.8 percent versus 7.4 percent. And they have lower inactivity—33 percent versus 44 percent. The male-female gap increases by age, with male labor force participation being 7 percentage points higher for ages 15 to 24, 14 percentage points higher for ages 25 to 49, and 20 percentage points higher for ages 50 to 63. By marital status, the smallest male-female gap is among singles (never married) at 6 percentage points. The gaps are widest among those who are married (25 percentage points) or living together (19 percentage points), indicating that a large share of women drop out of the labor force to begin and care for families. By level of education, the widest gaps are among the least educated and decrease with more years of schooling. For men and women with a primary school education, the gender gap is 17 percentage points. It narrows to 6 percentage points for those with post-secondary education.

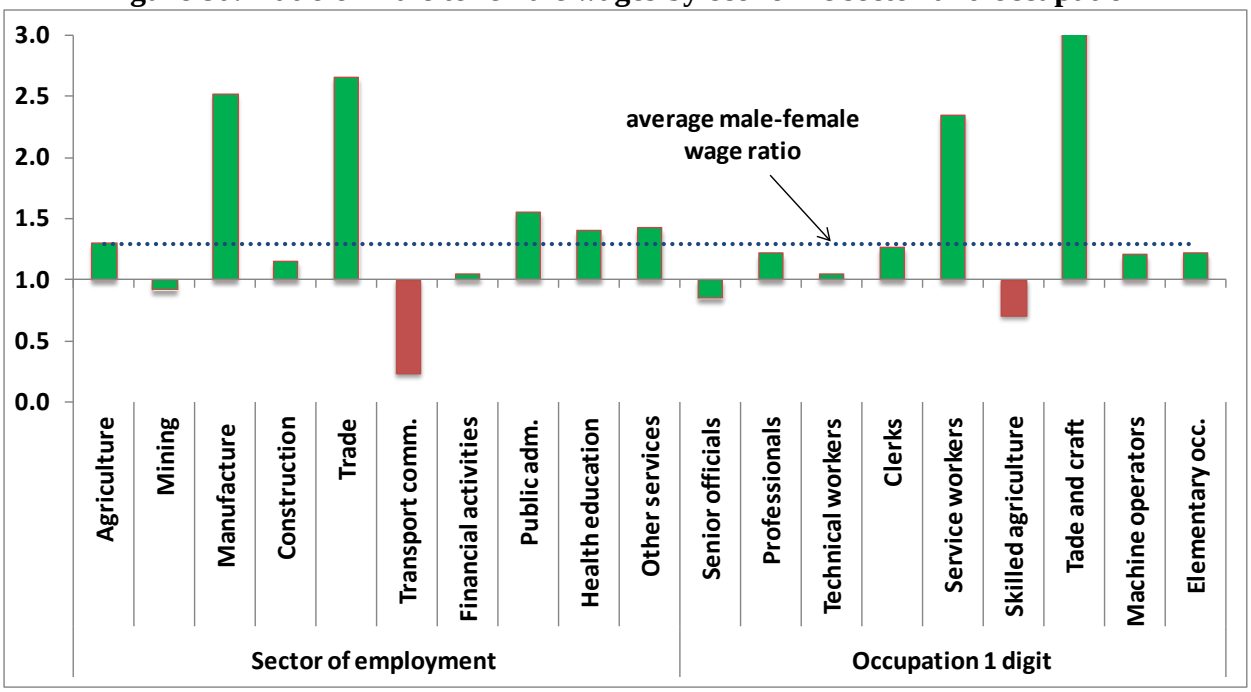
Figure 79: Male and female labor force participation, employment, and unemployment rates by selected characteristics



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

166. **On average, men earn 29 percent more than women, with some differences by occupation or sector of employment.** The male pay advantage is highest in urban areas, where men earn 42 percent more than women. In rural areas, man and women earn equal amounts. Turning to sector of employment, men's pay trails women's by 23 percent in transport and communications (Figure 80). In manufacturing and in trade, men's pay is 2.5 times greater than women's. By occupation, men in skilled agricultural occupations earn 71 percent of what women earn, helping explain the rural areas' pay equality. The largest male-female gaps are in trade and crafts, where men earn three times the wages of women, and in services, where men earn 2.35 times women.

Figure 80: Ratio of male to female wages by economic sector and occupation



Source: World Bank staff calculations from Botswana Core Welfare Indicators Survey.

iv. Summary: correlates of poverty and consumption—regressions analysis

167. **Regression analysis provides a more complete picture of demographic characteristics and poverty by controlling for a range of other factors.** The preceding discussion looked at poverty profiles between 2002/03 and 2009/10 based on descriptive statistics; however, the presentation is essentially a pair-wise correlation between an observable characteristic and poverty status. It does not reveal much about the combined effects of various variables on poverty. A fuller understanding of the links between observable characteristics and poverty status requires controlling for other variables. The use of regression models allows an analysis of the relationships between characteristics while controlling for other effects.

168. Two types of regression models are used to determine poverty correlations and better describe Botswana's poverty profile. The first is the consumption per capita regression model, where the log of household consumption per capita was regressed against such characteristics as household size and the number of children at different age levels. The second one is a logistic regression model that estimates the probability of falling into poverty based on the same households and individual characteristics used in the first model.

169. Appendix L presents the models' results for three levels of the urban hierarchy—cities and towns, urban villages, and rural areas. The independent variables in both models were observed individual and household demographic, education, and labor market characteristics and a set of household location characteristics. Key findings are presented for education, sources of income, and sector of employment, including changes between 2002/03 and 2009/10.

170. **Education**: Predictably, higher levels of education lead to higher levels of consumption and lower levels of poverty. In 2002/03, having a primary education rather than never attending

school led to an 18 percent increase in consumption and a 33 percent lower probability of being poor. Those with a secondary education had 51 percent higher consumption than those who had never attended school and a 63 percent lower probability of being poor. One of the key findings regarding education was that the returns to education narrowed between the two surveys, a result consistent with the unilabiate descriptive variables analyzed above. In 2009/10, those with a primary education had virtually the same consumption as those with no education, although the statistic was not significant. Those with a primary education had a 16 percent probability of being poor, a decrease from the probability of 33 percent in 2002/03. Those with a secondary education had only 25 percent higher consumption in 2009/10, compared to 51 percent in 20020/03. They had 32 percent lower probability of being poor in 2009/10, down from 55 percent in 2002/03. To sum up, education is still valued and higher levels lead to higher consumption and lower poverty, but the returns to education have narrowed in an economy that has difficulty absorbing and rewarding higher levels of education.

171. **Sources of income**: Consumption and poverty are also shaped by sources of income, with some differences emerging between the two surveys. In 2002/03, those persons with labor as their primary source of income had 19 percent higher consumption than those who were self-employed or who relied on their own production. Those with labor income had a 23 percent lower probability of being poor. People who relied on transfer income had 13 percent lower consumption and a 20 percent higher probability of being poor. The differences by source of income narrowed between the two surveys. In 2009/10, those whose main source of income was labor had only 5 percent higher consumption than those who were self-employed or who relied on their own production, down from 19 percent higher in 2002/03. They had a 15 percent lower probability of being poor, down from 23 percent lower in 2002/03. In 2009/10, those who relied on transfer income had only 2 percent lower consumption than those who were self-employed or who relied on their own production, although the statistic was not significant. In 2002/03, they had 13 percent lower consumption. In 2009/10, they had a 2 percent lower probability of being poor, again not statistically significant. In 2002/03, the probability was 20 percent lower. To sum up, having labor as the main source of income still leads to higher consumption and a lower probability of being poor, but there was virtually no difference between persons who were self-employed or who relied on their own production and those who relied on transfer income.

172. **Sector of employment**: Sector of employment was also crucial for levels of consumption. Compared to people not working, those employed in agriculture had 13 percent lower consumption, and those working in construction had 16 percent lower consumption. Persons employed in public administration had 15 percent higher consumption, and those in health and education were 21 percent higher. Compared to 2002/03, those employed in agriculture remained at 13 percent lower consumption in 2009/10, whereas those in construction only had 3 percent lower consumption, although the statistic was not significant. Those in public administration had 9 percent higher consumption, down slightly from 2002/03, while those in health and education had 24 percent higher consumption, up slightly from 2002/03.

Summary. This chapter examined three main dimensions of poverty: demographics, education, and labor market affiliation. Age and family size and structure have strong correlations with poverty. Larger households with more children have higher rates of poverty, and the gaps between large and small families widened. Male-headed households have much lower rates of

poverty than female-headed households, which are more likely to be single parent. The country's high rate of HIV/AIDS has a significant impact on family structure and poverty, with large numbers of incomplete families and orphans. However, orphans benefit from existing safety net policies and have lower poverty rates than other types of incomplete families. The elderly had significant declines in poverty, while young people 6 to 19 years of age had much smaller declines and now have the highest poverty rates of any age group. The level and quality of education highly correlate with poverty. Those with a secondary education have 51 percent higher consumption and a 63 percent lower probability of being poor than those who never attended school. A key finding regarding education is that the returns to schooling narrowed between the two surveys. Labor market affiliation is an important determinant of poverty. Employment reduces poverty, and sector affiliation is also important.

Chapter 6: Non-income dimensions of poverty in Botswana

This chapter goes beyond one-dimensional money metrics to consider multiple dimensions of poverty, including access to basic services and utilities, education, and food as well as ownership of durable household assets. Non-income dimensions take a broader multidimensional perspective to poverty analysis and help improve policy-making by highlighting problem areas that income-based analyses often fail to capture. Results tell a story that is consistent with the money metric of consumption analysis: poverty or deprivation levels in Botswana fell between 2002/03 and 2009/10 but inequality challenges persist. Gaps still exists with respect to ensuring citizens' access to basic services. The poor suffer deprivations beyond being classified as poor via per capita consumption. Specifically, 93 percent of the poor in 2009/10 lived in overcrowded housing, 79.2 percent had no electricity connections, 55.9 percent owned less than three types of household assets, 52.3 percent did not have flush toilets, and 15.3 percent did not have access to piped water. At least 15.3 percent of the poor were affected by an additional deprivation in 2009/10. Deprivation levels vary by geographic location, with rural residents more disadvantaged than their counterparts in urban areas.

173. Money metric poverty measures are often criticized for failing to capture broader multidimensional aspects of poverty that involve services not typically transacted in markets. For example, outcomes related to water and sanitation, education, health, and food security are crucial to people's well-being, and their intrinsic values often exceed their costs as measured in household expenditures on these items. Similarly, the social impacts of unemployment stretch beyond the observed income loss to affecting the quality of life of afflicted individuals.

174. This chapter complements the analyses in Chapter 5 by exploring changes in non-money measures of poverty and well-being between 2002/03 and 2009/10. It examines whether the highlighted progress in poverty reduction is supported by similar improvements in non-income dimensions, with a focus on access to basic services, utilities, education, and food as well as ownership of durable household assets. The choice of indicators is influenced by the availability of data that is comparable between the 2002/03 Household Income and Expenditure Survey (HIES) and the 2009/10 Botswana Core Welfare Indicators Survey (CWIS). These indicators have been associated with improving livelihoods, and they form part of important dimensions of poverty.

175. The chapter begins by examining the progress made in the provision of basic services and utilities between 2002/03 and 2009/10 in Section A. Section B explores changes in educational outcomes. A description and analyses of a household asset ownership index follows in Section C. In Section D, household food insecurity indicators are discussed. A discussion on multidimensional deprivation and concluding remarks are made in Section E.

A. Access to basic services and utilities

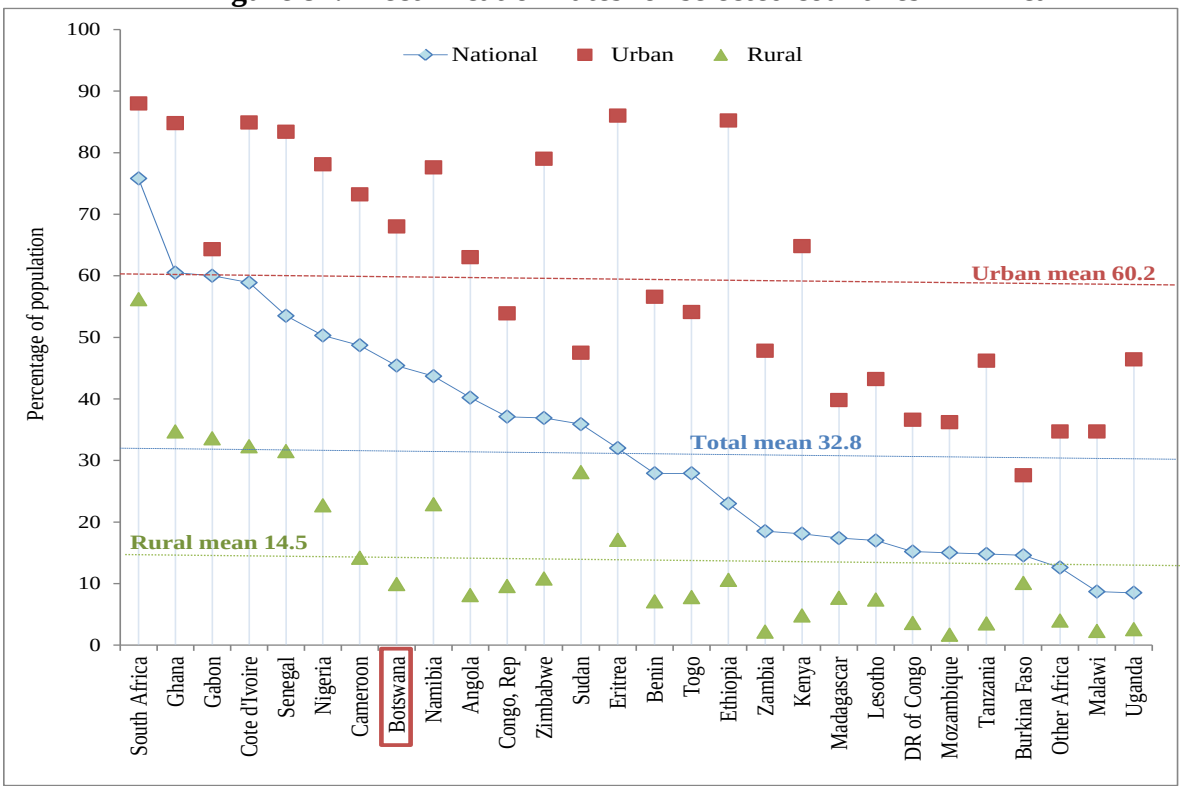
i. Access to and use of electricity

176. **Data from the International Energy Agency shows that Botswana's electrification rate was 45.4 percent in 2009/10.** As expected, electrification rates were higher in urban areas than in rural areas, with the urban rate at 68 percent and the rural one at 9.9 percent (IEA, 2013). Botswana's electrification rates compare favorably with those of other countries in sub-Saharan Africa (Figure 81); nationally, the rate was higher than the averages of 31.8 percent for sub-Saharan Africa and 42.9 percent for Africa as a whole. Considering the urban-rural divide, however, indicates the proportion of people with access to electricity falls below the African averages of 72.1 for urban areas and 23.6 percent for rural areas

177. **Although the share of population with access to electricity improved, it remains far below the 2016 targets of 80 percent nationally and 60 percent in rural areas set under the National Development Plan (NDP)**. Nationally, only 13 percent of the population had access to electricity in 1993/94; the figure rose to 26.8 percent in 2002/03 and further increased to 45.4 percent in 2009/10 (Figure 81). Spatial differences are stark, with cities/towns and urban villages having at least three times more coverage than rural areas. Given that poverty is concentrated in Botswana's rural areas, these differences could relate to: (i) poverty as a barrier to higher connection rates[35] and (ii) the spatial dimension of investment in (electricity) infrastructure. These patterns have a direct bearing on attempts to alleviate poverty. Lack of access to electricity in rural areas compromises efforts to integrate the rural population into the mainstream economy. Such integration would open up job and/or self-employment opportunities. Moreover, expanding electricity widely would contribute to gender equality and empower women because female-headed households tend to be poorer than male-headed households.

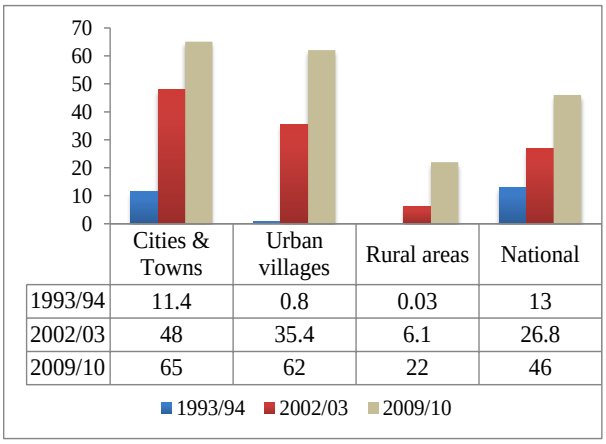
[35] The Government has implemented interventions to make electricity delivery and the payment mode pro-poor. However, these interventions focus on reducing the burden of upfront costs associated with connecting rural households to the grid. The Botswana Power Corporation gives loans to consumers, and they are required to eventually pay them back in full.

Figure 81: Electrification rates for selected countries in Africa



Source: International Energy Agency (2013).

Figure 82. Access to electricity, %

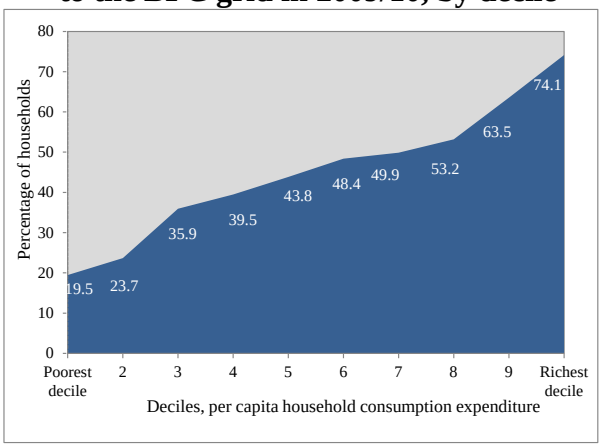


	Cities & Towns	Urban villages	Rural areas	National
1993/94	11.4	0.8	0.03	13
2002/03	48	35.4	6.1	26.8
2009/10	65	62	22	46

1993/94 2002/03 2009/10

Source: Statistics Botswana (2013).

Figure 83. Percent of households connected to the BPC grid in 2009/10, by decile



Source: Authors' calculations based on CWIS 2009/10 survey.

178. **Disparity in access to electricity is widespread and positively correlated with income.** Figure 83 presents the percentage of households connected to the Botswana Power Corporation (BPC) grid in 2009/10 by per capita consumption decile. At 74.1 percent, connection rates among the richest decile were close to four times the 19.5 percent among the poorest decile. The bottom 40 percent had a connection rate of 29.6 percent, compared to 48.2

percent among the top 60 percent. In terms of the poverty status, 20.9 percent of poor households were connected to the grid, compared to 55.5 percent of the non-poor. As stated above, the pattern revealed in Figure 83 underscores poverty as a barrier to access to electricity and a contributor to and/or a result of resource inequality. In addition, Figure 81 and Figure 82 point to two distinct challenges facing the Government: expanding the electrification infrastructure nationally and addressing the issue of affordability, which prevents poor households from being connected to the grid.

179. **Nationally, fuel wood was the principal fuel used by households for cooking, with 43.1 percent of households using it in 2009/10.** Next was liquid petroleum gas (LPG) at 38.2 percent (Table 14). As expected, rural households are most likey to use wood for cooking, an important factor in the fuel's dominance at the national level. Cities and towns are more likely to use gas and electricity for cooking.

Table 14: Principal fuel for cooking in 2009/10

	Cities & Towns	Urban villages	Rural areas	National
Wood	5.24	31.73	75.5	43.12
Gas (LPG)	62.18	45.88	17.33	38.19
Electricity	22.64	17.38	4.71	13.46
Bio gas	5	3.24	1.66	3.02
Paraffin	4.65	1.72	0.71	2.07
Solar power	0.24	0.04	0	0.08
Coal	0	0	0.09	0.04
Charcoal	0.05	0	0	0.01

Source: Authors' calculations based on CWIS 2009/10.

180. **As a principal fuel for cooking, lighting, and heating, electricity has been on an upward trend because of rising affluence and increased access to electricity.** Table 14 shows that electricity is most likely to be used for lighting, while it is least likely to be used for cooking. In general, electricity use of is negatively correlated with poverty levels, and variations across consumption expenditure deciles are stark (Table 15). In 2009/10, for example, the richest 10 percent of households were almost nine times more likely to use electricity for cooking than the poorest 10 percent. They were four times more likely to use electricity for lighting and almost 10 times more likely to use it for heating. In terms of geographical classification, households in cities and towns remain more likely to use electricity than households in urban villages and rural areas. This reflects geographical differences with respect to electrification infrastructure as well as differences in income levels.

Table 15: Proportion of households using electricity as a principal fuel for cooking, lighting, and heating (percentages)

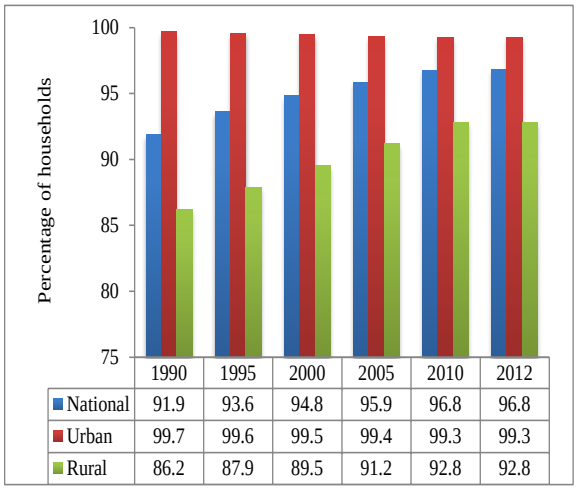
	Cooking		Lighting		Heating	
Decile	2002/03	2009/10	2002/03	2009/10	2002/03	2009/10
Poorest decile	0.0	3.4	2.7	20.4	0.3	5.1
Decile 2	0.0	5.3	2.5	22.6	0.0	7.6
Decile 3	1.2	9.1	5.5	35.4	1.2	13.1
Decile 4	2.1	10.8	10.9	40.9	1.9	16.2
Decile 5	4.4	11.8	13.5	45.7	2.0	21.5
Decile 6	1.5	13.1	15.2	47.2	3.7	23.0
Decile 7	2.8	15.7	23.0	51.4	5.0	24.5
Decile 8	3.6	17.1	33.2	55.3	8.4	29.1
Decile 9	8.4	20.1	49.4	65.5	16.3	38.3
Richest decile	17.5	29.7	71.8	76.4	29.8	50.1
Extreme poor	0.0	3.1	2.8	18.2	0.2	5.2
Poor	1.3	4.1	6.6	21.3	1.1	6.4
Non-poor	8.4	14.6	43.6	48.8	15.0	24.6
Bottom 40 percent	0.9	7.1	5.8	29.9	0.9	10.5
Cities & Towns	11.9	22.6	48.4	65.5	19.3	39.5
Urban villages	3.1	17.4	34.9	62.1	7.3	28.3
Rural areas	0.8	4.7	6.4	21.0	1.5	7.7
Total	6.6	13.4	34.3	45.7	11.5	22.6

Source: Authors' calculations based on CWIS 2002/03 and 2009/10.

ii. Access to and use of water and sanitation facilities

181. **Around 97 percent of Botswana's population had access to improved water sources in 2012.** Botswana has made strides in ensuring citizens have access to improved water sources—defined to include piped water on premises (inside or outside the dwelling unit), public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs, and rainwater collection. In 2012, 96.8 percent of the population had access to an improved water source, up 5 percentage points from 91.9 percent in 1990. While rural areas experienced an improvement of 6.6 percentage points, urban areas remained relatively stagnant, declining marginally by 0.4 percentage point from 99.7 percent in 1990. These proportions are higher than the upper-middle-income country average of 92.7 percent of the population with access to improved water sources (Figure 85). Sustainable access to improved water sources has been shown to affect and/or be affected by socio-economic outcomes, such as health, worker productivity, income, and education. This lends support to its use as a good non-income indicator of poverty as well as a universal indicator of human development.

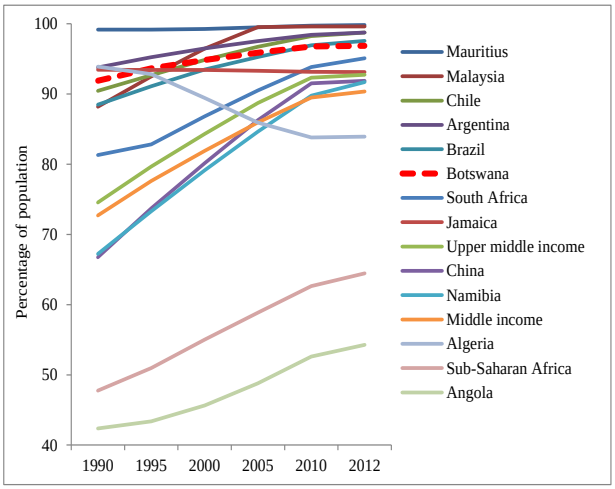
Figure 84: Access to improved water source



	1990	1995	2000	2005	2010	2012
National	91.9	93.6	94.8	95.9	96.8	96.8
Urban	99.7	99.6	99.5	99.4	99.3	99.3
Rural	86.2	87.9	89.5	91.2	92.8	92.8

Source: World Development Indicators.

Figure 85: Improved water source for selected countries



Source: World Development Indicators.

182. **Between 2002/03 and 2009/10, access to piped water—both indoors and outdoors as well as communal taps—registered a 2 percentage point increase from 86.9 to nearly 88.9 percent (Table 16).** Breaking the statistics down by the rural/urban divide reveals equity challenges, reflected in the lower use of piped water in rural areas than in cities/towns and urban villages. Rural areas experienced the slowest growth in the proportion of people using piped water, increasing marginally from 73.9 percent in 2002/03 to 74.8 percent in 2009/10.

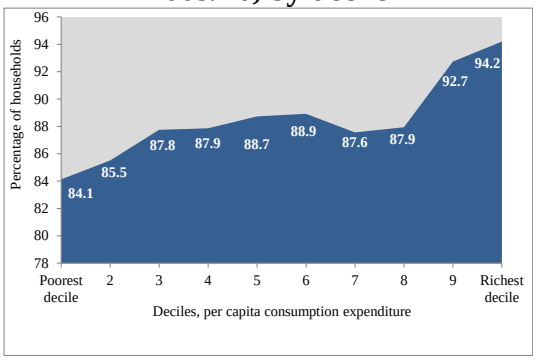
Table 16: Percentage of households by source of water

		Piped indoors	Piped outdoors	Communal tap within the locality	Communal tap outside the locality	Other
2002/03	Cities & Towns	44	37.1	15.6	0.2	3.1
	Urban villages	19.5	50	25.3	0.2	5
	Rural areas	5.1	16.1	44.4	8.3	26.1
	National	20.4	32.4	30.5	3.6	13.1
2009/10	Cities & Towns	52.1	37.7	9.8		0.4
	Urban villages	33.3	55.7	9.7		1.3
	Rural areas	12.4	31.8	30.6		25.2
	National	29.3	41.1	18.5		11.1

Source: Statistics Botswana (2013).

183. **Access to piped water is uneven across income groups.** Around 84.1 percent of the poorest 10 percent of households had access to piped water in 2009/10—10.3 percentage points lower that the proportion among the richest 10 percent (Figure 86). Among the bottom 40 percent, the share of households with access to piped water was 86.5 percent, compared to 89.9 percent of the top 60 percent.

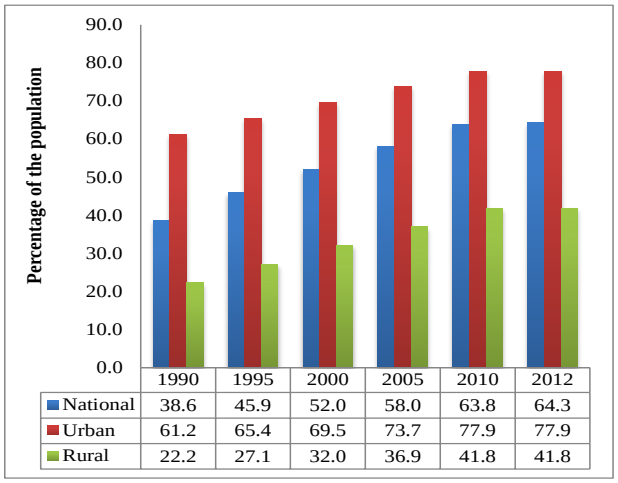
Figure 86: Access to piped water in 2009/10, by decile



Source: Authors' calculation based on CWIS 2009/10.

184. **The share of the population with access to improved sanitation facilities registered an impressive increase of 25.7 percentage points--from 38.6 percent in 1990 to 64.3 percent in 2012** (Figure 87). Improved sanitation facilities are defined to include flush/pour flush (to piped sewer system, septic tank, pit latrine), ventilated improved pit (VIP) latrine, pit latrine with slab, and composting toilet. Although still lagging urban areas, rural areas recorded an increase of 19.6 percentage points from 22.2 percent to 41.8 percent, compared to an increase of 16.6 percentage points in urban areas. Botswana trails the upper-middle-income country average of 74.0 percent of the population with access to improved sanitation facilities.

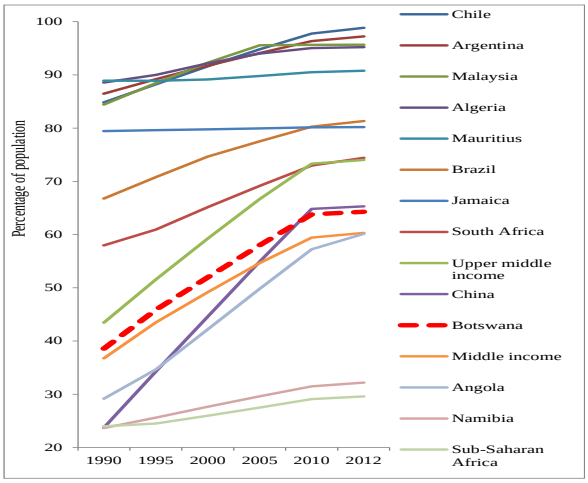
Figure 87: Access to improved water source



	1990	1995	2000	2005	2010	2012
National	38.6	45.9	52.0	58.0	63.8	64.3
Urban	61.2	65.4	69.5	73.7	77.9	77.9
Rural	22.2	27.1	32.0	36.9	41.8	41.8

Source: World Development Indicators.

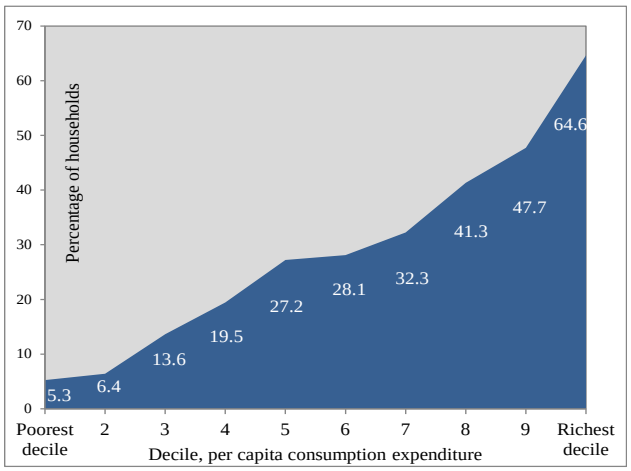
Figure 88: Improved water source for selected countries



Source: World Development Indicators.

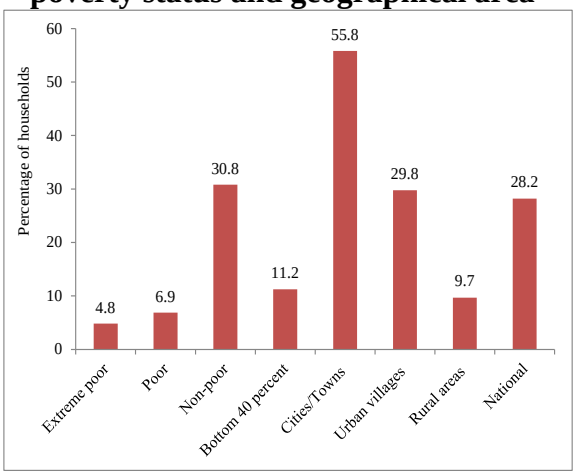
185. **In Botswana, access to flush toilets remains particularly low among the poor.** The use of flush toilets (both own and communal) was a paltry 5.3 percent for the poorest 10 percent, well below the 64.6 percent for the richest 10 percent (Figure 89). As expected, the extreme poor were the hardest hit, with only 4.8 percent of households having access to flush toilets. The bottom 40 percent on the per capita consumption expenditure spectrum had more than 11 percent of households with access to flush toilets (Figure 90).

Figure 89: Access to flush toilets by decile



Source: Authors' calculations based on CWIS 2009/10.

Figure 90: Access to flush toilets by poverty status and geographical area



Source: Authors' calculations based on CWIS 2009/10.

iii. Access to housing and overcrowding

186. **Secure access to housing units correlates to poverty because it helps households generate income through, for example, rentals and/or providing collateral for entering the credit market.** HIES 2002/03 and CWIS 2009/10 collected information on households' mode of

acquisition of housing units. Table 17 shows that self-building was the most commonly cited mode of acquisition in both years. However, the incidence of households living in self-built houses fell from 55.8 percent in 2002/03 to 50.4 percent in 2009/10. The second most commonly cited mode of acquisition was renting from individuals, rising from 19.7 percent of households in 2002/03 to 23.8 percent in 2009/10. There are spatial differences in how housing units are acquired. In 2009/10, 69.0 percent of housing units in rural areas were self-built, compared to 54.1 percent in urban villages and 14.9 percent in cities and towns. The most prevalent mode of acquisition in cities and towns was renting from individuals at 52.4 percent of households. This reflects spatial differences with respect to the level of development of rental markets.

Table 17: Mode of acquisition of housing units, percentage of households

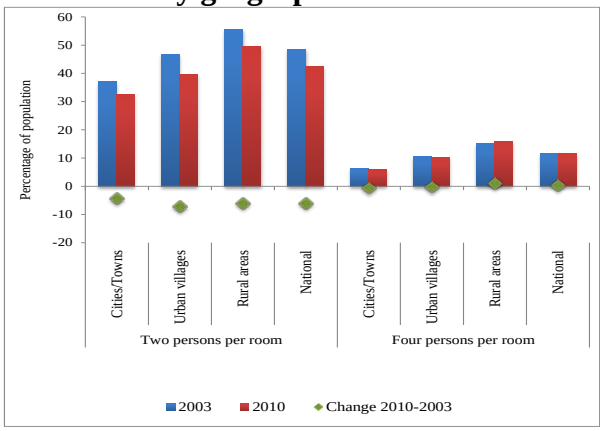
	2002/03				2009/10			
Mode of acquisition	Cities/ Towns	Urban villages	Rural areas	National	Cities/ Towns	Urban Villages	Rural areas	National
Purchased	3.9	0.6	0.2	1.3	5.8	2.8	2.2	3.3
Rent: BHC	8.5	1.2	0	2.7	4.3	1.2		1.5
Rent: Government	4.5	6.8	1.8	3.9	5	5.3	2.1	3.9
Rent: Council	2.3	2.8	1.6	2.2	1.5	1.5	1.9	1.7
Rent: Individual	45.4	18.6	3.3	19.7	52.4	23.9	6.4	23.8
Rent: Company	7.7	0.9	0.3	2.6	6.2	1.7	0.3	2.2
Rent: VDC	0	0.5	1.7	0.9	0.2	0.7	1.2	0.8
Free	6.1	1.6	8.9	5.9	7.1	4.8	12.5	8.6
Inherited	1.8	4.3	4.1	3.5	2.6	4.2	4.4	3.9
Self-built	18.6	62	76.1	55.8	14.9	54.1	69	50.4
Other	1.1	1.3	2	1.5				

Source: Statistics Botswana (2013).

Note: BHC is the Botswana Housing Corporation**,** a parastatal corporation tasked with providing housing, office, and other building needs for the central government and local authorities and facilitating others to carry out building schemes in Botswana. VDC is the Village Development Committee.

187. **Overcrowding in housing has been linked to worsening of health and education outcomes (see, for example Leventhal and Newman (2010) and Lund et. al (2010).** The number of persons per room in a dwelling unit is the most common measure of overcrowding, mainly because the number of rooms is easy to count. This analysis uses two such indicators: the first two persons per room and the second four persons per room. Figure 91 presents the results at the national level as well as by geographical area. Overcrowding is regarded as a good indicator of persistent poverty because it is less susceptible than other measures of poverty to fluctuations.

Figure 91: Overcrowding headcount rate, by geographical area



Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

188. **In Botswana, 42.4 percent of the population was defined as overcrowded in 2009/10, using the standard of two persons per room.** However, overcrowding appears to

have fallen by 6.1 percentage points—from 48.5 percent in 2002/03. Both urban and rural areas experienced an easing of overcrowding. The largest decline was in urban villages, where overcrowding fell from 46.9 percent in 2002/03 to 39.6 percent in 2009/10. Tightening the standard to four persons per room leads to a decline in the overcrowding rate to 11.6 percent in 2002/03, but it rose marginally to 11.8 percent in 2009/10.

Table 18: Overcrowding gap

	2002/03	2009/10	Change
Two persons-per-room			
Cities/Towns	13.6	13.0	-0.6
Urban villages	17.7	16.0	-1.7
Rural areas	22.9	22.3	-0.6
Total	19.1	18.1	-1.0
Four persons-per-room			
Cities/Towns	2.0	2.3	0.3
Urban villages	3.0	3.4	0.4
Rural areas	4.5	6.4	1.9
Total	3.4	4.5	1.1

Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

189. **Using the standard of two persons per room shows a decline in the depth of overcrowding between 2002/03 and 2009/10.** The overcrowding gap indicates the depth of overcrowding by measuring how far overcrowded households are from the standard of two persons per room standard.[36] Nationally, the overcrowding gap fell from 19.1 in 2002/03 to 18.1 in 2009/10 (Table 18). Urban villages experienced the largest decline in overcrowding depth, while cities/towns and rural areas both experienced decreases of 0.6. In policy terms, this implies the resources needed to ease overcrowding among households declined between 2002/03 and 2009/10.

190. **Gaborone had the least overcrowding in both 2002/03 and 2009/10, while the rural South-West region had the highest**. In Gaborone, 32.1 percent of households were overcrowded under the standard of two persons per room (Table 21). This was 24.2 percentage points lower than the 56.3 percent in the South-West. The rural South-East region had the largest decline in overcrowding—11.6 percentage points, going from 49.8 percent in 2002/03 to 38.1 percent in 2009/10. However, this region had the country's second-highest proportion of overcrowded households, trailing only the rural North-West. The rural South-East had 27.5 percent overcrowded households, and rural North-East had 36.6 percent.

[37] No direction of causality is implied. The analysis focuses on correlations rather than causal relationships.

Table 19: Overcrowding headcount rate by region, %

	Overcrowding Headcount Rate			Distribution of the Overcrowded		
	2002/03	2009/10	Change	2003	2010	Change
Two persons per room						
Gaborone	33.9	32.1	-1.8	7.5	7.8	0.2
Francistown	35.6	33.4	-2.2	3.6	4.1	0.4
Other Cities & Towns	42.9	32.7	-10.2	6.1	4.2	-1.9
Rural South-East	49.8	38.1	-11.6	30.3	27.5	-2.7
Rural North-East	49.8	46.5	-3.3	33.4	36.6	3.2
Rural North-West	56.7	55.1	-1.6	9.8	9.1	-0.6
Rural South-West	64.5	56.3	-8.3	9.3	10.7	1.5
Total	48.5	42.4	-6.1	100.0	100.0	0.0
Four persons per room						
Gaborone	6.1	6.0	-0.1	5.7	5.3	-0.5
Francistown	5.5	5.2	-0.3	2.4	2.3	-0.1
Other Cities & Towns	7.8	6.2	-1.6	4.7	2.8	-1.8
Rural South-East	12.1	10.1	-2.0	30.9	26.3	-4.6
Rural North-East	11.7	14.4	2.7	32.9	40.8	7.9
Rural North-West	12.2	13.3	1.1	8.8	8.0	-0.9
Rural South-West	24.4	21.2	-3.2	14.7	14.6	-0.1
Total	11.6	11.8	0.2	100.0	100.0	0.0

Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

191. **Table 192 examines characteristics that could make household more likely to experience overcrowding.** The characteristics considered include the head of household's gender, age, education level, and employment status and the household's income status.

192. **Looking at employment status, the probability of overcrowding is highest among households with a head who is "not in labor force or education."** The overcrowding headcount rate for these households was 51.7 percent in 2009/10, declining from 55.0 percent in 2002/03. Unemployment appears associated with increased overcrowding. Among households with unemployed heads, 50.5 percent faced overcrowding, compared to 36.8 percent for households with an employed head. In 2009/10, most overcrowded households (51.4 percent) had an employed head. This group constituted the highest share of the population (59.4 percent).

193. **Improving head of households' educational attainment is associated with reduced likelihood of overcrowding.** In 2009/10, 56.0 percent of households with a head who never attended school were overcrowded, 29.1 percentage points higher than the proportion among households headed by someone with a secondary education. Among those affected by overcrowding in 2009/10, 40.5 percent had a household head who never attended school.

194. **Overcrowding is shown to be more prevalent among female-headed households than male-headed households.** The share of female-headed overcrowded households decreased from 48.3 percent in 2002/03 to 44.8 percent in 2009/10. Male-headed households, on the other hand, experienced an 8.4 percentage point decline from to 48.4 percent in 2002/03 to 40.0 percent in 2009/10. Among overcrowded households, 53 percent were headed by females in 2009/10.

195. **Child-headed households have the highest prevalence of overcrowding.** Households headed by children between 6 and 14 years old had an overcrowding headcount ratio of 59.9 percent in 2009/10. These households were rare—only 0.1 percent of all households. The next cohort—households headed by someone 15 to 19 years old—had the lowest overcrowding rate at 14.3 percent. Between 2002/03 and 2009/10, the largest change in overcrowding came among households headed by persons aged 40 to 44; they saw a decline of 14.9 percentage points in the overcrowding rate.

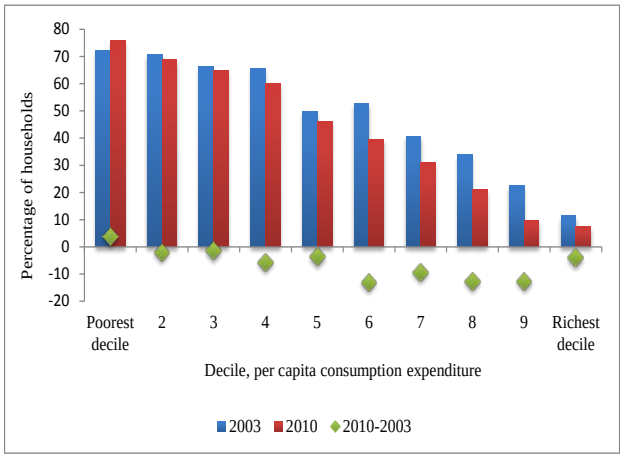
Table 20: Overcrowding headcount rate by household characteristics

	Overcrowding Headcount Rate			Distribution of the overcrowded		
	2002/03	2009/10	Change	2002/03	2009/10	Change
Employment status of the household head						
Employed	44.3	36.8	-7.5	55.2	51.4	-3.8
Unemployed	61.0	50.5	-10.5	5.7	6.8	1.1
Student	27.8	21.4	-6.4	0.5	0.5	0.0
Not in labor force or education	55.0	51.7	-3.3	38.6	41.2	2.6
Education of the household head						
Never attended	61.5	56.0	-5.5	47.1	40.5	-6.5
Pre-school		37.1			0.3	
Informal	41.0	50.0	9.0	2.4	5.1	2.7
Primary	49.3	47.3	-2.0	35.5	30.6	-4.9
Secondary	29.1	26.8	-2.3	15.1	23.5	8.4
Gender of the household head						
Male	48.8	40.0	-8.8	51.3	47.0	-4.2
Female	48.3	44.8	-3.4	48.7	53.0	4.2
Household head's age						
6-14	65.9	59.9	-6.0	0.2	0.1	-0.1
15-19	25.7	14.3	-11.4	0.4	0.2	-0.2
20-24	30.4	31.3	0.9	2.1	2.5	0.4
25-29	37.5	34.4	-3.1	5.3	6.7	1.4
30-34	44.4	39.4	-5.1	8.7	9.0	0.3
35-39	47.4	41.3	-6.1	10.0	10.6	0.6
40-44	52.7	37.8	-14.9	12.8	8.9	-3.9
45-49	49.5	46.7	-2.8	12.7	12.0	-0.6
50-54	59.0	44.9	-14.1	12.4	11.7	-0.7
55-59	54.7	49.6	-5.0	8.8	10.4	1.6
60-64	55.8	44.3	-11.5	8.3	7.8	-0.5
65+	45.1	45.4	0.4	18.3	20.0	1.6
Total	**48.5**	**42.4**	**-6.1**	**100.0**	**100.0**	**0.0**

Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

196. **Overcrowding predominantly affects the poor.** Households defined as poor had an overcrowding headcount rate of 70.7 percent, far above overcrowding rate of 7.6 percent for the rich (Figure 92). Overcrowding rates fall with income levels. Overcrowding is close to 10 times as prevalent among the poorest decile as among the richest decile. This suggests that use of persons per room is a reliable indicator of deprivation caused by low consumption expenditure or income.[37]

Figure 92: Overcrowding headcount rate, by decile



Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

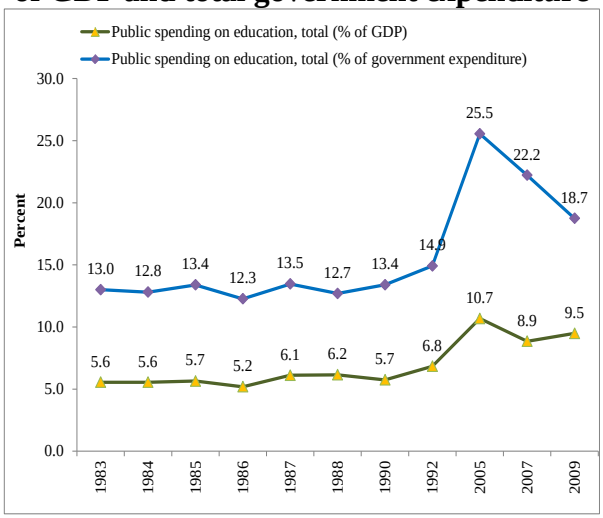
B. Access to education

197. **Botswana's commitment to improving educational access and quality is reflected in a well-funded education sector, with education spending making up a relatively high share of GDP and total government budgets.** After stagnating between 1983 and 1992, resources allocated to education saw a dramatic increase in 2005 (Figure 93). In 1992, public outlays on education made up 14.9 percent of total expenditures, and the education allocation peaked in 2005 at 25.5 percent, or 10.7 percent of GDP. Although it fell to 18.7 percent in 2009, Botswana's education spending remains relatively high compared to other upper-middle-income countries. As a percentage of GDP, for instance, public spending on education in 2009 was 4.4 percentage points higher than the average for upper-middle-income-countries. A correlation between high percentages of GDP allocated to education and better access and quality is not guaranteed; however, a well-funded education system is expected to help Botswana increase enrollment and retention rates.

198. **With more resources allocated to education, pupil-teacher ratios have been declining, and the pool of formally trained teachers has been increasing**. Ceteris paribus, declining pupil-teacher ratios imply teachers are spending more time with individual students. From 1998 to 2009, the pupil-teacher ratio fell by 2.2 percentage points to 25.4 percent (Figure 94), well below the target of 30 pupils per class set under the National Development Plan. The lower pupil-teacher rates are expected to work together with higher numbers of trained teachers to raise the quality of education. The proportion of trained primary school teachers rose to 99.6 percent in 2009, a gain of 6.8 percentage points since 1998. These results reflect concerted efforts, including upgrading the minimum teacher qualification from certificate to diploma through, for example, institutional training and distance education.

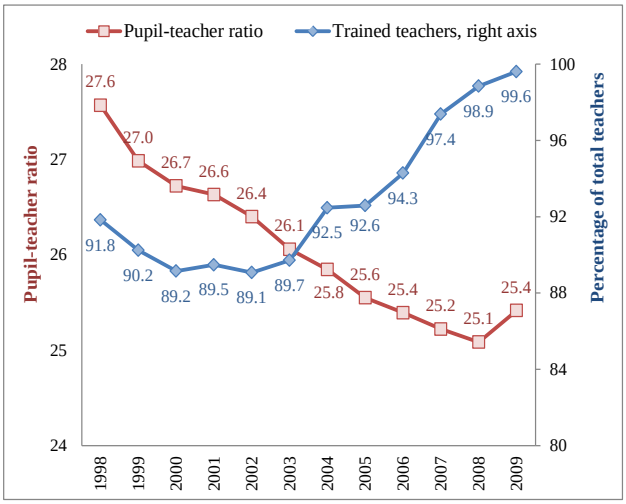
[37] No direction of causality is implied. The analysis focuses on correlations rather than causal relationships.

Figure 93: Educational spending as a share of GDP and total government expenditure



Source: World Development Indicators.

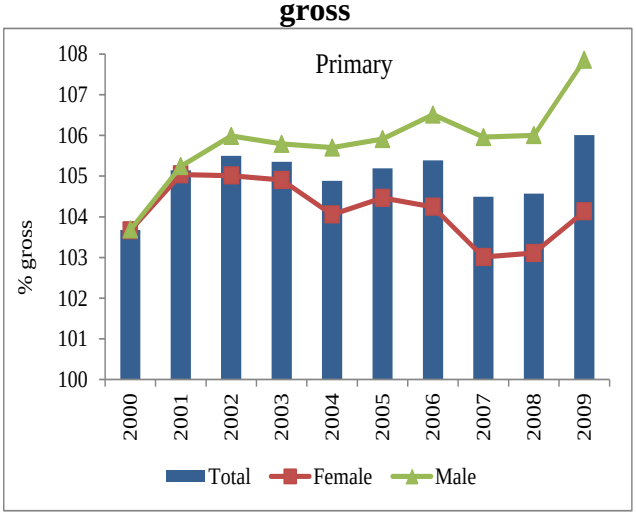
Figure 94: Trained teachers and pupil-teacher ratio



Source: World Development Indicators.

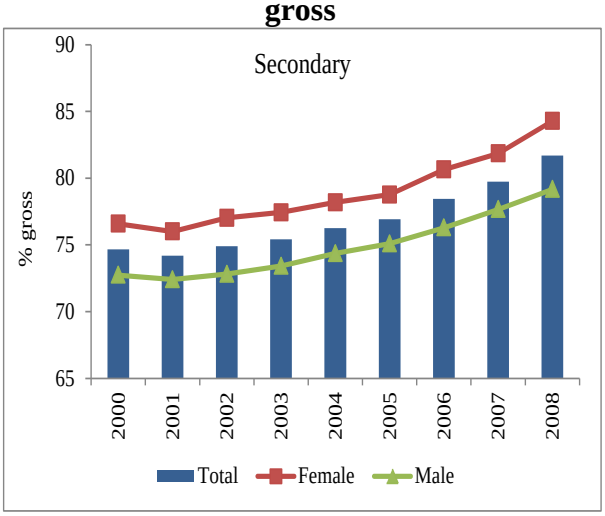
199. **Botswana's enrollment rates have been on an upward trend since 2000.** The estimated net primary-school enrollment rate (NER) is defined as the proportion of children in their official primary-school years who are enrolled in primary education. It has been consistently above 80 percent since 2000, reaching 83.3 percent in 2009. NERs are higher for females than males, both at the primary and secondary levels. In 2009, the gross primary-school enrollment ratio (GER)— total primary education enrollment, regardless of age, as a percentage of the eligible official primary school-age population—was at least 25.6 percentage points higher than the NER. This indicates that 25.6 percent of students were outside the target age cohort. It also suggests room for improvement in the internal efficiency of Botswana's primary education system. Throughout the decade, primary enrollment rates were higher for male children, while secondary enrollment rates have been slightly higher for female children than for their male counterparts (Figure 95 and Figure 96). Along with lower pupil-teacher ratios and better-trained teachers, rising enrollment rates have been accompanied by increased provision of teachers. This improvement is supported by data from the CWIS 2009/10, which shows that 99.3 percent of children aged 6 and 9 years were enrolled in school. The rate for those between ages 10 and 14 was 97.9 percent.

Figure 95: Primary school enrollment, % gross



Source: World Development Indicators.

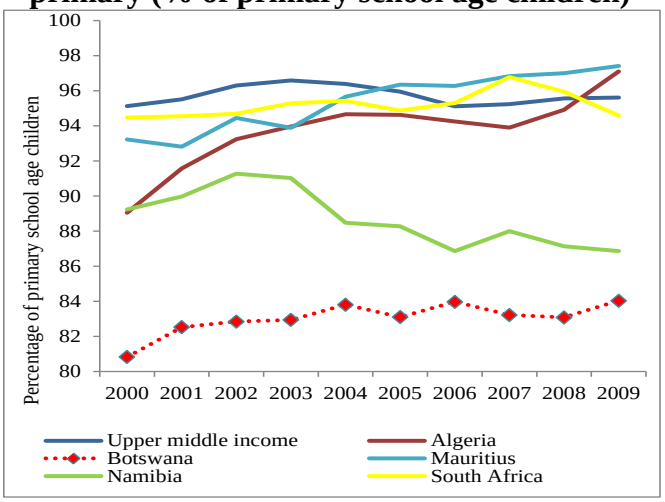
Figure 96: Secondary school enrollment, % gross



Source: World Development Indicators.

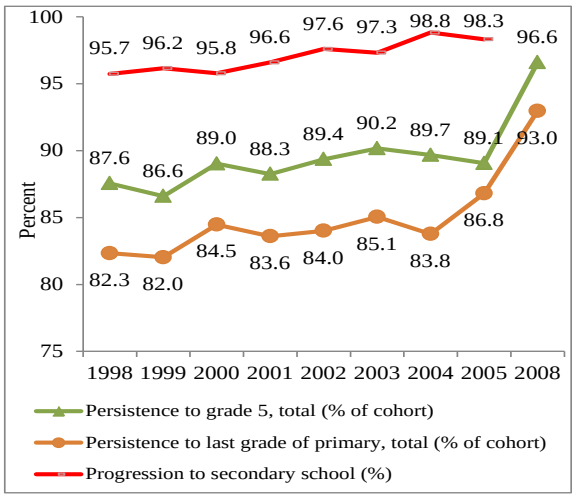
200. **The adjusted net primary-school enrollment rate improved 3.2 percentage points between 2000 and 2009.** Adjusted net primary-school enrollment is primary school-age pupils who are enrolled in primary education as a share of the total population of official primary school age. This indicator allows for the possibility that some children might begin primary school early (before the official age to enter primary school) and proceed to secondary school before they reach the official upper age limit of primary education. By 2009, adjusted net enrollment stood at 84.0 percent. Despite this improvement, Botswana's enrollment rates have been consistently below those of other upper-middle-income countries, such as Algeria, Mauritius, Namibia, and South Africa (Figure 97). In fact, the adjusted enrollment rate in 2009 was 11.6 percentage points lower than the average for all upper-middle-income countries.

Figure 97: Adjusted net enrollment rate, primary (% of primary school age children)



Source: World Development Indicators.

Figure 98: Education survival rates

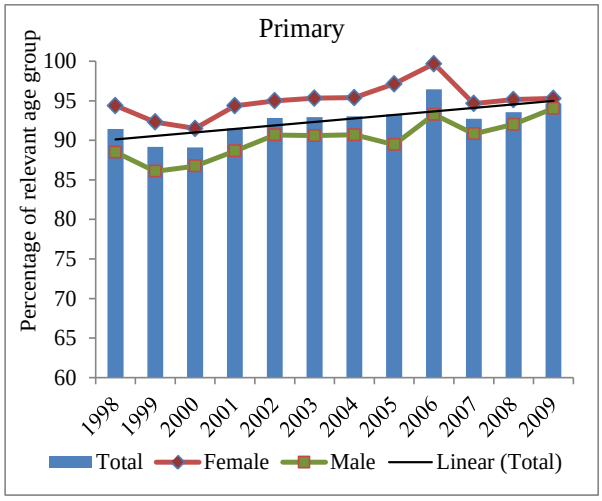


Source: World Development Indicators.

201. **In addition to the improved access to education reflected in enrollment rates, progression from one level of study to another has improved.** In 1998, 87.5 percent of pupils starting first grade reached the fifth grade; by 2008, it had increased by around 9.0 percentage points to 95.6 percent. The proportion of those starting first grade who managed to reach the last primary grade rose from 82.3 percent in 1998 to 93 percent in 2008. Progression into secondary school also improved. In 2005, 98.3 percent of all pupils enrolled in the final grade of primary school went on to junior secondary school, compared to 95.7 percent in 1998. These trends suggest Botswana has laid a foundation for a fully literate society.

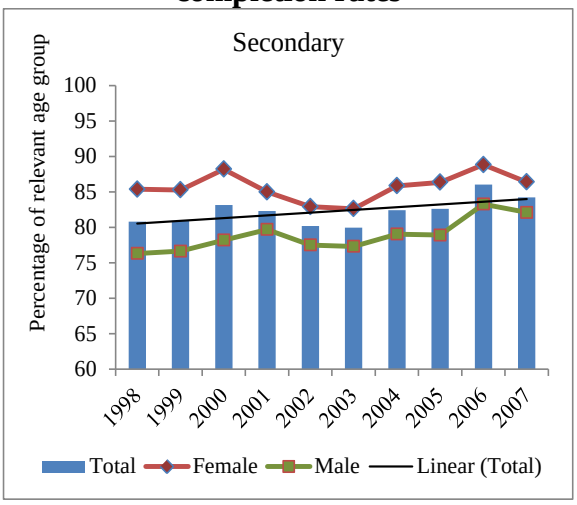
202. **Despite notable variations in both primary and secondary education completion rates, trends have been upward, on average.** In particular, primary completion rates rose from 91.4 percent in 1998 to 94.7 percent in 2009 (Figure 99). Completion rates peaked in 2006 at 96.4 percent for primary education and 86.0 percent for secondary schools. Generally, girls outperform boys in completion of both primary and secondary education—a fact observed between 1998 and 2009. Although the gap fluctuated, it narrowed from 5.9 percentage points in 1998 to 1.2 percentage points in 2009 for primary schools (Figure 99). For secondary schools, the gap declined from 9.1 percentage points to 4.3 percentage points (Figure 100). Botswana still lags its upper-middle-income peers, with primary-school completion rates consistently below average between 1998 and 2009.

Figure 99: Primary education completion rates



Source: World Development Indicators.

Figure 100: Secondary education completion rates

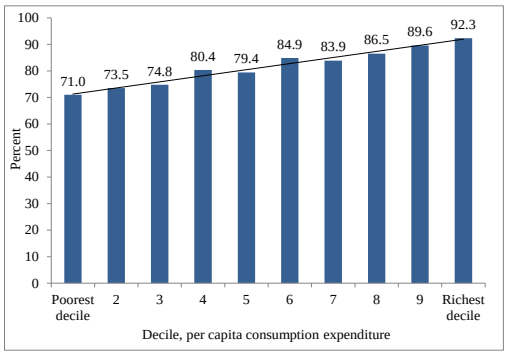


Source: World Development Indicators.

203. **Class repetitions pose a threat to completion of primary education (Grade 7) in Botswana, particularly among boys.** In 2009, for instance, 4.6 percent of total primary enrollment repeated a grade or class, slightly down from 3.4 percent in 2000. The proportion on repeaters was higher among boys (5.5 percent) than girls (4.1 percent).

204. **Educational outcomes are uneven across consumption expenditure groups, favoring rich households.** Data from the CWIS 2009/10 was used to divide households into deciles by per capita consumption expenditures to examine whether educational outcomes among rich households differed from those among poor households. The outcome considered is the proportion of persons age 15 and older completing at least five years of education— basically, at least primary school. Results presented in Figure 101 illustrate how aggregated statistics mask differences that prevail across household types. In the top 10 consumption decile, the proportion of persons age 15 and older who completed at least five years of schooling was around 1.3 times higher than the average for the bottom 10 percent.

Figure 101: Proportion of persons older than 15 completing at least five years of schooling in 2009/10, by decile

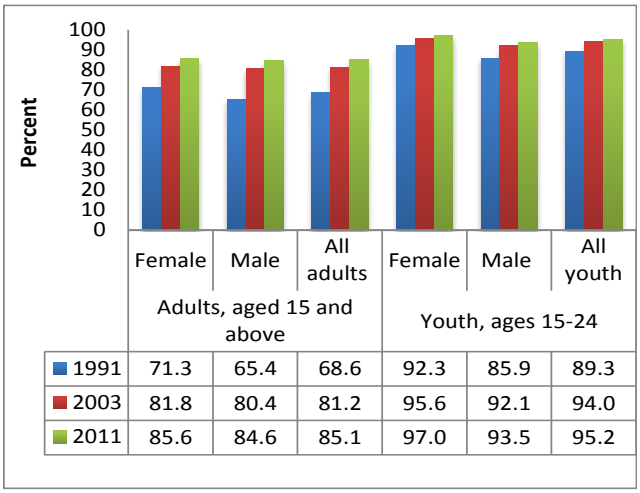


Source: Authors' calculations based on CWIS 2009/10.

205. **The gap in educational outcomes between the rich and poor persists, even though primary education is free.** This suggests the poor face non-fee barriers that compromise their educational outcomes, including the cost of accessing education (e.g., distance to school). Unfortunately, rural residents face poorer educational outcomes than residents of cities and towns. In 2010, 67.9 percent of rural residents age 15 and older had completed at least five years of schooling, 24.9 percentage points lower than the 92.8 percent in cities and towns. Urban villages registered 84.7 percent. These statistics point to expanding educational opportunities as a key to poverty reduction in rural areas.

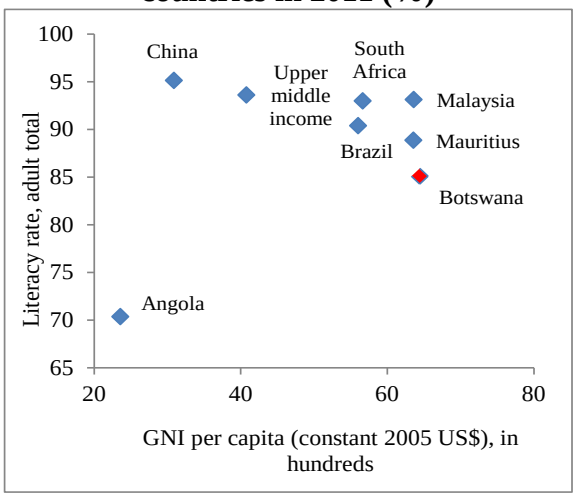
206. **Literacy rates showed a marked improvement from 1991 to 2011.** The adult literacy rate rose from 68.6 percent in 1991 to 85.1 percent in 2011 (Figure 102). Youth literacy rates were consistently higher—89.3 percent in 1991 and 95.2 percent in 2011. Females have marginally higher rates than males. Compared to the average of selected upper-middle-income countries, Botswana lagged with an average adult literacy rate of 93.6 percent in 2011 (Figure 103).

Figure 102: Literacy rates (%)



Source: World Development Indicators.

Figure 103: Literacy rates for selected countries in 2011 (%)



Source: World Development Indicators.

207. **Using CWIS 2009/10, Statistics Botswana (2013) corroborated the rising literacy rates.** The survey administered reading and simple calculation tests to persons above 10 years in age. Reading ability rates were estimated at 85.3 percent; numeracy rates were at 84.5 percent. Females scored higher by 1.4 percentage points on reading ability and by 0.7 percentage point on numeracy. Geographic differences exist with regard to reading ability and numeracy rates (Table 21). Reading and numeracy rates were above the national average among youth aged 15 to 24.

Table 21: Reading ability and numeracy rates (%)

	Reading ability rates (%)					Numeracy rates (%)				
	Male	Female	15+ years	15-24 years	National	Male	Female	15+ Years	15-24 years	National
Cities & Towns	96.1	96.5	96.3	98.8	96.3	95.1	95.3	96.1	98.8	95.4
Urban villages	90	89.3	88.5	98.0	90	89.5	89.7	87.6	97.9	89.9
Rural areas	75	76.3	72.1	91.2	75.6	74.2	75.4	70.4	90.4	75.5
National	**85.1**	**86.5**	**83.7**	**95.8**	**85.3**	**84.7**	**85.4**	**82.3**	**95.4**	**84.5**

Source: Statistics Botswana (2013).

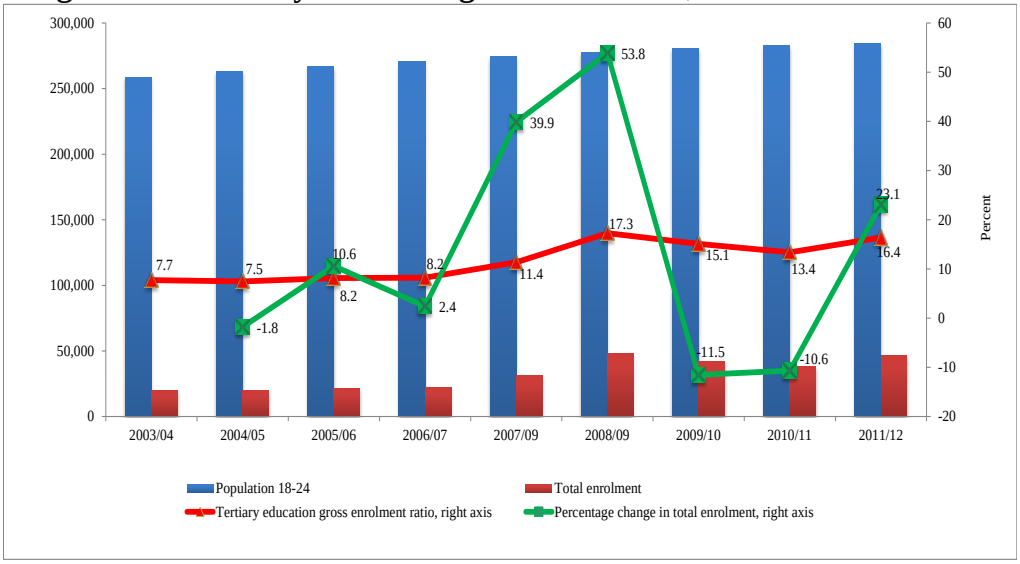
208. **Reading ability and numeracy rates are notably higher in urban areas than in rural areas.** With higher levels of poverty in rural areas, poor literacy could be compounded with poverty in the sense that reading difficulties might be a cause or consequence of poverty. In addition to poor literacy rates, the rural population had the highest proportion of persons who had never attended school. According to the 2009/10 survey, 62 percent of those aged 2 and above who never attended school lived in rural areas, compared to 9 percent in cities/towns and 29 percent in urban villages. Nationally, 21 percent of the population had never attended school in 2009/10. This means policies that enhance access to education, particularly in rural areas, could be pro-poor and could facilitate a reduction in inequities between urban and rural areas.

209. **Botswana's impressive developments in primary and secondary education have been accompanied by rather muted progress in tertiary education**. Figure 104 shows that demand for tertiary education—proxied by the tertiary education gross enrollment rate (TEGER)—has been increasing over time, partly due to a rising population. The proportion of those aged 18 to 24 enrolled in tertiary education rose from 7.7 percent in 2003/04 to 16.4 percent in 2011/12. Enrollment in tertiary education grew by 132.9 percent between 2003/04 and 2011/12—a huge enrollment increase in a short time. Such fast growth comes with several challenges—notably, ensuring the quality of education is globally competitive and, at the same time, nationally relevant.

210. **The Tertiary Education Council (TEC) has introduced measures to address quality and relevance in tertiary education, but quality remains low, with graduates said to be "weak in language and social skills, numeracy, and attitudes."**[38] Of policy concern, TEGER has been fluctuating since 2003/04, which is expected to have adverse impacts on planning and financing for tertiary education. The TEC (2012) attributes these fluctuations to variations in the level of sponsorships in some years and less-than-satisfactory school results in other years. In general, such fluctuations point to underutilization of spaces in tertiary institutions and suggest that the long-term Vision 2016 goal of ensuring the country's tertiary education is internationally competitive by 2016 might not be realized. With an enrollment rate of 16.4 percent in 2011/12, Botswana trails comparable countries. In Mauritius, for example, the gross tertiary school enrollment rate was 36.0 percent in 2011 and 39.9 percent in 2012. Upper-middle-income countries averaged 33.4 percent in 2011. As a result, the slow progress at tertiary level has been identified as a constraint to building a knowledge-based economy and society in Botswana (Molutsi, 2009).

[38] http://www.universityworldnews.com/article.php?story=20140206171913145.

Figure 104: Tertiary education gross enrollment, 2003/04—2011/12

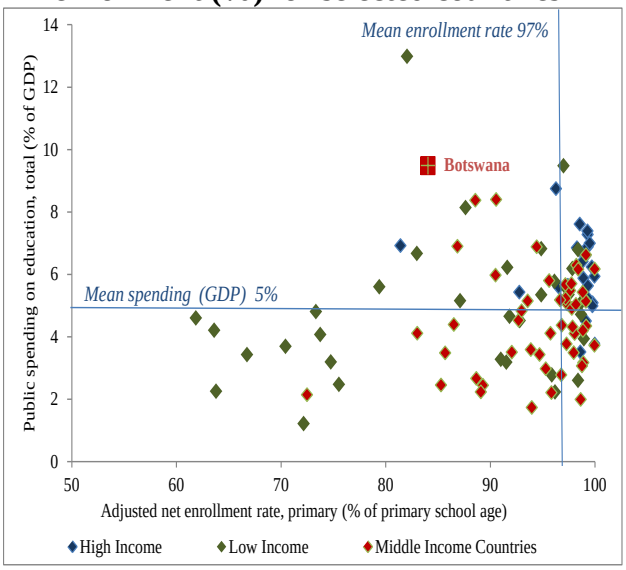


Source: Tertiary Education Council of Botswana Annual Report 2011/12 and Molusti (2009).

211. **Overall, Botswana has seen notable improvements in education inputs, participation, efficiency, and outcomes.** However, fluctuating enrollment and survival rates in primary and secondary schools indicate that challenges remain with respect to the consistency of enrollment and retention of students. More important, comparing some of the educational outcomes with other upper-middle-income countries (Figure 105 and Figure 106) suggests Botswana is not doing as well as it should be, given the resources it allocates to education.[39] In particular, adjusted net enrollment rates for primary schools are much lower than most upper-middle-income countries that spend significantly less on education as a share of GDP. The same pattern holds with respect to adult literacy rates: Botswana lags the upper-middle-income average as well as other peers, yet it spends proportionately more on education.

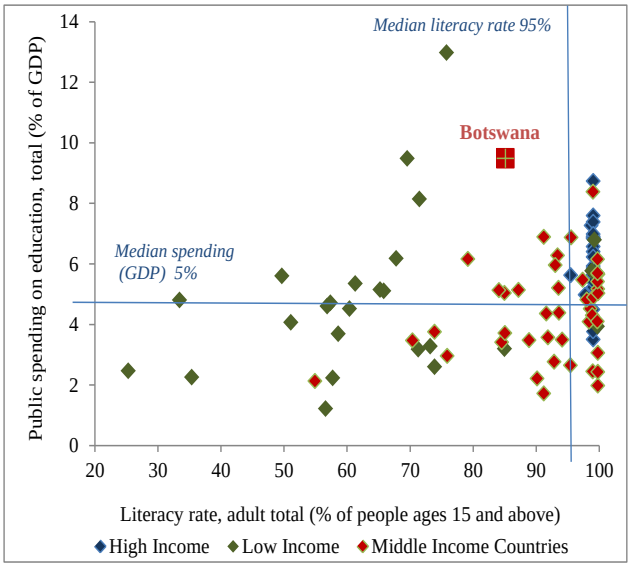
[39] It is important to emphasize that a country's level of public spending on education depends on its overall education system.

Figure 105: Public spending on education vis-à-vis adjusted net primary school enrollment (%) for selected countries



Source: World Development Indicators, based on 110 countries; latest available data for 2008-2012.

Figure 106: Public spending on education vis-à-vis adult literacy rates (%) for selected countries



Source: World Development Indicators, based on 110 countries; latest available data for 2008-2012.

212. **Although other upper-middle-income countries allocate a relatively small portion of their GDP to education, they achieve relatively wide coverage and better literacy outcomes.** Though dated, the analysis by Nordås and Gergis (2000) remains relevant in highlighting the efficiency challenges facing Botswana's education sector. They showed that, compared to other countries, Botswana places less emphasis on higher education and more on primary and secondary education. Based on data for 66 countries, the empirical analysis involved estimating the relationship between public spending on schooling and subsequent educational outcomes, and then predicting outcomes based on spending levels. For Botswana, predicted average years of education and schooling were higher than the actual values. The discrepancy was highest with respect to tertiary education. This indicates that the country is not getting as much as it could out of its spending on education. Although educational outcomes have been improving, Botswana needs to identify solutions to the challenge of low productivity of the educational sector. The issue could relate in part to poverty and low returns to education, which reduces incentives for individuals to acquire skills. Overall, the country needs to develop sound policies that promote the efficient use of resources allocated to the education sector.

213. **The foregoing discussion on education can be summarized as follows: Botswana has made notable progress in marshalling resources to and promoting participation in the education sector.** In addition, progress has been made in terms of key output indicators—in particular, rising primary and secondary enrollments. Looking beyond this, however, suggests the challenges that need further public attention relate to (i) inequities in educational outcomes that favor of the rich; (ii) low and variable enrollment rates as well as relatively low quality in tertiary education; and (iii) inefficiency in the use of resources allocated to education. Relative to

comparable countries, Botswana puts in a lot of resources into education but lags many countries that spend relatively less in key educational measures.

C. Poverty and inequality in asset ownership

214. **Household-level ownership of physical assets is often used to examine well-being because it captures material deprivations.** Several methods are used to construct asset-ownership indices, and the economic theories underlying them vary and are typically informal in making their interpretations in a very context specific. One simple approach is to base the index on the number of assets a household owns among a pre-specified set of durable assets. The set needs to be comparable in terms of data availability and definitions used in surveys. The main challenge is that household preferences change, and this might drive differences in asset ownership patterns across space and time. Nonetheless, such indices are attractive and practical because their use of quantities rather than prices avoids complications arising from price fluctuations.

Table 22: Asset ownership in Botswana, percentage of households

	Total		2002/03			2009/10		
	2002/03	2009/10	Cities/ Towns	Urban villages	Rural areas	Cities/ Towns	Urban villages	Rural areas
Van	12.8	11.6	16.8	12.8	12.8	15.0	13.2	8.2
Car	11.8	15.4	18.7	9.3	9.3	26.1	17.8	6.9
Tractor	1.3	1.2	0.8	1.8	1.8	0.5	1.4	1.5
Donkey cart	10.6	12.6	2.5	11.5	11.5	2.4	9.6	21.2
Bicycle	13.3	12.1	12.0	13.4	13.4	9.9	11.6	13.8
Wheel barrow	37.7	36.4	27.6	50.6	50.6	20.2	42.9	41.7
Radio/cassette/CD player	66.9	56.1	74.3	68.9	68.9	63.9	61.4	47.2
Video cassette recorder	19.4	14.4	29.6	16.6	16.6	22.6	17.6	6.8
Television	32.0	46.9	46.2	30.6	30.6	67.5	59.3	24.7
Refrigerator/freezer	37.0	39.8	50.0	37.4	37.4	56.7	51.8	20.2
Washing machine	4.8	4.6	8.7	2.0	2.0	9.0	5.2	1.3
Air conditioner	3.4	3.7	6.3	1.2	1.2	7.7	4.0	0.9
Electric/gas cooker	1.5	57.8	2.0	1.3	1.3	77.3	72.2	34.7
Personal computer/laptop	6.5	10.3	11.6	2.8	2.8	21.3	11.0	2.8
Telephone	20.6	8.3	28.2	22.8	22.8	11.0	10.8	4.8
Cellular phone	48.9	80.1	64.8	49.8	49.8	92.5	88.2	66.1
Microwave cooker	8.5	15.4	15.2	4.1	4.1	28.6	18.4	4.9

Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

215. **This section takes this approach and constructs, for each durable asset, a dummy variable that takes the value of one if a Botswana household owns any of that particular item and zero otherwise.** Looking at the types of assets common to both the 2002/03 and 2009/10 surveys leaves a total of 17 items in the core set of assets. Table 22 reports the proportion of households holding at least one of each of these items. For example, 11.8 percent of households owned a car in 2002/03, rising to 15.4 percent in 2009/10. For all durable goods—with the exception of tractors, donkey carts, bicycles, motorcycles, and wheelbarrows—ownership rates are highest in cities and towns, followed by urban villages. Rural areas have the

lowest ownership rates. In part, these gaps reflect differences in infrastructure across the three geographic classifications that make some assets more suited to some areas than others. In addition, these differences reflect varying income levels across areas. The total asset ownership index for each household was computed by adding up the dummy variables. Given that the set include 17 items, the index ranges from zero to 17. An index of zero signifies a household owns none of the 17 items, while a score of 17 means a household has at least one of each item. A household owning, for example, 10 of the 17 items gets a score of 10. Table 23 summarizes the indices by geographic area.[40]

216. **The number of assets owned by an average household increased by around one unit between 2002/03 and 2009/10 (Table 22).** An average household owned close to three out of a set of 17 assets in 2002/03, rising by an additional asset to four in 2009/10. The increase was highest at 71.3 percent in rural areas, compared to increases of 21.4 percent in cities and towns and 38.2 percent in urban villages. Overall, the asset ownership indices are highest in cities and towns, followed by urban villages and rural areas. As indicated above, this reflects infrastructure differences that might bias ownership in favor of urban areas, where electrification rates, for example, are higher than in rural areas. Further breakdown of asset holdings by regions shows Gaborone had relatively high ownership rates compared to other areas.

Table 23: Mean assets ownership index by geographic regions

	2002/03	2009/10	Percent change
Strata			
Cities/Towns	4.8	5.8	21.4
Urban villages	3.7	5.0	38.2
Rural areas	1.9	3.2	71.3
Region			
Gaborone	5.2	6.2	19.1
Francistown	4.6	5.4	16.5
Other Cities & Towns	4.2	5.4	28.6
Rural South-East	3.1	4.6	50.5
Rural North-East	2.6	3.9	51.0
Rural North-West	2.2	3.7	66.0
Rural South-West	1.6	2.8	75.4
Total	**3.1**	**4.4**	**41.2**

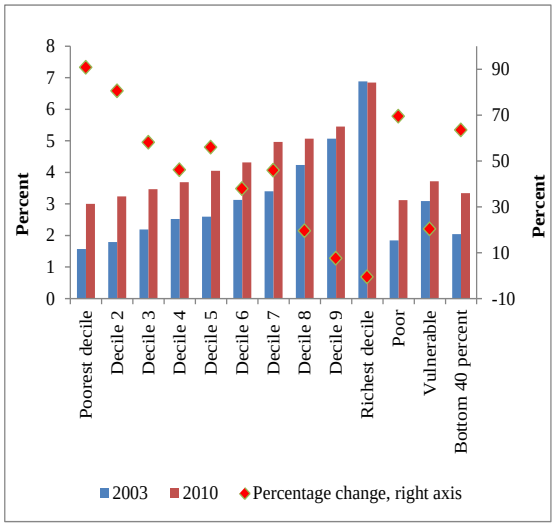
Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

217. **As expected, asset ownership is higher among richer households**. In 2002/03, the richest decile had an average of seven assets, close to four times the assets of the poorest decile (Figure 107). By 2009/10, the gap was halved, with the richest decile having twice the number of assets owned as the poorest decile. The narrowing of the gap was due to an increase in the asset ownership among the poorest decile. In fact, growth in asset ownership was highest among the poorest deciles, which saw a 91 percent increase between 2002/03 and 2009/10. All deciles

[40] Robustness checks were done to ensure results held with the exclusion of some assets that might not be relevant in all geographic areas because of differences in existing infrastructure (e.g., variations in electrification rates). Excluded, for example, were cellular phones, electric/gas cookers, and donkey carts. The results were shown to be robust.

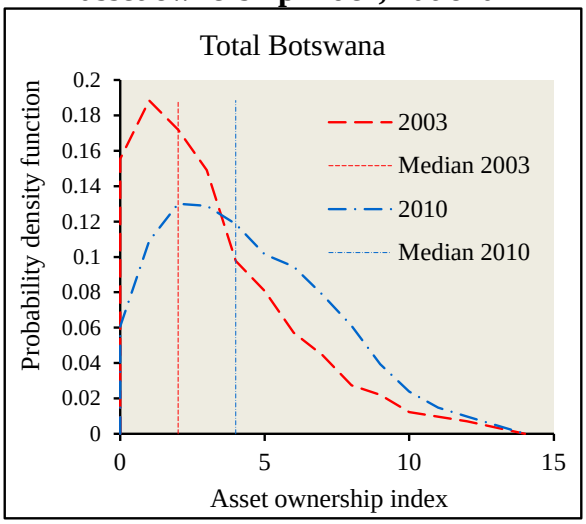
experienced asset growth, except for the richest, which remained stagnant. Poor and vulnerable households as well as households in the bottom 40 percent of the per capita consumption spectrum were below the national average of around four assets in both years. In 2009/10, poor households and those in the bottom 40 percent had an average asset holding of three each, while vulnerable households had close to four. In 2009/10, the top 60 percent of households had an assets index almost twice as high as that of the bottom 40 percent.

Figure 107: Asset ownership indices, by decile



Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

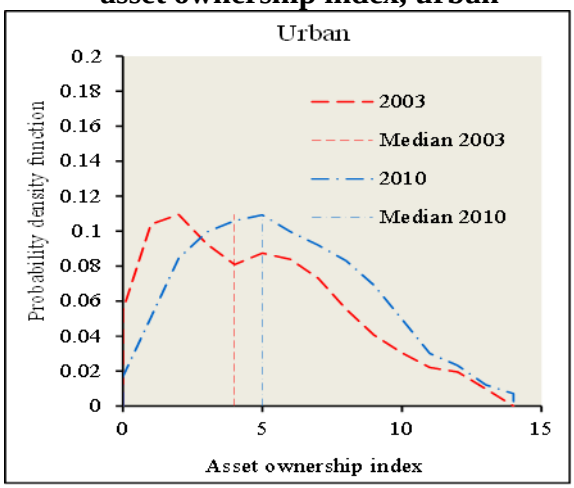
Figure 108: Probability density function of asset ownership index, national



Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

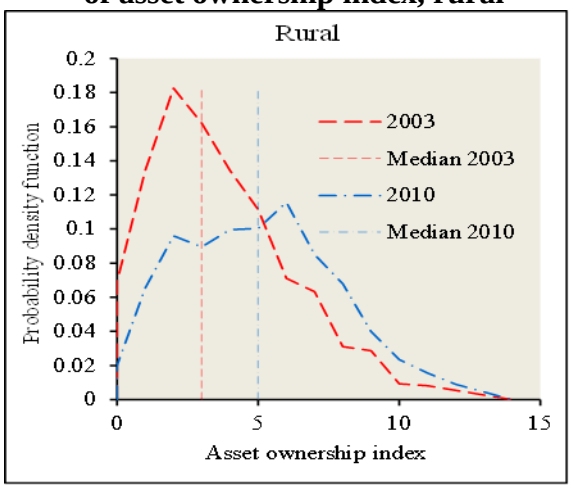
218. **The shift of the index distributions to the right corroborates the growth in asset ownership between 2002/03 and 2009/10**. The probability density function for urban areas (cities/towns and urban villages) and rural areas support these improvements (Figure 109 and Figure 110).

Figure 109: Probability density function of asset ownership index, urban



Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

Figure 110: Probability density function of asset ownership index, rural



Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

219. **Akin to the use of poverty lines to analyze the incidence of poverty, we defined two levels of asset deprivation.** The first set the deprivation level at four assets, and households with less than four assets were considered asset poor. Households were also deemed asset poor when they fell below the second standard, set at three assets. Table 24 reports the resulting headcount asset deprivation rates.

220. **Using the three-asset threshold, asset poverty declined by an impressive 19.6 percentage points between 2002/03 and 2009/10, mirroring the reduction in poverty headcount rates discussed in Chapter 1.** In 2002/03, 50.3 percent of Batswana households were asset poor; by 2009/10, it had fallen to 30.7 percent (Table 24). The magnitude of improvement rises slightly to 20.9 percentage points for the four-asset deprivation line. Over this period, the asset deprivation headcount rate dropped from 64.8 percent to 43.9 percent. Improvements were sharper in rural than in urban areas, although absolute headcount rates remained higher in the countryside than in other parts of Botswana. Gaborone had the lowest asset-deprivation rates.

Table 24: Assets ownership deprivation by geographic regions

	Asset ownership deprivation headcount rate			Distribution of the asset poor		
	2002/03	2009/10	Change	2002/03	2009/10	Change
Deprivation line: less than 3 assets						
Cities/Towns	31.5	16.2	-15.2	14.2	11.0	-3.2
Urban villages	38.3	21.8	-16.5	25.4	25.7	0.2
Rural areas	69.0	45.1	-23.9	60.4	63.3	2.9
Region						
Gaborone	28.1	14.1	-14.0	6.0	4.7	-1.3
Francistown	32.8	18.5	-14.2	3.2	3.1	-0.1
Other Cities & Towns	35.8	18.1	-17.6	4.9	3.2	-1.7
Rural South-East	49.4	25.4	-24.0	29.0	25.4	-3.6
Rural North-East	54.5	35.3	-19.3	35.3	38.4	3.1
Rural North-West	67.8	46.7	-21.2	11.3	10.7	-0.6
Rural South-West	73.8	55.0	-18.8	10.2	14.5	4.3
Total	**50.3**	**30.7**	**-19.6**	**100.0**	**100.0**	**0.0**
Deprivation line: less than 4 assets						
Cities/Towns	42.0	26.9	-15.0	14.7	12.8	-1.9
Urban villages	54.3	32.6	-21.8	28.0	26.8	-1.2
Rural areas	84.4	61.5	-22.9	57.3	60.4	3.1
Region						
Gaborone	38.0	22.5	-15.5	6.3	5.3	-1.1
Francistown	44.1	32.0	-12.1	3.4	3.8	0.4
Other Cities & Towns	46.7	30.6	-16.1	5.0	3.8	-1.2
Rural South-East	65.4	39.9	-25.5	29.8	27.9	-1.9
Rural North-East	73.1	49.2	-23.9	36.7	37.5	0.8
Rural North-West	74.9	55.4	-19.5	9.7	8.9	-0.8
Rural South-West	85.1	70.3	-14.9	9.2	12.9	3.8
Total	**64.8**	**43.9**	**-20.9**	**100.0**	**100.0**	**0.0**

Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

221. **Despite rural areas' sharp asset poverty improvement, asset poverty is highly concentrated in the countryside**. In 2009/10, 63.3 percent of the asset poor at the three-asset threshold were in rural areas, compared to 25.7 percent in urban villages and 11.0 percent in cities and towns (Table 24). Using the four-asset threshold gives a distribution of 60.4 percent in rural areas, 26.8 percent in urban villages, and 12.8 percent in cities and towns. The distribution of the population in 2009/10 was: 20.9 percent in cities and towns after a decline of 1.8 percentage points decline; 36.1 percent in urban villages after an increase of 2.7 percentage points; and 43.0 percent in rural areas after a decline of 0.9 percentage point. This points to increased migration to urban villages.

222. **As with per capita consumption poverty, the depth of asset poverty (or asset deprivation) fell between 2002/03 and 2009/10, with the largest decline in rural areas.** This is supported by an analysis of the asset-deprivation gap, which illustrates how far asset-poor households are from a specified asset poverty line.[41] Between 2002/03 and 2009/10, the

[41] The asset deprivation gap is computed by adding up all the differences between the asset holdings of persons or households defined as asset poor and the deprivation line and dividing the total by the population. It lies between

deprivation gap declined from 34.0 to 18.9 when the three-asset deprivation line is used and from 25.6 to 12.7 when the four-asset deprivation line is used (Table 25). Table 26 shows that rural areas outperformed both cities/towns and urban villages in reducing the depth of asset poverty.

Table 25: Depth of asset poverty

	2002/03	2009/10	Change
Deprivation line: less than 3 assets			
Cities/Towns	19.6	8.8	-10.8
Urban villages	22.8	12.2	-10.6
Rural areas	49.9	29.5	-20.4
National	34.0	18.9	-15.1
Deprivation line: less than 4 assets			
Cities/Towns	13.4	4.7	-8.7
Urban villages	14.7	7.1	-7.6
Rural areas	40.1	21.2	-18.8
National	25.6	12.7	-12.9

Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

223. **Household characteristics are expected to influence (or be influenced by) asset holdings.** For example, policy makers might be interested not only in the differences between female- and male-headed households but also in how the gap between them has changed over time. Similar understanding is needed with respected to other characteristics, such as the age, employment status, and education levels of the head of household. Table 26 presents asset-deprivation headcount rates by different household characteristics under the three-asset threshold.

Table 26: Asset ownership deprivation by household characteristics, deprivation line of three assets

	Asset ownership deprivation headcount Rate			Distribution of the asset deprived		
	2002/03	2009/10	Change	2002/03	2009/10	Change
Employment status of the household head						
Employed	42.0	26.0	-16.0	50.6	50.3	-0.2
Unemployed	67.8	39.5	-28.3	6.1	7.4	1.3
Student	62.6	28.7	-33.9	1.1	1.0	-0.1
Not in labor force or education	62.3	37.4	-24.9	42.2	41.3	-1.0
Education of the household head						
Never attended	67.3	49.0	-18.4	49.8	49.1	-0.7
Pre-school		10.4			0.1	
Informal	63.2	38.1	-25.1	3.5	5.3	1.8
Primary	45.1	27.6	-17.5	31.3	24.7	-6.6
Secondary	30.7	17.1	-13.6	15.4	20.8	5.4
Gender of the household head						

zero and 100. Zero means no asset poverty while 100 indicates zero asset holdings for all households and a positive asset poverty line.

	Asset ownership deprivation headcount Rate			Distribution of the asset deprived		
	2002/03	2009/10	Change	2002/03	2009/10	Change
Male	42.8	24.5	-18.2	43.4	39.9	-3.5
Female	58.0	36.8	-21.2	56.6	60.1	3.5
Household head's age						
6-14	100.0	100.0	0.0	0.3	0.3	0.0
15-19	71.6	38.6	-33.0	1.1	0.8	-0.3
20-24	74.1	46.7	-27.4	4.9	5.2	0.3
25-29	55.3	33.0	-22.3	7.6	8.9	1.3
30-34	47.2	25.6	-21.7	8.9	8.1	-0.9
35-39	43.9	27.8	-16.0	8.9	9.9	1.0
40-44	42.8	22.5	-20.3	10.0	7.3	-2.7
45-49	47.2	25.4	-21.8	11.7	9.0	-2.6
50-54	49.1	29.0	-20.0	10.0	10.5	0.5
55-59	45.2	29.0	-16.2	7.0	8.4	1.4
60-64	48.9	29.7	-19.2	7.0	7.2	0.2
65+	57.5	40.2	-17.3	22.6	24.4	1.8
Household size						
1	67.4	36.9	-30.5	7.4	10.4	3.0
2	57.0	33.3	-23.7	8.2	10.7	2.5
3	53.5	29.1	-24.4	9.1	11.2	2.1
4	45.9	28.3	-17.5	11.3	12.9	1.7
5	46.9	27.7	-19.2	11.9	11.6	-0.2
6	47.5	27.8	-19.7	10.9	9.1	-1.8
7 or more	49.3	31.9	-17.4	41.3	34.0	-7.3
Total	**50.3**	**30.7**	**-19.6**	**100.0**	**100.0**	**0.0**

Source: Authors' calculations based on HIES 2002/03 and CWIS 2009/10.

224. **A head of household's unemployment exposes the household to a higher chance of being asset poor.** The household head's employment status is categorized as employed, unemployed, student, and "not in labor force or education." Households with an employed head face the least risk of being asset poor. Unemployment leads to the highest risk of being asset poor. In 2002/03, 67.8 percent of households with an unemployed head were asset poor, and this fell by 28.3 percentage points to 39.5 percent in 2009/10. Generally, employment raises the household's income, which facilitates acquisition and maintenance of physical assets.

225. **Educated household heads are associated with greater asset holdings.** Household with heads who never attended school were almost three times more likely to be asset poor than those with heads who completed secondary school. In 2009/10, 49.0 percent of households with a head who never attended school were asset poor, compared to 17.1 percent for those with heads who finished secondary school. Education enhances heads' knowledge of various types of assets, which influences the diversity of assets that the household might choose to hold, ceteris paribus.

226. **Female-headed households are more likely than male-headed households to be asset poor.** In 2009/10, 24.5 percent of male-headed households were asset poor, 12.2 percentage points less than the 36.8 percent asset-poverty rate for female-headed households. Between 2002/03 and 2009/10, however, the gap between male- and female-headed households eased from 15.2 percentage points to 12.2 percentage points. This was due to a greater reduction in

asset poverty among female-headed households (21.2 percentage points) than among male-headed households (18.2 percentage points).

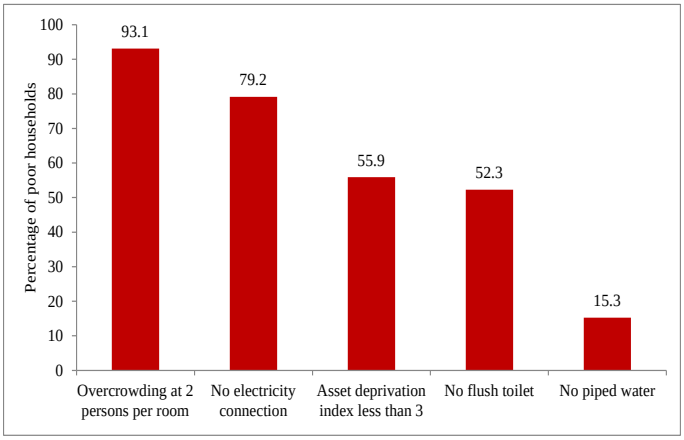
227. **Household size is associated with reduced asset-poverty rates.** Ceteris paribus, a growing household size raises the demand for a diverse set of consumer goods, such as mobile phones. Depending on the composition of household members, this would lead to greater asset accumulation and subsequently lower asset poverty rates.

D. Multidimensional deprivation and concluding remarks

228. **Although the income- and consumption-based poverty indicators discussed in Chapter 1 tell a positive story about poverty and inequality reduction between 2002/03 and 2009/10, the analysis in this chapter suggests gaps still exist with respect to ensuring citizens' access to basic services**. In particular, these gaps disproportionately affect poor and vulnerable households. In addition, non-income indicators suggest poverty remains concentrated in rural areas, despite the gains made over the years in these areas. Inequality presents challenges to poverty reduction, especially in rural areas.

229. **In addition to being poor as measured by per capita consumption, at least 15.3 percent of the poor faced an additional deprivation in 2009/10.** Figure 111 shows that 93.1 percent of the poor were in overcrowded housing, 79.2 percent were not connected to the main electricity supply, 55.9 percent owned less than three types of household assets, 52.3 percent did not have flush toilets, and 15.3 percent did not have access to piped water.

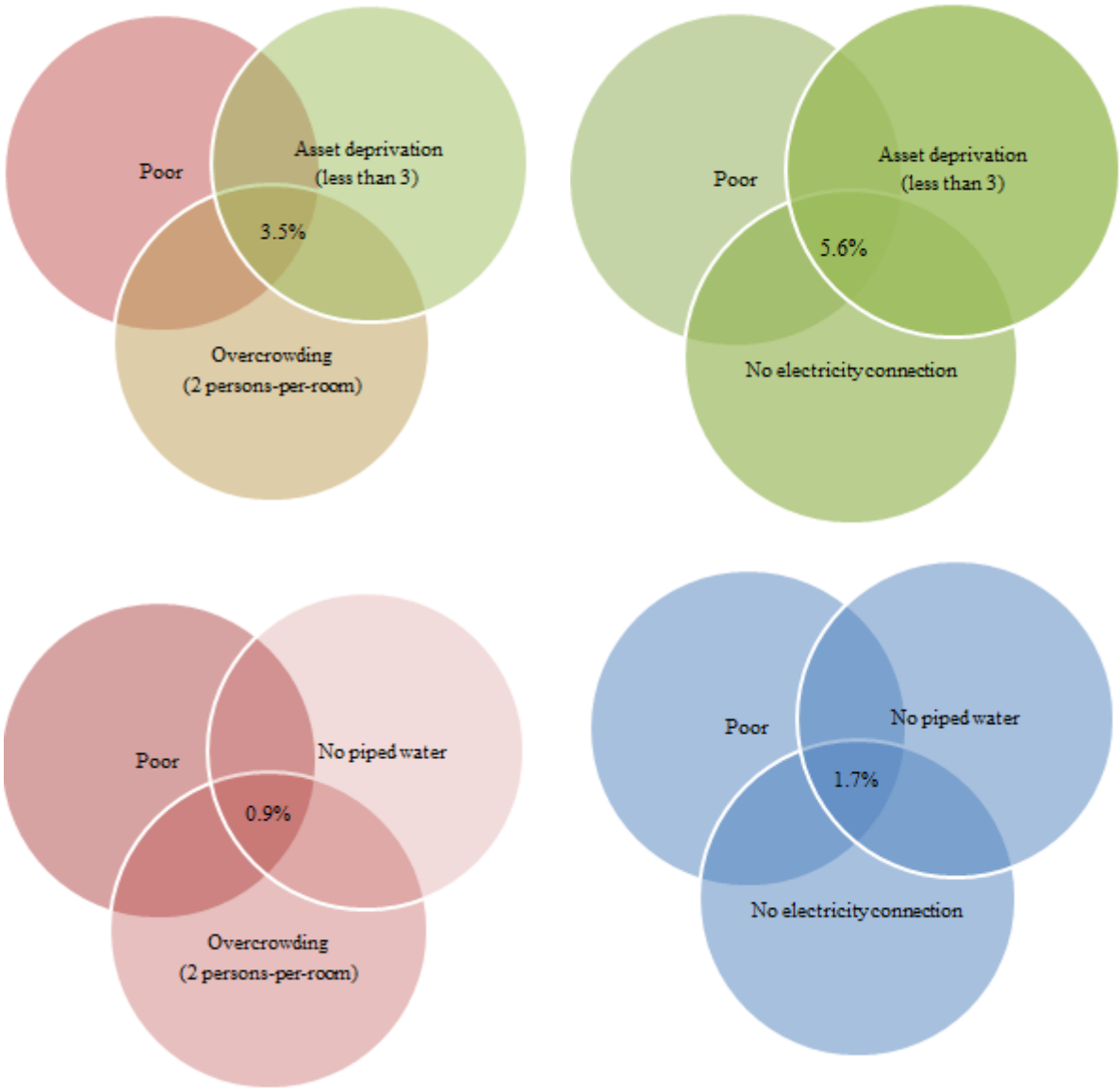
Figure 111: Deprivations affecting the poor in 2009/10



Source: Authors' calculations based on CWIS 2009/10.

230. **In 2009/10, 3.5 percent of the population was poor, lived in overcrowded housing, and was deprived in terms of asset ownership (Figure 112).** In addition, 1.7 percent were poor, with no access to electricity and piped water. The share of the population that was poor and living in overcrowded housing with no access to piped water was 0.9 percent. The highest proportion of households deprived on more than one dimension was the 5.6 percent that were poor and asset deprived with no electricity connection.

Figure 112: Venn diagrams of non-income and income poverty



Source: Authors' calculations based on CWIS 2009/10.

Summary. This chapter went beyond the one-dimensional money-metric poverty measures by considering multiple dimensions of poverty. Non-income dimensions add a broader perspective to poverty analysis and help improve policy-making by highlighting problem areas that income-based analyses often fail to capture. Results tell a story that is consistent with money metric consumption analysis: poverty or deprivation levels in Botswana fell between 2002/03 and 2009/10, but inequality challenges persist. Disparities with respect to multidimensional poverty indicators are positively correlated with income and manifest themselves differently by geographic area, with rural residents more disadvantaged than their counterparts in urban areas.

Chapter 7: Health outcomes and poverty

This chapter examines health outcomes, access, utilization, and expenditure variables—and consequently health-equity issues in Botswana. Over the past four decades, the Government has consistently demonstrated that health is central to its development agenda. Botswana possesses a strong primary health-care system and a good health-service delivery infrastructure. An important exception is the high HIV-infection prevalence that has distorted the population structure. Notable disparities in key health indicators remain. Botswana's child malnutrition and mortality estimates remain high, particularly given the national investments to improve child health and survival. Chronic malnutrition constitutes a substantial challenge. Average stunting among children under age 5 was 30 percent, compared to 11.6 percent for wasting and 14 percent for underweight. The main recommendation centers on intensifying the scale-up of evidence-based, cost-effective interventions to prevent and treat under-nutrition, with highest priority on the conception to 24-month "window of opportunity," where countries get the highest returns from investments.

A. Health sector achievements and challenges

231. **Botswana is a physically large country with a small population (density of 3.5 people per square kilometer), causing health-service delivery to be resource-intensive with respect to both financial and human resources, especially at decentralized levels.** Strengthening and sustaining health systems poses a particular challenge in this context. While much of its health focus has been understandably directed toward communicable diseases, particularly HIV/AIDS, Botswana has put less focus on the growing problem of non-communicable diseases (NCDs). These diseases already account for an estimated 30 percent of deaths in the sub-Saharan Africa (SSA) region, and they are expected to become the leading cause of morbidity and mortality by 2030. Chronic diseases magnify long-term care needs, obviously for NCDs but also for communicable diseases (with the 95 percent coverage of Botswana's antiretroviral drug treatment program, HIV/AIDS has largely become a chronic condition). Meeting these needs poses an increasing and substantial challenge to the health system—one that may disproportionately impact the poor. Multi-drug resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB) also constitute emerging challenges in Botswana, primarily among migrant workers. With respect to health financing, Botswana has seen a significant reduction in the number of health-sector development partners in recent years. Development support allocated to HIV/AIDS has been impacted particularly hard.

232. **Equity has long been an important goal in the health sector, but disparities between the poor and non-poor persist within all countries.**[42] The poor tend to have higher rates of mortality and morbidity, lower levels of health service utilization (despite higher levels of need),

[42] O'Donnell, O.,van Doorslaer, E., Wagstaff, A., Lindelow, M. (2008). Analyzing health equity using household survey data: A guide to techniques and their implementation. World Bank Institute Learning Resource Series, Washington, D.C.

and often spend more on health care as a portion of income. It is generally accepted that these inequalities do not reflect differences in preferences between the poor and non-poor; rather, they primarily reflect differences in constraints, including lower incomes, higher time costs, less access to health insurance, living conditions that are more likely to encourage the spread of disease, etc.[43] As a result, such inequalities tend to be viewed not simply as inequalities but as inequities.[44]

233. **In Botswana, the Government has consistently demonstrated over the past four decades that health is central to its development agenda.** Recognizing that "health is a precondition for sustained development"[45] and that "sustainable development can only be achieved in the absence of a high prevalence of debilitating communicable and non-communicable diseases,"[46] Botswana has dedicated a significant share of its resources to investments in health. Data from the National Health Accounts[47] indicate that Botswana' health expenditures accounted for an average of 5 percent of GDP between 1995 and 2012. Botswana's 2010 National Health Account shows total health expenditure (THE) rose from US$ 660.8 million in 2007/08 to US$ 789.9 million in 2009/10, a 30 percent increase. On a per capita basis, THE rose from US$380 in 2007/08 and US$444 in 2009/10.

234. **As a percentage of GDP, health expenditures grew from 5.3 percent in 2007/08 to 6.3 percent in 2009/10.** This is one of the highest rates of health spending among SSA countries. Government is the major source of health funds, accounting for 67.3 percent of THE in 2007/08 and 68.1 percent in 2009/10. Private sources are the second main source of health funds at an average of 20.6 percent, while donors contributed an average of 11.5 percent over this period. At 4.4 percent, Botswana has one of the lowest out-of-pocket payment spending levels in Africa. Government's role as the major source of health funding yields a relatively sustainable health system—at least in the absence of shocks to the macroeconomic environment. However, the continued decline in donor funding (from 14 percent in 2007/08 to 7.9 percent in 2009/10) yields a challenge, principally because this trend has accelerated since 2010.

235. **Table 27 shows that Botswana's health indicators are generally favorable—with the notable exception of high HIV infection rates.** Immunization coverage (90 percent for measles, for example) and antenatal service delivery coverage are notably comprehensive. A measles follow-up campaign in 2013 reached 94.5 percent of eligible children with measles vaccines and 94.6 percent with Vitamin A supplements.[48] The infant mortality rate is estimated at 33 per 1,000 live births, and the under-age 5 mortality is estimated at 31 per 1,000 live births. In terms of human resources for health, Botswana possesses 4.9 physicians and 26.5 nurses and midwives per 10,000 people—about twice the SSA average. Population growth has been on a steady

[43] Wagstaff, A., 2001. Economics, health and development: Some ethical dilemmas facing the World Bank and the international community. Journal of Medical Ethics 27(4): 262–67.
[44] Gwatkin, D.R., Wagstaff, A., Yazbeck, A.S. (2005). Reaching the poor with health, nutrition, and population services: What works, what doesn't, and why. The World Bank. Washington, D.C.
[45] 2012 UN Conference on Sustainable Development.
[46] Ibid.
[47] WHO 2001/02; 2007/08; 2009/10.
[48] UNICEF. (2013). UNICEF Annual Report-Botswana. Accessed on June 18, 2014 from UNICF: http://www.unicef.org/about/annualreport/files/Botswana_COAR_2013.pdf

decline since 1981, falling to 1.9 percent in 2011. Botswana has a relatively young population, with children (0-17 years old) constituting an estimated 41 percent of the population in 2014.[49]

Table 27: Key health indicators

Indicator	Year	Value
Contraceptive prevalence (percent)	2008	52.8
Antenatal care coverage— at least one visit (percent)	2007	93.6
Births attended by skilled health personnel (percent)	2010	99.1
Maternal mortality ratio (per 100 000 live births)	2010	160
Total fertility rate (per woman)	2012	2.67
Prevalence of HIV among those aged 18 months and older (percent)	2014	18.5
Deaths due to HIV/AIDS (per 100,000 population)	2011	207
Age-standardized mortality rate by cause (ages 30-70, per 100 000 population)—All causes	2008	1633
Age-standardized mortality rate by cause (ages 30-70, per 100 000 population)—Cardiovasular disease and diabetes	2008	293

Source: WHO (2013); NACA (2014).

236. **Botswana possesses a strong primary health-care system and a good health-service delivery infrastructure.** Primary health-care services in Botswana include an extensive network of 101 clinics with beds, 171 clinics without beds, 338 health posts, and 844 mobile stops. These facilities are integrated into overall hospital services, being provided in the outpatient sections of primary, district, and referral hospitals. An estimated 84 percent of the Botswana population lives within five kilometers of a health facility. The Ministry of Health (MOH) was recently restructured to improve decentralized service delivery, and it has developed a new strategy to address the growing burden of NCDs. The Ministry of Health's recent NCD strategy explicitly capitalizes on existing health-sector resources, facilities, and capacities, fostering greater system efficiencies. Botswana has a high political commitment to addressing health challenges, which has translated into increasing health expenditures in recent years.

B. HIV/AIDS epidemic status and impact on society

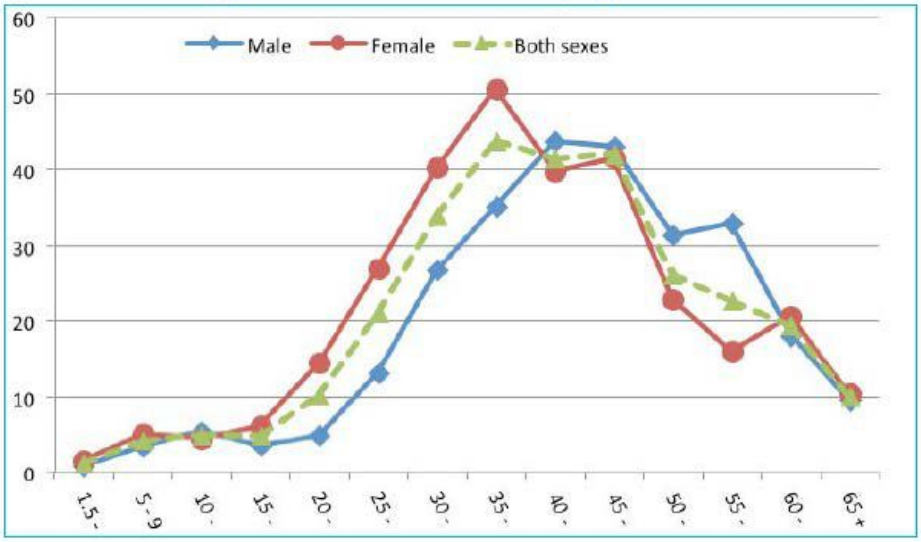
237. **Over two decades into the AIDS epidemic, Botswana faces the world's second highest national HIV/AIDS prevalence.** Data from the 2013 Botswana AIDS Impact Survey IV (BAIS IV) indicate moderate gains in some areas of the national HIV/AIDS response. HIV prevalence is estimated at 18.5 percent for the general population (population share weighted averages; aged 18 weeks and over). Rates were 19.2 percent for females and 14.1 percent for males. These represent slight increases from the BAIS III in 2008, when prevalence was estimated at 17.6 percent overall, 20.4 percent for females, and 14.2 percent for males (population share weighted averages).[50] Results from the 2011 Botswana Sentinel Surveillance Survey estimated HIV prevalence to be 30.4 percent among women 15 to 49. In BAIS IV, HIV

[49] Ibid.
[50] Republic of Botswana (2014). Global AIDS Progress Report. National AIDS Coordinating Agency, 31 March 2014.

prevalence data varied slightly depending upon residence and district, with urban estimates at 17.5 percent and rural at 15.8 percent. HIV-adjusted incidence is estimated at 1.35 percent—an estimated 9,170 new infections occurred in 2013.[51] By end-2013, it was estimated that 319,750 HIV-infected people were living in Botswana, with 87 percent of them receiving anti-retroviral drugs at no cost in accordance with national eligibility guidelines. Already low, mother-to-child-transmission (PMTCT) rates continued to improve in 2013, with the BAIS IV data indicating that only 2.2 percent of infants born to HIV-positive mothers are seropositive, a notable improvement from the 3.9 percent in 2008 (BAIS III). Approximately 534 health facilities are now dispensing anti-retroviral drugs. Botswana has maintained high coverage of HIV/AIDS-related maternal and child survival interventions. The data show antenatal attendance at 94 percent, high antenatal HIV testing at 98 percent, and anti-retroviral prophylaxis for the prevention of PMTCT at 93 percent.[52]

238. **HIV/AIDS does not affect all people equally**. The impact of HIV/AIDS differs markedly by gender and age, reflecting traditional roles and responsibilities in both household and market activities. HIV/AIDS risk and vulnerability are substantially different for men and women in Botswana, made clear by the age- and sex-differentiated prevalence rates. Gender-based vulnerability to HIV infection is clearly demonstrated in population-based BAIS surveys. Epidemiologic data illustrate a clear pattern of gender disparity, with women generally exhibiting higher HIV prevalence rates than men, particularly in the 15-to-39-year age cohort (Figure 113). Conversely, more men are HIV positive at older ages. This overall epidemiologic pattern strongly suggests substantial intergenerational HIV transmission.

Figure 113: HIV prevalence by age and sex[53]



Source: Authors' calculations.

[51] Republic of Botswana. (2014). Botswana AIDS Impact Survey—BAIS IV 2013, Summary Results. National AIDS Coordinating Agency/Ministry of Health/Central Statistics Office.
[52] UNICEF (2013).
[53] NACA (2014).

239. **Strong gender disparity in HIV prevalence appears throughout the BAIS IV survey**. It estimates HIV prevalence among women at 20.8 percent, compared to men at 15.6 percent. In BAIS IV, prevalence among females was highest at 43.7 percent in the 35-39 age group; in the 2011 Antenatal Sentinel Surveillance Survey, it was as high as 52.3 percent. BAIS IV also highlighted the challenge faced by poor, uneducated, and unemployed women, with HIV prevalence rates exceeding 35 percent for day laborers, domestic helpers, and women who never attended school. The survey also highlighted the need for continuous HIV-prevention strategies targeting pregnant females—10.2 percent of whom sero-converted during the course of their pregnancies.

240. **HIV/AIDS has distorted the population structure of Botswana.** The magnitude of the epidemic tripled crude mortality rates (deaths per 100,000 people) between 1991 and 2003, resulting in unprecedented death rates among young adults across all social strata over the past two decades. The epidemic has exerted a substantial negative impact on fundamental human development indicators, including life expectancy at birth, infant/child mortality, and maternal mortality. The Botswana Central Statistics Office estimates that life expectancy had decreased to 56 years by 2004. In the absence of the HIV/AIDS epidemic, it is estimated that life expectancy would have increased to 70 years by 2000. Despite Botswana's income level and investment in human development, AIDS-related morbidity and mortality have resulted a decline from 71st in 1996 to 124th in 2005 in the UNDP Human Development Index international rankings, a measure heavily impacted by life expectancy. By 2013, progress achieved in the national response to HIV/AIDS had raised the estimate of Botswana's life expectancy to 65 years. This improvement contributed to a corresponding increase in Botswana's rank to 119th among 186 countries in the 2013 Human Development Index.

241. **As a cause of orphanhood, AIDS is exceptional in that if one parent is HIV-positive, there is a high probability that the other parent has also been infected**. This increases the risk that children could lose both parents at young age. The BAIS IV indicates that 14.4 percent of children below age 18 were orphans. The HIV/AIDS epidemic has placed exceptional stresses on traditional social safety nets, particularly on family elders. The implications for dependency ratios alone are dramatic—a smaller number of adults will have to support large numbers of young and elderly. In 2013, an estimated 13.9 percent of households caring for orphans received some free social support (e.g. food baskets, education support, psycho-social support) in the 12 months preceding the survey.

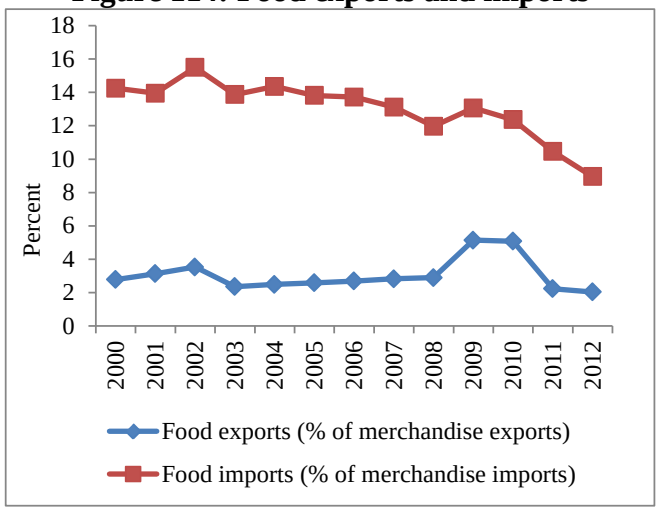
242. **The epidemic continues to pose a substantial impediment to achieving the Government's objectives of poverty reduction, economic diversification, and growth**. The cost of these critical development programs, along with increasing macroeconomic diversification efforts, pose a particular challenge to Botswana, given the scale of the financial outlays required to support the national HIV/AIDS prevention, care, treatment programs. The National Strategy for Poverty Reduction emphasizes the role of HIV/AIDS as both a cause and consequence of poverty, unemployment, and inequality and seeks to integrate poverty reduction strategies into the medium-term expenditure framework. The Government has expressed significant concern over the fact that national HIV/AIDS-related investments have displaced other budget priorities, especially given the paucity of donors active in Botswana. It should be

noted that the Government directly finances more than 90 percent of the national HIV/AIDS program.

C. Undernourishment and food inadequacy

243. **Botswana has limited agricultural potential.** The environment is semi-arid, with the Kalahari Desert covering a large area of the country, impeding the ability to expand agricultural production. Only a paltry 5 percent of the country is arable. Droughts are frequent and have become even more common in recent years, reflecting climate change impacts. This has hit smallholder farmers particularly hard because of their limited use of improved and modern agricultural technologies. These climatic challenges have led to a policy shift away from the goal of food self-sufficiency. Now, the country strives for national and household food security, emphasizing the need to promote food production where conditions are favorable and to meet shortfalls from commercial imports. The country's reliance on food imports is relatively high when compared to food exports (Figure 114).

Figure 114: Food exports and imports



Source: Word Development Indicators.

244. **The Government has used a number of strategies to address food-security challenges.** In 2008, it introduced the Integrated Support Programme for Arable Agricultural Development (ISPAAD), aimed at supporting poor farmers with the technology adoption needed to raise productivity. ISPAAD's stated objectives are to "increase grain production, promote food security at household and national levels, commercialize agriculture through mechanization, facilitate access to farm inputs and credit, and improve extension outreach."[54] ISPAAD gets support from the Agriculture Services Support Project (ASSP), which places emphasis on fostering the use of improved agricultural technologies, lowering the cost of farm mechanization, and promoting irrigation among smallholder farmers using waste water resources.[55] The ASSP's broad objectives are to reduce rural poverty and address challenges associated with low-yield production, excess reliance on food imports, and heavy dependency on subsidies that are unsustainable in the long run. The heavy reliance on food imports presents a threat to national and household food security.

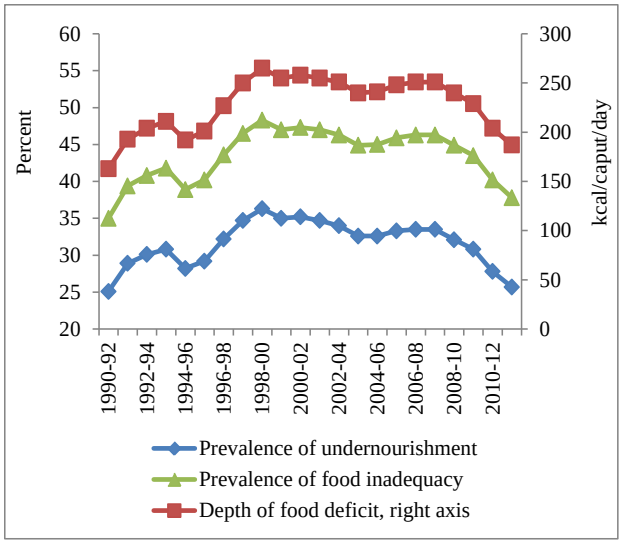
245. **At the national level, some of the widely used indicators of food security and food access include the prevalence of undernourishment, the prevalence of food inadequacy, and**

[54] http://www.gov.bw/en/Ministries--Authorities/Ministries/MinistryofAgriculture-MOA/Departments-of-MOA/MOA-Departments1/ISPAAD-Programme/.

[55] http://www.gov.bw/en/Ministries--Authorities/Ministries/MinistryOf Agriculture-MOA/Tools--Services/Services--Forms/Agriculture-Service-Support-Project-ASSP1/.

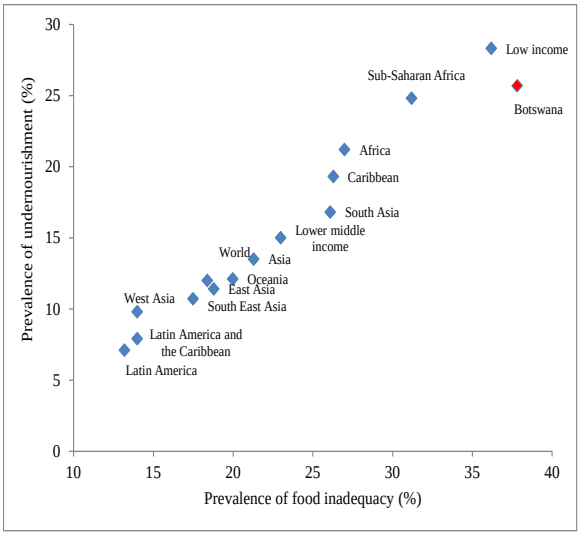
the depth of food deficit. The prevalence of undernourishment provides information on how the population fares in reaching a specified minimum level of dietary energy. It is often presented as the percentage of the population whose food intake continuously falls below set dietary energy requirements. Similar to the well-known headcount poverty rate, food inadequacy is the proportion of the population whose food access is considered inadequate when benchmarked against minimum dietary energy. The depth of food deficit quantifies the number of calories needed to lift the undernourished to the specified standard, ceteris paribus.

Figure 115: Food security indicators, Botswana



Source: Food and Agricultural Organization (2014).

Figure 116: Prevalence of food inadequacy and undernourishment, 2011-13



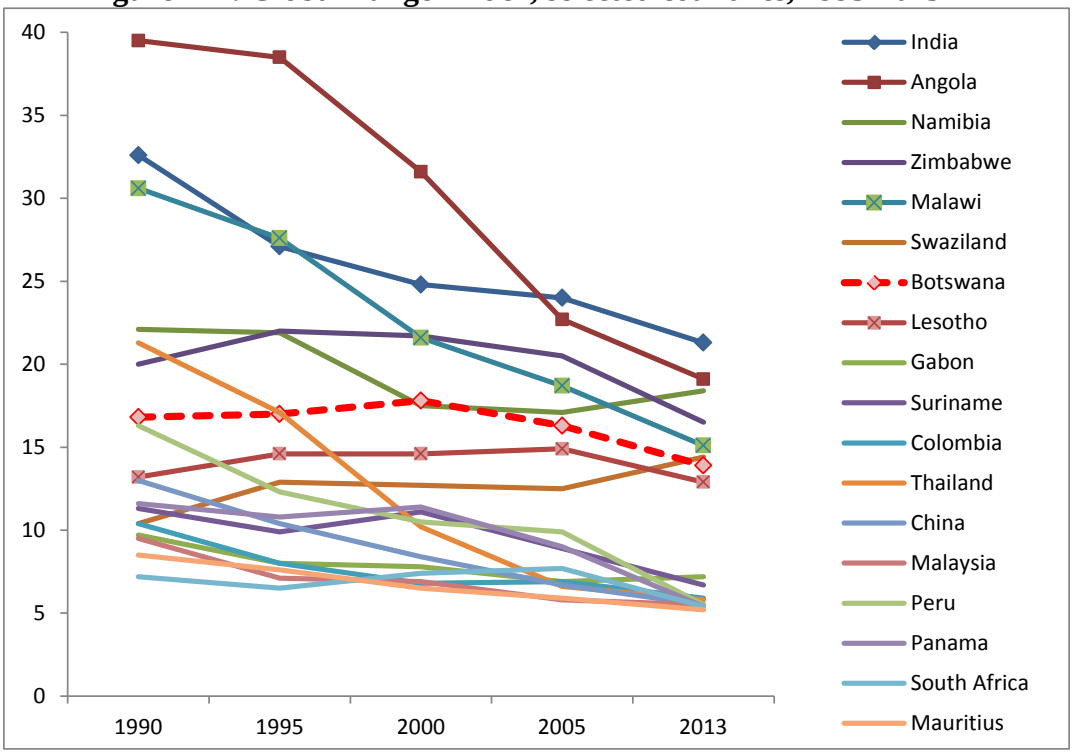
Source: Food and Agricultural Organization (2014).

246. **At least 25 percent of Botswana was undernourished between 1990 and 2013, peaking at 36.3 percent between 1998 and 2000.** The incidence of food inadequacy was almost always 12 percentage points higher than the incidence of undernourishment throughout the period covered in Figure 116. The widest gap was in 2009-11, when the prevalence of inadequacy was 12.7 percentage points higher than the prevalence of undernourishment. The two series trend together—not surprising, given that the food inadequacy measure captures the total amount of dietary energy required for the undernourished to meet their energy requirements. Between 1990 and 2013, average prevalence of food inadequacy was 43.5 percent, 11.8 percentage points higher than the 31.7 percent average for the prevalence of undernourishment. All things being equal, it takes around 228 calories per person to lift the average person out of undernourished status.

247. **Botswana's food-security indicators are relatively high for an upper-middle-income country.** The prevalence of both undernourishment and food inadequacy were above the average for most regions in the world (Figure 116). At 25.7 percent, for example, the prevalence of undernourishment was a percentage point higher than the sub-Saharan Africa average and 10.7 percentage points higher than the lower middle countries' average. Compared to the global

average, Botswana has 13.7 percentage points higher proportion of persons affected by undernourishment. The picture is similar for the depth of food deficit.

Figure 117: Global hunger index, selected countries, 1995-2013



Source: International Food Policy Research Institute (2013).

248. **The International Food Policy Research Institute (IFPRI) produces a Global Hunger Index (GHI), a multidimensional statistical tool that comprehensively measures and tracks hunger.** It combines three equally weighted indicators: (i) the prevalence of undernourishment; (ii) the prevalence of underweight children aged 5 and below; and (iii) the mortality rate of children under age 5. Countries are ranked on a 100-point scale, with zero being the best ("no hunger") and 100 being the worst. Values less than 4.9 reflect "low hunger," values between 5 and 9.9 reflect "moderate hunger," values between 10 and 19.9 indicate "serious hunger," values between 20 and 29.9 are "alarming," and values exceeding 30 point to "extremely alarming" hunger problems (von Grebmer et al., 2013). Figure 117 presents the 1990, 1995, 2000, 2005, and 2013 indices for Botswana and other selected countries.[56]

249. **Botswana faced "serious hunger" for the entire period between 1990 and 2013.** The country's GHI readings were: 16.8 in 1990, 17.0 in 1995, 17.8 in 2000, 16.3 in 2005, and 13.9 in 2013. A slight improvement to was recorded in 2013—not big enough to warrant a re-classification from "serious hunger" to "moderate hunger." Botswana's "serious hunger" problems are a policy concern, and the country lags its upper-middle-income peers in reducing hunger levels.

[56] Data for the 1990 GHI covers 1990 to 1992, the data for 1995 covers 1994 to 1996, the data for 2000 covers 1999 to 2001, the data for 2005 covers 2004 to 2006, and the data for 2013 covers 2010 to 2012.

250. **In sum, Botswana struggles with undernourishment and food adequacy.** Taken together, these statistics suggest access to food is an important dimension of poverty, and food poverty still afflicts a significant portion of the population.

D. Child nutrition and self-reported child health outcomes

Background—challenges of the under-nutrition in Botswana

251. **Under-nutrition is one of the world's most serious but least addressed public-health challenges, with human and economic costs that disproportionately impact the very poor and women and children.** The condition involves being underweight and having vitamin and mineral (micronutrient) deficiencies. The effects of low weight and micronutrient deficiencies are substantial: permanent disability, irreversible physical and cognitive damage, and reduced disease resistance that increases the severity of illnesses, such as pneumonia, diarrhea, and malaria. Globally, under-nutrition in women and children is the underlying cause of 3.5 million deaths and 35 percent of the disease burden in children under 5 years of age.[57] Each year, under-nutrition results in an estimated 261 million lost disability-adjusted life years (DALYs), the majority of which occur from birth to 24 months, the most vulnerable period in children's lives.[58] The economic costs of under-nutrition, measured in terms of lost productivity and economic growth, are significant—estimates range from 2 percent to 3 percent of GDP in some countries.[59]

252. **Children under 24 months are highly susceptible to becoming undernourished.** Young children's susceptibility is driven by their rapid growth which, if coupled with repeated childhood infections/illnesses and inadequate nutrition, leads to slowing or reduced growth.[60] Recent studies have also indicated that low-birth-weight infants and stunted children may be at greater risk of chronic diseases, such as diabetes and heart disease, than children who start out life well-nourished.[61]

Box 10: Key definitions in child nutrition

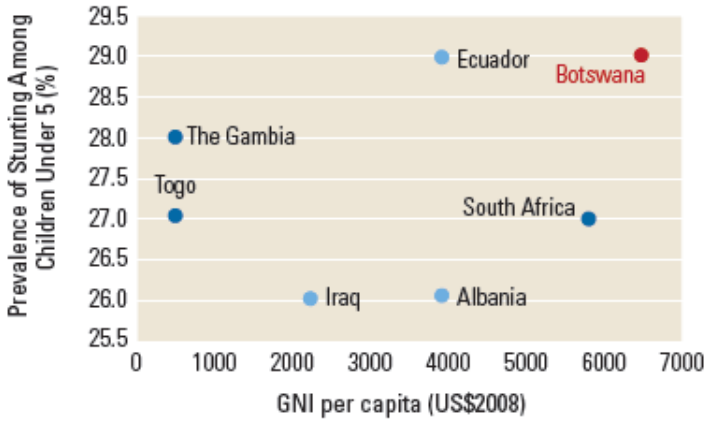
Stunting is low height for age (too short).
Underweight is low weight for age (too small).
Wasting is low weight for height (too thin).

253. **Botswana's child malnutrition and mortality estimates remain high and are not commensurate with national investments in improving child health and survival**. Figure 118 shows that Botswana has rates of stunting similar to African countries with much lower national

[57] Black, R.E. et al. (2008). Maternal and child under-nutrition: Global and regional exposures and health consequences. Lancet 371 (9608): 243-60.
[58] Lopez, A.D. et al. (2006). Global burden of disease and risk factors. Washington, D.C.: Oxford University Press and the World Bank.
[59] Victoria, C.G. et al. (2008). Maternal and child under-nutrition: Consequences for adult health and human capital. Lancet 371: 340-57.
[60] Shrimpton, R., et al. (2001). Worldwide timing of growth faltering: Implications for nutritional interventions. Pediatrics 107 (5), E75.
[61] Victoria, C.G. et al. (2008).

incomes. Countries with lower per capita incomes in other regions, such as Albania and Iraq, exhibit lower rates of child stunting, suggesting that stunting is not merely a function of income. Although progress has been made, Botswana is not considered to be on target in achieving its MDG goals with respect to halving the population suffering from hunger/malnutrition (Goal 1c), reducing child mortality (Goal 4), and reducing maternal mortality (Goal 5).

Figure 118: High stunting in Botswana, given its national income[62]



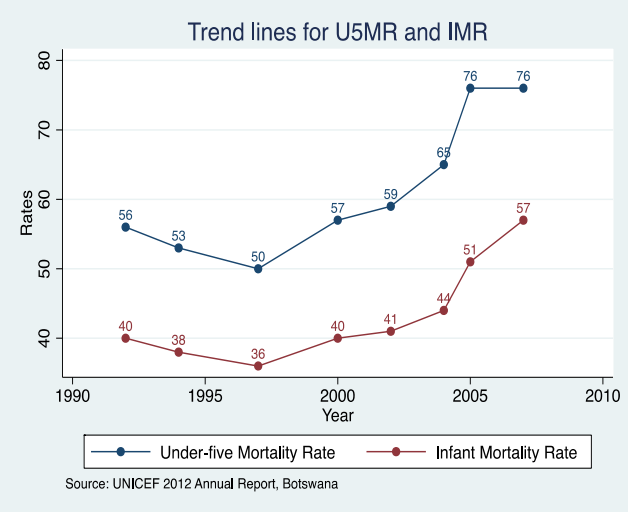
Source: Authors' calculations

254. **More than half of all deaths of children under age 5 in Botswana are a result of preventable diseases.** In 2007, the top five causes of death were diarrhea, pneumonia, septicemia, dehydration, and HIV/AIDS related illnesses.[63] The most vulnerable children live in poor households and rural areas and have caregivers with low levels of education.[64] Additional analyses have associated increased risk of childhood health vulnerability to large families (more than seven members) and households with one parent deceased, orphaned children, single parents, a female head, and elderly people.[65]

[62] Botswana: Nutrition at a glance. The World Bank. Retrieved June 18, 2014, from World Bank: http://siteresources.worldbank.org/NUTRITION/Resources/281846-1271963823772/botswana1711screen.pdf.
[63] UNICEF (2012).
[64] Ibid.
[65] Ibid.

255. **Botswana faces an upward trend in the infant mortality.** The 2007 Botswana Family Health Survey (BFHS) found mortality rates of 34 per 1,000 live births for newborns, 57 per 1,000 live births for infants, and 76 per 1,000 live births for children under age 5 (Figure 119). The major causes of mortality were newborn conditions and diarrhea and pneumonia, with malnutrition as major underlying cause. The 2007 BFHS also found prevalence rates of 12 percent for underweight, 9 percent for wasting, 31 percent for stunting, and 15 percent for obesity. A 2013 University of Botswana child-mortality study indicated that the major causes of death among children were respiratory infections, sepsis, meningitis, diarrhea, and malnutrition. Most deaths occurred in the first month of life, and 63 percent of children who died had some degree of malnutrition. This study estimated that 50 percent of those who died were HIV-exposed and 17 percent HIV-infected.[66]

Figure 119: Under age 5 and infant mortality trends



Source: Authors' calculations

256. **Malnutrition remains a significant problem in children under age 5.** Within this age group, the prevalence of malnutrition becomes evident in children of complementary feeding age, suggesting that poor diets and hygiene practices are contributory factors. A closer examination of child malnutrition in Botswana reveals that stunting rapidly increases to more than 40 percent within the first 24 months of life then stabilizes at around 30 percent, a pattern typically associated with poor infant feeding and child-care practices and high burdens of infectious diseases in young children. Limited data is available on micronutrient deficiencies, but mortality rates, disease burdens, and the infant and young child-feeding practices suggest that deficiencies of vitamin A, iron, and zinc may affect a significant proportion of mothers and children. To prevent micronutrient malnutrition, the Government introduced vitamin A supplements for pregnant women and infants in 1996. Universal salt iodization was also introduced in 1996.[67]

257. **Less than one in four newborn children is exclusively breastfed for the first three months in Botswana.** Just one in five infants experiences exclusive breastfeeding for the first six months—the recommendation for HIV-negative mothers. Continued breastfeeding, common in other sub-Saharan African countries, is rarely practiced in Botswana. Only one-third of

[66] UNICEF (2013)
[67] Nyepi, M.S. (2010). The need for professional training/education in nutrition education and communication in Botswana. FAO Report, Nutrition Education and Consumer Awareness Group. Accessed from FAO: FAO.org.

children aged 12-15 months still breastfeeds, and the figure drops to just 6 percent among children aged 20-23 months.

258. **Diarrheal diseases continue to be a challenge and places formula-fed children at a particularly high risk of malnutrition and death.** In 2006, for example, more than 22,000 cases of diarrhea were identified in children less than 5 years old, with 470 deaths reported.[68] The diarrhea cases were 20 times more likely to have mothers who do not breastfeed. Most of the cases were malnourished children who received infant formula through the anti-HIV/AIDS prevention of mother-to-child transmission (PMTCT) program. Through the PMTCT program, HIV-positive mothers receive infant formula for children up to 12 months of age. Mothers obtain the formula from nearby health facilities. The rigorous implementation of the PMTCT program's policy of providing infant formula to HIV-positive mothers, while dramatically reducing HIV transmission from mother to child, has also dramatically increased the risk of dying from other causes, notably diarrhea and pneumonia.[69] The higher mortality extends to children of HIV-negative mothers, who are not adequately counseled on infant and young child feeding practices, particularly the importance of exclusive breastfeeding in the first six months. As a result, they opt for infant formula to feed their newborns.

259. **The high prevalence of HIV is contributing to problems of both under-nutrition in children and household food insecurity.** While there is not adequate data at household level, the observations from several regional studies show unacceptably high levels of household food insecurity. In a 2008 study, more than 50 percent of households were moderately food insecure in the Okavango Delta.[70] More recently, food-insecure households were reported in the Mabutsane and Bobirwa health districts.[71] Some recent studies also note increases in the prevalence of malnutrition in children, thought to be associated with cases of HIV exposure.

260. **A 2012 study noted a higher prevalence of malnutrition in HIV-positive children who are receiving anti-retroviral treatment and have undetectable viruses (indicating excellent virus control and medical care).**[72] The higher stunting rates among these children pointed to the consequences of the chronic under-nutrition that these HIV-infected children had experienced. The below-average daily meals suggested that HIV-positive children were not adequately fed, that some homes may use poor child-feeding practices, and/or that some caregivers may have transferred child-feeding responsibilities to schools.[73] The major intervention targeting school children is the Government-financed school-feeding program. It provides children with meals that supply at least a third of their dietary requirements when schools are in session (not weekends and holidays, when schools are not in session). The care of HIV patients by households also competes with caregivers' meaningful contributions in agriculture and other income-generating activities.

[68] Carter, 2006; Mach et al., 2009.
[69] The causes of the diarrheal and pneumonia deaths are the loss of maternal immunity normally transmitted through breast milk and increased exposure to pathogens from the use of unclean water and contaminated bottles.
[70] Nnyepi and Ngwenya (2008).
[71] UNICEF-Botswana (2010).
[72] Baylor International Pediatric AIDS Initiative (2012). To feed or to nourish: Perspectives of HIV-infected and affected children about their food environment. Accessed on June 20, 2014 at BIPAI: BIPAI.org.
[73] Ibid.

261. **Among other major nutrition interventions in Botswana are the supplemental feeding programs for children under age 5 and pregnant women and the food assistance given to destitute persons, orphaned children up to 18 years of age, and debilitated TB and AIDS patients.** These programs largely prevent protein-energy malnutrition and temporary food insecurity. In this regard, it is significant that the BAIS surveys found a notable reduction—from 31.2 percent in 2008 to 13.9 percent in 2013—in households receiving free basic external support in the past 12 months for caring for orphaned and vulnerable children up to age 17.[74]

E. Results from the CWIS 2009/10 child health data

262. **CWIS 2009/10 provides selected health outcome, access, utilization, and expenditure variables, enabling an examination of health-equity issues in Botswana.** The CWIS household questionnaire collected data on self-reported acute and chronic illness and their effects on daily activity, adult mortality, type of health-care provider consulted (not disaggregated in terms of causes of ill-health), tobacco and alcohol consumption, number of health-care visits, immunization coverage, treatment of diarrhea, health expenditures, and health-insurance coverage. Anthropometric measures for both children and adults were also included as part of the CWIS health section.

263. The following sections of this chapter will examine available CWIS data for evidence of health-equity challenges in the following areas:

- Child nutrition (anthropometric measures) and self-reported child-health outcomes;
- Self-reported adult health outcomes and health behavior;
- Self-reported child health care utilization;
- Self-reported adult health care utilization;
- Self-reported health financing/expenditures.

264. **Average stunting among children under age 5 years was 30 percent, wasting was 11.6 percent, and underweight was 14 percent (Figure 120).** Based on CWIS data, stunting seems to be the predominant cause of under-nutrition children under age 5 in Botswana.

[74] NACA (2014).

Figure 120: : Percent malnourished below 5 years of age

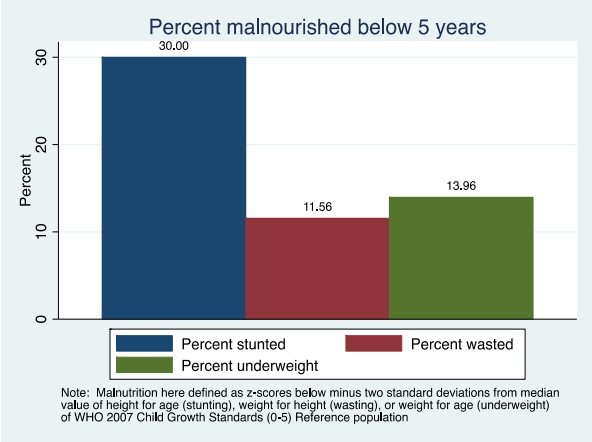
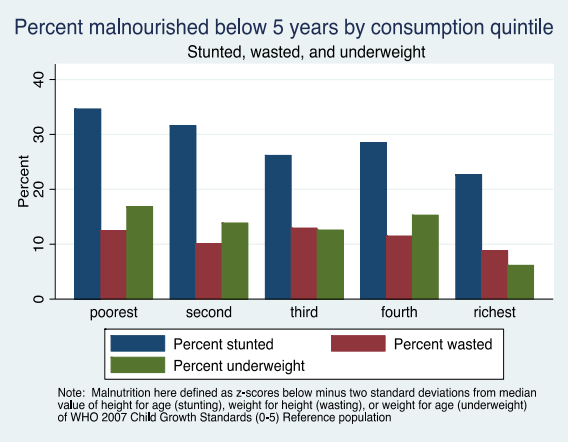


Figure 121: Percent malnourished below 5 years of age by consumption quintile



Source: Authors' calculations.

265. **The gradient for stunting for children under age 5 follows consumption expenditures—from 35 percent in the poorest quintile to 23 percent in the richest quintile (Figure 121).** With respect to underweight children under age 5, the gradient extends from 16.8 percent in the poorest quintile to 6.2 percent in the richest. The fourth quintile did not strictly follow the gradient, with a stunting rate of 28.5 percent and underweight rate of 15.3 percent, both higher than the third (less wealthy) quintile. Figure 122 depicts a clear trend for both stunting and underweight on the basis of the head of household's social class. The results indicate a range from 35.4 percent in the poorest class to 21.7 percent in the richest class for stunting.

Figure 122: Percent malnourished below 5 years of age by social class

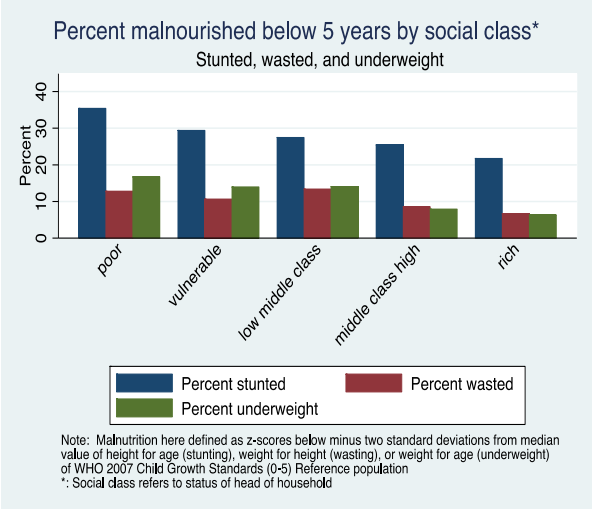
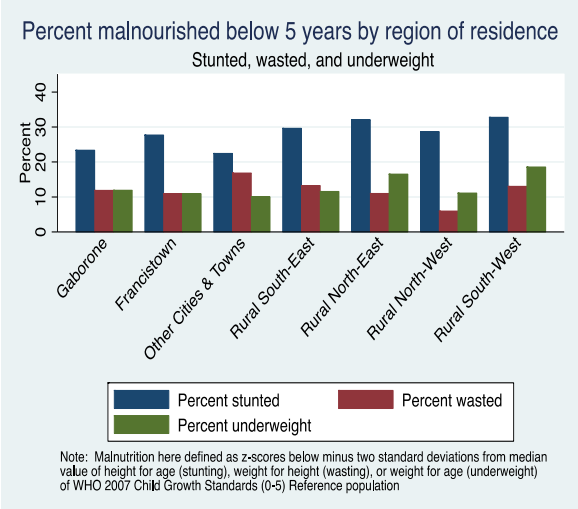


Figure 123: Percent malnourished below 5 years of age by region of residence



Source: Authors' calculations.

266. **Looking at regional differentials, stunting rates were highest in the rural North-East (32.1 percent) and rural South-West (32.8 percent) and lowest in Gaborone (23.3 percent)**

(Figure 123). A similar pattern was observed for underweight children, with rates of 16.5 percent in the rural North-East, 18.6 percent in the rural South-West, and 11.9 percent in Gaborone.

267. **The highest stunting rate is observed among the poor.** In Figure 124, a comparison of malnutrition by consumption category—below and above the poverty line—indicates higher rates of stunting, underweight, and wasting among the poor. Notably, these rates were not substantially higher between consumption categories, with differences ranging from 4.8 percentage points for stunting rates to 3.2 percentage points for underweight rates.

Figure 124: Malnutrition below 5 years of age by consumption category (below/above poverty line)

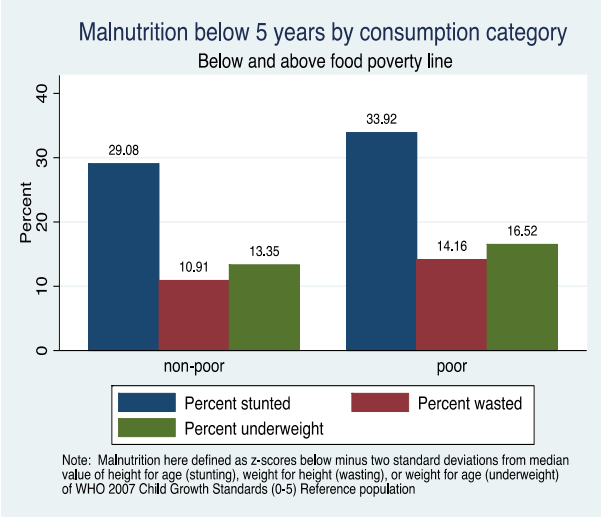
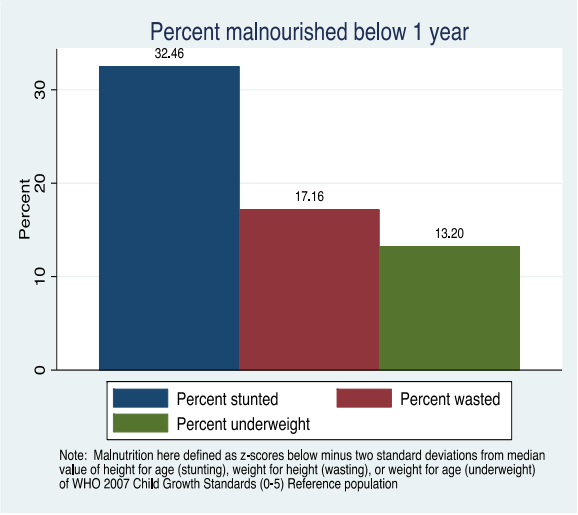


Figure 125: Percent malnourished under 1 year of age



Source: Authors' calculations.

268. **Stunting rates are about 2 percentage points higher for infants (up to age 1) than for the under age 5 cohort (Figure 124 and Figure 125).** The underweight rate for infants nearly matches the under age 5 group (a difference of less than 1 percentage point). These data emphasize that both chronic and acute malnutrition begin in early childhood. Figure 127 depicts malnutrition in the 0-12 month age cohort by consumption category (below and above the food poverty line) and notes an increase in stunting, wasting, and underweight in those classifies as poor.

Figure 126: Percent malnourished below 1 year of age (by consumption quintile)

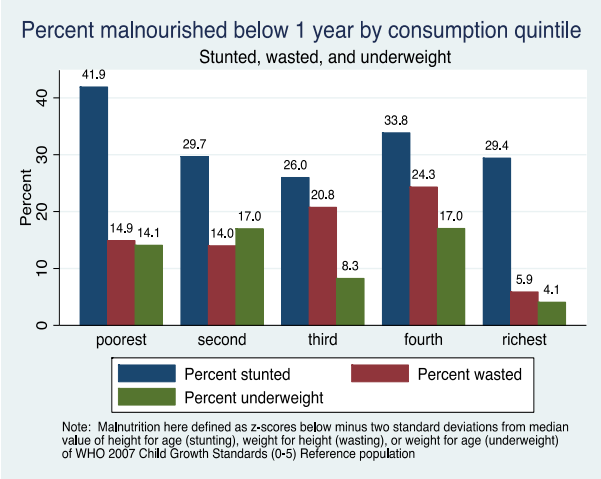
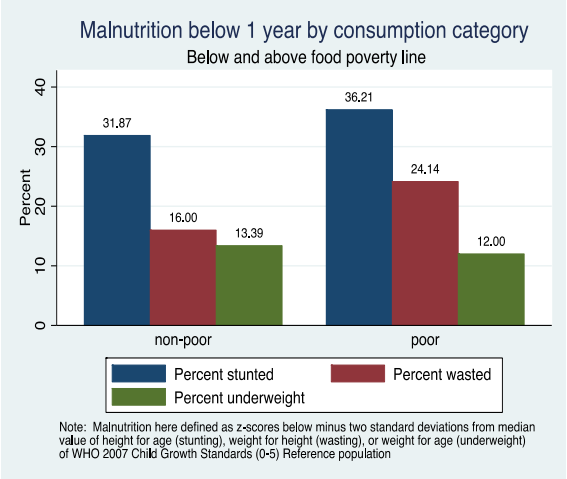


Figure 127: Malnutrition below 1 year of age by consumption category (below/above food poverty line)



Source: Authors' calculations.

269. **Stunting and household consumption show a significant correlation.** In Figure 126, stunting rates are higher of in the fourth quintile (33.8 percent) than the third and second, although there remains a large gap between the poorest quintile (41.9 percent) and richest quintile (29.4 percent). For infants up to age 1, underweight rates follow a similar pattern in the second and fourth quintiles. It is hypothesized that this unclear picture derives from relatively small sample size for infants (n=647; with 95 categorized as below the food poverty line; i.e., extreme poor, and 552 categorized as above the food poverty line).

270. **Concentration curve analysis confirms the disadvantages of the poor and vulnerable in terms of stunting.** Figure 128 depicts the stunting concentration curve by consumption for children under age 5. The negative concentration index of -.0770334*** indicates the poor are at a disadvantage. However, the magnitude was not large, although it was statistically significant at the 1 percent level. Figure 129 presents the stunting concentration curve by social class ranking of households for the under age 5 cohort. The stunting concentration index by social class head was -.0722134***. The two concentration curves are similar.

Figure 128: Stunting concentration curve by consumption (under age 5)

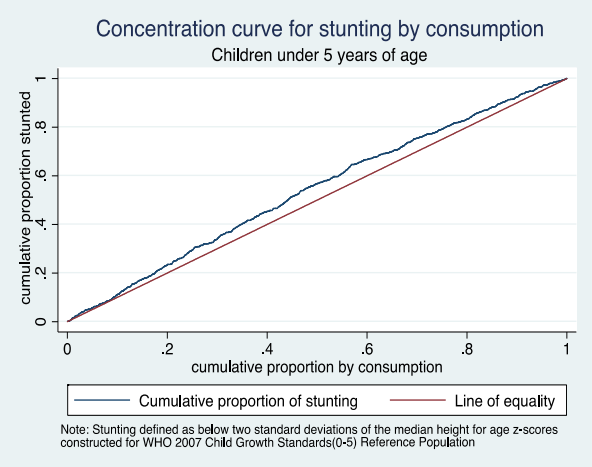
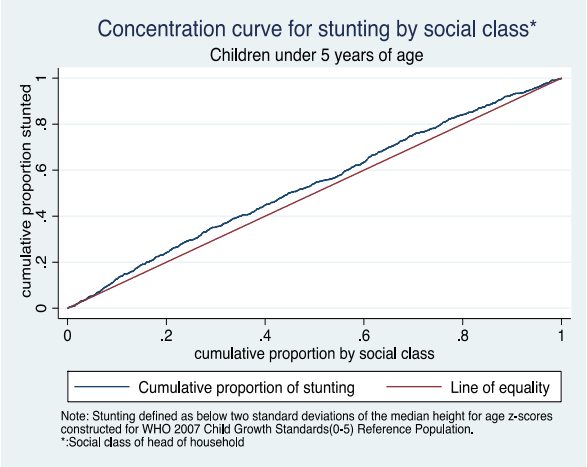


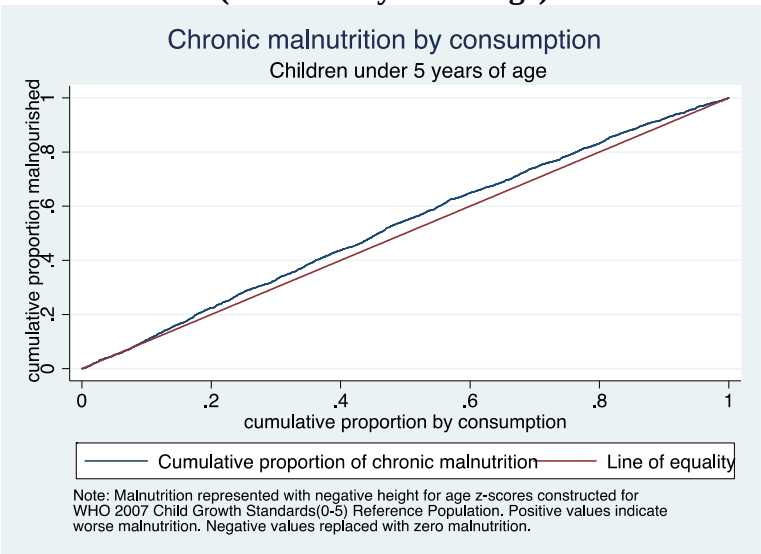
Figure 129: Stunting concentration curve by social class (under age 5)



Source: Authors' calculations.

271. **As with stunting, malnutrition measures show the poor are disadvantaged.** Figure 130 illustrates chronic malnutrition by consumption for the under age 5 cohort. The figure plots the concentration curve for negative height for age, so that higher positive values imply worse malnutrition and, following the Wagstaff et al. methodology, all negative values are adjusted to zero, implying no malnutrition. The concentration index was -.0582945***, close to the figure for stunting (above), confirming the disadvantages facing the poor. Although this concentration index was not found to be substantial, it was statistically significant at the 1 percent level (***).

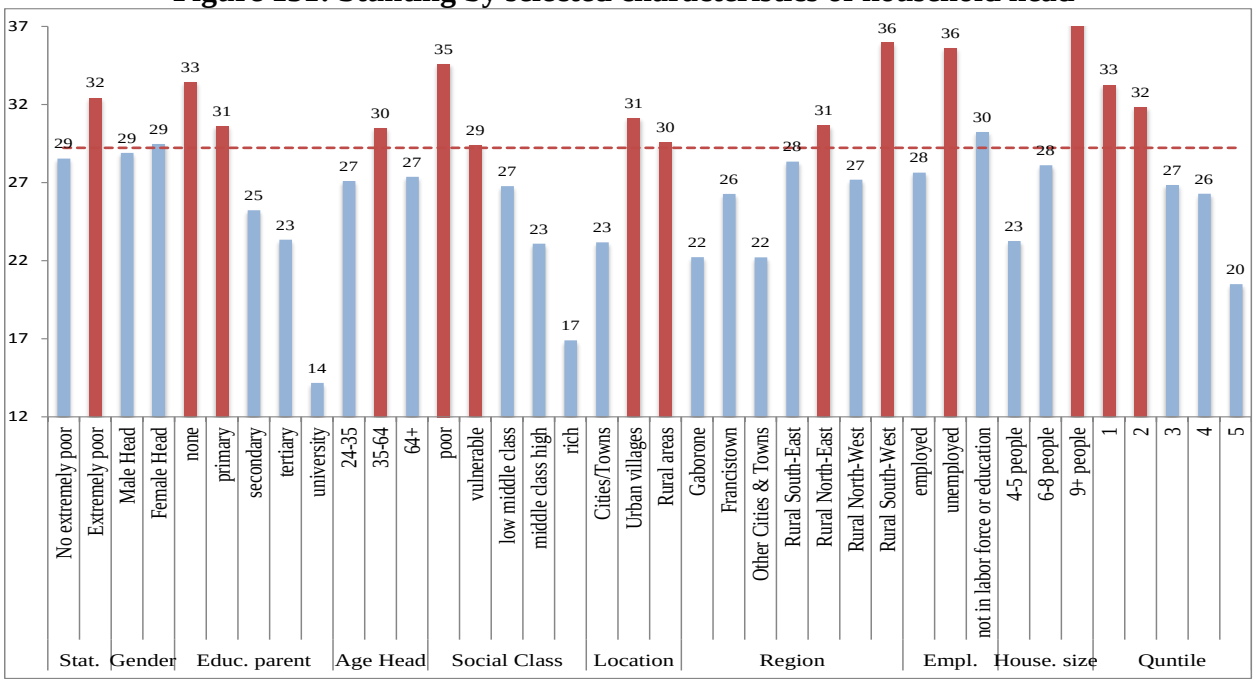
Figure 130: Chronic malnutrition by consumption (under five years of age)



Source: Authors' calculations.

272. **Stunting is highly associated with poverty status, low education of parents, rural and urban village location, and unemployment.** Figure 131 tracks stunting in relation to selected characteristics of the household head. This analysis yields clear trends with respect to social class, consumption quintile, employment and education of household head, and household size. The dashed line in the graph represents the national average for stunting. Stunted children are predominantly in households that are poor or vulnerable, located in rural poor areas, and headed by someone unemployed or less educated. Stunting is strongly associated with household size; it is more likely in households with nine or more children.

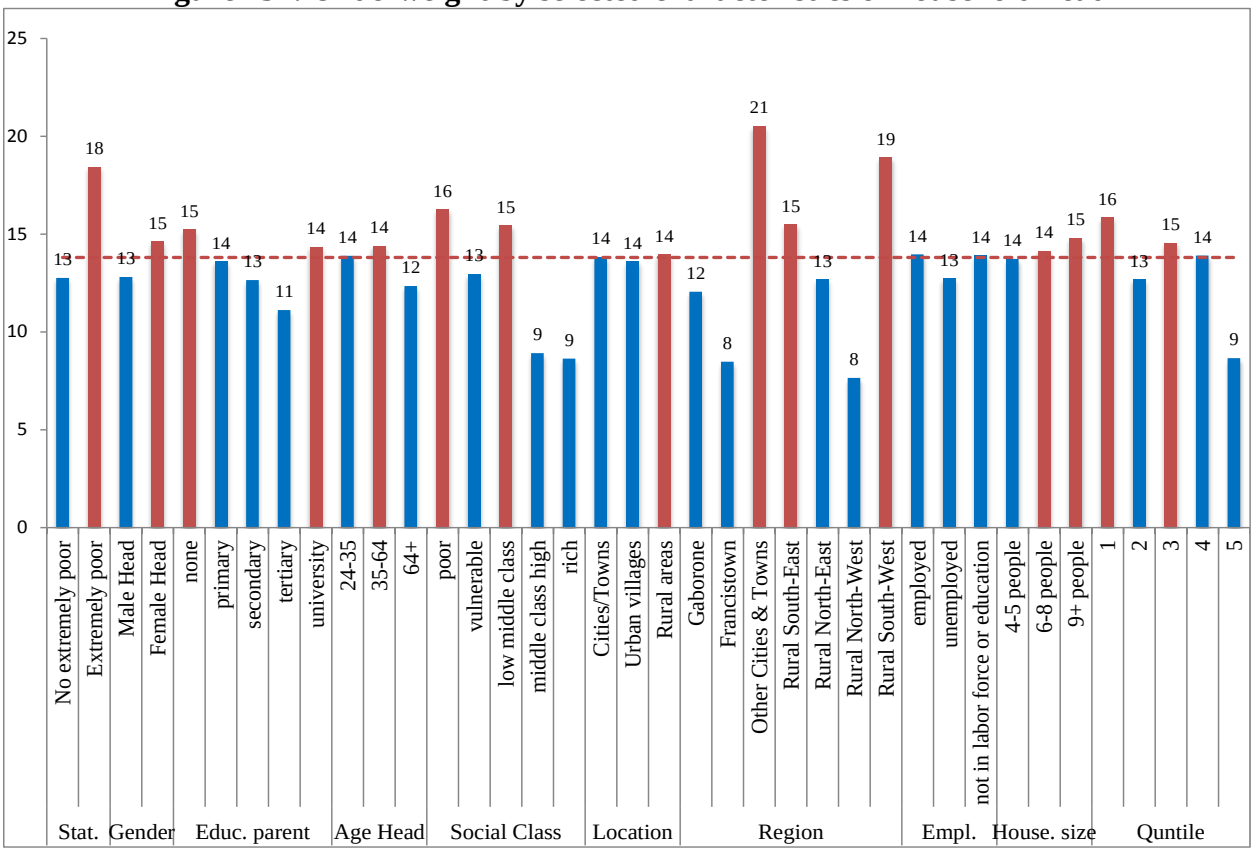
Figure 131: Stunting by selected characteristics of household head



Source: Authors' calculations. Dotted red line represents the country's average stunting.

273. **The characteristics associated with underweight are similar to those for stunting.** A higher proportion of underweight children were found in rural areas and larger households. Figure 132 illustrates a clear trend between underweight children and the household head's social class. Being extremely poor and living in small cities and towns, the rural South-West, and large families increased the probability of underweight children.

Figure 132: Underweight by selected characteristics of household head



Source: Authors' calculations. The dashed line represents mean underweight in the entire population.

F. Self-reported adult[75] health outcomes and behavior

274. **HIV/AIDS and hypertension were the most common self-reported chronic illnesses in adults (Figure 133).** However, both were self-reported by less than 6 percent of the sampled adult population. The low reporting of HIV/AIDS likely derives partly from the fact that some respondents may have considered HIV/AIDS a communicable disease rather than a non-communicable/chronic illness. In addition, the near-universal coverage of Botswana's strong anti-retroviral treatment program has enabled HIV-positive individuals to experience far fewer episodes of HIV/AIDS-related illness. The stigma associated with HIV/AIDS also may have impacted self-reporting of HIV/AIDS illness.

[75] Adult age defined as 15 years and above.

Figure 133: Percent of adults reporting chronic illness

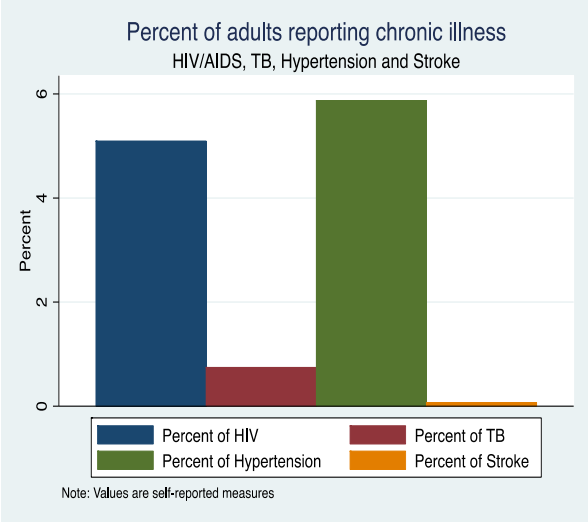
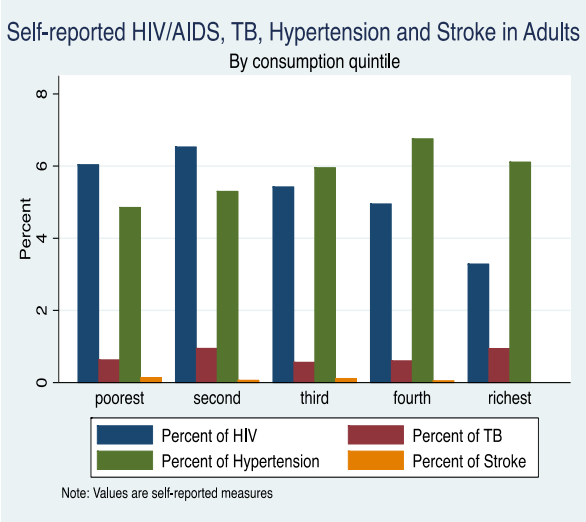


Figure 134: Self-reported HIV/AIDS, TB, hypertension, and stroke in adults



Source Author's calculations.

275. **Self-reporting of HIV/AIDS illnesses appears to increase with age and decrease with consumption expenditures (peaking in the second quintile), female gender, and primary education (Figure 134).** On the other hand, the presence of hypertension is correlated with increasing consumption expenditure (peaking in the fourth quintile), higher educational levels, older age, female gender, and obesity or being overweight.

276. **A relatively high percentage of adults were objectively[76] assessed as overweight (20.11 percent) or obese (14.59 percent).** The probability of reporting above normal weight[77] increased among the non-poor (up 2.71 percentage points) and residents of Gaborone and Francistown. Among adults, 16.37 percent reported current smoking, and 21.36 percent reported current alcohol consumption. Higher socioeconomic status was correlated with greater consumption of beer and tobacco and lower consumption of traditional beer (and vice versa). The probability of consuming alcohol and tobacco was higher among males than females.

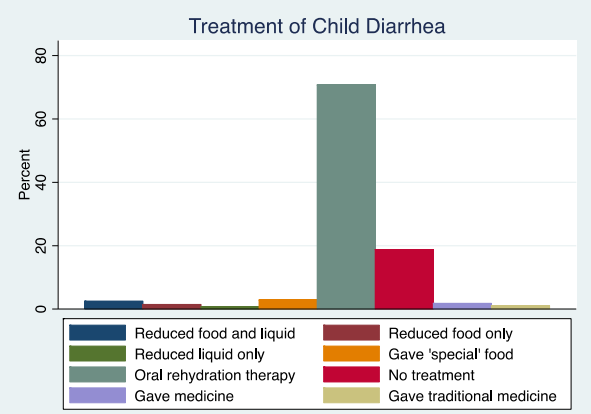
277. **Ministry of Health data indicate a corresponding increase in non-communicable diseases in Botswana—namely, hypertension, cancers, and diabetes.** Previous studies have shown that the prevalence of a body mass index (BMI) of at least 25 is 38.6 percent among adults 25-64 years of age.[78] The health risks of being overweight are particularly serious in women (53.4 percent) compared to men (22.1 percent). A Ministry of Health study further revealed that consumption of fruits and vegetables is low, with about 97 percent of adults eating less than five servings a day. Previous studies have also noted that risk factors for non-communicable diseases—such as smoking, physical inactivity, and high blood pressure—were increasing among Botswana's adult population.

[76] Body Mass Index (BMI) was calculated using weight and height measurements. Overweight refers to a BMI > 25 kg/m^2 while obese refers to a BMI >30 kg/m^2.
[77] Above-normal weight refers to adult BMI classified as either obese or overweight.
[78] Ministry of Health/WHO (2007).

G. Self-reported child health-care utilization

278. **CWIS data indicated that child diarrhea was appropriately treated in most cases and that coverage of vaccinations was high across consumption categories and regions of residence (Figure 135).** The proportion of children with diarrhea that were appropriately treated with oral rehydration therapy averaged 70.76 percent, varying from above 80 percent in Gaborone and Francistown to 65 percent in the rural South-West. There were, however, no significant differences in administration of oral rehydration therapy for diarrhea across consumption categories.

Figure 135:Treatment of child diarrhea



Source: Authors' calculations.

279. **The portion of children aged 12 to 23 months who received recommended vaccinations exceeded 95 percent for all vaccines.** Coverage varies between 95.42 (Hepatitis B) to 98.89 for BCG.[79] There were no significant differences across consumption expenditure categories or regions. The high vaccination rates reflect the success of Botswana's comprehensive and strong routine pediatric immunization program.

280. **CWIS data point to relatively equitable access to primary care across quintiles.** More than 96 percent of the surveyed population above 6 years of age consulted a formal medical practitioner when experiencing illness, rather than visiting a traditional healer or pharmacist. Individuals in poorer consumption quintiles were only slightly (-3.1 percent) less likely to consult a formal medical practitioner. A fixed clinic was the point of service for more than 50 percent of consultations (Figure 136). Variation across regions was minimal.

[79] BCG is an acronym that stands for Bacille Calmette–Guérin (Tuberculosis) Vaccine.

Figure 136: Provider type consulted for ill-health

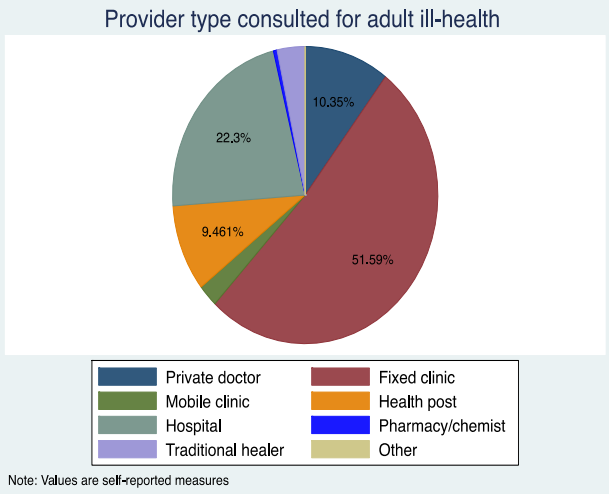
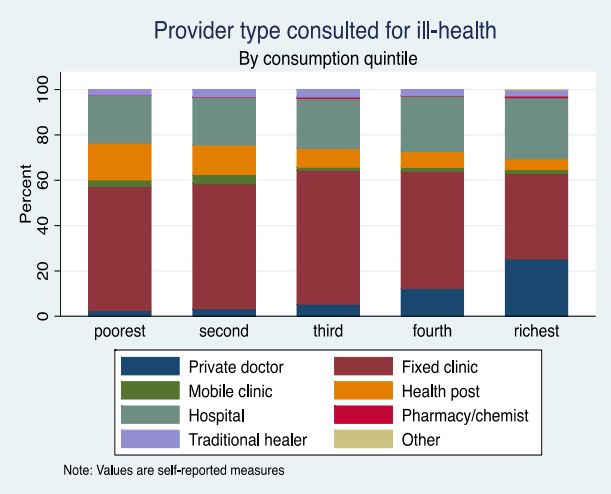


Figure 137: Provider type consulted for ill-health by consumption quintile



Source: Authors' calculations.

281. **Richer consumption quintiles were more likely to consult private physicians or visit hospitals for care.** Figure 137 clearly depicts the predominant use of fixed clinics across social groups. A very small proportion of the survey sample reported utilization of mobile clinics. As expected, the use of private doctors was found to increase with consumption; to a lesser extent, so does the use of hospitals.

H. Health financing and financial protection

282. **CWIS data demonstrated a clear gradient in health-insurance coverage—from less than 5 percent in the poorest consumption quintile to 38 percent in the richest group (Figure 139).** Despite this disparity, it should be noted Botswana had a low rate of catastrophic expenditures, which may be related[80] to the high percentage of health expenditures covered by the government and the low cost-recovery rates at the primary care level.

[80] http://www.who.int/countryfocus/cooperation_strategy/ccsbrief_bwa_en.pdf.

Figure 138: Type of health insurance coverage

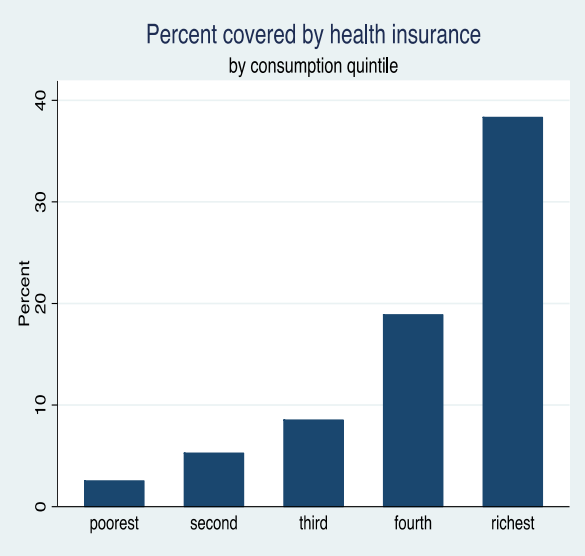
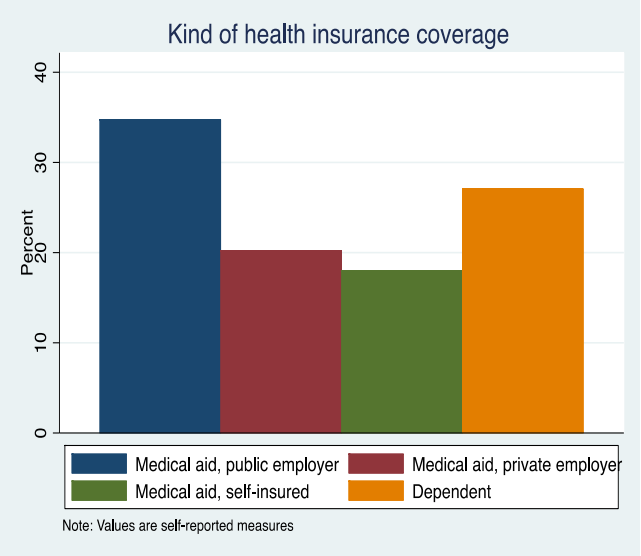


Figure 139: Percent covered by health insurance



Source: Authors' calculations.

283. **CWIS data indicate that insurance through employment was the predominant route to coverage (Figure 138).** In Figure 140, the bars for each quintile sum to 100 percent, representing sources of insurance for covered individuals in the quintile. A much higher percentage of the poorest quintile was self-insured (41.72 percent) relative to the richest quintile (15.71 percent), with a clear gradient in between.

Figure 140: Type of health insurance coverage by consumption quintile

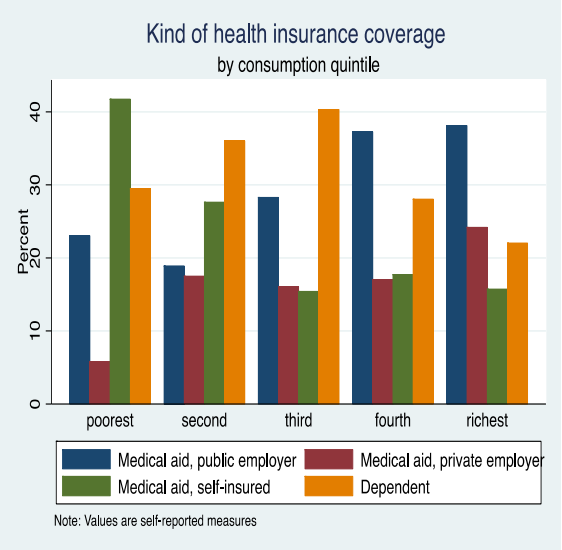
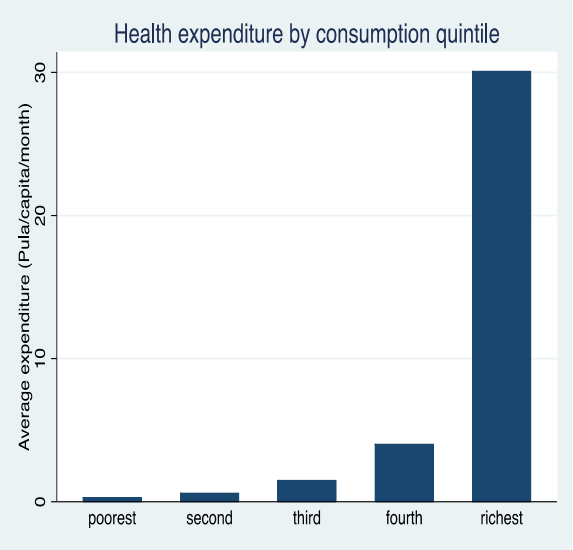


Figure 141: Health expenditure by consumption quintile



Source: Authors' calculations.

284. **CWIS data show that out-of-pocket health expenditures per capita increase with consumption quintile (Figure 141).** This trend probably does not stem from a lack of access of

needed care by poorer quintiles; instead, it probably reflects the provider type accessed by wealthier quintiles—the greater probability of receiving hospital rather than clinic care and using private rather than public providers. In Figure 142, the concentration index (0.495) clearly indicates the dominance of health insurance coverage among the wealthier cohorts, indicated by the depth of the curve below the line of equality.

Figure 142: Concentration curve for health insurance coverage

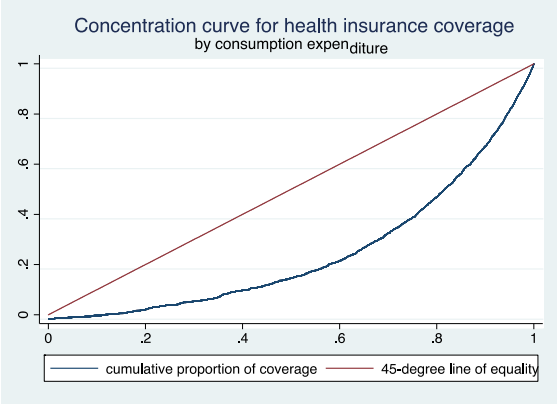
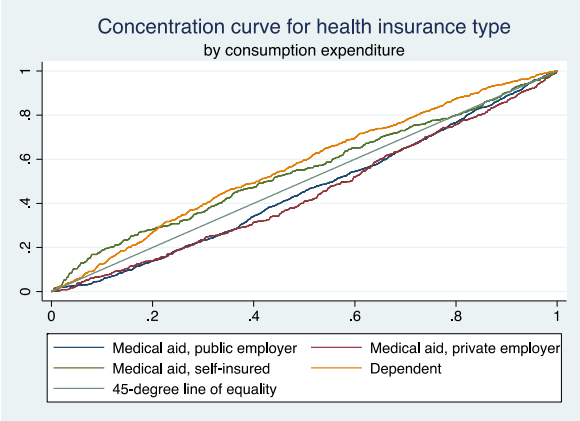


Figure 143: Concentration curve for health insurance type by consumption quintile



Source: Authors' calculations.

285. **Disaggregating coverage by type reveals socioeconomic inequality**. There has been a concentration of self-insurance and dependence in poorer quintiles and employment-related insurance in richer quintiles. All these coefficients are statistically significant (Figure 143).

I. Summary and key recommendations

286. **In child nutrition and health, intensify the scale up of evidence-based, cost-effective interventions to prevent and treat under-nutrition, with the highest priority on the conception to 24-month "window of opportunity," where countries obtain the highest returns on investments.** Botswana needs a greater focus on the most disadvantaged populations. CWIS data consistently noted a peak in child malnutrition in the two poorest quintiles, emphasizing the need to examine/address vulnerability among the poor and "near poor." In addition, the fact that national investments have not translated into more positive child-nutrition outcomes, plus the relative inelasticity of some child-nutrition indicators, points to the need for more in-depth analysis into the socio-cultural dynamics of infant and young child-feeding practices. The recently adopted Botswana Nutrition Strategy of 2012-2016 supports significant strides in improving child nutrition. With respect to child health more broadly, current data trends suggest that focusing on factors relating to improving the quality and continuity of care, rather than merely access, would likely be instrumental in addressing major bottlenecks to improving health outcomes.

287. **Adopt an Integrated Health System Strengthening Approach for Addressing the Double Burden of Disease:** Much of the health focus in sub-Saharan Africa, including Botswana, has been understandably directed toward communicable diseases, particularly HIV/AIDS. There has been less acknowledgement of the growing problem of non-communicable

diseases (NCDs). These diseases already account for about 30 percent of the region's deaths, and they are expected to become the leading cause of ill health and death by 2030. Among adults, CWIS data reveals an increase in biologic and behavioral risk factors for non-communicable diseases, including tobacco use, alcohol consumption, high blood pressure, and being overweight and obese. These trends suggest the poor would be particularly vulnerable to this dual burden of disease. Long-term care needs grow with chronic diseases, both communicable (as more people benefit from antiretroviral drug treatment, HIV/AIDS has become a chronic condition) and NCDs. They could threaten to overwhelm the health system. Given the evolving, complex health burden in Botswana, avoiding this outcome could depend on three strategies that build on the Ministry of Health's new NCD initiative.

a. **First, capitalize on inter-linkages between conditions and on their common determinants**. Not much attention has been paid to the extent to which communicable diseases contribute to the onset of NCDs and to potential common interventions. For example, the human papilloma virus (HPV) causes cervical cancer, a leading killer of women in Botswana, and HPV-associated cancers occur more frequently in HIV-infected patients. Some interventions to prevent such NCDs as cervical cancer are straight out of the communicable disease toolbox. Immunization programs could be expanded to provide HPV vaccines for young girls and protect them against HPV strains that cause 70 percent of cervical cancer cases. Collaboration with reproductive and sexual-health programs, including HIV/AIDS, could help raise awareness of early signs and symptoms of cervical and breast cancer and increase coverage of low-cost cervical-cancer screening and treatment programs.

b. **Second, focus on common care needs, rather than disease categories**. This implies using platforms, resources, experiences, and models already in place for dealing with communicable diseases. This might include those for providing diagnosis and antiretroviral drug treatment for AIDS and for scaling up cervical cancer control along a continuum of health services—disease prevention, diagnosis, treatment, and care.

c. **Third, capitalize on existing resources and capabilities.** The delivery of services needs to be redesigned around multidisciplinary teams working in existing facilities to facilitate task-shifting among existing personnel, raising knowledge and skills and bringing care closer to patients. Other approaches include using common laboratory services, procurement, and supply lines for getting essential drugs to remote clinics and scaling up the use of new technologies, such integrated health information systems. Linking health spending decisions to adoption of clinical guidelines for service provision would encourage coordination of care and improve the quality of services.

288. **Much of the illness burden and inefficient use of resources could potentially be avoided in Botswana.** But to do so, the Government and its development partners need to prioritize building health systems that deal with the multiple health needs of the population (including the poor and most vulnerable groups), rather than only a few specific diseases.

Chapter 8: Social protection

Social-protection programs have contributed substantially to poverty reduction in Botswana. Almost seven in 10 people, and up to nine in 10 among the poorest 20 percent, live in households receiving some form of government support from various social-protection programs. At the national poverty datum line, the simulated poverty headcount is 25 percent lower than it would be in the absence of social-protection transfers—19. 4 percent instead of 24.3 percent. While social-protection transfers may not raise most of the poor above the poverty line, they significantly reduce the consumption gap. In the absence of social-protection programs, the poverty gap would be 69 percent higher. School meals, old-age pensions, and several forms of government aid, provided in kind or in cash, have the largest effect. Botswana has an opportunity to completely eliminate absolute poverty in a budget-neutral way through better targeting of social-assistance programs and improving the adequacy of benefits for the poor. Introducing a Family Support Grant to provide cash benefits to all families in absolute poverty, as identified through a targeting system based on a proxy-means test, would be a cost-effective way to address absolute poverty. In addition, the impact of the program could be enhanced by linking benefits to certain desirable behavioral changes, such as making investments in children's human capital. These behavior-changing programs have emerged in many countries as a proven strategy for increasing opportunities for the poor, breaking the intergenerational transmission of poverty, and reducing inequality.

A. Major social-protection programs

289. **Botswana has a mature and comprehensive social-protection system**. It includes programs under three major categories: social insurance, social assistance or safety nets, and active labor market programs (Table 28). Social insurance includes a defined-contribution pension scheme for public officers—the Botswana Public Officers Pension Plan (BPOPF). The social-assistance mix includes a public-works program (Ipelegeng); a social (non-contributory) old-age pension; cash and in-kind assistance for indigent persons (Destitute Persons Program); support for families who care for orphans (Orphan Care Program); support for families taking care of chronically ill (Community Home Based Care Program); nutrition programs for infants and pregnant and lactating women (Vulnerable Group Feeding Program); and school feeding for primary- and secondary-school children. Scholarships and sponsorships to support students in tertiary education are also an important safety-net component, and they are analyzed mainly because of the significant amount of public resources devoted to them. Active labor market programs include several skills training and internship and apprenticeship programs as well as a Youth Development Fund to create sustainable employment opportunities for young people.

Table 28: Main social protection and labor programs—spending and beneficiaries, 2012/13

	Spending	Share of GDP	No. of beneficiaries	Share of Population
1. Social Insurance	**1,435**	**1.2**		
Public Officers Pension Fund	1,087	0.9	6,600	0.3
Non-contributory Public Plan	348	0.3	n.a.	
2. Active Labor Market Programs	**214**	**0.2**	**4,928**	**0.2**
National Internship Program	73	0.1	2,891	0.1
Apprentice Program (MTCT)	20	0.0	949	0.0
Youth Development Fund	97	0.1	1,088	0.1
Youth Empowerment Scheme	24	0.0	n.a.	
3. Social Assistance	**3,698**	**1.7**		
Cash and Near Cash	833	0.7		
Orphan Care	301	0.2	40,030	1.9
Destitute Persons	241	0.2	30,518	1.5
Old Age Pension	279	0.2	93,639	4.5
In-kind Food Transfers	651	0.5		
Vulnerable Group Feeding Program	166	0.1	383,392	18.3
Primary School Feeding Program	275	0.2	268,761	12.8
Secondary School Feeding Program	210	0.2	161,929	7.7
Public Works / Ipelegeng	409	0.3	55,000	2.6
Poverty Eradication Initiative (APP)	104	0.1	3,586	0.2
Other Transfers [a/]	38	0.0	3,424	0.2
4. Sponsorships/Scholarships	**1,674**	**1.4**	**28,507**	**1.4**
Total Social Protection and Labor	**5,347**	**4.4**		
Memorandum items				
GDP (P millions)	122,500			
Population			2,099,601	

Source: Program managers, MFDP's Budget Books, and CSO (2012).
Notes: a/ Other transfers include: Community Home-based Care, MLGRD transfers to NGOs, Remote Area Development Program, and Word War Veterans.

290. **A detailed description of the major social-protection programs, their implementation arrangements, and their achievements is included in a recent Social Protection Sector Review (World Bank and BIPDA, 2013).** This chapter summarizes the document's findings but focuses on select number of programs captured by the CWIS. The objective is to expand the previous assessment and bring new evidence on some programs' effectiveness in terms of coverage, benefit incidence, and adequacy as well as their role in poverty and inequality reduction. This type of evidence can shape decisions about prioritizing resources toward programs that have the largest potential to contribute to poverty reduction because they perform well in targeting the poor. It can also aid in reassessing the design, implementation, and efficiency of those programs that may not share their benefits equitably across various income groups.

291. **The CWIS collects very limited information about use and benefits for social-protection programs.** Only a very few programs can be identified individually—pensions, old-age pensions, school feeding, the veterans program, and sponsorships and scholarships. All other programs are lumped together under a catch-all category called "government aid." This chapter

focuses mostly on programs captured in the CWIS to better understand their effectiveness in terms of coverage of the poor, targeting accuracy, and contribution to poverty alleviation. Below is a brief description of major programs, including those covered by the household survey

i. Social insurance

292. **All public servants are covered by a defined-contribution pension plan, the Botswana Public Officers Pension Fund (BPOPF).** BPOPF members contribute 5 percent of their salaries to individual savings accounts, and public employers add 15 percent. Members can make additional voluntary contributions of up to 10 percent of their salaries.[81] The compulsory retirement age is age 60, and the early retirement age is age 45. As of March 31, 2012, the BPOPF had 98,226 active members, 6,518 deferred (or inactive) members, and 6,619 pensioners.

293. **In addition there are several private and voluntary occupational schemes.** Occupational pension plans are usually established by medium-sized and large employers. Together, these systems cover 49,752 formal-sector employees. Pension plans are financed both by employers and employees. Contributions depend on plan rules. The total employer and employee contribution rate under an average plan is between 10 percent and 15 percent of the beneficiary's salary (typically, 5 percent in employee contributions and 5 percent to 10 percent in employer contributions).[82]

ii. Social assistance programs

294. **Veterans Program.** Introduced in 1998, this program provides pensions for veterans of World War II and their survivors (spouses and children up to age of 21). The benefit provided by the program is a monthly cash transfer of P390 (US$51), equivalent to 57 percent of the food poverty line. Payments are made through the Post Office.

295. **Old Age Pension (OAP).** Established in 1996, the OAP is a universal flat transfer that benefits all those aged 65 and older. In 2012/13, the program covered 93,639 beneficiaries. Since October 2012, the value of the monthly pension has been P250 (US$33), equivalent to 37 percent of the food poverty line. As in the veterans program, payments are made through the Post Office. In 2012/13, the OAP cost P279 million.

296. **Primary School Feeding Program.** It provides free school lunches to all students—about 94 percent of the total—who attend public primary schools. Primary school children receive a meal equivalent to one-third of a child's daily nutritional needs. The meals consist of sorghum porridge, maize, stewed beef, beans, bread, and UHT milk. They may also include locally procured seasonal fruits and vegetables.[83] In remote areas, students receive two meals a day. Parents' contributions to the program are currently limited to paying "pot fees" to purchase utensils and other items, such as salt and detergent for cleaning.[84] In 2012/13, the program

[81] http://83.143.28.92/bpopf2012/employer-information.
[82] Oxford Policy Management (2010), page 85.
[83] World Bank (2010a).
[84] BIDPA (2012), page 39.

reached 268,761 beneficiaries at a cost P274.8 million. The annual cost per student is two to three times higher in Botswana than in school-feeding programs in other countries.

297. **Secondary School Feeding Program.** The program provides meals to secondary students in public schools and students who board in special educational institutions (boarders receive three meals a day). The content of the meals is similar to the primary feeding program. The secondary feeding program is managed by the Ministry of Education and Skills Development (MESD) and financed from its budget. Each school procures its own food with transfers received from the MESD.[85] In 2012/13, the program had 161,929 beneficiaries, costing at total of P209.9 million.

298. **Orphan Care Program.** One of the largest assistance programs in Botswana, this program is designed to respond to orphans' needs, including food, clothing, shelter, education, protection, and care. Households taking care of orphans receive a food basket and other items (such as a school uniform, clothing, and a transportation allowance) worth about P625 per month (US$82), equivalent to 92 percent of the food poverty line. Orphans are also provided with psychosocial support from social workers in the Ministry of Local Government and Rural Development (MLGRD). The beneficiaries are not means-tested; the program is open to all families who apply.

299. **Destitute Persons Program.** Established in 1980, this program serves people in need who have absolutely no other sources of income or support. It classifies destitute persons as either permanent or temporary. The permanently destitute are those whose age or physical or mental conditions renders them completely dependent. They are eligible for benefits for life but require an annual recertification by social workers. The temporarily destitute are those who are incapacitated by ill health or natural disasters, thus unable to support themselves in the short term. In theory, the program is means-tested. In practice, social workers select beneficiaries with input from the Village and Ward Development Committee (VDC/WDC) and local authorities. The OAP received by the elderly is not taken into consideration, so they can also qualify for the Destitute Persons Program. As of March 2013, the program covered 28,001 permanent and 2,034 temporary destitute people. The benefits include a coupon (a smartcard similar to the one used for the Orphan Care Program) to buy food, a cash allowance for nonfood needs (P90 since October 2012), access to social services, and various subsidies (for example, for housing).[86] The food coupon and the cash are provided monthly. The food allowance is intended to provide recipients with 1,750 Kcal per day.[87] The coupon has a value of between P450 (US$59) and P650 (US$86), depending on the locality, with the largest transfer being provided in remote areas where food prices tend to be higher. The amount of the food coupon depends on family size or the number of dependents under age 18. For families of five or more members, the amount of the food coupon is doubled. It should be noted that in the "remote areas" the MLGRD still distributes food baskets because of a lack of infrastructure to handle smartcards. The cash allowance is paid through the Post Office, using a checkbook-like leaflet. In 2012/13, the

[85] Ministry of Local Government (2010b), page 33.
[86] World Bank (2010a).
[87] BIDPA (2010), p. 26.

program cost P241 million, including the food coupon, the cash allowance, and support for needy students and needy children.

300. **Vulnerable Groups Feeding Program (VGFP).** The VGFP provides monthly take-home rations to vulnerable children aged 6 to 60 months, to pregnant and lactating women, and to TB and leprosy patients from poor households. The rations' contents vary depending on the beneficiary. Health clinics provide the rations, and the staff is expected to screen the beneficiaries and provide rations only to those with symptoms of under-nutrition. All pregnant or nursing teenagers (up to 18 years old) receive the ration.[88] In remote and drought-affected areas, all households receive extra rations. In 2012/13, the program served 383,392 beneficiaries, making it one of Botswana's largest social-protection programs. In 2012/13, the monthly cost of take-home rations was P34.70 (US$4.6) for children aged 6 to 36 months and P76.10 (US$10) for children aged 37 to 60 months and other beneficiaries. In 2012/13, the MLGRD spent P166.3 million on the program.

301. **Sponsorships and Scholarships.** Sponsorships are the financial support provided to high school graduates for studies in national institutions; scholarships are support provided for studies abroad. All students who complete high school with a passing grade can apply and obtain a sponsorship to study in the country.[89] Scholarships to study abroad are granted mostly for specialties not available in the country or for graduate work. Students are expected to return home and work for the Government for a couple of years. The MESD's Department of Tertiary Education Financing (TEF) is responsible for the program. In April 1995, the Government introduced a reorganized bursaries scheme, with students awarded grants and loans to pursue their tertiary education. The beneficiaries are expected to pay back the loan portion of their sponsorship as soon as they become employed.[90] According to the TEF, however, the recovery rate is less than 5 percent. The sponsorships pay for tuition fees, books, equipment, living allowance, warm clothing, medical fees, insurance, and other costs. The program pays tuition and other fees directly to the institution, while a cash allowance is given to the student. The average annual cost per student studying in local institutions varies between P36,000 (arts) and P63,000 (computing). For overseas study, the annual cost varies between P479,000 and P547,000. The annual allowance for those studying within the country is P1,420 per month (US$187) for 12 months, which is equivalent to twice the food poverty line or twice the minimum wage in manufacturing. In 2011/12, 28,507 students benefited from sponsorships and scholarships.

302. **Ipelegeng.** The Ipelegeng (self-reliance) program provides cash to people participating in labor-intensive public works, both in urban and rural areas. It became a permanent program in 2008, replacing a long series of drought relief "food-for-work" programs dating back to independence in 1966. The Cabinet decides the overall number of work slots for each monthly cycle. The program then allocates this monthly number to constituencies based on their share of Botswana's total population. The incidence of poverty and availability of basic infrastructure in

[88] Ministry of Health (2011), pages 3 and 4.
[89] The criterion is at least a C average in six subjects. This is equivalent to a 36 score. Recently, this minimum score was lowered to 34. The criterion is also five-points lower for orphans and vulnerable children, remote area dwellers, and for people with disabilities. Currently their score is 29.
[90] http://www.moe.gov.bw/

each constituency are also considered when deciding the work-slot allocation, and districts have some flexibility in reallocating work slots within their jurisdictions. All those over 18 years old and willing to work for the program's pay rate may apply for work. The program was originally designed to be self-targeted. Because of excess demand, however, recruitment is done by the VDC/WDC. Workers need to reapply every month, and they are engaged if there are work slots available. If there are not enough slots, those who did not work the previous month have priority. With excess demand in most areas, a lottery is used to select beneficiaries. In May 2013, there were 56,274 people working in the program, 32 percent of them in urban areas. The program's pay is currently P480 for six hours of work for 20 or 22 days, depending on the length of the month. In addition, starting in 2012/13, a meal is now supplied to the workers at a daily cost of P5.

B. Assessment of the social-protection and labor systems

303. **The effectiveness of social-protection programs in reducing poverty depends on whether they cover a significant number of poor and vulnerable.** The key issues are whether benefits are accruing mostly to the poor and whether they are adequate to significantly reduce the consumption gap. Cost effectiveness also depends on the efficiently of administration in terms of identification of beneficiaries and delivery of benefits. This section assesses Botswana's social-protection system, focusing specifically on: spending; coverage, gaps, and overlaps; benefit incidence; and generosity of benefits and incentive compatibility.

i. Spending on social protection

304. **Botswana dedicates a large part of its GDP to social protection, and it is one of the few countries in Africa that fully funds social-protection programs out of its own resources**. During the 2012/13 fiscal year, social-protection spending was P5.347 billion, or about 4.4 percent of GDP. Social insurance spending accounted for 1.2 percent of GDP and consisted of contributory pensions mainly for public-sector employees. The active labor market programs' total spending represented 0.17 percent of GDP. Social assistance spending represented another 1.7 percent of GDP, allocated to a diverse mix of programs that address the country's most vulnerable groups. Sponsorships and scholarships for students in tertiary education account for 1.4 percent of GDP.

305. **As a share of GDP, spending has been declining in recent years—from a high of 6.1 percent in 2009/10 to 4.4 percent in 20012/13.** During this period, overall social safety net spending decreased slightly, with a relatively large cuts in the sponsorships/scholarship and the Community Home-Base Care (CHBC) programs. The Destitute Persons Program registered decreases in 2009/10 and 2011/12, when many able working beneficiaries were transferred to the public-works program. It increased again in 2012/13. In constant 2009/10 prices, total social protection and labor spending declined 9 percent from P4.7 billion in 2009/10 to P4.2 billion in 2012/13, with spending on the social safety net falling 15 percent.

306. **Social-assistance spending in Botswana shows a countercyclical trend, playing an important role in mitigating crises by increasing the benefits and or expanding the number of beneficiaries.** During the most recent drought in 2012, the Government took a series of

measures to mitigate the adverse impacts on the poor. These measures included the provision of a second meal for primary-schools students in affected areas until the end of the 2012/13 fiscal year. The MLGRD also began supporting vulnerable groups in affected areas through its Destitute Persons Program and increased the enrollment of workers in its labor-intensive public-works program (Ipelegeng).[91] This may have prevented an increase in poverty rates.

307. **Despite the public perception of high spending levels, overall social-protection spending in Botswana is lower than the average for upper-middle-income countries**. In particular, social-insurance spending is significantly lower than it is in other upper-middle-income countries.[92] However, social-assistance spending is substantially higher than the average for upper-middle-income countries. The spending level is comparable to Namibia and South Africa, countries that, like Botswana, use the social assistance to provide support to large shares of households not covered by social insurance. If scholarships and sponsorships were excluded from social-assistance spending, however, it drops to 1.7 percent of GDP, which is 23 percent lower than the average for middle-income countries. Compared to other African countries, Botswana's social-protection spending is above average for both social insurance and social assistance.

Figure 144: Spending on social protection by category and country, as a percent of GDP

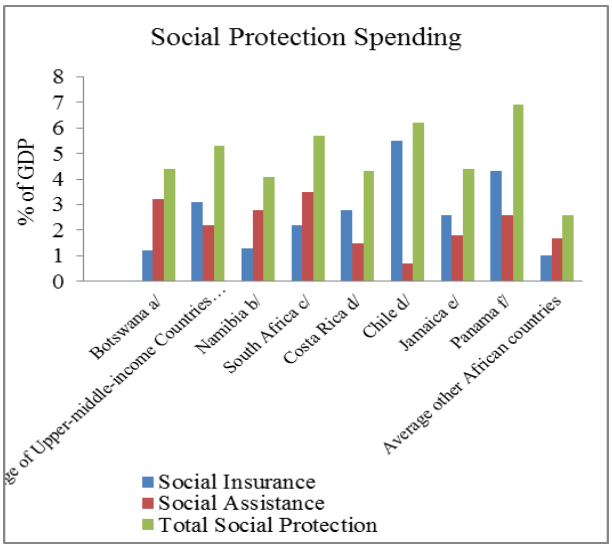
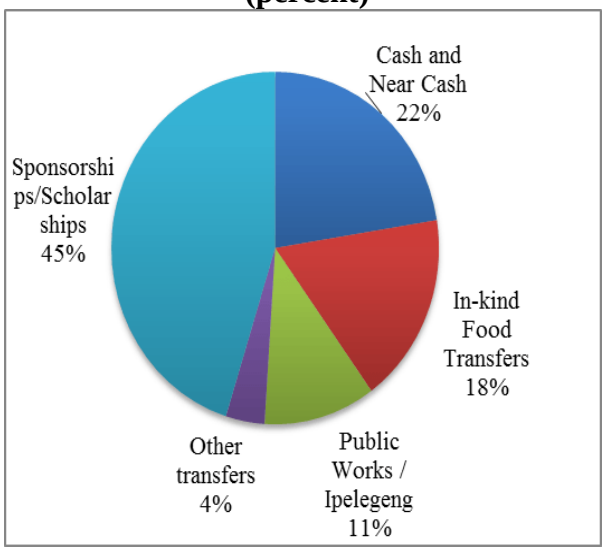


Figure 145: Distribution of social assistance spending by type of program, 2012/13 (percent)



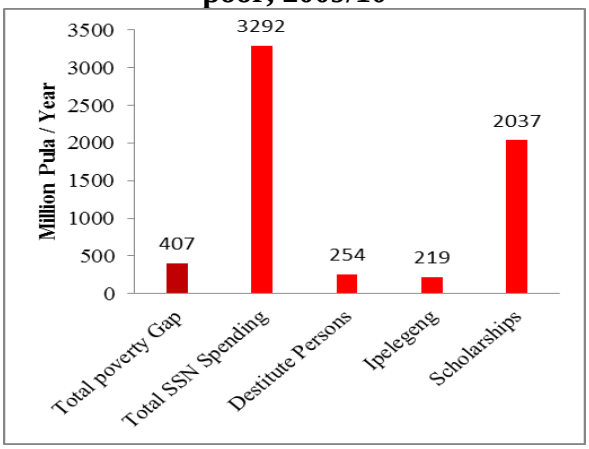
Source: Social Insurance = Public pension spending from World Bank's (HDNSP) Pension database (http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/EXTSOCIALPROTECTION/EXTPENSIONS/0,,contentMDK:23231994~menuPK:8874064~pagePK:148956~piPK:216618~theSitePK:396253,00.html). a/ Botswana: Table 1 in this chapter. b/ Namibia: budget amount from Ministry of Finance of Namibia (2011). c/South Africa: Republic of South Africa (2012), Tables 1.2 and Table 8.5. d/ Chile and Costa Rica: World Bank's Social Protection Databases- Wiegand and Grosh (2008). e/ Jamaica: Marques (2011a). f/ Panama: Marques (2009). Other countries: World Bank (2013), Table 9.

[91] http://www.mmegi.bw/index.php?sid=1&aid=156&dir=2012/august/wednesday1.

[92] This comparison should be interpreted with caution because the definitions (such as the scope of social assistance) may not be fully consistent across countries.

308. **The distribution of social-assistance spending is biased toward programs that by design are not meant to target only the poor.** A single program—sponsorships and scholarships, which grants benefits based on merit and not need—accounts for nearly half (45.3 percent) of total social-assistance spending. By contrast, programs designed to target the poorest and most vulnerable households, including the Destitute Persons Program, Ipelegeng, and Orphan Care Program, together absorb less than one-fifth of total social-assistance spending. Even if were perfectly targeted to the poorest, this amount it would not be enough to bring everyone above the poverty line. This may explain why, despite overall high level of spending on social assistance, about 20 percent of Botswana's population still lives without sufficient income to be able to support a minimum level of consumption.

Figure 146: Social-protection spending compared to consumption gaps of the poor, 2009/10



Source: Authors' calculations.
Note: For the poverty gap it was assumed that the average consumption gap of the poor as percentage of the poverty line was 38 percent.

309. **In Botswana, the total amount spent annually on social assistance would be more than enough to completely close the consumption gap and eradicate poverty.** Assuming perfect targeting, the annual cost of giving all poor residents—i.e., 19.3 percent of the total population—just enough to rise above the poverty threshold would be P407 million, or 0.33 percent of GDP. This figure shows that the cost of filling the poverty gap could be easily covered with the money Botswana now allocates to social assistance. For example, a small fraction of current spending on scholarships, one of the largest programs, could be sufficient to bring every poor household up to the poverty line.

310. **To eradicate poverty in an efficient way, Botswana would need to put in place a good targeting system to identify the poor and grant them benefits that are adequate to fill in their consumption deficits.** A good targeting mechanism, based on a proxy means test, can be developed using CWIS 2009/10 to identify the households' characteristics that explain most of the changes in consumption. Selecting only those characteristics that are easily observed and hard to manipulate will ensure effective targeting. It is important to acknowledge that even a well-targeted program would have some inherent leakage toward the non-poor, which will push the actual program budget above the perfect-targeting scenario (see last section).

ii. Program coverage, overlaps, and gaps

311. **Coverage assessment of social-protection programs is important in determining whether they reach intended beneficiaries.** Since CWIS 2009/10 only captures data on a few programs, it is important to rely on administrative caseload data to assess whether programs cover a substantial number of the poor or intended beneficiaries. Botswana has several universal programs with good take-up rates. Five programs—the Orphan Care Program, the Primary and Secondary School Feeding Programs, the OAP, and the Veterans Program—seek to cover all people in defined categories and generally benefit a large share of the targeted groups. One important exception is the Orphan Care Program, which covers only 30 percent of its target group in part because of the restrictive definition of orphans (for program eligibility, for example, an orphan is defined as a child who lost both parents).

312. **The Destitute Persons Program's caseload covers about one-fourth of the estimated number of poor people.** Unfortunately, CWIS 2009/10 cannot provide data on the program's actual coverage. However, CWIS 2002/03 indicates that targeting is quite accurate; therefore, based on current caseloads, the program reaches only one of four poor people. The income thresholds used to determine eligibility for the Destitute Persons Program have not been updated in years and today represent only one-third of the minimum wage in agriculture and less than 20 percent of the poverty line. This may contribute to the program's low coverage because few people can meet the eligibility criteria. In addition, the requirement for destitute but able-bodied adults to join the public-works scheme further reduces coverage.

313. **The labor-intensive public-works program Ipelegeng also has limited coverage.** Excess demand for the program has been systemic in most constituencies, except Gaborone**.** This has meant that a lottery has usually been needed to select beneficiaries, or that duration on the program has been restricted to allow more beneficiaries to enroll. An allocation based on the poverty map at lowest possible administrative level could provide a useful tool to estimate overall potential beneficiaries as well as the allocation per area.

314. **Unfortunately, the CWIS did not collect take-up information on individual targeted programs, so no inferences can be made about coverage by income groups or area of residence.** The assumption is that these programs are included as part of a catch-all category called "government aid." We assume the results for this category hold for individual programs.

315. **Considering all programs, overall coverage is high, mostly due to social assistance.** Coverage of contributory pensions is low, with less than 3 percent of population living in a household receiving this benefit. While few people live in households that benefit from formal social insurance, a large majority receive some form of social assistance, leading to high overall coverage. Almost 72 percent of the population lives in a household with at least one member who benefits from a social-protection program. The school-feeding schemes are the single largest contributor to this high level of coverage, given the large share of families that have at least one child attending a public primary or secondary school. Social pension, a universal benefit for all persons 65 and older, also shows relatively higher coverage.

316. **Coverage among the poor is even higher, with almost 90 percent of those in the bottom 20 percent of the population living in households receiving some form of social protection.** School feeding is the program with the highest coverage among the poor. Almost 90 percent of the population lives in a household where at least one child receives school meals. While many programs operate at the individual level, they contribute to overall household consumption, indirectly benefiting all members of a household.

317. **Social-protection programs also benefit a large share of the moderately poor.** Eight of 10 persons in the bottom three quintiles live in households receiving some form of support— a student benefiting from school meals, an elderly person receiving a social pension. As shown in the first chapter, these households are not necessarily much better off than the poorest 20 percent, and they may be in upper-income groups just because they receive social-protection programs. In the absence of these benefits, these households might see their consumption fall (see discussion later in this chapter).

318. **Even the richest 20 percent of the population is covered by social protection, most of it government aid not necessarily intended for this income group**. Almost 40 percent of people in the richest 20 percent quintile receive some form of government aid (Figure 147). This group might be expected to benefit from formal pensions; yet, coverage is not much higher than in lower income groups (Figure 148). Less than 2.5 percent of the population in the top quintile live in households receiving pensions. Many households in this group are still able to access various forms of government aid. This finding points to the need to assess the eligibility criteria for various programs and step up compliance, enforcing the rules to prevent resources intended for the less well-off from leaking to non-intended beneficiaries.

Figure 147: Coverage with social-protection programs, by income groups

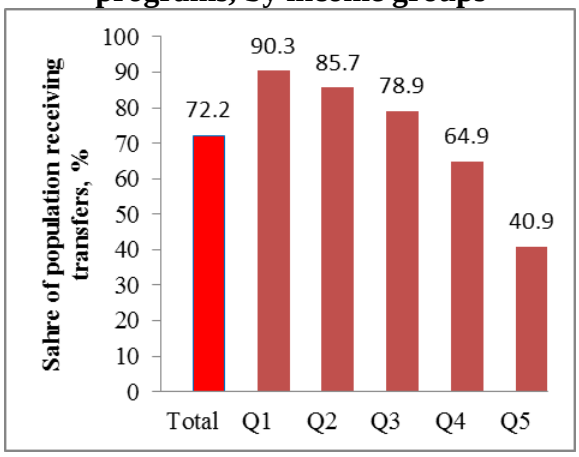
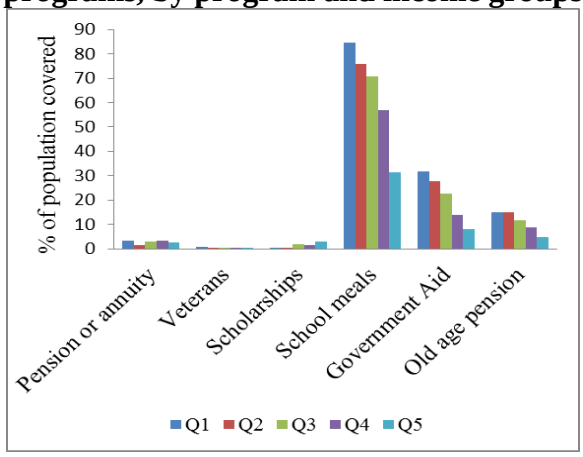


Figure 148: Coverage with social-protection programs, by program and income groups



Source: WB SPAdept using 2009/10 CIWS:
Note: Program coverage is the portion of population in each group that receives the transfer.

319. **Most programs cover a higher proportion of lower-income groups, but some have higher participation among the upper-income groups.** Scholarships are a good example. The overall program coverage is small, with only 1.4 percent of the population living in recipient

households, but the wealthiest 20 percent are 10 times more likely to receive the benefit than the poorest 20 percent.

320. **While about 10 percent of poor people are not receiving any benefit, eligibility criteria result in significant program overlaps.** Almost 7 percent of all households in the poorest quintile benefit from at least three programs, and 39 percent benefit from at least two programs.[93] Even in the richest quintile, 6 percent of households benefit from at least two programs. Many of those who received government aid also received OAP and school-feeding benefits. These overlaps are a direct consequence of how the programs define target group and eligibility criteria as well as the fragmented approach to social protection. Focusing on the family rather than individuals could eliminate unjustified overlaps and make programs more effective.

iii. Adequacy of benefits

321. **Three issues are relevant to assessing the adequacy or generosity of social-protection programs:** (i) whether existing programs are generous enough to achieve their expected impact; (ii) whether they are overly generous and create a culture of "dependency" with disincentives for work and saving; and (iii) whether they are too generous to be financially sustainable. To address these issues, we looked at international benchmarks that compare the benefits paid by major social-assistance programs as a share of total household consumption. We focus on the Botswana programs for which there is comparative international information—the Old Age Pension, the public-works program Ipelegeng, and the Destitute Persons Program. Table 29 presents the benefits paid by these programs.

Table 29: Program benefits, 2012/13

Program	Type of Benefit	Estimated monthly value (P)	Estimated monthly value (US$)
OAP	Cash	250	32.9
Destitute	Food P450 - 650 + cash P90 a/	640	84.2
Ipelegeng	Cash P480 + Food P100	580	76.3

Source: Republic of Botswana (2013), page 6; for Ipelegeng, Statistics Botswana (2012).

322. **Table 30 shows global estimates of the generosity of various types of social assistance programs in developing countries taken from a World Bank study (Grosh et al, 2008).** Generosity is defined as the program transfer divided by the average consumption expenditures of the poorest households (the first quintile, Q1). In Botswana, CWIS 2009/10 does not have data on benefits received from most targeted programs, so their generosity is assessed by comparing the administrative level of benefits to the poverty line or minimum wage.

[93] SPAdept using 2009/2010 CWIS. The analysis is restricted to the nine assistance programs covered by the survey— the veterans program, the OAP, scholarships, pensions, and a catch-all category "government aid."

Table 30: Generosity of social assistance programs in developing countries

Programs (in parenthesis no. of countries)	Median transfer as percent of average HH consumption	Range transfer as percent of average HH consumption a/	Denominator
Non-contributory (Social) Pensions (14)	27	12-53	Q1 b/
Last Resort Programs (20) c/	23	5-45	Q1 b/
Family Allowance (15) d/	18	6-28	Q1 b/

Source: Grosh et al (2008) Table 5.1 (page 137).

323. **The Destitute Persons Program offers a benefit that covers a significant share of the poverty line.** Including both the value of food and the cash allowance, the benefit is equivalent to P640 per month and represents 72 percent of the total poverty datum line. It may seems excessively generous when compared to the median transfer for last-resort income programs in other middle-income countries. However, this benefit is meant to cover a substantial part of recipients' consumption because eligible households are assumed to have no other income source. The benefit is equivalent to 143 percent of the agricultural minimum wage (P445 per month).[94] Reports suggest that people do not want to graduate from the program because the benefit is higher than what they could earn working at the minimum wage in agriculture. However, most beneficiaries lack labor capacity and are not expected to work. Since 2009, those who may qualify by the income test but are able-bodied have been transferred to the Ipelegeng program. In 2013, two new items were added to the program—all beneficiaries receive a blanket and the elderly living alone receive a radio. While they improve adequacy for those in need, these element may become appealing to non-intended beneficiaries.

324. **The Old Age Pension does not ensure food security in the absence of other income sources.** The government's pension scheme provides a monthly cash transfer of P250 to all those 65 years and older, a benefit that corresponds to 24 percent of the poorest households' food consumption. Table 31 indicates that the median generosity for such pensions in a sample of developing countries is 27 percent of adjusted consumption of the poorest quintile, slightly higher than in Botswana. The OAP benefit is equivalent 37 percent of the food poverty line, not enough to sustain an individual whose only income source is the pension.

325. **Labor-intensive public works offer benefits in excess of the minimum wage.** The Ipelegeng labor-intensive public-work program pays P480 a month, plus meals that are equivalent to an additional P100. The total compensation—P580 a month for six hours of work a day for five days a week—is 30 percent higher than the minimum wage for agricultural workers and equivalent to 85 percent of the absolute (food) poverty line of a family of four. Adjusted for time worked, the hourly Ipelegeng remuneration, including meals, exceeds the minimum hourly wage by 90 percent in agricultural and 5 percent in manufacturing.[95]

[94] Commissioner of Labor and Social Security (2012).

[95] The Ipelegeng hourly wage is P4.4 (=P580/22 days/six hours); the manufacturing minimum wage is P4.20 an hour; and the agricultural minimum wage rate is P2.29 an hour for a 45-hour workweek.

326. **Social-protection benefits make a significant contribution to the living standards of the poorest households.** Overall, government programs account for almost 27 percent to these households' total consumption (Table 31). As expected, pensions and annuities make the most significant contribution. While generous, representing six times the average consumption of the poorest 20 percent, scholarships go to a very small number of poor households.

Table 31: Generosity of transfers as a share of total consumption

Direct and indirect beneficiaries

	Quintiles of per capita consumption					
	Total	Q1	Q2	Q3	Q4	Q5
All social protection	10.6	27.3	14.6	12.6	9.3	7.6
All social insurance	39.0	36.9	34.3	48.2	49.9	35.2
Pension or annuity	39.0	36.9	34.3	48.2	49.9	35.2
All labor market programs	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
All social assistance	8.3	26.1	14.0	11.0	6.9	4.4
Veterans	4.3	11.9	23.8	18.6	20.0	1.6
Scholarships	37.8	591.9	96.2	75.4	52.9	27.0
School meals	3.2	11.8	5.7	4.2	2.7	1.1
Government aid	10.5	24.0	16.9	12.7	8.3	4.2
Old age pension	9.2	23.8	15.6	11.9	10.3	3.7

Source: WB SPAdept using 2009/10 CIWS.

Notes: Generosity is the mean value of the transfer amount received by all beneficiaries in a group as a share of average total welfare of the beneficiaries in that group.

327. **To sum up, Botswana's major social-assistance programs, while not substantial in absolute value, seem quite generous when compared to the poverty datum line or minimum wages in agriculture or manufacturing**. The Destitute Persons Program benefits are comparable with the median of similar programs in several developing countries, but Ipelegeng provides compensation for a six-hour workday that is 30 percent higher than the minimum wage for agricultural workers, or 90 percent higher when adjusted for hours worked.

iv. Targeting accuracy

328. **The success of social-protection programs in reducing poverty increases when most of the benefits flow to the lower-income groups.** Of course, not all social-protection programs are designed to benefit only the poor, but the larger the share flowing to the poorest and most vulnerable, the larger the program's role in reducing poverty and inequality. Benefit-incidence analysis helps to evaluate the targeting efficiency of social-assistance programs—the extent to which the poor benefit from the programs. The benefit incidence shows the share of total benefits going to each percent of the population ranked by household consumption per capita. A concentration curve is one way to represent this graphically. Programs with benefits flowing equally to each quintile have straight 45-degree concentration lines. Pro-poor programs have concentration curves above the 45-degree line. They are progressive—i.e., they improve the existing distribution of consumption—if their concentration curves are above the consumption concentration curve. If programs' concentration curves lie between the diagonal and the

consumption curve, the programs are not pro-poor, although they are progressive. Concentration curves that lie below the consumption curve are not pro-poor and they're regressive, meaning they worsen than the existing distribution of consumption.

329. **Pensions and annuities are very regressive, with most benefits accruing to the better off.** The richest 20 percent receive almost 61 percent of total pension benefits; the bottom 20 percent receive less than 3 percent (Figure 149). To some extent, this is to be expected. Pensions go mostly to people who worked in the formal sector, and they are most likely found among the richest fifth of households. The distribution of pension benefits across income groups is very similar to the distribution of total consumption.

Figure 149: Benefit incidence of pensions

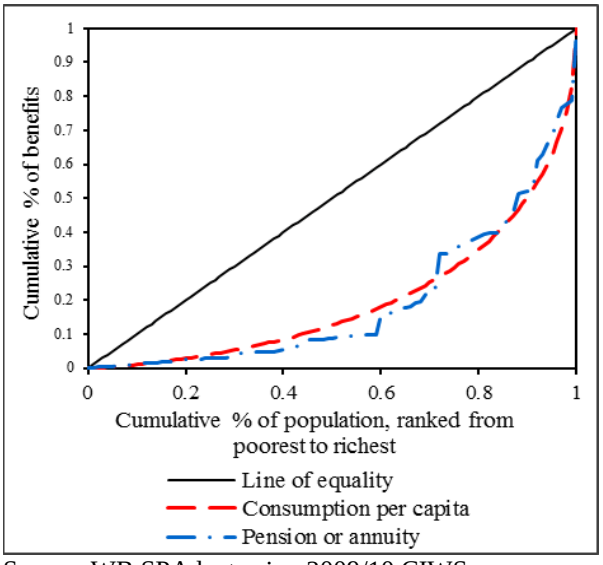
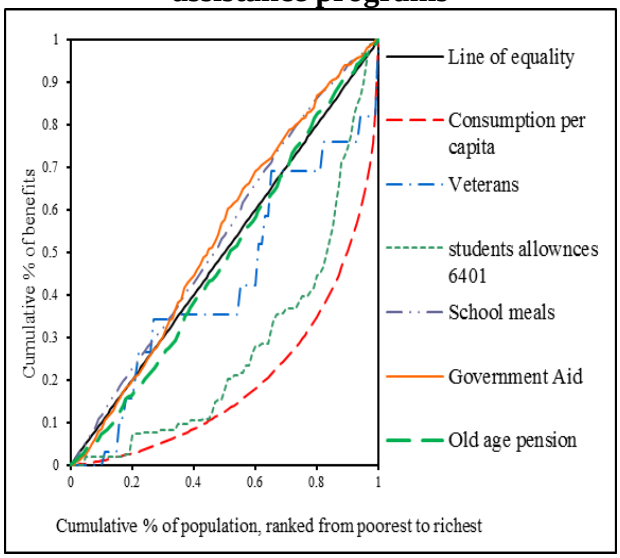


Figure 150: Benefit incidence of social-assistance programs

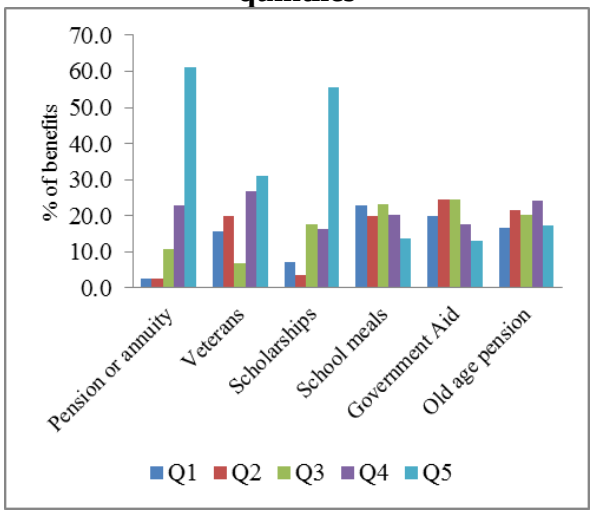


Source: WB SPAdept using 2009/10 CIWS.

330. **Most social-assistance transfers are mildly progressive.** In particular, the lowest three consumption quintiles receive a higher share of government aid transfers than their share of the total population (Figure 150). The Old Age Pension is almost equally distributed across income groups.

331. **Sponsorship and scholarship benefits flow overwhelmingly to better-off households.** The richest fifth of households take 55 percent of the scholarships; the poorest fifth get only 7 percent (Figure 151). The program grants benefits on merit rather than poverty status; however, it is important to consider the implications in terms of its contribution to greater inequality.

Figure 151: Distribution social-protection programs' benefits by consumption quintiles



Source: WB SPAdept using 2009/10 CIWS.

C. Options to increase the role of social-protection programs in poverty reduction

i. Introducing a Family Support Grant program

332. **Economic growth is expected to bring some but not all poor families out of poverty.** Many households will not be able to share the benefits of growth if they cannot engage in gainful employment, or if their incomes from labor are insufficient for their family size and circumstances. Targeted programs to deliver adequate support to those living in absolute poverty can achieve the goal of eliminating absolute poverty much faster and at a low cost. This could be done through a last-resort anti-poverty program that would protect all families. Existing programs' focus on helping vulnerable individuals leads to overlapping assistance for some families, while others are not be covered at all. In particular, most families with orphans, destitute persons, elderly over 65 years old, or breadwinners in Ipelegeng receive enough cash assistance to bring their total income or consumption above the absolute poverty line. The rest of the families in absolute poverty are left out.

333. **Introducing a Family Support Grant (FSG) program to offer a benefit level set around the average consumption gap would help achieve the objective of Vision 2016—elimination of absolute poverty.** The (minimum) target group for such a program would be the number of people in absolute poverty. CWIS 2009/10 estimated that 16 percent of the population had consumption below the food poverty line of about P170 a month per person, or P680 for a family of four. This is equivalent to 336,000 persons, or 84,000 families in 2012/13. We suggest an FSG benefit of P85 per person, equal to half the poverty line and sufficient to lift many of the poor over the food poverty line. This is equivalent to P340 per month for a four-person

household. The proposed benefit is higher than the average monthly consumption of the poor, which is about P65 per capita.[96] The annual cost of an FSG program offering P85 a month per capita to the 84,000 poorest families, and operating with 15 percent administrative costs, would be P394 million, or 0.32 percent of GDP. This program variant is illustrated in Table 32 (column 2) and named "theoretical scenario."

334. **To implement the FSG, the Government would need to develop a mechanism to identify (target) families living in absolute poverty.** This report recommends the development and use of a targeting system based on a proxy-means test (PMT), described at length in the Social Protection Report (World Bank and BIDPA, 2013). Because a family's consumption (or income) is difficult to measure, the PMT method determines eligibility with a regression on a set of observable characteristics that are easy to verify and hard to conceal or falsify, such as dwelling characteristics, ownership of large durable items, or household size and composition. This estimation could be done based on data in a recent household survey, such as CWIS 2009/10. The regression coefficients are then multiplied by the characteristics of each applicant family to generate a score—in this case, the predicted level of consumption by a family with those characteristics. Families whose predicted consumption is below the prescribed threshold are deemed eligible for the program.

335. **To cover all families in absolute poverty and allow for some inherent leakage, the PMT targeting mechanism would have to cover more than the 16 percent of the population.** All social assistance programs that target the poor end up including some beneficiaries who are non-poor; i.e. inclusion error or leakage of program funds toward the non-poor. Even well-performing programs in developed economies have inclusion errors of 10 percent to 33 percent. A recent review of social-assistance programs in developing programs (Grosh et al, 2008) shows that well-performing programs have inclusion errors of 20 percent to 50 percent. Many of those included but not poor are, however, in the vicinity of the poverty line.

336. **Several scenarios assuming different levels of inclusion errors point to an affordable program.** A moderate FSG scenario based on a 33 percent leakage rate should target 24 percent of the population—16 percentage points of absolute poor, plus 8 percentage points leakage. If the PMT model's predictive power is lower and the leakage rate rises to 50 percent, then the FSG program should target 32 percent of the population to ensure reaching the poorest 16 percent. These program variants are identified as Option 1 and Option 2 in Table 34. They would be 50 percent and 100 percent more expensive than the "perfectly targeted" program. Option 1, an FSG program covering 24 percent of the population, would cost P577 million, or 0.47 percent of GDP. Option 2, covering 32 percent of the population, would cost P770 million, or 0.63 percent of GDP.

337. To **maintain a budget-neutral stance and promote program consolidation, the Government could consider replacing the Orphan Care and Destitute Persons programs with the FSG program.** In 2012, the two programs covered 70,548 individual beneficiaries at a

[96] T consumption gap of P53 per capita per month represented 38 percent of the per capita absolute poverty line of P140 in 2009/10.

total cost of about P543 million, or 0.44 percent of GDP. Currently, these two programs cover only a fraction of the population in absolute poverty. Replacing them with FSG Option 1 would cover all orphans or destitute persons living in absolute poverty and some of those living in moderate poverty. Option 1 would require an additional P53 million and would offer benefits to 500,000 persons, including the poorest 16 percent, with benefits sufficient to lift them out of absolute poverty. Option 2 would cost an additional P246 million a year, or 0.2 percent of GDP, and would cover about one-third of the poorest population.

Table 32: Illustrative options and cost of the family support grant

Assumptions about program leakage outside the group of absolute poor:		Theoretical Scenario	Option 1	Option 2	Option 3
		Perfect Targeting	Leakage of 33 percent	Leakage of 50 percent	Leakage of 33%, excluding family members covered by other programs*
Number of beneficiaries	Percent population	16	24	32	24
	'000 Persons	336	504	672	378*
Benefit Level	P/Per capita/Month	85	85	85	85
Transfers (P/ Million)	Per Month	29	43	57	32
	Per year	343	514	685	385
Admin Costs	Assumed @ 15%	51	63	85	48
Total costs	Mil. P/ Year	394	577	770	433
Percent of GDP	**%**	**0.32**	**0.47**	**0.63**	**0.35**
Savings by discontinuing the Orphans and Destitute programs:	Mil. P/ Year		524	524	433
	Mil. P/ Year		53	246	
Savings (-) / Add'l Budget Required (+)	Percent of GDP	0.32	0.04	0.20	0.35
Pro Memoria					
GDP	P/ Million	122,500			
Population	000 persons	2100			

Source: Authors' estimates.

Notes: Options 1 and 2 assume that FSG program would replace the Orphan Care and Destitute Persons programs, thus they are budget neutral reforms. Option 3 assumes that all existing social safety net programs continue to operate. The theoretical scenario illustrates the minimum size and cost of such a program. It is presented only for comparison purposes; it cannot be implemented as such.

*) The objective of the program is to cover all families in absolute poverty; i.e., the 16 percentage points poorest. The program target group is the sum of absolute poor, plus an assumed leakage rate.

**) Under Option 3, all eligible families receive P85 per capita a month, except members on other social-protection benefits (Orphans, Destitute Persons, Old Age Pension, and Ipelegeng).

338. **If replacing Orphan Care and Destitute Persons programs is politically unfeasible, the Government still has the option to cover the social-protection gaps with a**

complementary FSG program at a moderate fiscal cost. One way to weave the FSG into the current programs is to offer the FSG benefit—i.e., P85 per capita per month, or P340 for a family of four—only to those family members who are not receiving other, more generous individual benefits. These other benefits include the food rations for orphans and destitute persons, the Qld Age Pension, and the wages earned in Ipelegeng. Those who get these benefits will continue to receive them. Family members who do not get other individual benefits will receive the P85 FSG. The implementation of the "complementary FSG program" would require using an administrative definition of "family" that excludes members who receive other benefits. For example, a family of seven members that includes a destitute person and an elderly relative on pension would receive the FSG grant only for the remaining five members. Assuming 25 percent of FSG individuals eligible received other individual-level benefits, it would result in an additional FSG cost of P433 million, or 0.35 percent of GDP. This increase in the net budget could be compensated for by the introduction of a 25 percent co-payment for scholarships or sponsorships for tertiary education (discussed in the next paragraphs).

339. **Over medium term, the Government could consider enhancing social-protection programs by introducing work requirements for able-bodied individuals (in areas where the public-works program does not operate) and by tying cash assistance to certain behavioral changes related to the use of nutrition, health, and education services.** A program of this type offers the opportunity to promote behavioral changes that help families increase their children's human capital, helping break the intergenerational transmission of poverty. Conditional cash transfers (CCTs) have been successfully implemented in a variety of middle-income countries. They have been rigorously evaluated and found to be highly effective in improving child outcomes, including poverty status, nutrition, health, and schooling.[97] Burkina Faso recently conducted a randomized program evaluation of a pilot cash-transfer program in rural areas, with the goal of comparing the impact of conditional versus unconditional cash transfers. The CCT was very effective at getting parents to increase their investments in children. The conditionality pushed parents to enroll marginalized children in school—those not enrolled at baseline, girls, and low-ability children.[98]

340. **The FSG could provide cash transfers to families in return for behavioral changes that would build their human capital and help them rise out of poverty.** The persistence of high rates of under-nutrition may be an argument for ensuring that transfers are conditional on behavioral changes, such as attending health clinics for growth monitoring, participating in feeding and caring practices education, giving babies micronutrients, and taking severely undernourished children to clinics for therapeutic feeding. In addition, the relatively large number of young children who are not attending primary school may be another argument for requiring parents to send their children to school. A CCT could also help reduce the large drop in secondary-school enrollment by giving parents an additional incentive to ensure that their children continue studying and complete secondary education. However, conditionality adds to the program's operating cost.

[97] Fiszbein and Schady (2009).
[98] Damien de Walque (2013).

ii. Strengthening the public-works program Ipelegeng

341. **The targeting and[99] effectiveness of the Ipelegeng public-works program, a key intervention for expanding employment opportunities for the able-bodied absolute poor, could be further improved.** This will require adjustments to three parameters: reducing the wage rate; increasing the number of months of employment and/or slots in the program; and allocating the program budget in proportion to regional poverty rates.

342. **The program could improve its targeting and increase the number of beneficiaries by offering lower wages for an extended period of time.** The current Ipelegeng wage rate—P580 a person, including the food component—is above the minimum wage, diminishing its self-targeting potential by increasing the demand for the program from better-off individuals. In turn, this leads to rationing the excess demand through a lottery system. In addition to the wage rate issue, the government could also review the number of days offered to each worker. The time on the program is not enough to help the poor to cope with unemployment, seasonal or otherwise.

343. **Reducing the wage rate by one-third would allow extending the duration of the program and serve more beneficiaries, all under the same budget.** A monthly wage rate of P390—in line with the minimum wage for agricultural work—would allow the program to raise the employment time frame from 8.7 to 12 months and increase number of beneficiaries 10 percent (Option A in Table 33). Alternatively, lowering the wage rate but keeping the duration at 8.7 months could expand coverage to 81,800 places under the same budget (Option B). Both options would improve the program's targeting; i.e., would ensure that applicants are among the poor.

Table 33: Reforming Ipelegeng: offering lower wages would improve targeting and cover more poor people for longer periods

		2012/13	2013/14	
		Actual	Option A	Option B
Overall Budget	P/ Million	409	409	409
Labor costs	Percent	68	68	68
	P/ Million	278	278	278
Wage rate	P/ month	580	390	390
No beneficiaries	Persons	55,000	60,000	81,800
No of months		8.7	11.9	8.7

Source: Authors' estimates.

344. **The Ipelegeng's effectiveness could be increased by allocating the budget to regions based on the estimated poverty rate.** The number of work slots in the program should be related to the incidence of poverty and food insecurity in each constituency, rather than the current formula that uses the share of the population. This rigid allocation formula often leads to excess supply in Gaborone and excess demand in most other places. To increase effectiveness, the program's size—and, implicitly, its budget—needs to be based on the total number of poor

[99] At the time of this report, the CWIS micro data was not available to estimate the targeting accuracy of the Ipelegeng in 2009/10.

adults needing work, and its regional distribution needs to be determined on the basis of the regional distribution of absolute poverty (e.g. based on the regional estimates of absolute poverty in the CWIS or, even better, through a poverty map).

iii. Financing reforms without increase in overall social-protection expenditures

345. **To finance the FSG program's additional cost, savings could be obtained in the short term by reducing the generosity of costly programs.** Scholarships and sponsorships for tertiary students cost P1.674 million in 2012/13, or 1.4 percent of GDP, and absorbs 45 percent of total social-assistance spending. Reallocating a small share of these resources away from this program and channeling them to the FSG could eradicate absolute poverty. The Government could reduce scholarships by about 25 percent for high-income students. More than 42 percent of beneficiaries are from the wealthiest quintile and only 4.7 percent from the poorest fifth. Students from high-income families could cover a share of the cost of their tertiary education, while poor students would maintain their merit/need-based scholarships covering the full cost of a tertiary education.

346. **Reducing the generosity of the sponsorship/scholarship program could pay for a large share of the FSG program's budget.** A 25 percent reduction would save about P420 million a year. Assuming that all beneficiaries in the poorest 60 percent of the income distribution (almost 38 percent of the total) will continue to receive full payment of their sponsorship and scholarships, the savings from such a measure would amount to P280 million a year, enough to pay for the Option 3 FSG program.

Summary. Social-protection programs have contributed substantially to poverty alleviation in Botswana. Almost seven of 10 people, and up to nine of 10 among the poorest 20 percent, live in households receiving some form of government support from various social-protection programs. The transfers may not raise most of the poor above the poverty line, but the benefits do significantly reduce the consumption gap. A cost-effective way to address absolute poverty could involve Introducing a Family Support Grant to provide cash benefits to all families in absolute poverty, identified through a targeting system based on a proxy-means test. In addition, the program's impact could be enhanced by linking access to benefits with certain desirable behavioral changes—e.g., making investments in human capital of children. Behavior-changing programs have emerged in many countries as a proven strategy for increasing opportunities for the poor, breaking the intergenerational transmission of poverty, and reducing inequality.

Chapter 9: Poverty projections and policy scenario

This chapter looks into the possible poverty and distributional changes associated with different growth trajectories and policy scenarios. Poverty in Botswana is expected to fall below 12 percent in 2018 and below 6 percent in 2030. Somewhat slower growth would put the potential gains at risk. In addition, current growth patterns are not likely to improve Botswana's unequal distribution of income; in fact, they may increase the disparities even further. Additional simulations show the pace of poverty reduction can be significantly accelerated with more employment and improvements in the education. However, the distribution of income may—again—become more unequal. This is why redistributive policies may have to be put in place. Simulations of increasing public transfers suggest that better targeting of such transfers would help to reduce poverty and improve the income distribution.

A. Drivers of poverty and distributional change

347. **Persistent inequality and relatively high rates of rural poverty remain challenges in Botswana.** High inequality implies that the country's growth elasticity of poverty reduction is relatively low. In principle, this could be overcome by a pro-poor pattern of sectoral growth—i.e., higher growth in sectors from which the poor derive their livelihood.

348. **In this chapter we use a micro-simulation tool to analyze the prospects for further poverty reduction and decreasing inequality in Botswana.** We simulate trajectories of poverty and distributional change under a number of growth and policy scenarios, drawing partly on the macroeconomic and demographic projections. In addition, the simulation model helps to overcome the lack of recent micro data by using actual observed macroeconomic data to simulate the income distribution for 2013. We simulate the poverty and distributional implications of changes in demographics, occupations and labor incomes, and public transfers.

Box 11: Micro-simulation approach

The micro-simulation model creates a counterfactual distribution of income based on a number of "input variables" that are exogenous to the micro simulation. These include: (i) demographic variables (composition of the population by age and education); (ii) labor market variables (employment by sector, wages, and farm profits); and (iii) exogenous income variables (public transfers and taxes, private transfers). Demographic changes are simulated using reweighting techniques. The core of the simulation model is an empirical representation of the income-generation process, with household income being composed of individual labor incomes, household farm incomes (from agriculture and livestock), net public and private transfer income (including remittances), and other income sources.[100] Farming and livestock rearing are typically operated by self-employed individuals, but these occupations may involve other household members as well. The model simulates occupational choices and corresponding earnings. The underlying econometric model is estimated using CWIS 2009/10 data.

CWIS 2009/10 income data are highly imperfect, particularly for agricultural and livestock activities. We

[100] The model is inspired by the work of Alatas and Bourguignon (2005). Similar micro simulation models can be found in Bussolo and Lay (2005), Lay, Thiele and Wiebelt (2008), and Lay (2010).

therefore use a number of imputation procedures and assumption to fill data gaps. Details are available from the authors upon request. For the welfare assessment—i.e., the computation of per capita "income" growth rates, poverty, and distributional indicators—we use the expenditure aggregate used in the earlier chapter on poverty and inequality. Practically, we apply the growth rate of household income from the micro simulation model to total household expenditure.

349. **We stress that the simulations of this chapter should not be interpreted as an attempt to make precise quantitative predictions on specific indictors.** Rather, they should be seen as an instrument to better understand key structural features of Botswana's economy and income distribution that matter for effective policies to reduce poverty and inequality.

B. Baseline macro and demographic scenario--main assumptions

350. **In the first set of simulations, we analyze the poverty and distributional changes associated with the economic growth scenario portrayed in the next three paragraphs.** The information on employment in 2009/10 comes from CWIS 2009/10.

Table 34: GDP and employment by sector

	Value added in millions of Pula (constant 2006 prices)			Employment		
	2010	2013	p2018	2010	2013	2018
Agriculture	1,720	1,490	1,804	235,395	235,872	241,316
Livestock	998	705	837	41,396	40,180	40,727
Smallholder agriculture	722	785	967	132,798	133,957	137,309
Wage agriculture				61,201	61,735	63,280
Mining	11,005	11,063	12,677	17,129	17,129	17,129
Manufacturing	4,174	4,879	5,629	56,630	66,207	76,380
Public sector	9,229	10,661	13,058	261,779	282,096	316,093
Other	32,934	41,896	52,685	374,948	395,354	419,921
Total	59,062	69,990	85,854	945,881	996,658	1,070,839

Source: Authors' calculation.

Note: Employment figures are based on the Botswana 2009/10 CWIS. The figures do not correspond one-to-one to the official employment data, and they are used only as a reference for the growth -rate calculations.

351. **The scenarios rely on assumptions of demographic change and a better-educated workforce.** Specifically, we use the demographic forecasts from the UN World Population Prospects (UN, 2012) and apply them to the working-age population (Table 35).

Table 35: Demographic assumptions of baseline scenario

Age group	Observed in 2009/10	2013p	2018p
15-24	0.20	0.22	0.21
25-59	0.73	0.72	0.74
60+	0.07	0.05	0.07
Total working-age population	1305	1376	1464

Source: Authors' calculation based on UN (2012).

352. **For school achievement among the working-age population, we extrapolate (assuming a reduced pace of expansion) the observed changes between 2000 and 2009 in completed primary, lower, upper, and post-secondary education.** We assume that the share of the working-age population with no schooling or only primary schooling falls by 8 percentage points, while the share of individuals with upper and post-secondary education expands (Table 38).

Table 36: Educational expansion assumptions of baseline scenario

Education	Observed in 2009/10	2013p	2018p
None	0.18	0.16	0.14
Primary	0.18	0.16	0.14
Lower secondary	0.29	0.29	0.29
Upper secondary	0.18	0.20	0.22
Post-secondary	0.17	0.19	0.21

Source: Authors' calculations based on the Botswana 2009/10 CWIS.

C. Poverty projections based on the micro-simulation approach

353. **Putting the exogenous input variables to the micro-simulation model generates counterfactual income distributions for 2013 and 2018.** Figure 152 and Figure 153 present the actual and projected poverty rates obtained from the micro-simulation model.

Figure 152: Poverty projections, total economy

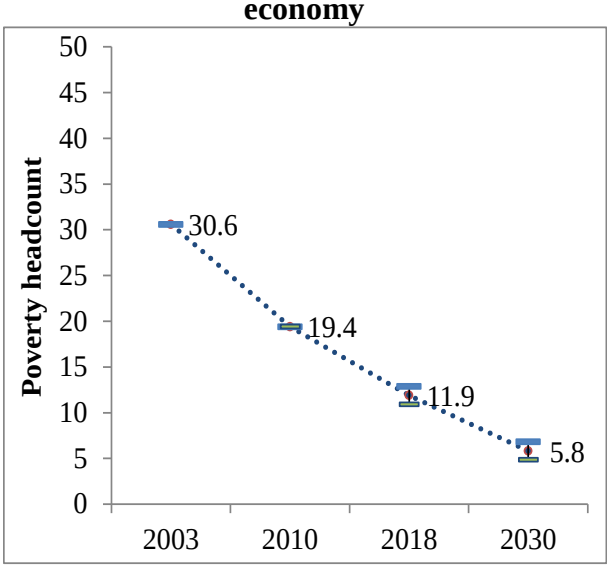
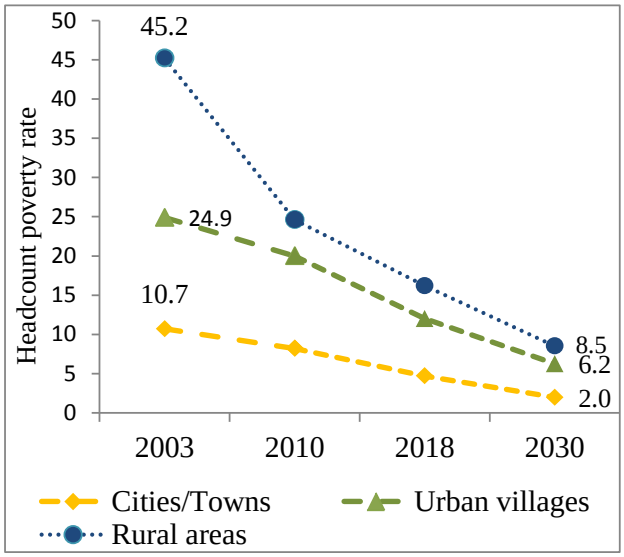


Figure 153: Poverty projections, by location



Source: Authors' calculations. 2002/03 and 2009/10 are actual figures, 2018 and 2030 are projections based on the micro-simulation approach. Baseline scenario. Range of the estimates is presented on the left hand chart.

354. **In the baseline scenario, poverty declines from 19.4 percent in 2009/10 to a simulated 11.9 percent in 2018 and 5.8 percent in 2030**. This reduction is driven by cumulative growth in per capita incomes, which corresponds to an annual GDP growth of 4.5

percent. Figure 152 illustrates poverty projections for Botswana. In addition, projections are made for geographic locations. As shown in the baseline scenario presented in Figure 153, poverty in the cities and towns is expected to decrease from 8.2 percent in 2009/10 to 4.7 percent in 2018 and 2 percent in 2030. Projections for urban villages suggest a reduction from 20.0 percent in 2009/10 to 15.6 percent in 2013 and 12 percent in 2018. In rural areas, poverty is projected to fall as well, but it will likely remain higher than other locations. Rural areas' poverty rates are projected to fall from an estimated 24.6 percent in 2009/10 to 16.2 percent in 2018 and 8.5 percent in 2030.

355. **Disparities in poverty between urban and rural areas are expected to decline further, and the gap between cities and rural areas will be 11.5 percentage points in 2018, down from 16.4 percentage points in 2009/10.** Despite the regional convergence on poverty, income inequality among regions will grow, worsening the income distribution. The main driver of the expected increase in income inequality is the growing disparity in earnings between other sectors (mainly services) and agriculture and livestock. This also explains why the Gini index increases most in urban villages, where incomes from both non-agriculture and agriculture are important.

356. **Under the baseline projections, the growth scenarios are associated with moderate decreases in poverty and moderate increases in inequality.** However, somewhat slower growth would put potential gains at risk. Weaker economic growth following internal or external shocks could erode the achieved gains and hamper poverty reduction.

D. More jobs for accelerated poverty reduction

357. **Employment generation is the key factor for poverty reduction.** Job creation is often stressed as the key development challenge in Southern African countries, particularly in Botswana. Usually, job creation without additional growth would at least lower inequality. Our simulation exercises, however, suggest that this is not necessarily the case. A larger employment elasticity of growth implies higher employment and smaller increases in value added per workers. To illustrate this, we have varied the employment elasticity of growth (Table 37) and distinguished low, medium, and high employment growth scenarios under unchanged output growth.

Table 37: Employment elasticities of growth, by sector in baseline scenario

	Employment elasticities of growth			
Sector	base	Low	medium	High
Agriculture (smallholder)	0.10	0.10	0.50	0.75
Livestock (smallholder)	0.10	0.10	0.50	0.75
Agriculture/Livestock (wage-employed)	0.10	0.10	0.50	0.75
Mining	0.00	0.00	0.50	0.75
Manufacturing	1.00	0.20	0.75	1.00
All other sectors	0.20	0.10	0.50	0.75
Public sector	0.50	0.10	0.50	0.50

Source: Authors' calculations.

358. **Table 38 shows projections for Botswana's occupational structure for 2018 under three different scenarios.** With very low employment elasticities of growth, output growth is not sufficient to absorb the growing potential workforce, so the percentage of inactive working-age individuals rises from 27 percent (baseline) to 32 percent. Under the medium employment generation scenario, this rate falls to 21 percent; for high employment growth, it is 16 percent (Table 40). The official unemployment rate stands at about 15 percent. The high employment growth scenario would roughly eliminate unemployment, assuming constant labor force participation. The assumed sectoral differences in employment generation produce corresponding shifts in the projected sectoral composition of employment. Service sectors generate the most additional jobs under both the medium- and the high-elasticity scenarios, reflecting their importance to initial employment and high output growth rates

Table 38: Occupations under different employment elasticities of growth, %

Occupation	2018 (low employment)	2018 (medium employment)	2018 (high employment)
Inactive	32.4	20.9	15.7
Agriculture (smallholder)	9.4	10.6	11.4
Livestock (smallholder)	2.8	2.6	2.5
Agriculture/Livestock (wage-employed)	4.3	4.9	5.2
Mining	1.2	1.3	1.3
Manufacturing	4.1	4.9	5.2
All other sectors	27.1	33.3	37.1
Public sector	18.6	21.6	21.6

Source: Authors' calculations.

359. A**t given value-added growth rates, higher employment growth results in more moderate increases in individual or farm incomes.** Table 39 shows the order of magnitude of this effect. With an employment elasticity of growth close to 1, incomes will be stagnant, while zero elasticity implies that all value-added gains accrue to those already employed in the sector. For livestock, incomes increase because the cumulative value-added growth between 2010 and 2018 is negative.

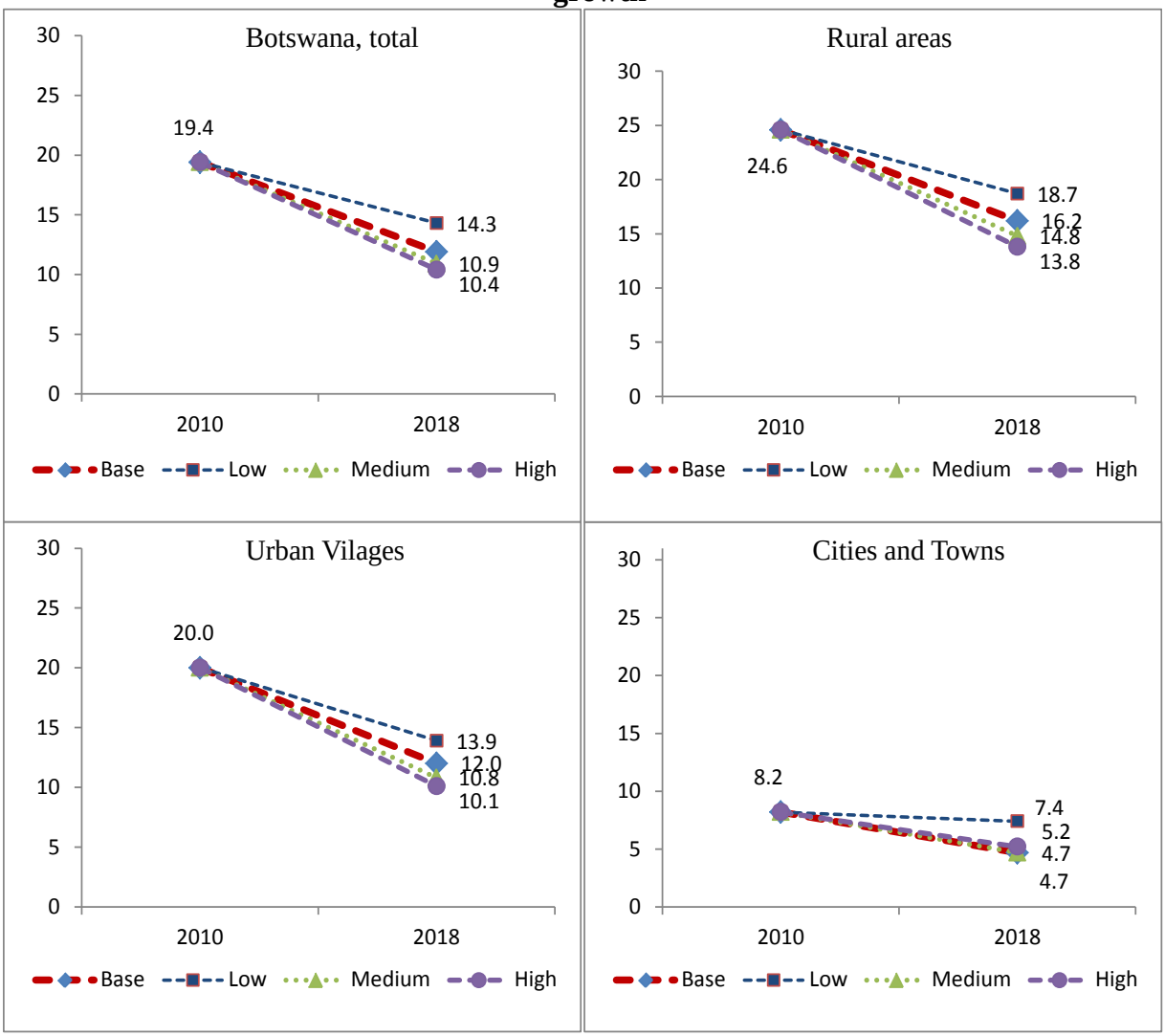
Table 39: Incomes per worker under different employment elasticities of growth

Income	2018p (base)	p2018 (low employment)	p2018 (medium)	p2018 (high employment)
Agriculture (smallholder)	1.30	1.30	1.15	1.07
Livestock (smallholder)	0.85	0.85	0.91	0.95
Agriculture/Livestock (wage-employed)	1.30	1.30	1.15	1.07
Mining	1.15	1.15	1.07	1.03
Manufacturing	1.00	1.26	1.07	1.00
All other sectors	1.43	1.51	1.23	1.10
Public sector	1.17	1.36	1.17	1.17
Other income sources				
Net private transfers	1.28	1.28	1.28	1.28
Net public transfers	1.28	1.28	1.28	1.28
Other income	1.28	1.28	1.28	1.28

Source: Authors' calculations.

360. **At high levels of employment, decreases in average sectoral individual or farm incomes cause average per capita incomes to decline, but this effect is partly offset by higher employment.** Nevertheless, average per capita income declines somewhat with more employment generation.[101] Despite slightly lower per capita incomes, poverty falls significantly faster in the scenarios with more employment generation (Figure 154).

Figure 154: Poverty and income distribution under different employment elasticities of growth



Source: Authors' calculations. Projections for 2018 under four different labor-intensity scenarios, based on the micro-simulation approach. Base stands for baseline scenario, followed by low labor generation, medium labor generation, and high labor generation.

361. **Employment generation is a key for accelerated poverty reduction.** In Figure 154, poverty in 2018 differs based on the different scenarios of labor intensity. Higher employment

[101] This is because the simulation model fixes average sectoral incomes per worker and not the sum of incomes.

intensity reduces poverty to 10.4 percent, well below the baseline scenario of 11.9 percent. Low labor intensity increases poverty to 14.3 percent. The labor intensity is equally important in rural and urban areas. The ranges are: 4.9 percentage points in rural areas (18.7 percent low labor intensity minus 13.8 percent high labor intensity), 3.8 percentage points in urban villages (13.9 percent low labor intensity minus 10.1 percent high labor intensity); and 2.7 percentage points for cities and towns (7.4 percent low labor intensity minus 4.7 percent high labor intensity).

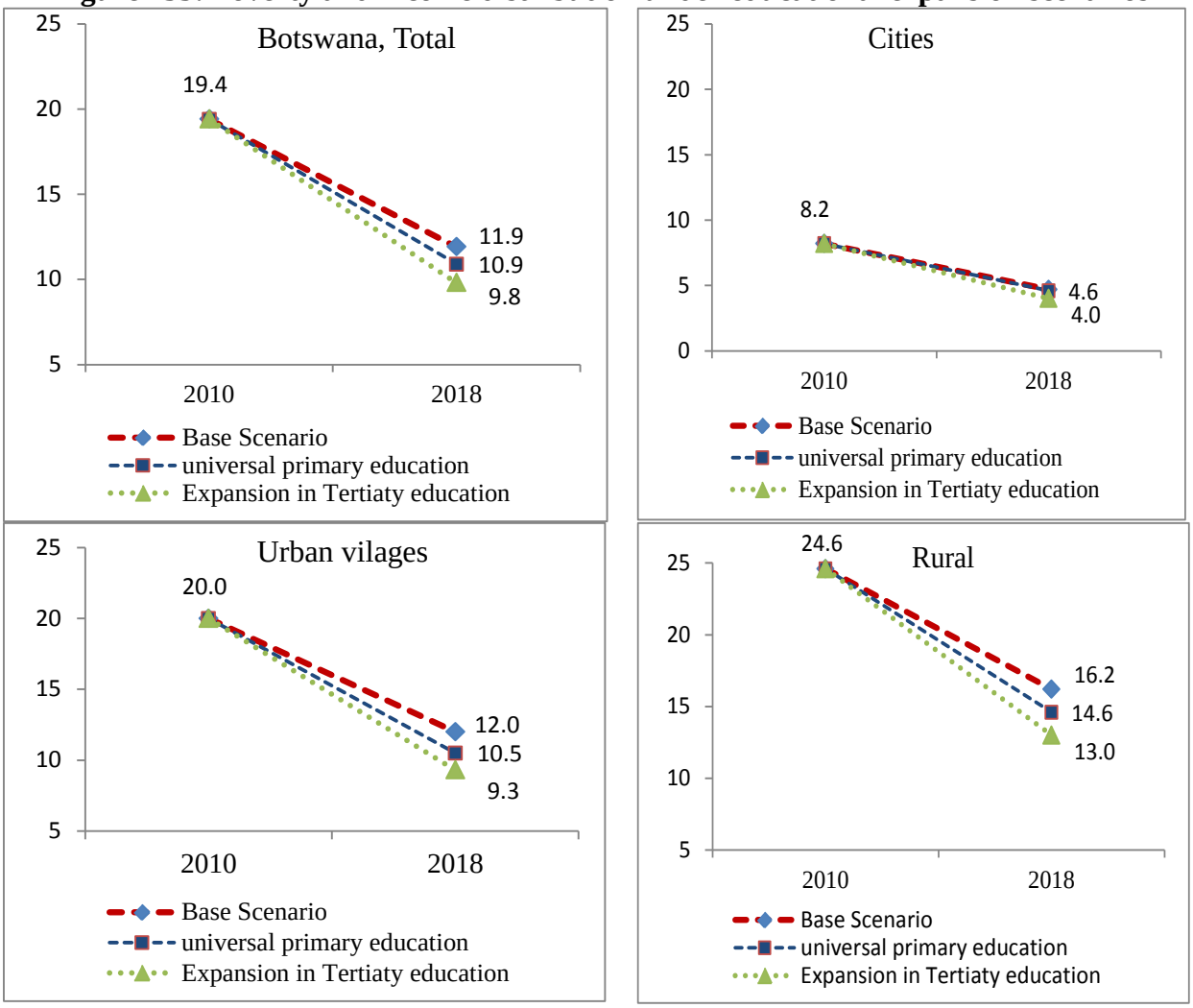
362. **Just generating more jobs on a given growth path will not fundamentally alter the income distribution.** When more employment is generated, the income distribution worsens considerably. While inequality within urban areas falls, inequality within urban villages and rural areas increases drastically. Two factors are at work. First, per worker incomes grow slower in sectors like agriculture, manufacturing, and services, which employ more workers than sectors with faster income growth, such as mining and the public sector. Second, it matters who gets the jobs. Furthermore, our simulations illustrate the importance of productivity growth when more employment is generated.

E. Education expansion

363. **Almost a fifth of Botswana's working-age population has not even completed primary schooling, and almost 40 percent have upper secondary or higher education.** Disparities in educational endowments parallel income disparities. Policies can directly address educational inequalities while also contributing to narrowing income inequality. We use our simulation model to analyze in a stylized way how different education policies would affect poverty and the income distribution. We look at two scenarios for 2018. In the first, we expand primary education, reducing to zero the number of individuals without schooling. In the second, we hold constant the number of individuals with no schooling or only a primary education but increase the number of those with upper-secondary and higher education at the expense of those with lower-secondary education. These scenarios are compared to the 2010 baseline scenario (Figure 155).

364. **Educational expansion would reduce poverty, but the effects of the two policy scenarios are more moderate than might be expected.** Our simulations suggest that the impact is higher for tertiary education than for primary education. Compared to the baseline, the poverty headcount is 1 percentage point lower under the universal primary education scenario and 1 percentage point higher in the second scenario. The poverty reduction under tertiary expansion, however, is much more significant, resulting in poverty reduction of 3.2 percentage points. The impact of tertiary expansion is even more evident in rural areas.

Figure 155: Poverty and income distribution under educational expansion scenarios

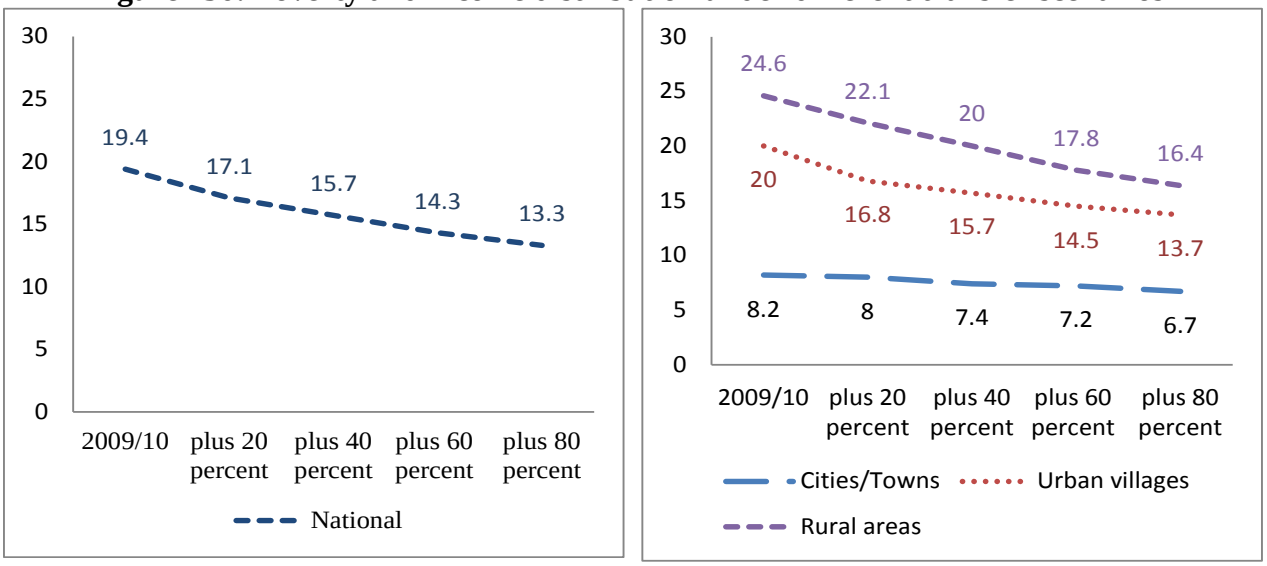


Source: Authors' calculations.

F. Transfers: scope for better targeting

365. **Public transfers are an important source of income in Botswana, particular for the poor.** While the distribution of transfers appears progressive, the country's massive income disparities imply that substantial resources are also being spent on transfers to relatively rich population groups. Furthermore, most public jobs tend to benefit richer household, an issue that we do not explore further. Because of the paucity of reliable income data, we are left with some illustrative scenarios that should be interpreted with caution. Specifically, we simulate a proportional increase in net public transfers (transfers minus taxes) to each household by 20 percent, 40 percent, 60 percent, and 80 percent. These scenarios are then compared to a scheme that increases net transfers only to poor households by 80 percent (Figure 156).

Figure 156: Poverty and income distribution under different transfer scenarios

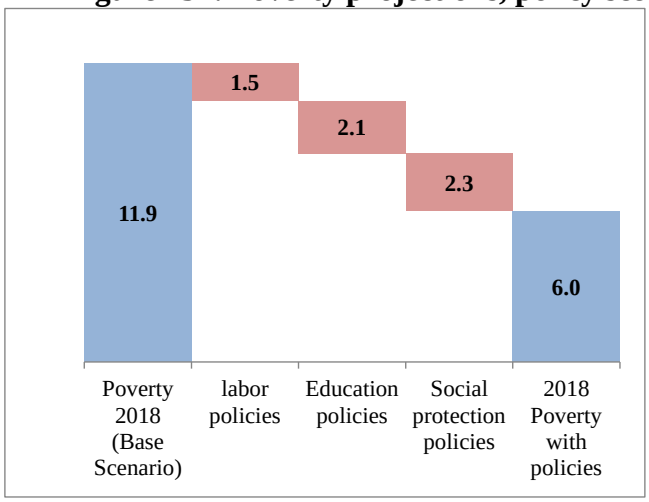


Source: Authors' calculations.

366. **Expansion of transfers is important, but their targeting efficiency is crucial.** The different scenarios' increases in per capita incomes can be interpreted as an approximation of each scenario's resource costs. Increasing transfers has the expected poverty and distributional consequences. Yet, the impacts on both poverty and the income distribution are moderate despite substantial budgetary costs. Increasing net transfers by 80 percent reduces national poverty by 6 percentage points, while the Gini indices decrease by 2 to 3 points. Most striking, however, is what happens if this increase in net transfers is restricted to initially poor households. In this case, the effects on aggregate poverty and distributional indicators are very similar to those of an increase across the board.[102] Yet, resource costs are negligible—only 0.36 percent of initial household income. Our simulation exercises suggest that better targeted transfers can indeed make a dent in poverty at relatively low budgetary costs.

[102] Note that the proportional increase in net negative transfers may cause some households to fall below the poverty line. This causes the difference between the two last scenarios in poverty indicators. The poverty effects would be identical if there were no negative net transfers.

Figure 157: Poverty projections, policy scenarios



Source: Authors' calculations.

Summary. This chapter looked into the possible poverty and distributional changes associated with different growth trajectories. Poverty in Botswana is expected to fall below 12 percent in 2018 and below 6 percent in 2030. Somewhat lower growth would put the potential gains at risk. In addition, current growth patterns are not likely to improve Botswana's unequal distribution of income; in fact, they may even further increase the disparities. Additional simulations show that the pace of poverty can be significantly accelerated if more employment is generated, primary and tertiary education is expanded, and targeted social transfers are intensified. It is estimated that such policies could halve projected poverty in 2018 and might completely eradicate poverty by 2030. The next chapter discusses policy measures needed to reduce inequality and poverty in Botswana.

Chapter 10: Summary and recommendations

367. **Choosing the appropriate mix of policy instruments to reduce poverty and promote opportunities for the poor is at the heart of Botswana's effort to redefine its development strategy.** This chapter briefly summarizes the policy instruments that could be useful in reducing poverty. The proposed reforms are associated with the analytical discussions in previous chapters. Reliable survey data are crucial for sound social policymaking, and a separate section is dedicated specifically to improving the system of household surveys. This report is analytical in its nature, and the policy recommendations presented here are not prescriptive. Additional specific policy recommendations have been provided earlier in the report in the health and social protection chapters. Every option for reducing poverty comes with administrative and fiscal-feasibility costs, which require further detailed analysis and are not included in this report.

A. Boosting productivity, employment, and labor-market efficiency

368. **Botswana has achieved significant success in increasing employment rates between 2002/03 and 2009/10.** Moreover, the biggest gains were achieved among the historically most disadvantaged groups—rural areas, women, and older workers. This appears to have had a significant, positive impact on poverty, with households headed by an employed worker showing a substantially reduced propensity to being poor. At the same time, it is unclear whether the expansion in rural employment is sustainable, given the important role played by government agricultural subsidies. Moreover, the failure of the non-agricultural private sector—formal or informal—to deliver quality employment for a growing youth population remains a significant problem and represents a serious barrier to the structural transformation of the economy. From a policy perspective, the agenda to address these concerns is a relatively large and difficult one that will take time to deliver, and it will require attention to managing transitions and sequencing reforms. Specifically, the analysis conducted so far suggest two-main planks of the broad agenda: (i) building sustainable, quality employment in the medium term through structural transformation and (ii) blending social protection and employment strategies in the short term to ensure continued progress on poverty reduction.

B. Education sector

369. **Botswana boasts high investments in education, yet it faces significant challenges of educational quality when compared to countries with similar levels of GDP per capita.** Given the country's vision of reducing its reliance on diamonds, its main natural resource, and shifting toward a knowledge-based economy, the education sector will need to be a principal focus of reform in coming years. To this end, several major initiatives are needed. These actions, grouped by educational level, are detailed in the "Botswana—Skills for Competitiveness and Economic Growth" policy note series produced by the World Bank in 2013. As the previous chapter argued, investment in tertiary education could lead to faster poverty reduction. The quality and accessibility of basic education also needs to be improved.

C. Health sector

370. **Botswana has dedicated a significant share of its resources to health and possesses one of the highest rates of spending on health among countries in sub-Saharan Africa.** Botswana's health indicators are generally favorable, with the notable exception of high HIV infection rates. There is a significant political commitment to addressing health challenges in Botswana, and it has translated into increasing health expenditures in recent years. While much of Botswana's health focus has been understandably directed toward communicable diseases, particularly HIV/AIDS, the country has shown less focus on the growing challenge of non-communicable diseases (NCDs). The long-term care needs of chronic diseases, both communicable and non-communicable, pose an increasing and substantial challenge to the health system—and these issues may disproportionately impact the poor.

D. Social protection and safety nets

371. **Social-protection programs have contributed substantially to alleviating poverty in Botswana.** The country now has the opportunity to completely eliminate absolute poverty in a budget-neutral way through better targeting of social-assistance programs and improving the adequacy of benefits for the poor. A cost-effective way to address absolute poverty could be a Family Support Grant to provide a cash benefit to all families in absolute poverty, identified through a targeting system based on a proxy-means test. In addition, the impact of the program could be enhanced by linking access to benefits to certain desirable behavioral changes—for example, making investments in children's human capital. Behavior-changing programs have emerged in many countries as a proven strategy for increasing opportunities for the poor, breaking the intergenerational transmission of poverty, and reducing inequality.

E. Improving survey data for evidence based policy making

372. **The Government needs a well-functioning system of monitoring poverty, welfare indicators, social assistance programs, labor market outcomes, and other areas.** Botswana faces a clear need to develop a reliable monitoring system. Statistics Botswana (SB) has recently become an independent agency pursuing an ambitious reform plan. Since getting its independence in November 2010,[103] SB has been designing, with the support of development partners, a reform program in all areas of statistics. A new National Statistical Development Strategy is underway, covering nine main areas of statistics. The institution strives to collect up-to-date, high-quality, and high-frequency statistics. Even though the SB has made significant improvements during the past three years with help from various donors and development agencies, the national statistical system still needs improvements in collecting frequent data.

373. **Current statistical systems in Botswana lack frequent social and labor indicators**. The former Central Statistics Office administered the main household surveys—the Botswana Core Welfare Indicator Survey (CWIS) and the Households Income and Expenditure Survey (HIES)—twice over the last 13 years—in (2002/03 and 2009/10. A Labor Force Survey (LFS)

[103] Under the Statistics Act of 2009, the Central Statistics Office (CSO), which had been a department of the Ministry of Finance and Development Planning, was transformed into Statistics Botswana (SB), responsible for the country's statistical systems.

has been conducted once in 10 years. The most recent LFS was in 2008, and the next one is planned for 2017. The SB published the results of the last CWIS in August 2013, with a three-year delay after its completion. Low frequency of the data and delays in publishing survey results impede evidence- based policymaking and constrain the implementation of the poverty eradication strategy. Labor and social policies in Botswana are not based on factual information.

374. **The main recommendation involves transforming the National Core Welfare Indicators survey into a permanently Multi-Topic Household Survey (MTHS).** This new survey will be a core instrument, providing a long-term solution for frequent, high-quality data collection that generates a wide range of social and economic indicators and serves as the country's main source of micro data. The proposed MTHS will be carried out on a continuous basis and include permanent and rotating modules. The permanent modules will include information on individual demographics, location, labor, education, health, incomes, (possibly) consumption, living conditions, access to services indicators, and agriculture. A set of specialized modules will be introduced in the survey on the rotating basis.

ANNEXES

Annex A: Survey Data and Official Poverty Lines

Central Statistical Office Botswana conducted the Botswana Core Welfare Indicators Survey (CWIS) in 2009/10, which has significantly extended the NHIES survey. Central Statistical Office Botswana carried out the Core Welfare Indicators Survey (CWIS) from April 2009 to March 2010. The CWIS was an integrated household survey providing the information required for measuring and monitoring poverty, and measuring wide range of the human development and access to services information. The survey had substantially improved the earlier HIES by expanding coverage and depth of the available information. The survey included modules on Household Consumption and Expenditure; Education, Health, Access to Amenities, Employment, Community Activities and other information on Schools and Health Facilities. The CWIS collected much wider range of indicators in comparison to the HIES. The CWIS introduced several new modules and questions. The survey collected detailed information on individual health characteristics including anthropometric measures of the population allowing defining stunting and malnutrition among the children. CWIS included modules of self-assessing poverty and deprivation and provided detailed information on education and labor characteristics.

Covering much broader range of the indicators, the CWIS preserves its comparability to the HIES in the core area relevant for the poverty measurement. The surveys remain comparable in terms of the level of the geographical representation, sample size, and the core modules measuring households' consumption, agricultural production, sources of incomes, and expenditures. Both surveys have had similar main objectives-providing a basis for establishing the level of poverty and describing poverty profile. Both surveys were similar and comparable in the way consumption data were collected and organized-the sampling methods were comparable and the sample frame was drawn from the same census. The consumption aggregate and the poverty datum lines were constructed based on the similar methodology adopted in 2004 making the welfare aggregates comparable over time. The main characteristics of the two surveys are summarized in Box 2.

In order to monitor poverty patterns in Botswana, a Poverty Datum Line has been designed by the Central Statistical Office (CSO) to make poverty rates in 2002/2003 comparable with those from previous studies (1974/1975 and 1989). Calculations were therefore carried out focusing on the same five components used in the past (food, clothes, personal items household goods and housing). Also, the same age-gender disaggregation was used to calculate individual requirements.

The poverty line basket's composition is described in Table A1 (food items) and Table A2 (non-food items). The basket includes both items whose requirements are specific to individuals like food, clothes and personal items, and items needed by the household. While quantities vary according to age and sex for the former, the amount of items needed by the household varies according to the household size. All quantities are expressed on a monthly basis.

Food. Food quantities were defined as the "minimum requirements needed to lead a healthy and productive life" [CSO 2008]. Despite the richness of information collected by the 2002/03 HIES the food basket was defined as comprising 11 items; most other items were not included as not recommended from a nutritional point of view. Individual food requirements were defined after dividing the population into 11 classes on the basis of their age and gender (Table A1).

Clothing. A minimum requirement for clothing was defined as the amount allowing individuals to be healthy, to work and to take part in normal social and religious activities; furthermore individuals need to have alternative items to wear whenever they wash their clothes. Also in this case individual needs have been assessed dividing the population into 7 categories on the basis of age and gender (Table A2).

Personal items. In addition to food and clothes, the basket contains another group of items, covering health, hygiene and other personal households, whose minimum requirements have been assessed on the basis of individual's age and gender (Table A3).

Household goods. Household goods are shared among household members. The minimum requirements were set proportional to the number of persons living under the same roof. Nonetheless the need associated to some of the variables have been adjusted to consider scale economies. Although the list of household's good identifies a set of basic articles valid for both urban and rural areas, some adjustments have been made for few items in order to take into consideration their different employment in urban and rural areas (Table A3).

Housing. The allowance for housing differs between urban and rural areas. For the latter, it is assumed that the 1989 typical rondavels build by mud and thatch are still prevalent. For urban areas, in line with past studies, rental values have been used as a proxy to estimate the value of minimum housing requirements (Table A4). Some relevant exclusions are worth mentioning: the PDL makes no allowance for health assistance. Nor is there an allowance for travelling or entertainment. Once defined the basket comprising the above five categories, its cost was estimated using prices collected in May 2004. Data collectors surveyed 2,560 outlets in 53 different localities collecting prices for 123 items. The items in the basket were priced using the "minimum regular prices"[104]. The fact that prices were collected separately that implies a spatial deflator is implicitly built-in the official PDL.

[104] "Regular prices are the actual prices faced by consumers for a longer period of time, while special or discount prices are short-term prices. For PDL purposes, regular prices were used." (Central Statistical Office, 2008)

Table A1: Monthly food requirement (Kg) by sex and age

	Items	Quantities										
		0	0-3	4-6	7-9	10-14	15-19		20-64		65+	
		Both genders					Male	Female	Male	Female	Male	Female
1	Cereal 1 Meal	4.2	6.2	8.4	9.0	10.0	12.0	12.0	12.6	11.4	10.8	9.7
2	Cereal 2 Bread Flour	0.8	1.0	1.5	2.3	2.3	2.3	2.3	2.3	2.3	1.9	1.9
3	Sugar	0.3	0.5	0.8	0.8	1.0	1.0	1.0	1.0	1.0	0.9	0.9
4	Vegetables	1.1	2.4	2.6	2.6	3.5	3.5	3.5	3.5	3.5	3.0	3.0
5	Greens	0.5	0.8	1.0	1.0	1.5	1.5	1.5	1.5	1.5	1.3	1.3
6	Pulses	0.3	0.3	0.5	0.8	0.8	1.0	1.0	1.0	1.0	1.0	1.0
7	Fat	0.3	0.4	0.5	0.5	0.5	0.8	0.8	0.8	0.8	0.6	0.6
8	Salt	0.0	0.0	0.0	0.0	0.5	0.5	0.5	0.5	0.5	0.4	0.4
9	Meat	0.7	1.4	1.6	1.2	1.2	2.4	2.3	2.4	2.3	2.0	1.8
10	Tea/Coffee	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.3	0.3	0.2	0.2
11	Fresh Milk	10.3	8.2	8.2	5.7	5.7	3.9	3.9	3.9	3.9	3.3	3.3

Source: CSO (2008)

Table A2: Clothing requirements by sex and age.

Items		Quantities						
		0-2	2-6		7-17		Adult	
		Both genders	Male	Female	Male	Female	Male	Female
12	Shoes	-	-	-	-	-	2	2
13	Trousers (14+)	-	-	-	1	-	2	-
14	Shorts	-	2	-	2	-	-	-
15	Underwear (14+)	-	-	-	-	-	2	-
16	Shirt	-	1	-	2	-	2	-
17	T-shirts	-	2	2	2	2	2	2
18	Jersey	-	2	2	2	2	2	2
19	Jacket	-	-	-	-	-	1	-
20	Hat (over 55)	-	-	-	-	-	1	-
21	Dress	-	-	-	-	2	-	2
22	Half slip (14+)	-	-	-	-	-	-	1
23	Panties (14+)	-	-	-	-	4	-	4
24	Shawl	-	-	-	-	-	-	1
25	Bra (14+)	-	-	-	-	2		2
26	Headscarf	-	-	-	-	-	-	1
27	Leather shoes	-	-	-	1	1	-	-
28	School socks	-	-	-	2	2	-	-
29	School tunic	-	-	-	-	2	-	-
30	School blouse	-	-	-	-	2	-	-
31	Play shoes	-	2	2	-	-	-	-
32	Nappies	12	-	-	-	-	-	-
33	Plastic pants	2	-	-	-	-	-	-
34	Vests	2	-	-	-	-	-	-
35	Rompers	2	-	-	-	-	-	-
36	Jersey	2	-	-	-	-	-	-
37	Knitted hat	2	-	-	-	-	-	-
38	Bootees	2	-	-	-	-	-	-
39	Blanket	2	-	-	-	-	-	-
40	Shawl	1	-	-	-	-	-	-
41	Tracksuit	2	-	-	-	-	-	-
42	Baby nappy pin	1	-	-	-	-	-	-

Source: CSO (2008)

Table A3: Personal items requirements by sex and age.

Items		Quantities				
		0-11	12-13	14-17	Adult	
		Both	Both genders	Both genders	Male	Female
43	Toilet soap, 150 g	24	12	12	12	12
44	Toothbrush	-	1	1	1	1
45	Toothpaste, 50ml	-	8	8	8	8
46	Vaseline 50g	6	6	6	6	6
47	Mug	1	1	1	1	1
48	Spoon	1	1	1	1	1
49	Bowl	1	1	1	1	1
50	Washing rag	2	2	2	2	2
51	Razor blade, Minora	6	-	-	-	-

Source: CSO (2008)

Table A4: Household goods and housing requirements

Items		Quantities	Items		Quantities
52	Bench, one	1	70	Primus	1
53	Sitting mat	1	71	Matches, box	48
54	Bath tub	1	72	Cooking pot	2
55	Tub Bucket	1	73	3 legs Basket	2
56	Iron, flat	1	74	Pestle (motshe)	2
57	Suitcase	1	75	Mortar (kika)	1
58	Needle	1	77	Winnowing fan	1
59	Thread Teapot	1	78	Axe	1
60	Kitchen knife	1	79	Pick	1
61	Stirrer	1	80	Matches, box	36
62	Pair of scissors Bowl	1	81	Paraffin	
63	Hoe (for weeding)	1		N. Members 1	5
64	Grass broom	2		N. Members: 2-6	10
65	Shoe polish, small	6		N. Members: 7-12	15
67	Comb	1		N. Members: 13+	20
68	Toilet paper	1	82	Firewood	1
69	Saucepan	24	83	Housing	Function of HH size

Source: CSO (2008)

Both households' income and consumption were collected by Statistics Botswana in 2002/03 and 2009/10, but consumption is the only reliable measure to use for poverty analysis. It is a well-known fact that the consumption is easier to measure more accurately than income. Survey questions on income typically require a long reference period to capture seasonal incomes, and agricultural incomes are extremely volatile. Additionally, household income aggregate is difficult to construct for self-employed households, households engaged in subsistence agriculture and for employees of the informal sector, because it is hard to estimate business expenses and revenues. The consumption data are less prompt to these problems. The main

reason, however, to use consumption instead of income for welfare measurement is due to major underreporting of the households' incomes. Questions about consumption are usually viewed as less sensitive than questions about income, especially if respondents are concerned that information on income will be used for tax purposes. For these reasons, under-reporting of the incomes is a general problem of any households' survey and survey-based estimates of income for richer households are often substantially lower than those of consumption. Botswana survey data are not exempt from the problem of income inconsistency. We analyzed income data in depth and realized that while formal employment wages are well reported in the surveys, the self-employment incomes and especially agricultural business incomes are mostly under-reported. Thus, only small portion of the rural households reported business activities in agriculture. The results based on income and consumption is drastically different for this reason. Statistics Botswana analyzed income and consumption data and found opposite trends in terms of changes in the inequality measures, but the main reason of those inconsistencies are following the differences in the data quality between income and consumption. In this study, we use internationally adopted methodology for estimation consumption aggregate and the consumption used as the main measure for poverty analysis.

The way consumption aggregate was constructed in Botswana is generally in line with the international recommendations, but some improvements should be made in the future upon collecting additional information allowing imputing value of the durable goods, housing, and rents. It is recommended that the consumption measure for poverty analysis be estimated on the basis of recommendations made by the International Labor Organization (ILO) (2003) based on the guidance provided in the Deaton & Zaidi (2002). The general method constructing the aggregate follows the recommended methodology, but there are some differences especially in relation to the estimation of the durable goods. The international guidelines suggest use of values of durable goods and imputed housing in the consumption aggregate. However, Botswana households' surveys did not collect all the information required to calculate these values. Durable goods can be dealt with in several ways in the welfare aggregate. Further improvements can be made to the consumption aggregate by improving the collection of Household Survey data. There is a need to account for the imputed use value of durables, which requires collecting information on the purchase value, estimated resale value, and date of acquisition of durable goods. Estimation of in-kind consumption from gifts and self-produced food is currently made by applying a regional average unit value based on the reported ratios of purchase values to purchase quantities. With these exceptions, the consumption aggregate adopted in this study is merely following the international standards and there is no easy way to improve the measures without improving survey methodology. We describe below the construction of the consumption aggregate and its component in more detail.

Annex B: Poverty Lines and Spatial Cost-of-Living Differences

The only way to replicate the official estimates using aggregated poverty lines is that of imposing ex-ante, i.e. by construction, the consistency between official poverty estimates and the aggregated poverty lines. For instance, if we want to use, as it is standard in many poverty assessment reports, a single national level poverty line consistent with official estimates we need to derive this poverty line not as an average line calculated over the official households' level poverty lines but as the value of the quantile function calculated at the official national incidence of poverty:

$$PL_i = F^{-1}(H_i) \tag{2}$$

where F^{-1} is the inverse of the cumulative density function of the total households' expenditure and H_i is the official poverty headcount for the year i. Applying the above formula we obtain the implicit poverty lines $PL_{03} = X$ and $PL_{09} = Y$. It is immediate to verify that the poverty lines PL_{03} and PL_{09} satisfy, by construction, the following property:

$$prob\{THE_h^{03} \leq PL_{03}\} = H_{03}$$
$$prob\{THE_h^{09} \leq PL_{09}\} = H_{09}$$

where THE_h^{09} and THE_h^{09} are the total household expenditures for 2003 and 2009 respectively.

Annex C: Implicit Spatial Deflation and Regional Poverty Profile

Implicit regional poverty lines define a set of spatial price deflators that adjust for cost-of-living differences and differences in needs across the national territory. As illustrated in section 4.1 the analytical strategy followed by CSO is that adjusting for spatial differences in the cost of living and differences in needs producing not a single poverty line, but a set of poverty lines defined at the household level. Actually, they calculated 3,465 poverty lines in 2002/03 and 3,803 poverty lines in 2009. The regional poverty lines in Tables 2 and 3 (last columns), synthetize all these poverty lines by regions. However, these average poverty lines are analytically not consistent with the official 2002/03 and 2009/10 poverty estimates. If we use the average PDL poverty lines in table 2 and 3 instead of all the 3465 and 3803 household level poverty lines we do not obtain/replicate the official poverty estimates. However, a set of implicit regional poverty lines consistent with the official poverty rates can be easily estimated using the quintile function[105] and Table C1 shows the results.

Table C1 – Implicit spatial price indices, 2003-2009

	PDL 2003	PDL 2009	SPI 2003	SPI 2009
Gaborone	579	1,068	76.4	81.0
Francistown	721	1,133	95.2	86.0
Other Cities & T	728	1,094	96.1	83.1
Rural South-East	734	1,296	96.8	98.4
Rural North-East	815	1,428	107.6	108.4
Rural North-West	808	1,479	106.6	112.3
Rural South-West	863	1,388	113.9	105.3
Cities/Towns	661	1,091	87.8	82.2
Urban villages	806	1,532	107.1	115.5
Rural areas	760	1,269	100.9	95.7
Rural	759.7	1,269	100	95.6
Urban	760	1,373	100	103.4
Botswana	758	1,318	100	100

Source: Our estimates.

[105] See the appendix B

The ratio between a regional poverty line and the national level poverty line can be interpreted as an implicit spatial cost-of-living index. This is because the regional level poverty lines, keeping constant the standard of living, take into account for differences in the households' consumption pattern and in the local market prices structure. Hence a simple estimate of the spatial cost of living index SPI_r^i for the region r in year i is given by:

$$SPI_r^i = \frac{PL_i^r}{E[PL_i]}$$

where PL_i^r is the average poverty line for region r and $E[PL_i]$ is the average national poverty line. Table C1 (col. 3 and 4) shows the estimate for the regional cost of living differences obtained applying the equation above. Basically, the spatial price deflators in table C1 are the ones implicitly used by CSO to obtain official poverty measures in 2002/2003 and 2009/2010.

Quite surprisingly the spatial price indices used by CSO are lower that national average in Gaborone, Francistown, and Other Cities and higher than national average in most of rural areas (the only exception being Rural South East). This is in contrast with standard international evidence and with the well-known Balassa-Samuelson effect according to which the cost of living should be higher in rich areas than in poor areas. Figures C1 and C2 below shows the impact of implicit regional deflations on the regional poverty profiles. The table compares the official poverty incidence estimates with the estimate we obtain using the unique national level poverty line $E[PL_i]$.

Figure C1: The incidence of poverty by region and implicit spatial deflation, 2003

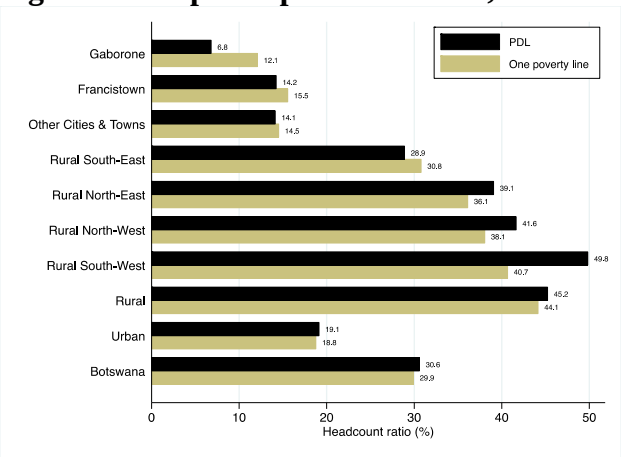
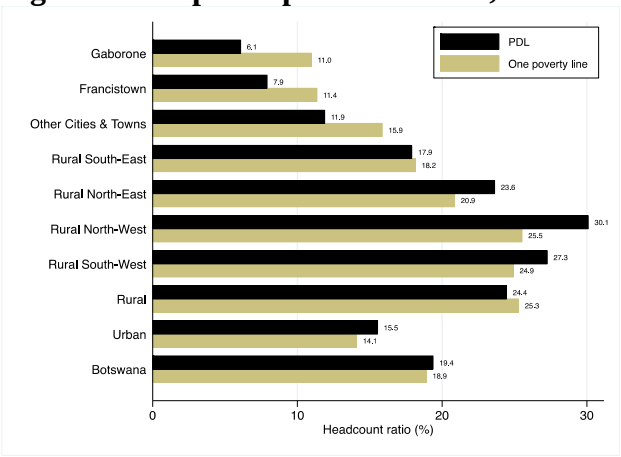


Figure C2: The incidence of poverty by region and implicit spatial deflation, 2010



Source: World Bank estimates.

In principle, the spatial price indices in Table C1 could be used to adjust the nominal consumption aggregate to take into account for differences in the cost of living. This is what has been done, implicitly, by CSO in poverty analysis. However a direct adjustment of the households' expenditure would affect also inequality analysis. Nevertheless, we decided to do not use spatial deflators for inequality analysis for at least three reasons: 1) there is a clear consensus on the methodology that should be used to estimate spatial price indices (see Gibson 200? and Deaton and Zaidi, 2002). The method used to estimate the indices in table 12 is opaque

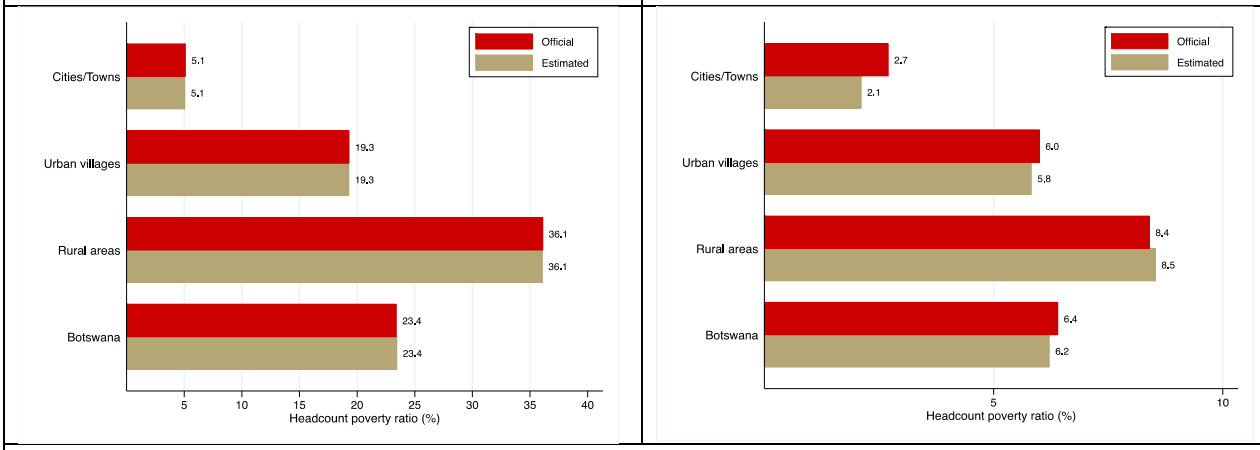
and it is not clear if this method is consistent with the best practices adopted in the literature; 2) the price indices in table 12 are clearly focused on the consumption pattern of the poor while inequality analysis refers to the entire expenditure distribution; 3) the ratio between poverty lines take into account not only for differences in the cost of living and in consumption patterns but also for differences in needs. For instance, regional poverty lines, in measuring the cost of housing, incorporate economies of scales. While these elements are crucial in measuring poverty it is not obvious that they should be considered in inequality analysis.

Annex D: On the Replicability of Official Poverty Estimates

The capacity to replicate official estimates is a pre-condition to investigate the poverty trend in Botswana during the 2000s. Based on the datasets kindly made available to us by the CSO, we estimated poverty and inequality rates and compared our results with the official estimates published in various sources. This Appendix shows a selection of the results.

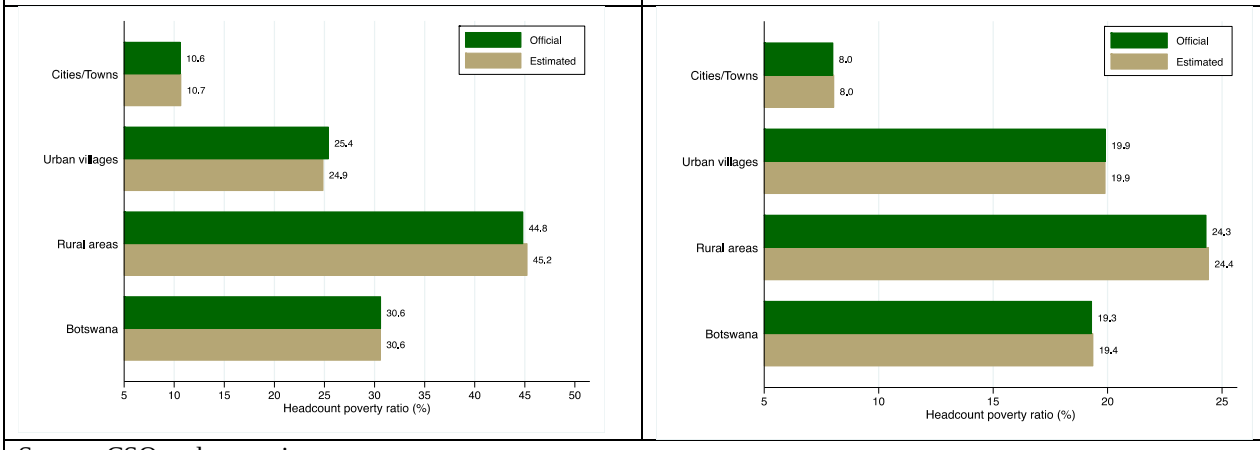
Figure D1 compares the poverty headcount rates when using the "old" one-dollar-a-day poverty line (that is $1.08 a day in 1993 PPP terms, or $32.74 per month). Overall, estimated poverty rates match official estimates almost perfectly. When it comes to using the "poverty datum line", that is the official poverty lines calculated by the CSO, small differences are observed between (Figure D2).

Figure D1 – Official versus estimated poverty rates (one-dollar-a-day poverty line)



Source: CSO and our estimates

Figure D2 – Official versus estimated poverty rates (poverty datum line)



Source: CSO and our estimates

Annex E: Inflation and Poverty Trends

The analysis of the poverty trend in Botswana is complicated given the official method used to estimate poverty lines. CSO (2008) has documented the construction of the 2002-03 poverty line. Overall, ca. 3,500 different poverty lines were estimated for a sample comprising 6,053 households. A similar method was also applied in 2009/10, when a new battery of poverty lines was estimated (ca. 3,800 poverty lines for 7,844 households).[106]

In order to apply standard poverty trend decomposition techniques we need a real consumption aggregate for 2002-03 and 2009-10. In the context of Botswana there is a plurality of temporal deflators available for this purpose and it is not immediately clear which one we should use. On the other hand, as we will argue shortly, the choice of the deflator is key in identifying the poverty trend.

The first and simplest option is to use the official CPI, regularly published by the Botswana CSO since the early 1960s. A second option is to use the implicit CPI that is embedded by the availability of two national level poverty lines. In principle, the ratio between the average 2009-10 poverty line to the average 2002-03 poverty line can be interpreted as the (cumulative) inflation rate faced by the poor between the two survey years. A third option – the one that we recommend in this note - is to use another implicit deflator that can be calculated by dividing the quantiles corresponding to the official national headcount poverty rates for the two survey years.

A full understanding of the pros and cons associated with each of the above mentioned options is essential to make a decision capable to reconcile the requirements of welfare analysts with the political need of using national poverty lines, firmly established in the country. In this note we illustrate and discuss each option and provide estimates of alternative CPIs to be used in the report.

1. Official inflation. The official CPI can be used to update the official 2002-03 poverty lines. The main drawback with this procedure is that it fails to reproduce the official poverty trend. To illustrate, let $PL^n_{03} = E\left[PL^g_{03}\right]$ denote the official national poverty line for 2002-03 calculated as an average of the 2002-03 poverty lines, where $PL^g_{03}$is the poverty line for the households belonging to the group/type g (as mentioned above, in 2002-03 there are ca. 3,500 different lines in the household-level sample). Similarly, let $PL^n_{09} = E\left[PL^g_{09}\right]$ denote the corresponding official national level poverty line for 2009-10. It follows that:

$$\widetilde{PL}^n_{09} = E\left[CPI_{09} \times PL^g_{03}\right] = CPI_{09} \times E\left[PL^g_{03}\right] = CPI_{09} \times PL^n_{03} \neq PL^n_{09}$$

Conclusion: if we apply the official CPI to the 2002-03 poverty lines, the incidence of poverty based on PL^n_{09} will be different from the estimate of the incidence of poverty based on $\widetilde{PL}^n_{09}$. The discrepancy between the analyst's and the official poverty estimates is often the source of confusion and this leads us to consider a different option.

[106] This is a presumption, in fact, as we failed to find a methodological note for 2009-10.

2. Inflation implicit in the ratio of official poverty lines. We can calculate an implicit deflator $\widetilde{CPI}_{09}$ as the ratio between the average national official poverty lines:

$$\widetilde{CPI}_{09} = \frac{E\left[PL_{09}^{g}\right]}{E\left[PL_{03}^{g}\right]}$$

As with option 1, this procedure will produce a poverty trend different from the official trend. This is due to the fact that the national poverty headcount is a weighted average of household-level headcount rates ($H_{09} = E\left[H_{09}^{g}\right]$) which in turn are based on group specific poverty lines: $H_{09}^{g} = F\left(PL_{09}^{g}\right)$, and the latter depend on "group specific" implicit deflators. What we get then is

$$\widetilde{PL}_{09}^{g} = \widetilde{CPI}_{09} \times PL_{03}^{g} = \frac{PL_{09}^{n}}{PL_{03}^{n}} \times PL_{03}^{g} \neq PL_{09}^{g}$$

As before, the conclusion here is that the analyst's and the official poverty trends will not match.

3. Inflation implicit in the ratio of the official poverty-line quantiles. If the analyst wants to mimic (stick to) the official poverty trend, she can calculate an implicit deflator $\widetilde{CPI}_{09}$ as the ratio between inverse of the cumulative density function (i.e., the quantile function) at the official national headcount ratio in 2009 and the inverse of the cumulative density function) at the official national headcount ratio in 2002/03:

$$\widetilde{CPI}_{09} = \frac{F_{09}^{-1}(H_{09})}{F_{03}^{-1}(H_{03})}$$

by construction $F_{09}^{-1}(H_{09}) = \widehat{PL}_{09}^{n}$ and $F_{03}^{-1}(H_{03}) = \widehat{PL}_{03}^{n}$ are the national level poverty lines consistent with the official incidence of poverty in 2009 and 2003, respectively. The main advantage of this procedure is that it does not alter the official trend of poverty. This can be shown as follows:

$$\widetilde{PL}_{09}^{n}=CPI_{09} \times \widehat{PL}_{03}^{n} = \frac{F_{09}^{-1}(H_{09})}{F_{03}^{-1}(H_{03})} \times \widehat{PL}_{03}^{n} = F_{09}^{-1}(H_{09})$$

The estimated poverty headcount is given by:

$$\widetilde{H}_{09} = F[\mathrm{F}_{09}^{-1}(H_{09})] = H_{09}$$

Table E1 shows the results for the three methods. Overall, methods 1 and 3 produce estimated inflation rates that are very close to each other. This implies that (i) the analysis of poverty changes is robust to the choice of the CPI and (ii) there is no need to reconcile any conflict between official and estimated poverty trends.

Table E1: Estimated inflation rates between 2002-03 and 2009-10

	Method	Cumulative Inflation	Annual Inflation (%)
1	Official CPI	1.86	10.85
2	Implicit CPI	1.55	7.59
3	Quantile ratio	1.82	10.49
	- Cities/Towns	1.78	10.13
	- Urban villages	1.60	8.18
	- Rural areas	1.84	10.65

Source: CSO and our estimates

Annex F: Poverty Dominance Analysis

Among the most powerful tools to carry out poverty comparisons is poverty dominance analysis (Atkinson 1987). The aim of dominance analysis is to carry out ordinal comparisons across distributions, so as to answer the question "Is poverty lower in 2009/10 than in 2002/03?" as opposed to cardinal comparisons where the question is "How lower is poverty in 2009/10 than in 2002/03"? The main advantage of this approach is that the answer does not depend on where the poverty line is set. Given the laboriousness of the method for setting poverty lines in Botswana (Section 4 and Appendix A) the focus on poverty dominance analysis turns out particularly appropriate in the context of Botswana.

Poverty in Botswana has unambiguously decreased between 2002/03 and 2009/10. In order to investigate whether poverty in Botswana did decrease between 2002/03 and 2009/10, we must compare the cumulative density functions (CDF) for 2002/03 and 2009/10. We adjust for inflation the 2003 PCE using the official CPI. The CPI between 2003 and 2009/10 equals 1.8242. Figure F1 shows the so-called poverty incidence curves (Ravallion 1994: 67) for 2003 (dashed line) and 2009/10 (solid). Clearly, the 2009/10 distribution first-order stochastically dominates (FOD) the 2003 distribution. The interpretation of this finding is that for much of the distributions we observe, households in 2009/10 are better off than households in 2002/03.[107]

Foster and Shorrocks (1988) showed that FOD implies higher order stochastic dominance. In our context this means that the poverty trend between 2003 and 2009/10 is robust not only to the choice of the poverty line, but also to choice of the poverty measure (within the FGT class of poverty measures). In other words, poverty in Botswana has decreased not only in terms of incidence (headcount ratio) but also in depth (poverty gap index) and severity (poverty gap squared index).

The decrease in poverty is robust to sampling errors. Further investigation is required to check the statistical significance of the difference between the two curves. In section 2 we argued that the two surveys are comparable in terms of sampling design; yet, it is important to rule out the possibility that sampling errors play any major role in the result established in Figure F1. Chen and Duclos (2011) provide a simple test to check whether the distance between the two curves is statistically significant. In Figure 6 the null hypothesis is "non-dominance": the test rejects this hypothesis for all poverty lines up to 1,900 pula/household/month. This corresponds to the 85^{th}- percentile of the population. We can therefore legitimately conclude that, at the national level, poverty in Botswana has decreased between 2002/03 and 2009/10. This finding does not depend on where the poverty line is drawn (as long as it falls in the range of 0-1,900 pula/household/month).

[107] This holds true for poverty lines in the range [0, 1,960] pula/household/month. In 2009/10 only 13 percent of the population had PCE greater than 1,960 pula per month.

Figure F1: Poverty incidence curve, Botswana 2002/03-2009/10.

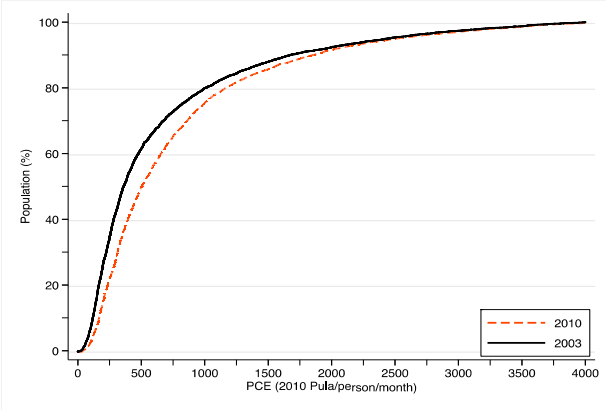
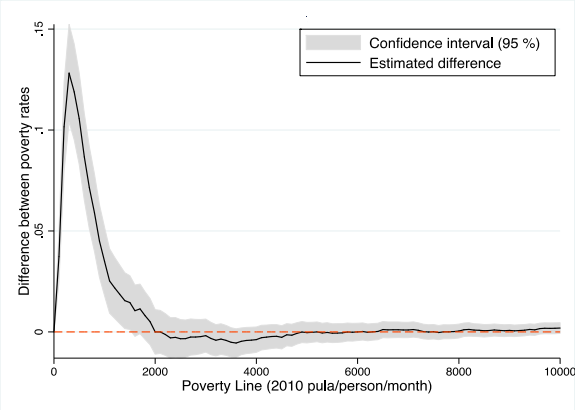
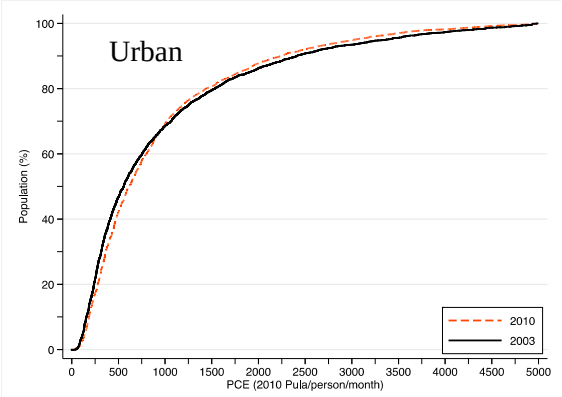


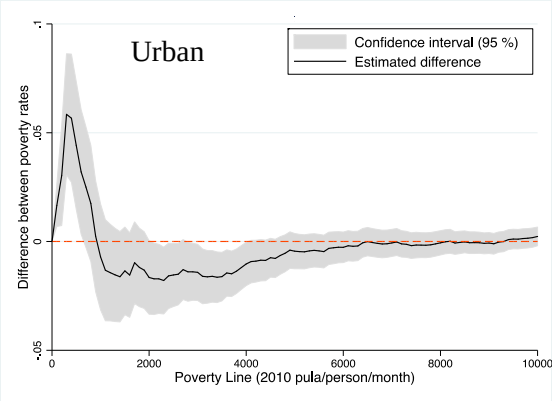
Figure F2 – Differences in cumulative distributions functions (2003 minus 2010), with 95% confidence intervals

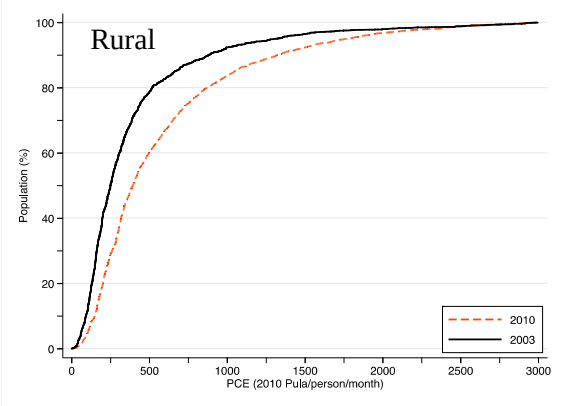


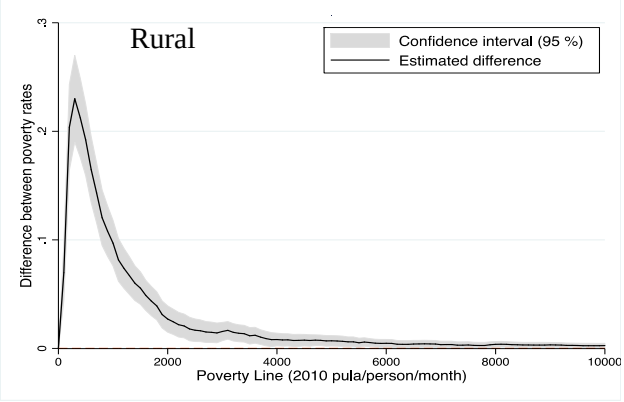
Source: Author's estimates based on HIES (2002/03) and CWIS (2009/10)

Figure F3: Poverty incidence curves by urban and rural area, Botswana 2002/03-2009/10.









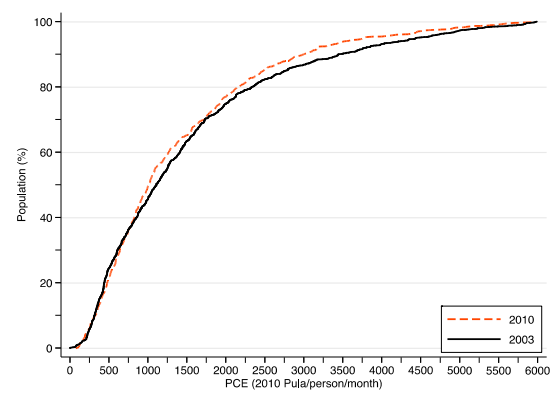
Poverty in cities and towns did not improve much: most gains benefitted rural areas. When we extend the analysis at the stratum level, results are shown in Figure F3. For each figure we report two graphs: on the left is the poverty incidence curve that allows testing for first-order stochastic dominance, while the graph on the right-hand side shows the results of the Chen-Duclos test. For the urban stratum the null of non-dominance cannot be rejected (this holds true for all plausible ranges of poverty lines). Based on this, we cannot conclude that urban poverty

has decreased significantly during the 2000s. In contrast, total areas show clear-cut FOD: the incidence of poverty has decreased significantly.

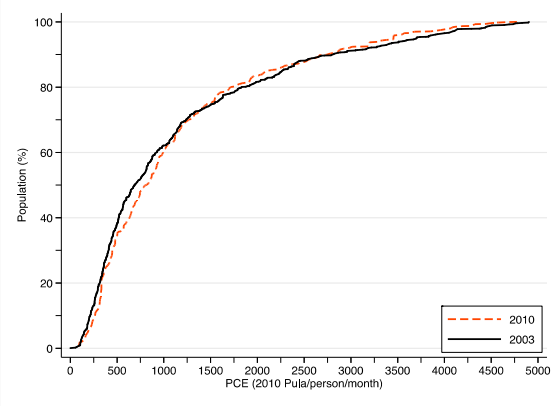
Not all rural areas, however, have equally participated in the reduction of poverty. In western areas poverty have improved by less than in eastern areas. Botswana is organized in seven regions, and we have calculated poverty incidence curves for each of them (Figure F4).

Figure F4: Poverty incidence curves by urban region, Botswana 2002/03-2009/10.

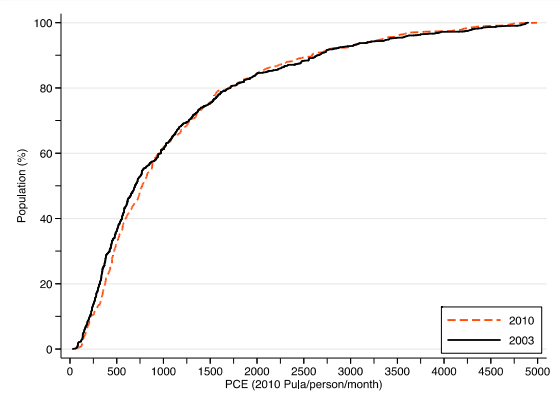
Gaborone



Francistown



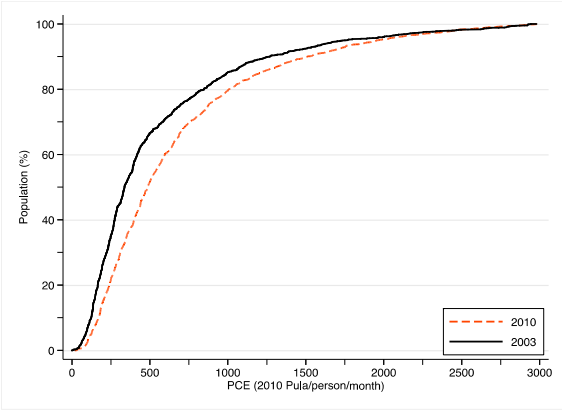
Other cities and towns



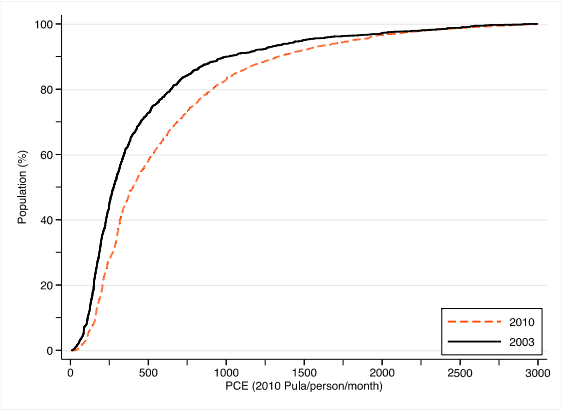
Source: Author's estimates based on HIES (2002/03) and CWIS (2009/10)

Figure F5 – Poverty incidence curve by rural region, Botswana 2002/03-2009/10.

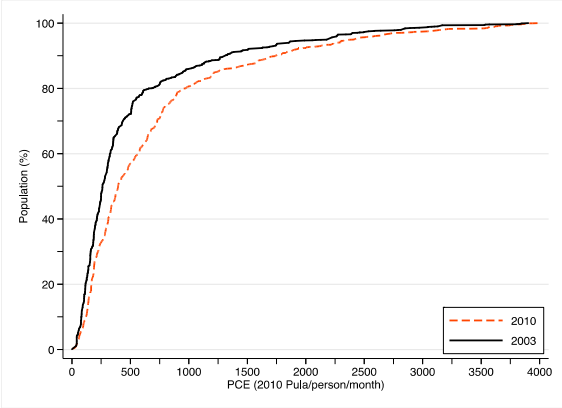
Rural South-East



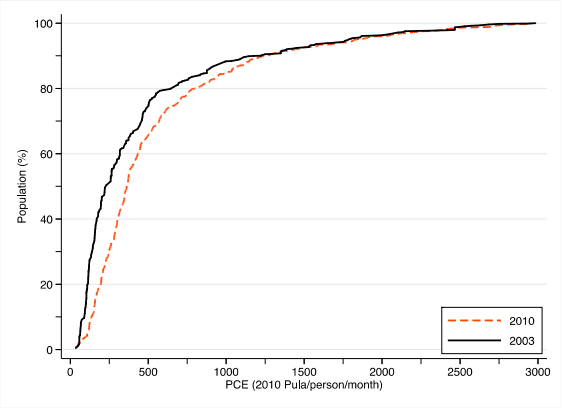
Rural North-East



Rural North-West



Rural South-West



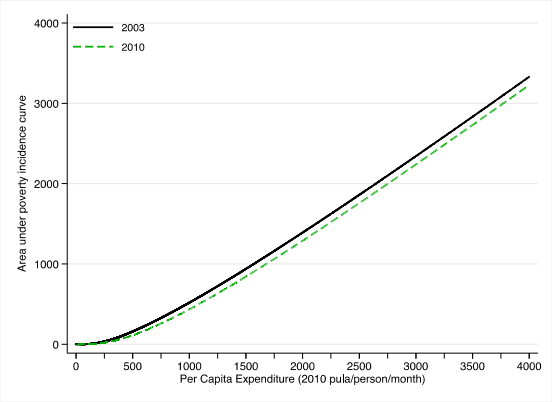
Source: Author's estimates based on HIES (2002/03) and CWIS (2009/10)

The depth of poverty in cities and towns did not decrease between 2003 and 2009. When the use of a poverty indicator such as the headcount poverty fails to rank two distributions, as is the case with urban area in Botswana, one strategy is to investigate whether the use of a different poverty measure can lead to different results. Figure F6 shows the so-called poverty deficit curves and poverty severity curves (Ravallion 1994: 67-72). When one curve lies above the other we say that we observe second-order stochastic dominance (SOD) and third-order stochastic dominance (TOD), respectively.

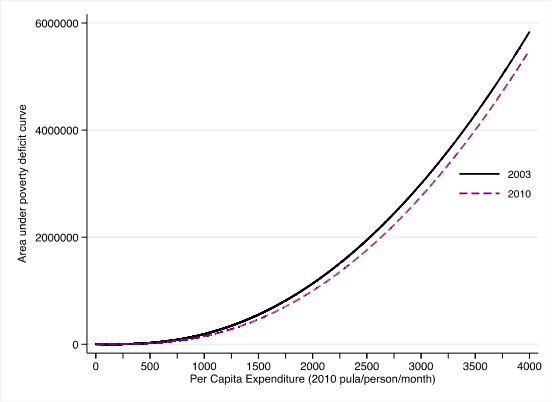
Figure F6: Poverty deficit and severity curves, Botswana 2002/03-2009/10

Botswana

Poverty deficit curve (poverty gap)

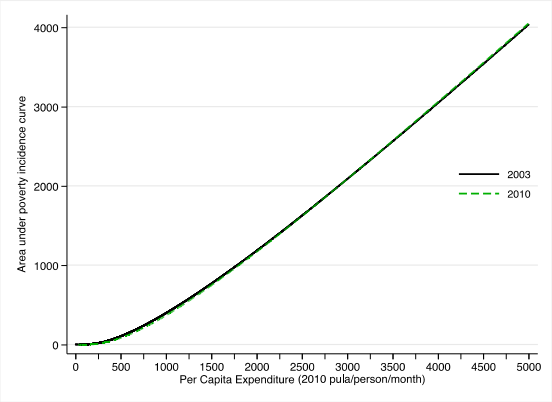


Poverty severity curve (poverty gap squared)

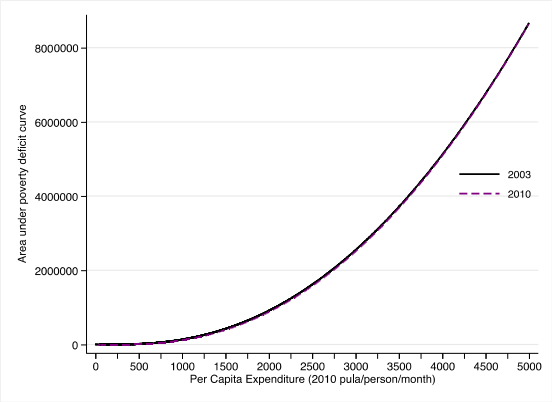


Urban

Poverty deficit curve (poverty gap)

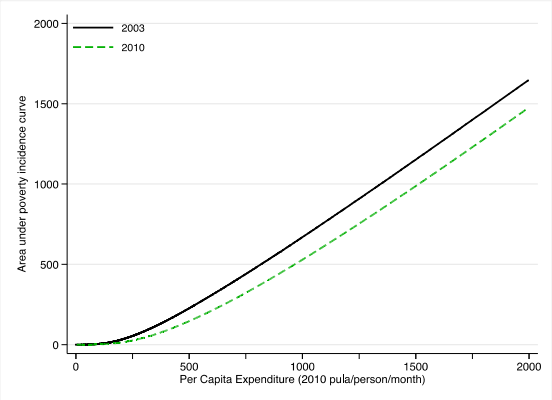


Poverty severity curve (poverty gap squared)

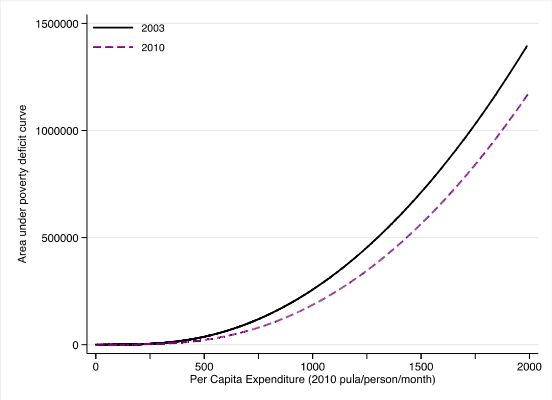


Rural

Poverty deficit curve (poverty gap)



Poverty severity curve (poverty gap squared)



Source: Author's estimates based on HIES (2002/03) and CWIS (2009/10)

Annex G: Sectoral Decomposition of Poverty and Inequality

The poverty trend can be also decomposed into the relative contributions of (i) changes in poverty within population sub-groups (for instance, rural and cities and towns or sector of activity), and (ii) changes in population shares across sub-groups. This kind of decomposition gives a sense of role played by population shifts in determining poverty dynamics.

Because of the additive decomposability of the FGT class of poverty indices, the poverty index H at time t can be written as:

$$H(t) = \sum_{k=1}^{K} n_k(t) H_k(t)$$

where $n_k(t)$ is the share of the population in sub-group k in period t and $H_k(t)$ is the FTG poverty index in sub-group k in period t. The question here is that of understanding how much of the observed variation in $H(t)$ is due to change in sub-group poverty measures $H_k(t)$ and how much depends on changes in the population shares $n_k(t)$. Following Ravallon and Huppi (1991) the sectoral decomposition can be linearly approximated as follow:

$$\Delta H = \underbrace{\sum_{k=1}^{K} n_k(t)[H_k(t_1) - H_k(t_0)]}_{\text{within-group}} + \underbrace{\sum_{k=1}^{K} H_k(t_0)[n_k(t_1) - n_k(t_0)]}_{\text{between-group}} + R$$

where the first term of the RHS capture the change in poverty due to change in poverty within the groups, the second term measures the contribution of population shifts and R denotes a residual term.

Table G1 shows the results of the decomposition for selected groups. The main result is that the within-group effects dominate, regardless the choice of the poverty measure and the definition of population sub-groups.

Table G1: Sectoral decomposition by area, region and sector, 2002/03-2009/10

Sub-group partition	Change in national index (%)	Change in poverty accounted for by changes in		
		Intra-sectoral effect	Intergroup effect	Residual
by urban/rural				
H	-11,22	-11,14	-0,24	0,16
	100	99	2	-1
PG	-5,5	-5,5	-0,1	0,1
	100	99	2	-1
PG2	-3,13	-3,12	-0,06	0,04
	100	99	2	-1
by region				
H	-11,22	-11,35	0,46	-0,33
	100	101	-4	3
PG	-5,5	-5,5	0,2	-0,2
	100	100	-3	3
PG2	-3,13	-3,14	0,09	-0,09
	100	100	-3	3
By economic sector: Primary/secondary/tertiary/not in labor force				
H	-11,24	-11,38	0,14	0,00
	100	101	-1	0
PG	-5,5	-5,4	-0,1	0,0
	100	98	3	-1
PG2	-3,13	-3,08	-0,08	0,02
	100	98	2	-1

Source: Author's estimates based on HIES (2002/03) and CWIS (2009/10)

Annex H: Poverty and Inequality Profile

Mean and Median Per Capita Consumption Expenditure, Growth, and the Gini Coefficient

	Mean	Median	Gini Coefficient
2003			
Cities/Towns	1,905.3	980.0	58.4
Urban villages	987.6	420.7	61.3
Rural areas	543.5	255.1	60.9
Total	**1,000.2**	**385.1**	**64.7**
2010			
Cities/Towns	1,967.5	950.6	59.9
Urban villages	1,037.8	515.9	58.3
Rural areas	802.3	407.7	56.8
Total	**1,130.3**	**529.6**	**60.5**
Percentage change			
Cities/Towns	3.3	-3.0	
Urban villages	5.1	22.6	
Rural areas	47.6	59.8	
Total	**13.0**	**37.5**	
Change			
Cities/Towns			1.5
Urban villages			-3.0
Rural areas			-4.1
Total			**-4.3**

Note: Changes shown between years 2002/3 and 2009/10

Table H1: Overall Poverty

	Poverty Headcount Rate			Poverty Gap			Squared Poverty Gap		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Cities/Towns	10.7	8.0	-2.6	3.3	2.4	-0.9	1.5	1.0	-0.5
Urban villages	24.9	19.9	-5.0	8.6	6.0	-2.6	4.0	2.6	-1.4
Rural areas	45.2	24.4	-20.8	18.3	8.3	-10.0	9.8	4.0	-5.8
Total	**30.6**	**19.4**	**-11.2**	**11.7**	**6.2**	**-5.4**	**6.0**	**2.9**	**-3.1**
Poverty line = zfoodpc10									
Cities/Towns	5.1	4.7	-0.4	1.6	1.1	-0.5	0.7	0.4	-0.3
Urban villages	18.5	14.2	-4.2	5.5	3.9	-1.6	2.4	1.7	-0.7
Rural areas	35.0	17.8	-17.2	12.8	5.7	-7.1	6.6	2.7	-3.9
Total	**22.7**	**13.8**	**-8.9**	**7.8**	**4.1**	**-3.7**	**3.8**	**1.9**	**-2.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H2: Distribution of Poor in Urban and Rural Areas

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Cities/Towns	10.7	8.0	-2.6	7.9	8.6	0.8	22.6	20.9	-1.8
Urban villages	24.9	19.9	-5.0	27.1	37.0	9.9	33.4	36.1	2.7
Rural areas	45.2	24.4	-20.8	65.0	54.3	-10.7	44.0	43.0	-0.9
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Cities/Towns	5.1	4.7	-0.4	5.1	7.0	2.0	22.6	20.9	-1.8
Urban villages	18.5	14.2	-4.2	27.2	37.3	10.1	33.4	36.1	2.7
Rural areas	35.0	17.8	-17.2	67.7	55.6	-12.1	44.0	43.0	-0.9
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H3: Distribution of Population across Quintiles

	Quintiles of WA				
	Q1	Q2	Q3	Q4	Q5
2003					
Cities/Towns	4.1	8.6	17.3	27.3	42.8
Urban villages	15.1	21.1	20.1	23.1	20.5
Rural areas	31.9	25.0	21.3	13.9	7.9
Total	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**
2010					
Cities/Towns	7.0	11.6	18.1	25.9	37.3
Urban villages	20.2	20.2	21.2	20.4	18.1
Rural areas	26.1	23.9	19.9	16.8	13.2
Total	**20.0**	**20.0**	**20.0**	**20.0**	**20.0**
Change					
Cities/Towns	3.0	3.1	0.8	-1.4	-5.5
Urban villages	5.0	-0.9	1.1	-2.7	-2.5
Rural areas	-5.7	-1.1	-1.4	2.9	5.4
Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H4: Headcount Ratio by Sub-national Regions

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Region									
Gaborone	6.8	6.1	-0.7	2.4	3.2	0.8	10.8	10.3	-0.5
Francistown	14.2	7.9	-6.3	2.3	2.1	-0.2	5.0	5.2	0.2
Other Cities & Towns	14.1	11.9	-2.2	3.2	3.3	0.1	6.9	5.4	-1.5
Rural South-East	28.9	17.9	-11.0	27.8	28.3	0.4	29.5	30.6	1.1
Rural North-East	39.1	23.6	-15.4	41.6	40.8	-0.8	32.5	33.4	0.9
Rural North-West	41.6	30.1	-11.5	11.4	10.9	-0.4	8.4	7.0	-1.3
Rural South-West	49.8	27.3	-22.6	11.3	11.4	0.0	7.0	8.1	1.1
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Region									
Gaborone	2.4	4.0	1.6	1.1	3.0	1.9	10.8	10.3	-0.5
Francistown	7.2	4.3	-2.9	1.6	1.6	0.1	5.0	5.2	0.2
Other Cities & Towns	7.9	6.2	-1.7	2.4	2.4	0.0	6.9	5.4	-1.5
Rural South-East	21.9	13.0	-8.9	28.5	28.9	0.5	29.5	30.6	1.1
Rural North-East	28.4	15.8	-12.6	40.8	38.4	-2.4	32.5	33.4	0.9
Rural North-West	32.0	24.3	-7.7	11.8	12.4	0.7	8.4	7.0	-1.3
Rural South-West	45.4	22.5	-22.9	13.9	13.2	-0.7	7.0	8.1	1.1
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H5: Squared Gap Measure by Sub-national Regions

	Squared Poverty Gap			Contribution to Overall Poverty			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Region									
Gaborone	1.0	0.7	-0.3	3.7	3.8	0.1	10.8	10.3	-0.5
Francistown	2.0	1.2	-0.8	2.7	3.0	0.3	5.0	5.2	0.2
Other Cities & Towns	2.1	1.4	-0.7	3.5	3.9	0.4	6.9	5.4	-1.5
Rural South-East	5.4	2.6	-2.8	24.5	25.8	1.2	29.5	30.6	1.1
Rural North-East	7.1	3.2	-3.9	37.0	35.8	-1.3	32.5	33.4	0.9
Rural North-West	10.3	6.3	-4.0	14.1	14.7	0.6	8.4	7.0	-1.3
Rural South-West	12.3	4.6	-7.7	14.5	13.0	-1.5	7.0	8.1	1.1
Total	**6.0**	**2.9**	**-3.1**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Region									
Gaborone	0.5	0.3	-0.3	1.7	1.5	-0.1	10.8	10.3	-0.5
Francistown	0.8	0.5	-0.3	1.2	1.3	0.1	5.0	5.2	0.2
Other Cities & Towns	1.0	0.5	-0.4	1.8	1.7	-0.1	6.9	5.4	-1.5
Rural South-East	3.5	1.7	-1.7	25.1	27.7	2.6	29.5	30.6	1.1
Rural North-East	4.5	2.0	-2.5	37.3	35.9	-1.5	32.5	33.4	0.9
Rural North-West	7.4	4.7	-2.8	16.8	17.7	0.9	8.4	7.0	-1.3
Rural South-West	8.3	3.1	-5.2	16.1	14.2	-1.9	7.0	8.1	1.1
Total	**3.8**	**1.9**	**-2.0**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H6: Headcount Ratio by Household Head's Characteristics

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Gender of the household head									
Male	27.3	16.3	-10.9	45.4	42.0	-3.4	51.0	49.9	-1.1
Female	34.1	22.4	-11.7	54.6	58.0	3.4	49.0	50.1	1.1
Household head's age									
6-14	39.9	6.5	-33.4	0.2	0.0	-0.2	0.1	0.1	-0.1
15-19	16.2	20.1	3.9	0.4	0.6	0.2	0.8	0.6	-0.2
20-24	20.9	12.3	-8.7	2.3	2.1	-0.1	3.3	3.4	0.1
25-29	19.0	10.9	-8.1	4.3	4.7	0.4	6.9	8.3	1.4
30-34	17.0	13.0	-4.0	5.3	6.5	1.2	9.5	9.7	0.2
35-39	22.1	18.7	-3.5	7.4	10.5	3.1	10.2	10.9	0.7
40-44	29.6	14.1	-15.4	11.4	7.3	-4.1	11.8	10.0	-1.8
45-49	33.6	21.4	-12.2	13.6	12.1	-1.6	12.4	10.9	-1.5
50-54	31.0	21.9	-9.1	10.3	12.5	2.2	10.2	11.1	0.9
55-59	31.1	20.2	-10.9	7.9	9.3	1.3	7.8	8.9	1.1
60-64	39.6	22.8	-16.8	9.3	8.8	-0.5	7.2	7.5	0.3
65+	42.7	26.6	-16.2	27.6	25.6	-2.0	19.7	18.6	-1.1
Education of the household head									
Never attended	50.2	31.6	-18.7	61.0	50.1	-10.9	37.1	30.7	-6.4
Pre-school		21.0			0.3			0.3	
Informal	44.0	17.9	-26.1	4.0	4.0	-0.1	2.8	4.3	1.5
Primary	25.1	21.2	-3.9	28.6	30.0	1.4	34.9	27.5	-7.5
Secondary	7.7	8.1	0.4	6.3	15.6	9.2	25.1	37.2	12.1
Total	30.6	19.4	-11.2	100.0	100.0	0.0	100.0	100.0	0.0
Poverty line = zfoodpc10									
Gender of the household head									
Male	20.5	11.0	-9.5	46.0	39.8	-6.2	51.0	49.9	-1.1
Female	25.0	16.5	-8.5	54.0	60.2	6.2	49.0	50.1	1.1
Household head's age									
6-14	21.2	0.0	-21.2	0.1	0.0	-0.1	0.1	0.1	-0.1
15-19	13.5	11.6	-1.9	0.5	0.5	0.1	0.8	0.6	-0.2
20-24	12.9	9.2	-3.8	1.9	2.3	0.4	3.3	3.4	0.1
25-29	11.1	7.4	-3.7	3.4	4.5	1.1	6.9	8.3	1.4
30-34	11.9	8.3	-3.6	5.0	5.9	0.9	9.5	9.7	0.2
35-39	15.6	13.5	-2.1	7.0	10.7	3.6	10.2	10.9	0.7
40-44	20.4	10.5	-9.8	10.6	7.6	-2.9	11.8	10.0	-1.8
45-49	26.8	14.0	-12.8	14.7	11.1	-3.6	12.4	10.9	-1.5
50-54	23.1	16.9	-6.2	10.4	13.6	3.2	10.2	11.1	0.9
55-59	23.0	14.4	-8.5	7.9	9.3	1.4	7.8	8.9	1.1
60-64	33.7	15.5	-18.1	10.7	8.5	-2.2	7.2	7.5	0.3
65+	32.2	19.3	-12.9	28.0	26.1	-1.8	19.7	18.6	-1.1
Education of the household head									
Never attended	38.5	23.9	-14.6	62.9	53.3	-9.7	37.1	30.7	-6.4
Pre-school		0.0			0.0			0.3	
Informal	36.3	12.8	-23.5	4.5	4.0	-0.5	2.8	4.3	1.5
Primary	17.9	14.4	-3.6	27.6	28.6	1.1	34.9	27.5	-7.5
Secondary	4.6	5.2	0.7	5.0	14.1	9.1	25.1	37.2	12.1
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H7: Headcount Ratio by Employment Category

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Empl									
Employed	18.7	11.2	-7.5	17.2	18.6	1.4	28.2	32.2	4.0
Unemployed	32.2	21.1	-11.1	9.3	7.2	-2.1	8.8	6.6	-2.2
Student	27.7	24.1	-3.6	14.0	28.4	14.4	15.5	22.8	7.3
Not in labor force or education	38.3	23.1	-15.2	59.4	45.8	-13.7	47.5	38.4	-9.1
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Empl									
Employed	12.9	7.4	-5.5	16.0	17.2	1.2	28.2	32.2	4.0
Unemployed	24.7	14.9	-9.8	9.6	7.1	-2.5	8.8	6.6	-2.2
Student	19.7	17.4	-2.3	13.4	28.8	15.3	15.5	22.8	7.3
Not in labor force or education	29.1	16.8	-12.3	60.9	46.9	-14.1	47.5	38.4	-9.1
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H8: Headcount Ratio by Age Groups

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Age									
0-5	40.5	25.3	-15.1	19.0	18.1	-0.9	14.4	13.9	-0.5
6-14	34.5	27.3	-7.2	26.9	28.0	1.1	23.9	19.9	-4.0
15-19	28.9	21.8	-7.1	10.4	11.1	0.7	11.0	9.8	-1.2
20-24	25.8	15.8	-10.0	8.4	7.6	-0.8	10.0	9.3	-0.7
25-29	23.7	14.0	-9.7	6.3	7.1	0.8	8.1	9.8	1.7
30-34	20.9	13.4	-7.5	4.5	5.4	1.0	6.6	7.8	1.3
35-39	21.4	12.9	-8.5	3.6	4.1	0.4	5.2	6.1	0.9
40-44	25.2	13.8	-11.4	3.8	3.3	-0.4	4.6	4.7	0.1
45-49	28.6	13.7	-14.9	3.6	3.0	-0.6	3.8	4.2	0.3
50-54	28.1	16.2	-11.9	2.7	3.2	0.5	2.9	3.8	0.9
55-59	27.9	14.6	-13.3	2.0	2.1	0.1	2.2	2.8	0.6
60-64	34.2	15.7	-18.4	2.1	1.8	-0.3	1.9	2.2	0.3
65+	37.7	17.7	-20.0	6.6	5.2	-1.4	5.4	5.7	0.3
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Age									
0-5	31.6	18.5	-13.1	20.1	18.7	-1.4	14.4	13.9	-0.5
6-14	25.6	20.3	-5.4	26.9	29.3	2.3	23.9	19.9	-4.0
15-19	21.1	15.0	-6.1	10.2	10.7	0.5	11.0	9.8	-1.2
20-24	18.9	11.2	-7.7	8.4	7.6	-0.7	10.0	9.3	-0.7
25-29	17.1	9.7	-7.4	6.1	6.9	0.8	8.1	9.8	1.7
30-34	14.6	9.0	-5.6	4.2	5.1	0.9	6.6	7.8	1.3
35-39	15.9	9.2	-6.7	3.6	4.0	0.4	5.2	6.1	0.9
40-44	17.3	9.1	-8.2	3.5	3.1	-0.4	4.6	4.7	0.1
45-49	21.6	9.0	-12.6	3.6	2.7	-0.9	3.8	4.2	0.3
50-54	20.7	12.0	-8.7	2.7	3.3	0.6	2.9	3.8	0.9
55-59	20.5	9.7	-10.8	2.0	2.0	0.0	2.2	2.8	0.6
60-64	27.6	10.3	-17.3	2.3	1.6	-0.7	1.9	2.2	0.3
65+	26.9	11.9	-15.0	6.4	4.9	-1.5	5.4	5.7	0.3
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H9: Headcount Ratio by Education Level

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10 educational level - 5 categories									
Never attended	44.8	25.7	-19.1	36.8	34.1	-2.7	24.8	25.7	0.9
Pre-school	12.1	11.5	-0.7	0.5	0.8	0.3	1.3	1.3	0.1
Informal	33.9	13.0	-20.9	1.1	0.9	-0.1	1.0	1.4	0.4
Primary	32.0	23.8	-8.1	42.1	38.1	-3.9	39.7	31.0	-8.7
Secondary	17.7	12.4	-5.3	19.6	26.1	6.5	33.3	40.6	7.3
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10 educational level - 5 categories									
Never attended	35.0	18.6	-16.4	38.7	34.7	-4.0	24.8	25.7	0.9
Pre-school	9.4	9.1	-0.3	0.5	0.9	0.3	1.3	1.3	0.1
Informal	26.8	8.7	-18.0	1.1	0.9	-0.3	1.0	1.4	0.4
Primary	23.3	17.3	-6.0	41.3	38.9	-2.4	39.7	31.0	-8.7
Secondary	12.3	8.3	-4.0	18.3	24.6	6.3	33.3	40.6	7.3
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H10: Elasticity of FGT Indices to Per capita Consumption Expenditure

	Poverty Headcount Rate			Poverty Gap			Squared Poverty Gap		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Cities/Towns	-1.84	-1.11	0.73	-1.98	-2.15	-0.17	-1.95	-2.44	-0.50
Urban villages	-1.22	-1.81	-0.59	-1.71	-2.03	-0.32	-2.02	-2.19	-0.17
Rural areas	-0.68	-1.26	-0.58	-1.37	-1.76	-0.39	-1.57	-1.87	-0.30
Total	**-0.92**	**-1.45**	**-0.53**	**-1.49**	**-1.88**	**-0.39**	**-1.70**	**-2.02**	**-0.32**
Poverty line = zfoodpc10									
Cities/Towns	-1.68	-2.08	-0.39	-1.93	-2.60	-0.67	-2.08	-3.10	-1.02
Urban villages	-2.02	-2.07	-0.05	-2.00	-2.25	-0.25	-2.32	-2.24	0.08
Rural areas	-1.07	-1.67	-0.60	-1.57	-1.89	-0.32	-1.68	-1.90	-0.22
Total	**-1.36**	**-1.85**	**-0.49**	**-1.69**	**-2.06**	**-0.37**	**-1.83**	**-2.06**	**-0.24**

Note: Changes shown between years 2002/3 and 2009/10

Table H11: Headcount Ratio by Demographic Composition

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Number of children 0-6 years old									
no children	17.8	9.5	-8.3	21.4	20.9	-0.5	36.8	42.5	5.8
1	27.3	18.4	-8.9	24.4	24.8	0.4	27.3	26.1	-1.2
2	39.5	25.7	-13.8	26.1	23.3	-2.7	20.2	17.6	-2.6
3 or more children	54.8	43.8	-11.1	28.2	31.0	2.8	15.7	13.7	-2.0
Household size									
1	8.2	1.9	-6.3	1.5	0.8	-0.6	5.5	8.6	3.1
2	14.0	4.8	-9.2	3.3	2.4	-0.9	7.2	9.9	2.6
3	18.9	8.5	-10.4	5.3	5.2	-0.1	8.5	11.8	3.3
4	21.2	10.0	-11.2	8.5	7.2	-1.3	12.3	14.0	1.7
5	24.6	16.0	-8.7	10.2	10.6	0.4	12.7	12.9	0.2
6	31.5	21.8	-9.7	11.9	11.4	-0.5	11.6	10.1	-1.5
7 or more	43.0	36.9	-6.1	59.3	62.3	3.0	42.2	32.7	-9.4
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Number of children 0-6 years old									
no children	11.0	6.1	-4.9	17.8	18.7	0.9	36.8	42.5	5.8
1	20.8	12.4	-8.5	25.0	23.5	-1.6	27.3	26.1	-1.2
2	28.5	19.0	-9.6	25.4	24.3	-1.1	20.2	17.6	-2.6
3 or more children	45.9	33.7	-12.2	31.8	33.6	1.8	15.7	13.7	-2.0
Household size									
1	3.6	0.9	-2.7	0.9	0.6	-0.3	5.5	8.6	3.1
2	8.0	2.4	-5.5	2.5	1.7	-0.8	7.2	9.9	2.6
3	12.7	5.4	-7.3	4.7	4.6	-0.2	8.5	11.8	3.3
4	13.1	6.5	-6.6	7.1	6.6	-0.5	12.3	14.0	1.7
5	17.7	10.2	-7.4	9.9	9.6	-0.3	12.7	12.9	0.2
6	20.6	15.5	-5.1	10.5	11.3	0.8	11.6	10.1	-1.5
7 or more	34.7	27.6	-7.1	64.4	65.6	1.2	42.2	32.7	-9.4
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H12: Sensitivity of Poverty Measures to the Choice of Poverty Line

	Poverty Headcount Rate	Change from actual (%)	Poverty Gap	Change from actual (%)	Squared Poverty Gap	Change from actual (%)
2003						
Poverty line = zpc10						
Actual	30.6	0.0	11.7	0.0	6.0	0.0
+5%	32.3	5.6	12.6	8.1	6.5	9.6
+10%	35.0	14.3	13.6	16.3	7.1	19.3
+20%	38.9	27.1	15.5	33.3	8.3	39.1
-5%	29.0	-5.3	10.7	-8.1	5.4	-9.4
-10%	27.4	-10.6	9.7	-16.5	4.9	-18.6
-20%	22.6	-26.1	7.8	-33.0	3.8	-36.0
Poverty line = zfoodpc10						
Actual	22.7	0.0	7.8	0.0	3.8	0.0
+5%	24.7	9.0	8.6	9.6	4.2	10.6
+10%	26.2	15.4	9.4	19.5	4.7	21.5
+20%	28.7	26.3	10.9	38.7	5.5	44.3
-5%	21.0	-7.7	7.1	-9.4	3.4	-10.2
-10%	19.2	-15.5	6.4	-18.5	3.1	-20.0
-20%	15.6	-31.2	5.0	-36.5	2.4	-38.1
2010						
Poverty line = zpc10						
Actual	19.4	0.0	6.2	0.0	2.9	0.0
+5%	20.8	7.3	6.9	10.6	3.2	11.9
+10%	22.2	14.4	7.5	21.3	3.6	24.2
+20%	25.4	31.3	8.9	42.8	4.3	50.0
-5%	17.7	-8.8	5.6	-10.4	2.5	-11.3
-10%	16.2	-16.2	4.9	-20.7	2.2	-22.1
-20%	12.8	-34.1	3.7	-40.0	1.7	-41.4
Poverty line = zfoodpc10						
Actual	13.8	0.0	4.1	0.0	1.9	0.0
+5%	15.5	12.3	4.6	12.1	2.1	12.5
+10%	16.5	19.8	5.1	24.6	2.3	25.8
+20%	19.1	38.9	6.2	50.4	2.9	54.3
-5%	12.4	-9.9	3.6	-11.7	1.6	-11.7
-10%	10.9	-20.7	3.2	-22.5	1.4	-22.6
-20%	8.2	-40.8	2.4	-41.8	1.1	-41.8

Table H13: Elasticity Watts Index, SST Index, and CHUC Index to Per capita Consumption Expenditure

	Watts Index			Sen-Shorrocks-Thon Index			CHUC Index		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Cities/Towns	4.6	3.2	-1.4	6.4	4.8	-1.6	7.5	4.4	-3.1
Urban villages	12.0	8.3	-3.7	15.7	11.2	-4.5	15.7	11.7	-3.9
Rural areas	28.1	12.0	-16.0	31.0	15.2	-15.8	35.5	18.2	-17.4
Total	**17.4**	**8.8**	**-8.5**	**20.9**	**11.7**	**-9.3**	**24.4**	**13.3**	**-11.1**
Poverty line = zfoodpc10									
Cities/Towns	2.2	1.4	-0.7	3.2	2.2	-0.9	3.5	1.8	-1.7
Urban villages	7.4	5.4	-2.0	10.4	7.6	-2.8	9.8	8.0	-1.8
Rural areas	19.2	8.3	-11.0	22.8	10.8	-12.0	26.6	13.2	-13.4
Total	**11.4**	**5.8**	**-5.6**	**14.6**	**7.9**	**-6.7**	**16.9**	**9.1**	**-7.8**

Note: Changes shown between years 2002/3 and 2009/10

Table H14: Growth and Redistribution Decomposition of Poverty Changes

				Change in incidence of poverty		
	2003	2010	Actual change	Growth	Redistribution	Interaction
Poverty Headcount Rate						
Poverty line = zpc10						
Cities/Towns	10.66	8.03	-2.63	-0.43	-2.21	0.02
Urban villages	24.86	19.87	-4.99	-1.51	-3.60	0.12
Rural areas	45.22	24.45	-20.77	-17.92	-3.11	0.26
Total	**30.60**	**19.37**	**-11.22**	**-3.64**	**-7.86**	**0.28**
Poverty line = zfoodpc10						
Cities/Towns	5.10	4.65	-0.45	-0.42	-0.15	0.12
Urban villages	18.48	14.23	-4.25	-1.85	-2.80	0.40
Rural areas	35.00	17.80	-17.20	-16.90	-2.58	2.28
Total	**22.71**	**13.77**	**-8.94**	**-3.81**	**-5.35**	**0.22**
Poverty Gap						
Poverty line = zpc10						
Cities/Towns	3.31	2.45	-0.86	-0.23	-0.68	0.05
Urban villages	8.57	5.96	-2.61	-0.77	-1.90	0.07
Rural areas	18.30	8.26	-10.04	-9.03	-2.04	1.03
Total	**11.65**	**6.22**	**-5.44**	**-2.22**	**-3.72**	**0.49**
Poverty line = zfoodpc10						
Cities/Towns	1.60	1.13	-0.47	-0.11	-0.35	-0.01
Urban villages	5.52	3.95	-1.58	-0.61	-1.05	0.08
Rural areas	12.81	5.70	-7.11	-6.70	-0.76	0.34
Total	**7.84**	**4.11**	**-3.73**	**-1.67**	**-2.40**	**0.34**
Squared Poverty Gap						
Poverty line = zpc10						
Cities/Towns	1.55	1.01	-0.53	-0.11	-0.44	0.01
Urban villages	4.00	2.62	-1.37	-0.44	-1.03	0.09
Rural areas	9.76	3.99	-5.78	-5.08	-1.19	0.49
Total	**5.98**	**2.87**	**-3.10**	**-1.27**	**-2.19**	**0.36**
Poverty line = zfoodpc10						
Cities/Towns	0.73	0.40	-0.33	-0.05	-0.28	0.00
Urban villages	2.36	1.69	-0.67	-0.30	-0.43	0.06
Rural areas	6.57	2.71	-3.86	-3.50	-0.44	0.08
Total	**3.84**	**1.86**	**-1.98**	**-0.88**	**-1.35**	**0.25**

Note: Changes shown between years 2002/3 and 2009/10

Table H15: Breakdown of Gini Coefficient by Geography

	2003	2010
Total	**64.7**	**60.5**
Urban / rural		
Within-group inequality	18.9	19.0
Between-group inequality	27.0	18.7
Overlap	18.9	22.8
Region		
Within-group inequality	11.3	11.8
Between-group inequality	25.2	17.3
Overlap	28.3	31.3

Table H16: Decomposition of Generalized Entropy Measures by Geography

	2003			2010			Change		
		GE(1)	GE(2)	GE(0)	GE(1)	GE(2)	GE(0)	GE(1)	GE(2)
Total	0.796	0.896	2.623	0.669	0.823	3.206	-0.127	-0.073	0.583
Urban / rural									
Between-group inequality	0.126	0.128	0.139	0.063	0.068	0.077	-0.064	-0.060	-0.062
Between as a share of total	0.159	0.143	0.053	0.094	0.083	0.024	-0.065	-0.060	-0.029
Within-group inequality	0.669	0.768	2.485	0.606	0.754	3.130	-0.064	-0.013	0.645
Region									
Between-group inequality	0.106	0.117	0.137	0.060	0.068	0.081	-0.047	-0.049	-0.056
Between as a share of total	0.134	0.131	0.052	0.090	0.083	0.025	-0.044	-0.048	-0.027
Within-group inequality	0.689	0.779	2.486	0.609	0.754	3.125	-0.081	-0.024	0.639

Note: Changes shown between years 2002/3 and 2009/10

Table H17: Headcount Ratio by school attendance ever Level

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Never attended school age 12+									
Attended	23.4	15.1	-8.3	69.7	78.3	8.6	81.1	85.0	3.9
Never attended	43.6	23.7	-19.9	30.3	21.7	-8.6	18.9	15.0	-3.9
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Never attended school age 12+									
Attended	16.7	10.3	-6.4	68.1	77.7	9.6	81.1	85.0	3.9
Never attended	33.5	16.8	-16.6	31.9	22.3	-9.6	18.9	15.0	-3.9
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Table H18: Headcount Ratio by Occupation Category

	Poverty Headcount Rate			Distribution of the Poor			Distribution of Population		
	2003	2010	Change	2003	2010	Change	2003	2010	Change
Poverty line = zpc10									
Occupation 1 digit									
Senior officials	2.5	5.4	2.9	0.4	1.5	1.2	2.8	3.2	0.5
Professionals	1.6	2.7	1.2	0.4	1.7	1.3	5.1	7.1	2.0
Technical workers	4.8	2.5	-2.4	1.8	1.8	-0.1	7.1	8.0	0.9
Clerks	4.5	6.9	2.4	1.7	3.4	1.7	7.3	5.6	-1.7
Service workers	15.5	10.4	-5.1	10.0	13.8	3.8	12.0	15.0	2.9
Skilled agriculture	37.9	20.0	-18.0	26.2	24.6	-1.6	12.9	13.9	0.9
Tade and craft	20.5	9.8	-10.7	16.7	9.7	-6.9	15.2	11.2	-4.0
Machine operators	8.3	5.5	-2.9	2.8	2.9	0.0	6.4	5.9	-0.5
Elementary occupations	24.0	15.2	-8.8	40.0	40.6	0.7	31.2	30.1	-1.1
Total	**30.6**	**19.4**	**-11.2**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**
Poverty line = zfoodpc10									
Occupation 1 digit									
Senior officials	0.2	3.2	3.0	0.1	1.4	1.3	2.8	3.2	0.5
Professionals	1.1	1.2	0.1	0.4	1.2	0.7	5.1	7.1	2.0
Technical workers	3.6	2.1	-1.6	2.0	2.2	0.2	7.1	8.0	0.9
Clerks	2.4	5.2	2.8	1.4	3.8	2.5	7.3	5.6	-1.7
Service workers	9.3	6.0	-3.3	8.6	12.0	3.4	12.0	15.0	2.9
Skilled agriculture	28.7	14.0	-14.7	28.7	25.8	-2.9	12.9	13.9	0.9
Tade and craft	13.4	6.8	-6.6	15.7	10.2	-5.6	15.2	11.2	-4.0
Machine operators	5.1	2.3	-2.9	2.5	1.8	-0.8	6.4	5.9	-0.5
Elementary occupations	16.8	10.4	-6.4	40.5	41.6	1.1	31.2	30.1	-1.1
Total	**22.7**	**13.8**	**-8.9**	**100.0**	**100.0**	**0.0**	**100.0**	**100.0**	**0.0**

Note: Changes shown between years 2002/3 and 2009/10

Annex I: Poverty and Consumption Regression Results

Table I1: Determinants of being poor and income, Botswana 2002/03

Variables Description	Poverty Logistic		Consumption regression	
	coef.	se	coef.	Se
Age Square	-0.604***	(0.0847)	-0.000251***	(4.68e-05)
Log of household size	-823.4***	(76.40)	-0.515***	(0.0417)
Gender	-183.2***	(44.88)	-0.0789**	(0.0367)
Married	198.6***	(48.96)	0.166***	(0.0359)
Urban villages (base city)	-40.74	(159.1)	-0.245***	(0.0624)
Rural areas (base city)	-190.0	(168.8)	-0.542***	(0.0682)
pre-school (base no education)	124.1	(82.43)	0.0505	(0.0949)
primary (base no education)	213.3***	(41.83)	0.350***	(0.0397)
secondary (base no education)	1,020***	(106.0)	0.822***	(0.0560)
unemployed	813.4*	(420.3)	1.193***	(0.354)
student	1,206**	(472.8)	1.570***	(0.377)
not in LF	1,075***	(410.9)	1.298***	(0.346)
mining	358.5	(267.4)	0.386***	(0.130)
Manufacture utilities	-342.1	(243.4)	-0.103	(0.0999)
Construction	-244.9	(232.0)	-0.0159	(0.0914)
Trade	-208.4	(221.4)	-0.0217	(0.0873)
Transport communications	-358.8	(266.1)	0.0157	(0.124)
Financial activities	873.3	(562.9)	0.129	(0.153)
Public administration	-144.9	(207.2)	0.150*	(0.0886)
Health education	-102.1	(233.3)	0.136	(0.0942)
Other services	-515.8**	(214.6)	-0.107	(0.0930)
Professionals	-3,322***	(702.9)	-2.258***	(0.369)
Technical workers	252.4	(519.2)	0.0932	(0.112)
Clerks	-1,012**	(484.3)	-0.240**	(0.112)
Service workers	-1,763***	(445.4)	-0.377***	(0.108)
Skilled agriculture	-1,990***	(448.7)	-0.714***	(0.106)
Trade and craft	-2,406***	(567.1)	-0.954***	(0.135)
Machine operators	-1,886***	(436.4)	-0.688***	(0.111)
Elementary occupations	-1,535***	(447.9)	-0.396***	(0.117)
Other	-2,145***	(466.4)	-0.825***	(0.107)
Francistown	-223.3	(151.5)	-0.125**	(0.0513)
Other Cities & Towns	-266.7**	(130.7)	-0.175***	(0.0520)
Rural South-East	-261.7**	(112.6)	0.0533	(0.0612)
Rural North-East	-389.6***	(110.4)	-0.0571	(0.0596)
Rural North-West	-273.2**	(116.7)	-0.000786	(0.0860)
2 children	-417.9***	(121.2)	-0.0915*	(0.0503)
3 children	-435.6***	(113.2)	-0.172***	(0.0583)
4+ children	-138.5	(138.4)	-0.214***	(0.0829)
Family with children without one parent	73.00*	(39.06)	0.0381	(0.0374)
Constant	2,714***	(529.7)	6.952***	(0.194)
	6,053		6,047	
	0.222		0.519	

*** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in parentheses.

Source: Author's estimations.

Table I2: Determinants of being poor and income, Botswana 2009/10

Description	Poverty Logit		Consumption regression	
	coef.	se	coef.	Se
Age	-0.0430***	(0.0101)	0.0305***	(0.00403)
Age Square	0.000328***	(9.08e-05)	-0.000228***	(3.77e-05)
Log of household size	0.614***	(0.0897)	-0.644***	(0.0314)
Gender	0.0888	(0.0694)	-0.0573**	(0.0274)
Married	-0.0552	(0.0732)	0.139***	(0.0295)
Urban villages (base city)	0.216	(0.152)	-0.159***	(0.0568)
Rural areas (base city)	0.299**	(0.150)	-0.272***	(0.0560)
Pre-school (base no education)	-0.311	(0.497)	0.200	(0.192)
Informal (base no education)	-0.478***	(0.143)	0.163***	(0.0555)
Primary (base no education)	-0.292***	(0.0756)	0.176***	(0.0328)
Secondary (base no education)	-0.567***	(0.0975)	0.415***	(0.0398)
Tertiary (base no education)	-0.707***	(0.173)	0.668***	(0.0551)
University (base no education)	-1.064***	(0.277)	0.908***	(0.0695)
Don't know (base no education)	-0.520**	(0.212)	0.330***	(0.0976)
vUnemployed	-0.00975	(0.200)	-0.0516	(0.0765)
Student	-0.672**	(0.316)	0.199**	(0.0980)
Not in LF	-0.218	(0.146)	0.0139	(0.0536)
Mining	-0.638**	(0.272)	0.404***	(0.0805)
Manufacture utilities	-0.0888	(0.186)	0.124*	(0.0670)
Construction	-0.0108	(0.185)	0.0679	(0.0667)
Trade	-0.146	(0.183)	0.0515	(0.0626)
Transport communications	-0.185	(0.256)	0.0513	(0.0880)
Financial activities	-0.0792	(0.132)	0.106**	(0.0501)
Public administration	-0.785***	(0.232)	0.302***	(0.0712)
Health education	-0.0547	(0.133)	0.0711	(0.0515)
Other services	0.355	(0.691)	0.0905	(0.272)
Professionals	0.342	(0.317)	-0.282**	(0.110)
Technical workers	0.00687	(0.322)	-0.183*	(0.104)
Clerks	0.0817	(0.326)	-0.311***	(0.107)
Service workers	0.153	(0.260)	-0.405***	(0.0951)
Skilled agriculture	0.303	(0.274)	-0.512***	(0.105)
Trade and craft	0.192	(0.268)	-0.398***	(0.0997)
Machine operators	0.150	(0.272)	-0.306***	(0.101)
Elementary occupations	0.251	(0.251)	-0.502***	(0.0944)
Other	0.0984	(0.743)	-0.599**	(0.288)
Francistown	-0.0694	(0.201)	-0.0377	(0.0621)
Other Cities & Towns	0.360**	(0.150)	-0.226***	(0.0509)
Rural South-East	-0.140	(0.104)	0.0240	(0.0444)
Rural North-East	-0.0752	(0.102)	0.0431	(0.0434)
Rural North-West	0.170	(0.125)	-0.0750	(0.0599)
2 children	0.0418	(0.105)	-0.136***	(0.0391)
3 children	0.263**	(0.111)	-0.260***	(0.0447)
4+ children	0.502***	(0.165)	-0.344***	(0.0670)
Family with children without one parent	0.0407	(0.0708)	0.0402	(0.0307)
Discouraged and age >= 15	0.0665	(0.152)	0.0583	(0.0900)
Constant	-0.996**	(0.390)	6.896***	(0.150)

*** p<0.01, ** p<0.05, * p<0.1 Robust standard errors in parentheses.

Source: Author's estimations

Annex J: Labor Market

Table J1: Main Indicators of the Labor Market

	2003	2010	Change
Unemployment rate	24.8	17.9	-7.0
Employment-to-working-age-population ratio	47.5	50.3	2.8
Working age population as a fraction of total population	56.3	60.5	4.2
Poverty rate among the unemployed	32.2	21.2	-11.0

Note: Changes shown between years 2002/3 and 2009/10

Table J2: Hierarchical Decomposition of the Labor Force (Hierarchical rates)

	2003	2010	Change
0. Total population	100.0	100.0	0.0
1. Population 6 years and above	85.6	86.1	0.5
1.1 Child population (6-14 years of age)	27.9b	23.1	-4.8
1.2 Population above the working age limit	6.3	6.7	0.4
1.2.1 Employed	26.8	30.2	3.4
1.3 Working age population (15-64 years of age)	65.8	70.2	4.5
1.3.1 Inactive	36.8	38.7	1.9
1.3.2 Active	63.2	61.3	-1.9
1.3.2.1 Employed	75.2	82.1	7.0
1.3.2.2 Unemployed	24.8	17.9	-7.0

Note: Changes shown between years 2002/3 and 2009/10

Table J3: Employment Categories, Shares in Total Employment

	2003	2010	Change
Total			
Employed	56.3	56.5	0.2
Student	17.2	14.5	-2.8
Not in labor force or education	26.4	29.0	2.6
Non-agriculture			
Employed	100.0	91.4	-8.6
Not in labor force or education	0.0	8.6	8.6
Agriculture			
Employed	99.9	98.1	-1.8
Not in labor force or education	0.1	1.9	1.8

Note: Changes shown between years 2002/3 and 2009/10

Table J4: Distribution of the Employed by Economic Sector

	Share of total employment		
	2003	2010	Change
Sector of employment (10 categories)			
Agriculture	18.5	23.5	5.1
Mining	3.2	2.7	-0.4
Manufacture utilities	10.8	8.1	-2.7
Construction	9.4	7.6	-1.8
Trade	13.7	10.6	-3.1
Transport communications	2.9	2.7	-0.2
Financial activities	1.1	1.4	0.3
Public administration	15.1	17.0	2.0
Health education	11.9	7.8	-4.1
Other services	13.5	18.6	5.1
Total	100.0	100.0	0.0

Note: Changes shown between years 2002/3 and 2009/10

Table J5: Distribution of the Employed along Selected Characteristics - Level of Education

	Share of total employment		
	2003	2010	Change
Level of education			
Total			
Never attended	18.1	13.5	-4.7
Pre-school	0.0	0.1	0.1
Informal	1.4	1.7	0.3
Primary	30.2	20.5	-9.6
Secondary	50.3	64.2	13.9
Total	100.0	100.0	0.0
Non-agriculture			
Never attended	11.8	8.3	-3.6
Pre-school		0.1	
Informal	1.1	1.3	0.2
Primary	29.0	17.4	-11.6
Secondary	58.0	72.8	14.8
Total	100.0	100.0	0.0
Agriculture			
Never attended	45.9	30.3	-15.6
Pre-school		0.1	
Informal	2.6	3.0	0.5
Primary	35.2	30.6	-4.5
Secondary	16.4	36.0	19.6
Total	100.0	100.0	0.0

Note: Changes shown between years 2002/3 and 2009/10

Table J6: Poverty Rate of the Working Age Population by Individual Employment Status and Urban/Rural

	2003	2010	Change
Employed			
Urban	11.4	8.2	-3.2
Rural	29.8	15.5	-14.4
Total	17.9	11.1	-6.9
Unemployed			
Urban	22.5	19.3	-3.2
Rural	49.4	24.2	-25.1
Total	32.2	21.2	-11.0
Inactive			
Urban	20.8	16.0	-4.8
Rural	49.6	26.5	-23.1
Total	33.1	19.8	-13.2
Total working age population			
Urban	16.4	12.5	-3.9
Rural	40.9	20.5	-20.3
Total	25.7	15.6	-10.2
Total population			
Urban	19.1	15.5	-3.6
Rural	45.2	24.4	-20.8
Total	30.6	19.4	-11.2

Note: Changes shown between years 2002/3 and 2009/10

Table J7: Poverty Rates of the Working Age Population by Employment Category of the Household Head and Urban/Rural

	2003	2010	Change
Employed			
Urban	10.5	8.4	-2.1
Rural	28.6	15.6	-13.0
Total	16.1	11.0	-5.1
Student			
Urban	3.8	2.0	-1.8
Rural	12.6	22.9	10.3
Total	6.8	4.4	-2.4
Not in labor force or education			
Urban	32.1	14.7	-17.4
Rural	55.9	28.8	-27.1
Total	45.4	20.4	-25.0
Total working age population			
Urban	16.4	12.5	-3.9
Rural	40.9	20.5	-20.3
Total	25.7	15.6	-10.2
Total population			
Urban	19.1	15.5	-3.6
Rural	45.2	24.4	-20.8
Total	30.6	19.4	-11.2

Note: Changes shown between years 2002/3 and 2009/10

Table J8: Poverty Rates of the Working Age Population by Individual Sector of Employment

	2003	2010	Change
Agriculture	35.4	18.3	-17.1
Mining	8.0	2.9	-5.1
Manufacture utilities	17.3	6.6	-10.7
Construction	15.7	9.2	-6.5
Trade	16.3	10.3	-5.9
Transport communications	12.9	6.3	-6.6
Financial activities	4.2	3.5	-0.8
Public administration	13.7	9.3	-4.3
Health education	7.7	4.0	-3.7
Other services	16.3	11.4	-4.9

Note: Changes shown between years 2002/3 and 2009/10

Table J9: Poverty Rates of the Working Age Population by Sector of Employment Household Head

	2003	2010	Change
Agriculture	37.6	19.6	-18.0
Mining	4.1	3.2	-0.9
Manufacture utilities	17.2	10.6	-6.6
Construction	12.8	10.3	-2.5
Trade	14.1	9.7	-4.4
Transport communications	13.5	8.8	-4.8
Financial activities	11.3	0.0	-11.3
Public administration	11.5	10.0	-1.5
Health education	8.5	1.8	-6.7
Other services	14.7	12.1	-2.5

Note: Changes shown between years 2002/3 and 2009/10

Table J10: Distribution of the Working Age Population by Poverty and Individual Employment Status (shares of total employment)

	Poor			Non poor		
	2003	2010	Change	2003	2010	Change
Total						
Employed	33.1	35.8	2.7	52.5	53.0	0.5
Unemployed	19.6	14.9	-4.7	14.3	10.2	-4.1
Other inactive	47.3	49.4	2.1	33.2	36.8	3.6
Area of residence						
Urban						
Employed	34.6	32.3	-2.3	52.6	51.7	-0.9
Unemployed	22.2	17.1	-5.1	15.0	10.2	-4.8
Other inactive	43.2	50.6	7.4	32.4	38.1	5.7
Rural						
Employed	32.1	39.2	7.1	52.2	55.4	3.2
Unemployed	17.9	12.6	-5.2	12.7	10.2	-2.4
Other inactive	50.0	48.1	-1.9	35.1	34.4	-0.7

Note: Changes shown between years 2002/3 and 2009/10

Table J11: Distribution of Working Age Population by Poverty and Employment Status of Household Head (shares of total employment)

	Poor			Non poor		
	2003	2010	Change	2003	2010	Change
Total						
Employed	44.1	48.6	4.5	73.5	66.9	-6.6
Unemployed	5.7	9.0	3.3	4.1	5.0	0.8
Other inactive	50.1	42.3	-7.8	22.4	28.1	5.8
Area of residence						
Urban						
Employed	49.1	48.2	-1.0	77.3	68.1	-9.2
Unemployed	6.5	10.8	4.3	4.4	4.5	0.1
Other inactive	44.3	41.0	-3.3	18.3	27.4	9.1
Rural						
Employed	40.9	49.1	8.2	64.7	64.7	0.0
Unemployed	5.2	7.2	2.0	3.6	5.8	2.3
Other inactive	53.9	43.7	-10.2	31.8	29.5	-2.3

Note: Changes shown between years 2002/3 and 2009/10

Table J12: Distribution of the Employed by Poverty and Individual Employment Category (shares of total employment)

	Poor			Non poor		
	2003	2010	Change	2003	2010	Change
Total						
Employed	41.2	42.0	0.8	61.2	59.0	-2.2
Student	16.4	18.2	1.8	17.5	13.8	-3.7
Not in labor force or education	42.5	39.8	-2.6	21.2	27.1	5.9
Total	100.0	100.0	0.0	100.0	100.0	0.0
Area of residence						
Urban						
Employed	44.4	38.9	-5.5	61.9	57.6	-4.3
Student	20.0	24.1	4.1	20.1	16.9	-3.2
Not in labor force or education	35.6	36.9	1.3	18.0	25.6	7.5
Total	100.0	100.0	0.0	100.0	100.0	0.0
Rural						
Employed	39.1	44.9	5.8	59.8	61.7	1.9
Student	14.1	12.5	-1.7	11.8	8.3	-3.5
Not in labor force or education	46.7	42.6	-4.1	28.4	30.0	1.6
Total	100.0	100.0	0.0	100.0	100.0	0.0

Note: Changes shown between years 2002/3 and 2009/10

Table J13: Distribution of the Employed by Poverty and Employment Category of Household Head (shares of total employment)

	Poor			Non poor		
	2003	2010	Change	2003	2010	Change
Total						
Employed	55.4	63.3	7.9	83.6	76.2	-7.4
Student	0.4	0.5	0.1	1.5	1.9	0.3
Not in labor force or education	44.2	36.2	-8.0	14.9	21.9	7.0
Total	100.0	100.0	0.0	100.0	100.0	0.0
Area of residence						
Urban						
Employed	64.3	66.3	2.0	87.1	76.2	-10.9
Student	0.4	0.5	0.1	1.5	2.6	1.1
Not in labor force or education	35.3	33.2	-2.2	11.4	21.3	9.8
Total	100.0	100.0	0.0	100.0	100.0	0.0
Rural						
Employed	50.0	60.6	10.6	75.4	76.2	0.8
Student	0.4	0.5	0.1	1.6	0.5	-1.1
Not in labor force or education	49.6	38.9	-10.8	22.9	23.3	0.3
Total	100.0	100.0	0.0	100.0	100.0	0.0

Note: Changes shown between years 2002/3 and 2009/10

Table J14: Unemployment Rates Among Selected Groups

	Unemployment Rate by Groups			Group Share Among Unemployed		
	2003	2010	Change	2003	2010	Change
Total	24.8	17.9	-7.0	100.0	100.0	0.0
Gender						
Male	22.6	14.4	-8.3	46.3	41.7	-4.6
Female	27.0	21.6	-5.4	53.7	58.3	4.6
Age group						
15-24	51.1	34.8	-16.3	54.8	38.0	-16.8
25-54	16.4	14.6	-1.8	44.4	59.3	14.9
55-64	3.4	6.0	2.6	0.9	2.7	1.9
Area of residence						
Urban	24.6	18.4	-6.3	64.0	62.8	-1.1
Rural	25.2	17.1	-8.1	36.0	37.2	1.1
Region						
Gaborone	16.5	9.0	-7.5	11.0	6.8	-4.2
Francistown	18.6	17.1	-1.5	4.6	6.3	1.7
Other Cities & Towns	22.5	14.4	-8.1	8.2	5.4	-2.8
Rural South-East	27.8	21.4	-6.4	31.4	36.6	5.2
Rural North-East	29.6	19.3	-10.3	31.9	31.4	-0.5
Rural North-West	22.6	19.5	-3.1	6.9	7.5	0.6
Rural South-West	25.1	15.8	-9.3	6.0	6.0	0.0
Educational level - 5 Categories						
Never attended	11.4	12.7	1.2	7.1	9.0	1.9
Pre-school		14.0		0.0	0.1	0.1
Informal	11.7	20.4	8.6	0.6	2.0	1.5
Primary	19.4	16.9	-2.5	22.0	19.2	-2.8
Secondary	31.6	19.1	-12.5	70.3	69.6	-0.7
Non poor	21.4	16.2	-5.3	67.8	78.8	11.0
Poor	37.2	29.4	-7.8	32.2	21.2	-11.0
Quintiles of consumption						
Lowest quintile	39.1	30.1	-9.0	20.8	21.5	0.7
2	35.0	26.4	-8.6	20.3	23.1	2.9
3	31.9	22.8	-9.1	22.7	23.0	0.3
4	23.4	15.4	-8.0	22.1	19.5	-2.6
Highest quintile	11.1	7.4	-3.7	14.1	12.8	-1.2

Note: Changes shown between years 2002/3 and 2009/10

Table J15: Labor market outcomes

	Employment Rate by Groups			Group Share Among Employed		
	2003	2010	Change	2003	2010	Change
Total	75.2	82.1	7.0	100.0	100.0	0.0
Gender						
Male	77.4	85.6	8.3	52.2	54.0	1.8
Female	73.0	78.4	5.4	47.8	46.0	-1.8
Age group						
15-24	48.9	65.2	16.3	17.3	15.5	-1.9
25-54	83.6	85.4	1.8	74.6	75.2	0.6
55-64	96.6	94.0	-2.6	8.1	9.3	1.2
Area of residence						
Urban	75.4	81.6	6.3	64.6	60.8	-3.9
Rural	74.8	82.9	8.1	35.4	39.2	3.9
Region						
Gaborone	83.5	91.0	7.5	18.4	14.9	-3.5
Francistown	81.4	82.9	1.5	6.7	6.7	0.0
Other Cities & Towns	77.5	85.6	8.1	9.3	6.9	-2.4
Rural South-East	72.2	78.6	6.4	26.9	29.3	2.3
Rural North-East	70.4	80.7	10.3	25.0	28.5	3.5
Rural North-West	77.4	80.5	3.1	7.8	6.8	-1.0
Rural South-West	74.9	84.2	9.3	5.9	6.9	1.0
Educational level - 5 categories						
Never attended	88.6	87.3	-1.2	18.1	13.5	-4.7
Pre-school		86.0		0.0	0.1	0.1
Informal	88.3	79.6	-8.6	1.4	1.7	0.3
Primary	80.6	83.1	2.5	30.2	20.5	-9.6
Secondary	68.4	80.9	12.5	50.3	64.2	13.9
Non poor	78.6	83.8	5.3	82.1	88.9	6.9
Poor	62.8	70.6	7.8	17.9	11.1	-6.9
Quintiles of consumption						
Lowest quintile	60.9	69.9	9.0	10.7	10.8	0.1
2	65.0	73.6	8.6	12.4	14.0	1.6
3	68.1	77.2	9.1	16.0	16.9	0.9
4	76.6	84.6	8.0	23.8	23.3	-0.5
Highest quintile	88.9	92.6	3.7	37.0	34.9	-2.1

Note: Changes shown between years 2002/3 and 2009/10

Table J16: Labor force participation, employment and unemployment rates by individual characteristics and place of residence

	Labor force participation rate		Employment rate		Unemployment rate		Inactive population	
	Male	Female	Male	Female	Male	Female	Male	Female
Area of residence								
Urban	65.2	56.2	36.9	30.1	6.4	8.2	34.8	43.8
Rural	71.3	55.2	36.1	25.7	5.0	6.3	28.7	44.8
Age								
0-14			0.0	0.0	0.0	0.0		
15-24	35.1	33.7	23.5	18.7	11.6	15.0	64.9	66.3
25-49	81.4	69.8	71.7	57.8	9.7	12.0	18.6	30.2
50-63	73.8	53.1	69.0	47.8	4.9	5.3	26.2	46.9
64+			32.0	16.8	0.0	0.4		
Marital status								
Married	87.5	62.4	77.6	52.6	3.0	6.6	12.5	37.6
Living together	82.8	65.3	75.3	48.6	6.2	16.3	17.2	34.7
Seperated	60.8	57.8	63.5	47.9	0.0	8.9	39.2	42.2
Divorced	76.1	59.6	54.3	50.7	5.9	2.7	23.9	40.4
Widowed/widower	75.1	57.3	43.9	33.0	3.3	2.1	24.9	42.7
Never married	52.4	51.4	33.6	32.8	11.2	11.6	47.6	48.6
Education								
No education	74.3	68.3	42.6	33.0	2.2	2.6	25.7	31.7
Primary	67.0	53.2	21.2	17.2	3.6	4.1	33.0	46.8
Secondary	60.8	53.9	47.5	38.0	11.2	14.3	39.2	46.1
Post-secondary	73.2	67.3	66.5	61.0	6.4	6.0	26.8	32.7

Annex K: Correlates of poverty

Table K1: Probability of being poor

	2003				2010			
	Total	Cities/Towns	Urban villages	Rural areas	Total	Cities/Towns	Urban villages	Rural areas
Household characteristics								
Log of household size	0.34*	0.05	0.67*	0.47**	0.15	-0.25	0.31	0.24
Log of household size squared	0.08	0.16**	0.01	0.01	0.2*	0.31**	0.17**	0.16**
Share of children 0-6	(base)	(base)	(base)	(base)	(base)	(base)	(base)	(base)
Share of children 7-16	-0.66*	-0.65	-0.64	-0.91*	0.34**	-0.18	0.51	0.11
Share of male adults	-0.4**	-0.14	-0.03	-1.02*	-0.44**	-0.68	-0.42	-0.64**
Share of female adults	-0.36	-0.08	-0.41	-0.78**	-0.22	-0.43	-0.32	-0.53
Share of Elderly (>=60)	-0.49**	-0.04	-0.32	-0.99**	-0.27	-0.43	-0.22	-0.83*
Region								
Gaborone	(base)	(base)	(base)	(base)	(base)	(base)	(base)	(base)
Francistown	0.16	0.17			-0.01	-0.07		
Other Cities & Towns	0.1	0.12			0.37**	0.3**		
Rural South-East	0.02				0.04			
Rural North-East	0.16		0.08	0.18**	0.08		-0.05	0.08
Rural North-West	0.07		0.02	0.21	0.09		0.25	-0.03
Rural South-West	0.13		-0.08	0.23	-0.02		0.11	-0.08
Main source inc.								
Self and own	(base)	(base)	(base)	(base)	(base)	(base)	(base)	(base)
Labor	-0.23*	-0.38*	-0.04	-0.18	-0.15**	-0.34**	0.06	-0.21**
Transfers	0.2**	-0.12	0.25	0.28**	-0.02	-0.02	0.2	-0.07
Individual characteristics								
Log of household head's age	0.01	-0.01	0.03	0.03	-0.33*	-0.12	0.04	0.03
Location								
Rural	(base)				(base)			
Urban	-0.15**				0.03			
Gender of the head								
Male	(base)	(base)	(base)	(base)	(base)	(base)	(base)	(base)
Female	-0.02	-0.01	0.22**	-0.16	0.01	-0.09	0.09	-0.03
Education of the head								
Never attended	(base)	(base)	(base)	(base)	(base)	(base)	(base)	(base)
Primary	-0.33*	-0.39*	-0.22**	-0.39*	-0.16**	-0.39**	-0.15	-0.1
Secondary	-0.55*	-0.53*	-0.64*	-0.63*	-0.32*	-0.51**	-0.24	-0.19
Employment status of head								
Employed	(base)	(base)	(base)	(base)	(base)	(base)	(base)	(base)
Unemployed	0.21**	0.06	0.19	0.46**	-0.04	0.24	0.16	-0.03
Student	0.09	0.3	-4.44	0.34	-0.43	-0.18	-0.05	-0.08
Not in labor force or education	0.17**	0.09	0.08	0.28**	-0.05	-0.02	0.02	-0.06

	2003				2010			
	Total	Cities/Towns	Urban villages	Rural areas	Total	Cities/Towns	Urban villages	Rural areas
Additional regressors								
Share of employed in the household	0.17	-0.01	-0.11	0.35	0.17*	-0.34	-0.42	-0.21
Assets index	-0.21*	-0.19*	-0.26*	-0.14*	0.12*	-0.14*	-0.11*	-0.11*
Sector of Employment (not working - base)								
Agriculture	-0.14	-0.57	0.59**	-0.16	0.12	0.84	-0.1	0.13
Mining	-0.01	0.07	-4.34	0.68	-0.88*	-0.29	-3.25	0.06
Manufacture utilities	-0.16	0.05	-0.5	0	-0.3	-0.65	-0.01	-0.09
Construction	-0.05	0.12	0.02	-0.07	-0.2	-0.08	0.12	-1.08**
Trade	-0.09	0	0.04	0.22	-0.36**	-0.2	-0.05	-0.23
Transport Communications	0.07	-0.2	-0.08	-3.92	-0.18	0.63	-0.16	-4.75
Financial activities	0.32	0.2	-3.23		-3.75	-3.11	-3.52	-2.94
Public administration	-0.39**	-0.49	-0.04	-0.41	-0.16	0.29	0.02	-0.13
Health education	-0.22	-0.65	0.29	-0.51	-0.86*	0.3	-0.68	-0.4
Other services	0.12	0.22	-0.14	-0.47	-0.1	0.62*	0.1	-0.37
Intercept	5.97*	-0.26	-0.86**	-0.13	-0.1	0.2	-1.5*	-0.8*
Number of observations	5,938	2,778	1,734	1,438	7,725	2,018	2,402	3,187
Adjusted R2	0.60	0.19	0.28	0.20	0.25	0.23	0.28	0.21

Annex L: Health

Table L1: Child Health and Care Utilization

Indicator	Stunting (%)	Wasting (%)	Underweight (%)	Diarrhea (%)	Appropriate Diarrhea Treatment (%)	Vaccines Received (%)	Number
Age (years)							
0	32.46	17.16	13.20	11.46	71.43	8.00	647
1	40.04	9.05	13.12	16.29	69.70	10.65	633
2	34.46	7.51	12.56	5.59	72.97	10.87	672
3	24.65	14.34	16.22	5.81	66.67	10.84	673
4	19.96	12.70	14.65	3.81	76.00	10.89	664
Gender							
Male	31.21	11.38	15.49	9.40	71.83	10.31	1606
Female	28.93	11.72	12.52	7.57	69.60	10.37	1683
Household Size							
1-5	25.31	11.97	13.06	8.89	72.88	10.50	1342
6-10	30.97	11.10	13.73	7.85	69.72	10.27	1444
11-15	40.67	12.11	18.01	9.31	67.57	10.01	412
16-20	34.62	6.45	10.00	8.33	66.67	10.70	79
21+	75.00	33.33	25.00	0.00	-------	11.00	12
Consumption Quintile							
Poorest	34.63	12.48	16.81	7.39	70.15	10.31	965
Second	31.59	10.07	13.88	10.30	65.00	10.17	810
Third	26.17	12.95	12.59	7.83	87.27	10.48	725
Fourth	28.49	11.50	15.30	9.58	68.09	10.35	505
Richest	22.66	8.81	6.15	6.36	55.56	10.55	284
Region of Residence							
Gaborone	23.33	11.85	11.89	6.76	92.31	10.46	209
Francistown	27.69	10.91	10.89	9.09	90.00	9.95	110
Rural SE	29.62	13.24	11.57	6.66	64.81	10.39	864
Rural NE	32.08	10.99	16.50	8.11	68.37	10.35	1238
Rural NW	28.67	5.95	11.08	14.37	80.00	10.08	368
Rural SW	32.75	13.00	18.55	9.70	65.52	10.36	314
Other Towns	22.41	16.81	10.00	7.10	53.85	10.62	186
Urban/Rural							
Urban	30.10	12.01	12.46	7.88	72.95	10.40	1665
Rural	29.91	11.15	15.40	9.02	68.96	10.29	1624

Notes: All values are restricted to children below or equal to five years of age. Child anthropometric measures estimated as z-scores for height-for-age (stunting), weight-for-height (wasting) and weight-for-age (underweight) using WHO Child Growth Standards for children. Child malnutrition in each category is classified as below 2 standard deviations of the median value in the reference population. Appropriate diarrhea treatment here refers to home treatment of acute diarrhea with oral rehydration therapy. The outcome "diarrhea" refers to self-reported episodes of diarrhea over the past two weeks.

Table L2: Health Outcomes II

Indicator	HIV/AIDS (%)	TB (%)	Stroke (%)	Hypertension (%)	Overweight (%)	Obesity (%)	Number
Age Category (years)							
0-15	0.96	0.25	0.03	0.00	0.00	0.00	9971
15-24	0.92	0.37	0.00	0.22	11.38	7.36	4582
24-35	6.26	0.47	0.04	0.96	19.15	12.03	5102
35-64	8.73	0.99	0.10	10.29	24.60	19.72	5976
64+	1.59	2.04	0.25	23.62	21.88	21.88	1578
Gender							
Male	2.80	0.60	0.05	2.20	15.24	8.52	12967
Female	5.36	0.66	0.07	6.56	24.24	19.74	14249
Household Size							
1-5	4.75	0.75	0.07	5.02	20.96	14.23	15381
6-10	3.33	0.46	0.04	3.90	19.08	15.50	9250
11-15	3.01	0.54	0.12	2.83	14.68	15.23	2123
16-20	3.59	0.33	0.00	5.56	21.26	10.24	401
21+	0.00	0.00	0.00	0.00	14.29	23.81	67
Consumption Quintile							
Poorest	4.32	0.48	0.09	3.16	17.29	14.04	5559
Second	5.03	0.79	0.07	3.77	16.90	13.44	5480
Third	4.32	0.48	0.11	4.47	19.44	12.52	5610
Fourth	4.16	0.49	0.04	5.50	21.58	16.31	5293
Richest	3.01	0.92	0.00	5.41	22.81	15.66	5280
Region of Residence							
Gaborone	2.59	0.41	0.00	3.24	23.03	15.80	2723
Francistown	4.11	0.59	0.00	3.23	23.33	16.20	1156
Rural SE	3.12	0.56	0.08	5.01	19.95	14.63	7494
Rural NE	5.20	0.54	0.12	5.11	18.16	13.17	9138
Rural NW	4.91	0.76	0.00	3.33	21.42	12.49	2547
Rural SW	5.78	1.75	0.00	4.99	16.46	15.45	2291
Other Towns	2.80	0.30	0.00	3.22	22.90	18.10	1873
Urban/Rural							
Urban	3.49	0.45	0.01	4.18	21.57	15.73	15408
Rural	5.05	0.89	0.12	4.93	17.82	12.80	11814
Employment (Above 15 Years)							
Employed	3.35	0.52	0.08	3.91	18.11	13.82	8641
Unemployed	5.49	0.82	0.03	5.48	21.56	15.15	18581
Educational Level							
Never Attended	5.33	1.27	0.12	9.88	16.54	12.06	7101
Pre-School	1.56	1.56	0.00	2.34	39.13	26.09	374
Informal	7.24	1.07	0.00	17.16	29.34	19.83	374
Primary	4.73	0.57	0.08	4.50	20.04	17.95	8556
Secondary	3.23	0.45	0.03	2.35	20.67	13.81	10817

Notes: Overweight and obesity here are defined as Body Mass Indices (kilogram per meter squared) above 25 and 30 respectively. Non-anthropometric measures are self-reported health outcomes.

Table L3: Financial Risk Protection

Indicator	Insurance Coverage (%)	Health Expenditure Per Capita (Pula/Mth.)	Catastrophic Health Expenditure (%)	Number
Age Category (years)				
0-15	11.73	3.19	0.14	9971
15-24	10.62	4.27	0.04	4582
24-35	17.56	8.63	0.18	5102
35-64	21.84	14.39	0.23	5976
64+	5.04	7.43	0.32	1578
Gender				
Male	15.23	7.87	0.17	12967
Female	13.78	6.39	0.15	14249
Household Size				
1-5	19.84	9.70	0.19	15381
6-10	8.86	4.58	0.16	9250
11-15	2.78	0.68	0.00	2123
16-20	0.28	0.31	0.00	401
21+	0.00	0.00	0.00	67
Consumption Quintile				
Poorest	2.54	0.29	0.13	5559
Second	5.28	0.59	0.02	5480
Third	8.52	1.49	0.09	5610
Fourth	18.90	4.01	0.26	5293
Richest	38.33	30.07	0.32	5280
Region of Residence				
Gaborone	33.65	11.89	0.07	2723
Francistown	25.17	7.24	0.00	1156
Rural SE	10.95	6.44	0.17	7494
Rural NE	8.61	7.44	0.21	9138
Rural NW	11.88	6.06	0.12	2547
Rural SW	8.27	2.63	0.26	2291
Other Towns	33.54	7.85	0.05	1873
Urban/Rural				
Urban	21.07	9.79	0.22	15408
Rural	5.87	3.58	0.08	11814
Employment (Above 15 Years)				
Employed	22.26	12.31	0.19	8641
Unemployed	10.82	4.67	0.15	18581
Educational Level				
Never Attended	6.31	4.25	0.14	7101
Pre-School	37.67	5.67	0.53	374
Informal	7.82	2.55	0.27	374
Primary	9.33	2.92	0.15	8556
Secondary	23.26	12.47	0.17	10817

Notes: Health expenditure is classified as catastrophic when it exceeds 40% of non-food expenditure.

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