



The Uganda **Poverty Assessment** Report 2016

Farms, cities and good fortune : assessing poverty reduction in Uganda
from 2006 to 2013



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Uganda from 2006 to 2013

SEPTEMBER 2016

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ABBREVIATIONS AND ACRONYMS

ACLED	Armed Conflict Location and Event Data
CAPI	Computer Assisted Personal Interviews
CEM	Country Economic Memorandum
CPI	Consumer Price Index
EPRC	Economic Policy Research Center
GDP	Gross Domestic Product
GNI	Gross National Income
GoU	Government of Uganda
ICT	Information and Communication Technology
MoFPED	Ministry of Finance, Planning, and Economic Development
NMS	National Medical Store
PPP	Purchasing Power Parity
PTA	Parents and Teachers Association
PTB	Pulmonary tuberculosis
RIF	Recentered Influence Functions
RIGA	Rural Income-Generating Activities
SDI	Service Delivery Indicators
SMC	School Management Committee
UBOS	Uganda Bureau of Statistics
UDHS	Uganda Demographic and Health Survey
UNICEF	United Nations Children’s Emergency Fund
UNHS	Uganda National Household Survey
UNPS	Uganda National Panel Survey
UPE	Universal Primary Education
USE	Universal Secondary Education
WDI	World Development Indicators
WRSI	Water Requirement Satisfaction Index

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EXECUTIVE SUMMARY

Uganda has set out an ambitious agenda for its future; its 2040 Vision foresees a middle-income country with the majority of its citizens living in urban areas, having smaller families, and earning income in non-agricultural sectors.

Uganda's progress in reducing poverty over the last two decades is a remarkable story of success. From 1993 to 2006, annual reduction in the national poverty rate of 1.9 percentage points a year resulted from the restoration of peace and stability to much of the country after Yoweri Museveni came into power, the series of economic liberalization reforms that were implemented, and the investments of households and firms that these encouraged.

Poverty reduction has remained impressive since 2006—the period of focus for this report—even though it has fallen more slowly. The national poverty rate fell by 1.6 percentage points per year and the international extreme poverty rate fell by 2.7 percentage points per year, the second fastest reduction in extreme poverty per year in Sub-Saharan Africa during this time.

Uganda's poverty reduction since 2006 has coincided with a period of slower economic growth. Despite this, poor households still experienced consumption growth and poverty fell. Understanding why this was and whether it is sustainable offers lessons for other countries grappling with how to ensure that the poor can still see improvements in their lives, even in the face of a slowing global economy.

However, Uganda's success is not without caveats. In 2013, more than a third of its citizens lived below the international extreme poverty line of US\$1.90 a day. What's more, the low national poverty rate of 19.7 percent is based on a poverty line that was set over twenty years ago and is now too low, and not reflective of a reality in which too many Ugandans live today. Vulnerability has also remained high. For every three Ugandans that moved out of poverty, two fell into poverty. Poverty has also become increasingly concentrated in the Northern and Eastern regions of the country.

And, of more concern, it is not clear that the processes that brought about gains in the past will be enough to address the future poverty challenge in Uganda, particularly in the impoverished Northern and Eastern regions.

Acknowledging both the impressive progress and its limitations, however, it is helpful to look at the factors that contributed to Uganda's poverty reduction since 2006 and to examine policies that have worked alongside possible improvements to make progress more sustainable into the future.

Much of Uganda's poverty reduction was built on agricultural income growth that particularly benefited poor households. Peace in northern Uganda, improved regional crop markets, and good weather drove growth in agricultural incomes. Modest gains in education also contributed to growth, as did urbanization.

Uganda's formula for success is one that works especially well when conditions are favorable, particularly in agriculture. And luck has been on Uganda's side in the last decade. Good rainfall and prices can account for two-thirds of the growth in crop income of the bottom 40 percent from 2006 to 2012. Prices reflect not just improvements in marketing efficiency resulting from market liberalization, but also many factors beyond domestic policy control: positive price trends in international markets and increased demand for Ugandan crop exports in regional markets as a result of peace in South Sudan and the Democratic Republic of Congo.

There was little fundamental change in how the households earned their income that benefited poverty reduction—either in agriculture or in other sectors. Most households continue to earn income in informal, low-investment, low-productivity activities such as

traditional crop farming and small-scale retail trading, and there has been little change in the proportion of households that count agriculture as their main sector of employment since 2006. In addition, persistently high fertility rates held back poverty reduction. A quarter of Uganda's households are female headed and these households experienced lower productivity largely because of the higher time-burden of childcare that they face. Limited spending on safety nets also resulted in fiscal redistribution having little direct impact on poverty reduction.

Uganda has set out an ambitious agenda for its future; its 2040 Vision foresees a middle-income country with the majority of its citizens living in urban areas, having smaller families, and earning income in non-agricultural sectors. Sustained gains in poverty reduction and the achievement of this vision for Uganda will require a fundamental shift in the nature of production—from low-investment, informal activities to higher-capital, more productive employment and a more rapid reduction in fertility rates.

To make this happen, effective public investment in services such as education, health, agricultural extension, and safety nets will be crucial. Structural change undoubtedly also requires a focus on firm growth and job creation, but for this growth to be inclusive of the poorest households, it must be paired with investments in education, skills, and finance, especially for vulnerable groups such as adolescent girls. The significant increase in primary enrollment rates brought about by the benefits of the Universal Primary Education (UPE) program has yet to translate into substantial improvements in educational outcomes. Primary completion rates were merely 53 percent in 2011, much lower than countries with similar income levels. Pregnancy is the fourth most common reason for dropping out of secondary school: in 2013, 1 in 10 girls report dropping out of secondary school as a result of pregnancy. Public transfers to households are negligible in Uganda—total spending on direct income support to poor households was 0.4 percent of gross domestic product (GDP) compared with 1.1 percent in other low-income countries in Africa.

But for these public investments to be effective, Uganda cannot let implementation gaps and poor service

delivery continue. Teacher absenteeism keeps students from learning and achieving, and teachers and health workers often lack the minimum knowledge to properly teach pupils or treat patients. As a consequence, children may go to school, but not master the knowledge that they need to be successful in the labor market. Similarly, public and private spending on health access does not guarantee that people are receiving quality service. All these can have a negative impact on people's skill attainment and health, even more so for the poor as they experience the lowest quality of services. Improving community-based monitoring and demand-side accountability is an important part of the solution, but more than this will be needed. Poorer communities are more likely to express satisfaction with any services that they are receiving, even though their quality is worse than in better-off communities.

Liberalization of markets has been important to Uganda's success in the past, but some markets are currently failing to work. The low quality of agricultural inputs in domestic markets results in poorer quality outputs and lower earnings. If authentic technologies replaced these low-quality products, average returns for smallholder farmers would be over 50 percent. Increasing the adoption of more modern technologies will entail improving the quality of inputs in local markets through certification (public or private). Improvements in rural financial markets are also needed to increase the access to financial capital that is required for agricultural input purchases, nonfarm employment growth, and rural to urban migration. This will be imperative to ensure consumption growth for poor households regardless of weather variations and regional and international prices.

Although there is an important role for the state in bringing about the change Uganda needs to see, the continued importance of security and liberalized markets cannot be underestimated. Ensuring continued stability in the region and further promoting efficient crop markets and regional exports will be important for future income growth in Uganda. This growth, when paired with an inclusive policy framework and stronger investments in basic services, can lead to more sustainable poverty reduction and improvements in the quality of life of millions of Ugandans.



OVERVIEW

- 1. Uganda's progress in reducing poverty from 1993 to 2006 is a remarkable story of success that has been well told.** Annual reductions in the national poverty rate of 1.9 percentage points a year resulted from the restoration of peace and stability to much of the country after Yoweri Museveni came into power in 1986, the series of economic liberalization reforms that were implemented in the 1990s, and the investments of households and firms that these encouraged (see for example, Collier and Reinikka 2003; World Bank 2007).
- 2. The narrative of Uganda's continued, albeit slightly slower, progress in reducing poverty since 2006 is less familiar.** Uganda reduced the proportion of people living on less than US\$1.90 per person per day by 2.7 percentage points per year, the second fastest percentage point reduction in extreme poverty per year in Sub-Saharan Africa during this period.¹ The national poverty rate continued to fall by 1.6 percentage points per year. However, during this time the national poverty line, set using data from 1993, became an increasingly poor standard against which to measure who was poor.
- 3. This was a period in which growth slowed as the gains from reforms years earlier had been fully realized, and weak infrastructure and increasing corruption increasingly constrained private sector competitiveness (World Bank 2015).** How, in this context, was Uganda still able to secure inclusive consumption growth for many of its citizens? Understanding the drivers of recent poverty reduction is important for offering lessons on how to reduce poverty further in the future not only in Uganda, but also for other countries in the region that have not experienced such progress.
- 4. This report examines Uganda's progress in reducing poverty, with a specific focus on the period 2006 to 2013.** The report shows that high growth from 2006 to 2010 benefited poverty reduction. Although growth slowed for all households from 2010, poor households were able to maintain above average consumption growth and poverty reduction did not falter. Agricultural income growth particularly benefited poor households aided by peace in northern Uganda, improved regional markets, and good weather. Modest gains in education also appear to have contributed to the growth for poor households, as did urbanization. However there was little fundamental change in the nature of production that benefited poverty reduction—either in agriculture or in other sectors. In addition, persistently high dependency ratios held back poverty reduction, and limited spending on safety nets resulted in fiscal policy

1. Uganda reduced the extreme poverty rate by 2.7 percentage points a year, second only to Chad, which reduced the extreme poverty rate by 3.1 percentage points per year. This is using poverty numbers reported in Povcalnet as of January 2016 and using the surveys deemed comparable by World Bank 2016.

contributing to neither poverty reduction nor to improving vulnerability.

5. Is Uganda on a path to end extreme poverty?

The benefits of security and liberalized markets for poverty reduction cannot be underestimated and will likely aid future poverty reduction as they have done in the past. However, sustained gains also require a fundamental shift in the nature of production from low-investment, informal activities to higher-capital, more productive employment. This in turn requires effective public investment in services (such as education, health, rural finance, quality of agricultural inputs and extension services), infrastructure (such as regional corridors and electricity), and safety nets. Addressing this requires addressing public investment implementation gaps and improving service delivery.

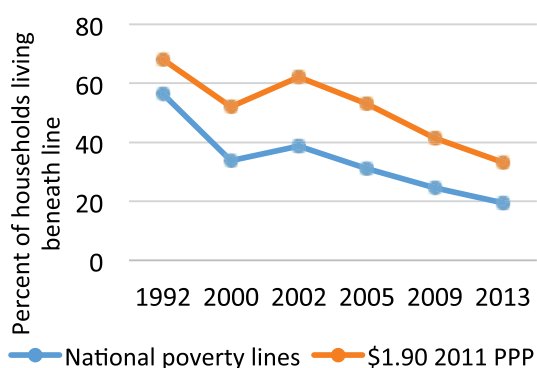
6. Before turning in further detail to the key findings of the report, it is important to note that the analysis undertaken in this report is only possible because the Government of Uganda (GoU) has invested in a high quality series of household surveys to document

progress in well-being since 1993. The UBOS has conducted high-quality household surveys every three to four years that have provided a comparable series of data on poverty and other household characteristics for the last twenty years. Uganda is one of the few countries in the region to have achieved this level of comparable, frequent poverty monitoring over time. Without this, it would not be possible to document the lessons Uganda provides.

A RECORD OF PROGRESS

7. Uganda recorded impressive rates of poverty reduction in the last two decades. The proportion of the Ugandan population living in poverty—whether measured using the national poverty line or the international poverty line—more than halved from 1993 to 2013 (Figure 1). The proportion of the population living below the national poverty line declined from 56.4 percent in 1993 to 19.7 percent in 2013.² The proportion of households living below the international extreme poverty line of US\$1.90 a day (2011 prices) fell from 68.1 percent in 1993 to 34.6 percent in 2013. The depth and severity of poverty have also fallen consistently.

FIGURE 1: Headcount poverty rate, national and international poverty line, 1993 to 2013



Source: Uganda National Household Survey (UNHS) 2006–2013.



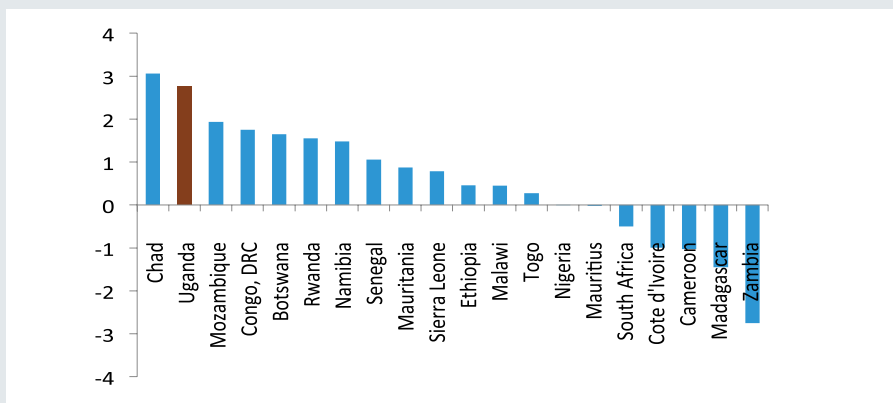
Most districts have difficulties in accessing basic services such as safe water

2. The national poverty line ranges from US\$0.88 to US\$1.04 2005 PPP per capita depending on the region. Poverty in Uganda is calculated using a cost-of-basic-needs approach. Consumption expenditure data is collected on food and non-food items through the UNHS conducted every three to four years. The poverty line was set in 1993 by calculating the cost of consuming 3,000 calories per adult equivalent and then adding an amount (the amount depending on the region) to capture non-food expenditures. The poverty line has only been updated for the cost of inflation since then and is low by international standards.

8. Progress in the period of focus for this report, 2006 to 2013, has been a little slower but still very fast by regional standards. The international extreme poverty rate—the proportion of households living on less than US\$1.90 purchasing power parity (PPP) per day—fell by 2.7 percentage points per year since 2003. Although this was slower than the rate of progress in earlier years, it was still the second fastest percentage point reduction in poverty per year in Sub-Saharan Africa (Figure 2). The high percentage point reduction is in part

due to the fact Uganda started with a high poverty rate. However, even considering the percentage reduction in poverty, Uganda’s performance has been impressive—the fifth fastest in the region during this time. The national poverty rate fell by 1.6 percentage points a year during this period, only slightly slower than the 1.9 percentage point reduction recorded from 1993 to 2006. However, the national poverty line has not been updated since 1993, causing this to become an increasingly poor measure of who is poor in Uganda today.

FIGURE 2: Annual reduction of poverty headcount at international poverty line, selected Sub-Saharan Africa countries (2003-2013)



Source: Staff calculations using Povcalnet.

9. Recent gains in poverty reduction have occurred during a period in which growth started to slow. Although growth slowed for all households, poor households still experienced consumption growth and poverty fell. Peace in northern Uganda and agricultural income growth aided consumption growth for poorer rural households, even though better-off urban households did not fare as well. As a result, the period from 2010 to 2013 was the only period in the last twenty years in which consumption growth was higher among the bottom 40 percent (2.3 percent per year) than among the top 60 percent (1.6 percent per year).

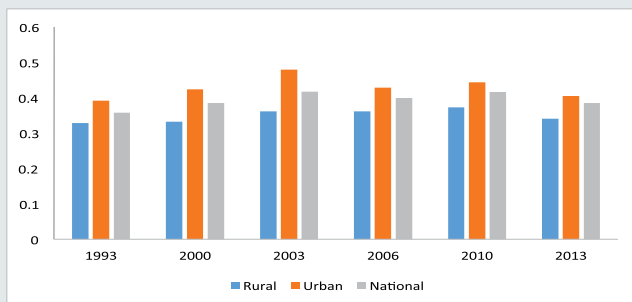
has been marginal and inequality fell from 2010 to 2013. Inequality increased in rural and urban Uganda from 1993 to 2010, by any measure. National inequality, as measured by the Gini index, increased from 0.36 in 1993 to 0.42 in 2010 (Figure 3). This finding holds when looking at other measures of inequality such as the Theil index with the parameter $\alpha=-1$ which emphasizes inequality for lower incomes, and the absolute and relative difference between the bottom 10 percent and the top 90 percent. However, the increase has been marginal and Uganda has a moderately low rate of inequality compared to other countries in the region (Figure 4). Inequality fell from 41.5 percent in 2010 to 38.5 percent in 2013, a reduction of 1 percentage point in the Gini per year.

10. In general, growth brought rising inequality as well as rising consumption but the increase

11. Trends in non-monetary well-being also point to improvements in the well-being of Ugandan households. Infant mortality dropped from 88 in 2001 to 76 in 2006 and 54 in 2011. Under-five mortality stood at 90 in 2011, having declined from 152 in 2001 to 137 in 2006.³ Between 2001 and 2011, under-five mortality dropped by 5.6 annually in Uganda. This was a considerable improvement in comparison to regional and global averages.

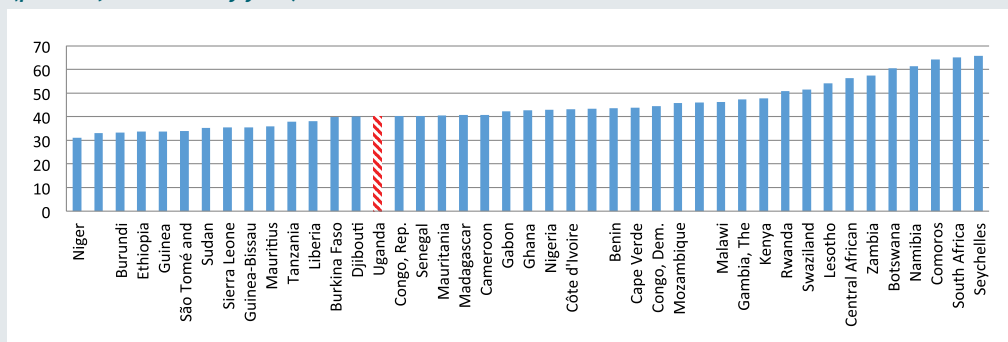
For example, between 2001 and 2011, under-five mortality dropped by 5.2 annually for Sub-Saharan African countries and by only 2.4 for the world. Education outcomes have also improved over time, for example the primary net enrollment rate increased from 84 percent in 2006 to 86 percent in 2013. In addition, ownership of modern assets such as telephones and motorcycles increased, while ownership of traditional assets, such as bicycles, fell.

FIGURE 3: Rising inequality: the Gini coefficient from 1993–2013



Source: UNHS 1993–2013.

FIGURE 4: Inequality is increasing, but remains moderate compared to the region (percent, latest survey year)



Source: World Development Indicators (WDI).

BUT MANY CHALLENGES REMAIN

12. However, despite the substantial progress that has been sustained over two decades, Uganda remains a very poor country. In 1993, Uganda was one of the poorest countries in the world, so, even after two decades of progress, poverty is still widespread. In 2013, more than a third of its citizens live below the international extreme poverty line of US\$1.90 a day.

13. The low national poverty rate of 19.7 percent reflects a poverty line that is too low and not a reality in which only a fifth of Ugandans are unable to meet their basic needs. When the national poverty lines are converted into 2011 PPP they vary from 72 percent to 82 percent of the international extreme poverty line of US\$1.90. The international extreme poverty line is designed to

3. Infant mortality and under-five mortality are per 1,000 children

capture the average national poverty line among the world's poorest countries, so the fact that Uganda's poverty lines are much lower, suggests that the poverty lines used in Uganda are too low.

14. An updated national poverty line that reflects the changes in consumption patterns of Ugandan households since 1993 suggests a poverty rate in the range of 33 to 35 percent.

The national poverty lines were set using data from 1993 and have not been updated to reflect the real price increases of some foods that poor households consume and the changing nature of food and non-food consumption in Uganda. Poverty lines that are 25 percent to 30 percent higher would reflect the changes in consumption over the last 15 years and would bring the lines closer to the standard used by other low-income countries.

15. Although there was improvement in the non-monetary dimension of well-being, the country still faces widespread deprivation.

Despite improvement over the last decade, access to basic infrastructure services remains abysmally low, particularly for the poor. Access to improved sanitation facilities remains very low by regional and international standards. Less than a third of households (31.3 percent) have adequate sanitation and a quarter of poor households have no toilet facility at all. Access to electricity in Uganda is one of the lowest in the world. Only 14

percent of households in Uganda use electricity for lighting.

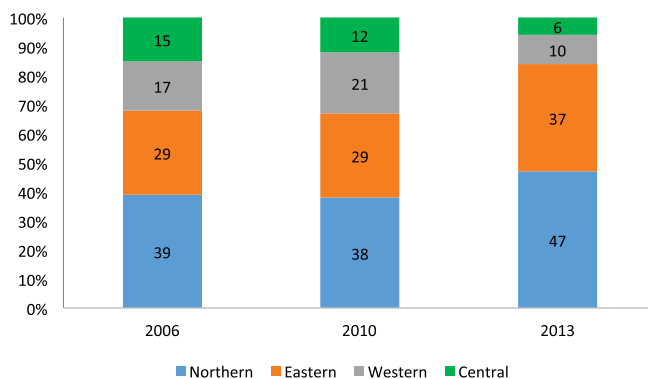
16. In addition, vulnerability to poverty in Uganda is high.

Between 2005 and 2009, for every three Ugandans who were lifted out of poverty, two fell back into poverty, illustrating the fragility of the gains realized by the poorest households (Ssewanyana and Kasirye 2012). Uganda's success in reducing poverty has resulted in many households that are living just out of poverty who remain vulnerable to falling back in to poverty in the face of a negative shock.

17. Poverty has become increasingly concentrated in the Northern and Eastern regions of Uganda as the Central and Western regions have experienced more rapid poverty reduction.

There are large and increasing regional variations in poverty with most of the poor concentrated in the north and the east. In 2006, approximately 68 percent of the poor lived in the northern and eastern parts of the country. Seven years later, this proportion increased to 84 percent. Poverty has fallen in all regions, but gains have been slower in the poorer Northern and Eastern regions (Figure 5). The annual percent reduction in poverty has been almost twice as high in the Central and Western regions (7.4 and 7.9 percent respectively) than in the Northern and Eastern regions (3.1 and 4.7 percent respectively).

FIGURE 5: Share of poor population in each region, 2006–2013



Source: UNHS 2006–2013.

18. High fertility rates and widespread acceptance of discriminatory attitudes to women hold back the participation of women in Uganda’s development, despite impressive gains in primary female enrollment, maternal mortality, and poverty reduction among female-headed households. Although, on average, female-headed households are no poorer than male-headed households, some groups of female-headed households are particularly vulnerable to poverty. Female widows are almost twice as likely to be poor compared to male widowers. Maternal mortality rates have been falling but are still high and given each woman goes through six births on average, having children still poses a significant risk to women. High pregnancy rates, particularly

among teenage girls, also jeopardize educational attainment. Pregnancy is the fourth most common reason for dropping out of secondary school: in 2013, 1 in 10 girls report dropping out of secondary school as a result of pregnancy. Lower rates of agricultural productivity among female-headed households can largely be accounted for by the higher childcare demands they face (Ali et al. 2015). Perceptions also limit Uganda’s progress in reducing gender inequalities: perceptions of gender appropriate economic roles have been found to account for lower female earnings (Campo et al. 2015), and worryingly, nearly four in every five Ugandan women accept domestic violence—the second highest acceptance of domestic violence in Sub-Saharan Africa (World Bank 2016a).



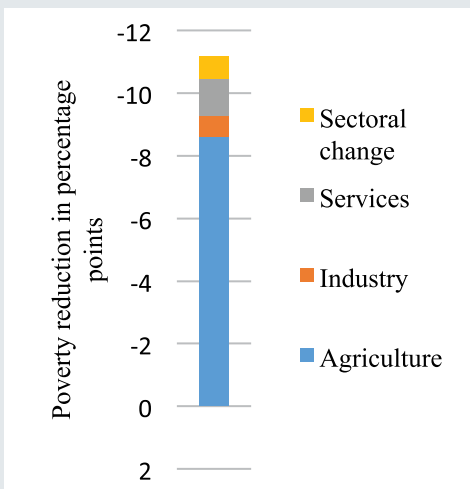
Long queue at a Health center in Kabong District.

AGRICULTURE

19. **Poverty reduction among households in agriculture accounts for 79 percent of national poverty reduction from 2006 to 2013 (Figure 6).** To some extent this is to be expected as the agricultural sector is the main sector of employment for households in Uganda, particularly so for poorer households. Although the agricultural sector is the

main sector of employment, half of those engaged in agriculture have additional sources of income from non-agricultural activities. However, poverty fell just as fast for agricultural households that were solely engaged in agriculture as for those with diversified income sources, suggesting that growth in agricultural incomes drove poverty reduction.

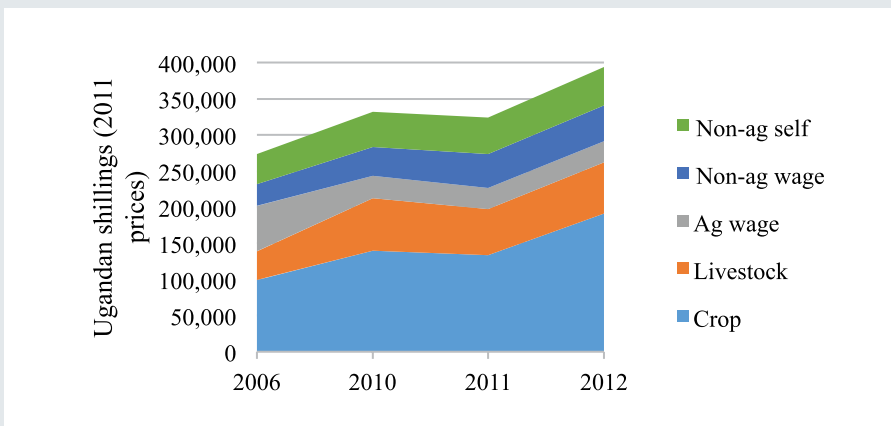
FIGURE 6: Sectoral contribution to poverty reduction, 2006 to 2013, main source of income



Source: UNHS 2006–2013.

20. **High rates of agricultural income growth were observed from 2006 to 2012, particularly for the poorest.** Figure 7 shows how different sources of income have grown for households in the bottom 40 percent from 2006 to 2012. Agricultural income grew at 6 percent per capita per year. Agricultural income growth is also found to be more strongly correlated with consumption growth than other sources of income growth, particularly for the bottom 40 percent.

FIGURE 7: Real income per capita by source of income, bottom 40 percent



Source: Uganda National Panel Survey (UNPS) 2006–2012

21. Agricultural incomes grew because the government got right some key fundamentals that provided the incentives to invest time in agricultural production and engage in agricultural markets. Conflict with the Lord's Resistance Army in the Northern region of Uganda was stabilized in 2008 and this had a positive impact on crop income. Establishing peace was associated with a doubling (a 112 percent growth) in crop income in affected areas. In addition, markets, particularly in the north and east, have been improving since 2006 because of infrastructure investments, new export markets opening up in South Sudan, DRC and in Kenya, better market information for farmers and traders (because of the development of a well-functioning information and communication technology [ICT] sector), and growth in trade services, which improved marketing efficiency. This has contributed to real relative price increases for agricultural commodities that poor farmers grow and sell.

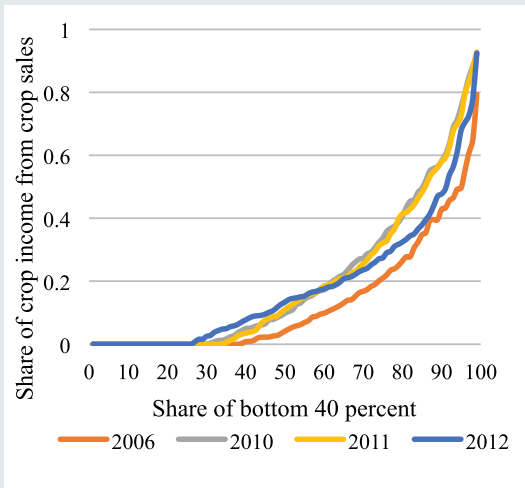
22. Luck was also on Uganda's side: good weather benefited many households and positive price trends in international and regional markets aided real crop price increases. Prices reflect not just improvements in marketing efficiency, but also favorable changes in supply and demand conditions within and outside of Uganda. Peace in South Sudan and the Democratic Republic of Congo provided new sources of demand for Ugandan food production. Good rainfall and prices account for 51 percent of the improvement in crop income for all households and 66 percent of the improvement in crop income for the bottom 40 percent. A 10 percent increase in water sufficiency increases crop income by 9.9 percent. A 10 percent increase in the price of maize or beans increases crop income by 4.5 and 9.2 percent, respectively.

23. The importance of regional and domestic markets in contributing to agricultural growth is confirmed by the fact that the share of

household income coming from crop sales increased from 2006 to 2012. The share of households in the bottom 40 percent that are selling crops increased from 60 percent in 2006 to 72 percent in 2012 (Figure 8). It is crops that are produced for domestic and regional consumption that dominate crop income. Coffee is important for some households, but does not comprise more than 10 percent of crop income in any region. This is consistent with the export data that shows that coffee fell from comprising three-quarters of exports at the beginning of the 1990s to a third of exports by 2005 (World Bank 2007) and that 41 percent of exports now go to Uganda's four regional neighbors (in order of importance): South Sudan, the Democratic Republic of Congo, Kenya, and Rwanda (World Bank 2016b).

24. Agricultural growth was not driven by technology adoption or change in the nature of production. When extension services were provided crop income was 20 percent higher, but few households received extension services. Extension services expanded from 8 percent of households in 2006 to 12 percent of households in 2013. There was very little growth in the use of improved inputs and as a result modernization of agricultural practices contributed very little to crop income growth. Understanding why farmers did not adopt agricultural technologies during this time of high prices and designing policies that help farmers overcome these constraints needs to be a key area of action going forward. Recent research suggests that poor quality of inputs, limited access to credit, and lack of knowledge are binding constraints. The high prevalence of low-quality inputs in domestic input markets results in negative returns on average, even though prices are high. If authentic technologies replaced these low-quality products, average returns for smallholder farmers would be over 50 percent.

FIGURE 8: Share of crop income derived from crop sales, bottom 40 percent, 2006–2012

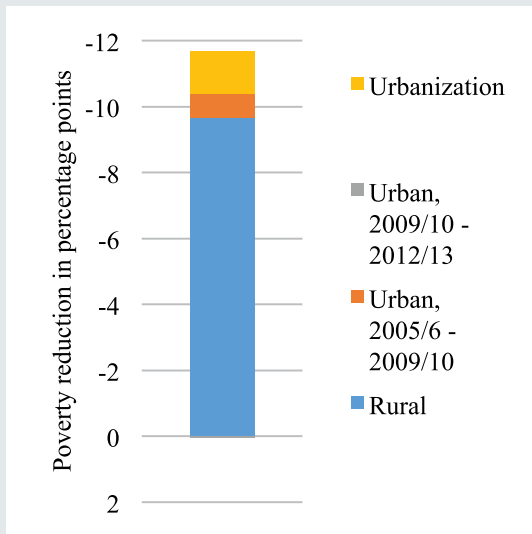


Source: Staff calculations using rural income-generating activities (RIGA) income aggregates calculated from UNPS 2006–2012

25. Urbanization can account for one-tenth of the poverty reduction that took place from 2006 to 2013, accounting for the movement of 180,000 people out of poverty.

While the bulk of Uganda’s 35 million inhabitants live in rural areas, the country is urbanizing at a considerable pace. Between 2002 and 2014 the share of Uganda’s population living in urban areas increased by more than 50 percent, from 12.1 percent to 18.4 percent (UBOS 2014b). Urbanization has been an important driver of poverty reduction from 2006 to 2013 (Figure 9). Migration, in addition to demographics and redistricting, contributes to urbanization.

FIGURE 9: Locational contribution to poverty reduction



Source: Staff calculations using UNHS 2006–2013

26. Careful analysis on the impact of migration suggests it results in consumption growth that is 14.6 percent higher per year for migrants compared to those who do not migrate.

Migration has a large and positive impact, both for those who move to rural destinations and those who move to urban destinations, but the impact of migration is larger when it entails moving to an urban area. Annual consumption growth is 16.3 percent higher for those who migrate to urban destinations and 14 percent higher for those who migrate to rural destinations. Migration can bring about welfare gains if individuals are able to move from areas where the return to labor is low to areas where the return to labor is higher because of better market opportunities.

This appears to have been the case for both rural-urban migration and rural-rural migration in which migrants often came from remote, conflict affected rural areas. Migration can also aid poverty reduction through the remittances that it allows. Currently little is known about the role of remittances in bringing about poverty reduction in Uganda.

27. Urban migration is facilitated by education and access to finance and hindered by remoteness and lack of access to social networks in urban areas. Those who are more educated are more likely to migrate and more likely to send household members to migrate. Even once controlling for other factors, a one-year increase in schooling leads to 0.1 percent increase in the incidence of out-migration. Having a formal loan and a savings account increases the likelihood of becoming a migrant-sending household by 3 and 6 percentage points, respectively, controlling for other factors. Access to finance can also help overcome the costs associated with migrating from a remote area to a distant urban center. There is also some evidence that access to mobile phones helps overcome barriers associated with limited social networks in urban areas.

28. Some migration—both rural and urban—is the result of experiencing loss of income, assets, or security. Young, working age individuals from areas with higher levels of conflict-related fatalities were more likely to migrate and migrated to rural areas. Young, working age individuals from areas with high levels of rainfall-induced harvest losses were more likely to migrate to urban areas. Losing assets and having no network to rely on in a time of need also encouraged migration. While migration helped increase the welfare of these individuals in the face of shocks, it is not clear whether migration is the optimal instrument to manage risk. Reducing exposure to risk and increasing access to other tools with which to manage shocks when they do occur may prove more beneficial in the long term.

EDUCATION

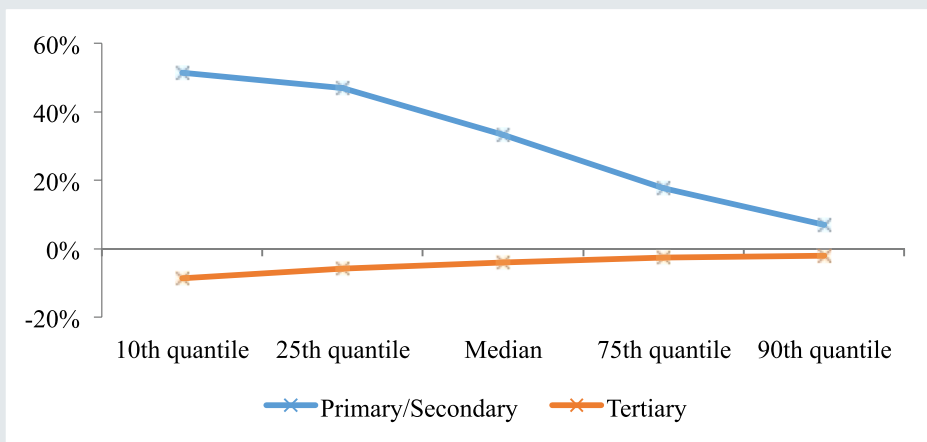
29. Although progress on education has been slow, progress has aided poverty reduction, accounting for half of the consumption growth experienced by poor households. Households with higher levels of education have higher agricultural incomes and more productive nonfarm enterprises. Education also enables migration and helps households gain more productive wage employment. The estimated returns to education in Uganda range from 4.5–8.3 percent (Lekfuangfu et al. 2012). Over the last decade, there was slow improvement in human capital outcomes but the slight increase of the share of households with secondary education aided consumption growth. Decomposition analysis suggests this improvement can account for half of the consumption growth of households at the bottom of the consumption distribution (Figure 10). The strong positive correlation of secondary education and consumption growth is particularly important for poor households.

30. Higher educational outcomes contribute to growth in wage employment income and migration and enables households to diversify in the face of shocks. Panel data analysis shows that as households have increased the level of education of household members they are more likely to see growth in wage income and in migration, particularly to urban areas. Having some secondary education implies a 1.4 percent reduction in the intensity of a weather shock for households in the bottom 40 percent. More education facilitates diversification by enabling increased participation in the labor market. Productivity in agriculture is also higher for those with higher levels of education.



Pupils in class in Alidi Primary School, Oyam District

FIGURE 10: Contribution of education to consumption growth



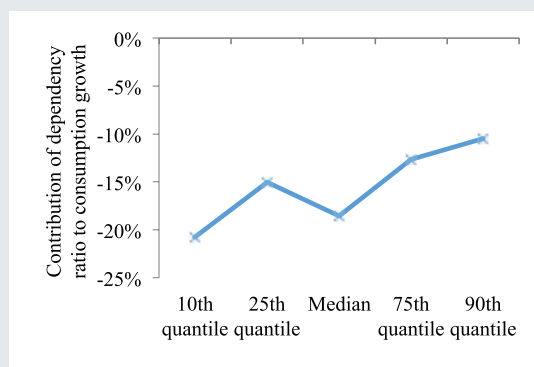
Source: Staff calculations using UNHS 2006–2013.

WHAT DID NOT CONTRIBUTE? DEMOGRAPHICS, STRUCTURAL CHANGE, AND REDISTRIBUTIVE FISCAL POLICY

DEMOGRAPHICS

31. **Uganda has one of the youngest and most rapidly growing populations in the world.** About half (48.7 percent) of Uganda’s population is younger than 15, well above Sub-Saharan Africa’s average of 43.2 percent and world average of 26.8 percent. The country’s population growth rate, currently at 3.3 percent, is also above Africa’s average.
32. **An increasing dependency ratio held back consumption growth from 2006 to 2013, reducing the consumption growth of the poorest households by 15 percent to 20 percent.** Although the fertility rate is high, it has been slowly falling over the last two decades. However, the drop in fertility rates in recent years has yet to substantially change the demographic composition of Ugandan households. The dependency ratio has been increasing, particularly for poorer households. This increase held back consumption growth from 2006 to 2013 (Figure 11). Reducing the dependency ratio will benefit consumption growth, particularly for poorer households.

FIGURE 11: Higher dependency ratios held back consumption growth, especially for the poorest



Source: Staff calculations using UNHS 2006–2013

The drop in fertility rates in recent years has yet to substantially change the demographic composition of Ugandan households. The dependency ratio has been increasing, particularly for poorer households.

STRUCTURAL CHANGE

33. **There has been little change in the proportion of households that count agriculture as their main sector of employment since 2006.**

This is despite high growth rates in services and manufacturing during this period. Additionally few households have diversified into nonfarm activities. From 1993 to 2006, many households stayed in agriculture, but diversified their sources of income by taking additional income activities in non-agricultural sectors (Fox and Pimhidzai 2011). This trend has not been observed since 2006. The high rates of growth in non-agricultural sectors resulted in job creation keeping pace with growth in the working age population, but not outpacing growth.

34. **Structural change and diversification was not a major driver of poverty reduction since 2006, although growth in nonfarm incomes helped some households.**

Although diversification may have driven poverty reduction before 2006, when

diversification was rapidly increasing, it was not a major driver of progress from 2006 to 2013. Poverty reduction was just as fast for those solely in agriculture as it was for those with diversified income sources. However, some households did experience growth in non-agricultural incomes and this aided improvements in consumption and reductions in poverty.

35. **Diversification has increased the resilience of households to shocks by making them less vulnerable to the impact of bad weather.**

Weather has a smaller impact on consumption than it does on crop income because households are able to increase income from non-agricultural activities (Table 1). If agricultural income is affected by climate shocks, households can offset this with increased nonfarm income. As a result, a lot of movement in and out of nonfarm activities by agricultural households is observed.

TABLE 1: Impact of weather on diversification

Impact of 10 percent reduction in rainfall on...	Crop income	Non-agricultural wage income	Nonfarm self-employment income	Consumption
All households	18.9***	-36.3***	-28.0***	4.8***
Bottom 40 percent	24.2***	-43.7***	-33.3***	4.0**

Source: Staff calculations using UNPS 2006–2012.

Note: Significance levels are reported as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

36. **Unhelpful gender norms, low levels of education, and lack of access to infrastructure and finance has limited the degree to which households move out of agriculture.**

Low education, lack of access to financial instruments (both savings and credit), and lack of access to requisite infrastructure (such as electricity) has constrained non-agricultural income growth for many households. In addition, strong gender norms have constrained non-agricultural income growth for many women during this period. Female adolescents are likely to give birth and get married young, limiting their income earning potential (Bandiera et al. 2015). Gender norms influence the type of activities women

engage in, causing them to go into lower productive sectors (Campo et al. 2015).

37. **Limited firm growth and job creation has also resulted in structural change contributing little to poverty reduction.**

While an analysis of the constraints to firm growth is beyond the scope of this report, and have been discussed elsewhere (for example, World Bank 2015), the results of the analysis undertaken show that the limited growth of non-agricultural jobs for the bottom 40 percent has been a missed opportunity for Uganda. Structural change could have contributed to poverty reduction more had this been present.

REDISTRIBUTIVE FISCAL POLICY

38. Growth, not redistribution, drives poverty reduction in Uganda reflecting a limited use of fiscal policy to redistribute incomes in comparison to other countries in the region.

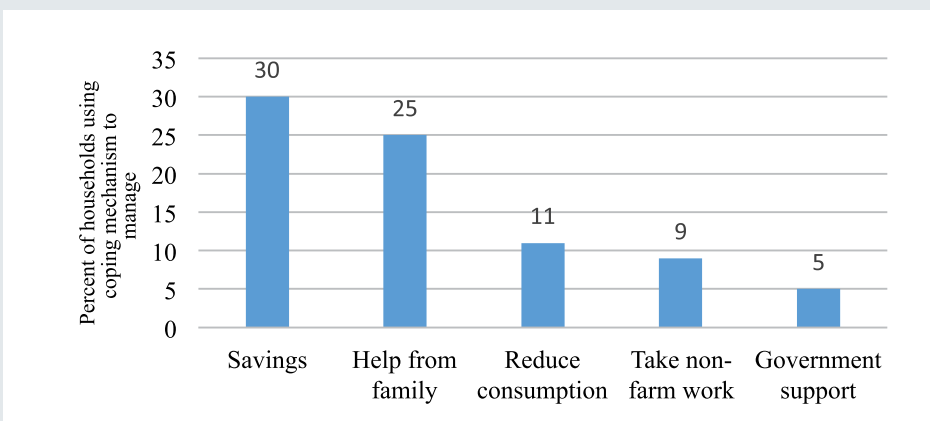
Public transfers to households are negligible in Uganda. The proportion of poor households receiving any kind of transfer is 5 percent. Uganda's total spending on social security in 2013 was 1 percent of GDP compared to an average of 2.8 percent for other countries in Africa. Of that 1 percent, only 0.4 percent was spent on direct income support to poor households, compared with 1.1 percent in other low-income countries in Africa (World Bank 2015).

39. There is also limited government support available to households to manage shocks to welfare. Figure 12 indicates that households rely on savings (35 percent) and help from family (25 percent) to mitigate the impact of shocks. Very few report receiving support from the government,

highlighting the absence of reliable official safety net programs. Safety nets provided by savings, family, and friends are of paramount importance in the absence of official safety net programs. In a context in which income volatility is high, limited formal safety nets result in considerable vulnerability to poverty. Savings cannot help mitigate large shocks and reliance on families and friends in the absence of formal safety nets is not always ideal. If all are affected by the same bad event (for example, poor rains or low cash crop prices), they are unable to provide help. Not only does the lack of formal safety nets result in households falling into poverty when setbacks occur, it also limits consumption growth for poor and vulnerable households. These households avoid investing in risky production activities even when returns are high. In addition, excessive reliance on informal networks can result in individuals hiding or foregoing income to avoid the risk of this type of informal taxation in the future (Fafchamps and Hill 2015; Jakiela and Ozier 2015).

Uganda's total spending on social security in 2013 was 1 percent of GDP compared to an average of 2.8 percent for other countries in Africa.

FIGURE 12: Self-reported coping mechanism



Source: Nikolaski et al. (2015) using UNPS 2011.

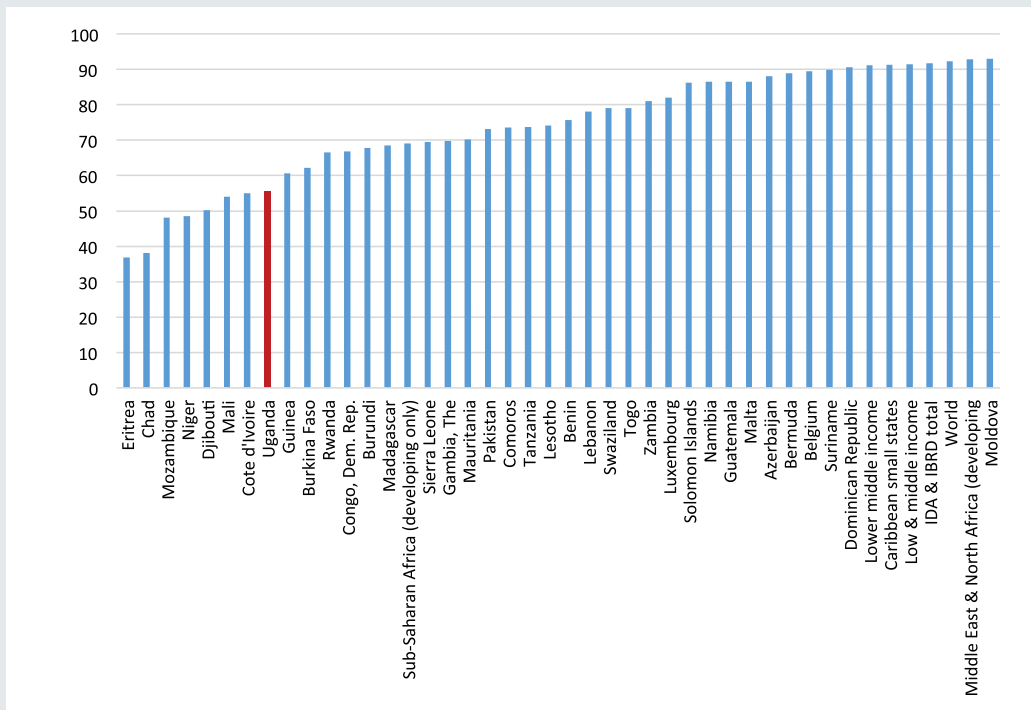
IMPROVING HEALTH AND EDUCATION OUTCOMES FOR POVERTY REDUCTION IN UGANDA

40. Although fiscal policy does not play an important role in directly redistributing income to reduce poverty, public spending can provide an important role in facilitating poverty reduction through the provision of basic services. However, the share of public spending on education and health services is low in Uganda, in comparison to regional peers. In 2013, public spending on health accounted for only 24 percent of the total expenditure on health. In contrast, this share was 37 percent among low-income countries and almost 44 percent among developing economies in Sub-Saharan Africa (World Bank 2015). This is compounded by the fact that overall public spending is low because of limited tax revenue generation. Because of low levels of spending, out-of-pocket payments are generally higher in Uganda than those in other countries in the region and in countries with similar levels of GDP per capita. Public investment in education also remains

low, averaging about 3.2 percent of GDP annually. It is also here that the implementation gap that has been increasing in recent years has limited the effectiveness of government.

41. The significant increase in primary enrollment rates has yet to translate into substantial improvements in educational outcomes. The high primary school enrollment rates among both poor and rich children reflect the benefits of the UPE program that was introduced by the GoU in 1997. However, primary completion rates are lower than expected, and the trends show that the completion rate fell as more children were enrolled in school. Uganda's gross primary completion rate was 53 percent in 2011. When compared with its peers, Uganda's primary completion rate is low (Figure 13). As a consequence, the out-of-school rate for lower secondary is much higher than its income peers.

FIGURE 13: Primary completion rate is among the lowest in the world



Source: WDI.

42. More and better health and education inputs seem to be available in better-off locations, as expected. Consider, for example, the number of pupils per classroom. These ratios are much higher for the poorest quintile of communities than the richest. A typical classroom in the poorest quintile has 116 pupils, while the corresponding figure for the richest quintile is 58 pupils. Teacher absenteeism rates at the level of schools or classrooms are also negatively correlated with welfare.⁴ For communities in the poorest quintile, about four out of ten teachers are absent from school. Teachers are more likely to be absent in poorer areas. Unlike in the education sector, there is no apparent correlation between health workers' absenteeism and the welfare level of communities. However, there is a clear correlation between patient caseload and community welfare.⁵ A health worker in the poorest quintile provides consultations to six outpatients per day (median value) versus three for staff in facilities in the richest quintile of communities. Sick people in poor areas are more likely to face overcrowding and long queues while visiting their health centers.

43. The low quality of inputs negatively affects service delivery outcomes, especially in poor areas. Teacher's absenteeism constitutes a barrier to pupil's achievement. Similarly, teachers and health workers often lack the minimum knowledge to properly teach or treat patients. Evidence suggests that workers knowledge is lower in poor communities. As a consequence, children may go to school, but not master the necessary knowledge that they need to be successful on the labor market. Similarly, public and private spending on health will not guarantee value for money. All these have the potential to have a negative impact on human capital accumulation, even more so for the poor, as they experienced the lowest quality of services.

44. Poorer communities are more likely to be satisfied with the services that they are receiving, even though it is clear from the

analysis that the level of inputs and their quality is higher in better-off communities. The perceived quality of service is negatively correlated with community welfare. The likely explanation is that poor communities are so deprived that their expectations are low. This leads them to be more rapidly satisfied with the services they get. By contrast, better-off communities have higher expectations and, therefore, are more demanding about quality and less satisfied even if objectively they are getting comparatively better services. This has a series of implications on how to deal with community feedback, including importance of access to information and education of beneficiaries on what quality to expect. This result also implies that community feedback as such is useful, but should not be the sole source of monitoring information.

45. The contrast between satisfaction and quality of service provision raises questions for the effectiveness of community based monitoring and the demand for accountability.

If the population in poor communities has low expectations or is not exposed enough to what services of good quality should look like, to be able to indeed assess quality, it is not clear that it can effectively lobby for quality services. For social accountability mechanisms to be effective, additional measures may be needed to enable disadvantaged communities to properly monitor the services they receive. The issue is not specific to Uganda, and there are examples of social accountability initiatives with mixed results (Fox 2015). Issues of political economy may also have to be considered for social accountability measures to work (Joshia and Houtzagerb 2012). The importance of information for a positive impact of community monitoring has been documented for the case of Uganda by Reinikka and Svensson (2005) and Svensson et al. (2015) among others. Reinikka and Svensson (2005) conducted an experiment that shows that making information on budget allocation available to beneficiaries reduces

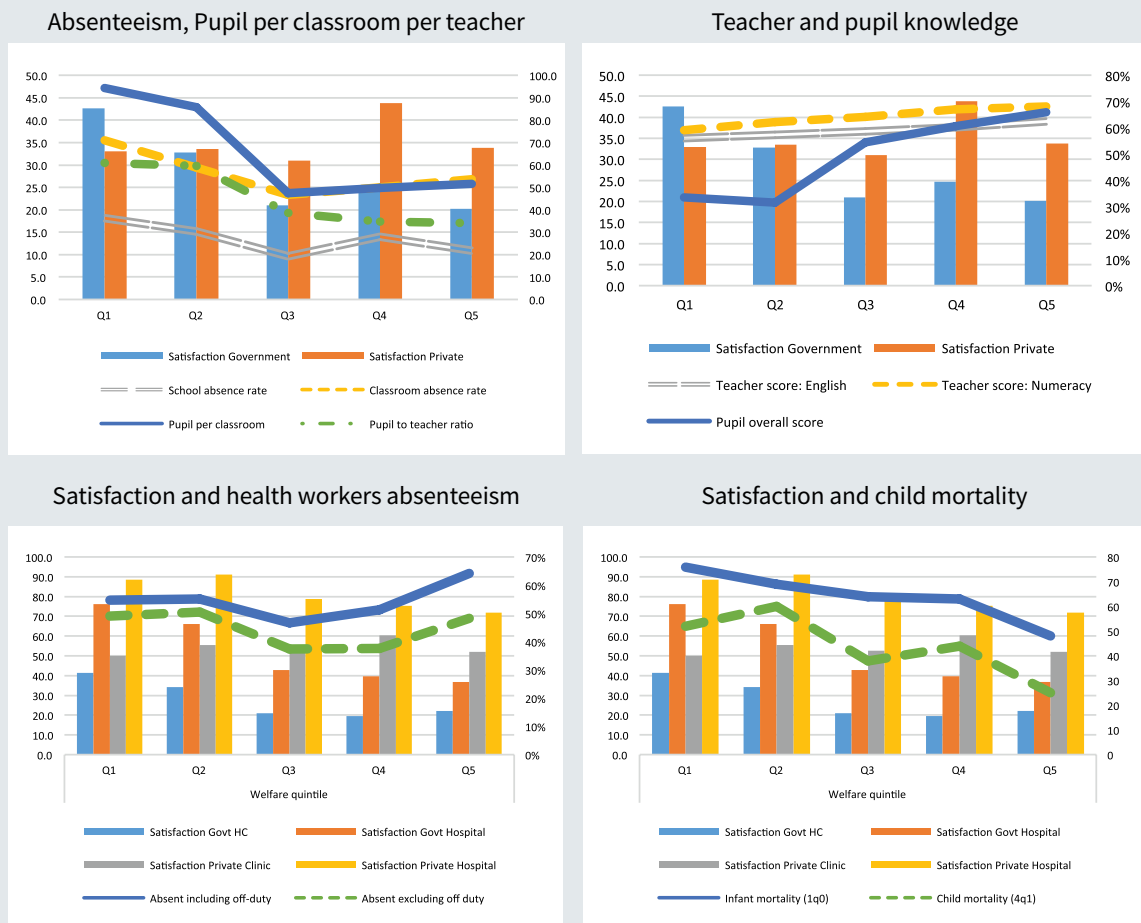
4. That is, whether teachers are in the classroom even if they may be in the school.

5. Patient caseload is defined as the average number of outpatient visits a health worker attends to per working day.

corruption and elite capture and has a positive impact on enrollment and educational outcomes. Svensson et al. (2015) conducted an experiment on community-based monitoring of absenteeism versus head teachers monitoring. They found that local monitoring improves teacher attendance but only when the head teacher is responsible for

monitoring and there are financial incentives for teachers at stake. Moreover, they also found that parents generate significantly less reliable reports than head teachers do. Overall, in a context where poverty and expectations are a problem, more needs to be done for social accountability to be effective.

FIGURE 14: Inputs and user satisfaction by welfare quintiles in education sector



Source: Staff calculations using the 2013 Service Delivery Indicators (SDI) survey, the UNHS 2012/13, and the Uganda Demographic and Health Survey (UDHS) 2011.

If the population in poor communities has low expectations or is not exposed enough to what services of good quality should look like, to be able to indeed assess quality, it is not clear that it can effectively lobby for quality services.

ENDING EXTREME POVERTY IN UGANDA

- 46. This report has documented that Uganda has continued to reduce poverty from 2006 to 2013, even as growth faltered.** Although growth slowed for all households, poor households still experienced consumption growth and poverty fell. Agricultural growth drove much of this poverty reduction aided by peace in the north, improvements in domestic and regional food markets, favorable international prices, and good weather. Urbanization and modest improvements in education outcomes also contributed to poverty reduction.
- 47. However, it is not clear that the processes that brought about gains in the past can be relied upon to address the continuing challenge of extreme poverty in Uganda, particularly in the impoverished Northern and Eastern regions.** Uganda's formula for success is one that works when conditions are favorable, particularly in agriculture. Moreover, luck was on Uganda's side. There was little fundamental change in the nature of production that benefited poverty reduction—either in agriculture or in other sectors.
- 48. The benefits of security and liberalized markets cannot be underestimated and will likely aid future poverty reduction, as they have done in the past.** Ensuring continued stability in the region, and further promoting efficient crop markets and regional exports such as through investments in regional corridors and improving export efficiency will be important for future agricultural growth in Uganda, and this benefits poor households.
- 49. However, sustained gains also require a fundamental shift in the nature of production from low-investment, informal activities to higher-capital, more productive employment.** This in turn requires effective public investment in services (such as education, health, and agricultural extension) and safety nets. Without this, it is hard to ensure sustained progress in poverty reduction, reduce vulnerability, and address regional inequality.
- 50. Modernizing agricultural production will require a focus both on fostering demand for agricultural products and on addressing the constraints households face in making investments.** Continued efforts in increasing demand for agricultural production through regional trade, growth in urban demand, and investments in agro-processing industries are needed to keep prices of agricultural commodities high. Addressing constraints to modern input adoption will entail improving the quality of inputs in local markets through certification (public or private), and complementary investments in extension and credit to address the knowledge and financial constraints farmers face. This is particularly important in the Northern and Eastern regions where agricultural income growth is particularly vulnerable. Addressing the volatility of returns to investing in agriculture in this region—through safety nets or other insurance mechanisms—may also be needed.
- 51. Increasing the contribution of non-agricultural income growth to poverty reduction requires a focus on firm growth and job creation, but also investments in education and increased financial inclusion.** An assessment of the constraints to firm growth are beyond the focus of this report, but this report has shown that for non-agricultural growth to be inclusive of the poorest households, investments in education and skills training for the poorest are needed (especially for vulnerable groups such as adolescent girls), as well as stronger financial markets for savings and credit. When urbanization occurs this brings direct gains to those who move, and evidence suggests that investments in education and financial markets will aid migration.
- 52. Improving educational outcomes and addressing knowledge gaps through extension and vocational training will require improving service delivery.** Although the analysis highlights many benefits to higher education, progress in improving educational outcomes has been slow.

The quality of service delivery is lower for poorer households and poorer households are also less vocal about the poor quality of service delivery they receive, limiting the effectiveness of local accountability mechanisms to improve service delivery in poor communities.

- 53. Concerted action to reduce fertility rates is also needed to reduce the strain that high dependency ratios puts on poverty reduction and to improve the socioeconomic status of women.** Investing in education and economic opportunities for adolescent girls helps to reduce fertility rates.



Vocational training center in Moyo District



INTRODUCTION

This report examines Uganda's progress in reducing poverty over the last two decades, with a specific focus on the period 2006 to 2013. Uganda's progress in reducing poverty from 1993 to 2006 is a remarkable story of success that has been well told. Annual reductions in the national poverty rate of 1.9 percentage points a year resulted from the restoration of peace and stability to much of the country after Yoweri Museveni came into power in 1986, the series of economic liberalization reforms that were implemented in the 1990s, and the investments of households and firms that these encouraged (see for example, Collier and Reinikka 2003, World Bank 2007).

The narrative of Uganda's continued, albeit slightly slower, progress in reducing poverty since 2006 is less familiar. This was a period in which growth started to slow, as the gains from reforms years earlier had been fully realized, and weak infrastructure and increasing corruption increasingly constrained private sector competitiveness (World Bank 2015). During this period, the national poverty rate still fell by 1.6 percentage points per year and Uganda still recorded the second fastest percentage point reduction in extreme poverty per year in Sub-Saharan Africa since 2000, an African success story.⁶ This report examines how, in this context, Uganda was still able to secure consumption growth for many of its citizens.

Uganda has a wealth of household survey data that has been used in this work. The quality, regularity, and comparability of available household surveys set Uganda apart from many other countries in the region. The core of the analysis undertaken in the report uses two series of surveys: (a) the UNHS undertaken in 1992/93, 1999/2000, 2002/03, 2005/06, 2009/10, and 2012/13 (henceforth referred to as 1993, 2000, 2003, 2006, 2010, and 2013), and (b) the UNPS undertaken in 2005/06, 2009/10, 2010/11, and 2011/12 (henceforth referred to as 2006, 2010, 2011, and 2012).

The UNHS is a nationally representative cross-section and it is from this series that the official consumption aggregates and monetary poverty estimates are derived. This series also provides official statistics on many non-monetary dimensions of well-being. As its name suggests, the UNPS is a panel survey in which households surveyed in UNHS 2006 were revisited in subsequent survey rounds. The sample was nationally representative in 2006 and a random sample of split-offs from sample households have also been followed with the aim of keeping the survey national representative. The survey collects much of the same data as in the UNHS but in addition has detailed information on agriculture, income earned from other sources, and anthropometric data. The advantages of using a panel survey for the analysis of poverty trends are described in Box 1.

6. Uganda reduced the extreme poverty rate by 2.7 percentage points a year, second only to Chad who reduced the extreme poverty rate by 3.1 percentage points per year. This is using poverty numbers reported in Povcalnet as of January 2016, and using the surveys deemed comparable by World Bank 2016.

The UDHS undertaken in 2001, 2006, and 2011 and the SDI survey undertaken in 2013 complement this analysis. The UDHS is a nationally representative cross section designed to provide population and health indicator estimates for the country as a whole and for urban and rural areas separately. Estimates can also be reported for the ten subregions of Uganda. The SDI survey collects facility-based data from primary schools and health facilities. The sample frame is the list of all facilities in the country. The survey instruments incorporate recent innovations in measuring provider competence and effort (World Bank 2013). The sample design is national, with the possibility of disaggregating results by rural/urban locations as well as regions and by type of provider (public or private) for both education and health.

Chapters 1 and 2 synthesize progress since 1993, but with a focus on 2006 to 2013. **Chapter 1** starts with a focus on monetary poverty. In addition to documenting trends in national and international poverty and inequality it examines the incidence of consumption growth; assesses whether the poverty line is too low given the changes in the consumption patterns of the poor since the line was set in 1993; and simulates future poverty trends. **Chapter 2** takes as its focus progress in non-monetary dimensions of well-being and in particular assesses the degree to which households in Uganda have experienced change in non-monetary dimensions of well-being that are commensurate with the country's economic development.

The overwhelming conclusion of Chapters 1 and 2 is that there has been substantial progress in well-being in Uganda since 2006. In the chapters that follow, the factors that have contributed to this progress are explored. **Chapter 3** examines the drivers of poverty reduction through decomposition analysis using the UNHS and through analysis of the UNPS that has followed the same households through this period. It highlights the importance of agriculture, urban migration, and modest gains in education. It also highlights the limited role of structural change since 2006, the persistently high dependency ratios which held back poverty reduction and limited spending on safety nets, which have resulted in fiscal policy contributing to

neither poverty reduction nor to improving vulnerability.

Chapter 4 explores the nature of agricultural growth that has reduced poverty in further detail and examines what drove progress for poor households during this period.

Chapter 5 explores why structural change contributes so little to progress by examining the constraints households in the bottom 40 percent face in moving out of agriculture. **Chapter 6** uses panel analysis to quantify the welfare gains from migration and to explore who has benefited from migration and what constrains migration of others during 2006 to 2012.

In looking back to explain drivers and constraints of progress, these chapters point to a number of priorities for ending extreme poverty in Uganda. Peace in northern Uganda, improved regional markets and good weather drove growth in agricultural incomes. The benefits of security and liberalized markets will likely aid future poverty reduction as they have done in the past. However, there was little fundamental change in the nature of production that benefited poverty reduction—either in agriculture or in other sectors. Sustained welfare gains also require a fundamental shift in the nature of production from low-investment, informal activities to higher-capital, more productive employment. The analysis highlights that transitions require effective public investment in services (such as education, health, and agricultural extension), infrastructure (such as regional corridors and electricity) and safety nets.

Increasing the effectiveness of public investment in Uganda for poverty reduction, in turn requires addressing improving service delivery. For example, the analysis shows that education increases agricultural income, aids migration and transitions out of agriculture, and reduces vulnerability. Yet progress in improving educational outcome has been slow. **Chapter 7** takes as its focus the relationship between service delivery and poverty reduction, highlighting that the quality of service delivery is lower for poorer households and that poorer households are also less vocal about the poor quality of service delivery they receive, limiting the effectiveness of local accountability mechanisms to improve service delivery in poor communities.

BOX 1: Use of Panel Data for Poverty Analysis

This report draws on the nationally representative UNPS to analyze the drivers of welfare changes in Uganda over time. Panel data provides a number of advantages for the analysis of welfare outcomes. It allows the same household to be followed over time, making it possible to calculate the income and consumption growth of a given household over time. Panel data also allows for regression analysis to look at how changes in the characteristics or behavior of the household or individual over time have contributed to changes in welfare. This is arguably a stronger basis for identifying what has caused welfare improvements than just looking at the characteristics of those that are poor or non-poor.

However, caution is still warranted in drawing causal conclusions from panel analysis, as it is possible that a characteristic of the household not captured in the analysis allowed the household to both change behavior and experience welfare gains. Inferring that the behavior change caused this improvement would be erroneous. The core pieces of analysis in Chapters 4 and 6 thus rely on changes that can be considered exogenous.

In addition, the attrition present in panel surveys—and in the UNPS in particular—makes it less representative of Ugandan households over time. Households that stay in their original location are more likely to be found in a successive visit, but households that have moved or new households that have formed from old households are less likely to be found. Controlling for attrition in the analysis is difficult. This has been addressed in this report by: (a) not using the UNPS to develop descriptive statistics if the same variable is available in the UNHS, (b) focusing analysis on households that have not moved (Chapter 4) or specifically analyzing the splits and moves (as is done in Chapter 6).



Pupils in class in Alidi Primary School, Oyam District

CHAPTERS

The image features a dirt road that curves through a field of tall grass and scattered trees. The entire scene is overlaid with a dark teal gradient, which is darker at the top and bottom edges and lighter in the center. The word "CHAPTERS" is written in a bold, white, sans-serif font across the middle of the image.

CHAPTER: 1

UGANDA'S PROGRESS IN REDUCING POVERTY

Uganda has recorded impressive rates of poverty reduction in the last two decades. The proportion of the Ugandan population living in poverty—whether measured using the national poverty line or the international poverty line—more than halved from 1993 to 2013.



- 1. The Ugandan economy has experienced high growth through much of the last two decades.** Peace and stability were restored in much of the country in 1986 when Yoweri Museveni came into power and then in the north of Uganda in 2008. Stability and the series of economic liberalization reforms that were implemented in the 1990s contributed to high growth (see for example, Collier and Reinikka 2003, World Bank 2007). Growth started to slow in 2010 as the gains from peace and the reforms years earlier had been fully realized, and weak infrastructure and increasing corruption increasingly constrained private sector competitiveness (World Bank 2015).
- 2. This chapter documents that Ugandan households have also experienced progress in monetary well-being during the last two decades, including during the period of focus for this report, 2006 to 2013.** Although consumption growth has been lower, on average, in recent years, it has become increasingly pro-poor. The period from 2010 to 2013 was the only period in the last twenty years in which consumption growth benefited the poor more than the rich and inequality fell. The national poverty rate fell by 1.6 percentage points a year since 2006 (compared to 1.9 percentage points a year before then) and the international poverty rate fell by 2.7 percentage points per year (much higher than the regional average of 0.74 during this period).

During 2006 to 2013, Uganda had the second fastest percentage point reduction in poverty per year in Sub-Saharan Africa.

- 3. However, this progress is not without its challenges.** Uganda remains a very poor country. In 2013, more than a third of Ugandans lived below the international extreme poverty line of US\$1.90 a day. The low national poverty rate of 19.7 percent reflects a poverty line that is too low and not a reality in which only a fifth of Ugandans are unable to meet their basic needs. An updated national poverty line that reflects the changes in consumption patterns of Uganda households since 1993 suggests a higher national poverty line is needed. Even with a higher line, progress in reducing poverty has been impressive over the last two decades. Yet progress has pushed many households just out of poverty and they are vulnerable to falling back in to poverty. In addition, regional disparities are increasing over time and

poverty is now concentrated in the Northern and Eastern regions of the country where progress is slower.

- 4. This chapter documents trends in national and international poverty rates incorporating findings from World Bank and other studies that have also documented progress in well-being over this period (for example, Ssewanyana and Kasirye 2013, MoFPED 2014, UBOS 2014a, World Bank 2015).** It assesses whether the poverty line is too low given the changes in the consumption patterns of the poor since the line was set in 1993 and examines what the implications of a higher poverty line would be for poverty incidence in Uganda. The chapter then turns to examining the incidence of consumption growth and how the distribution of consumption of Ugandan households has changed over time. The chapter concludes by providing a profile of characteristics of the poor and simulating future poverty trends.

1.1. Recent progress in poverty reduction

- 5. Uganda has recorded impressive rates of poverty reduction in the last two decades.** The proportion of the Ugandan population living in poverty—whether measured using the national poverty line or the international poverty line—more than halved from 1993 to 2013 (Table 1.1 and Figure 1.1.1). The proportion of the population living under the national poverty line declined from 56.4 percent in 1993 to 19.7 percent in 2013.⁷ The proportion of households living beneath the international extreme poverty line of US\$1.90 a day (2011 prices) fell from 68.1 percent in 1993 to 34.6 percent in 2013. The rate of progress has been particularly

fast in the last decade with international extreme poverty falling from 62.2 percent in 2003.

- 6. The depth and severity of poverty have also fallen consistently.** Measured at the national poverty line, the poverty gap—the average amount that each household lives beneath the poverty line (expressed as a percentage of the poverty line)—fell from 11.9 percent in 2003 to 5.2 percent in 2013 (Table 1.2)⁸. The severity of poverty, an index that gives more weight to those households who fall substantially below the poverty line, fell from 5.1 percent to 2 percent.

7. The national poverty line ranges from US\$0.88 to US\$1.04 2005 PPP per capita depending on the region. Poverty in Uganda is calculated using a cost-of-basic-needs approach. Consumption expenditure data is collected on food and non-food items through the UNHS conducted every three to four years. The poverty line was set in 1993 by calculating the cost of consuming 3,000 calories per adult equivalent and then adding an amount (the amount depending on the region) to capture non-food expenditures. The poverty line has only been updated for the cost of inflation since then and is low by international standards.

8. This measure reflects the depth of poverty as well as its incidence. The indicator is often described as the per capita amount of resources needed to eliminate poverty or reduce the poor's shortfall from the poverty line to zero, through perfectly targeted cash transfers.

7. **Uganda has experienced one of the fastest reductions in extreme poverty seen in Sub-Saharan Africa.** Uganda's reduction in poverty has kept pace with the strong growth in gross national income (GNI) per capita that it experienced from 1999 to 2013 (Figure 1.1.2). Uganda had the second fastest percentage point reduction in poverty per year in Sub-Saharan Africa during the period of focus for this study (2006 to 2013), an African success story (Figure 1.1.3).

8. **Trends in non-monetary well-being also tell the same story of rapid improvements in the well-being of Ugandan households, but there is still much left to be achieved.** The share of households with improved roof material went up by 7 percentage points, from 61 percent in 2006 to 68 percent in 2013. Nearly three-quarters of households in Uganda had access to improved water sources in 2013. Ownership of modern assets such as mobile phones and motorcycles has increased. Performance on adult literacy is way above expected, given the GNI level, and is on the rise. Cross-country regressions also suggest that Uganda performs well on child and maternal

mortality and child nutrition. However, Uganda is still lagging behind in many dimensions. For instance, access to electricity is one of the lowest in the world. Education outcomes have improved as well, but the significant increase in primary enrollment rates has yet to translate at higher levels. Chapter 2 looks at non-monetary well-being in detail.

9. **However, Uganda is still a poor country; more than a third of the country still lives in extreme poverty as measured by the international poverty line of US\$1.90 a day.** Figure 1.1.4 indicates that in comparison to other countries in Sub-Saharan Africa, Uganda experiences moderate poverty rates. The poverty gap (at US\$1.90 2011 PPP per capita per day) indicates that it will take an average payment of US\$70 per capita per year to eliminate extreme poverty in Uganda. Understanding the drivers of recent poverty reduction is important both for offering lessons on how to reduce poverty further in the future not only in Uganda, but also for other countries in the region that have not experienced such a remarkable reduction in poverty.

TABLE 1.1: Poverty from 1993 to 2013, national and international line

Proportion of the Population Living Beneath		
	National Poverty Line*	International Poverty Line**
1993	56.4	68.1
2000	33.8	52.1
2003	38.8	62.2
2006	31.1	53.2
2010	24.5	41.5
2013	19.7	34.6

Source: UNHS 1993–2013.

Note: * Ranges from US\$0.94 to US\$1.07 PPP per capita per day depending on the region of the country.¹⁰
 ** US\$1.90 2011 PPP per capita per day.

9. Uganda reduced the extreme poverty rate by 2.7 percentage points a year, second only to Chad which reduced the extreme poverty rate by 3.1 percentage points per year. This is using poverty numbers reported in Povcalnet as of January 2016 and using the surveys deemed comparable by World Bank 2016.

10. This is calculated by converting the region-specific national poverty lines to U.S. dollar 2005 PPP and dividing by the average ratio of adult equivalents to individuals (given the national poverty line is a per adult equivalent line).

TABLE 1.2: Reductions in the depth and severity of poverty at the national line, 1993 to 2013

	Poverty Depth			Poverty Severity		
	National	Rural	Urban	National	Rural	Urban
1993	20.3	22	8.3	9.9	10.81	3.48
2000	10	11.2	2.1	4.25	4.79	0.68
2003	11.9	13.1	3.9	5.1	5.7	1.6
2006	8.7	9.7	3.5	3.5	3.9	1.4
2010	6.7	7.6	1.8	2.8	3.1	0.6
2013	5.2	6	2.5	2	2.4	0.9

Source: UNHS 1993–2013.

Note: 2000 excludes Kitgum, Gulu, Bundibugyo, Kasese, and Pader districts.

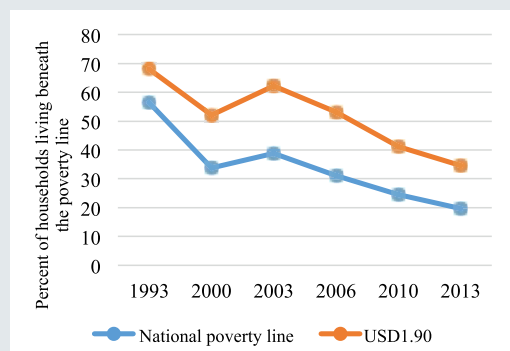
TABLE 1.3: National poverty rates by region

Year	Region			
	Central	Eastern	Northern	Western
1993	45.6	58.8	73.5	52.7
2000	19.7	34.9	63.7	26.2
2003	22.3	46.0	63.0	32.9
2006	16.4	35.9	60.7	20.5
2010	10.7	24.3	46.2	21.8
2013	4.7	24.5	43.7	8.7
Percentage point reduction, 2003–2013	17.6	21.5	19.3	24.2
Annual percent reduction, 2003–2013	7.9%	4.7%	3.1%	7.4%

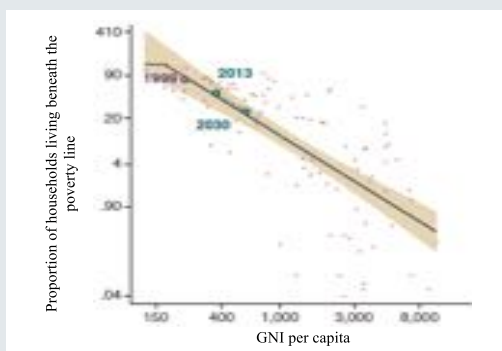
Source: UNHS 1993–2013

FIGURE 1.1: Two decades of progress in reducing poverty

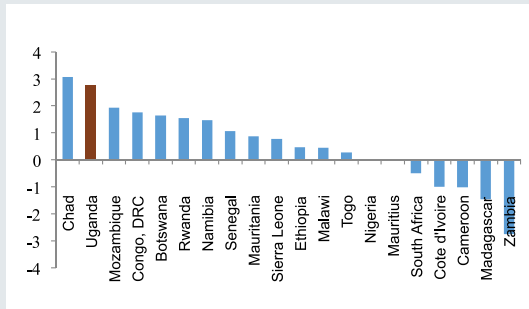
1. Headcount poverty rate, national and international poverty line, 1993 to 2013



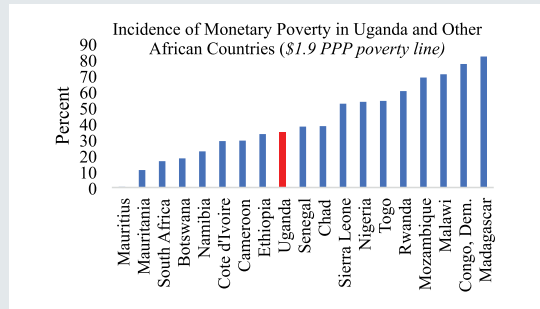
2. Poverty reduction and growth in GNI per capita, Uganda (marked) and all other countries



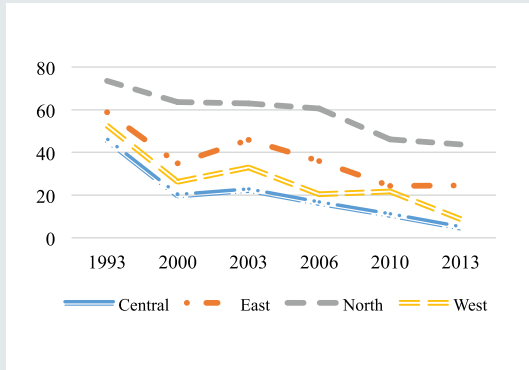
3. Annual reduction of poverty headcount at international poverty line for selected countries (2003-2013)



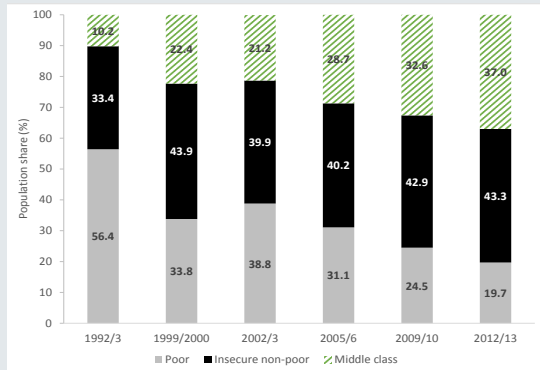
4. Extreme poverty, Uganda and other African countries (latest survey year)



5. National poverty rates by region



6. Poor, vulnerable, and middle class



Sources: 1, 5: UNHS 1993–2013; 2 Gable, Lofgren, and Osorio-Rodarte (2015); 3, 4: WDI; 6: MoFPED 2015.

Notes: 2: Each point represents a country, the years denote Uganda's values for 1999, 2013, and 2013 (projected). The regression line and confidence interval is also shown. The graph uses 2005 PPP and the poverty rate of US\$1.25 2005 PPP per day. 6: Poverty Status Report: Absolute poor: living below the national poverty line; Insecure: living below twice the poverty line; Middle class: living above twice the poverty line.

10. Poverty has fallen in all regions, but gains have been slower in the poorer Northern and Eastern regions (Figure 1.1.5).

As Table 1.3 shows, the annual percent reduction in poverty has been almost twice as high in the Central and Western regions (7.4 and 7.9 percent, respectively) than in the Northern and Eastern regions (3.1 and 4.7 percent, respectively). However, the percentage point reduction in poverty has been similar across regions. Spatial concentration of poverty in the Northern and Eastern regions is occurring as a result.

11. In spite of the significant decline in the poverty

rate, vulnerability to poverty in Uganda is high.

Nearly 43 percent of Ugandans were insecure non-poor in 2013, defined as those living above the poverty line but living on less than twice the poverty line (Figure 1.1.6)¹¹. Between 2005 and 2009, for every three Ugandans who were lifted out of poverty, two fell back into poverty, illustrating the fragility of the gains realized by the poorest households (Ssewanyana and Kasirye 2013). Uganda's success in reducing poverty has resulted in many households that are living just above the poverty line who remain vulnerable to falling under the poverty line in the face of a negative shock.

11. As per the Poverty Status Report 2014 produced by the MoFPED.

1.2 Is the national poverty line a good measure of poverty in Uganda?

- 12. The national poverty line used to define an individual as poor or non-poor in Uganda is low—about three-quarters of the international extreme poverty line of US\$1.90—and results in a low national poverty rate.** Poverty in Uganda is measured by assessing whether a household consumes enough to meet their basic food needs and other necessary expenditures. The amount needed for basic food needs and other necessary expenditures is captured in the national poverty lines. Uganda has different poverty lines for different regions to allow for the fact that the cost of living varies across different parts of the country (see Box 1.1 for more details on how poverty is measured in Uganda). When these poverty lines are converted into 2011 PPP they vary from US\$1.36 to US\$1.55, 72 percent to 82 percent of the international extreme poverty line of US\$1.90. The international extreme poverty line is designed to capture the average national poverty line among the world's poorest countries, so the fact that Uganda's poverty lines are much lower suggests that the poverty line in Uganda is perhaps too low.¹²
- 13. The national poverty line in Uganda was established using data from 1993 and has been updated using the Consumer Price Index (CPI) since then.** The poverty line was set based on an in-depth analysis of the pattern of food and non-food consumption among Uganda's poor (Appleton et al. 1999).
- 14. However, much has changed in Uganda since 1993 and the amount poor households need to cover the basic food and non-food needs may be quite different.** Consumption patterns are likely to have changed since 1993, reflecting the different realities of living in Uganda today. For example, in 1993, no household owned a mobile phone, yet today most households in Uganda own mobile phones and purchase credit on a regular basis to make and receive calls. Relative prices of food items have changed substantially since 1993 and households may have adjusted their food consumption patterns in response. In addition, if the goods that make up the basket of consumption that sets the poverty line experienced inflation higher than the CPI, using the CPI may not have allowed the poverty line to keep up with the cost of living.
- 15. This section examines how consumption patterns have changed over time and what this means for how poverty is measured in Uganda and the trends in poverty reduction over time.** The amount and structure of non-food spending is examined first. Then the structure of food spending and the degree to which the value of the food basket has been properly updated by using the CPI since 1993.
- 16. The share of consumption that the poor spend on non-food items is 6 to 26 percent higher in 2013 than in 1993 when the poverty line was set.** Table 1.4 presents results on how the share of non-food items in total consumption of poor households has changed over time in Uganda. In column 1, the results reported in Appleton et al. (1999) are presented. In columns 2 and 3, the same method used by Appleton et al. (see Annex 1 for details) is used to estimate the share of non-food items in total consumption in 2013. The share of non-food consumption for food poor households is presented in column 2 and for the bottom 50 percent in column 3. In 1993, these two groups were identical, as food poor households comprised the bottom 50 percent of households, but this is no longer the case. The share of non-food expenditure is higher in 2013 in all regions, with particularly large changes in the rural parts of the Central and Northern regions. Without adjusting the food basket, this increase in share of non-food expenditure would entail a 5 percent increase in the poverty line.

12. This conversion takes into account the fact that the national poverty line uses consumption per adult equivalent and the international poverty line uses consumption per capita.

- 17. Although the overall amount of spending on non-food items has increased since 1993, the structure of non-food expenditure has not changed much.** Figure 1.2 presents the share of expenditure on the major groups of non-food items in total non-food expenditure in 2000 and 2013 and shows little change over time. In addition, when expenditure on selected items is tracked from 2000 to 2013 there is little change in the relative share of these items in total non-food expenditure, even though they do fluctuate. However, one big change is expenditure on telephone services. This was nonexistent in 2000, but by 2013 comprised 2 percent of non-food expenditure.
- 18. Household survey data indicates that the prices of food items in the food poverty line basket may have risen faster than the CPI on average.** In 1993, a food basket that provides 3,000 calories per adult equivalent was defined. The cost of this basket was US\$ 11,463 per month in 1993 prices. If the CPI is used to adjust this basket, the cost is US\$ 46,263 (2013 prices). However, when the cost of purchasing this same basket is recomputed using the unit food prices recorded in UNHS 2013, the value is 43 percent higher: US\$ 66,067 (2013 prices).^{13 14} This could, in part, be driven by methodological differences (although to the extent possible, the same assumptions as used in Appleton et al. 1999 were adopted), but it could also reflect that the prices of some items in the consumption basket have risen faster than the CPI. In particular, Figure 1.3 shows that the prices of sweet potatoes, meat, fish, matooke, sorghum, millet, and sim-sim increased much faster than the prices of other goods.
- 19. The structure of food consumption has also changed substantially across time, in part reflecting that some foods had become much more expensive.** Figure 1.4 presents data on the share of consumption spending on the seven most important food items that together comprised half of food expenditure in 1993. In 2013, these items also comprised almost half of consumption expenditure (47 percent), but sorghum and maize had become significantly more important and sweet potato and matooke less so. The price of matooke and sweet potatoes increased during this time, perhaps providing part of the explanation as to their declining share, but not fully, as the real price of sorghum and maize also increased during this time. Changes in the relative prices of food items and changing consumption patterns require the items in the food basket to be updated.
- 20. This analysis suggests that the national poverty lines are too low to reflect the cost of basic needs of Ugandan households in 2013.** This analysis also suggests that the national poverty lines in 2013 should be higher than the lines currently used. The items in the basket of food consumption need to be updated, as does the amount by which the food consumption basket is scaled to account for non-food consumption. A fuller analysis of consumption needs of poor households is needed to determine what the new basket and line should be, but the existing analysis suggests the current line is too low.
- 21. A higher poverty line would raise the national poverty rate—perhaps to 33–35 percent—but this higher rate still represents significant progress in reducing poverty over the last two decades.** Without re-estimating what should be in the food consumption basket of the poorest households, it is not possible to know how much the national poverty line should be increased by.

13. Households were asked the values and quantities of items they consumed, and dividing the value by the quantity provides the unit price. Quantities were often reported in nonstandard units and the quantities measured in nonstandard units were converted into kilograms using conversion factors reported in the survey as well as the conversion factors used in the consumption module of the Living Standards Measurement Study–Integrated Surveys on Agriculture (LSMS-ISA). Not all nonstandard units were converted, but enough to provide unit values.

14. The two most common types of consumption recorded are ‘consumption of own produce’ and ‘consumption in the household’ of produce that is purchased. Prices imputed from own consumption are consistently lower across almost all items, and there is a valid concern that households might systematically undervalue consumption from own production. Therefore, the price from purchased ‘consumption in the household’ is used. This is also done when calculating the official household food consumption aggregate.

If the basket did not change, the analysis suggests the poverty line may need to increase by 50 percent—a 44 percent increase in the basket and a 5 percent increase in non-food consumption. This is very close to the poverty line re-estimation done by Appleton (2003). However, given households do substitute away from foods that become relatively more expensive, this would likely be

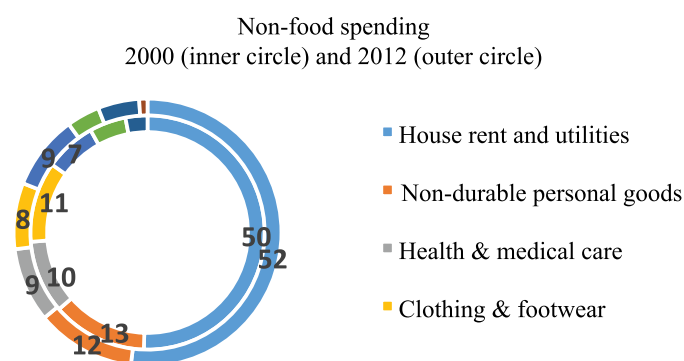
an overestimate. An increase of 25 percent to 30 percent could be enough. Increasing the national poverty lines by this amount would also bring them closer to the international extreme poverty line. This would increase the national poverty rate in 2013 to 32.7 to 35.2 percent. Although higher, this poverty rate still represents significant progress in reducing poverty over the last two decades.

TABLE 1.4: Spending on non-food items among poor households, 1993 and 2013

Region	Share of Total Expenditure on Non-food Items			Percentage Change in Share of Non-food, 1993–2013 (Percent)
	Food Poor Households, 1993	Food Poor Households, 2013	Bottom 50 Percent, 2013	
Central Rural	0.39	0.49	0.50	26
Central Urban	0.51	0.58	0.59	14
East Rural	0.35	0.40	0.40	14
East Urban	0.44	0.49	0.49	11
North Rural	0.32	0.39	0.40	22
North Urban	0.41	0.48	0.48	17
West Rural	0.36	0.38	0.38	6
West Urban	0.42	0.47	0.47	12

Source: Column 1 is results from Appleton et al. (1999). Columns 2 and 3 are results of staff calculations.¹⁵

FIGURE 1.2: Structure of non-food spending over time

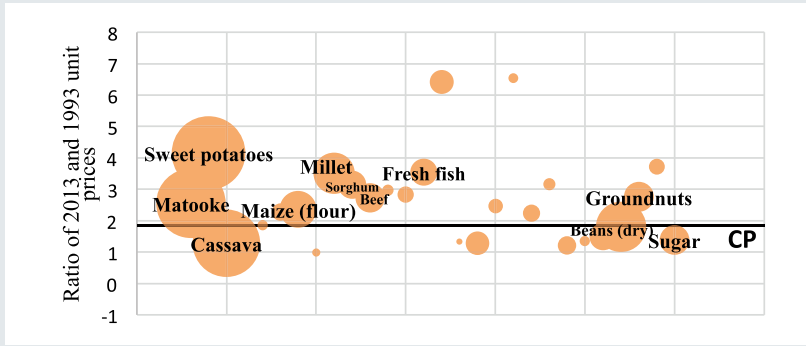


Source: UNHS 2000 and 2013.

Note: This excludes imputed value of freely acquired water, charcoal, and firewood.

15. Note that the results in column 2 and 3 are not much different from each other. This is because the two reference groups do not differ significantly in terms of demographic characteristics and the coefficients of these demographic characteristics (in a regression of non-food share) are not large compared to the constant term and region dummies. The weighted demographic characteristics, weighted by the corresponding coefficient, of the food poor and the bottom 50 percent of households is 0.077 and 0.081, respectively. The weighted difference in demographic characteristics of the two groups is 0.004 only, and this minor difference results in 0.01 difference in non-food share in Central Rural, Central Urban, and Northern Rural categories. In other locations, the use of a different reference group does not affect non-food share.

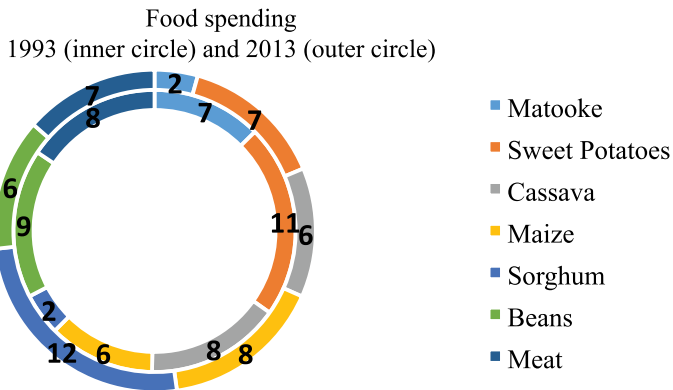
FIGURE 1.3: Prices of food items, 1993–2013



Source: Appleton et al. 1999 and UNHS 2013.

Note: Size of bubble reflects the share of the food consumption basket comprised by the item.

FIGURE 1.4: Structure of food spending over time



Source: UNHS 2000 and 2013.



Shop keeper in Ttula - Kawmpe, Kampala

BOX 1.1: How poverty is measured in Uganda

The poverty line was set in 1998 using 1993 data by estimating the amount of expenditure needed to satisfy the minimum daily calorie requirements and basic non-food needs. Appleton et al. (1999) identified the 28 commonly consumed food items and the corresponding amount consumed to meet 3,000 calories per adult equivalent. Calorie requirement varies by age and gender, and hence the 3,000 calories is per adult equivalence. Based on the population structure then, the average per capita calorie need was 2,283 calories.

The minimum expenditure on basic non-food needs was estimated using the classic approach of Ravallion and Bidani (1994) by identifying the non-food expenditure of households that are just on the food poverty line. The justification for using these households' non-food expenditure as a reference is that the poor have sacrificed some of their need for calories to buy the non-food items. Therefore, these non-food expenditures should also be regarded as meeting essential needs. The non-food expenditure was allowed to vary by region and rural/urban areas to account for spatial differences prices (Appleton et al. 1999).

The poverty line is the sum of expenditure on basic food and non-food items. Since 1993, the CPI has been used to update this poverty line.

Source: Appleton et al. (1999).

1.3 The incidence of progress and shared prosperity

22. Reducing the number of people living below the national poverty line is a significant measure of progress. However, this is just one measure of how Ugandan households have fared. This section takes a closer look at changes in the distribution of consumption in Uganda from 1993 to 2013, focusing on 2006 to 2013, and sheds light on the role of growth and redistribution in bringing about changes in poverty. Much of the analysis refers to

the bottom 40 percent. This group is the focus of the World Bank Group's goal of shared prosperity. In Uganda, this group comprises all of those living below the national poverty line as well as some living above the national poverty line who are vulnerable to falling back into poverty. The bottom 40 percent is a group referred to in much of the analysis in subsequent chapters also.

INCIDENCE OF GROWTH AND SHARED PROSPERITY

23. The period from 1993 to 2000 was a period of recovery and stabilization and yielded high consumption growth for all households (an average of 5.3 percent per annum) and substantial poverty reduction. Internal peace, fiscal discipline, and the removal of implicit taxation through liberalization of the exchange rate and coffee marketing provided the environment needed for growth in household consumption (Collier and Reinikka 2003). In rural areas (which dominate the national distribution, given that

Uganda has remained 84 percent rural throughout this time) the bottom 40 percent of the population benefited from growth of 5.3 percent annually and the top 60 percent benefited from growth of 4.6 percent (Figure 1.5.1 and Table 1.5). In urban areas, the pattern of progress was even more rapid, particularly for wealthier households. The bottom 40 percent in urban areas saw incomes increase by 6.9 percent per annum and the top 60 percent had consumption growth of 8.6 percent.¹⁶

16. It is possible that the growth rates are somewhat inflated, given the 2000 survey could not be carried out in some districts where fighting was ongoing. Even taking this into account, consumption growth and poverty reduction during this period was high and impressive.

- 24. From 2000 to 2006, GDP per capita growth rates dropped and poverty fell marginally (Figure 1.6).** Rural households experienced low levels of consumption growth, particularly the bottom 40 percent for whom growth was 0.9 percent per annum. In urban areas, household consumption growth was negative (Figure 1.5.2). The national poverty rate only fell by a couple of percentage points as a result, from 33.8 to 31.1 percent.
- 25. High levels of broad-based consumption growth were again realized from 2006 to 2010, reflecting high GDP growth, the cessation of conflict in the north of Uganda, and improving terms of trade for many farmers (Figure 1.5.3).** The establishment of peace in the north of Uganda benefited households in the Northern, Eastern, and Central regions (Figure 1.5.5). Prices for food goods were also high during this period, benefiting rural households. Consumption growth of the bottom 40 percent in rural areas averaged 3.2 percent and for the top 60 percent it was 3.0 percent. Urban areas also saw high levels of growth, although this growth was less pro-poor. On average, consumption growth in urban areas was 5.1 percent for the bottom 40 percent and 5.7 percent for the top 60 percent. Given that households in urban areas tend to be wealthier, nationally growth was marginally higher for the top 60 percent (3.5 percent) than for the bottom 40 percent (3.4 percent).
- 26. Although consumption growth was on average very strong during this period, households in the Western region fared badly from 2006 to 2010.** Figure 1.5.5 shows that consumption growth was negative for most households in the Western region. Figure 1.7 helps partially explain why: coffee prices in 2010 were almost identical to prices in 2006, but the higher price of food (indicated in the graph with maize prices, but present for other staples too) resulted in the terms of trade worsening for coffee-producing households, which are predominantly in the Western region.
- 27. Strong poverty reduction was recorded from 2010 to 2013, even though this was a period of lower GDP per capita growth, because of strong, pro-poor consumption growth in rural areas (Figure 1.5.4).** Just as from 2000 to 2006, GDP per capita growth was less than 3 percent (Figure 1.6), yet poverty fell by 5 percentage points. Higher average household consumption growth was observed from 2010 to 2013 (1.9 percent), than during 2000 to 2006 (1.3 percent), as a result of strong consumption growth in rural areas. Rural consumption growth was also pro-poor: the consumption growth rate of the bottom 40 percent was 2.0 percent compared to a consumption growth rate of 1.0 percent among the top 60 percent. In contrast urban growth rates were negative, although more so for the urban middle class (-2.6 percent).
- 28. The pattern of pro-poor growth from 2010 to 2013 is again consistent with price trends during this period.** Subsequent chapters further examine the factors underpinning these high rates of pro-poor consumption growth, but Figure 1.7 helps point to some of the external factors that may contribute to the pattern of consumption growth observed. International coffee prices increased, thereby increasing the terms of trade for coffee-producing households and resulting in very high rates of consumption growth for households in the Western region (Figure 1.5.6).¹⁷ The bottom 40 percent of households in the Western region experienced annual income growth of 7.5 percent in these three years. Prices of maize and other staples were also high, increasing the terms of trade for many rural households in other regions. Domestic markets in Uganda are characterized by low entry costs and high levels of competition, which allows changes in market prices to be transmitted quickly to farmers (Fafchamps and Hill 2008). However, although higher food prices may have aided rural households, the excessively high rates of inflation observed during the election spending in 2011 hurt urban households.
- 29. The period from 2010 to 2013 was the only period in the last twenty years in which consumption growth benefited the poor more**

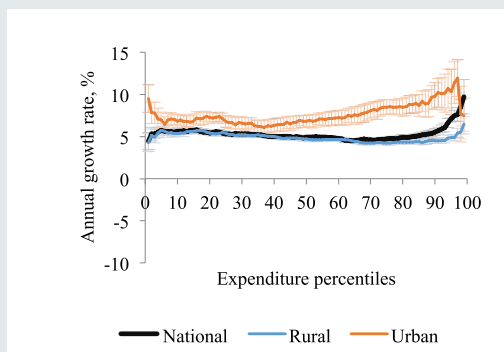
17. Even though coffee is a perennial crop, high prices translate into immediate welfare gains as farmers exert more labor on maintaining and pruning the tree and on harvesting coffee when coffee prices are high (Hill 2010).

than the rich and inequality fell. The average annual consumption growth rate of the bottom 40 percent is used to assess shared prosperity. This growth rate can be compared to a relative target—the growth rate of the top 60 percent—to determine whether progress has been shared; or to an absolute target, when 3 percent per annum is often used. The period from 2010 to 2013 was the only

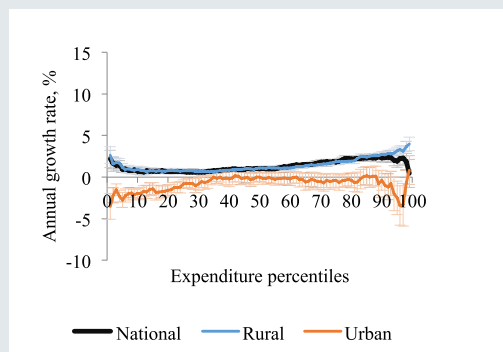
period in which the growth rate of the bottom 40 percent was higher than the growth rate of the top 60 percent (2.3 percent compared to 1.8 percent). However, from 1993 to 2000 and 2006 to 2010 very high growth rates were observed for the bottom 40 percent (5.4 and 3.4 percent, respectively). Shared prosperity was not met by any measure from 2000 to 2006 (Table 1.5).

FIGURE 1.5: The incidence of consumption growth, 1993 to 2013

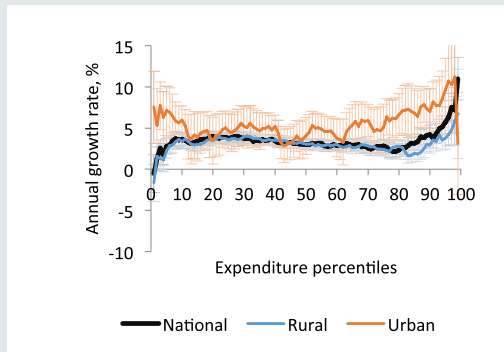
1. 1993–2000: High, broad based growth



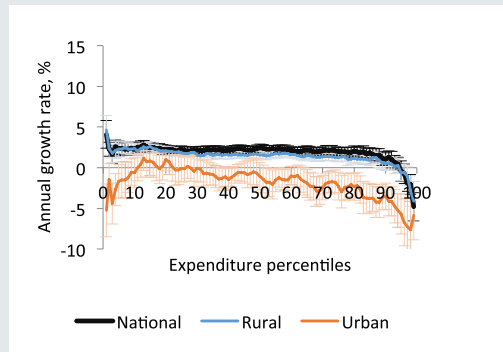
2. 2000–2006: Stagnation and worsening inequality



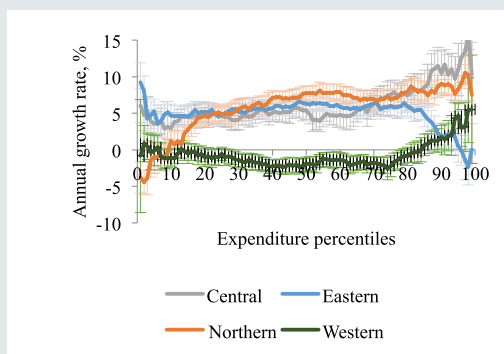
3. 2006–2010: High, inequality increasing growth



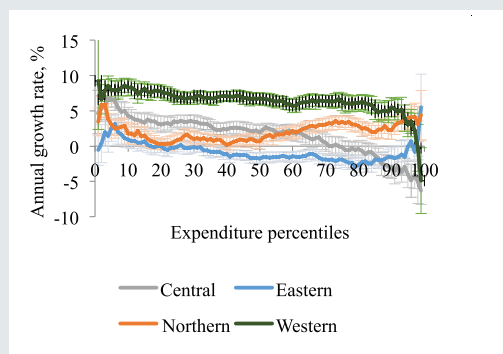
4. 2010–2013: Low, pro-poor consumption growth



5. Regional consumption growth from 2006 to 2010



6. Regional consumption growth from 2010 to 2013



Source: Staff calculations using UNHS 1993–2013.

TABLE 1.5: Shared prosperity, 1993–2013

	1993–2000		2000–2006		2006–2010		2010–2013	
	Bottom 40%	Top 60%	Bottom 40%	Top 60%	Bottom 40%	Top 60%	Bottom 40%	Top 60%
National	5.4	5.2	0.8	1.6	3.4	3.5	2.3	1.6
Rural	5.3	4.6	0.9	1.8	3.2	3.0	2.0	1.0
Urban	6.9	8.1	-1.3	-0.4	5.1	5.7	-0.6	-2.6
Regions:								
Central	7.0	6.3	1.1	2.6	4.5	7.2	3.8	0.0
Eastern	6.2	4.8	0.1	0.2	5.2	4.9	0.2	-1.5
Northern	1.9	1.9	2.2	0.9	3.1	7.7	1.6	2.4
Western	7.0	5.5	1.2	2.2	-0.9	-0.6	7.5	5.7

Source: Staff calculations using UNHS 1993–2013.

FIGURE 1.6: GDP per capita growth, 1993 to 2013

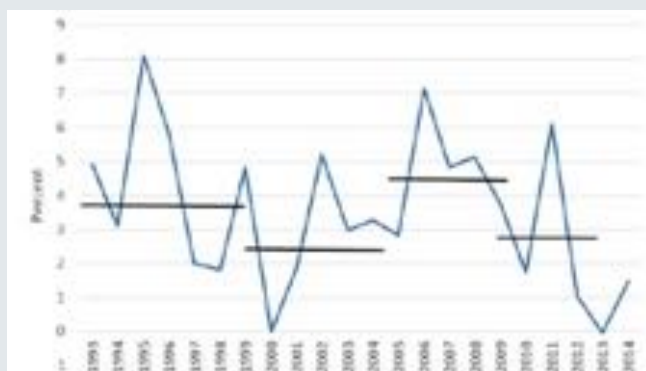
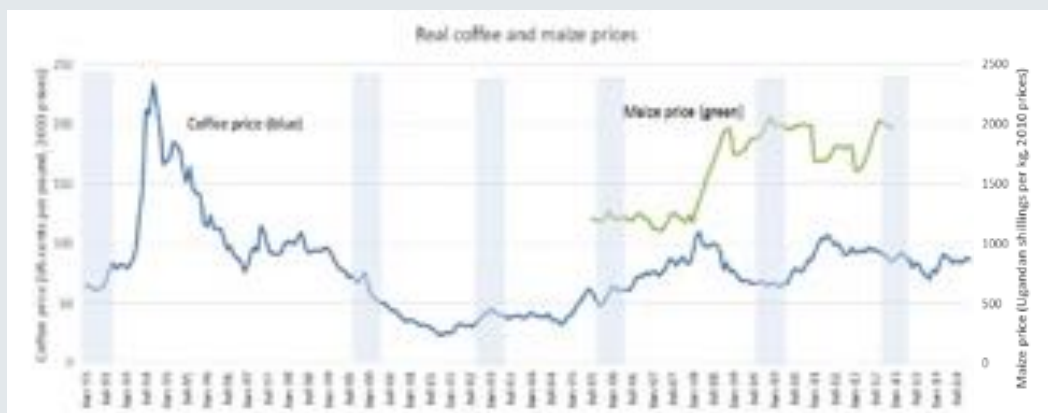


FIGURE 1.7: Coffee and maize prices, 1993 to 2013

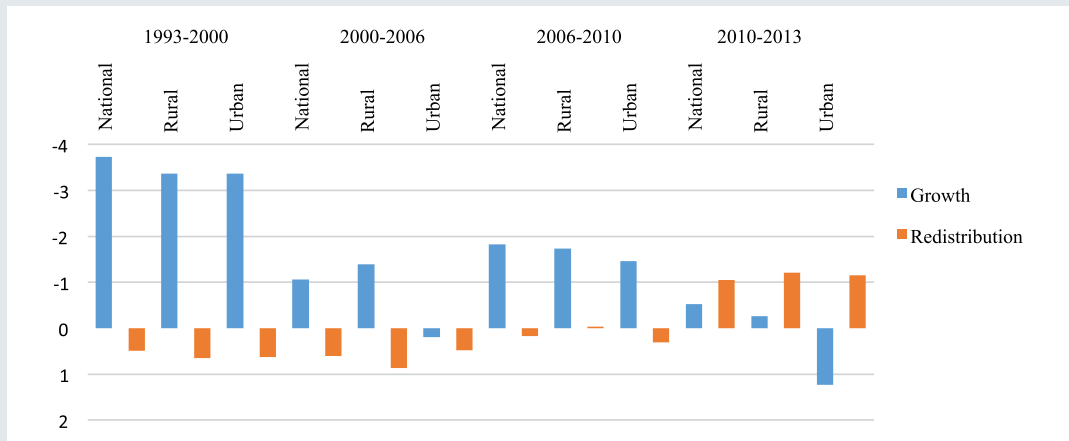


Source: Staff calculations using UNHS 1993–2013.

30. As a result, 2010 to 2013 was the only period in which redistribution contributed to poverty reduction. Poverty reduction can be decomposed into a part that comes from an average increase in consumption across the population ('growth,' that is, the consumption levels of all households increasing) and that which comes from a change in the shape of the consumption distribution ('redistribution,' that is, consumption of the poorest growing faster than consumption of the richest).

Results of this decomposition are presented in Figure 1.8. Until 2010, all poverty reduction in Uganda resulted from growth. Changes in the shape of consumption distribution—redistribution—undermined progress in poverty reduction, as richer households were consistently gaining more than poor households. However, from 2010 to 2013, both growth and redistribution contributed to poverty reduction, as poorer households gained more than richer households.

FIGURE 1.8: Decomposing poverty reduction into growth and redistribution



Source: Staff calculations using UNHS 1993–2013.

INEQUALITY

- 31. The growth incidence analysis also provides some indication as to how inequality has changed over time and the next paragraphs present information on summary measures of inequality.** Box 1.2 outlines the inequality measures used.
- 32. Inequality has been steadily increasing in rural and urban Uganda from 1993 to 2010, by any measure.** Inequality, as measured by the Gini index, increased from 35.7 percent in 1993 to 41.5 percent in 2010 (Figure 1.9.2). This finding holds when looking at other measures of inequality such as the Theil index with the parameter $\alpha=-1$ which emphasizes inequality for lower incomes and

the absolute and relative difference between the bottom 10 percent and the top 90 percent (Figures 1.9.3 to 1.9.5).

- 33. However, the increase has been marginal and Uganda has a moderately low rate of inequality compared to other countries in the region.** The change in the Gini from 1993 to 2010 has been an annual increase of 0.4 percentage points per year. Figure 1.9.1 shows that Uganda faces moderately low inequality in comparison to other countries in the region. Inequality is higher in urban areas than in rural areas, as is often the case, but the increase in inequality in urban areas has occurred at the same speed as the increase in inequality in rural areas.

34. **Inequality fell from 2010 to 2013, consistent with the finding that changes in the consumption distribution favored the poor during this period.** Inequality fell from 41.5 percent in 2010 to 38.5 percent in 2013, a reduction of 1 percentage point in the Gini per year.

BOX 1.2: Inequality Measures

While poverty measures absolute deprivation with respect to a given threshold, inequality is a relative measure of poverty indicating how little some parts of a population have relative to the whole population.

In the context of monetary poverty, equality can be defined as an equal distribution of consumption/income across the population. This means that each share of the population owns the same share of consumption/income. The Lorenz Curve compares graphically the cumulative share of the population with their cumulative share of consumption/income. A perfectly equal consumption/income distribution is indicated by a diagonal. The other extreme is complete inequality where one individual owns all the consumption/income. These two (theoretical) extremes define the boundaries for observed inequality.

The Gini coefficient is the most commonly used measure for inequality. A Gini coefficient of 0 indicates perfect equality while 1 signifies complete inequality. In relation to the Lorenz Curve, the Gini coefficient measures the area between the Lorenz Curve and the diagonal.

The Theil index measures inequality based on an entropy measure. A parameter α controls emphasis to measure inequality for higher incomes (larger α) or lower incomes (smaller α). The Theil index with parameter $\alpha = 1$ is usually called Theil T while using $\alpha = 0$ is called Theil L or log deviation measure.

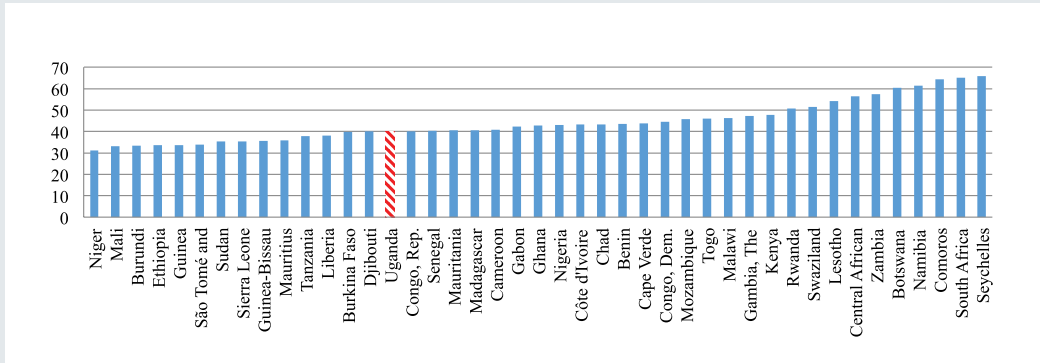
Relative and absolute income differences can be used to compare inequality dynamics over time. Usually, percentiles are used to compare incomes of different groups. For example, $p90/p10$ is the ratio (for relative incomes) or difference (for absolute incomes) of the average income in the 90th and 10th percentile.

Source: World Bank's Poverty Handbook.

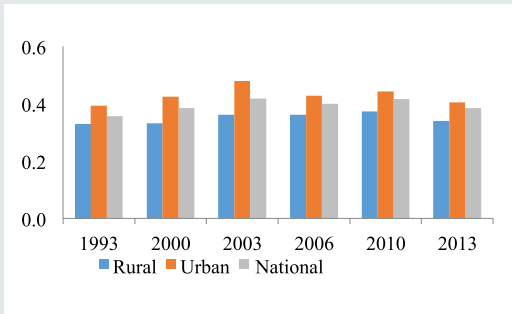


FIGURE 1.9: Inequality in Uganda

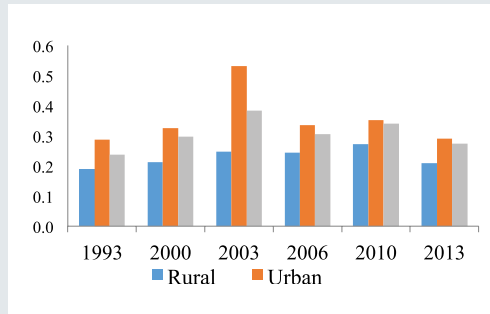
1. Gini in comparison to other countries in the region (percent, latest survey year)



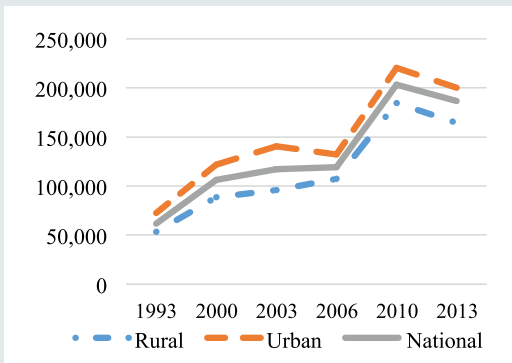
2. Gini over time



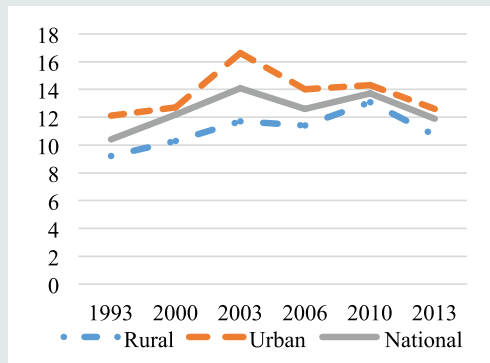
3. Theil over time



4. Absolute difference (Ugandan shillings)



5. Relative difference (percent)



Source: 1: WDI; 2-5: Staff calculations using UNHS 1993-2013.

1.4 Who are the poor in Uganda?

35. Most of the poor in Uganda live in rural areas.

Nearly 84 percent of the population and 90 percent of the poor lived in rural areas in 2013. One in four rural Ugandans lives in poverty compared to just one in ten urban Ugandans.

36. There are large and increasing regional variations in poverty with most of the poor concentrated in the north and the east.

In 2006, approximately 68 percent of the poor lived in the Northern and Eastern regions of the country. Seven years later, this proportion increased to 84 percent (Figure 1.10.1). About 47 percent of the poor live in the Northern region and another 37 percent live in the Eastern region. A focus on the Northern and Eastern regions will be needed for Uganda to end extreme poverty and boost shared prosperity as

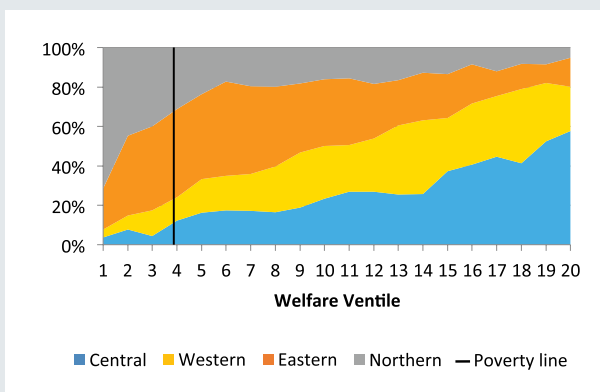
well as to reduce social and political tensions that can emerge from stark differences across regions (Box 1.3).

37. In particular, two subregions in the north, the North East and West Nile subregions, have a very high poverty headcount. Almost three in four residents (74 percent) in North East subregion live below the national poverty line (Figure 1.10.2). The North East subregion is also the least populous. Poverty is also much higher than the national average in the West Nile and Mid-Northern subregions where 43 percent and 35 percent of the population live in poverty, respectively. On the contrary, Kampala has a poverty rate of only 1 percent and poverty is in single digits in the Central 1 and Central 2 subregions.

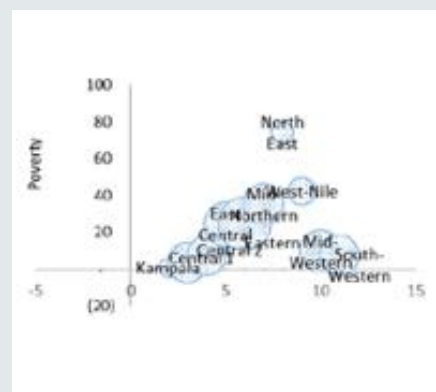
In 2013, approximately 84 percent of the poor lived in the Northern and Eastern regions of the country.

FIGURE 1.10: Where do the poor live?

1. Population in each region by welfare ventile



2. Poverty rates by subregion



Source: UNHS 2013.

Note: In Figure 1.10.2, the size of the circle is proportional to population size of the subregion.

BOX 1.3: Spatial Dimensions of Poverty

Households in Uganda's Northern, Eastern, and Western regions have much lower levels of human capital, fewer assets, and more limited access to infrastructure than households in the Central region. The Northern region is the worst, largely because the conflict took lives, damaged communities, destroyed assets, and had lasting effects on the aspirations of many individuals. Households in the north are larger and more likely to be headed by a woman and are more likely to have a household head with no education (Table 1.6). Most households own land but they are less likely to own other assets and have lower access to infrastructure services. The Eastern region also lags behind the Central and Western region in nearly all of these measures.

TABLE 1.6: Human capital, asset ownership, and access to infrastructure across regions

	Central	Eastern	Northern	Western
Household size	4.2	5.4	5.0	4.8
Dependency ratio	101	130	134	116
Household is headed by a female (%)	30	30	35	31
Head has no education (%)	14	19	27	25
Head has some primary education (%)	43	50	41	41
Head has completed primary education (%)	9	7	8	11
Head has some secondary education (%)	19	15	12	11
Head has completed secondary education (%)	7	5	3	5
Head has tertiary education (%)	6	3	5	5
Literacy rate among 18+ year-olds (% literate)	79	60	56	72
Owens a mobile phone (%)	82	52	35	63
Has electricity (%)	40	6	3	8
Has piped water (%)	20	5	1	6
Availability of tarmac roads (%)	53	21	19	27
No toilet (%)	5	8	29	2
Owens land (%)	59	78	80	86

Source: UBOS 2013. Report on UNHS 2013.

Households in the Northern region also have more limited access to markets and services. For households in these regions, distances to schools and health services are much larger as are distances to markets. The provision of agricultural extension and veterinary services is much lower and this is of concern given the reliance of these households on agriculture and livestock income. Rural financial institutions are almost entirely absent in the north. These constraints have limited the accumulation of human capital and the extent to which households can use their assets to earn a return in these regions.

Household income among the bottom 40 percent is low in the Eastern and Northern regions and heavily reliant on food crops and livestock farming. Livestock income comprises 39 percent of the agricultural income of the bottom 40 percent who live in the north. In addition, rainfall is lower and more volatile in the north increasing the vulnerability of households in this region, while households in the east are particularly vulnerable to the collapse of maize prices (Chapter 4).

38. Those in the bottom 40 percent live in larger families and have more dependents than the top 60 percent. Households in the bottom 40 percent have 6 members on average compared to 4.6 in the top 60 percent. As a result, the dependency ratio is 13 percentage points higher for those living in the bottom 40 percent. This gap between the bottom 40 percent and top 60 percent has remained constant between 2006 and 2013 (Table 1.7). In addition, the proportion of households headed by women has increased slightly during this period but this has happened for households across all

income groups. Households in the bottom 40 percent are just as likely to be headed by a woman as households in the top 60 percent. This means that on average female-headed households are no less likely to be poor. This is true in both rural and urban Uganda. However, households that are headed by female widowers are more likely to be poor than households headed by male widowers (18 percent compared to 11 percent, significant at 10 percent). This is consistent with findings on the poverty of female widows in Uganda in the 1990s (Appleton 1996).

TABLE 1.7: Fertility rates and dependency ratios, 2006–13

	2006		2010		2013				
	Bottom 40	Top 60	Bottom 40	Top 60	Bottom 40	Top 60			
Household composition									
Children ages 0 to 5	1.5	1.0	***	1.4	1.0	***	1.4	1.0	***
Children ages 6 to 14	1.2	0.9	***	1.3	0.7	***	1.2	0.8	***
Male adults ages 15 to 59	1.1	0.9	***	1.2	0.8	***	1.2	0.8	***
Female adults ages 15 to 59	2.1	2.1		2.0	2.0	*	1.9	1.9	
Seniors v 60	0.2	0.2	**	0.2	0.2	***	0.3	0.2	***
Household size	6.1	5.1	***	6.1	4.6	***	6.0	4.6	***
Dependency ratio	136.1	98.3	***	142.9	97.7	***	141.8	99.6	***
Head is female	27.4%	26.6%		31.4%	29.5%		31.4%	30.7%	

Source: UNHS 2013.

Note: Stars indicate whether bottom 40 percent and top 60 percent are significantly different using a Wald test. *** indicates significantly different at 99% confidence, ** at 95% confidence, and * at 90% confidence.

39. Ugandan households have a higher level of education than in the past, but it remains low, particularly among poorer households. Although there has been much progress in educational attainment in recent years (see Chapter 2), many working-age adults still have low levels of education—only 23.8 percent of household heads had higher than primary education. Within the bottom 40 percent of the population, this is only 11 percent.

40. Access to infrastructure services, particularly for the poor, remains low even by regional standards. By 2013, more households owned land, mobile phones, and motorcycles, and also accessed electricity and piped water, compared with

2006 (Chapter 2). However, these levels of access remain relatively low by international and even regional standards, with only 12.4 percent and 6.8 percent of households having access to electricity and piped water, respectively, in 2013. In addition, there are large variations in asset ownership and access to infrastructure services between the rich and the poor. Mobile phone ownership is only 37 percent among the bottom 40 percent compared with 70 percent among the top 60. Almost no households in the bottom 40 percent have access to electricity or piped water, compared with 20 percent and 10 percent, respectively, in the top 60 (Table 1.8). Interestingly, more poor households report to owning land, reflecting the predominance of farming as their prime occupation.

TABLE 1.8: Human and physical capital and livelihoods among the bottom 40 percent, 2013

Proportion of Individuals That Live in a Household in Which...	Bottom 40	Top 60
Education level of the head of the household is:		
None	29.4	16.3
Primary	58.5	49.0
Secondary	11.4	27.3
Tertiary	0.7	7.5
The household owns the following assets:		
Bicycle	30.5	30.9
Mobile phone	36.7	70.4
Electricity	1.7	19.6
Piped water	0.4	10.2
Land	83.2	74.0
Main income source of the household is:		
Farming	52.6	38.8
Wage employment	20.4	25.4
Other source	27.0	35.7
The household owns a nonfarm business	31.6	40.0

Source: UNHS 2013.

41. Poorer households are more likely to report farming as their primary occupation. More than half of the households in the bottom 40 percent (53 percent) depend on agricultural production as their main source of income compared with 39 percent of those in the top 60. Wage employment and ownership of a nonfarm business is higher among the top 60 percent than among the bottom

40 percent (Table 1.8). In addition, although crop income is becoming less important over time it is still the main source of income for most households at the bottom of the consumption distribution, with richer households reporting higher levels of wage employment income and income from nonfarm household enterprises (Table 1.8).

1.5. Conclusion and outlook: Ending extreme poverty in Uganda

42. This chapter has documented Uganda’s impressive rate of poverty reduction in the last two decades. Uganda’s progress, during the period of focus of this report, was slower than from 1993 to 2006, but still very fast. The poverty rate measured against the international line of US\$1.90 PPP per day fell by 2.7 percentage points per annum, the second fastest percentage point reduction in poverty per

year in Sub-Saharan Africa. Consumption growth has slowed in recent years, but it has become increasingly pro-poor which has allowed poverty rates to continue to decline.

43. However, Uganda’s progress in reducing poverty is not an unqualified success and Uganda remains a very poor country. The low national

poverty rate of 19.7 percent reflects a poverty line that is too low. An updated poverty line would suggest a third of Ugandans remain unable to meet their basic needs. In addition, vulnerability to poverty is high which makes it hard for individuals to sustain gains in welfare. Moreover, poverty is increasingly concentrated in the Northern and Eastern regions.

- 44. Is Uganda on a path to end extreme poverty by 2030?** In Chapters 3 to 7 of this report we examine in further detail what has driven progress in Uganda, and this provides some insight into whether or not Uganda is on a path of sustained poverty reduction that would allow it to end extreme poverty. This section reports simulation results to examine what poverty rates may be in Uganda in the next 5, 10, and 15 years, if recent patterns of consumption growth continue. As the rest of the report highlights though, this is not guaranteed. Three scenarios are identified in which the average growth rate is estimated based on recent history:¹⁸
- Pessimistic scenario assumes annual average consumption growth of 1 percent, which is about the growth rate observed in the low growth period from 2000 to 2006.
 - Intermediate scenario assumes annual average consumption growth of 2.5 percent, which is about the average growth rate observed over the period 2006 to 2013.
 - Optimistic scenario assumes annual average consumption growth of 4 percent, higher than the consumption growth rates observed since 2000, but lower than the very high rates observed from 1993 to 2000.
- 45. Assuming the same growth rate for all households in the population, household consumption is multiplied by 1 plus the growth rate for each year in the simulation.** However, as growth incidence curves indicate, the assumption of average growth across the population is usually

violated. Therefore, for each scenario household consumption is also simulated assuming for a pro-poor growth scenario in which growth rates are higher for the bottom 40 percent than for the top 60 percent, as was the case from 2010 to 2013.

- 46. In the most optimistic scenario, extreme poverty will be almost eradicated, reduced to 4 percent, by 2030.** Figure 1.11 and Table 1.9 present results from the simulation analysis detailing the trend in poverty rates over time under the scenarios considered. Poverty rates in 2030 range between 4 and 21 percent. The most optimistic scenario entails reducing extreme poverty to 4 percent by 2030, which would be a remarkable achievement, given that 34.6 percent of the population is in poverty in 2013.
- 47. Achieving this low level of extreme poverty requires both high and pro-poor growth, something that Uganda has not been able to achieve concurrently in the last two decades.** The scenarios point to a number of reasons why 4 percent extreme poverty in 2030 may be an overly optimistic projection. First, this scenario assumes consumption growth rates averaging 4 percent, which is a growth rate for consumption that has not been observed since the high growth period of 1993 to 2000. Secondly, this assumes higher growth rates for the bottom 40 percent, something only seen from 2010 to 2013.
- 48. A more realistic scenario predicts an extreme poverty rate of 12 percent by 2030.** This still represents an impressive reduction in poverty. A more realistic scenario is a growth rate of 2.5 percent, the average of the growth rate observed from 2006 to 2013, and growth that is not pro-poor.
- 49. However, although historical trends suggest this scenario may be more realistic, caution should be noted given the increasing concentration of intransigent poverty in the Northern and Eastern regions.** Regional inequality has been worsening

18. The label of the scenarios (pessimistic to optimistic) refers to the average assumed growth rate. It does not imply that growth distribution across the population is 'better' in the optimistic scenario than in the pessimistic scenario.

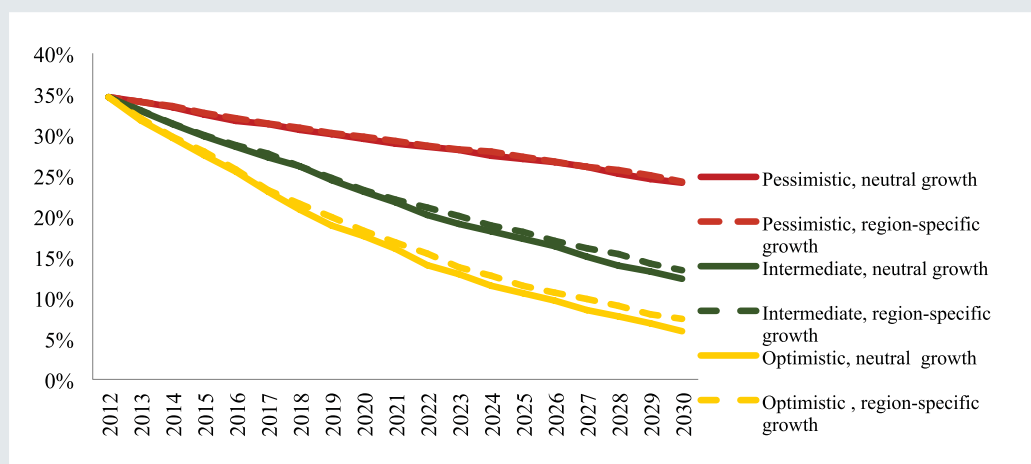
in recent years and the majority of Uganda's poor are now concentrated in the Northern and Eastern regions. Consumption growth rates have, on average, been lower in the Northern and Eastern regions than in the rest of the country and unless this trend is reversed, assuming a growth rate of 2.5 percent for the poorest households in Uganda is overly optimistic.

50. In a scenario in which policies and investments are unable to bring about faster growth in the Northern region, extreme poverty in 2030 will be 13 percent. A series of scenarios are conducted in which household consumption growth rates remain lower in the Northern and Eastern regions. Results are presented in Figure 1.12 and Table 1.9.

FIGURE 1.11: Trends in poverty incidence



FIGURE 1.12: Trends in poverty incidence for different regional growth rates



Source: Staff calculations using UNHS 2013.

TABLE 1.9: Poverty statistics in 2030

	Headcount	Depth	Severity
2012	34.6	10.3	4.4
Neutral Growth			
Pessimistic	24.1	6.6	2.7
Intermediate	12.3	3.1	1.2
Optimistic	5.9	1.3	0.4
Bottom 40% Grow Faster			
Pessimistic	22.3	2.6	0.9
Intermediate	10.6	2.6	0.9
Optimistic	4.2	0.9	0.3
Region-specific Growth Rates			
Pessimistic	24.2	6.8	2.8
Intermediate	13.4	3.5	1.3
Optimistic	7.4	1.7	0.6

Source: Staff calculations using UNHS 2013.



CHAPTER: 2

NON-MONETARY DIMENSIONS OF POVERTY IN UGANDA

Uganda's progress in reducing income poverty is strongly reflected in some non-monetary indicators of welfare, although the country still has a long way to go on some dimensions.



51. **Chapter 1 highlighted the impressive performance in reducing monetary poverty over the last decade.** The proportion of the population living under the national monetary poverty line declined from 56.4 percent in 1993 to 19.7 percent in 2013.
52. **Poverty is multidimensional in nature and there are some limitations to relying solely on the monetary poverty measures.** It has been well documented in literature that well-being is a broad description of the state of people's living conditions (for example, McGillivray and Clarke 2006; Saunders 2005). Beyond monetary poverty, it is important to have a more comprehensive understanding of how the country has performed on other dimensions of well-being. Socioeconomic indicators of well-being can provide a valuable complement to existing monetary measures of poverty, and this would allow to better target programs and policies to reach those who need them the most. Non-monetary aspects of well-being can complement the monetary measure.
53. **This chapter analyzes levels and trends of non-monetary poverty indicators in Uganda focusing on selected dimensions of housing conditions, infrastructure services, physical capital, and human capital.** The selection of non-monetary indicators was guided by

literature on multidimensional poverty (See Etang and Tsimpo 2016 for more details). Although very comprehensive, the list of non-monetary indicators analyzed in this chapter is not exhaustive. The indicators used are categorized into four broad dimensions: (a) housing conditions, (b) infrastructure services, (c) physical capital, and (d) human capital.

54. The analysis shows that Uganda's progress in reducing income poverty is strongly reflected in some non-monetary indicators of welfare,

2.1 Housing conditions

55. The share of households using improved roof materials has expanded, but improvements in wall and floor materials have stalled. Figure 2.1 shows that usage of improved roof materials has slightly increase between 2006 and 2013, providing evidence for rising living standards, including for rural households (Figure 2.1.1). At the national level, the share of households with improved roof material went up by 7 percentage points, from 61 percent in 2006 to 68 percent in 2013. Improved wall material went up by 4 percentage points at the national level and improved floor material by only 2 percentage points. Interestingly, the slight rise in improved housing conditions between 2006 and 2013 seems to have occurred mainly for the roof of the house,¹⁹ a bit more so for households in the rural areas (by 5 percentage points) than in the urban areas (3 percentage points). The majority of urban households have cement floors, while less than 20 percent of rural households do so. The fact that the majority of rural households continue to live in dwellings with earth (mud) floors is a concern, as this can pose health risks.

56. Stark differences persist between poor and non-poor households (based on the monetary

although the country still has a long way to go on some dimensions. Ownership of modern assets and the share of households using improved roofs increased over the last decade. Education outcomes have improved as well, but the significant increase in primary enrollment rates has yet to translate at higher levels. There was a substantial decline in all components of child mortality, but malnutrition continues to be widespread. The evidence presented in this chapter points to two areas that require special attention: infrastructure and educational outcomes beyond enrollment.

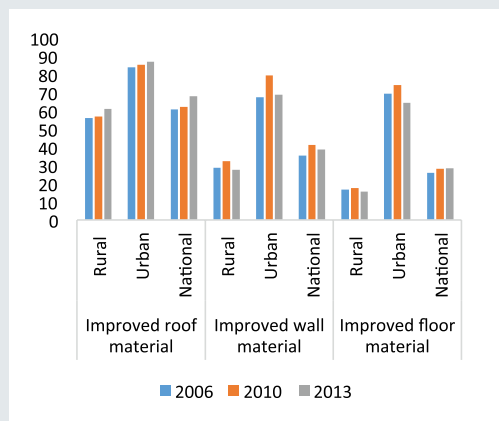
measure of poverty) regarding housing construction materials in 2006, 2010, and 2013.

The most visible distinction between the poor and non-poor was the materials used to roof the house (Figure 2.1.2). The share of households with improved roof material was substantially (at least 35 percentage points) higher among the non-poor for each of the three years. The materials used for the walls and floor show significant variations between poor and non-poor households. The share of households with improved wall and floor materials was 28–30 percentage points higher among the non-poor across 2006 and 2013. An important point, worthy of note, is that the gap between poor and non-poor households increased slightly between 2006 and 2013 with regard to improved roof and wall materials, although it was stable for improved floor materials. Increases in poverty rate are associated with decreases in the use of improved roof materials, and vice versa. The Northern region with the highest poverty rates in 2006, 2010, and 2013 was also the region with low use of improved roof materials during the same periods. The opposite is true for the Central region with high levels of improved roof materials and low poverty rates in all three years.

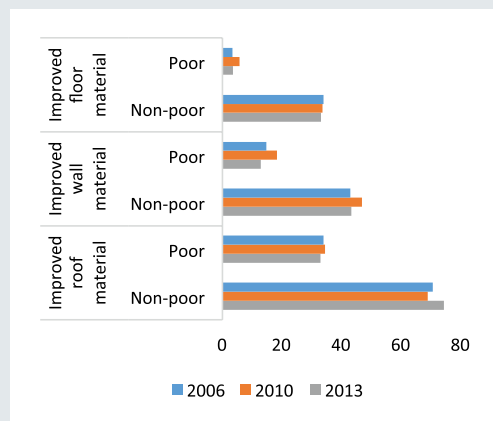
19. The type of roof is often used in developing countries as a proxy-indicator for poverty, among others for targeting purposes of unconditional cash transfer program.

FIGURE 2.1: Distribution of households by main type of construction materials (%), 2006–2013

1. By location



2. By poverty status



Source: UNHS 2006, 2010, and 2013.

Notes: The definition of improved roof material includes iron sheets and tiles. Improved wall material includes burnt bricks with mud, burnt bricks with cement, cement blocks, and stones. Improved floor includes cement and mosaic or tiles.

2.2 Infrastructure services

57. Access to improved water has expanded overall during the past decade, but regional and socioeconomic inequities in access persist.

Improved water sources are broadly available, with access having increased modestly over the last decade.²⁰ At the national level, the share of households with access to improved sources of drinking water increased by 4 percentage points between 2006 and 2013. While nearly three quarters of households in Uganda had access to improved water sources of drinking water in 2013, a substantial share of households still lacked access to this basic need. Access among residents of Kampala is almost universal (95 percent). In other urban areas, 84 percent of households have access to improved water sources in 2013, compared to 67 percent in rural areas. Access to improved water increased between 2006 and 2013 across all regions and consumption quintiles. The Western and the

Eastern regions recorded the most improvement over this period. The same is true for the second, third, and fifth consumption quintiles.

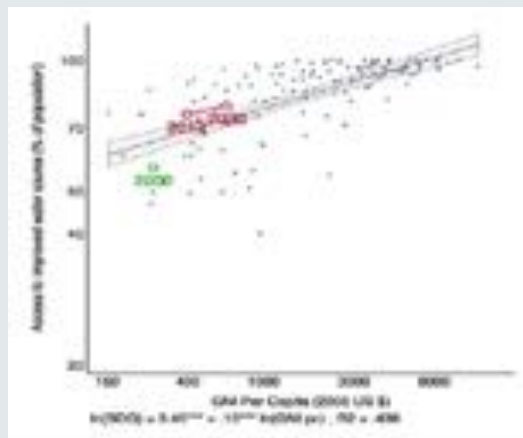
58. Uganda’s access to an improved source of drinking water was slightly above expected levels and progress over time was faster than the expected level. Access to improved sources of drinking water was relatively high by international standards. Also, Uganda performs better than the average country in Sub-Saharan Africa and better than its East African Community counterparts in 2012. With respect to the pace of progress over time, cross-country correlations with GNI per capita indicate that progress in access to improved water sources was faster than could be expected, given the change in GNI during 2000–2012. The performance may be related to a focus on low-cost type of supply in rural areas (borehole), under a

20. The World Health Organization (WHO/UNICEF Joint Monitoring Programme) defines ‘improved’ sources of drinking water as including piped water into the dwelling, piped water into a yard/plot, a public tap or standpipe, a tube well or borehole, a protected dug well, a protected spring, bottled water, and rain water. ‘Unimproved’ sources of drinking water include an unprotected spring, an unprotected dug well, a cart with small tank/drum, a tanker-truck, and surface water (WHO and UNICEF 2006).

pro-poor strategy. The fact that access to improved water sources increased as poverty declined during the past decade is probably not surprising given a high correlation between the two, according to cross-country data for low- and middle-income countries (Figure 2.2). Access to improved sources

of drinking water is associated with increases in income (GNI per capita). There does not seem to be a significant gender difference with regard to access to piped water, with about 8 percent of female-headed households having piped water compared to 7 percent for male-headed households.

FIGURE 2.2: Access to improved water source vs. GNI per capita



Source: Gable, Lofgren, and Osorio-Rodarte (2015)

59. Sanitation remains a serious issue as only a small minority of households has adequate sanitation.

Furthermore, there is a strong link between poverty and the presence of improved toilet facilities. Figure 2.3.1 provides estimates of the share of the population with access to improved sanitation based on UNHS 2013 data (due to changes in questionnaire categories, it is difficult to provide a trend over time). The data suggest that only 14.0 percent of households have access to improved sanitation. If unimproved facilities are split between shared but improved facilities and unimproved facilities, the proportion of households with a shared improved facility is 17.3 percent. Clearly, most households do not have access to adequate sanitation, and when they do have access, in most cases the facilities used are shared, often by too many households. A rural/urban breakdown of access to sanitation shows that urban households

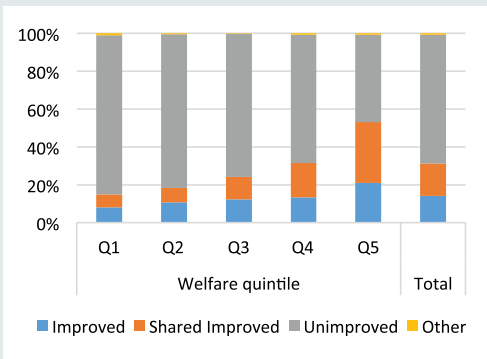
are more likely to have access to improved sanitation compared to households in rural areas. The data show that 19.7 percent of households in Kampala and 18.6 percent in other urban areas had access to improved sanitation against 12.3 percent in rural areas. This is also the case for shared but improved sanitation (50.5 percent of households in Kampala and 36.1 percent in other urban areas compared to 9.4 percent in rural areas). Looking at sanitation from a gender dimension, UNHS 2013 data suggest that the share of female-headed households that have no toilet is slightly higher than the corresponding number for male-headed households (12 percent and 9 percent, respectively). This finding is consistent with evidence of a strong correlation between poverty and lack of toilet facilities—poor households are mostly those without a toilet facility, and it is known that female-headed households are more likely to be poor.

60. In 2011, Uganda’s access to improved sanitation was slightly above expected levels. Overall, Uganda performs slightly better given the level of GNI. However, access to improved sanitation facilities remains low by international standards

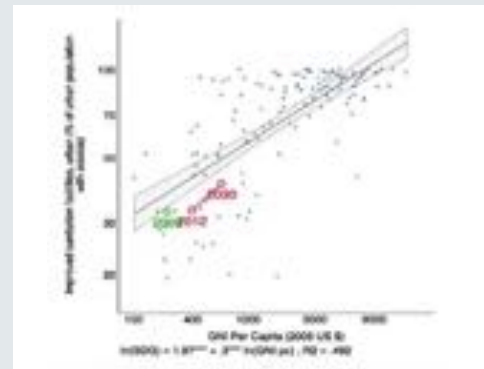
for those in urban areas. A big challenge remains in terms of access to improved sanitation facilities in urban areas, where Uganda is performing below expectation compared to other countries (as shown in Figure 2.3.2).

FIGURE 2.3: Percentage of households using an improved latrine

1. By welfare quintiles



2. Improved latrine vs. GNI per capita, urban population only



Source: UNHS 2013.

Source: Gable, Lofgren, and Osorio-Rodarte (2015).

61. Residential coverage of electricity remains very low. Only one out of seven households used electricity for lighting in 2013. At the national level, 14 percent²¹ of households in Uganda use electricity for lighting.²² Figure 2.4.1 indicates that there was a slight increase in the percentage of households across Uganda that used electricity as the main source of fuel for lighting over the survey periods from 10 percent in 2006 to 12 percent in 2010 and then to 14 percent in 2013, resulting in 4 percentage points increase in electricity use between 2006 and 2013. While UMEME’s distribution network has grown over the last few years, residential coverage rates remain very low due to limited access rates at the neighborhood or village level and limited take-up by households of the service when access is (at least in principle) available in the area where they live (Tsimpo and

Wodon 2014b). There has been a recent increase in alternative forms of electricity coverage, especially through solar generation, but overall coverage rates still remain very low. Tsimpo and Wodon (2014b) argue that the slight increase in electricity coverage, despite increases in connections, is because of population growth and a reduction in household size as well.

62. There is a strong correlation between poverty and use of electricity, and connection rates are virtually nonexistent in the bottom 40 percent. As Figure 2.4.1 shows, access to electricity decreases with poverty. Not surprisingly, electricity coverage rates are much higher among households in the top 60 percent of the distribution than among those in the bottom 40 percent. About 17 percent households, on average, for the top

21.. This number is based on the UNHS 2013 survey and is consistent with findings of the Energy for Rural Transformation Survey 2012 and the UDHS 2012 which found that electricity is used for lighting by about 15 percent of households (UBOS 2014, UNHS 2013 Report)

22. Electricity sources include national grid, solar, personal generator or community/thermal plant.

60 percent of the distribution use electricity for lighting, whereas connection rates are virtually nonexistent among the bottom 40 percent.

63. There exist stark differences in electricity usage across rural and urban households.

During the last decade, more than 40 percent of urban households used electricity for lighting compared to a mere 4 percent in rural areas. For the rural households, the number has remained fairly stable over the last decade. The share of urban households that used electricity for lighting increased from 41 percent in 2006 to 48 percent in 2010 and then fell by 8 percentage points to 40 percent in 2013. It is surprising that the urban usage rate fell substantially between 2010 and 2013. The data show that the gain in access to electricity from 2006 to 2013 happened in rural areas. According to UNHS 2013 data, there is only a slight gender difference with respect to access to electricity, with 11 percent of female-headed household having access compared to 12 percent for male-headed households. Availability of electricity and network (piped) water may help in reducing time spent on domestic chores and increase economic opportunities and earnings, especially for women, ultimately reducing poverty. Women

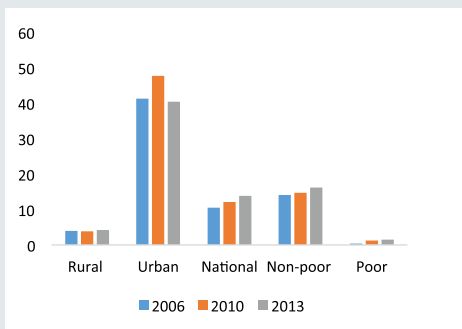
and children spend a considerable amount of time on household chores, including collecting water and fuel, cooking, and taking care of children and the elderly (Blackden and Wodon 2006; WHO and UNICEF 2006). A connection to the electricity or piped water network eases access to timesaving technology and therefore reduces domestic work, especially for women. Tsimo and Wodon (2014b) use UNHS 2013 data to demonstrate that if electricity or piped water were provided to all households living in areas where the network is available at the neighborhood level, connections for households not yet connected would enable women to increase market work by up to two hours per week. This has additional impact on household income and poverty.

64. Although the share of Uganda’s population with electricity access has improved slightly during the last decade, it is still far below what is expected.²³

Access to electricity in Uganda is one of the lowest in the world (Figure 2.4.2). Access to electricity remains very low even by regional standards, with only 18 percent of the population having access in 2012. This is half the average for Sub-Saharan Africa and almost a fifth of the world average.

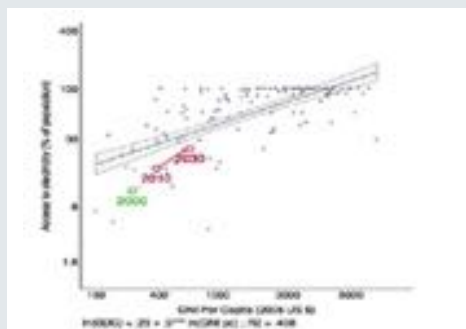
FIGURE 2.4: Access to electricity (% of population)

By location and poverty status



Source: UNHS 2013.

2. Uganda compared to other countries



Source: Gable, Lofgren, and Osorio-Rodarte (2015).

23. Data on electricity access are provided by the International Energy Association. The access indicator refers to the population share with access to electricity in their homes. While this definition leaves out access to production sectors, an indicator based on a broader definition would paint a similar picture.

2.3 Physical capital

65. Ownership of modern assets increased while ownership of traditional assets deteriorated.

Figure 2.5 presents the distribution of households by ownership of some of the key assets. More households own land, mobile phones, and motorcycles, at the expense of pedal cycles. Land ownership information was not collected in 2006.

66. The proportion of households who owned a piece of land appears to remain stable between 2000 and 2013.

However, land ownership increased for the poor. About three-quarters of households own a piece of land. This share increased between 2010 and 2013, particularly for the poor who are mostly involved in agriculture. This can be considered as a positive sign as it can potentially contribute to improvement of their productivity and living standards. Even if the land was not directly used for agriculture, land ownership, if accompanied by formal titles, can help households to access credit that could be used to improve their welfare. A gender breakdown of the data shows that the share of male-headed households that own land in 2013 is higher than the corresponding number for female-headed households (about 86 percent and 76 percent, respectively). Given that land is a productive asset and agricultural productivity is lower among female-headed households (see Chapter 4), finding ways to improve land ownership among female-headed households would benefit efforts to close this gap and reduce poverty among households headed by females in Uganda.

67. There was a notable increase in the proportion of households who own a mobile phone.

About 170 percent more households owned a mobile phone in 2010 than in 2006, and 30 percent

more households have a mobile phone in 2013 compared to 2010. This is probably not surprising given that mobile phone ownership has increased substantially across Africa. As with land ownership, a gender gap appears in terms of mobile phone ownership. The share of households that own a mobile phone is substantially higher when the household head is a male (66 percent) than if it is a female (50 percent). As male-headed households are generally richer, they can more easily afford the cost of purchasing and maintaining a mobile phone than poorer households can.

68. Ownership of motorcycles is low, but on the rise.

The share of households owning a motor cycle remains low at 6.7 percent in 2013. However, this represents a major improvement from the mere 2.6 percent in 2006.

69. The ownership of mobile phones and motorcycles appear to have improved substantially more among the well-off (top 60 percent).

As illustrated in Figure 2.5, the proportion of bottom 40 percent households having a mobile phone has grown substantially, by 35 percentage points, on average, compared to 46 percentage points for the top 60 percent households.²⁴ With regard to motorcycles, increase in ownership between 2006 and 2013 remained fairly stable among the bottom 40 percent households while it increased by 5 percentage points among the top 60 percent.

70. Conversely, ownership of more traditional assets such as bicycles has declined.

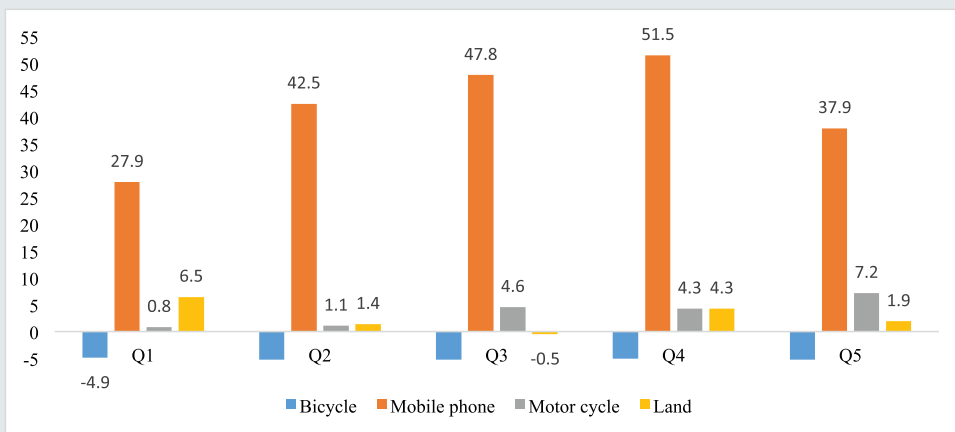
It seems that households have replaced bicycles by a more modern transport mode, as can be seen from the decline of bicycles and increase of motorcycles.

24. Asset ownership growth could also be shown in terms of percentage change. However, it would be more informative to show in percentage point terms rather than percentage change, because a large relative increase from a very small base may not be very meaningful in an absolute sense.

This is consistent with Seff et al. (2014), who, using Tanzania National Panel Survey data, show that households tend to replace traditional devices such as radios and bicycles by more upgraded goods, such as TVs or motorcycles. Thus, the declining levels of bicycle ownership observed

are not necessarily an indicator of declining levels of wealth. Rather, the rise in motorcycle ownership, coupled with the decline in bicycle ownership, supports the notion that these goods are substitutes of each other.

FIGURE 2.5: Changes in asset ownership, by consumption quintile, 2006–2013 (absolute numbers)



Source: UNHS 2006 and 2013.

Note: Changes are calculated between 2006 and 2013, except for land, which is between 2010 and 2013 because land ownership data was not collected in 2006.

2.4 Human capital

EDUCATION²⁵

71. Adult literacy rates are high in Uganda, given its income level, but have not changed much over time although progress in youth literacy rates has been faster. Adult literacy is substantially higher when compared to countries with a similar GNI level (Figure 2.6A.2). The national adult literacy rate (for those ages 18 years and above) stands at 68 percent (Figure 2.6A.1),²⁶ and has been fairly stable between 2006 and 2013 as one might expect

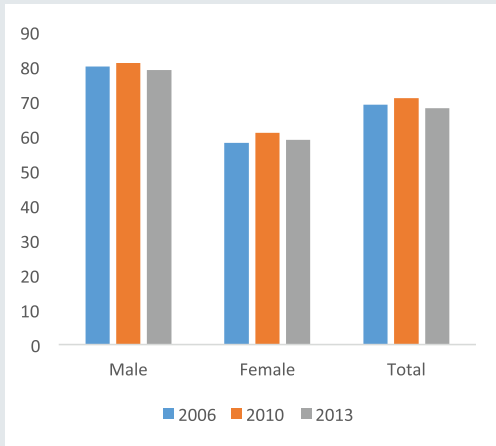
given that this is a stock variable. Adult literacy rates are substantially higher among males than females. One might expect to see more rapid change in literacy rates among young adults. The youth literacy rate has improved over time, and this is the case for both males and females between 15 and 24 years old. It is found that male and female youths have similar levels of literacy (Gable, Lofgren, and Osorio-Rodarte 2015).

25. This report looks at both stock variables such as adult literacy rates and flow variables such as school enrollment. Stock variables should not be expected to change much in the short run, while flow variables should.

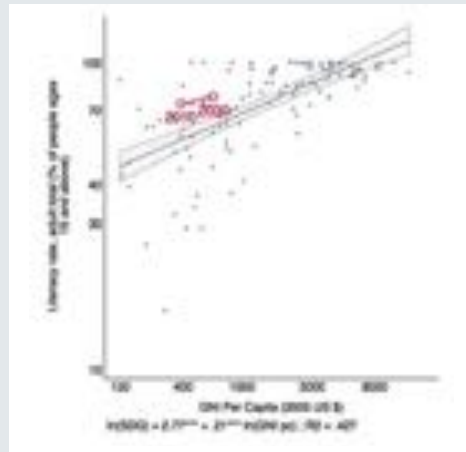
26. Adult literacy rate: the percentage of the population, ages 18 and above, who can, with understanding, read and write a short, simple statement on their everyday life.

FIGURE 2.6A: Trends in adult literacy rates (%)

1. Adult literacy rate (%)



2. Adult literacy rate vs. GNI per capita



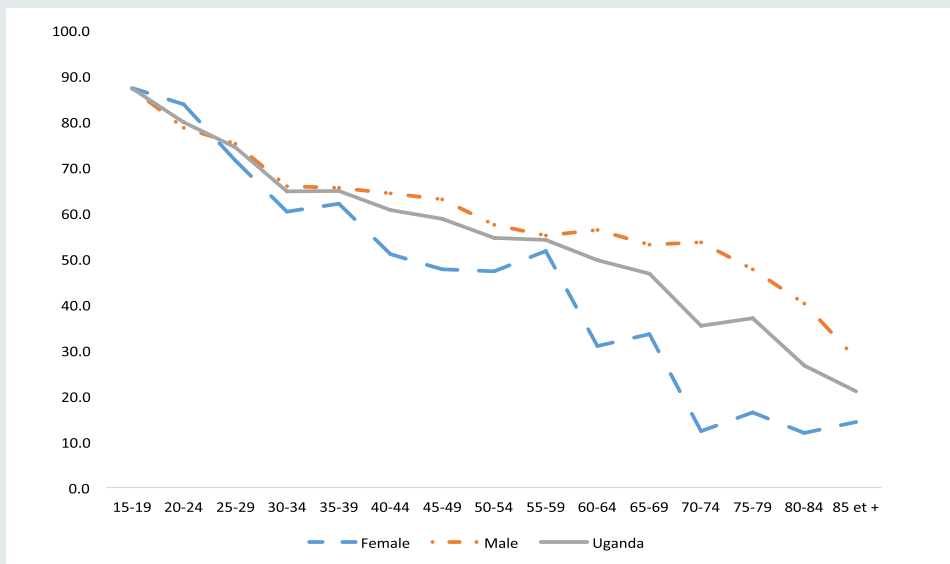
Source: UNHS 2006, 2010, and 2013.

Source: Gable, Lofgren, and Osorio-Rodarte (2015).

72. Gender gap in literacy rate has closed. Given the averages in Figure 2.6B and the large gender disparity, Figure 2.7 graphs the literacy rate across cohorts, suggesting that younger males and females are equally literate while there are more literate men

than women for the older cohorts. This is probably partly because schools are more accessible now than in the past decades, enabling more young women to study now while they could not do so in the past due to lack of nearby school facilities.

FIGURE 2.6B: Literacy gap across cohorts (%)



Source: UNHS 2013.

73. Net enrollment in primary schools are high and have increased over time. Primary school enrollments (6–12 years) increased slightly between 2006 and 2013. According to UNHS data the primary net enrollment rate increased from 84 percent in 2006 to 86 percent in 2013 (Table 2.1). This is up from 67 percent in 1995 and 79 percent in 2000. Interestingly, primary net enrollment deteriorated in 2010 before recovering in 2013. The same holds for a number of indicators on education, and there might be a common explanation for the oscillation. Exogenous shocks affecting incomes often have

negative impact on schooling. For instance, Nyqvist (2012) shows that in Uganda, a decrease in rainfall is associated with a reduction in female enrollment in grade 7 (primary school). However, this effect is significant for older girls only. There is no significant effect of rainfall variation on the enrollment of boys and young girls. Table 2.1 indicates that there is no marked difference in male versus female net enrollment. It should be noted that, unlike Table 2.1, which covers all grades and ages, Nyqvist focused on grade 7 only and split boys and girls by age.

TABLE 2.1: Trends in net enrollment rates in primary schools (%)

	Boys	Girls	Total
2006	84	85	84
2010	82	83	83
2013	85	87	86

Source: UBOS reports based on UNHS 2006, 2010, and 2013.

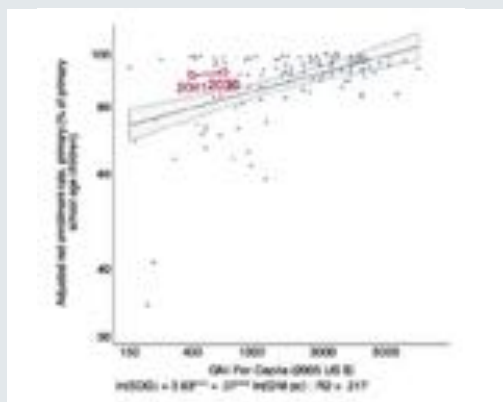
74. According to cross-country regression analysis, Uganda’s net primary enrollment rates are above the expected level when compared to other countries with similar incomes. Primary school enrollment rates are on the rise and higher than expectations, given the GNI level (Figure 2.7.1). The expansion of enrollment in primary schools was observed for both males and females (Gable et al. 2015). The magnitude of increase in net primary enrollments for boys and girls was similar. The high primary school enrollment rates among both poor and rich children reflect the benefits of the UPE program that was introduced by the GoU in 1997. Under the UPE program, all tuition fees and Parents and Teachers Association (PTA) charges for primary education were abolished to ensure that by 2015 children

everywhere, boys and girls alike, will be able to complete a full course of primary schooling.

75. Uganda has been successful in enrolling children in primary school but completion rates are lower than expected, and the trends show that the situation deteriorated over the last decade. The primary completion rate has generally fallen since the beginning of the 2000s (Figure 2.7.2). Ideally, completion should be timely. This means that most of the population in the targeted age group (12 years) should complete the last grade at the age of 12 years. Uganda’s gross primary completion rate was 53 percent in 2011. This is mainly due to a very high primary school dropout rate of 75.2 percent. When compared with its income peers (GNI per capita), Uganda’s primary completion rate is very low.

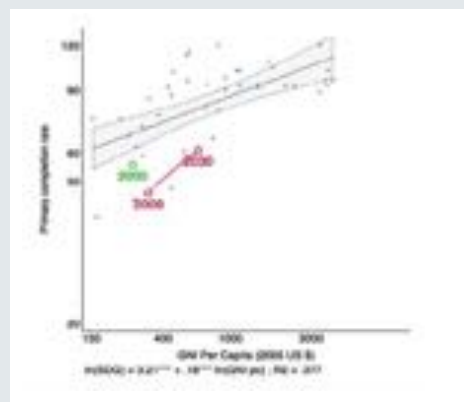
FIGURE 2.7: Net enrollment and primary completion rates

1. Net enrollment in primary vs. GNI per capita



Source: Gable, Lofgren, and Osorio-Rodarte (2015).

2. Primary completion rate vs. GNI per capita



Source: Gable, Lofgren, and Osorio-Rodarte (2014).

76. Enrollment in secondary schools remains very low, meaning that the increase in primary school enrollment has yet to translate at higher levels.

Here, the analysis focuses on the out-of-school rate (that is, the inverse of net enrollment).²⁷ Out-of-school rate stands at 23 percent in 2011. This is within the expected level when compared to other countries with similar incomes (Figure 2.8.1). Secondary enrollment rates remain low, regardless of the Universal Secondary Education (USE) program introduced by the GoU in 2007. Although secondary schools tuition fees were abolished, students still have to pay boarding fees, uniform costs, and for school materials, among others costs. This is reflected in the estimated share of monthly expenditure on education, which decreased from 9.6 percent in 2006 through 8.5 percent in 2010 to 7.5 percent in 2013.

77. The low secondary enrollment rates are due to several factors, including the poor performance at primary level, affordability, and attitude/tradeoffs. First, not enough children complete primary school. As shown above, primary

completion rates are very low in Uganda. Perhaps the low completion rates are because parents cannot continue investment (for example, when a shock occurs), or they do not see the investment being worthwhile (due to perceived low returns, child's poor performance, and so on). Second, cost seems to be a very important factor preventing many children from attending secondary school, and it is the main reason for dropping out (Figure 2.8.2). On the other hand, almost no child stated physical accessibility (that is, distance) or that further schooling was not available. Third, the other major reasons are related to attitude toward education. These include children not willing to attend, pregnancy and poor academic progress, and parents not wanting the child to continue school. This negative attitude toward education is mostly seen among children in the bottom 40 percent. Finally, an economic shock is the other main reason for dropping out of secondary school, with about 11 percent of dropouts citing sickness/calamity in family as the most important factor preventing them from attending school.

27. The out-of-school rate for children of lower secondary school age is defined as the number of children of official lower secondary school age who are not enrolled in lower secondary school expressed as a percentage of the population of official lower secondary school age (Gable et al. 2014).

78. Child marriage and early pregnancy have a large negative impact on education attainment, especially for girls. While primary completion rates are low in Uganda, they have converged for boys and girls. This is mainly because the male completion rate is declining over time (Gable et al. 2014). As documented by Wodon et al. (2016a), child marriage and early pregnancy appeared to be one of the main reasons why girls drop out of school prematurely. The issue of early pregnancy is mentioned by 16.2 percent of parents as the main reason for girls dropping out.

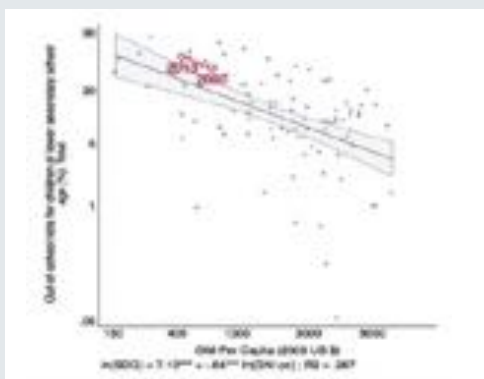
79. These results have policy implications. Obviously, free tuition alone is not enough for primary completion rates and secondary enrollment rates. Efforts to improve secondary school enrollments must start with programs that would boost primary school completions. In addition, social protection programs that can enable households to cope with negative shocks would enable their children to stay in secondary school when a shock hits. Various types of interventions can be also considered to delay

marriage and support girls who marry early.²⁸ Curbing early marriage and pregnancy will also help reduce the fertility rate and, subsequently, the dependency ratio thus affecting welfare positively.

80. There is a strong correlation between poverty and education. The Central region has the lowest percentage of persons with no formal schooling together with the lowest poverty rate. On the other hand, the high share of people with no formal education in the Northern region is associated strongly with high poverty rates in the region. Finding that poverty is strongly correlated with education has policy implications. Promoting policies and programs to achieve UPE as well as promoting transition from primary to secondary, and, subsequently, tertiary education will be important for poverty reduction. Education equips people with the needed skills to transition from subsistence agriculture to more productive activities. Furthermore, a better-educated population would likely be more productive, participating more efficiently in promoting economic growth and poverty reduction.

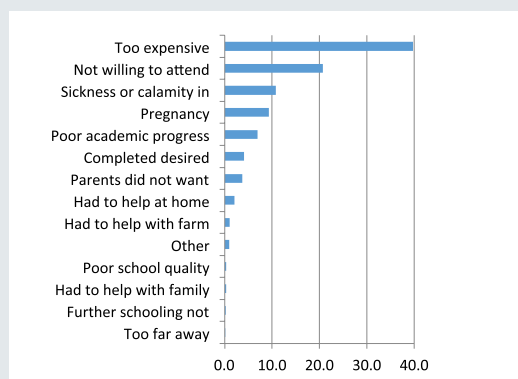
FIGURE 2.8: Out-of-school rate for lower secondary and reason for dropping out of school

1. Out-of-school rate for lower secondary vs. GNI per capita



Source: Gable, Lofgren, and Osorio-Rodarte (2015).

2. Main reasons for dropping out of school, children ages 13–18, 2013



Source: Authors' calculation, based on UNHS 2013.

28. Such interventions will include: (a) empowering girls with information, skills, and support networks; (b) educating and mobilizing parents and community members; (c) enhancing the accessibility and quality of formal schooling for girls; (d) offering economic support and incentives for girls and their families; and (e) fostering an enabling legal and policy framework. See Wodon et al. (2016) for more details.

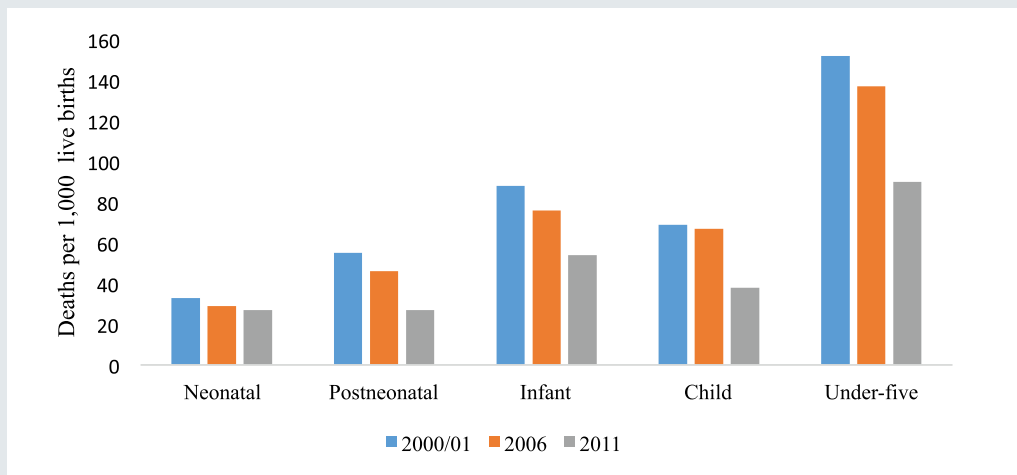
HEALTH AND NUTRITION

81. According to cross-country regression analysis, Uganda's under-five mortality rates seem to be exactly at the expected level. There has been a remarkable decline in all components of early childhood mortality over the 15-year period preceding UDHS 2011. There have been substantial decreases in early childhood mortality rates (Figures 2.9, 2.10.1, 2.10.2, and 2.11.1). Infant mortality (which measures the probability of infants dying before their first birthday per 1,000 live births) dropped from 88 in 2001 to 76 in 2006 and 54 in 2011. For the five years preceding UDHS 2011, the child mortality rate was 38 per 1,000 live births. This implies that one in every twenty-six children, who survived the first birthday, does not live to the fifth birthday. Under-five mortality, which measures the probability of children dying between birth and the fifth birthday, stood at 90 in 2011, having declined from 152 in 2001 to 137 in 2006. Declining trends were also observed for neonatal and post-neonatal rates. It is positive to

find that all these indicators are on a declining trend since 2000. Uganda achieved the Millennium Development Goals target of reducing child mortality by two-thirds by 2015 before the target date (compared with 1990).

- 82. Under-five mortality is significantly higher in rural areas than in urban areas.** The mortality rates were lowest in Kampala and highest in the Mid-Northern. This shows that there is a relation between child mortality and poverty, with Kampala having the lowest poverty rates and the Mid-Northern one of the subregions with high poverty levels. Indeed, under-five mortality rates were lowest among the top 60 percent.
- 83. Uganda has also made considerable progress to reduce maternal mortality over the past two decades.** Uganda's maternal mortality rate declined from 600 to 440 deaths per 100,000 live births between 1990 and 2011 (Figures 2.10.2 and 2.11.2).

FIGURE 2.9: Trends in childhood mortality, 2001–2011

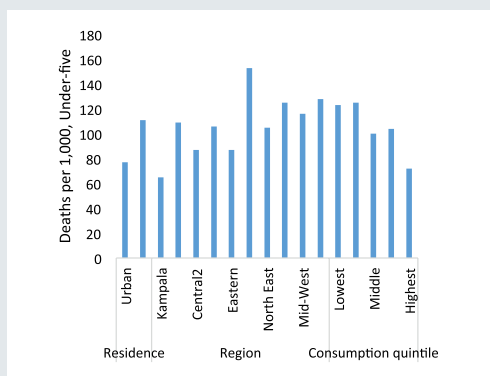


Source: UBOS UDHS Reports 2001, 2006, and 2011.

Notes: According to UBOS and ICF (2012) age-specific mortality rates are categorized and defined as follows: (a) neonatal mortality: the probability of dying within the first month of life; (b) post-neonatal mortality: the arithmetic difference between neonatal and infant mortality; (c) infant mortality: the probability of dying before the first birthday; (d) child mortality: the probability of dying between the first and the fifth birthday; and (e) under-five mortality: the probability of dying between birth and the fifth birthday. All rates are expressed per 1,000 live births except for child mortality, which is expressed per 1,000 children surviving to 12 months of age.

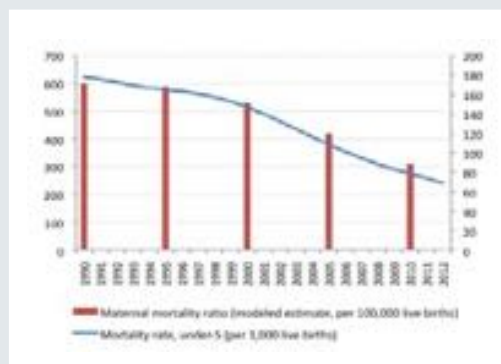
FIGURE 2.10: Under-five mortality by region and maternal mortality rates

1. Under-five mortality by region and consumption quintile, 2011



Source: UDHS 2011.

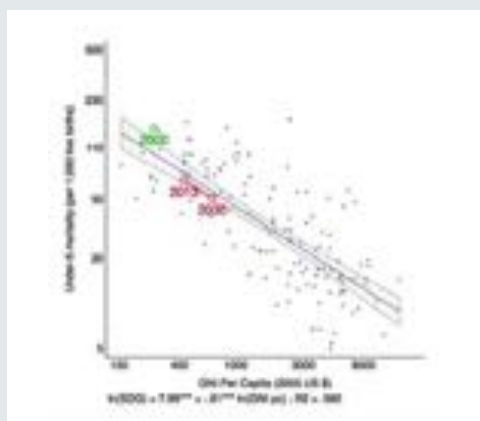
2. Maternal and under-five mortality rates, 1990–2012



Source: Gable et al. (2014).

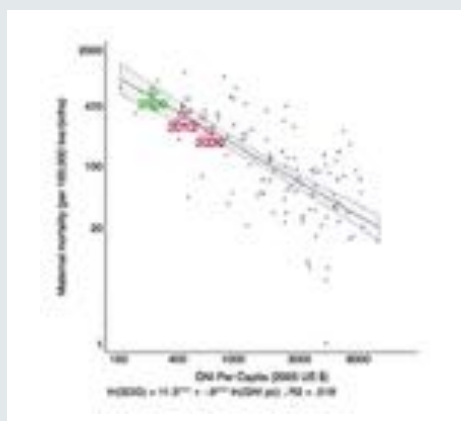
FIGURE 2.11: Maternal and under-five mortality rates in Uganda and international comparison

1. Under-five mortality rate vs. GNI per capita



Source: Gable et al. (2015).

2. Maternal mortality rate vs. GNI per capita



Source: Gable et al. (2015).

84. Anthropometric indicators for young children show some improvement since 1995, but the trends are uneven and malnutrition continues to be widespread. Stunting, defined as low height for age and an indicator of chronic malnutrition, was consistently high between 1995 and 2001

(at 45 percent). It came down to 38 percent in 2006 and dropped further in 2011 (to 33 percent). Nevertheless, the level of stunting remains quite high (Figure 2.12.1). Childhood stunting has long-term effects that are often irreversible. It can cause delayed motor function and diminished

cognitive ability; and children with low height-for-age in their early years may exhibit poor academic performance later in life (Seff et al. 2014; UNICEF 2007). In Uganda, wasting decreased slightly from 7 percent in 1995 to 5 percent in 2001, but has remained fairly unchanged since then. The incidence of underweight in Uganda stands at 14 percent in 2011, decreasing by 8 percentage points since 1995, and has been declining gradually over the periods from 1995 through 2001 and 2006 to 2011. The outlook seems positive, particularly for stunting and underweight. The results show a downward trend in the percentage of children stunted and underweight over the last two UDHSs, but the percentage of children who are wasted has remained stable.

85. The incidence of being underweight is lower in Uganda than in other low-income countries, and progress was recorded over the last decade. According to cross-country data for low- and middle-income countries, there is a strong correlation between poverty and malnutrition (Figure 2.12.2).²⁹ Thus, it is not surprising to find that both poverty and malnutrition have declined during the recent decades of strong growth in Uganda. The expected number is 19.6 percent for a country with Uganda's income per capita (Gable et al. 2014).³⁰ Uganda's current underweight rate of 14.1 percent of children under five years of age is slightly below the expected value. This means that incidences of being underweight in Uganda are fewer than in comparable countries. Perhaps this progress was partly due to the benefits of the Uganda Nutrition Action Plan that was launched in 2011.

86. However, the puzzle revealed by this analysis is that the patterns of the nutritional outcomes are not as expected across regions and welfare.

Stunting levels are higher in rural areas. Stunting incidences are lowest in Kampala, followed by the North East and Eastern subregions (Figure 2.13). Finding that the North East and Eastern subregions outperform other subregions in terms of stunting levels (with the exception of Kampala) is surprising and not as expected. The North East is the poorest subregion and the Eastern subregion is one of the poorest subregions of Uganda. The findings in Chapter 4 do point to the fact that there are improvements in reducing malnutrition when income increases, but the findings here show that the level of malnutrition is not correlated with the level of poverty, as would be initially expected. This may in part be due to the diverse possible causes of malnutrition, including not enough nutrients in available staple foods, lack of knowledge of adequate feeding, and lack of safe water and sanitation. However, the low correlation between poverty and nutrition outcomes has been observed in other contexts and cannot be fully explained. Speaking in the Lionel Robbins Memorial lectures in December 2015, Deaton talked about poverty and inequality in India.³¹ He noted that malnutrition is present at all levels of consumption and more so among the rich than the poor. This is consistent with the finding in Uganda. Deaton noted that it is not clear why this is the case in India, and this is true for Uganda also. Further research work is needed to better understand and explain the puzzle of why rates of malnutrition are not correlated with poverty.

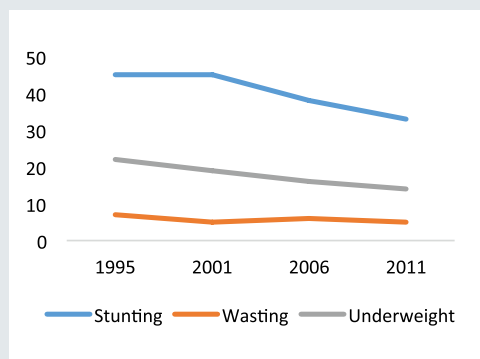
29. The correlation coefficient between the two variables is 0.60 in non-log form and 0.72 in log form.

30. The under-five underweight rate is defined as the percentage of children under the age of five years whose weight for age is more than two standard deviations below the median for the international reference population ages 0–59 months (WDI).

31. <http://www.livemint.com/Politics/jYcyQ0VZ6JZNhejdOpdywL/Angus-Deaton-on-India-at-the-LSE.html>

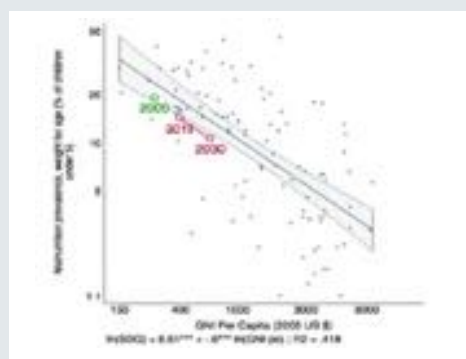
FIGURE 2.12: Malnutrition prevalence, underweight (% of children under five years) versus income per capita

1. Trends in nutritional status of children under five years (%)



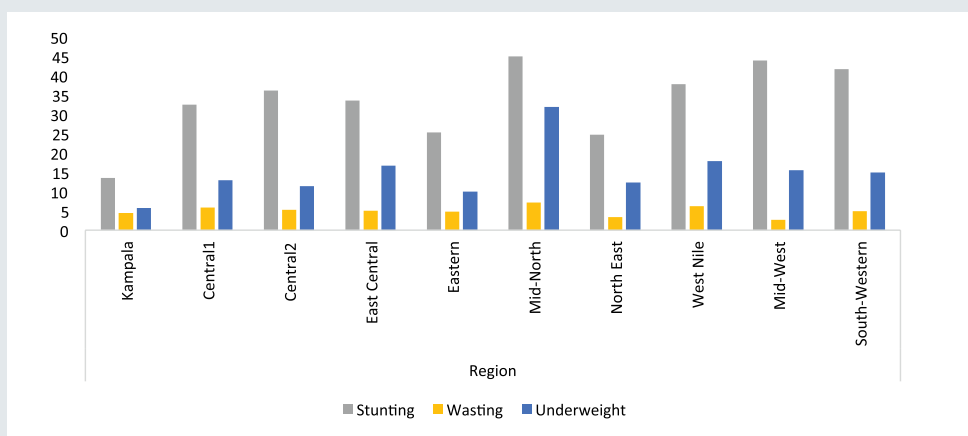
Source: UDHS 1995, 2001, 2006, and 2011.

2. Malnutrition prevalence, underweight (% of children under five years) versus income per capita



Source: Gable et al. (2014).

FIGURE 2.13: Nutritional status of children under 5 years, by region and consumption quintile, 2011 (in percent)



Source: UDHS 2011.

87. Objective and subjective indicators of poverty are similar. The UNHS 2013 contains information on people’s perceptions of poverty. Evidence shows that Uganda has been successful in reducing poverty in the last decade. However, do people necessarily feel better-off? It would be interesting to check whether people classified as poor based on income actually consider themselves as poor when asked the question: “If you were asked to

classify the household into very poor, poor, neither poor nor rich, rich, where would you put your own household?” The results in Table 2.2 suggest that the level of subjective poverty (16.1 percent) is not much different from the income poverty rate of 19.7 percent. The majority of households (92.6 percent) that are classified as income poor indeed are either poor or very poor.

TABLE 2.2: Perceptions about poverty (%)

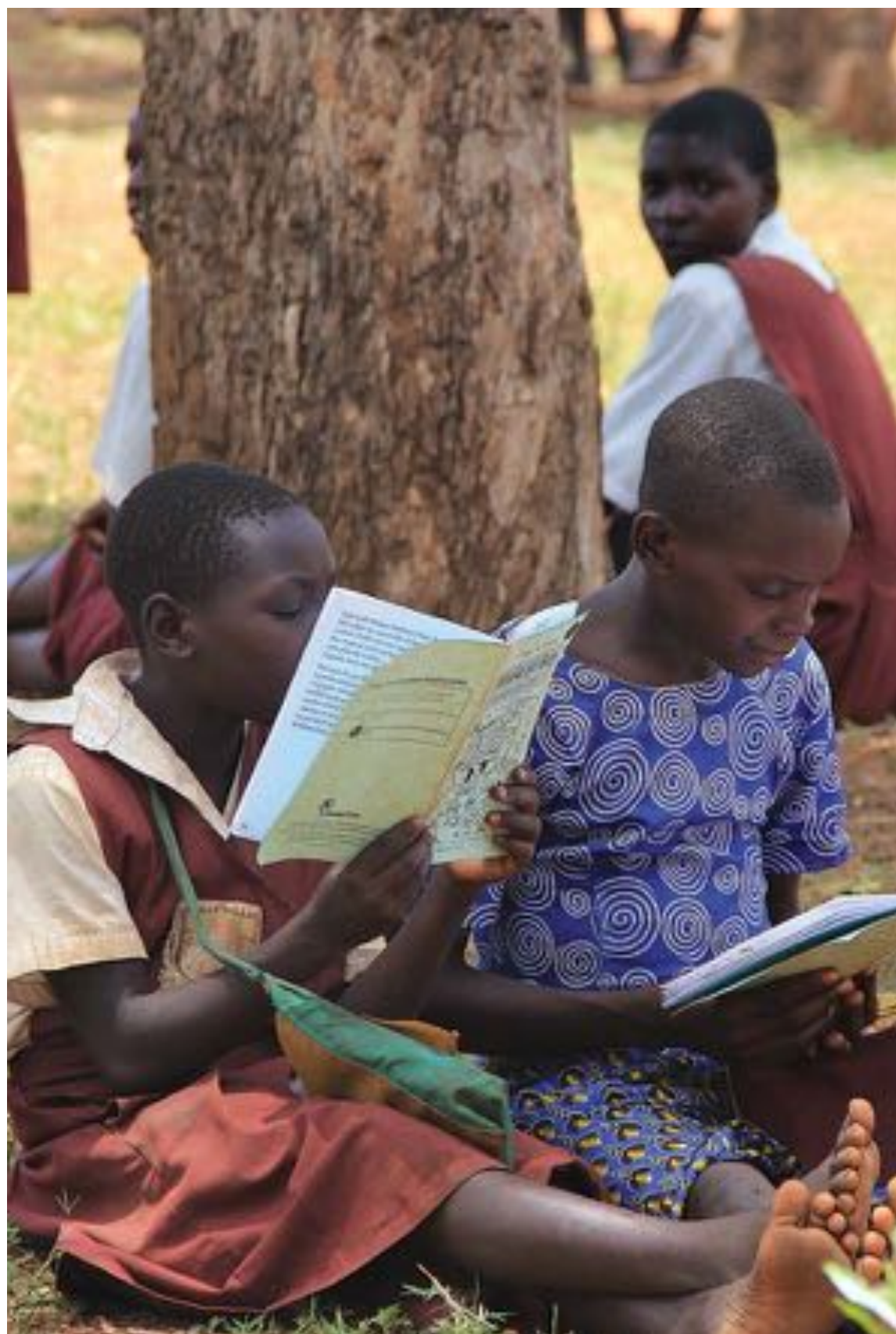
Self-assessed Poverty Status	Income Poverty Status			Total
	Poor	Non-poor Insecure	Middle Class	
Very poor	36.3	17.3	8.2	16.1
Poor	56.5	61.2	47.3	54.1
Neither poor nor rich	7.1	20.9	42.8	28.8
Rich	0.1	0.5	1.7	1.0

Source: UNHS 2013.

2.5 Conclusion

- 88. Uganda’s progress in reducing income poverty is strongly reflected in some non-monetary indicators of welfare.** Cross-country regressions suggest that Uganda performs well on improved water, adult literacy, child and maternal mortality, and child nutrition.
- 89. The evidence presented in this chapter points to areas where the country is performing less than expected and which require special attention: access to electricity and improved sanitation and education.** The GoU needs to improve investment

in power generation to improve access to electricity. Usage of improved sanitation is very low, and improving access to this facility will be important for the population well-being. There is also a need to increase primary education completion rates, as well as secondary education enrollment and completion rates, especially for girls, by addressing issues related to early marriage/pregnancy. As it will be illustrated in the next chapter, improved educational outcomes are important for improving people’s income generation capacity, which can lift many out of poverty.



CHAPTER: 3



HOW DID UGANDA REDUCE POVERTY?

Agriculture was the main driver of poverty reduction. Other important factors that contributed to poverty reduction include increased peace and stability in the North, urbanization and education.



90. **This chapter examines the factors behind Uganda's success in reducing poverty from 2006 to 2013.** It relies on analysis of the panel survey that has followed the same households through this period (UNPS) and decomposition analysis using the UNHS. The advantages of panel analysis for assessing drivers of poverty reduction are outlined in Box 1 and the decomposition methods used in this chapter are summarized in Box 3.1.

91. **The findings highlight the importance of agriculture, urban migration, and modest gains in education.** It also highlights the limited role of structural change since 2006, the persistently high dependency ratios which held back poverty reduction, and limited spending on safety nets, which have resulted in change in the distribution of household consumption having little direct impact on poverty reduction or on improving vulnerability.

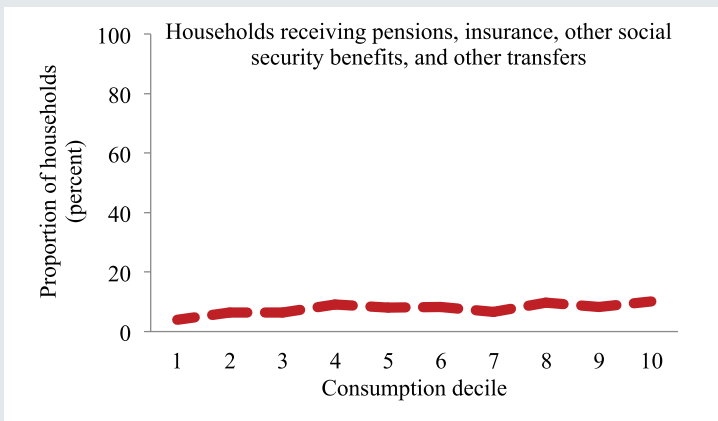
3.1 Growth, not redistribution, drives poverty reduction in Uganda

92. Public transfers to households are negligible in Uganda. Figure 3.1 shows the proportion of households reporting receiving any pensions, insurance, social security benefits, and other transfers across the income distribution. Less than 10 percent of households at any point in the income distribution receive these transfers. The proportion of poor households receiving transfers is only 5 percent. All incomes from pensions, insurance, scholarships, and alimony are included, and this may include private as well as public sources and as such overestimate the proportion of households receiving state transfers. Only 4.5 percent of the total population received any kind of direct income support and only 5 percent of the working population is part of a pension scheme.

93. This reflects a limited use of fiscal policy to directly improve the incomes of poor

households in Uganda, in comparison to other countries in the region. Uganda’s total spending on social security in 2013 was 1 percent of GDP compared to an average of 2.8 percent for other countries in Africa. Of that 1 percent, only 0.4 percent was spent on direct income support to poor households, compared with 1.1 percent in other low-income countries in Africa (Uganda Systematic Country Diagnostic). In addition to low spending on public transfers, there is, more broadly, a limited use of fiscal policy to redistribute incomes. De facto tax rates are very low in Uganda. The International Monetary Fund 2013 Article IV report documents that Uganda faces one of the highest revenue gaps among Sub-Saharan African countries. Redistributive fiscal policy thus plays a limited role in directly reducing inequality and addressing poverty. Box 3.2 discusses how, as oil revenues increase fiscal space, this could change.

FIGURE 3.1: Limited public transfers for Ugandan households

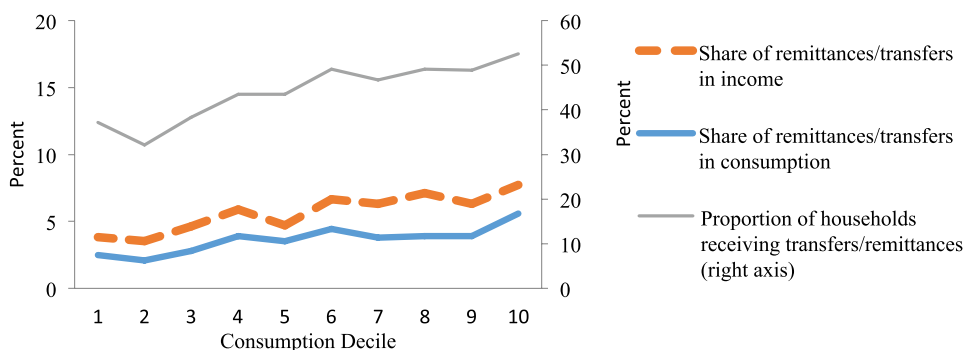


Source: Staff calculations using UNHS 2013.

94. Rates of informal redistribution are much higher, but remittances and transfers comprise a small share of income. Many Ugandans—32 percent to 53 percent of all households—report receiving transfers or remittances from family and friends. However, as Figure 3.2 indicates, these transfers comprise a small share of

income. The data available indicates that only 4 percent to 8 percent of household income (or 3 percent to 6 percent when compared to reported consumption) comprises transfers received from others. Transfers and remittances are a more important share for the top 60 percent than for the bottom 40 percent.

FIGURE 3.2: Informal transfers are a prevalent, but not important, source of income



Source: Staff calculations using UNHS 2013.

95. Given the limited role of public and private transfers as a source of income for poor households, growth in labor income is what drives poverty reduction in Uganda. Section 3.2 examines Uganda’s demographic change in the recent past and how the share and location of the working age population has changed and contributed to poverty reduction. Section 3.3 examines the type of labor income growth that Uganda has experienced and why this has been good for poverty reduction. Chapters 4 to 6 examine labor income growth in further depth, examining how agricultural growth, rural non-agricultural

growth, and migration have brought about poverty reduction in Uganda, and how they can continue to drive gains in the future.

96. Although fiscal policy is not redistributing income to directly reduce poverty, public spending does play a role in facilitating poverty reduction through the provision of basic services. The contribution of education and public utilities is considered in section 3.4 and analysis on how to improve the quality of service delivery for poverty reduction is discussed in Chapter 7.



BOX 3.1: What does decomposing changes in poverty entail?

In this chapter, the results of two decomposition methods are presented. The first method is the Recentered Influence Functions (RIF, Firpo et al. 2009) in which traditional Oaxaca-Blinder decompositions are applied to different percentiles of the consumption distribution. This allows an assessment of the amount of poverty reduction that can be accounted for by changes in the characteristics of households and individuals ('endowments') compared to the changing nature of the Ugandan economy and poverty. The second method, the Ravallion and Huppi (1991) inter-sectoral decomposition method quantifies how much poverty reduction among different groups or movement between different groups accounts for national poverty reduction.

Both decomposition methods rely on defining a counterfactual scenario and estimating what would have happened to poverty had the counterfactual scenario occurred. By defining a counterfactual scenario, the changes that have been important to overall poverty reduction can be quantified. Figure 3.3 depicts how this can work for two different counterfactual scenarios.

In the Ravallion and Huppi method, the focus is on a counterfactual of no change in the proportion of population in different sectors; and a counterfactual of no change in poverty among people in a given sector. These counterfactuals are used to examine the amount of poverty reduction that took place within sectors (as if sectors had not changed) and the amount of poverty reduction that took place because of people moving between sectors.

In the RIF analysis, the focus is on a counterfactual of a constant relationship between endowments and poverty in Uganda over 2006 to 2013. This counterfactual is used to determine which changes in endowments could have contributed to poverty reduction, and how much poverty reduction could have changed because of a changing relationship between poverty and endowments. The latter is sometimes referred to as changes in the returns to endowments, but really it represents how the conditional correlation between a given endowment and consumption has changed.

The RIF decomposition is carried out at five points of the distribution, representing five different welfare groups: the 10th percentile, the 25th percentile, the 50th percentile (median), the 75th percentile, and the 90th percentile. This exercise can be done robustly only at the national level because of the small sample size in urban areas.

In all decomposition approaches, there is an interaction effect which can be interpreted as a measure of the correlation between population shifts and inter-sectoral changes in poverty in the Ravallion and Huppi method and changes in endowments and returns in the RIF analysis. In the decompositions shown here it is quite small.

Source: World Bank's Poverty Handbook.

BOX 3.2: Expanding fiscal policy: How can oil revenues accelerate poverty reduction in Uganda?

The Country Economic Memorandum (CEM) recently produced by the World Bank, highlighted the importance of oil as a source of fiscal revenue when production starts. It argued that to maximize the socioeconomic impact of its new revenue, Uganda should increase public investment gradually and save some of its oil revenue in the early years of production to finance countercyclical policies (given the volatile nature of oil prices) and to mitigate Dutch Disease effects.

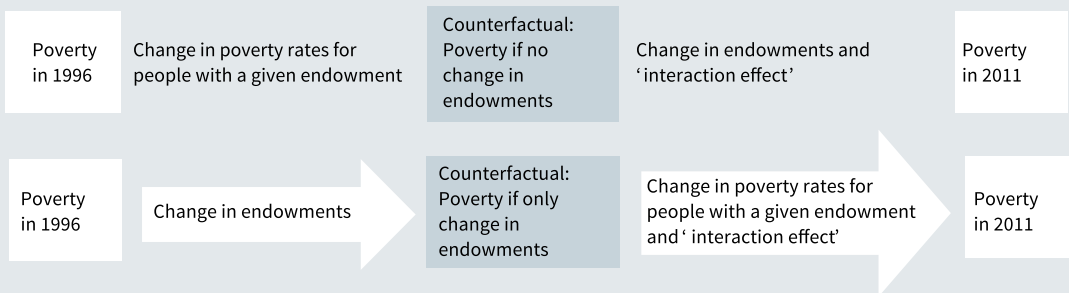
However, how should public investment best be allocated to facilitate sustainable, inclusive growth and aid poverty reduction?

Economic simulations undertaken for the CEM indicate that, initially, investment in transport and energy infrastructure would aid private sector development and have a stronger impact on growth. In the long-term, however, education and health spending will be more effective. Manufacturing and modern services—and the success of the government’s diversification strategy—depend on a healthy and well-educated labor force. The CEM also highlighted that future infrastructure development programs should give priority to the poorest/underdeveloped regions of the country to promote economic and political stability.

In addition, social programs focused on the poor should be designed and implemented to reduce poverty. Specifically, the CEM suggests that direct cash transfers to poor households, linked with changes in health and education practices should be considered and tested.

Source: World Bank 2016. “Economic Diversification and Growth in the Era of Oil and Volatility” Uganda CEM.

FIGURE 3.3: Using counterfactuals to quantify changes that have been important to poverty reduction



3.2 Demographic change, urbanization, and poverty reduction

SLOWLY DECLINING FERTILITY HAS NOT YET CONTRIBUTED TO DEMOGRAPHIC CHANGE OR POVERTY REDUCTION

97. Uganda has one of the youngest and most rapidly growing populations in the world.

About half (48.7 percent) of Uganda's population is younger than 15, well above Sub-Saharan Africa's average of 43.2 percent and the world average of 26.8 percent. The country's population growth rate, currently at 3.3 percent, has also been steadily above Africa's average, except for the period of peak prevalence in HIV/AIDS in early 2000s (World Bank 2011).

98. The fertility rate has been slowly falling over the last two decades but it remains high. The total fertility rate remained stable at a high level (around seven children per woman) between the 1960s and the mid-1900s (Figure 3.4.1), resulting in high population growth.³² This is in sharp contrast to neighboring Kenya and other countries in the region, such as Ghana and Ethiopia. Since 1995, the country has started a slow demographic transition. Total fertility rates started dropping steadily, from 7 in 1995 to 6.6 in 2005 and 5.9 in 2013. However, both the high fertility rates and the youthfulness of the population bring a very high youth dependency ratio.

99. Lower fertility can have positive effects on household living standards in both the short and longer term, and Ugandan households are missing out on these benefits. In the short term, lower fertility rates translate into smaller households and lower child dependency rates. Fewer dependent children in a household mean less strain on household resources and an increase in per equivalent adult consumption. In the long-

term, drops in fertility tend to lead to increased female labor market participation and better human capital outcomes for younger generations as more resources (public and private) can be invested in the education and health of each child.

100. The slight drop in fertility rates in recent years has not changed the demographic composition of Ugandan households. Dependency ratios have been increasing, particularly for poorer households. As illustrated in Chapter 1, the dependency ratio remains high and increased slightly from 1.11 to 1.14 between 2006 and 2013. The increase of the dependency ratio was more pronounced for poor households than for the non-poor households: the average dependency ratio in poor households increased from 1.38 in 2006 to 1.47 in 2013 (increase of 6.6 percent), while in non-poor households it increased by 5.8 percent (from 1.02 in 2006 to 1.08 in 2013).

101. Increasing dependency ratios held back consumption growth from 2006 to 2013. Changes in the dependency ratio between 2006 and 2013 have not been favorable for consumption growth (Figure 3.4.2). The increase of the dependency ratio was more costly in reducing consumption growth for poor households. The demographic transition process has yet to effectively materialize in poor households.

102. However, if the dependency ratio can be reduced, consumption growth will benefit. Reducing the dependency ratio, particularly for poorer households, is important for poverty

32. The total fertility rate is defined as the average number of children a hypothetical cohort of women could be expected to have at the end of the reproductive period.

reduction. As the demographic transition progresses in Uganda, the working-age population in Uganda will grow quickly (faster than the economically dependent population), causing dependency ratios to progressively decrease. The analysis suggests this would be associated with improvements in household living standards and poverty reduction. A recent impact evaluation shows that targeting adolescent girls as they transition from school to work and providing them with vocational training and information on sex, reproduction, and marriage reduces teen pregnancy and early marriage, contributing to reduced fertility rates (Bandiera et al. 2015).

103. Reducing fertility rates is also imperative to improving the socioeconomic status of women.

The total fertility rate of 5.9 is an average of 6 child births per women. Maternal mortality rates have been falling (Chapter 2) but are still high, and multiple births pose a significant health risk to women. High pregnancy rates, particularly among teenage girls, also jeopardize educational attainment. Pregnancy is the fourth most common reason for dropping out of secondary school: in 2013, 1 in 10 girls report dropping out of secondary school as a result of pregnancy. Additionally, there

is an increasing body of evidence that points to high fertility rates reducing the economic capacity of women, thereby limiting the extent to which women can contribute to and participate in economic growth. A major factor contributing to lower rates of agricultural productivity found among women is the childcare demands they face which reduces the time they can allocate to agricultural production (Ali et al. 2015). Bandiera et al. (2015) found that a program supporting life skills and livelihood training for teenage girls ages 14 to 20, simultaneously reduced the fertility rate by 26 percent and increased employment by 72 percent.

104. Faster progress in reducing fertility will also reduce the pressure on education and health services, allowing for better service delivery and better investments in human capital outcomes.

Currently Uganda has 5.7 million primary school age children (children ages 5 to 14), but this will increase to 6.6 million in five years' time and 7.5 million in ten years' time (calculations using data from United Nations: <http://data.un.org>). The challenges faced in delivering high quality services that are outlined in Chapter 7, will become even more severe if fertility rates are not reduced.

URBANIZATION HAS BEEN IMPORTANT FOR POVERTY REDUCTION

105. Uganda is predominantly a rural country and poverty reduction has thus been concentrated in rural areas. In Uganda, 82 percent of the population lives in rural areas (2014 census). A higher share of poor Ugandans live in rural areas given the higher rates of poverty in rural Uganda compared to urban Uganda. Figure 3.4.3 shows that 80 percent of poverty reduction took place in rural Uganda. Reductions in poverty in urban areas contributed to poverty reduction from 2006 to 2010, but not after then, partly because the urban poverty rate was so low by 2010.

106. However, urbanization accounted for one-tenth of poverty reduction from 2006 to 2013,

accounting for the movement of 180,000 people out of poverty. Census data shows that Uganda's urban population increased by half a percentage point per year from 2002 to 2014. This is an estimated increase of 3.5 percentage points in the urban population from 2006 to 2013. This small increase accounted for 10 percent of poverty reduction given the substantially higher welfare of households in urban areas.

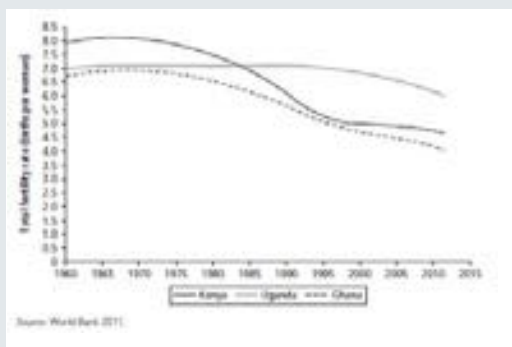
107. Welfare gains from rural to urban migration contribute to the role urbanization plays in reducing poverty. Some urbanization is likely a result of higher rates of natural population growth in urban areas than rural areas because of lower

mortality rates, but migration of individuals from rural to urban areas also helps. Figure 3.4.4 uses panel data in which individuals who migrated were tracked over time and shows how consumption increases much more for an individual when he or she moves from living in rural Uganda to living in an urban center, than for an individual who does not move. Migration can bring about welfare gains if individuals are able to move from areas

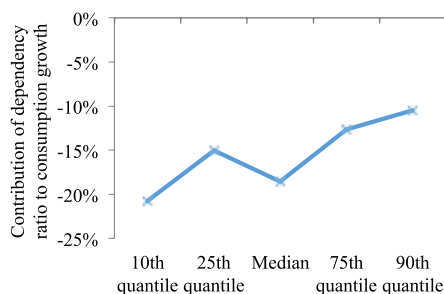
where the return to labor is low to areas where the return to labor is higher because of better market opportunities (Harris and Todaro 1970; Lewis 1954). Migration can also help bring welfare gains for a household by helping the household diversify income sources and minimize risk (Rosenzweig and Stark 1989; Stark and Bloom 1985). Chapter 6 looks at the impact of migration on welfare and the drivers of migration in more detail.

FIGURE 3.4: Demographic change and poverty reduction, 2006–2013

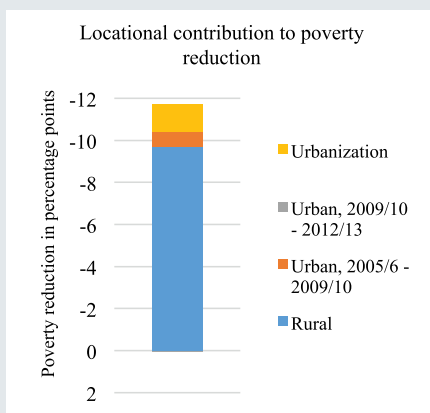
1. Uganda’s demographic transition has been slow



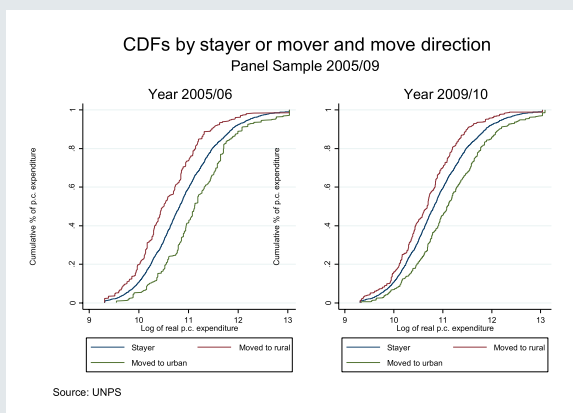
2. Higher dependency ratios held back consumption growth, especially for the poorest, 2006–2013



3. Rural areas and urbanization are important for poverty reduction



4. Migration to urban areas increases consumption



Source: 1: Canning et al. (2015); 2 and 3: Staff calculations using UNHS 2006–2013; 4: Mensah and O’Sullivan (2016) using UNPS 2006 and 2010.

3.3 Agricultural growth has been particularly important for poverty reduction

108. Cross-country analysis finds that growth in the sectors in which the poor are employed is more poverty reducing than growth in other sectors (Loayza and Raddatz 2010; and Christiaensen et al. 2013). In this section, we characterize the nature of employment and income for poor households and assess what type of income growth was most important for poverty reduction in Uganda from 2006 to 2013. Analysis conducted on poverty reduction from 1993 to 2006 highlighted the

importance of growth in coffee incomes (as a result of coffee marketing liberalization and favorable international prices), growth in agricultural productivity for goods produced for self-consumption, and growth in nonfarm enterprises for poverty reduction (Deininger and Okidi 2003; Fox and Pimhidzai 2011). This analysis in this section highlights the importance of continued trends of agricultural growth post-2006 in bringing about poverty reduction.

JOBS AND INCOME OF UGANDAN HOUSEHOLDS: DIVERSIFIED BUT NOT INCREASINGLY SO

109. The agricultural sector is the main sector of employment for households in Uganda, particularly so for poorer households. Agriculture is cited as the main sector of employment for 72 percent of the workforce in 2013 and 81 percent of households report engaging in some agricultural production. The poorest and the bottom 40 percent are even more concentrated in agriculture: 89 percent of poor households and 90 percent of the bottom 40 percent receive income from agricultural production.

110. However, half of those engaged in agriculture have additional sources of income from non-agricultural activities. Only 41 percent of households derive income only from agricultural activities, 40 percent of households are engaged in some form of employment in both agriculture and non-agricultural sectors. The majority of non-agricultural income is also earned in self-employment rather than wage employment. In 2013, 42 percent of households earned non-agricultural income from self-employment and 24 percent of households earned non-agricultural income from wage employment.

111. Households diversified their sources of income from 1993 to 2006. Since 2006 little additional diversification has been observed. Fox and Pimhidzai (2011) document dramatic growth in the number of sources of income Ugandan households reported from 1993 to 2006 (Table 3.1). The proportion of households that reported income from nonfarm self-employment increased by 1 percentage point a year from 28 percent in 1993 to 41 percent in 2006. Structural change was occurring during this time. Not by households moving out of agriculture, but by households staying in agriculture and taking on informal sector activities in agriculture and services. However, there has been very little increase in diversification and very little structural change since 2006 with diversification of household income sources similar in 2013 to 2006.

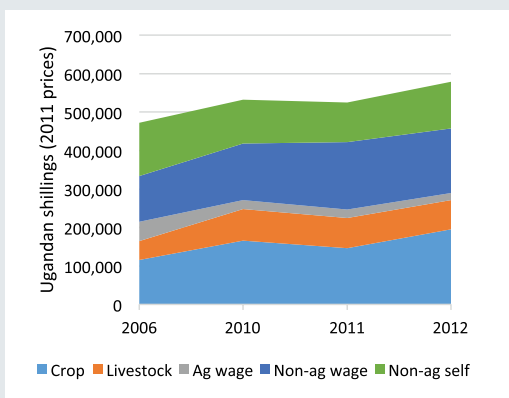
112. Poorer households are less diversified. On average, half of household income comes from agricultural production, but for the bottom 40 percent, three-quarters comes from agriculture. Information on real income per capita for households in Uganda across time is presented

in Figure 3.5.1 for all households and for the bottom 40 percent in Figure 3.5.2.³³ Together, crop, livestock, and agricultural wage income comprised 50 percent of the income of Ugandan households in 2012 and 73.8 percent of the income of the bottom

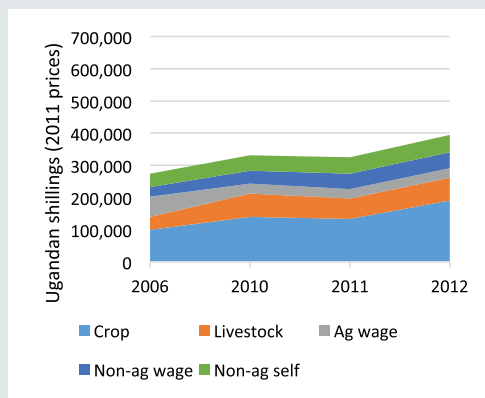
40 percent. Income from nonfarm self-employment is the second most important source of income followed by non-agricultural wage income (for all households and for the bottom 40 percent).³⁴

FIGURE 3.5: Household labor income and poverty reduction, 2006–2013

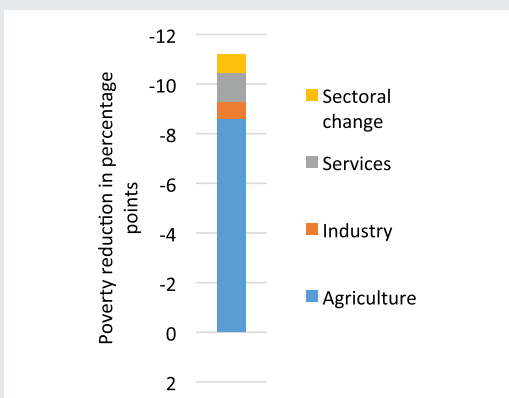
1. Real income per capita by source of income, all



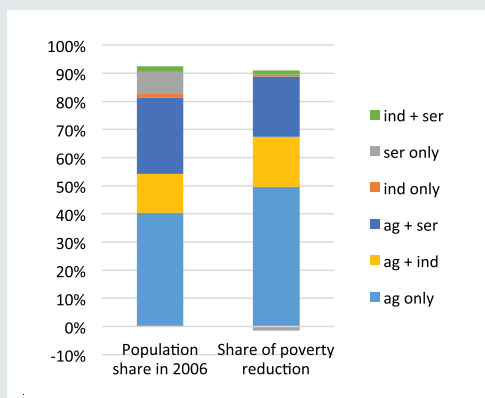
2. Real income per capita by source of income, bottom 40



3. Sectoral contribution to poverty reduction, 2006 to 2013, main source of income



4. Sectoral contribution to poverty reduction, 2006 to 2013, all sources of income



Source: 1 and 2: Staff calculations using UNPS 2006–2012; 3 and 4: Staff calculations using UNHS 2006–2013.

33. The data represents weighted averages of income from crop farming, livestock production, wage employment (in agriculture and non-agriculture sectors) and nonfarm self-employment. All values are in 2011 prices.

34. Finding a measure of non-agricultural self-employment income that compares well to the measures of gross agricultural income used is not straightforward. Much self-employment income comes from trade and taking only gross sales does not give an idea of how much was earned. To account for this net self-employment income in the analysis, which is gross self-employment income net of raw materials, operating expenses, and wages paid to others. Raw materials account for 81 percent of these expenditures. Operating expenses and wages paid to others account for 12–13 percent of gross income, suggesting that self-employment income would be a marginally more important source of income were these expenses not netted out.

TABLE 3.1: Structure of household income, 1993 to 2013

Proportion of Households Reporting Receiving Income from:	1993	2006	2013
Wage employment in agriculture	10.7	20.9	22.7
Wage employment out of agriculture (private and public)	21.2	27.2	24.0
Nonfarm self-employment	27.7	41.4	42.5
Agricultural self-employment	82.0	77.3	75.8

Source: Fox and Pimhidzai (2011) using UNHS 1993 and 2006. Authors' calculations for 2013 using UNHS 2013. Note: 2013 data estimated from a labor module, not income. Using income data suggests a higher share earning income from self-employment in agriculture (86 percent), a higher share earning income from self-employment in non-agriculture (45 percent), and 41 percent of households earning wage income (agriculture/non-agriculture not specified).

AGRICULTURAL GROWTH (NOT DIVERSIFICATION) ACCOUNTS FOR POVERTY REDUCTION

113. Poverty reduction among households in agriculture accounts for 79 percent of national poverty reduction from 2006 to 2013 (Figure 3.5.3). This is when households in agriculture are defined as all those households that report agriculture as their main sector of employment. The large contribution of this group to national poverty reduction is perhaps not surprising given that 72 percent of Uganda’s population cite agriculture as their main income source (UBOS 2014a). Kaminski and Christiaensen (2014) undertake decomposition analysis using the UNPS and find that agricultural growth contributed to 70 percent of the poverty reduction observed from 2006 to 2010. They also estimate that agricultural income growth accounted for 18 percent of consumption growth from 2006 to 2010, because of the lower importance of agricultural income for non-poor households.

114. However, as Table 3.1 suggests, agricultural households have diverse sources of income. Was it agricultural growth or growth in incomes from other sources that contributed to poverty reduction? To answer this question, agricultural households are categorized into those that derive income solely from agriculture and those with agricultural and non-agricultural income sources. Results are presented in Figure 3.5.4.

115. Poverty reduction was just as fast for those solely in agriculture, as for those with diversified income sources. The share of poverty reduction accounted for by households solely in agriculture is high, commensurate with the share of this type of household among those who were poor in 2006 (Figure 3.5.4). The share of poverty reduction accounted for by diversified households was also equivalent to their share in the poor population in the beginning of the period, indicating that it was not only for these households for whom poverty reduction was faster.

116. These findings suggest that although diversification may have driven poverty reduction before 2006 when diversification was rapidly increasing, it was not the main driver of progress from 2006 to 2013. There is a commonly held view that diversification has enabled predominantly agricultural households to become less poor. This may have been true before 2006 when many households were acquiring an additional non-agricultural income source, but this was no longer true after 2006. Instead, the findings are consistent with literature that points to agricultural income growth as a major source of poverty reduction in the country (Dorosh and Thurlow 2012; MoFPED 2014; Kassie, Shiferaw, and Muricho 2011).

117. Agriculture’s seemingly significant contribution to poverty reduction is consistent with the high rates of agricultural income growth observed from 2006 to 2013. On average, real per capita crop income grew by 9 percent per year, and by 11 percent for the poorest 40 percent (Table 3.3 and Figures 3.5.1 and 3.5.2). Overall, agricultural income per capita grew by 5 percent annually on average and 6 percent for the bottom 40 percent.³⁵

The growth in agricultural income recorded in survey data is not consistent with national account estimates (Box 3.3). For poor households, growth in non-agricultural per capita income was equal to growth in agricultural income (6 percent), but it accounts for a much smaller share of total income. Growth in non-agricultural income was lower when considering all households.

BOX 3.3: Agricultural growth in national accounts and survey data

Table 3.3 indicates substantial growth in real per capita agricultural incomes from 2006 to 2012 based on household survey data. In contrast, limited agricultural growth was recorded in the national accounts from 2006 to 2012. The national accounts suggest agricultural growth in Uganda has been consistently low, averaging only 2 percent over the past five years (see Figure 3.6) and below the performance achieved by other regional economies (see Table 3.2).

It is difficult to explain why there is this divergence between the national accounts estimates of agricultural growth and those found in the survey data. The national accounts estimates are not based on any additional sources of survey information (such as agricultural sample surveys which are often used in other countries to underpin estimates of agricultural value added) and it has been a number of years since an agricultural census was undertaken so it is difficult to assess what underpins the national accounts estimates and thus what might cause the divergence.

The UNPS may be biased to households that have stayed in agriculture, as households that attrited over time are probably more likely to be those that have moved out of agriculture. However, given that the nationally representative cross sections suggest that many households have stayed in agriculture during this time, this is unlikely to be a large source of bias.

TABLE 3.2: Agricultural GDP growth rates for selected Eastern African countries, 2000–2012

Country	2000–2009	2010–2012
Ethiopia	6.6	6.3
Tanzania	4.6	3.9
Kenya	2.3	4.6
Uganda	2.6	1.5

Source: World Bank, WDI.

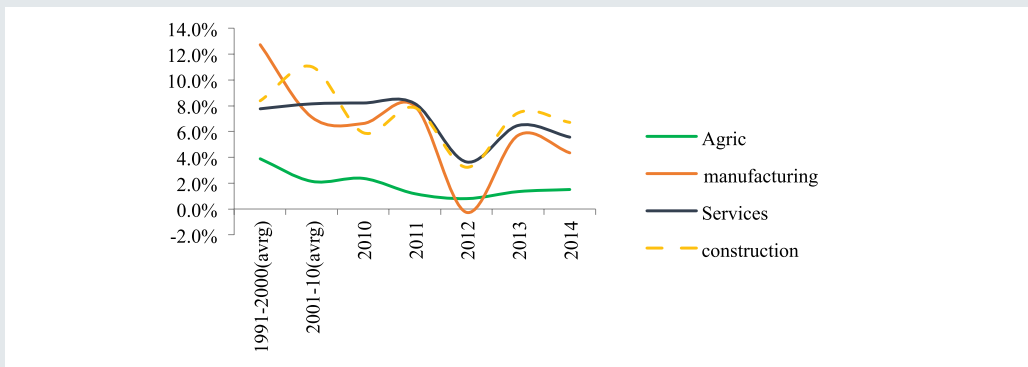
35. It is worth noting that the panel analysis may overestimate national average per capita agricultural growth (and underestimate national average per capita non-agricultural growth) as households that attrited over time are probably more likely to be those that have moved out of agriculture. However, the nationally representative cross sections undertaken during this time show that many households have stayed in agriculture, so this is unlikely to be a large source of bias.

118. Agricultural income growth is also found to be more strongly correlated with consumption growth than other sources of income growth, particularly for the bottom 40 percent.

Growth in real per capita income from different sources is correlated with household consumption to ascertain whether growth in some sources of income have been more important for increasing consumption than others.³⁶ The results are presented in Table 3.4 and indicate that agricultural income growth is more strongly correlated with

consumption growth than other sources of income growth. This correlation is larger for the bottom 40 percent (column 2) indicating that agricultural income growth has been more important for poverty reduction during this period than other types of income growth. Chapters 4 and 5 look further at agricultural and non-agricultural income growth and poverty reduction to examine how agricultural growth contributed to poverty reduction in this period and what holds back diversification and growth in nonfarm income.

FIGURE 3.6: Sectoral growth rates



Source: Uganda Fourth Economic Update.



Dry food grains on a market stall

36. Specifically, a fixed effects model was estimated using the log of per capita consumption and the log of per capita income, allowing an analysis of the relationship between changes in income and changes in consumption. Interview year and month fixed effects were also included. The analysis was conducted only for 2005/06 and 2009/10 as there is a marked reduction in the consumption aggregate after 2009/10 that is hard to explain and is inconsistent with the national poverty trend. It may result from methodological differences in the collection of consumption data in the 2010/11 and 2011/12 survey rounds. Computer Assisted Personal Interviews (CAPI) was introduced in the UNPS for the 2010/11 and 2011/12 rounds and this may have resulted in a reduction in reported consumption. CAPI was not introduced in the nationally representative cross-sectional survey, the UNHS.

TABLE 3.3: Real per capita Income growth by source of income, 2006 to 2012

	Agricultural Income				Non-agricultural Income		
	Crop	Livestock	Wage	Total	Wage	Self employment	Total
All households							
2006	115,320	49,322	50,147	214,788	118,582	138,486	257,068
2010	165,735	82,590	23,056	271,380	147,255	113,697	260,951
2011	145,938	78,789	21,651	246,378	175,932	103,013	278,945
2012	195,194	75,527	18,924	289,645	168,204	121,480	289,684
Annual growth	9%	8%	-10%	5%	6%	-1%	2%
Bottom 40 percent							
2006	99,423	39,696	62,849	201,968	29,566	42,219	71,785
2010	140,172	72,179	30,777	243,128	40,385	48,015	88,400
2011	133,862	63,163	29,428	226,454	47,188	50,536	97,723
2012	191,205	71,004	28,637	290,847	49,953	53,056	103,009
Annual growth	11%	12%	-8%	6%	8%	3%	6%

Source: Staff calculations using UNPS 2006–2012.

Note: Value of non-agricultural self-employment income for 2011 is interpolated between 2010 and 2012.

TABLE 3.4: Relationship between income and consumption, 2006-2010

	1	2
	Log of Per Capita Consumption	
	All Households	Bottom 40 Percent
Log of per capita real crop gross income	0.0324*** (0.00805)	0.0416*** (0.0103)
Log of per capita real livestock gross income	0.00573** (0.00283)	0.00479 (0.00347)
Log of per capita real agricultural wage	0.00127 (0.00239)	0.00186 (0.00278)
Log of per capita real non-agricultural wage	(0.00271)	(0.00359)
Log of per capita real self-employment income	0.00934*** (0.00246)	0.0106*** (0.00302)
Constant	10.28*** (0.140)	9.942*** (0.189)
Observations	4,171	3,017
R-squared	0.086	0.095
Number of households	2,644	1,853

Source: Authors' calculations using UNPS 2005/06 and 2009/10.

Notes: The dependent variable is log of real per capita consumption. Household, year, and month of interview fixed effects are included but not shown. Robust standard errors are in parentheses. Coefficient statistically significant at: ***1%, ** 5%, *10%.

3.4 Human capital, access to infrastructure, and poverty reduction

SMALL IMPROVEMENTS IN HUMAN CAPITAL HAVE BEEN ASSOCIATED WITH POVERTY REDUCTION

119. Over the last decade, there was slow improvement in human capital outcomes. For example, as illustrated in Chapter 2, adult literacy rates remained almost flat between 2006 and 2013. Little progress is also observed when considering all household members: between 2006 and 2013, there was a 2 percentage point increase in the proportion of households with at least one member with secondary education and a corresponding 2 percentage point reduction in the proportion of households in which the highest level of education achieved was primary (Table 3.5). However, for the poorest 40 percent the progress was twice as fast. These households experienced a 4 percent increase in the share of households with a member with secondary education or higher. The share of individuals in a household that achieves higher levels of education follows a similar trend. Very few are able to make it up to the tertiary level.

120. Education and skills allow households to improve their living standards by accessing more productive jobs and by increasing their productivity in self-employment activities. Estimates suggest that the rates of return to education in Uganda are high, both in wage employment and in self-employment in and out of agriculture. The return to an additional year of schooling in urban wage labor markets is 4.5–6.5

percent and in rural self-employment, it ranges from 6.8 percent in agriculture to 6.1–8.3 percent in non-agriculture (Lekfuangfu et al. 2012). Assessing returns to education is challenging as it is difficult to disentangle the effect of education on income from the effect of other characteristics associated with high education that also result in higher incomes, for example parental education or self-discipline, but estimates using the introduction of UPE to try and identify the causal impact of education suggest that if anything the returns to education are higher in Uganda than the estimates suggest (Lekfuangfu et al. 2012).

121. To assess the correlation between human capital and consumption growth, the relationship between the household's endowment in education and consumption is examined. The proxy that is used here is the maximum level of education achieved by any member of the household. There is a difference between attending school and effectively acquiring the relevant skill that matters for the labor market and poverty reduction, but in the absence of a measure of skills, the level of education achieved is used. Chapter 7 looks more in-depth into these issues of quality of service delivery and why educational attainment and skills acquired have not increased as would be expected in Uganda.



TABLE 3.5: Maximum level of education attended by a household member, 2006–2013

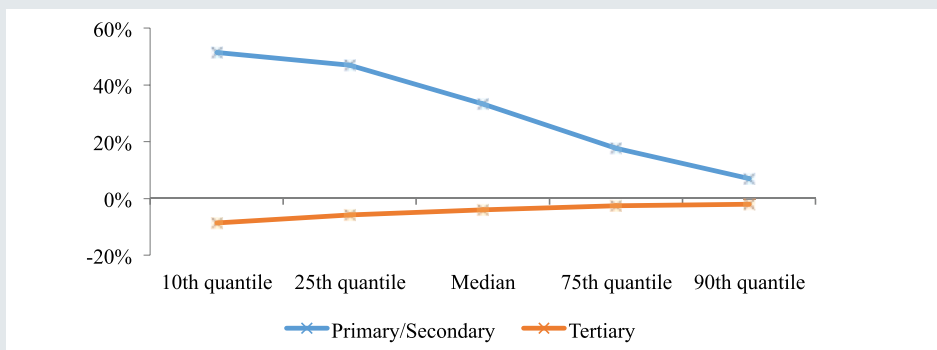
Welfare Quintile						
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Total
2006						
No education	4.0	1.2	1.3	1.4	1.0	1.8
Primary	73.1	62.3	55.5	46.4	22.4	51.9
Secondary	21.5	35.0	39.5	45.9	49.5	38.3
Tertiary	1.3	1.5	3.7	6.3	27.1	8.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
2013						
No education	3.3	1.9	1.1	1.4	1.6	1.9
Primary	70.0	57.6	53.6	42.1	27.4	50.1
Secondary	26.1	37.4	40.2	48.1	49.3	40.2
Tertiary	0.6	3.2	5.1	8.4	21.7	7.8
Total	100.0	100.0	100.0	100.0	100.0	100.0

Source: Staff calculations using the UNHS 2006 and 2013.

122. Although progress on education has been slow, it has been associated with income growth, accounting for almost half of the consumption growth experienced by the poorest households in decomposition analysis (Figure 3.7). As one moves up the consumption distribution, education accounts for less and less consumption growth until it accounts for nothing for those at the top of the distribution. It is possible that in decomposition analysis undertaken with a limited set of observed

household characteristics, changes in education are picking up other characteristics of households that have changed over time and that are also associated with (or driving) consumption growth. In subsequent chapters we use panel data to further examine the causal role that education plays in increasing agricultural and non-agricultural incomes (Chapters 4 and 5) and in encouraging migration (Chapter 6), to understand whether it did indeed have a large impact on consumption growth, and if so why.

FIGURE 3.7: Educational attainment is associated with consumption growth, except for the wealthiest households



Source: Staff calculations using the UNHS 2006 and 2013.

Note: Contribution of change in education level of household members to growth in per equivalent adult consumption (percent).

IMPROVEMENT IN ACCESS TO UTILITIES OVER THE LAST DECADE IS ASSOCIATED WITH CONSUMPTION GROWTH

123. Access to electricity and piped water is low in Uganda, but has improved in the last decade.

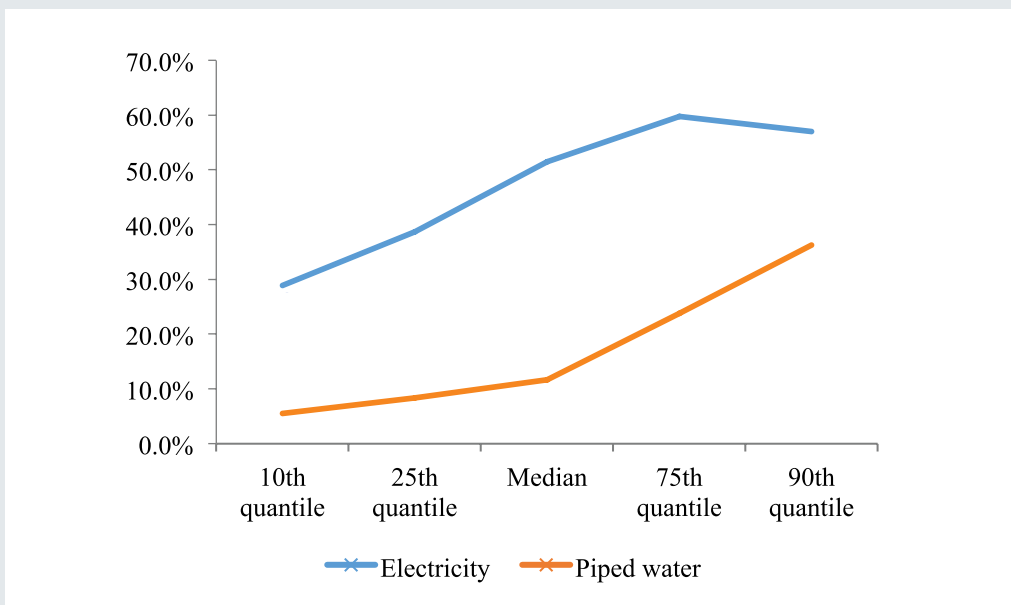
As Chapter 2 discusses, the share of households connected to the electricity grid increased from 10 percent in 2006 to 14 percent in 2013. In 2013, 7 percent of households were connected to the residential piped water network, a slight increase from 5.1 percent in 2006.

124. Increased access to electricity and piped water were associated with consumption growth, particularly for wealthier households that were

more likely to benefit from improved access.

As illustrated on Figure 3.8, increased access to electricity and residential piped water between 2006 and 2013 is associated with an increase of consumption, particularly for the non-poor. It is not possible to know from this analysis whether or not this association is causal. Given the limited impact of electricity on nonfarm income growth (Chapter 5) and the limited nonfarm income growth experienced by poor households during this period (Table 3.3), it may not be.

FIGURE 3.8: Increased access to electricity and piped water is associated with consumption growth



Source: Staff calculations using the UNHS 2006 and 2013.

Note: Contribution of change in education level of household members to growth in per equivalent adult consumption (percent).

3.5 Conclusion

125. This chapter has documented the importance of agricultural income growth, urbanization and improvements in human capital—albeit limited—in accounting for the poverty reduction that Uganda has experienced. High rates of agricultural income growth per capita, 6 percent, were observed from 2006 to 2012, particularly for the poorest, and this growth is strongly correlated with growth in consumption for the bottom 40 percent. The share of the population living in urban areas in Uganda increased by 6.3 percentage points from 2006 to 2014 and this accounted for 10 percent of Uganda’s poverty reduction given the better economic opportunities available in urban areas. Although education outcomes improved slowly from 2006 to 2013, this improvement can account for substantial income growth among the poorest. Returns to education still appear to be high in Uganda, both for rural households engaged in agriculture and nonfarm activities and for urban households with members in wage employment. Chapters 4 to 6 explore the role of agriculture, migration, and education in more detail.

126. This chapter also highlights three factors that did not contribute to poverty reduction: demographic transition, structural change, and public safety nets. Uganda has one of the youngest and most rapidly growing populations in the world. An increasing dependency ratio held back consumption growth from 2006 to 2013, reducing the consumption growth of the poorest households by 15 percent to 20 percent. Securing more rapid reductions in the fertility rate in Uganda is essential both for poverty reduction and for improving the socioeconomic status of women. Another area that saw little change in this period was the structure of household incomes. Although rapid diversification out of agriculture was observed prior to 2006, little movement has been observed since then, suggesting that high rates of growth in services and industry has not resulted in high rates of job creation. Job creation in services and industry just kept up with population growth. Finally, public transfers to poor households in Uganda are minimal and contribute little to poverty reduction reflecting a limited use of fiscal policy to directly improve the incomes of poor households in Uganda, in comparison to other countries in the region.



CHAPTER: 4

AGRICULTURAL GROWTH AND POVERTY REDUCTION IN UGANDA³⁷

Agricultural incomes grew because the government got some key fundamentals right that provided the incentives to invest in agriculture. Luck was also on Uganda's side: good weather benefited many households and positive price trends in international and regional markets aided real crop price increases.



127. Chapter 3 highlighted the important role that agricultural income growth has played in reducing poverty in Uganda from 2006 to 2013. Half of all poverty reduction occurred within households whose only income source was in agriculture. This increased to nearly 80 percent when considering households with other income sources, but the main occupation is in agriculture.

128. This chapter assesses the factors that have contributed (and those that have not) to growth in agricultural income of households in recent years. The focus of the analysis is on crop income earned through self-employment, as this constitutes two-thirds of household agricultural income. Changes in production practices of households as well as changes in the external environment that may have had a direct impact on crop income or affected how households decided to produce.

129. The analysis shows that Uganda was able to get many of the fundamentals right. The government secured stability in the north and enabled private markets for agricultural produce to develop across the country, resulting in real relative price increases for agricultural

37. This chapter draws on the background paper: "Welfare, income growth, and shocks in Uganda" by Ruth Hill and Carolina Mejia-Mantilla.

commodities that poor farmers grow and sell. Ensuring continued stability in the region and further promoting efficient crop markets and regional exports will be important for future crop income growth in Uganda.

130. Also, luck was on Uganda's side: good weather benefited many households and the positive price trends in international food and commodity markets during this period aided real crop price increases.

As a result, a favorable external environment (some of it policy induced and some of it not), accounted for two-thirds of the change in agricultural income among poor households, contributing to higher household consumption and lower poverty.

131. However, there are also areas where less progress was made: extension services remain limited and production practices did not change much.

There was very little growth in the use of improved inputs and as a result modernization of agricultural practices contributed very little to crop income growth. Understanding why farmers did not adopt agricultural technologies during this time of high prices and designing policies that helps farmers overcome these constraints needs to be a key area of action going forward. Recent research suggests that poor quality of inputs, limited access to credit, and lack of knowledge are binding constraints.

132. In addition, large gender differences in agricultural productivity limit the equity of agricultural growth.

Female farm managers are 13 percent less productive than male farm managers are. The gap increases to 33 percent when comparing male and female farmers with

similar plot sizes in the same region. Gender differences in household labor, childcare responsibilities, education, and extension contribute to this large gender gap between female and male farm managers.

133. The reliance on weather and prices also offers some cause for concern. When prices are poor or when the rains do fail, crop income growth falters and consumption falls, reversing gains in poverty reduction.

This is indeed what happened in the Northern and Eastern regions in 2011. Households need to be able to both benefit from good prices and weather and have access to coping mechanisms to be protected from low prices and poor weather. Sustained growth in incomes and welfare will also require productivity growth in agriculture—possibly through the use of improved seeds, fertilizer, pesticides, and irrigation—and diversification to other more remunerative forms of employment.

134. Diversification of income offers households the ability to protect consumption from weather shocks, but it is not enough to fully protect consumption, and better safety nets are needed.

Education is essential to enabling households to diversify and better-educated households had consumption that was better insured from weather shocks as a result. However, the ability to diversify does not fully insure consumption. The inability of Uganda to implement a functioning public safety net system has resulted in households relying on informal networks and own savings to manage shocks. These are imperfect insurance mechanisms and as a consequence high levels of vulnerability are observed.

4.1 Agriculture and poverty in Uganda

135. For households in Uganda—both rich and poor—agricultural income is largely comprised of crop income earned through self-employment.

Self-employment crop income comprises two-thirds of agricultural income, livestock self-employment income comprises a

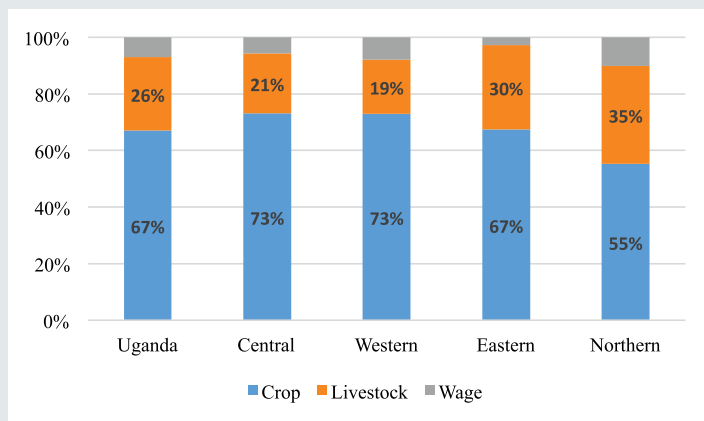
quarter of agricultural income, and the remaining comes from agricultural wage employment (Table 4.1). Livestock income and crop income have grown at an equal pace from 2006 to 2012 for all households and the bottom 40 percent alike (Chapter 3). Agricultural wage income has fallen.

Table 4.1: Agricultural income, 2012

Proportion of Agricultural Income from:	All Households	Bottom 40 Percent
Self-employment in crop production	0.67	0.66
Self-employment in livestock	0.26	0.24
Agricultural wages	0.07	0.10

Source: UNHS 2012.

Figure 4.1: Structure of agricultural income by region, 2012



Source: Staff calculations using RIGA income aggregates calculated from UNPS 2012.

136. For households in the poorer Northern region, livestock income is more important, comprising 35 percent of agricultural income, but crop income still dominates (Figure 4.1).

This is true for all households, on average, and households in the bottom 40 percent. This is in contrast to the Central and Western regions where livestock comprises about 20 percent of agricultural income. Income from livestock in the north is dominated by income from crop sales, whereas sales of by-products such as milk are a more important share of livestock income in other regions (18 percent to 25 percent compared to 9 percent in the north).

137. Maize, beans, matooke, and cassava are the four most important crops grown in Uganda, as a share of total crop income. Table 4.2 indicates that maize and beans are universally important—comprising 10 percent or more of crop incomes in all regions. Matooke is important in all

regions except the Northern region, and cassava is important in all regions except the Western region. The crops produced are very similar among the bottom 40 percent.

138. The share of household income coming from crop sales has increased from 2006 to 2012.

Figure 4.2 shows that the share of crop income marketed has increased over time for the bottom 40 percent. The share of households in the bottom 40 percent selling crops has increased from 60 percent in 2006 to 72 percent in 2012.

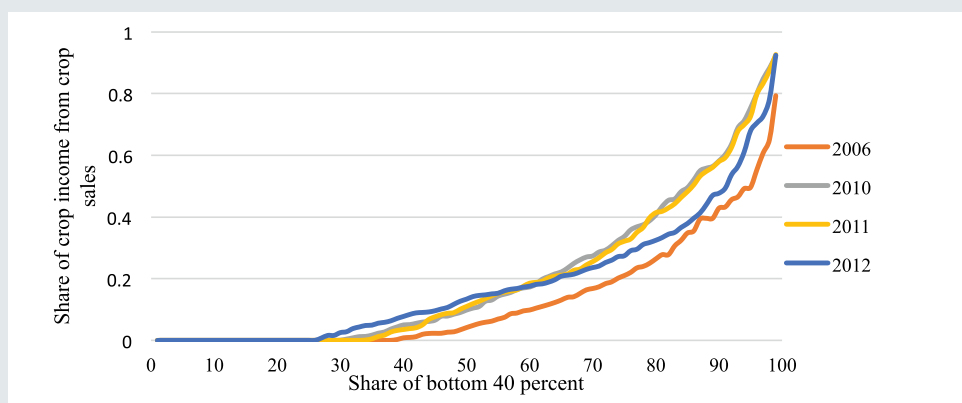
139. Crops that are produced for domestic and regional consumption dominate crop income.

Coffee is important for some households, but does not comprise more than 10 percent of crop income in any region. Sunflower produced for commercial production has increased in importance in recent years, particularly in the north, but it is still a relatively small share of crop income. The growth

of sugarcane, particularly in the Eastern region has been reported, but by 2012 it was not comprising more than 1 percent of crop income in that region. This is consistent with the export data that shows that coffee fell from comprising three-quarters of exports at the beginning of the 1990s to a third

of exports by 2005 (World Bank 2007) and that 41 percent of exports now go to Uganda's four regional neighbors (in order of importance): South Sudan, the Democratic Republic of Congo, Kenya, and Rwanda (World Bank 2015).

Figure 4.2: Share of crop income derived from crop sales, bottom 40 percent, 2006–2012



Source: Staff calculations using RIGA income aggregates calculated from UNPS 2006–2012.

Table 4.2: The nature of crop income, 2012

Proportion of Crop Income from (Average)	All Households					Bottom 40 Percent				
	National	Central	Eastern	Northern	Western	National	Central	Eastern	Northern	Western
Sales of crops	0.30	0.30	0.27	0.28	0.35	0.26	0.26	0.24	0.26	0.31
Beans	0.16	0.18	0.11	0.13	0.21	0.15	0.19	0.13	0.14	0.21
Maize	0.17	0.15	0.25	0.16	0.10	0.17	0.18	0.25	0.15	0.12
Matooke	0.16	0.25	0.08	0.02	0.34	0.10	0.20	0.08	0.01	0.30
Cassava	0.11	0.09	0.15	0.14	0.04	0.12	0.11	0.16	0.15	0.05
Sweet Potatoes	0.09	0.15	0.11	0.06	0.06	0.08	0.17	0.12	0.06	0.07
Groundnuts	0.06	0.02	0.08	0.06	0.05	0.04	0.02	0.06	0.05	0.04
Coffee	0.04	0.08	0.03	0.01	0.05	0.03	0.06	0.03	0	0.06
Sorghum	0.04	0.00	0.03	0.09	0.02	0.05	0	0.03	0.11	0.02
Finger Millet	0.03	0.01	0.06	0.04	0.02	0.03	0	0.05	0.04	0.02
Simsim	0.02	0.00	0.01	0.06	0.00	0.02	0	0	0.07	0
Sunflower	0.02	0.00	0.00	0.05	0.00	0.02	0	0	0.06	0

Source: Staff calculations using UNPS 2012.

Note: Red indicates a share 10 percent and higher in a given region; green indicates a share between 4 percent and 10 percent.

Table 4.3: Household characteristics, by wave

	2006			2010			2011			2012		
	Mean	s.d.	Median	Mean	s.d.	Median	Mean	s.d.	Median	Mean	s.d.	Median
Age of household head	43.75	15.10	41.00	47.62	14.90	45.00	48.17	14.90	46.00	48.73	14.61	46.00
Household head is male	0.74	0.44		0.72	0.45		0.69	0.46		0.68	0.47	
Education of household head	2.49	1.29	2.00	2.43	1.28	2.00	2.54	1.31	2.00	2.45	1.27	2.00
Distance to market selling agricultural inputs in Km	10.05	10.92	7.33	6.99	8.43	4.00	6.92	9.19	4.00	5.15	5.09	4.00
Received any visits by extension services in past 12 months	0.09	0.28	0.00	0.16	0.37	0.00	0.08	0.27	0.00	0.12	0.33	0.00
Total area planted self-reported, in Ha	2.79	3.22	1.82	3.69	3.56	2.43	3.10	3.18	2.02	2.90	3.07	1.78
Renter (land)	0.23			0.14			0.19			0.19		
Use of fertilizer (1=yes) during the year	0.17			0.22			0.22			0.24		
Use of pesticides (1=yes) during the year	0.13			0.16			0.14			0.12		
Use of seeds and seedlings (1=yes) during the year	0.64			0.80			0.69			0.71		
Any hired labor used (1=yes) during the year	0.56			0.57			0.52			0.44		
Number of fatalities in a 25 km radius	4.78	21.3	0	1.64	6.07	0	2.37	10.63	0	0.28	1.39	0

Source: Staff calculations using UNPS 2005/06–2011/12 Examining crop income growth.
Note: s.d. = Standard Deviation.

140. Given the importance of crop income, this section examines what factors contributed to its growth from 2006 to 2012. Some of the change is likely to have come from the substantial increase in crop marketing during this period. The role of changing household farming practices that can increase the amount of crops produced

and available for sale are considered separately from the role of the external environment: the introduction of peace, the nature of the weather, changes in prices, and access to markets. Of course, the external environment influences how households decide to farm and this relationship is considered in the discussion.

PRODUCTION PRACTICES

141. Production practices are significantly correlated with crop incomes in Uganda, but production practices did not change much between 2006 and 2012, so they contributed little to crop income growth. To capture the impact of changes in production practices on crop income growth, data on the area and ownership of the plot being harvested, the use of fertilizer, improved seeds and pesticides, household labor inputs (both hired labor and family labor), access to extension, and household demographics are used in a fixed effects panel regression analysis.³⁸ For households that did change production practices, large changes in income were observed but few households changed production practices during this time.

142. A household in the bottom 40 percent in 2006 that adopted both fertilizer and pesticides has a crop income that is 36 percent higher than the crop income for those that adopt neither. Table 4.4 presents regression results using four rounds of the UNPS panel. These results show that per capita crop income is significantly higher among those who farm more land and apply more labor, fertilizer, and pesticides. Using improved seeds does not have a significant effect on crop income. Households that use fertilizer and pesticides have crop incomes that were 12 percent and 19 percent higher, respectively, than those households which did not. The increase is even higher for households that were in the bottom 40 percent at the start of the period: crop incomes are 22 percent higher for those using fertilizer and 14 percent higher for those using pesticides. A 1 percent increase in the value of pesticide is

associated with a 2 percent rise in agricultural income; 1.98 percent for the bottom 40 percent. The estimates include individual fixed effects to account for time-invariant unobserved characteristics that simultaneously affect crop income growth and production practices, but it is still possible that time-varying characteristics are in part responsible for the observed relationships.

143. However, although there was some increase in the proportion of households using fertilizer and pesticides during this period, the increase was relatively marginal. The proportion of households using fertilizer increased from 17 percent in 2006 to 24 percent in 2012 while pesticide use hovered around 12–13 percent (Table 4.3). As a result, technology adoption did not contribute to large increases in crop incomes on average.

144. Households that farmed more land received higher per capita crop income, but not by much, and there was little increase in the area cultivated during this period. The coefficient estimates suggest that an increase of 1 ha in the area of land farmed is associated with an increase in crop income of only 2 percent. In addition, very little change in the area of land cultivated was recorded during this time. Detailed analysis on area of land cultivated in Uganda and other Sub-Saharan Africa countries shows that relying on self-reported land areas results in considerable (and systematic) measurement error (Kilic et al. 2014 and Carletto et al. 2015). Indeed the self-reported area of land cultivated fluctuated over the four rounds perhaps more than the true area of land

³⁸ The regression run is $\ln(Y_{i,t}) = \beta_0 + \beta_P P_{i,t} + \beta_E E_{i,t} + u_i + \varepsilon_{it}$ where $\ln(Y_{i,t})$ is the log of the real value of per capita crop income of household i at time t . $P_{i,t}$ is a set of variables representing production practices, containing the average plot area harvested by household i at time t , and an indicator variable if the household owns or owns and rents plots (only renter is the excluded category), dummy variables for inputs such as fertilizer, pesticide, seeds/seedlings, and hired labor, and the amount of family labor spent on the farm. $E_{i,t}$ is a set of variables capturing the external environment. It includes the distance in kilometers of household i to the nearest market selling agricultural inputs at time t , whether extension services were provided to any household in the community, prices of maize and beans at the nearest major urban market to household i at time t , the WRSI experienced by household i at time t , and the number of fatalities in proximity to household i at time t . The regression is run with household fixed effects u_i to control for time-invariant household characteristics. For more details see Hill and Mejia-Mantilla (2016).



cultivated. However, there is very little growth in the land cultivated over the period and, as a result, it does not appear that expansion of land cultivated by these households contributed much to the increases in average per capita income growth observed.

145. Increased household labor on crop production accounts for 10 percent of the growth in crop income.

Households that apply more labor—both family labor and hired labor—have higher crop incomes, as expected. A 10 percent increase in the number of days of family labor provided by the household is associated with an increase in crop income by 2 percent. The amount of household labor reportedly spent on agricultural production increased substantially between 2006 and 2011, falling again in 2012. This may not reflect a true change in household labor applied during this time. However, even if this does represent a real increase and if the return to this was as estimated in Table 4.4, the increase of 50 percent reported would only account for 10 percent of the increase in crop income. Regression results indicate that households that hire labor have agricultural production that is higher by 15–25 percent, but the use of hired labor actually fell during this time.

146. Human capital influences the type of labor available for crop income and real per capita crop income is higher for those who are educated.

Specifically, compared to those with no education, agricultural income is 26 percent higher in households whose head had some primary education, 34 percent higher in households whose head completed primary school, 25 percent higher for those with some secondary education, and 42 percent higher for those with post-secondary education. This is consistent with rates of return to education in agriculture estimated by Lekfuangfu et al. (2012). This suggests that increasing educational attainment can contribute to crop income growth, but the causality of the impact of education on crop income growth is hard to estimate with data available. It is also worth noting that improving human capital of existing farmers requires education of adults, such as is possible through extension.

147. Crop income was 20 percent higher in villages where extension services were provided, but few households received extension services.

Extension services expanded by 50 percent from 2006 to 2012. However, extension was expanding from a low base. Eight percent of households received extension services in 2006 and 12 percent

of households received extension services in 2012 (Table 4.3). The relationship between extension and crop income growth appears to come from the increased use of inputs that extension services may encourage. When use of inputs is controlled for, extension has no additional effect. However, even though household fixed effects are included in all regression estimates and the measure of extension used is availability of extension services in a village, it is hard to estimate the causal impact of extension from panel data. Experimental evidence suggests it can increase income when combined with access to credit (Bandiera et al. 2015).

148. Gender differences in access to labor, education, and extension account for a large gender gap between female and male farm managers: 33 percent when comparing men and women with similar farm sizes in the same region.

Closing the gap of a third of production is key to increasing agricultural productivity in Uganda equitably. Although, all else equal, male-headed households have lower levels of crop income than female-headed households, all else is usually not equal and a comparison of male and female farm managers shows that women have 13 percent lower productivity than men. This gap increases to 33 percent once the plot size and the region of residence is controlled. Female farm managers have fewer household members to provide labor, have a larger share of children in the household, which carries a significant childcare burden, and have lower levels of education, all of which contributed to the gap. In addition, women use less fertilizer and appear to benefit less from extension when they receive it. See Ali et al. (2015) for a fuller discussion of differences in productivity between male and female farmers in Uganda.

149. The fact that production practices did not change from 2006 to 2012 is a puzzle, as this was a period during which the returns to investing in crop production were increasing.

The return to investing more in inputs was increasing considerably—food prices were high and the weather was favorable—but only household

labor showed marked increases during this time. In general, input use is very low in Uganda in comparison to other countries in the region with data collected using a similar survey instrument (Binswanger and Savastano 2014; Sheehan and Barrett 2014).

150. Recent research highlights that low quality inputs are prevalent in local markets limiting the returns to adoption.

Bold et al. (2015) tested the quality of agricultural inputs purchased in local markets. They found that, on average, 30 percent of nutrients are missing in fertilizer, and that more than 50 percent of hybrid maize seeds are not authentic. This low quality results in negative returns on average, even though prices are high. If authentic technologies replaced these low-quality products, average returns for smallholder farmers would be over 50 percent. Public regulation and certification has not proven effective in guaranteeing quality products in this market. An ongoing impact evaluation by the International Food Policy Research Institute (IFPRI) is assessing whether privately provided e-verification can provide farmers with a guarantee that the product they are purchasing is of high quality. Lessons can also be learned from an evaluation of strategies to improve the quality of malaria medicine available in Uganda. Flooding the market with high-quality malaria drugs certified by a locally respected nongovernmental organization brought about an increase in the quality of Malaria medicine found in retail pharmacies (Björkman Nyqvist et al. 2012).

151. Farmer behavior suggests that farmers are aware of the returns to using inputs that they face and that this can explain the low rates of input use.

The average return to using inputs is estimated to be negative, but the actual returns each farmer faces depends on the input and crop prices he or she faces, and his or her ability to secure good inputs. Low adoption rates indicate that many farmers know the returns they face are negative. However, for some farmers who face particularly good prices (that is, low input or high output prices) or who have good networks that

allow them to ensure they are getting inputs of good quality, returns to using inputs are positive and it will be these farmers who use inputs and experience higher returns. This is what is observed in Tables 4.3 and 4.4. A small proportion of farmers use inputs and, on average, farmers who use inputs face high returns.

152. Other recent research highlights that complementary investments in credit, extension, and markets are needed to encourage crop income growth. An ongoing impact evaluation provides evidence that farmers face multiple constraints in improving crop

income, and that technology adoption requires complementary investments to be made. Bandiera et al. (2015) show that when credit and extension is offered together they increase crop income by 50 percent. This effect is not observed when extension or credit is provided alone. They also find that extension has the largest impact on crop income for households that are between 30 and 60 minutes to the nearest trading center. This could reflect the fact that it is easier for these households to purchase inputs or that it is easier for these households to sell their output, increasing the economic return from increased production.

THE EXTERNAL ENVIRONMENT

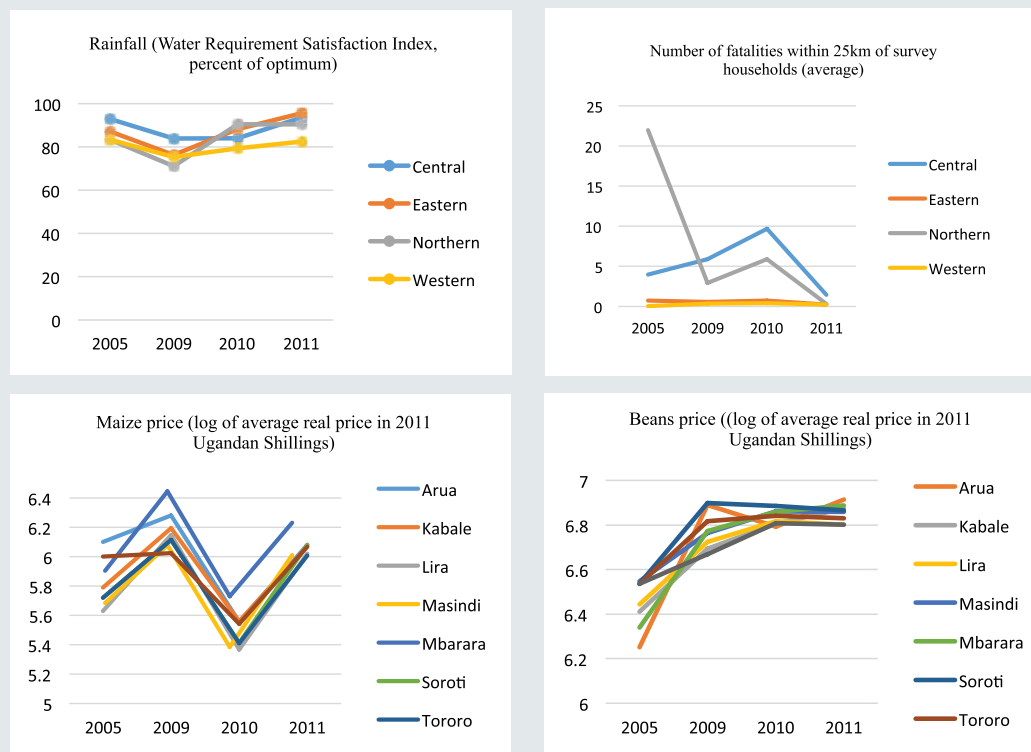
153. Changes in the external environment can have an impact on crop income directly and/or indirectly through the way that households produce. For example, good weather has a direct impact on crop income by determining production quantities but it can also affect crop income indirectly through the household's decision to apply inputs as a response to weather. Good prices for crops increase crop income but they also increase the incentives to produce and may encourage increased input use or labor as a result. Changes in the external environment that may have affected crop income are analyzed by looking at the impact of wholesale market prices, weather shocks, conflict fatalities, and changes in market access.

154. There were marked changes in the external environment from 2006 to 2012: conflict in the north ceased, prices increased but were volatile, and, in general, the weather was good. Figure 4.3 presents data on weather, price, and conflict by region across the years considered in the study. Conflict with the Lord's Resistance Army in the Northern region of Uganda (also affecting households in the northern parts of the Central region) was stabilized in 2008 and the impact of this is seen clearly in the reduction of conflict related fatalities reported in Armed Conflict Location and Event Data (ACLED) from 2006 to 2010. There was

an increase in the number of fatalities reported in 2011 but this fell again by 2012. Weather conditions were in general good, with rainfall deficits less than 20 percent in most cases. However, 2010 was a challenging year for households and higher losses were observed (although no higher than 30 percent). Maize and beans prices increased from 2006 to 2010. The real price of beans continued to rise in most markets in 2011, but maize prices crashed in that year, recovering in the subsequent season.

155. Changes in wholesale market prices may reflect the beneficial effects of improved infrastructure investments, increased efficiency in domestic markets, and development of new export markets. Markets in the north and east have been improving since 2006 because of infrastructure investments, new export markets opening up in South Sudan and in Kenya, and improved access to market information (because of the growth of the ICT sector) and growth in trade services which improved efficiency in markets. Svensson and Yanagizawa (2009) shows that improved access to market information helped farmers who were better informed to bargain for (and receive) higher prices. However, changes in supply and demand conditions within and outside of Uganda also have a large impact on price trends.

Figure 4.3: Price, conflict, and weather trends from 2005/06 to 2011/12



Source: Rainfall: Staff calculations using geoWRSI v 3.0, with global Potential Evapo-Transpiration (PET) and Rainfall Estimate (RFE) v2 (2001–2014) time series. Fatalities: ACLED. Prices: UBOS market price data collected for the CPI. Note: WRSI = Water Requirement Satisfaction Index.

156. Good rainfall and price changes account for 51 percent of the improvement in crop income for all households and 66 percent of the improvement in crop income for the bottom 40 percent. The strongest drivers of changes in crop incomes are changes in rainfall and prices (Table 4.4).^{39, 40} A 10 percent increase in water sufficiency increases crop income by 9.9 percent. A 10 percent

increase in the price of maize or beans increases crop income by 4.5 and 9.2 percent, respectively. Incomes of poorer households (those in the bottom 40 percent in 2005) are even more dependent on climate and prices. This is likely because the majority of poorer households are located in the Northern and Eastern regions and farming in these areas is more likely to be unimodal and experience

39. Only those variables that can be considered to represent the external environment are included in these regressions. This is done for two reasons. First, given these variables have an impact on production practices, a regression that includes production practices as independent variables does not allow the full impact of changes in the external environment to be captured. Secondly, given these variables are exogenous to household production decisions, they provide more robust estimates of drivers of changes in income. It is possible that changes in distance to market and provision of extension services in the community are not fully exogenous, with investments in infrastructure and services being targeted to communities that are more (or less) agriculturally productive. Regressions are also run in which distance to market and provision of extension are excluded, leaving only prices, weather, and conflict. The regression results presented do not include year fixed effects given the objective of the analysis is to explain changes in crop income across years. However, it is possible that other differences across years, correlated with changes in the external environment, are driving the results. To test this, a regression model including year fixed effects is also estimated. The results show the continued significance of weather, prices, peace, and extension provision.

40. As a final robustness check, a specification was run in which prices of regional crops—matooke in the center and west, and cassava in the north and east—were included instead of beans prices (results not shown). These results also showed the same findings: production practices played a role, but changes in the external environment were the main drivers of changes in crop income in Uganda.

larger yield variation because of rainfall. Regional variations are explored further below (Table 4.5). For households in the bottom 40 percent, a 10 percent increase in rainfall and a 10 percent increase in maize and beans prices, results in a 13.4 percent and 13.0 percent increase in crop income, respectively. Changes in distance to local market had no effect on crop income growth.

157. Peace is strongly associated with increased agricultural income growth. Every 1 percent reduction in the number of fatalities in a 25 km radius of the village was associated with crop income growth of 1.3 percent. The establishment of peace observed between 2006 and 2010 was associated with a doubling (a 112 percent growth) in crop income.

Table 4.4: Drivers of agricultural income growth

	All Households	Bottom 40 Percent	All Households	Bottom 40 Percent
Farming practices				
Total area planted self-reported, in Ha	0.00734** (0.00313)	0.00846 (0.00674)		
Renter (land)	0.0682 (0.126)	-0.0343 (0.189)		
Use of fertilizer	0.0846 (0.0523)	0.217** (0.0904)		
Use of pesticides	0.149*** (0.0479)	0.147** (0.0695)		
Used improved seeds/seedlings	0.0238 (0.0549)	0.0407 (0.0760)		
Hired labor used	0.148*** (0.0475)	0.209*** (0.0653)		
Log of number of days of family labor	0.173*** (0.0343)	0.231*** (0.0476)		
External environment				
Distance to output market (zkm)	-0.00613 (0.0194)	-0.00747 (0.0304)	-0.0260 (0.0259)	-0.0135 (0.0382)
Any extension in village in past 12 months	0.0600 (0.0457)	-0.00359 (0.0726)	0.200*** (0.0554)	0.222*** (0.0839)
Log of rainfall (percent of needs measured by WRSI)	0.986*** (0.196)	1.356*** (0.280)	2.064*** (0.362)	2.683*** (0.541)
Log of maize price	0.446*** (0.0674)	0.544*** (0.0970)	0.439*** (0.0879)	0.609*** (0.118)
Log of beans price	0.922*** (0.143)	1.295*** (0.213)	1.046*** (0.166)	1.191*** (0.232)
Log of number of fatalities	0.00849 (0.0413)	0.0406 (0.0577)	-0.132** (0.0606)	-0.152* (0.0787)
Constant	-2.048 (1.521)	-7.283*** (2.252)	-6.788*** (2.143)	-11.71*** (3.007)
Observations	5,145	2,501	6,184	2,991
Number of HHID	1,806	871	1,962	934

Source: Staff calculations using UNPS 2006–2012.

Note: Dependent variable is log of real per capita crop income. Household fixed effects are included. Robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

REGIONAL VARIATIONS

158. The level of agricultural income varies

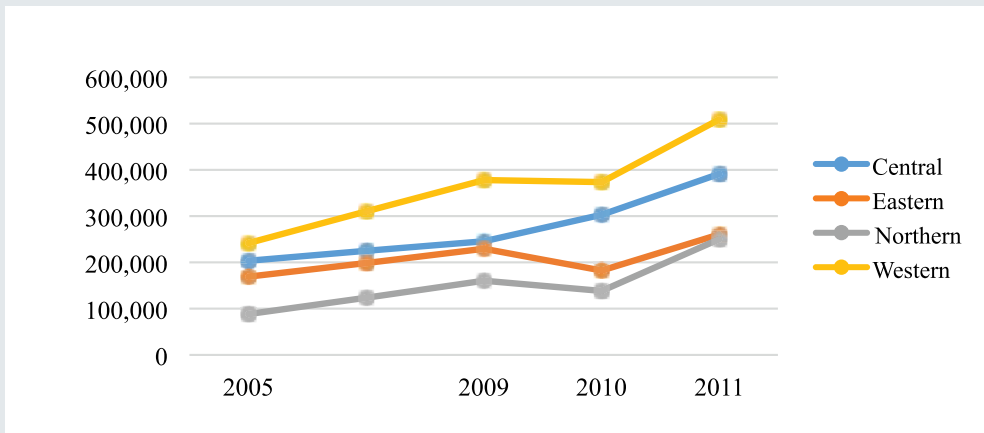
substantially across regions. High levels of crop income are recorded in the Western region and the lowest levels of crop income are seen in the Northern region (Figure 4.4). Although crop income in the Central region is not particularly

high, this reflects the fact that a much lower share of total income in the Central region comes from agriculture. In the Northern and Eastern regions, agricultural income is the dominant source of income, as in the Western region, but overall levels of income are much lower.

159. Agricultural income growth also varies across regions, and was negative between 2010 and 2011 in the east and north. Although growth recovered between 2010/11 and 2011/12, the

negative growth rate in the north and east resulted in both regions falling behind the center and west (Figure 4.4).

Figure 4.4: Regional differences in per capita crop income growth, 2005/6 to 2011/12



Source: Staff calculations using UNPS 2005/06–2011/12.

160. The external environment was changing in different ways across the four regions during this period. The Northern region in Uganda is the most drought prone and although rainfall was, in general, good during 2005/06 to 2011/12, the rainfall shortfall in 2009/10 was much larger in the north than elsewhere in the country (Figure 4.3). The Eastern region also experienced quite variable rainfall.⁴¹ The north is also the part of the country that experienced conflict until the cessation of hostilities in the late 2000s, and, thus, it saw the largest change in the number of fatalities due to conflict related violence. Maize prices are expected to be particularly important in the north and east, both because of its predominance in production in the east, but also because a lot of maize trade with Kenya and South Sudan goes through these regions. There are also large and increasing regional variations in welfare across Uganda. The

Western and Central regions are more economically developed. They have had many more years of stability than the Northern region and these regions have seen substantial development during this time. More stable climatic conditions and rapid urban growth in and around Kampala has also helped. The role of the external environment on crop income growth is analyzed separately for the four regions (Table 4.5).

161. Weather is a strong driver of crop income growth in the north and east, but not in other regions. Weather is particularly important in the north: a 10 percent rainfall shortfall results in a reduction in crop income of 38.3 percent in the north (compared to 8.7 percent in the east).

162. Prices have been important in all regions, but maize prices have only been important in the

41. Data also suggest larger losses on average in the west across the four years, but this may be because a maize model has been used to calculate the losses while this is not a crop grown in the west. The inclusion of regional dummies or household fixed effects controls for this persistent difference in the analysis.

north and east. A 10 percent reduction in the maize price results in a 6.6 percent and 11.1 percent reduction of agricultural income in the east and north, respectively, while it had no impact in the center and west. Beans prices are important in all regions, with a 10 percent increase in the beans prices increasing income by 6.3 percent to 13.5 percent across regions. The results also indicate that the cessation of violence in the late 2000s only affected crop income growth in the north.

163. The importance of the external environment in bringing about crop income growth is strongest in the north, followed by the east, making growth in these regions particularly vulnerable to shocks. These are also the regions that experienced negative income growth from 2010 to 2011, highlighting that while the dependence on the external environment benefited households in these regions, when peace was being established, rainfall was good, and prices were rising, it hurt them when rainfall fell and when maize crop prices collapsed in 2011.

Table 4.5: Changes in agricultural income: a regional story

	Centre	East	North	West
Log of rainfall (percent of needs measured by WRSI)	-0.335 (0.825)	0.868** (0.370)	3.826*** (0.578)	0.283 (0.524)
Log of maize price	0.243 (0.219)	0.657*** (0.114)	1.112*** (0.166)	0.00646 (0.132)
Log of beans price	0.627* (0.340)	0.936*** (0.318)	1.348*** (0.350)	1.074*** (0.203)
Log of number of fatalities	0.129 (0.167)	-0.0721 (0.149)	-0.131** (0.0651)	-0.0521 (0.221)
Constant	7.595 (5.108)	-1.921 (2.906)	-21.00*** (3.686)	4.008 (3.361)
Observations	1,585	2,114	2,253	1,856
Number of HHID	504	674	735	626

Source: Staff calculations using UNPS 2005/06–2011/12.

Notes: Dependent variable is log of real per capita crop income. Household fixed effects analysis with robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

4.2 Weather, prices, peace, and consumption growth

164. Can prices and weather explain the growth in consumption observed from 2006 to 2012, given their importance in driving agricultural income growth, and is peace as positively associated with consumption growth as it is with agricultural growth? Agricultural income is the most important source of income for households, particularly those in the bottom 40 percent, but it is only one of many sources of income (Chapter 3). Can these drivers of crop income growth explain consumption growth, particularly among those that were poor in 2006?

The impact of positive trends in prices, weather, and peace on household consumption growth is explored in Table 4.6. Column 1 reports the results for crop income that were discussed in section 4. Columns 2 to 5 detail results for livestock income, agricultural wage income, non-agricultural income, and nonfarm self-employment income. Column 6 examines the impact on household consumption using consumption data for 2006 and 2010, the years for which comparable consumption data was collected in the UNPS. Table 4.7 presents the same results for the bottom 40 percent.

165. Good weather and higher prices were important drivers of consumption growth but the impact is more muted than the impact on income. A 10 percent increase in water sufficiency results in consumption growth of 4.8 percent in per capita consumption (4.1 percent when considering households in the bottom 40 percent in 2005/06) compared to its impact of 9.9 percent crop income growth. A 10 percent increase in the price of maize and beans results in consumption growth of 5.1 percent. The impact is almost double for the bottom 40 percent—a 10 percent price increase results in 10.5 percent consumption growth.

166. The consumption of households in the north and east is more reliant on prices and weather than the consumption in wealthier households in the center and west. Given the limited sample size, households in the north and east are pooled together in the regression analysis, as are households in the center and west. Also just beans prices were considered (Table 4.8). The difference is largest when considering prices where a 10 percent increase in the beans price is associated with a 6.7 percent increase in consumption in the north and east and a 2.5 percent increase in consumption in the center and west.

167. The dependence of consumption on weather and prices can be a source of welfare improvements when the weather is good and prices are rising, but it also puts welfare gains at risk of being reversed if the weather fails or prices fall. This reliance on the external environment contributes to the high levels of vulnerability to poverty that are observed in Uganda. Indeed this was observed for many households in the north and east in 2011. Poor prices resulted in lower incomes and consumption and this decline in welfare had not fully been reversed by 2012. In the North and East, the greater reliance of households on weather and prices has both been a source of welfare improvements and vulnerability for Northern and Eastern households. Ultimately increasing the resilience of these

households to protect consumption from the downside of risk is essential to securing gains in welfare for these households.

168. Weather has a smaller impact on consumption than income because households have diversified sources of income and bad weather is compensated by higher non-agricultural income. Rainfall shocks do not affect income from livestock. However, wage employment and self-employment out of agriculture is significantly negatively affected by poor weather. The results suggest that diversification of productive activities can be an important risk hedging strategy for households in Uganda, particularly the poorest. If agricultural income is affected by climate shocks, households can offset this with increased nonfarm income. It is not clear whether household labor is pulled into own-farm agricultural production because of the increased demand for agricultural labor when the rainfall is good or whether household labor is pushed out of agriculture a result of a desperate need to smooth consumption when rainfall is bad. However, although some of the weather shock can be insured through diversification, the fact that weather still affects consumption shows that households are not able to fully insure their consumption from the impact of weather.

169. In contrast, price decreases affect all sources of income negatively. This means that when prices are good, total income is positively affected, but conversely when prices are bad, households are not able to mitigate crop income shortfalls by increasing income from other sources. The exception to this is agricultural wage income, which is surprising, given findings in other countries, that agricultural wage labor is positively affected by crop price increases and the expectation that higher prices would result in increased demand for agricultural wage labor. It is not clear why a negative relationship is observed in this context. The impact of prices on consumption is, however, smaller than the impact of prices on crop income,

indicating that even though households are not able to diversify to manage price risk, they are able to reduce the impact of prices on consumption by other means.

170. Although the cessation of violence is positively associated with crop income growth, a

significant relationship with consumption is not observed. The results suggest that this may be because households switched out of wage labor activities into self-employment activities in agriculture as peace was restored. Further analysis is needed to confirm this finding.

Table 4.6: Impact of weather, prices, and peace on income and consumption

	(1)	(2)	(3)	(4)	(5)	(6)
	Crop Income	Livestock Income	Agricultural Wage Income	Non-agricultural Wage Income	Nonfarm Self-employment Income	Consumption (2005/06, 2009/10)
Log of rainfall (percent of needs measured by WRSI)	1.886*** (0.343)	-0.198 (0.833)	-4.853*** (0.706)	-3.627*** (0.701)	-2.796*** (0.750)	0.478*** (0.147)
Log of maize price	0.492*** (0.0840)	-0.0671 (0.264)	-1.130*** (0.338)	-0.0973 (0.339)	-0.401 (0.371)	-0.218** (0.0975)
Log of beans price	1.091*** (0.155)	1.213** (0.516)	-1.453*** (0.506)	4.263*** (0.422)	1.175** (0.506)	0.729*** (0.125)
Log of number of fatalities	-0.146*** (0.0515)	-0.227 (0.142)	0.451*** (0.135)	0.323** (0.134)	0.177 (0.145)	-0.00909 (0.0143)
Constant	-6.619*** (2.010)	-0.196 (5.792)	36.68*** (5.804)	-12.84** (5.190)	9.026 (6.101)	5.127*** (1.172)
Observations	6,852	6,986	6,497	6,497	6,497	3,154
Number of HHID	2,044	2,046	2,045	2,045	2,045	1,946

Source: Staff calculations using UNPS.

Notes: Household fixed effects estimation with robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.



Table 4.7: Impact of weather, prices, and peace on income and consumption: Bottom 40 percent

	(1)	(2)	(3)	(4)	(5)	(6)
	Crop Income	Livestock Income	Agricultural Wage Income	Non-agricultural Wage Income	Nonfarm Self-employment Income	Consumption (2005/6, 2009/10)
Log of rainfall (percent of needs measured by WRSI)	2.417*** (0.506)	1.533 (1.177)	-6.419*** (1.017)	-4.366*** (0.946)	-3.335*** (1.015)	0.405** (0.190)
Log of maize price	0.715*** (0.113)	0.437 (0.377)	-1.418*** (0.519)	-0.281 (0.466)	-0.435 (0.504)	-0.00504 (0.122)
Log of beans price	1.247*** (0.214)	2.019*** (0.722)	0.0956 (0.752)	4.078*** (0.542)	1.678** (0.701)	1.049*** (0.140)
Log of number of fatalities	-0.187*** (0.0662)	-0.287 (0.177)	0.690*** (0.185)	0.455*** (0.170)	0.103 (0.184)	-0.00918 (0.0163)
Constant	-11.48*** (2.818)	-16.37** (8.120)	35.56*** (8.563)	-8.024 (6.843)	7.701 (8.198)	1.782 (1.463)
Observations	3,334	3,359	3,102	3,102	3,102	1,502
Number of HHID	966	966	964	964	964	927

Source: Staff calculations using UNPS 2005/06–2011/12.

Notes: Household fixed effects estimation with robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 4.8: Welfare changes: A regional story

	Centre and West	North and East
	Log Real Consumption Per Capita	
Log of rainfall (percent of needs measured by WRSI)	0.444** (0.825)	0.488** (0.219)
Log of beans price	0.245* (0.130)	0.674*** (0.122)
Log of number of fatalities	0.057 (0.053)	0.004 (0.016)
Constant	7.239 (1.603)	4.050** (1.701)
Observations	1,585	1618
Number of HHID	504	1022

Source: Staff calculations using UNPS 2005/06–2009/10.

Notes: Dependent variable is real per capita consumption. Month of interview dummies included but not shown. Household fixed effects estimation with robust standard errors in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

171. Weather and prices also affect nutritional outcomes. A 10 percent reduction in rainfall reduced the weight for age of children under 5 years in the bottom 40 percent by 5.9 percent.

Thus far, the results presented have relied on a monetary dependent variable and thus prices have both been part of the construction of the dependent variable as well as an explanatory variable included in the analysis. As a robustness check on the findings of the analysis, a non-monetary measure of welfare that is correlated with consumption is used: z-scores (standard scores) of weight for age and weight for height among children less than 5 years of age in the household. Results are presented in Table 4.9. This data was only collected from 2010 onward and only collected for children, making the sample size available for

these regressions much smaller. For this reason only one price—the prices of beans—is considered. Although the results are not consistently significant across specifications, they do show that weight for height and weight for age is positively affected by rainfall and by higher prices, as suggested by the regressions on income and consumption. A 10 percent reduction in rainfall reduced the average weight for age z-score of children under 5 years by 3.5 percent. This impact increases to 5.9 percent for children in the bottom 40 percent. These results indicate that changes in crop income do improve nutritional outcomes, even though evidence in Chapter 2 shows that this is not all that matters and children in wealthier regions are not necessarily less likely to suffer from malnutrition.

Table 4.9: Impact of weather, prices, and peace on weight for age and weight for height

	(1)	(2)	(3)	(4)
	Weight for Age Z-score	Weight for Height Z-score	Weight for Age Z-score	Weight for Height Z-score
Log of rainfall (percent of needs measured by WRSI)	0.364** (0.158)	0.397 (0.381)	0.586*** (0.223)	0.512 (0.669)
Log of beans price	0.194 (0.284)	0.704 (0.434)	0.364 (0.404)	1.213** (0.609)
Log of number of fatalities	0.0259 (0.0503)	-0.0230 (0.0738)	0.0536 (0.0638)	0.0330 (0.0885)
Constant	-3.798* (2.059)	-6.413* (3.801)	-6.009** (2.914)	-10.35* (6.139)
Observations	1,658	1,643	803	801
Number of HHID	957	953	465	465
Bottom 40 percent	No	No	Yes	Yes

Source: Staff calculations using UNPS 2010–2012.

Notes: Household fixed effects estimation with robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. In each case the dependent variables is averaged across all children below 5 years in the household.

4.3 Increasing the resilience of Ugandan households

172. Formal safety nets are available to very few households in Uganda. The results presented in Section 4.3 suggest that it is desirable for households to be more fully insured against shocks than they currently are. UNPS households were asked to report the most important types of coping mechanisms used if they faced an adverse shock in the last year (the answers were not mutually exclusive). As seen in Figure 4.5, households rely on savings (35 percent) and help from family (25 percent) to mitigate the impact of shocks. Very few report receiving support from the government, highlighting the absence of reliable official safety net programs. Safety nets provided by savings, family, and friends are of paramount importance in the absence of official safety net programs. However, reliance on informal insurance mechanisms has been shown to reduce incentives for productive investments among rural households in Uganda (Fafchamps and Hill 2015).

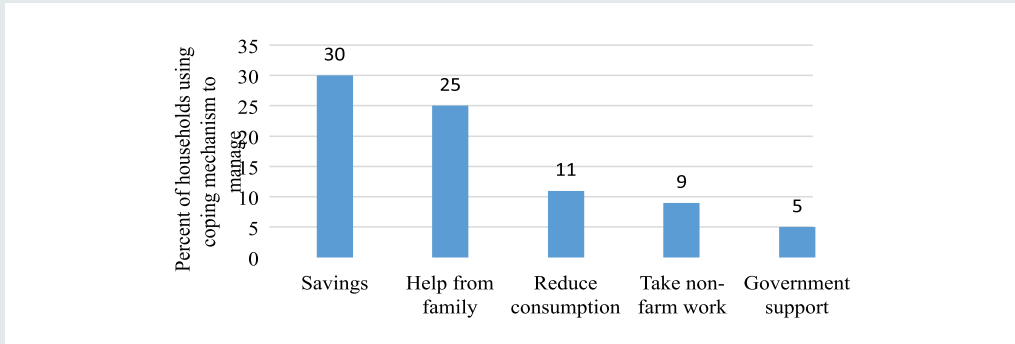
173. Are households with a higher level of human capital and access to financial instruments, such as having a savings account and having a loan, better able to smooth the impact of climate shocks and price declines? The only factor that helped households to mitigate the adverse effect of shocks was the level of education of the household head. Households that have a savings account or a loan from a financial institution are not more resilient to these shocks. Similarly, enhanced access to markets where agricultural inputs are sold and where agricultural products are sold as well as technical assistance, do not make a difference in the way households are affected by climate shocks and crop price declines.⁴²

174. Higher levels of education of the household head reduce the negative effect of rainfall shocks on consumption, compared to households where the head has no education at all. Having primary education reduces the effect of a weather shock by 2.8 percent compared to those with no education, while for those with complete secondary education, the reduction increases to 4.9 percent (Figure 4.6). Something similar occurs if we look at the effect of climate shocks on per capita consumption, albeit the magnitude is smaller: having some secondary education implies a 1.4 percent reduction in the intensity of the shock for households in the bottom 40 percent. More education facilitates diversification by enabling increased participation in the labor market, particularly in the non-agricultural sector. In addition, individuals who are more educated may assess and respond to risk more successfully. In both cases, crop income and per capita consumption, the higher the education level, the larger the impact for the households that belong to the bottom 40 of the distribution.



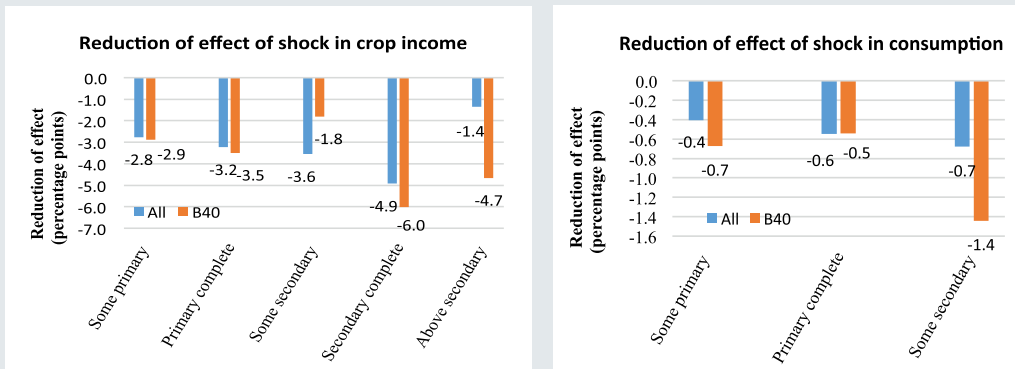
42. Instead of using the subjective responses of households, objective measures were used. For example, instead of using the response that the household used savings as a coping mechanism, an indicator that the household has a savings account was used.

Figure 4.5: Self-reported coping mechanisms



Source: Nikoloski et al. (2015).

Figure 4.6: Education mitigates the impact of climate shocks



Source: Staff estimation using UNPS 2006–2012.

Note: Results statistically significant at the 10 percent level for crop income. For consumption, only 'some secondary' education for the bottom 40 percent is statistically significant at the 5 percent level.

4.4 Conclusion

175. Agricultural incomes grew because the government got some key fundamentals right that provided the incentives to invest time in agricultural production and engage in agricultural markets. Conflict with the Lord's Resistance Army in the Northern region of Uganda was stabilized in 2008 and this had a positive impact on crop income. In addition, markets, particularly in the north and east, have been

improving since 2006 because of infrastructure investments, new export markets opening up in South Sudan and in Kenya, better market information for farmers and traders (because of the development of a well-functioning ICT sector), and growth in trade services, which improved marketing efficiency. This has contributed to real relative price increases for agricultural commodities that poor farmers grow and sell.

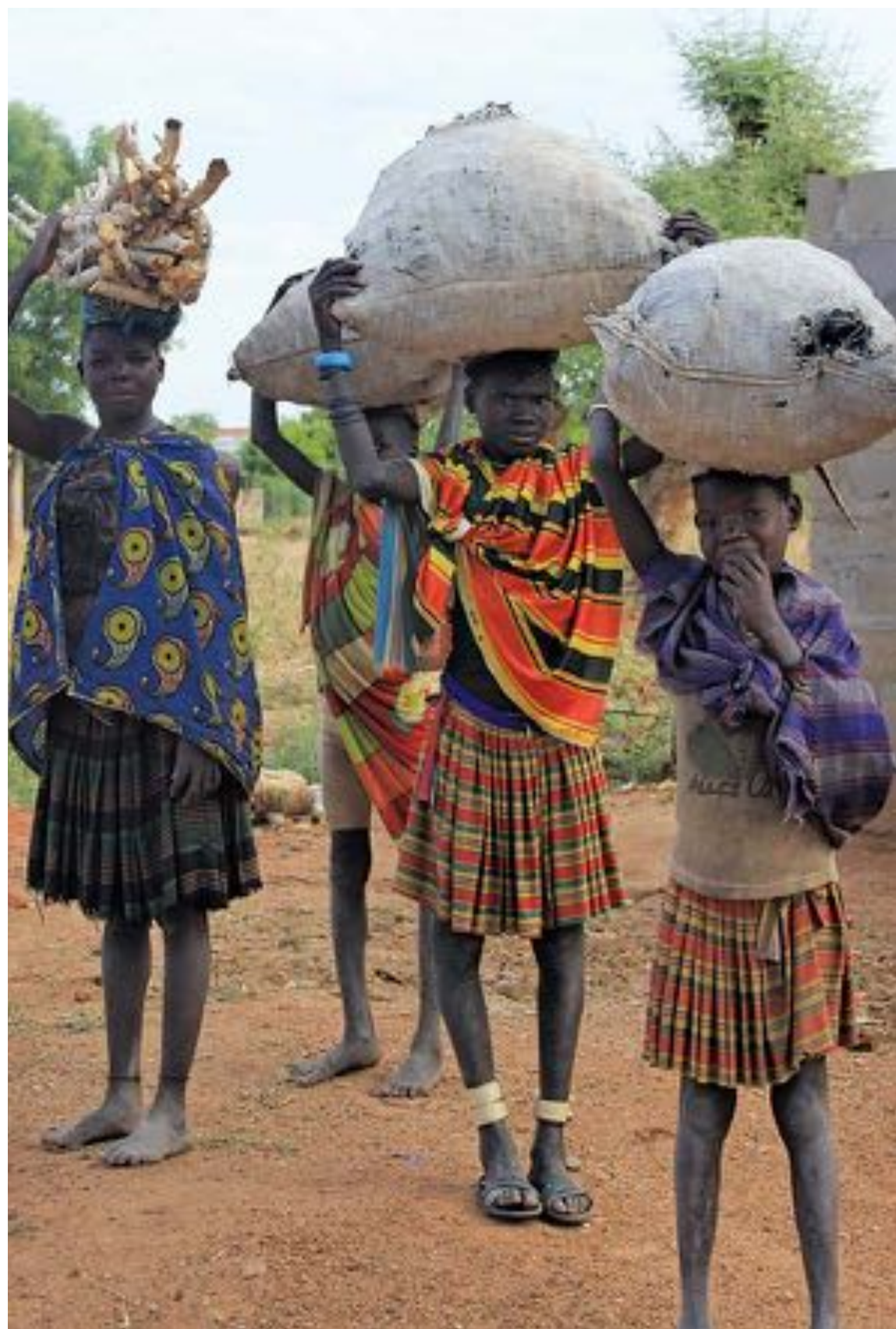
176. Luck was also on Uganda's side: good weather benefited many households and positive price trends in international and regional markets aided real crop price increases. Prices reflect not just improvements in marketing efficiency, but also favorable changes in supply and demand conditions within and outside of Uganda. Peace in South Sudan and the Democratic Republic of Congo provided new sources of demand for Ugandan food production. Good rainfall and prices account for 51 percent of the improvement in crop income for all households and 66 percent of the improvement in crop income for the bottom 40 percent.

177. Although households increased the volume that they marketed during this time, there was very little change in the nature of agricultural production. In the bottom 40 percent, the share of households selling crops increased from 60 percent in 2006 to 72 percent in 2012. When extension services were provided crop income was 20 percent higher, but few households received extension services. Extension services expanded but from 8 percent of households in 2006 to 12 percent of households in 2012. There was little growth in the use of improved inputs and as a result modernization of agricultural practices contributed very little to crop income growth.

178. The reliance on weather and prices also offers some cause for concern. When prices are poor or when the rains do fail, crop income growth falters and consumption falls, reversing

gains in poverty reduction. This is indeed what happened in the Northern and Eastern regions in 2011. Households need to be able to both benefit from good prices and weather and have access to coping mechanisms, such as public safety nets, to be protected from low prices and poor weather. Productivity growth in agriculture—possibly through the use of improved seeds, fertilizer, pesticides, and irrigation—and diversification to other more remunerative forms of employment can also improve resilience. This requires addressing the challenge of low quality agricultural inputs and constraints (such as credit, extension, and access to markets) that some farmers face.

179. For agricultural growth to be truly inclusive, it needs to address the gender productivity gap that still persists in agriculture. One of the biggest constraints female farmers face in comparison to male farmers is their limited access to labor and high childcare demands. Lowering the fertility rate will help address this constraint in the long term, but exploring community childcare may provide some gains in the immediate term. In addition improving access to inputs and tailoring extension services toward women may help address the fact that women currently use fewer inputs and gain less from extension when they do receive it.



CHAPTER: 5

NON-AGRICULTURAL GROWTH IN UGANDA

High growth in value-addition in industry and services has not been accompanied by a higher share of the workforce being employed in these sectors, limiting the degree to which these sectors contributed to poverty reduction.



- 180. Uganda has experienced high growth in industry and services when compared to the regional average.** Between 2003 and 2014, the mean annual growth rates of industry and services were 12.2 percent and 8.2 percent, respectively, which were higher than the average of developing Sub-Saharan Africa (3.5 percent for industry and 7.5 percent for the service sector, Figure 5.1). On the other hand, Uganda's mean annual growth rate of agriculture value added was 2.0 percent during the same period, which is lower than the average of developing Sub-Saharan Africa (5.4 percent).
- 181. The growth of services was largely driven by the expansion of posts and telecommunication services, which reflects the rapid growth of the ICT sector.** As shown in Figure 5.1.4, the fastest growth within the services sector came from post and telecommunication services.
- 182. High growth in value-addition in industry and services has not been accompanied by a larger proportion of the workforce employed in these sectors, suggesting that the job creation brought about by non-agricultural growth has only just kept up with population growth.** Table 5.1 summarizes the source of household income in 2006 and 2013. In 2006, 60 percent of households had income from non-agricultural sectors, while only 49 percent of the

bottom 40 percent households had income from non-agricultural sectors. In 2013, the proportion of households with non-agricultural income was very similar, decreasing slightly to 59 percent for all households and 47 percent for the bottom 40 percent households. However, specialization in these sectors did increase over this period: in 2006, 12 percent of all households were specialized in industry and services, and by 2013, this had increased to 17 percent. This is consistent with the discussion in Chapter 3 that since 2006 little additional income diversification has been observed.

183. However, the majority of Ugandan households derive some form of income from industry and services, and growth in this income has increased consumption and reduced vulnerability. Chapter 3 highlights that, although agricultural income growth is more strongly associated with consumption growth for the bottom 40 percent, non-agricultural income growth—particularly from self-employment—is also

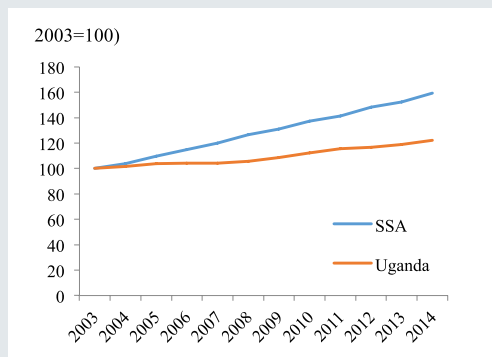
associated with higher consumption growth (Table 3.3). In addition, Chapter 4 provides evidence that the ability to diversify into non-agricultural income sources when agricultural conditions are less favorable has helped households be more resilient to shocks in agricultural income (Table 4.6).

184. This chapter examines which households have experienced non-agricultural income growth and what constrains further non-agricultural income growth. It examines income from both self-employment and wage employment in non-agricultural activities. The chapter focuses on constraints faced by households, and does not examine what has constrained firm creation of jobs in non-agricultural sectors in Uganda. Addressing the constraints households face in increasing non-agricultural income will help increase the inclusivity of non-agricultural growth, but more fundamentally, stronger job-creating firm growth is needed to drive poverty reduction in this area and this requires addressing the constraints firms face in growing and in creating new jobs.

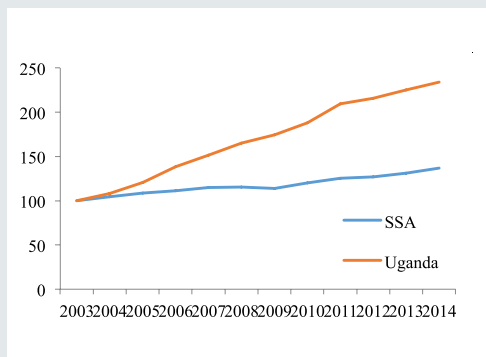


FIGURE 5.1: Sectoral growth in comparison to the region

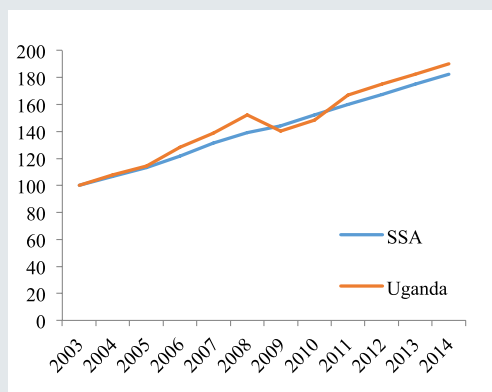
1: Growth in value addition in agriculture (Index 2003 = 100)



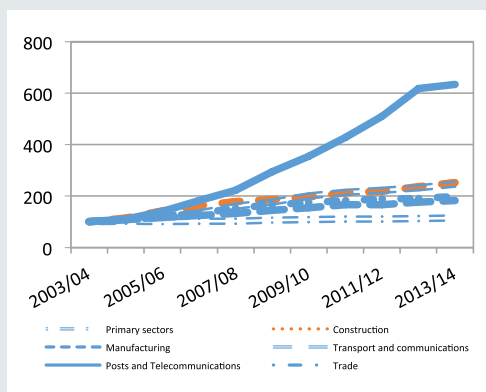
2: Growth in value addition in industry (Index 2003 = 100)



3: Growth in value addition in services (Index 2003 = 100)



4: Real growth in value addition across selected sectors (Index 2003/04 = 100)



Source: 1–3: WDI; 4: Uganda Systematic Country Diagnostic

Table 5.1: Source of household income by sector

	All Households		Bottom 40%	
	2006	2013	2006	2013
Agriculture only	40%	41%	51%	53%
Industry only	2%	3%	1%	2%
Services only	8%	11%	2%	5%
Agriculture and industry	14%	13%	18%	16%
Agriculture and services	27%	22%	21%	18%
Industry and services	2%	3%	1%	1%
All sectors	6%	5%	6%	3%

Source: Authors' calculations using UNHS 2006 and 2013

5.1 Characteristics of households that have experienced non-agricultural income growth

185. There are significant movements both in and out of non-agricultural sectors as households adjust their time spent in agricultural and non-agricultural activities depending on the returns to these activities in a given year.

The UNPS was analyzed to examine how many households move in and out of wage employment and self-employment in non-agricultural sectors over time. Table 5.2 shows this change for three periods: 2006 to 2010, 2010 to 2011, and 2011 to 2012. The net changes in engagement in non-agricultural wage employment and self-employment were close to zero in most periods, confirming the trend reported in Table 5.1. This is consistent with the finding in Chapter 4 that households increase and reduce their income in nonfarm activities based on whether conditions—namely weather and prices—are favorable to agricultural production in a given year.

186. More households in the bottom 40 percent exit non-agricultural sectors than enter non-

agricultural sectors. The net changes in the percentages of the bottom 40 percent households, which engage in both non-agricultural wage employment and self-employment, are negative in all periods, because more households in the bottom 40 percent exited non-agricultural wage employment and self-employment than went into non-agricultural wage employment and self-employment. Table 5.2 confirms that in net terms, a higher proportion of the bottom 40 percent moved into agriculture (out-of-wage and self-employment) than wealthier households. This is consistent with findings in Chapter 4 that households reduce nonfarm income when external conditions for agricultural production are favorable (prices are high and weather is good), as was the case during this period. This is also consistent with the findings by Nagler and Naude (2014) that higher income is associated with the probability of having non-agricultural enterprises.

Table 5.2: Moving in and out of non-agricultural employment

	Moving into...		Moving out of...		Net Change in...	
	Wage Employment	Self-employment	Wage Employment	Self-employment	Wage Employment	Self-employment
All households						
2006 to 2010	10.5%	19.0%	12.4%	17.4%	-1.9%	1.6%
2010 to 2011	17.3%	20.1%	18.6%	21.6%	-1.3%	-1.5%
2011 to 2012	17.0%	18.9%	17.3%	21.3%	-0.3%	-2.4%
Bottom 40 percent						
2006 to 2010	5.3%	13.1%	11.4%	17.8%	-6.1%	-4.8%
2010 to 2011	14.1%	15.6%	18.0%	20.2%	-3.9%	-4.5%
2011 to 2012	14.2%	18.6%	18.4%	21.5%	-4.2%	-2.9%

Source: Authors' calculations using UNPS 2006–2012

187. Those that were able to increase their self-employment income were more likely to live in households that were headed by young, educated men with better access to finance.

Table 5.3 presents the characteristics of households that saw income growth in non-agricultural income. Data is presented for 2011 to 2012, but similar results hold for different periods. The first columns describe the characteristics of those that increased (or did not increase) self-employment income and the latter columns describe the characteristics of those that increased non-agricultural wage income. Households headed by young men are most likely to increase self-employment income. Education is important, on average, but less so when focusing on the bottom 40 percent. Access to finance makes

growth in nonfarm self-employment income more likely, but for the bottom 40 percent, it is access to own savings that is most important, not access to credit.

188. Those that saw growth in wage income were also more likely to be in households headed by young, educated males, but education appears to be more important for the bottom 40 percent.

In addition, households who increased their non-agricultural wage income had lower levels of agricultural income. This suggests that non-agricultural wage income is a substitute, rather than complement of agricultural income (Table 5.3). Figure 5.2 shows educated individuals are more likely to be engaged in wage employment and less likely to be self-employed.

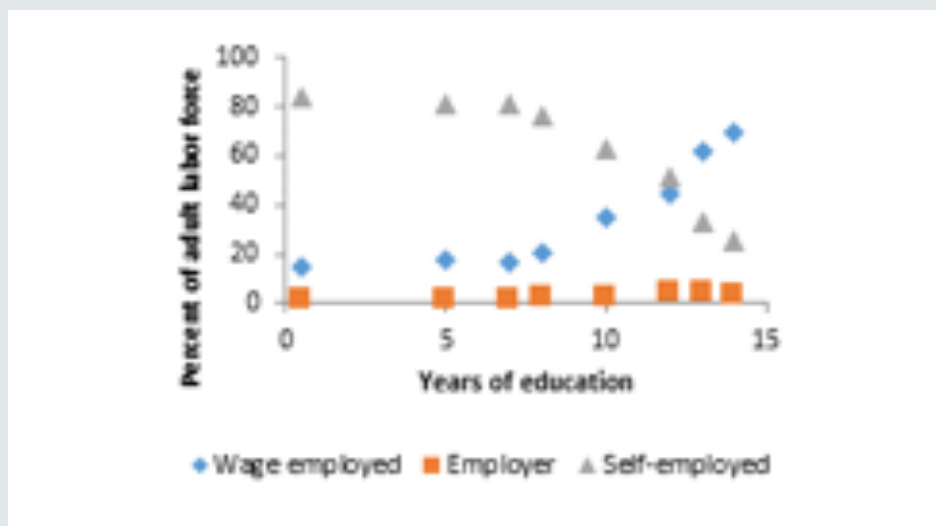
Table 5.3: Characteristics of households in 2011 that experienced non-agricultural growth from 2011 to 2012

All Households	Self-employment Income			Non-agricultural Wage Income		
	Increased	No Increase		Increased	No Increase	
Male headed household	0.76	0.69	***	0.75	0.7	
Age of head	44.4	47.4	***	44.37	46.95	***
Education of head	2.72	2.54	***	3.07	2.52	***
Has a mobile phone	0.57	0.47	***	0.61	0.48	***
Distance to market (km)	4.67	5.12		4.44	5.09	
Has savings	0.36	0.3	**	0.36	0.31	
Has a loan	0.46	0.4	**	0.44	0.41	
Real crop income (shillings, thousands)	540	530		460	540	**
Land owned	2.31	2.37		1.34	2.5	
Bottom 40 Percent	Self-employment Income			Non-agricultural Wage Income		
	Increased	No Increase		Increased	No Increase	
Male headed household	0.76	0.68	**	0.74	0.69	
Age of head	44.76	47.94	***	46.3	47.33	
Education of head	2.18	2.24		2.64	2.16	***
Has a mobile phone	0.33	0.3		0.43	0.29	***
Distance to market (km)	7.58	8.22		6.72	8.28	
Has savings	0.31	0.24	*	0.31	0.25	
Has a loan	0.36	0.35		0.35	0.35	
Real crop income (shillings, thousands)	410	460		410	450	
Land owned	1.22	1.22		1.31	1.2	
Extension visits	0.04	0.05		0.08	0.04	

Source: Authors' calculations using UNPS 2011–12.

Note: *** indicates significantly different at 1%, ** indicates significantly different at 5%, and * indicates significantly different at 10%.

Figure 5.2: Type of employment and education



Source: Staff calculations using UNHS 2013

5.2 Identifying constraints to non-agricultural income growth

189. This section presents findings from panel analysis and recent impact evaluations to examine whether gender, education, and access to finance constrains growth in non-agricultural incomes. It also looks at the role of access to infrastructure and markets.

190. Women are generally engaged in lower-earning self-employment activities and are less likely to experience self-employment income growth, but women who are running businesses in male-dominated sectors make profits as much as men do. Campo et al. (2015) find that, controlling for the sector in which a woman works, women make just as much as men. However, women tend to choose less profitable sectors. Women are more likely to work in sectors that are considered female, such as hairdressing and retail trade. Women who cross over into male-dominated sectors make as much as men and three times more than women who stay in female-dominated sectors. This study suggests women are self-selecting themselves into less productive sectors.

The study points out that women face limited networks and information about entering into male-dominated sectors and that this can constrain their non-agricultural earnings potential. The findings of this study are consistent with empirical evidence from various countries that shows that female entrepreneurs earn lower incomes than men (Berge et al. 2014; De Mel et al. 2008).

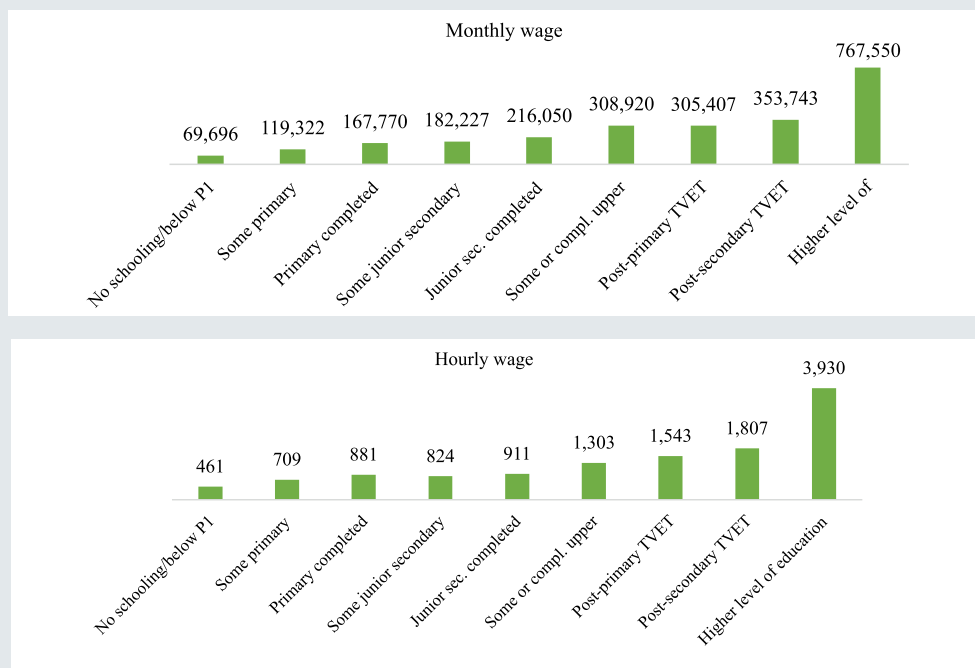
191. Poor households have lower educational attainment and face lower gains from moving into non-agricultural wage employment.

Figure 5.3 shows that non-agricultural wages increase quite rapidly with education in Uganda. The monthly wage of individuals with some upper secondary school education is more than twice as large as the monthly wage of individuals with some primary school education. Nagler and Naude (2014) report that lower levels of education are also associated with lower returns to self-employment. Estimating the returns to education is challenging as unobservable characteristics of individuals—such as work discipline—often

determine both an individual's educational attainment and the income they are able to secure. However, available evidence for Uganda suggests that there is a considerable return to education in the non-agricultural sector. Efforts to control for endogeneity suggest that the estimated returns are if anything, underestimated (Lekfuangfu, et al. 2012). There are also returns to education

in agriculture, but they are lower. This means that the gain from moving from agriculture to non-agricultural wage employment is lower for someone with primary education than for someone with secondary or post-secondary education. As discussed in Chapter 1, educational attainment is lower among the bottom 40 percent, posing a constraint to these households.

Figure 5.3: Average monthly and hourly wages by the level of education



Source: World Bank (2014) "Workforce Development and Returns to Education in Uganda."

192. Panel analysis suggests that educational attainment is a determining factor of non-agricultural wage income for the poor.

Table 5.4 summarizes the results of fixed-effects regression using UNPS data from 2010 and 2011. Dependent variables are logged wage income in non-agricultural sectors, logged non-agricultural self-employment income, and logged total income in non-agricultural sectors. Because agricultural income is endogenous, it is instrumented with the WRSI calculated from satellite rainfall data for each pixel using a cassava crop model calibrated to the growing seasons across Uganda. The

regression results in Table 5.4 show that maximum years of education among household members do not influence household income in non-agricultural sectors, in either wage employment or self-employment, when we use data for all households. However, it determines wage income among the bottom 40 percent of households. This implies educational attainment is an important determinant factor of non-agricultural wage employment only for the poor, and there is a potential gain from investment in school education among the poor.

Table 5.4: Determinants of non-agricultural household income

	All Households			Bottom 40 Percent		
	Wage	Self-employment	Total	Wage	Self-employment	Total
Log of real gross agricultural income per capita	-0.773 (0.698)	-0.950 (0.675)	-0.271 (0.651)	-0.698 (0.666)	-0.109 (0.654)	-0.070 (0.693)
Maximum number of years of education in the household	0.055 (0.112)	0.053 (0.112)	0.129 (0.106)	0.424** (0.196)	-0.125 (0.197)	0.362* (0.208)
Has a savings accounts with formal institutions	1.813*** (0.670)	1.641** (0.699)	1.325** (0.661)	2.396* (1.397)	2.511 (1.562)	4.258*** (1.651)
Obtained loan in past 12 months	-0.397 (0.397)	0.531 (0.402)	0.280 (0.383)	0.343 (0.586)	1.107* (0.594)	1.244** (0.628)
Distance to nearest population center with +20,000 (km)	-0.061 (0.089)	-0.074 (0.087)	-0.026 (0.083)	-0.340 (0.411)	0.0450 (0.416)	-0.365 (0.440)
Connection to electricity	0.201 (1.391)	-2.840** (1.413)	-0.694 (1.359)	1.807 (3.058)	-0.532 (3.107)	-0.230 (3.283)
Number of working age adults in the household	0.857*** (0.211)	0.531** (0.218)	0.860*** (0.208)	0.836*** (0.320)	0.285 (0.333)	0.639* (0.351)
Observations	3,300	3,106	3,140	1,422	1,360	1,366

Male-headed households only

	All Households			Bottom 40 Percent		
	Wage	Self-employment	Total	Wage	Self-employment	Total
Log of real gross agricultural income per capita	-0.678 (0.635)	-0.793 (0.610)	-0.342 (0.603)	-0.571 (0.630)	-0.144 (0.635)	-0.136 (0.672)
Maximum number of years of education in the household	0.0348 (0.136)	0.167 (0.132)	0.143 (0.128)	0.386 (0.258)	-0.156 (0.269)	0.292 (0.284)
Has a savings accounts with formal institutions	-0.144 (0.107)	-0.094 (0.105)	-0.085 (0.101)	-0.543 (0.603)	0.512 (0.622)	-0.174 (0.656)
Obtained loan in past 12 months	1.592** (0.759)	1.650** (0.789)	0.969 (0.768)	2.155 (1.733)	3.350* (2.028)	4.482** (2.140)
Distance to nearest population center with +20,000 (km)	-0.286 (0.449)	0.294 (0.446)	0.328 (0.434)	0.000 (0.662)	0.704 (0.696)	0.702 (0.734)
Connection to electricity	0.519 (1.462)	-2.056 (1.462)	-0.106 (1.440)	1.796 (3.076)	-0.601 (3.183)	-0.337 (3.355)
Number of working age adults in the household	0.546** (0.260)	0.249 (0.258)	0.435* (0.250)	0.407 (0.390)	0.220 (0.416)	0.205 (0.438)
Observations	2,516	2,352	2,380	1,046	992	998

Female-headed households only

	All Households			Bottom 40 Percent		
	Wage	Self-employment	Total	Wage	Self-employment	Total
Log of real gross agricultural income per capita	0.087 (0.545)	-0.578 (0.536)	0.004 (0.479)	-0.089 (0.557)	-0.366 (0.543)	-0.319 (0.536)
Maximum number of years of education in the household	-0.0577 (0.144)	0.094 (0.144)	0.126 (0.127)	0.146 (0.267)	0.207 (0.261)	0.478* (0.258)
Has a savings accounts with formal institutions	0.142 (0.130)	-0.086 (0.126)	0.0518 (0.113)	-0.324 (0.465)	-0.005 (0.464)	-0.320 (0.459)
Obtained loan in past 12 months	2.253** (1.014)	2.684** (1.048)	2.149** (0.908)	3.686 (2.573)	5.850** (2.718)	7.114*** (2.684)
Distance to nearest population center with +20,000 (km)	-1.267* (0.668)	0.521 (0.677)	-0.535 (0.603)	-0.846 (1.052)	1.728* (1.046)	1.759* (1.032)
Connection to electricity	1.909 (1.867)	-2.655 (1.962)	0.546 (1.748)	8.624 (6.260)	-1.241 (6.212)	0.138 (6.133)
Number of working age adults in the household	1.317*** (0.309)	0.988*** (0.307)	1.411*** (0.272)	1.469*** (0.540)	0.116 (0.540)	1.266** (0.533)
Observations	1,354	1,282	1,298	492	478	480

Note: Instrumental-variables regressions (fixed effects). Log real gross agricultural income per capita (crop and livestock) is instrumented with WRSI calculated from satellite rainfall data for each pixel using a cassava crop model calibrated to the growing seasons across Uganda.

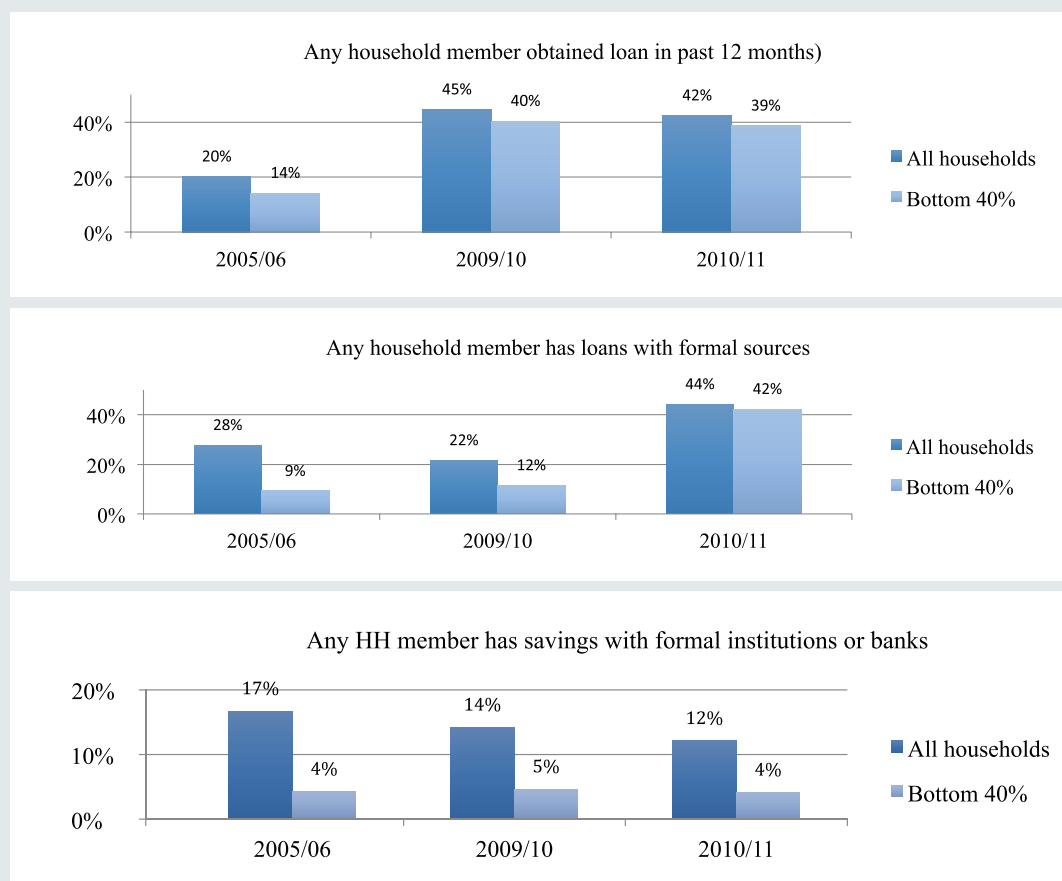
193. Poor households have limited access to credit, but access to credit has improved for the poor. Better access to loans increased self-employment income among the poor. Access to credit is also a very critical factor for developing non-agricultural self-employment. However, poor households have had limited access to credits. In 2006, 20 percent of all households had household members who obtained loans in the past 12 months, while only 14 percent of the bottom 40 percent had household members who obtained loans in the past 12 months (Figure 5.4). In 2012, the gap between the bottom 40 percent and other households narrowed. Among all households, 42 percent had members who obtained loans, while 39 percent of the bottom 40 percent had household members who obtained loans in the past 12 months. The gap in the proportion of households, which obtained loans with formal sources, also narrowed between the bottom 40 percent and other households. In 2006, 28 percent of households had members who obtained loans from formal sources, while only 9 percent of the bottom 40 percent had household members who obtained loans from formal institutions. In 2012, the gap between the bottom 40 percent and other households shrank. Among all households, 44 percent had household members who obtained loans from formal sources, while 42 percent of bottom 40 percent households had household members who obtained loans from formal sources. The regression results in Table 5.4 suggest that access to loans increased income from non-

agricultural self-employment for the bottom 40 percent of households, even though it did not increase income from self-employment for all households.

194. Access to savings also is strongly correlated with increased non-agricultural income. There is a large gap in access to savings accounts between the bottom 40 percent and other households. In 2011, 12 percent of all households had at least one member with a savings account with a formal financial institution, while it was only 4 percent for the bottom 40 percent of households. The regression results in Table 5.4 suggest that non-agricultural income is higher for those with savings account with formal institutions, more so than for those with credit. Access to savings is significantly correlated with income even when regressions are run separately for male- and female-headed households. This result is consistent with empirical findings from many countries that savings has relatively positive welfare impacts than credit (Van Rooyen et al. 2012). It may be because investment in non-agricultural businesses is often made out of savings. Thus, improving access to savings accounts has a great potential to increase non-agricultural income. Mobile money is a promising way to promote financial inclusion in Uganda. Gutierrez and Choi (2014) report that Uganda has the largest share of the population using mobile phones to make monetary transactions, even though half of the users of mobile money services are unbanked.



Figure 5.4: Access to finance



Source: UNPS 2006–2011.

195. Results of impact evaluations suggest poor women benefit from cash grants and business training, as they are the most financially constrained.

An earlier analysis suggests female-head households are less likely to be able to increase non-agricultural income. Blattman et al. (2016) provided women in poor households with cash grants of approximately US\$150 and basic business skills training in a war-affected region in northern Uganda. The women were encouraged to start retail businesses. Most started and sustained small retail businesses with the cash grant, while they continued farming. A year after the program, monthly cash earnings doubled from USh 16,500

to USh 31,300, cash savings tripled, and short-term expenditures and durable assets increased 30 percent to 50 percent relative to the control group which did not receive cash grants or training. The program had the strongest impacts on the people with the lowest levels of capital and access to credit. Their finding is consistent with the meta-analysis that financing support is more effective for women compared to other interventions, because poor women are the most credit-constrained group of people in the society (Cho and Honorati 2014). However, Fiala (2015) offered either capital with repayment (subsidized loans) or without (grants) to both male and female microenterprise

owners in poor households and randomly offers business skills training. He found no effect for female enterprises from either form of capital or the training, but found large effects for men with access to loans combined with training.

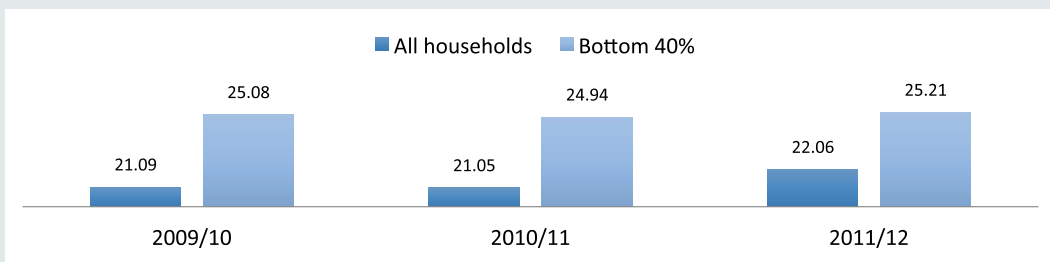
196. Impact evaluation studies provide evidence that there is strong demand for financial and skill training programs among youth, especially among women, and such programs can increase their earnings.

Blattman et al. (2014) conducted an unconditional cash transfer program for youth, and followed young adults for two and four years after receiving grants equal to annual incomes. Most started new skilled trades and labor supply increased by 17 percent. Earnings rose nearly 50 percent, especially among women. This suggests that young women face larger financial constraints than young men do. Bandiera, Goldstein et al. (2010) analyzed the intention to participate in training programs of adolescent girls (Bangladesh Rural Advancement Committee’s Adolescent Development Program). The program emphasizes the provision of life skills, entrepreneurship training, and microfinance. They found that the program attracts girls who are likely to place a high value on financial independence: single mothers and girls who are alienated from their families.

197. Access to electricity and markets does not seem to influence non-agricultural household income. As discussed in Chapter 1, only 1.7 percent of the bottom 40 percent of households have

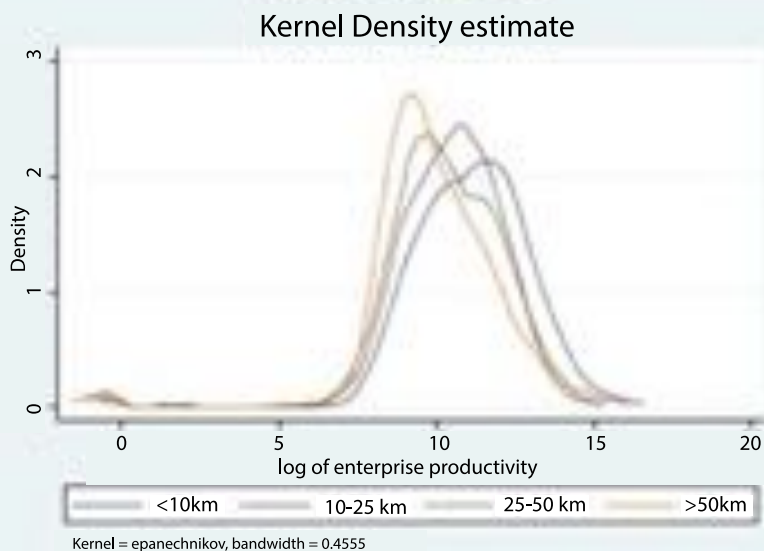
electricity at home, while 19.6 percent of the top 60 households have electricity at home. Golumbeanu and Barnes (2013) report that a very simple home wiring costs about US\$108 in Uganda and a security deposit of US\$43 is required to obtain electricity at home. The total connection charge is 61.6 percent of the average monthly income. This implies it is hard for the poor to afford electricity. The regression results in Table 5.4 indicate that access to electricity is not a determining factor of non-agricultural income. However, because the percentage of households with connection to electricity is so low among the bottom 40 percent, it is difficult to conclude that there is no impact of access to electricity on non-agricultural income for the poor. Poor households also tend to live far from cities. Figure 5.5 shows that the bottom 40 percent of households live around 25 km away from cities with a population of at least 20,000 people. The regression results in Table 5.4 do not indicate that the distance to cities affects non-agricultural income. However, Nagler and Naude (2014) demonstrate non-agricultural household enterprises located up to 10 km from a population center are the most productive, followed by household enterprises residing up to 25 km and 50 km away, respectively, as shown in Figure 5.6. Their results suggest that the poor engaged in non-agricultural self-employment may benefit from living near towns. Land size was also included as an independent variable in all regressions but it was not significantly correlated with income. This is consistent with Table 5.3.

Figure 5.5: Distance to nearest population center with +20,000 (km)



Source: UNPS 2006–2011.

FIGURE 5.6: Nonfarm self-employment productivity and distance



Source: Nagler and Naude (2014).

5.3 Conclusion

198. This chapter examined which households have experienced non-agricultural income growth, both in self-employment and wage employment. Uganda has experienced high growth in industry and services when compared to the regional average. However, high growth in value-addition in industry and services has not been accompanied by a higher share of the workforce being employed in these sectors, limiting the degree to which these sectors contributed to poverty reduction. The growth in these sectors did not result in job creation faster than population growth. The net changes in the percentages of the bottom 40 percent of households, which engage in both non-agricultural wage employment and self-employment, are negative, because more households in the bottom 40 percent exited non-agricultural wage employment and self-employment than went into non-agricultural wage employment and self-employment.

199. The chapter also examined what constrains further non-agricultural income growth, and, in particular, examined the findings from randomized controlled trials undertaken in Uganda to identify what interventions would help increase non-agricultural income growth.

Those that were able to increase their self-employment and wage income were more likely to live in households that were headed by young, educated men with better access to finance. Results of impact evaluations suggest that poor women can benefit from cash grants and business training, as they are the most financially constrained. Randomized controlled trials (RCTs) provide a clear indication of the types of interventions that work; however, they are often implemented on a small scale. It is not clear whether these interventions will also work at scale for growing self-employment and encouraging income diversification among the poor. More empirical evidence is needed on programs implemented at scale.

CHAPTER: 6

MOVING OUT AND UP: MIGRATION AND POVERTY IN UGANDA⁴³

Most of Uganda's rural migrants tend to move within their own region or to another rural area. Migration generates substantial welfare gains—with even larger gains accruing to those who migrate to urban areas.



200. While the bulk of Uganda's 35 million inhabitants live in rural areas, the country is urbanizing at a considerable pace. According to recent census data, the country's overall population density grew by 41 percent between 2002 and 2014 and the share of Uganda's population living in urban areas increased by more than 50 percent (from 12.1 percent to 18.4 percent) over the same period (UBOS 2014b). An alternative measure of urbanization that is comparable across countries, the agglomeration index, suggests that Uganda's urban share is actually higher than these rates would suggest, at 25 percent (World Bank 2012).

201. Urbanization has been an important driver of poverty reduction from 2006 to 2013, because of the much lower rates of poverty present in urban areas. Chapter 3 highlighted that urbanization accounts for 10 percent of the poverty reduction achieved from 2006 to 2013.

202. Migration, in addition to demographics and redistricting, contributes to urbanization. In Sub-Saharan Africa, lower mortality rates in urban areas result in higher natural population growth rates in urban areas, even in the presence of lower fertility rates (Jedwab

43. This chapter draws on the background paper: "Moving Out and Up: Panel Data Evidence on Migration and Poverty in Uganda" by Edouard Mensah and Michael O'Sullivan.

et al. 2015). Some of the expansion is due to a redefinition of administrative boundaries for urban areas. However, some is likely because of rural to urban migration.

203. This chapter considers the role of rural to urban migration and internal migration, more broadly, in bringing about poverty reduction in Uganda.

It uses panel data regression analysis to quantify the causal impact of migration on welfare. It uses the same panel to explore who has benefited from migration and what constrains migration of others. The role of international migration is not considered, given the lack of data on this.

204. Uganda is a country characterized by a relatively high degree of spatial mobility.

In the period of four years from 2005 to 2009, 22.9 percent of individuals moved to other districts. Migration patterns are likely tied to the country’s substantial regional and rural-urban wealth disparities, which shape the sets of economic opportunities available

to households.⁴⁴ The UNPS data used for this analysis indicated that 3 to 5 percent of households reported sending out a work migrant during the first two survey waves with an increase to 13 percent in later rounds (Table 6.1). This jump may be tied to a change in the way the household roster module was administered, because 2011 was the first year in which the UNPS employed computer-assisted personal interviewing methods for data collection. Year dummies are included in all regressions that use all years of the UNPS.

205. Despite the mobility of its population, most of Uganda’s rural migrants tend to move within their own region or to another rural area.

An analysis of 2002 census data, found that—though rural and urban populations are mobile—most migration events in Uganda occur within the same region and the majority of migrants into Kampala come from the adjoining Central region (Mukwaya et al. 2012).

Table 6.1: Share of households which sent a work migrant, by region, location, and year

	2006	2010	2011	2012
All households	0.03	0.05	0.13	0.13
	(0.20)	(0.22)	(0.31)	(0.33)
Regions				
Kampala	0.06	0.03	0.17	0.18
Central	0.04	0.06	0.14	0.17
Eastern	0.02	0.03	0.11	0.11
Northern	0.02	0.02	0.09	0.09
Western	0.04	0.07	0.16	0.16

Source: Authors’ calculations with UNPS. Standard deviations reported in parentheses.

206. The findings of this chapter suggest that migration generates substantial welfare gains—with even larger gains accruing to those who migrate to urban areas.

Rainfall shocks serve as a push factor for urban migration, while remoteness, violent conflict, and weak urban migrant networks

are associated with migration to rural areas. The findings suggest that policies to capture the welfare gains from migration to cities should focus on investments in education for men and women in rural areas as well as ICT and financial inclusion for rural households.

44. While economic considerations lead many of Uganda’s migrants to move, other factors also drive migration decisions. For example, insecurity and conflict, particularly in the North of the country during the 2000s, prompted the displacement and forced migration of large segments of the rural population (Mulumba and Olema 2009). A period of reverse migration then followed, with an influx of displaced residents returning to the North (World Bank 2012).

6.1 The impact of migration on poverty reduction

207. Migration can bring about welfare gains if individuals are able to move from areas where the return to labor is low to areas where the return to labor is higher because of better market opportunities. For example, an individual may be able to earn a higher income if she moves from being engaged in agriculture in a rural village to a job in Kampala (Harris and Todaro 1970; Lewis 1954). Migration can also help bring welfare gains for a household by helping the household minimize risk, diversify income sources, and relax the constraints existing in the markets for factors of production (capital, credit, land, and labor) through remittances (Azam and Gubert 2006; Rosenzweig and Stark 1989; Stark and Bloom 1985).

208. A simple comparison of the welfare distribution of those who migrate and those who do not, suggests that migration in Uganda provides welfare benefits for those who migrate. The distributions of consumption for those who migrate and those who do not are presented in Figure 6.1. Consumption is presented for 2006, before anyone migrates, and for 2010, after migration has occurred for those who migrate. The graph for 2006 shows that migrants and non-migrants had very similar levels of consumption before migrating—the two lines reflecting that the two distributions lie almost on top of each other. In 2010, the consumption distribution of migrants is to the right of the consumption distribution of non-migrants, particularly for the top two-thirds of the distribution, indicating that migration was beneficial. This is consistent with findings reported in earlier World Bank reports: an unpublished analysis of the UNHS 2006 found a positive correlation between labor mobility and per capita expenditure (World Bank 2008).

209. This beneficial effect is the result of migrants to rural areas ‘catching up’ with the welfare of non-migrants and migrants to urban areas

continuing to be wealthier than non-migrants.

Figure 6.2 presents the same data as Figure 6.1, but disaggregating migrants to rural and urban areas. Migrants to rural areas were poorer than non-migrants in 2006, before moving. After migrating this difference between rural migrants and non-migrants was almost closed. Migrants to urban areas were better-off than non-migrants both before and after migration.

210. Identifying the true impact of migration on welfare is challenging. Those who migrate often differ in unobservable ways from those who do not. For example, migrants may have more drive, and tolerance for risk and uncertainty than non-migrants. This makes it difficult to disentangle what contributes to welfare differences between migrants and non-migrants: the fact they migrated or their difference in attitude and outlook? These unobservable differences may have resulted in welfare differences for migrants even if they had not migrated. Recent studies on the welfare impacts of migration have used experimental methods (McKenzie and Sasin 2007, Bryan, Chowdhury, and Mobarak 2014) or panel regression analysis with instrumental variables (Beegle, De Weerd, and Dercon 2011; de Brauw, Mueller, and Woldehanna 2013) to try and identify the impact of migration on welfare. The analysis in this section follows Beegle et al. (2011) and uses panel regression analysis of individual household members with household fixed effects and instrumental variables to instrument for the decision of an individual to migrate.⁴⁵ Further details on the analytical method are provided in the background paper from which this chapter is drawn (O’Sullivan and Mensah 2016).

211. Analysis finds that migration results in consumption growth that is on average 14.6 percent higher per year than for those who do not migrate. The results of the panel regression analysis with instrumental variables are presented

45. The instruments used are a WRSI reflecting rainfall shocks experienced by households, number of conflict fatalities, distance to regional capital, share of one’s ethnicity living in urban areas, and an individual’s position in the household. For more details, see O’Sullivan and Mensah (2016).

in the first column of Table 6.2 and show a sizeable welfare impact—58.2 percent additional growth in consumption compared to non-migrants—that is strongly significant.

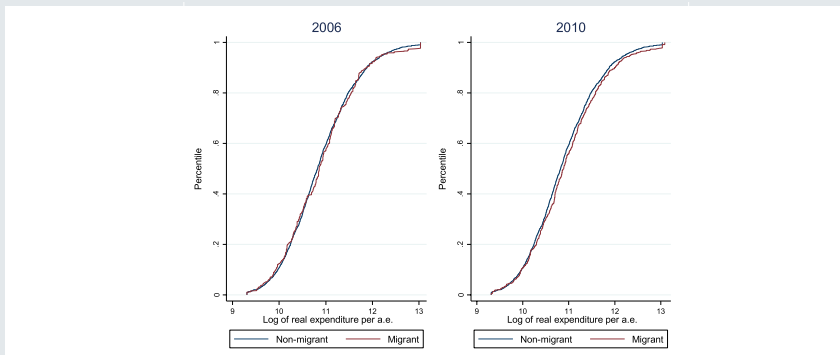
212. Migration has a large and positive impact, both for those who move to rural destinations and for those who move to urban destinations.

Columns 2 and 3 of Table 6.2 present the impact of migration on consumption for those who move to rural areas and those who move to urban areas. Annual consumption growth is 14 percent higher for those who migrate to rural destinations and 16.25 percent higher for those who migrate to urban destinations. Despite the larger gains from urban

migration, the bulk of Uganda’s migration flows still occur within rural areas.

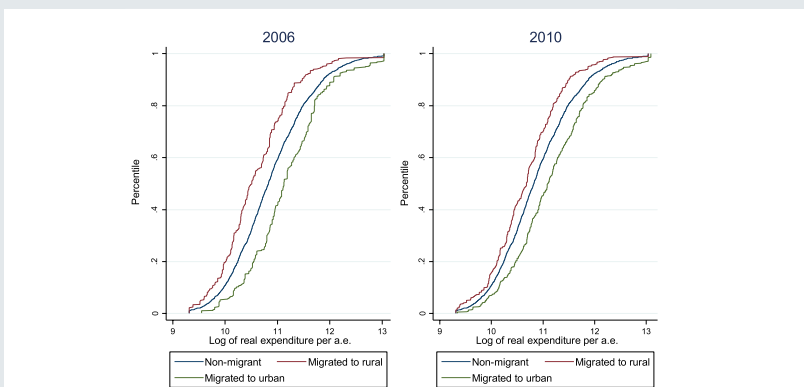
213. The gains from rural-to-rural migration may, at first, seem surprising. While it is expected that opportunities for employment in urban areas are likely to yield higher returns it is not clear that moving to another rural area would result in better employment opportunities. However, as the next section explores in greater detail, rural-to-rural migrants are often those moving from conflict-affected or remote rural areas to rural areas that offer stability and better access to markets. It is thus plausible that strong welfare gains result from rural-to-rural migration also.

Figure 6.1: Consumption of migrants and non-migrants, before (2006) and after (2010) migration



Source: UNPS 2006, 2010.

Figure 6.2: Consumption of rural and urban migrants, before (2006) and after (2010) migration



Source: UNPS 2006, 2010.

Table 6.2: Impact of migration

	(1)	(2)	(3)
	All Households	Rural Migrants and Non-migrants	Urban Migrants and Non-migrants
Migrated across survey waves (1=mover, 0=stayer)	0.582*** (0.142)		
Migrated to rural areas (1=mover, 0=stayer)		0.560*** (0.124)	
Migrated to urban areas (1=mover, 0=stayer)			0.651*** (0.233)
Male	0.003 (0.004)		
Unmarried	0.001 (0.007)	0.002 (0.003)	-0.002 (0.007)
Unmarried male	-0.000 (0.006)	-0.004 (0.003)	0.004 (0.006)
Age category (reference: ages 10–14)			
Ages 15–24	-0.004 (0.006)	0.001 (0.002)	-0.006 (0.006)
Ages 25–34	-0.006 (0.007)	-0.001 (0.003)	-0.006 (0.008)
Ages 35–49	-0.001 (0.006)	0.000 (0.003)	-0.003 (0.006)
Ages 50–65	0.013* (0.007)	0.001 (0.003)	0.012* (0.006)
Ages 66 plus	0.015* (0.009)	0.005 (0.004)	0.012 (0.009)
Number of effective years of schooling completed	0.001* (0.001)	0.000 (0.000)	0.001 (0.001)
Observations	11,338	10,783	10,824
Number of households	2,400	2,319	2,290

Source: Authors' calculations with UNPS 2006 and 2010.

Note: Initial Household Fixed Effects. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

214. Estimates of the impact of migration for other countries also find large gains to migration.

Beegle et al. (2011) in Tanzania estimate a 36 percentage point growth in consumption over a period of 14 years, relative to staying, 18 percentage point to 27 percentage point consumption growth

for movers to rural areas, and a 66 percentage point consumption growth for movers to urban areas. Ignoring the direction of the move, de Brauw et al. (2013), find migrants achieve 110 percent higher consumption than non-migrants, in Ethiopia, over a period of four years.

215. These estimated impacts do not take into account the impact of remittances on sending households. Chapter 3 documented that remittances are not a large share of overall income, but they are received by many households. Recent unpublished work using the UNPS sample suggests that remittances can be a vehicle for financial inclusion. The authors rely on household fixed effects estimations and uncover a positive relationship between internal remittances and formal credit (Gross and Ntim 2014).

216. However, migration is not universally beneficial, as it can have negative impacts on those who do not migrate, within the household or within the community. An analysis on the links between migration and schooling, which uses the UNPS datasets, finds that

attendance drops among schoolchildren whose households have lost an adult due to migration. However, school attendance is found to increase when the child migrates either solo or with his or her parents (Ferrone and Giannelli 2015). Strobl and Valfort (2015) combine 2002 census data with weather information to examine the impact of weather-induced migration on employment outcomes for non-migrants in Uganda. They uncover an adverse effect of migration on employment outcomes for residents in receiving communities—particularly in areas with fewer roads (a proxy for low capital mobility). Mwesigye and Matsumoto (2013) also find that communities with a higher relative share of migrants are more likely to experience land conflicts. These negative side effects need to be managed.

6.2 Who migrates?

217. Households located in poorer regions are less likely to send migrants, even though there are more gains from migration for these households. Households in the poorer regions of Uganda (Eastern and Northern regions) are 3 to 5 percentage points less likely to send work migrants when compared with households in the Central and Western regions (Table 6.1). Households in the poorest regions of Uganda have the most to gain from migration given the average levels of welfare are higher for households living outside of the north and east. On average, households that send migrants live 24 km closer to Kampala than households that do not send migrants.

218. Migrant-sending households have a larger number of adults and are more likely to be headed by a woman. Having a larger relative

supply of adult household labor, male or female, is associated with a higher probability of sending out a work migrant, presumably because these households are more likely to have underemployed adult labor, which reduces income that might be lost from a member migrating. On average, there is a difference of one member, between the ages 15 and 59, between those who migrate and those who do not. Both de facto female heads of household, who report being married, and de jure female heads who report being single, divorced, or widowed are more likely to send a migrant than male-headed households (Table 6.3). De facto female-headed households may be more likely to send out a migrant because the male head has previously migrated making it easier for other family members to migrate.

It is expected that opportunities for employment in urban areas are likely to yield higher returns but, it is not clear that moving to another rural area would result in better employment opportunities.

Table 6.3: Characteristics of households that send working migrants

	(1)	(2)	(2) – (1)	Coefficient in Regression+
	No Migrant	Sent Migrant	Difference	
De facto female-headed household	0.09	0.09	0.01	0.06***
De jure female-headed household	0.2	0.23	0.03*	0.03**
Age of household head	42.33	50.4	6.84***	0.00***
Number of adult males (15–59) in household	1.03	1.49	0.38***	0.04***
Number of adult females (15–59) in household	1.14	1.66	0.4***	0.04***
Number of adults ages 60+ in household	0.21	0.41	0.18***	0.03**

Source: UNPS 2006–2011 with classification of migrant status from UNPS 2010–2012, respectively.
 Note: + Random effects regression controlling for demographics, education, and regional fixed effects.
 Significance levels are reported as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

219. Young adults are most likely to migrate. Figure 6.3 shows that movers are more likely to be young adults (15–24 age category) and least likely to be above 50. Migrants selected for the move are selected to be of an economically active age. This is even more pronounced for movers to urban areas.

220. Women and men are just as likely to migrate to rural and urban areas, but when women migrate to urban areas they are more likely to be single than those who do not migrate. Table 6.4 shows that those who migrate (‘movers’) and those who do not (‘stayers’) have similar shares of males and females in their subsamples. Movers are more likely than stayers to be unmarried. This is driven by unmarried women being more likely to migrate to urban areas. Those who are married are just as likely as those who are not to move to rural areas, and married men are just as likely as unmarried men to move to urban areas. Brockerhoff and Eu (1993), in their demographic and health studies of eight Sub-Saharan African

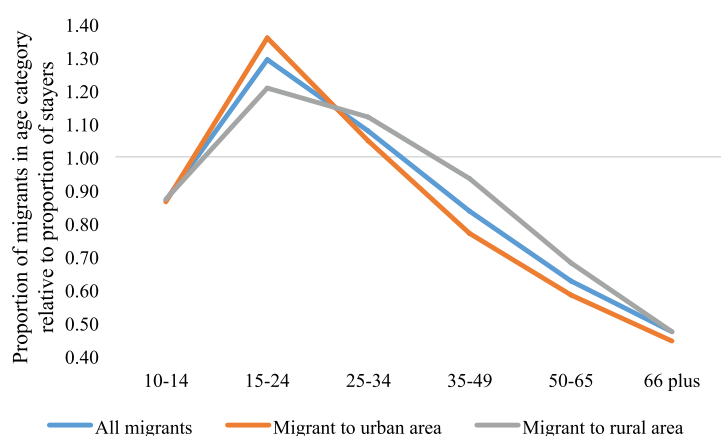
countries, including Uganda, associate rural-urban migration with females in their twenties who reach cities for marriage purposes. However, females may also leave their communities for reasons other than marriage, such as independence from social and family constraints, employment, and education (Chant 1992; Tacoli 1998).

221. The ranking of the individual in the household also plays a role in determining migration.

Those who migrate are less likely to be a head or spouse, or male or female child of the head, when compared to stayers (Table 6.4). However, once other individual characteristics such as gender, age, and education are controlled for, being a child of the head increases the probability that an individual migrates. It increases the probability of migration to rural areas by 1 percent and the probability of migration to urban areas by 2 percent. Those who migrate are more likely to be the oldest children.



Figure 6.3: Age distribution of migrants relative to stayers



Source: UNPS 2006 with classification of migrant status from UNPS 2010.

Note: These differences are statistically significant at 1% with the exception of the age category 25 to 34 where there is no statistically significant difference between migrants and stayers, and the rural and urban results for those ages 10 to 14, and those ages 50 to 65, which are significant at the 5% level.

Table 6.4: Characteristics of individuals who migrate before migration

	Non-mi-grants (1)	Migrants			Significance of Difference		
		All (2)	To Urban (3)	To Rural (4)	(1)-(2)	(1)-(3)	(1)-(4)
Male	0.47	0.48	0.47	0.49			
Head or spouse	0.37	0.20	0.16	0.26	***	***	***
Child of head	0.29	0.19	0.18	0.22	***	***	***
Male child of head	0.15	0.10	0.09	0.12	***	***	***
Female child of head	0.14	0.09	0.09	0.10	***	***	***
Age rank (highest value for oldest)	3.72	4.42	5.10	3.52	***	***	*
Unmarried	0.62	0.65	0.68	0.61	**	***	
Unmarried male	0.29	0.31	0.31	0.30			
Unmarried female	0.33	0.35	0.37	0.32		***	
Years of schooling completed	4.76	5.01	5.36	4.55	***	***	*
Log of real consumption per adult equivalent	10.88	10.95	11.15	10.68	***	***	***
Is poor	0.22	0.23	0.18	0.30		***	***
Number of observations	10,850	1,750	1,002	748			

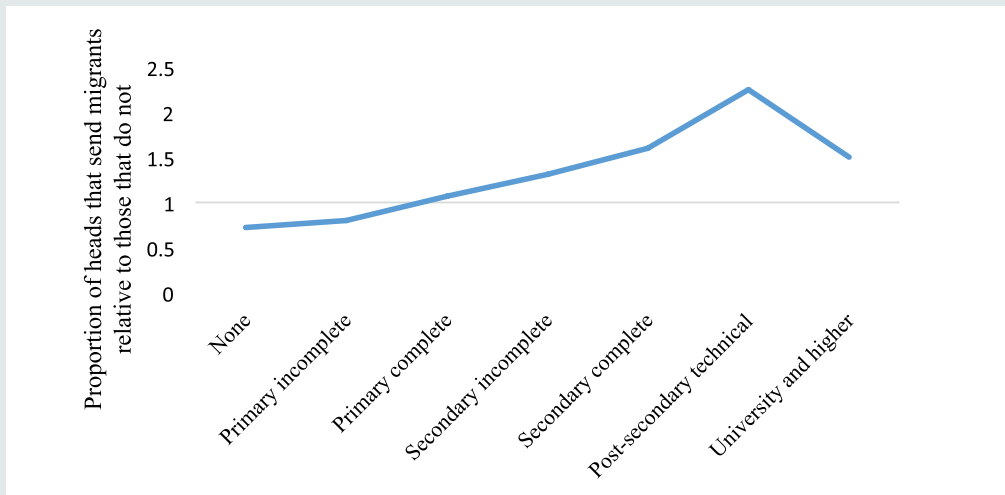
Source: UNPS 2006 with classification of migrant status from UNPS 2010.

Note: Significance levels are reported as follows: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

222. Those who migrate to urban areas are more educated than those who do not migrate. Migrants to rural areas are less educated than non-migrants are. On average, those who migrate have completed 0.25 more years of schooling than stayers. However this gap more than doubles to 0.6 years for those who migrate to urban areas. In contrast, those who migrate to rural areas are less educated than non-migrants are, although this

is not strongly significant (Table 6.4). Even once controlling for other factors, a 1-year increase in schooling leads to a 0.1 percent increase in the incidence of out-migration.⁴⁶ Fathers of movers tend to be better educated than those of stayers, while mothers of movers have received less education than those of stayers. However, the heads of households that send work migrants are more educated than those that do not (Figure 6.4).

Figure 6.4: Education of household head, households that send migrants relative to those that do not



Source: UNPS 2006–2011.

223. On average, migrants are no poorer than non-migrants before migrating. However, migrants to rural areas are poorer than non-migrants are and migrants to urban areas are richer than non-migrants are. Although movers come from households that are just as likely to be poor as

stayers at the baseline (23 percent and 22 percent, respectively), movers to urban areas are less poor than stayers (18 percent versus 22 percent), while movers to rural areas are poorer than stayers (30 percent versus 22 percent) (Table 6.4).

6.3 What aids and constrains migration?

224. Given the welfare gains associated with rural to urban migration, it is important to understand what drives and constrains migration and how constraints to migration can be overcome.

This section further examines the characteristics of those who were able to migrate and uses panel regression analysis to identify some of the drivers and constraints of migration in Uganda.

⁴⁶ This includes household fixed effects.

INVESTMENTS IN HUMAN, FINANCIAL, AND SOCIAL CAPITAL

225. The finding that those who are more educated are more likely to migrate and more likely to send household members to migrate suggests that educational investments may facilitate out-migration.

Other studies for countries in Sub-Saharan Africa also highlight the importance of education for out-migration. Brockerhoff and Eu (1993) highlight evidence that educated females most likely migrate to cities. In their analysis, Beegle et al. (2011) also highlight the positive influence (with a convex effect) of individual education on migration and consumption.

226. In addition to human capital, financial capital can drive household migration decisions.

Panel evidence from rural South Africa, for example, suggests that relaxing the credit constraints of households through transfer schemes can boost employment through labor migration (Ardington, Case, and Hosegood 2009). One of the few randomized experiments that examines the gains and constraints to domestic migration finds that a small monetary provision for migration transportation costs has a large impact on domestic migration in Bangladesh, driving substantial welfare gains (Bryan et al. 2014). However, Beegle et al. (2011) find that migration is not associated with financial constraints.

227. Household access to finance is associated with higher levels of migration in Uganda.

At the household level, those households that sent migrants are 13 percentage points more likely to have a formal loan than households that did not (28 percent compared to 17 percent), and 15 percentage points more likely to have a savings account with a formal institution (29 percent compared to 15 percent). These differences persist even when controlling for other household characteristics in a regression framework (Table 6.5). Having a formal loan and a formal savings

account increases the likelihood of being a migrant-sending household by 3 and 6 percentage points, respectively. Facilitating households' access to savings and credit products could help overcome liquidity constraints to migration.

228. However, it is access to finance for the sending household, not the individual migrant, that is associated with migration.

At the individual level, those who migrated were 6 percentage points less likely to have received a loan at the baseline than those who did not (Table 6.6). As such, the focus of financial inclusion programs should be on the sending household, helping them access loans on the migrant's behalf, rather than on the migrant.

229. International evidence points to the importance of social networks, in addition to human and financial capital, in facilitating migration.

Network relationships build upon social connections of kinship, friendship, and shared community origin to reduce costs and risks associated with the movement and increase the net expected gains from migration (Massey et al. 1993). Evidence of reliance on networks for lowering migration costs and risks largely exist in international migration literature (Ilahi and Jafarey 1999; Massey et al. 1993; McKenzie and Rapoport 2007).

230. Social networks appear to be important in Uganda too with migrant-sending households having stronger migrant networks, particularly in urban areas.

Households that send migrants are more likely to have a household head from an ethnicity with a higher share of migrants (Table 6.5).⁴⁷ Migrants, particularly urban migrants, are more likely to be from an ethnicity that has a larger share of its people living in cities. The share of urban residents within one's ethnicity is 14.1 percent among migrants and 16.1 percent among

47. The share of migrants in a given ethnicity is calculated using 2002 census data.

migrants to urban areas, compared to 12.6 percent among stayers (Table 6.6).⁴⁸ Those lacking urban ethnic-based networks migrate to rural rather than to urban areas. Within a regression framework, a 1 percent decrease in one's shared ethnicity in urban areas is associated with a 6.7 percent increase in the propensity to migrate to rural areas (at a 10 percent level of significance).

231. ICT can help individuals overcome limited ethnic networks to facilitate migration. Muto (2012) uses panel data from 94 rural villages across Uganda to explore the relationship between information and ethnic migration networks. Using cellular network coverage as an instrument, she finds that households with a mobile phone are more likely to send out a migrant for employment and that this effect is larger for households with smaller ethnic networks in Kampala. This result suggests that information received through mobile technologies can facilitate spatial mobility. In line with Muto (2012), mobile phone ownership is found to increase the probability that a household sends a migrant by 3 percent, even when controlling for household wealth (Table 6.5).⁴⁹

232. Living in a remote area constrains individuals from affording the long and costly move to urban areas and is associated with migration

MIGRATION AS INSURANCE

234. Studies on migration in other settings have underscored the idea that shocks can be a main driver of migration, as much as investments in human, social, and financial capital. For example, Kleemans (2015) discusses that migration may evolve as an ex post risk coping strategy to survive, in the face of negative income shocks, or as an investment strategy to increase future expected income. Beegle et al. (2011) find that young people experiencing rainfall shocks in Tanzania are more likely to migrate.

to closer rural destinations. On average, movers live closer to Kampala and to their regional capital at the baseline when compared with stayers (Table 6.6). However, rural movers are located further away from Kampala and their regional capital than stayers. At a 5 percent level of significance, for individuals of prime age to migrate, a one log-unit increase in the distance to the regional capital is associated with a 0.6 percent increase in the incidence of rural migration (Table 6.7). The results suggest that, for those living far from regional capitals, a less costly move to a rural area is the only viable option. Finding ways to remove these constraints—such as through improved access to credit and ICTs—will enhance urban migration opportunities for rural households, especially for those individuals of an economically active age.

233. There is little evidence that service availability influences migration decisions. Previous analysis for Uganda found that a lack of service amenities in rural areas was associated with greater out-migration (World Bank 2012). However, although households that send migrants are more likely to live in closer proximity to an elementary school and health clinic, controlling for other factors, there is little significant difference in access to services between those that send migrants and those that do not (Table 6.5).

235. There is some evidence that shocks do influence migration patterns in Uganda. Rainfall shocks were found to spur an exit from agriculture in favor of urban areas. Rainfall shocks are measured by a WRSI, which measures the amount of rainfall against the ideal that is required for optimal maize production. Those who migrated experienced a lower WRSI in 2005 than stayers, indicating a higher rainfall deficit experienced among those who moved. The rainfall deficit faced by urban movers relative to stayers

48. The share of urban residents in a given ethnicity is calculated using 2002 census data.

49. One may suspect that some of these household-level variables, such as access to formal savings and mobile phones, are merely correlates of having a higher level of welfare (which is also associated with out-migration). However, the results reported are robust to the inclusion of lagged household welfare levels, suggesting that these point estimates are not merely artifacts of higher pre-migration consumption levels.

is twice as large as the one for rural movers (Table 6.6). As a result, in a regression framework, rainfall shocks are strongly predictive of urban migration. A 25 percent reduction in the WRSI (that is, an increased rainfall deficit) leads to a 2.6 percent increase in the incidence of out-migration for young adults (Table 6.7). Migration to rural areas is no higher for those who experience rainfall shocks. In rain-fed agricultural areas and in the absence of crop insurance, rainfall deficits lead some individuals to escape from rural areas and settle in urban areas.

236. Violent conflict is also associated with

migration, but to rural areas. Movers come from areas that are more prone to violent conflict than stayers come from, with an even larger incidence of conflicts for urban movers than for rural movers (Table 6.6). However, in a regression framework, conflict is only significantly correlated with rural migration, not urban migration. A doubling of the number of conflict-related fatalities is associated with a 0.8 percent increase in the incidence of out-migration of young individuals of prime age to migrate. In 2005, the Northern region in Uganda faced conflict with four times the number of fatalities (22) than were recorded in the Central region (6), which was the region with the next highest fatality rate. Young individuals were 3.6 percent more likely to migrate from Northern Uganda than from Central Uganda (Table 6.7). This

migration was to rural areas.

237. Asset losses are associated with migration.

There is a positive and significant 4 percentage point relationship between a household experiencing a theft or fire and future out-migration once household fixed effects are controlled for. Two factors could be behind these results. It could be the case that with fewer assets, households are less committed to stay in their home village, encouraging the household to migrate. It could also be that migration is an economic coping mechanism for households that have experienced asset shocks.

238. In further support of the idea that migration is in part a household's attempt to insure itself against shocks, households with stronger networks to rely on in the face of shocks are less likely to send migrants.

A household's reliance on networks for insuring against shocks is associated with a 3 percentage point lower likelihood of sending out a migrant in the next survey round, once other household characteristics have been controlled for (Table 6.5). This finding suggests that households with less robust local support networks could instead rely on migration to deal with risk.

239. To some degree, migration in Uganda has aided poverty reduction by allowing households to manage shocks.

However, it is not clear from this



analysis whether migration of this type should be encouraged. Although this type of migration aided poverty reduction when it occurred, migration may or may not be the optimal strategy to manage

risk. Reducing households' exposure to risk or increasing their access to other ways to manage risk may be a more sustainable approach to increase resilience.

Table 6.5: Correlates of a household's decision to send a migrant

	(1)	(2)	(2) – (1)	Coefficient in Regression+
	No Migrant	Sent Migrant	Difference	
Household has a formal loan of any type	0.17	0.28	0.11***	0.03***
Household member has a savings account with a formal institution	0.14	0.29	0.11***	0.06***
Share of migrants within head's ethnicity	0.17	0.19	0.01***	0.07
Reliance on networks for insuring shocks	0.32	0.20	-0.08***	-0.03***
Household owns mobile phone	0.41	0.64	0.23***	0.03***
Elementary school within one hour of household	0.81	0.87	0.09***	-0.02*
Health center/clinic within one hour of household	0.69	0.82	0.13***	0.01

Source: Staff calculations using UNPS 2006–2011.

Table 6.6: Correlates of migration at the individual level

	Non-migrants (1)	Migrants			Significance of Difference		
		All (2)	To Urban (3)	To Rural (4)	(1)–(2)	(1)–(3)	(1)–(4)
Individual received loan from any source		0.117	0.147	0.076	***	***	***
Log kilometers from Kampala	4.820	4.698	4.220	5.209	***	***	***
Log kilometers from regional capital	4.195	3.935	3.443	4.461	***	***	***
Log WRSI maize	4.388	4.372	4.365	4.380	***	***	*
Log number of fatalities	0.803	1.735	1.973	1.417	***	***	***
Share of one's ethnicity living in urban areas	0.126	0.141	0.161	0.114	***	***	***

Source: Staff calculations using UNPS 2006–2011.

Table 6.7: Shocks, distance, and the probability of migration of 15–24-year-olds

	Effect on Probability of Migration of 15–24-Year-Olds, Percent		
	All	To Urban	To Rural
Decrease in WRSI from 100 to 75 percent	1.6	2.6*	1.0
Increase in number of fatalities from 6 to 24	3.6**	0.8	3.6***
Log kilometers from regional capital	0.008**	0.006**	0.002

Source: Staff calculations using UNPS 2006–2011.

6.4 Conclusion

240. This chapter has highlighted the strong welfare impact of migration—both to rural and urban areas—but particularly to urban areas. The welfare impact of migration strongly supports urbanization and pro-rural-urban migration policies for their linkage to poverty reduction in Uganda and similar developing countries.

241. The evidence is consistent with low levels of education, lack of access to finance, long distances to urban centers, and limited migrant networks in urban areas constraining migration for some households. Improving education, access to finance, and access to ICT would help these households migrate.

242. Migration is often undertaken to help mitigate the impact of negative shocks. Policies that allow free movement can transform the lives of rural individuals prone to shocks by offering them migration opportunities to boost their earning

potential in urban areas. However, it is not clear that migration is the optimal response to a shock. Policies are also needed to reduce exposure to risk and increase a household's access to markets and public programs that help it manage risk. The restoration of peace in northern Uganda was a major step in reducing exposure to risk.

243. Improving education outcomes for women may also require programs that encourage delaying young women's age at marriage. To ensure females take full advantage of urban migration opportunities for their own welfare and to facilitate remittance transfers to their parent households, programs that delay young women's age at marriage—such as adolescent empowerment interventions (Bandiera et al. 2014)—should be considered. The results highlight the importance of investments in the education of rural populations, which would increase human capital and enhance the migration potential for future generations.



After work Traffic, down town -Kampala

CHAPTER: 7

EDUCATION AND HEALTH SERVICES: QUALITY OF INPUTS, USER SATISFACTION, AND COMMUNITY WELFARE LEVELS⁵⁰

Poorer communities tend to have services of lower quality, but are more satisfied with the services that they are receiving.



244. A better-educated and healthy population is more likely to transition from subsistence agriculture to more productive jobs.

Chapters 2 and 5 highlighted the importance of human capital for poverty reduction. In Uganda, education is a key predictor of earnings as well as household consumption (see, for example, Fox and Pimhidzai 2011; and Tsimpo and Wodon 2014a). Apart from its impact on livelihoods, the case for investments in education can also be made on the basis of its impact on health outcomes, among others.

245. Since 1997, the GoU has implemented a series of policies as well as made substantial budget investments to improve education and health services as well as the demand for those services.

On the supply side, key policies include building and renovating schools and health centers; purchasing adequate instructional materials; training, hiring, and retaining teachers and health workers; improving the drugs policy under the national medical store (NMS); reducing teacher and health worker absenteeism; and serving areas that are hard to reach and hard to stay in. On the demand side, important policy reforms have been adopted as well, including for UPE, USE, school feeding programs, mama kits, and national immunization days, among others.

50. This chapter draws on the background paper: "Education and Health Services in Uganda: Quality of Inputs, User Satisfaction, and Community Welfare Levels," by Clarence Tsimpo, Alvin Etang, and Quentin Wodon.

246. This has led to improvements in access to education and health, but quality has deteriorated. For example, while access to education has improved, quality remains an issue and most students do not learn nearly enough. Arguments have actually been suggested that access has increased at the cost of quality, a problematic outcome because quality is essential for economic growth (Hanushek and Woessman 2012).

247. This chapter aims to assess the relationships between the quality of services in

education and health, the level of welfare of communities, and the satisfaction of users with facilities. The basic idea is to combine data from two different surveys to provide a profile of the quality of services available in communities in relationship to their level of welfare, while also assessing rates of user satisfaction with the services provided. This chapter draws heavily from two datasets: The SDI survey of 2013 and the UNHS of 2012/13. The SDI is used to compute the indicators on the supply and quality of services. The UNHS is used to rank facilities by welfare and to derive users' satisfaction.⁵¹

7.1 Quality of inputs at the school level

248. In general, more and better inputs seem to be available in better-off locations, as expected. Consider, for example, the pupil per classroom and pupil to teacher ratios. These ratios are much higher for the poorest quintile of communities than the richest (Figure 7.1 and Annex 2, Table A2.1). A typical classroom in the poorest quintile has 116 pupils, while the corresponding figure for the richest quintile is 58 pupils. A teacher in the poorest quintile has to attend to 58 pupils, while a corresponding teacher in the richest quintile attends to 31 pupils, on average.⁵² Overcrowding of pupils in classrooms in poorer areas is likely to have negative consequences on learning outcomes. The Northern region, which also happens to be the poorest region in Uganda, has the worst ratios.

249. Teacher absenteeism rates⁵³ at the level of schools or classrooms are also negatively correlated with welfare. Teachers are more likely to be absent in poorer areas. For communities in the poorest quintile, about four out of ten teachers are absent from school. The corresponding figure for the richest quintile is two out of ten teachers.

The two poorest regions (Northern and Eastern) are the regions with the highest rates of teacher absenteeism. Absenteeism may be driven in part by the fact that some locations in these regions are hard to reach (due to poor roads) and hard to live in (specific areas in Uganda are classified administratively as 'hard to reach/hard to stay'). Teacher absenteeism leads to inefficiency in public spending because teachers are paid with little benefits for students. While some level of absenteeism may be warranted, prevailing rates are clearly much too high, with likely consequences in terms of student learning (Finlayson 2009). Notably, absenteeism is higher among head teachers. Close to two out of five head teachers were not present. This certainly contributes to weakening the accountability mechanism at the school level.

250. Absenteeism rate is lower for female teachers. Female teachers are more likely to be present at school and in the classroom. School absenteeism rate for female teachers is 20 percent, which is 6 percentage points lower than male. This difference is statistically significant. Similarly, classroom

51. The UNHS provides information on household welfare. Each district of the country is split into two parts: urban and rural. The average household welfare is then attributed to the facilities in the SDI survey. Subsequently, this allows ranking of the facilities by quintiles of welfare.

52. Results from a Wald test confirm that the differences between the poorest and the richest quintiles are statistically significant

53. The SDI survey uses a standardized, internationally benchmarked methodology to measure absenteeism through unannounced visits. SDI teams conduct two visits to each facility. The first is announced in advance so as to increase the likelihood of being able to collect data on key indicators. The second visit, which happens during a seven-day period following the first visit, is unannounced and its purpose is to ascertain the whereabouts of staff. Staff who are not in the facility because it is not their shift are not considered absent. Health workers who are not in the facility because they are carrying out outreach activities are likewise not considered absent.

absenteeism for females is 44 percent, which is 14 percentage points lower than their male counterparts. Thus, teaching is not the only reason why male teachers show up in school. It would be interesting to understand what they could be doing in school when they are not in classrooms.

251. The learning environment in classrooms is again much better in richer areas. Schools in richer areas are more likely to have a library, electricity, and work displayed on the walls, among others (Figure 7.1). At the national level, serious challenges remain when it comes to classroom environment, especially in line with the country's ambition to become a middle-income country in the near future. Indeed, the availability of a library, electricity, or displayed material is still very low. For instance, only 8.8 percent of schools have a library. The corresponding figure for electricity is only 10.8 percent. It is worth noting that connectivity to electricity, while perhaps not the most essential element for student learning, is important to operationalize the 'skilling Uganda' agenda toward the use of ICT and appropriate vocational training.

252. Institutional aspects of the management of the schools show a mixed message across welfare distribution. At the national level, three out of five

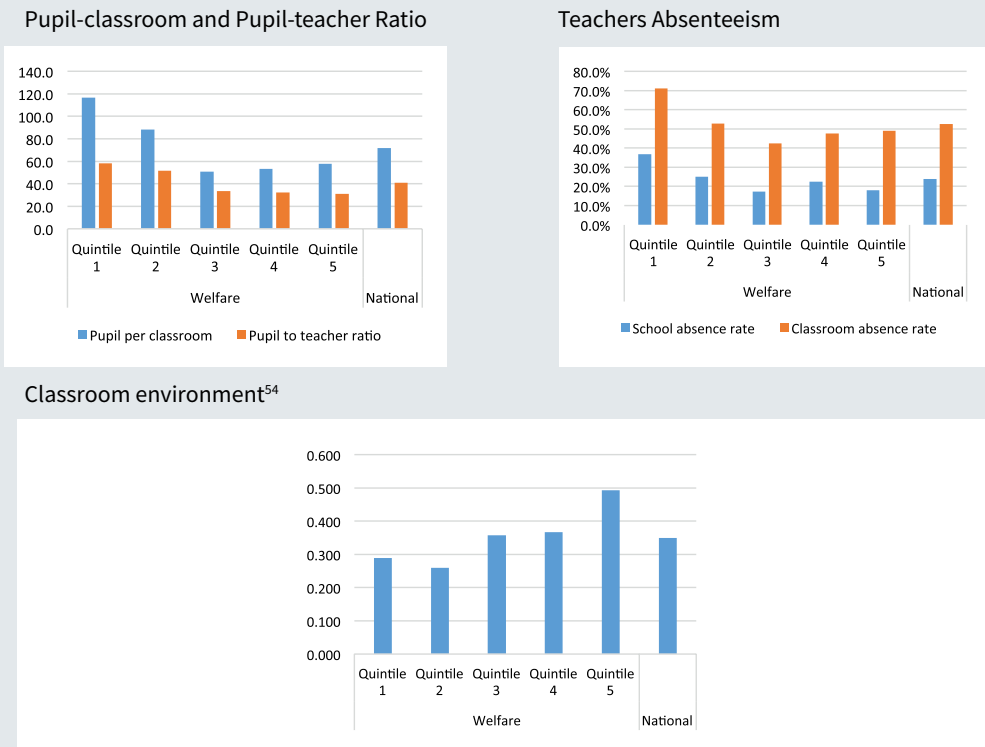
schools have a functioning PTA, even though, in principle, PTAs have been abolished in the country. Schools in poor areas are less likely to have a PTA. Indeed, while 46.6 percent of schools in the poorest quintile have a functioning PTA, the corresponding figure for the richest quintile is 55.2 percent (Annex 2, Table A2.1). By contrast, seven out of ten schools have a functioning School Management Committee (SMC), and there is no apparent relationship between welfare levels and the availability of an SMC in a school, probably because SMCs are mandatory.

253. Inspectors tend to often visit schools that are located in better-off areas. The likelihood of a school receiving the visit of an inspector during the school year is close to one for most schools. This is true across regions, regardless of welfare levels. The only exception is the Western region where up to 11 percent of schools did not receive the visit of inspectors. The number of inspections carried out at schools is, however, correlated with welfare. Inspectors tend to often visit schools that are located in better-off areas more. Here again, issues related to the fact that poor areas are more likely to be hard to reach/hard to stay areas may be at play in that visiting these areas is more costly for inspectors (Office of the Prime Minister 2012).



Classroom Blocks - Aduku ss

Figure 7.1: Inputs for primary schools by welfare and subregion



Source: Staff calculations using the 2013 SDI and the UNHS 2012/13 surveys.

7.2 Quality of inputs at the health center level

254. Sick people in poor areas are more likely to face overcrowding and long queues while visiting their health centers. The poorer the area, the higher the patient caseload⁵⁵ (Figure 7.2 and Annex 2, Table A2.2). Looking at the median, a health provider in the poorest quintile consulted six outpatients per day, against only three outpatients for the richest quintile. Health workers in the Northern region were the busiest and received six outpatients on a daily basis. The Eastern and Western regions also had high patient caseloads

with five health providers consulting six outpatients each, on a daily basis.

255. Unlike the education sector, there is no apparent correlation between health workers' absenteeism and welfare.⁵⁶ At the national level, it is estimated that excluding off duty, absenteeism rate is high at 42 percent. The incidence of health workers' absenteeism is quite similar across welfare quintiles. Results from a t-test show no statistically significant difference by quintile. There are important disparities across regions. Health

54. An index representing the quality of the classroom environment is estimated using factorial analysis. This index represents a weighted average of the various classroom characteristics (see Annex 2, Table A2.1 for the detailed list) with the weights for each variable directly derived from the data to maximize the explanatory power of the index.⁵⁵ See the previous footnote for education on how absenteeism measures are estimated.

55. Patient caseload is defined as the average number of outpatient visits a health worker attends to per working day.

56. See the previous footnote for education on how absenteeism measures are estimated.

workers are more likely to be absent in the Central region: half of the health workers were absent when excluding off duty. If the Central region is excluded from the analysis, then absenteeism of health workers negatively correlates with welfare and differences between the poor and the rich are statistically significant. Thus, remoteness (hard to reach/hard to stay) is a driver of health workers' absenteeism. On the other hand, the Central region being the one with the higher rate of absenteeism is something to explore further. Probably, available and appealing opportunities to diversify and increase income sources are playing a role here.

256. Contrary to the education sector, absenteeism of workers in the health sector is gender neutral.

Female health workers have the same probability to be absent as their male counterparts. This finding holds, even if one excludes the Central region. More analysis is needed to understand the underlying factors of absenteeism, but at least finding different patterns in the health and education sectors shows that particular actions might be needed for specific sectors to curb absenteeism in the country.

257. Disciplinary and quality assurance committees are more likely to be present in poor areas.

Institutional aspects of the management of health facilities show a mixed message across welfare distribution. On average, about half of the health facilities reported the presence of functioning Health Facility Management Committees. Very few health facilities have a procurement committee or an audit committee (only 5.9 and 6.2 percent, respectively). As a consequence, issues related to proper financial and resources management can be problematic. Disciplinary Committees are available only in one out of five health facilities. The share of health facilities with a quality assurance committee is also low (12.6 percent). Disciplinary and quality assurance committees are more likely to be present in poor areas. For instance, 37 percent of health

facilities in the poorest quintile have a disciplinary committee, compared to 17 percent for the top quintile.

258. In Uganda, most of the public facilities are push facilities.

Most public facilities (90 percent) are push facilities, which means that they receive drugs centrally. By contrast, most private facilities are pull facilities, which means that they order their drugs. For public facilities, drugs are centrally managed by the NMS. The NMS purchases drugs in bulk and handles the logistics of distribution across the country. It also retrieves expired drugs for proper disposal. This dichotomy between public and private providers is driving the story behind drugs.

259. The push system used by public facilities seems to be effective in that availability of essential drugs is higher in public facilities.

The six tracer drugs were indeed available in 46 percent of public facilities, but only in 15 percent of private facilities. The issue of lack of availability in private facilities may be related in part to 'for profit' behavior, in that little gain is to be obtained from these basic medicines. The presence of private pharmacies in areas where private health facilities operate and the comparative advantage of pharmacies in the drug business may be another factor explaining the low availability of these drugs in private facilities. Perhaps surprisingly, the Northern region is the region with the highest availability of tracer drugs. Efficiency of the NMS coupled with interventions of nongovernmental organizations may be a reason for this. Among the six tracer drugs, the measles vaccine had the highest stock-out rate.

260. The poorest localities are also those with very limited availability of basic infrastructure and equipment in health facilities.⁵⁷

The availability of basic infrastructure and equipment is positively correlated with community welfare. For example, health facilities in richer areas are more likely to have electricity and piped water,

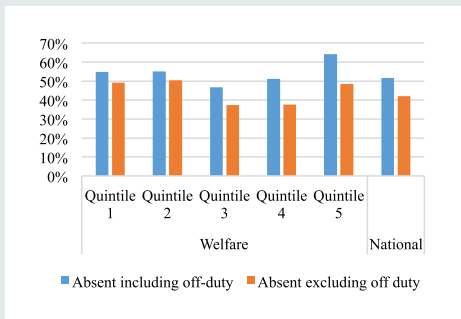
57. The SDI survey collected information on the availability of electricity, piped water, toilets, ambulance, microscope, weighing scale, blood pressure machine, thermometer, malaria test kit, HIV test kit, etc. (see Annex A7.3 for a detailed list).

as expected. Only one in ten health facilities has a functioning ambulance, again mostly in richer areas. Surprisingly, the availability of telephone (landline and mobile phone) remains low in most facilities. All health facilities in the richest quintile have an adult weighing scale, while the corresponding figure for the poorest quintile is 58 percent. Maternity waiting centers (antenatal rooms) are available in only 23.9 percent of health

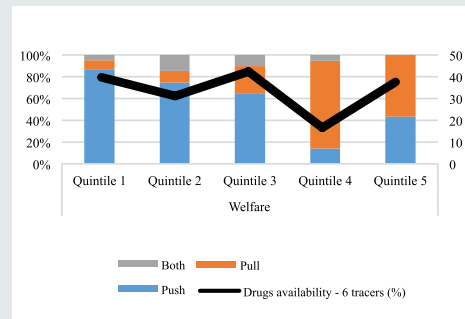
centers. This probably explains the fact that a low proportion of women delivered in formal health facilities under the attendance of specialized health workers, despite high rate of attendance for antenatal care and the mama kit program. The Northern and the Eastern regions, which happened to be the poorest, tend to have very limited availability of infrastructure and equipment in their health facilities.

Figure 7.2: Inputs for health facilities by welfare and subregion

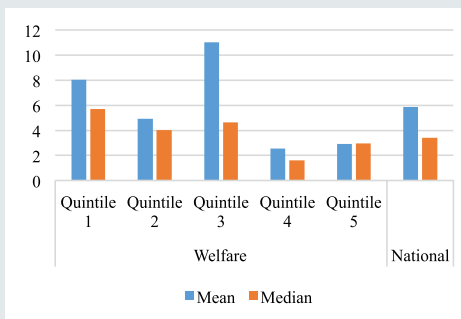
Health workers absenteeism



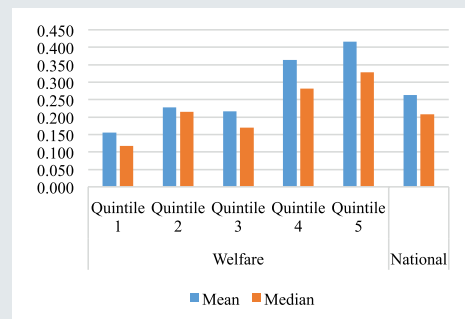
Push or a pull facility and drugs availability



Caseload (median)



Infrastructure availability index⁵⁸



Source: Staff calculations using the 2013 SDI and the UNHS 2012/13 surveys.

58. The share of teachers with minimum content knowledge was observed based on results of a customized teacher test administered to Primary 4 mathematics/numeracy and English teachers. The English test results were for teachers teaching English, and the mathematics test results were for teachers teaching mathematics. The tests were based on items from the curricula being taught in Uganda (World Bank 2013).

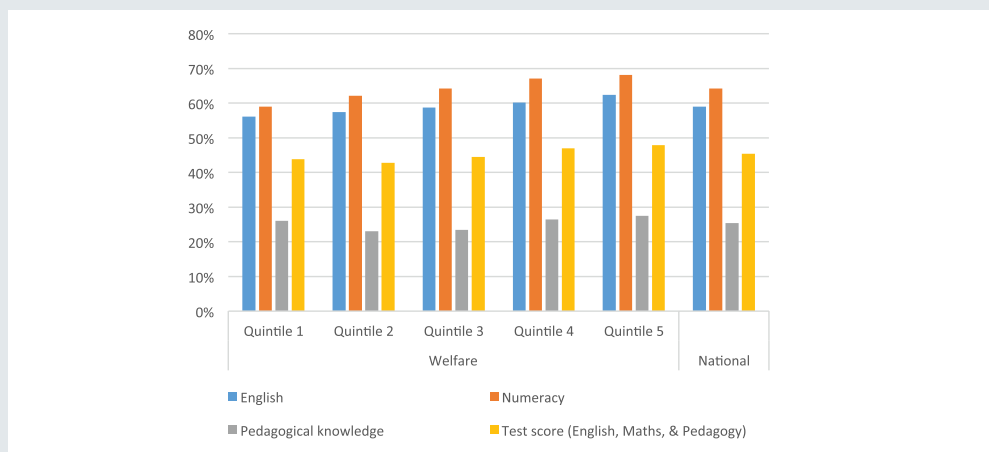
7.3 Knowledge and behavior of teachers

261. There is a clear, positive relationship between teacher knowledge and community welfare. Teachers’ knowledge of the subjects they teach is low, as are pedagogical skills to transform their knowledge into quality teaching.⁵⁹ On average, teachers scored 59 percent and 64 percent in the English and numeracy/mathematics tests, respectively (Figure 7.3). Teacher knowledge increases with community welfare. For instance, teachers in the poorest quintile of communities scored 56 percent and 59 percent in the English and numeracy/mathematics tests. The corresponding figures for the richer quintile of communities are 62 and 68 percent. The difference between the poorest and the richest quintile is statistically significant for English and mathematics. In line with the positive correlation between teacher knowledge and community welfare, the Northern region is also the region where teacher scores are the lowest for both the English and numeracy/mathematics tests.

262. Female teachers perform better in English, while male teachers perform better in mathematics. Female teachers scored 56 percent in English while their male counterparts score 53 percent on average. Although this difference seems small, it is statistically significant. With regard to mathematics, male teachers performed better than females, scoring 60 percent compared to 53 percent for female teachers. This difference is also statistically significant.

263. There are no significant differences in teachers’ pedagogical knowledge across community welfare quintiles. Results from a Wald test suggest similar pedagogical knowledge across the board. Estimation results suggest that overall, pedagogy skills are disappointingly low, as reflected in the average score of 25 percent on the pedagogy test and only 7 percent of teachers scored above 50 percent.

Figure 7.3: Primary school teachers’ assessment by welfare quintiles



Source: Staff calculations using the 2013 SDI and the UNHS 2012/13 surveys.

59. The share of teachers with minimum content knowledge was observed based on results of a customized teacher test administered to Primary 4 mathematics/numeracy and English teachers. The English test results were for teachers teaching English, and the mathematics test results were for teachers teaching mathematics. The tests were based on items from the curricula being taught in Uganda (World Bank 2013).

7.4 Knowledge and behavior of health workers

264. The accuracy of diagnostics is lower in poor areas, especially for acute diarrhea, pneumonia, diabetes mellitus, and pulmonary tuberculosis (PTB).⁶⁰

Only one in four health workers was able to diagnose all five tracer conditions. The diagnostic assessment shows that health workers perform very poorly on acute diarrhea. Less than half (47 percent) were able to properly diagnose acute diarrhea. Performance on pneumonia and diabetes mellitus is also very low, with only 60 percent able to accurately diagnose each of these diseases. For all the diseases, health workers' knowledge increases with welfare (Figure 7.4). For those in the poorest quintile, only 16 percent were able to accurately diagnose the five tracer conditions. The corresponding figure for the richest quintile is 39.6 percent. The biggest knowledge gap across welfare quintiles is revealed through diagnosis of pneumonia. Among health workers in the richest quintile, 85.3 percent were able to properly diagnose pneumonia, against only 44.5 of those in the poorest quintile. The knowledge gap across quintiles is also big (double digit) for acute diarrhea, diabetes mellitus, and PTB. Diagnostic accuracy was significantly higher in Kampala and lower in the Northern region. For example, in Kampala, 41 percent of the providers were able to accurately diagnose all the five tracer conditions. In the Northern region, only 11 percent of the providers were able to do so.

265. There is no clear correlation between community welfare and management of neonatal asphyxia, but proper management of post-partum hemorrhage increases with community welfare. Only half (54.3 percent) of the providers were able to properly manage maternal and newborn complications (post-partum hemorrhage and neonatal asphyxia). Proper management of post-partum hemorrhage

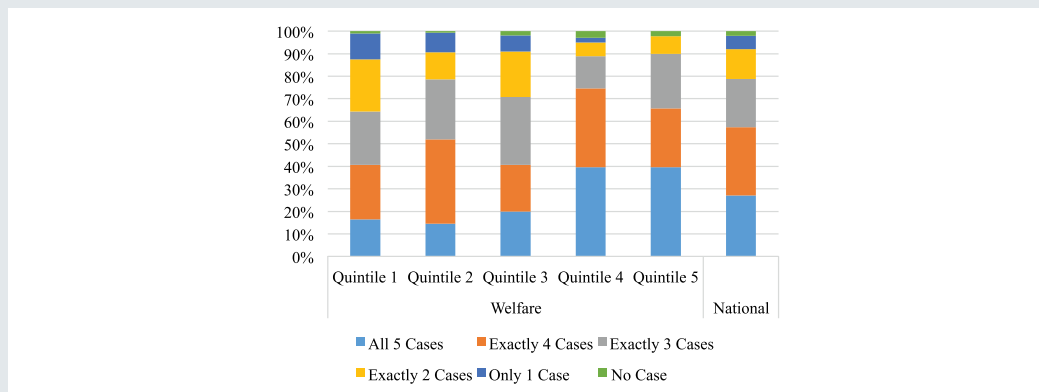
is positively correlated to community welfare. For example, for the richest quintile, 84.6 percent of providers were able to properly manage post-partum hemorrhage (Figure 7.5). The corresponding figure for the poorest quintile is 67.6 percent. Regionally, the worst performance is registered in the Eastern and Western regions where only 48.6 and 52 percent, respectively, of providers are able to properly manage neonatal asphyxia. The knowledge gap between these two regions and other regions regarding neonatal asphyxia is very big. In other regions, at least 74 percent of providers were able to properly deal with neonatal asphyxia.

266. Male health workers exhibit better knowledge of the common diseases as well as better management of neonatal asphyxia and post-partum hemorrhage. About 35 percent of male health workers were able to diagnose all the five cases. Meanwhile, only 13 percent of female health workers were able to do so. One out of four female workers (24 percent) was not able to properly manage any of the neonatal asphyxia and post-partum hemorrhage conditions. Meanwhile the corresponding figure for males is only 8 percent.



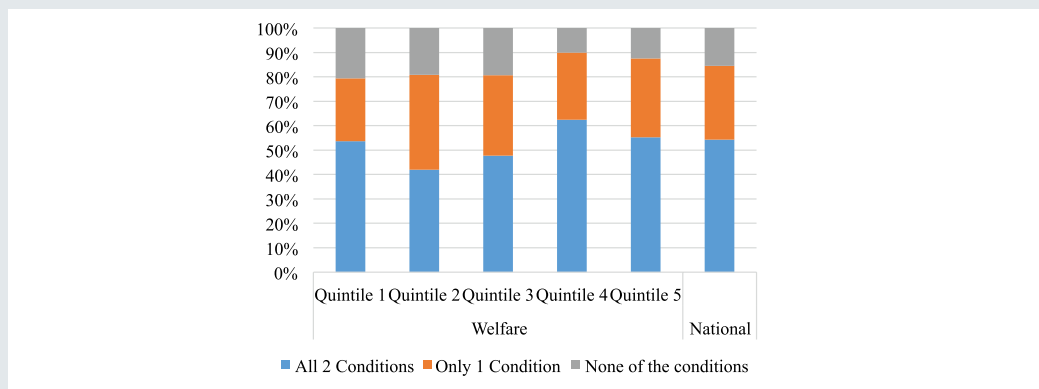
60. Health worker knowledge and quality of care were assessed using two indicators of process (adherence to clinical guidelines in five tracer conditions and management of maternal and newborn complications—as measured in the vignette interviews) and one indicator of outcomes (diagnostic accuracy in the five tracer conditions at the end of the vignette interviews). Three of the tracer conditions were childhood conditions (malaria with anemia, acute diarrhea with severe dehydration, and pneumonia), and two were adult conditions (PTB and diabetes mellitus). Two other conditions were included: post-partum hemorrhage, the most common cause of maternal death during birth; and neonatal asphyxia, the most common cause of neonatal death during birth (World Bank 2013).

Figure 7.4: Share of health workers giving the correct diagnostic (5 tracer conditions)



Source: Staff calculations using the 2013 SDI and the UNHS 2012/13 surveys.

Figure 7.5: Share of health workers giving the correct diagnostic for post-partum hemorrhage and neonatal asphyxia



Source: Staff calculations using the 2013 SDI and the UNHS 2012/13 surveys.

7.5 Outcomes at the school level

267. Learning outcomes are strongly and positively correlated with community welfare.

The pupil assessment consisted of three parts: English, numeracy, and non-verbal reasoning.⁶¹ Overall, pupils answered 47 percent of questions on the test correctly. The average score for English was 46 percent and for numeracy was 43 percent. The

average score on the non-verbal reasoning part of the test was 57 percent. There is substantial variation in learning outcomes across community welfare (Figure 7.6). For example, pupils in the richest quintile scored 66 percent overall while those in the poorest quintile scored only 34 percent. The largest gaps are observed for English, where

61. Learning outcomes were measured for grade 4 pupils. Outcome for health facilities are more complex to measure, hence the SDI survey did not attempt to collect such information. This section therefore focuses on student outcomes only. The objective of the pupil assessment was to assess basic reading, writing, and arithmetic skills. The test was designed by experts in international pedagogy and based on a review of primary curriculum materials from thirteen African countries, including Uganda (see Johnson, Cunningham, and Dowling 2012). The pupil assessment also measured non-verbal reasoning skills on the basis of Raven's matrices, a standard IQ measure that is designed to be valid across different cultures.

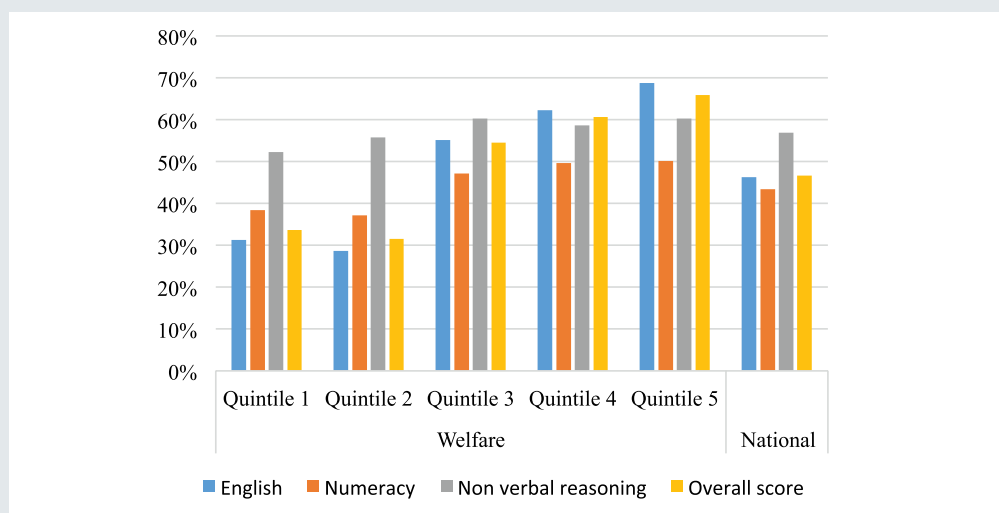
pupils in the richest quintile answered 69 percent of questions correctly versus only 31 percent of pupils in the poorest quintile. The knowledge gap across the welfare distribution is also important for numeracy. Students in wealthier communities performed better, which could be related to the fact that as discussed earlier, schools in wealthier communities had better inputs related to the classroom environment, teacher absenteeism, and pupil-teacher and pupil-classroom ratios, among others.

268. The low quality of inputs is affecting the performance in poor communities. The determinants of pupils’ performance is assessed using econometric modeling (Annex 2, Table A2.7). A wide range of factors can affect the ability of children to learn in school. Previous work for Uganda suggests that children from disadvantaged backgrounds are less likely to fare well. However, school-level factors also play a role (Mulindwa and Marshall 2013). Using the SDI and UNHS surveys it appears that performance is affected by a variety of factors, including pupil-teacher ratio, inspections, school/classroom environment, and, to some

extent, management. Teacher absenteeism reduces student performance. Better teacher behavior leads to better student performance, as does a better score of the teacher in English and numeracy tests. The econometric results also suggest that boys perform better than girls do, particularly in mathematics, and non-verbal reasoning.

269. These results are consistent with expectations and have the following implication: improving the quality of inputs could bring substantial gain in learning outcomes. The results suggest that improvements in the quality of teaching and the knowledge base of teachers could bring substantial gains in student performance, especially in poor areas. A reduction in pupil-teacher ratio as well as better school infrastructure would also bring gains, although these are likely to be smaller, and may be more costly to achieve in terms of budgetary resources. Although one should be careful not to infer causality, it could also be that strengthening the inspection regime would bring gains as well, while by contrast PTAs and SMCs seem to have less of a beneficial impact, possibly because how well they function matters more.

Figure 7.6: Pupil assessment (score)



Source: Staff calculations using the 2013 SDI and the UNHS 2012/13 surveys.

7.6 User satisfaction with facilities

270. Poorer communities are more likely to be satisfied with the services that they are receiving, even though it is clear from the analysis based on the SDI survey that the level of inputs and their quality is higher in better-off communities.

The perceived quality of service is negatively correlated with community welfare (Figure 7.7). The likely explanation is that poor communities are so deprived that their expectations are low. This leads them to be more easily satisfied with the services they get. By contrast, better-off communities have higher expectations and therefore are more demanding about quality and less satisfied, even if objectively they are getting comparatively better services.

271. Low expectations in poor communities can be a problem for social accountability.

Social accountability is an approach toward building accountability that relies on civic engagement, in which citizens participate directly or indirectly in demanding accountability from service providers and public officials. Social accountability generally combines information on rights and service delivery with collective action for change. In Uganda, social accountability has emerged as an important tool in the fight for better governance and service delivery. Examples include U-report, Barazas, and the Uganda Participatory Poverty Assessment Process.

272. Besides low expectations, there are several other hypotheses for this observation. First, it could just be lack of information to the poor of what their options or choices are. For example, the supply of private facilities may not be available for the poor. Second, poor people just cannot hold providers accountable because either they cannot observe provider quality or they do not have the power. Third, there also exists the possibility that the poor could be threatened if they engage in organizing themselves. Fourth and finally,

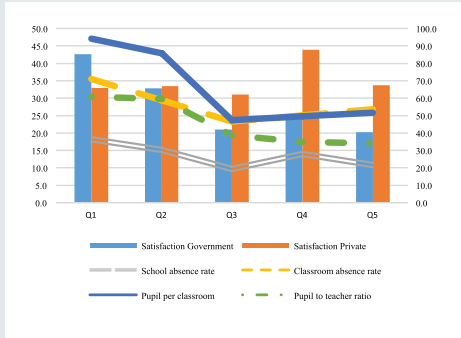
the opportunity costs of staying organized for a sustained period could be really high for the poor.

273. The contrast between the objective measures of inputs from the SDI survey and the measures of satisfaction from the UNHS raises questions for the effectiveness of community-based monitoring and the demand for accountability.

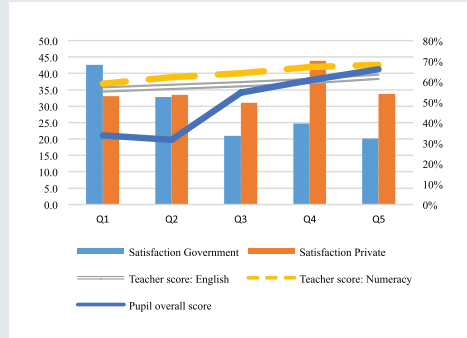
If the population in poor communities has low expectations or is not exposed enough to good quality services to be able to assess quality, it is not clear that it can effectively lobby for quality services. For social accountability mechanisms to be effective, additional measures may be needed to enable disadvantaged communities to properly monitor the services they receive. The issue is not specific to Uganda, and there are examples of social accountability initiatives with mixed results (Fox 2015). Issues of political economy may also have to be considered for social accountability measures to work (Joshia and Houtzagerb 2012). Overall, in a context where poverty and expectations are a problem, more needs to be done for social accountability to be effective. These findings are in line with existing literature. For example, Svensson et al. (2015) conducted an experiment on community-based monitoring of absenteeism versus head teachers monitoring. They found that local monitoring improves teacher attendance but only when the head teacher is responsible for monitoring and there are financial incentives for teachers at stake. Moreover, they also found that parents generate significantly less reliable reports than head teachers do. The results in this chapter further echo the importance of information as highlighted by (Reinikka and Svensson 2005). They conducted an experiment that shows that making information on budget allocation available to the beneficiaries, reduces corruption and elite capture, and ends up having a positive impact on enrollment and educational outcomes.

Figure 7.7: Inputs and user satisfaction by welfare quintiles in education sector

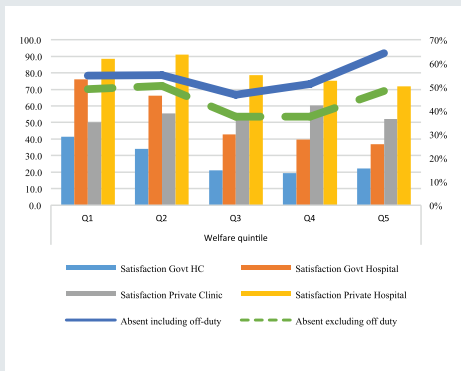
Absenteeism, pupil per classroom per teacher



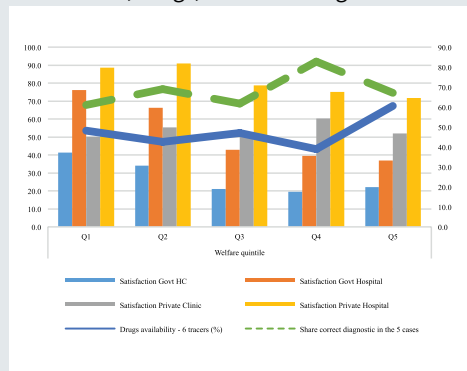
Teacher and pupil knowledge



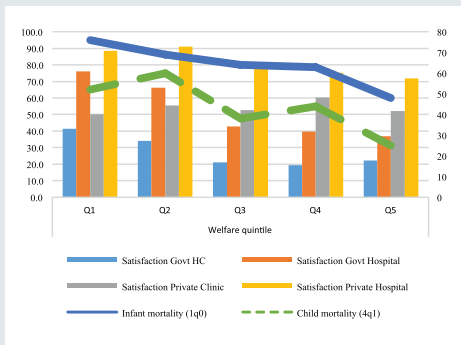
Satisfaction and health workers' absenteeism



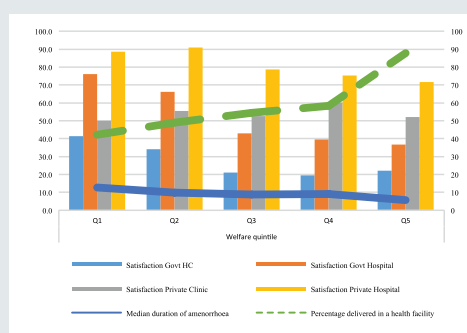
Satisfaction, drugs, and knowledge



Satisfaction and child mortality



Satisfaction and maternal health



Source: Staff calculations using the 2013 SDI survey, UNHS 2012/13, and UDHS 2011.

7.7 Conclusion

274. Poorer communities tend to have services of lower quality, but are more satisfied with the services that they are receiving. Low quality of inputs in poor communities negatively affects outcomes such as student learning. The poor are more likely to be satisfied with the service that they are getting, although objective measures from the SDI survey suggest that it should be the opposite. This implies that the poor are so deprived that their expectations are low, and they tend to be happy with the little service that they can get. Conversely, the non-poor tend to have higher expectations and therefore will be more demanding about quality and will be less satisfied, even if objectively they are getting the best service in the country.

275. The contrast between the objective measure of quality and the perceived quality raise has implications for social accountability mechanisms. If populations in poor areas have low expectations, their ability to monitor quality is weakened. Apart from the demonstration of the need to improve inputs for education and health facilities in Uganda, one of the implications of the analysis is that for social accountability mechanisms to be effective, additional measures must probably be taken to enable populations in poor communities to ask for and obtain higher quality services.



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ANNEXES

The image features a dirt road that curves through a field of tall grass and scattered trees. The entire scene is overlaid with a dark teal gradient that is darkest at the top and bottom edges and lighter in the center. The word "ANNEXES" is printed in a bold, white, sans-serif font across the middle of the image.

ANNEX 1: EXPLORING PATTERNS OF FOOD AND NON-FOOD CONSUMPTION OVER TIME, METHODOLOGY

1. Appleton et al. (1999) examined spending on basic non-food items to estimate the share of food in the national poverty line following an approach adopted from Ravallion and Bidani (1994). Appleton et al. investigated the expenditure patterns of people who are at the food poverty line by regressing the food share of household i (s_i) on region/urban-rural dummy, demographic characteristics, and the ratio of adult equivalent consumption expenditure (Y_i) to food poverty line z^f (and its square):

$$s_i = b_0 + b_1 \ln(Y_i / z^f) + b_2 \ln(Y_i / z^f)^2 + \sum_{j=2}^8 f_j D_j + b_3 w_i + e_i \quad (1)$$

...where e_i is the error term, D_j is dummy for the four regions urban/rural (central urban is excluded and serves as a reference group), w_i is the demographic characteristics of household i including household size, head's gender, and proportion of boys/girls of different age groups in the household, and z^f is the food poverty line, which is U Sh 21,258.

2. The estimation result for equation 1 is presented in Table A1.1. Column 2 of Table A1.1 shows the estimated coefficient by Appleton et al. (1999), using 1997/98 data. Column 3 of this table presents estimates of equation 1 using UNHS 2012/13 data.
3. Table 1.4 presents the share of spending on basic non-food items in total consumption expenditure using the national average demographic characteristics of these households (w_m). For households residing in region j , the predicted non-food share is given by $1 - (b_0 + f_j + b_3 w_m)$.⁶²

62. In equation 1, Central Urban is omitted. The interaction between the demographic characteristics of the 'food poor' households and the corresponding coefficients in Table A1.1, that is, $b_3 w_m$, is 0.071. Therefore, non-food share for Central Urban is $0.9 = 1 - (b_0 + b_3 w_m)$. In other regions, the share of non-food expenditure is estimated by $1 - (b_0 + f_j + b_3 w_m)$.⁶²

Table A1.1: Regression of food share

	1997/98		2012	
	Coef.	t-stat	Coef.	t-stat
Log consumption per capita divided by food poverty line	0.060	(11.9)	0.01	(1.64)
Square of log consumption per capita divided by food poverty line	-0.053	(-19.84)	-0.04***	(-14.97)
Central rural	-0.119	(-15.26)	0.09***	(11.67)
East rural	-0.052	(-6.46)	0.18***	(20.88)
East urban	0.044	(5.480)	0.09***	(7.94)
North rural	-0.031	(-3.65)	0.19***	(22.49)
North urban	0.029	(3.52)	0.10***	(9.68)
West rural	-0.020	(-2.50)	0.21***	(27.88)
West urban	0.066	(8.44)	0.12***	(9.71)
Household size	0.008	(1.54)	0.00	(0.00)
Male-headed household	-0.006	(-1.05)	-0.01*	(-1.94)
The following variables are as proportion of household size:				
Boys aged <6 years	0.071	(3.99)	0.12***	(6.54)
Boys aged 6–12 years	0.052	(2.62)	0.11***	(5.47)
Boys aged 13–17 years	0.041	(1.92)	0.06***	(2.83)
Men aged 60+	0.082	(5.33)	0.14***	(6.83)
Girls aged <6 years	0.089	(4.81)	0.11***	(6.18)
Girls aged 6–12 years	0.047	(2.34)	0.11***	(5.59)
Girls aged 13–17 years	0.022	(1.0)	0.02	(0.73)
Girls aged 18–59 years	0.056	(4.41)	0.08***	(5.22)
Women aged 60+	0.075	(4.32)	0.17***	(8.90)
Constant	0.55	(60.55)	0.34***	(22.68)
Observations		4,962		6,888
R-squared		0.255		0.43

Note: t-statistics in parentheses *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

ANNEX 2: ADDITIONAL TABLES ON SERVICE DELIVERY AND WELFARE

Table A2.1: Primary schools—resources and management

	Provider		Location		Region				Welfare					National	
	Public	Priv.	Urb.	Rur.	Central	Eastern	Kampala	Northern	Western	Q1	Q2	Q3	Q4		Q5
Basic resources															
Pupils per classroom	86.4	35.0	72.4	71.4	47.0	90.5	44.2	136.0	53.4	116.5	88.3	51.0	53.1	57.9	71.7
Pupil to teacher ratio	47.6	22.2	35.5	42.4	28.8	49.6	21.8	61.0	34.4	58.0	51.5	33.4	32.4	31.0	41.0
Pupil to textbook ratio	24.2	92.4	36.7	26.4	14.9	34.2	43.2	91.3	22.7	48.6	63.6	54.0	14.5	13.4	27.8
Teacher absenteeism (%)															
School absence rate	27.4	13.2	14.2	26.3	21.8	26.0	10.2	34.7	18.5	36.9	25.1	17.2	22.6	18.0	23.8
Classroom absence rate	57.0	39.8	46.7	54.1	46.7	59.7	42.9	69.5	42.1	71.1	52.8	42.5	47.5	49.0	52.6
Reasons for absence															
Not his/her shift	1.8	5.7	0.0	2.7	0.9	0.0	0.0	4.8	4.8	3.8	2.3	4.0	0.0	1.2	2.4
Sick	17.0	21.0	21.7	16.9	18.6	18.3	15.2	14.9	18.3	11.8	17.2	28.7	14.6	22.8	17.5
Maternity leave	3.9	5.6	4.1	4.1	8.0	3.0	2.1	3.0	2.5	3.9	2.0	3.6	4.1	7.3	4.1
In training	2.3	1.5	0.3	2.4	0.8	2.8	2.9	1.9	3.4	0.7	5.3	5.0	1.1	0.5	2.2
Field trip	29.7	30.3	45.0	27.7	31.3	21.4	34.3	30.2	39.1	27.6	27.8	37.4	25.4	35.0	29.8
Funeral	2.9	0.0	0.0	2.8	4.8	0.6	0.0	3.6	1.2	2.2	1.8	1.8	6.4	0.0	2.5
Other approved absence	1.1	0.0	0.0	1.1	3.6	0.0	0.0	0.0	0.2	0.0	0.0	0.3	0.8	4.1	0.9
Gone to retrieve salary	24.6	25.0	21.2	25.1	23.2	46.3	43.4	11.5	9.6	26.8	32.1	4.6	29.9	21.2	24.7
On strike	10.1	7.6	2.4	10.8	4.7	7.1	2.1	21.6	6.4	16.4	10.9	2.3	7.2	5.2	9.8
Other	6.7	3.2	5.2	6.3	4.2	0.4	0.0	8.5	14.5	6.8	0.5	12.3	10.5	2.6	6.2
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Classroom environment															

Library corner/books for pupils	9.4	6.9	31.2	5.4	11.1	11.2	36.6	0.0	7.4	1.1	1.0	11.6	4.2	28.2	8.8
Blackboard/whiteboard in class	99.7	100	100	99.7	100	100	100	100	99.3	100	100	98.9	100	100	99.8
Chalk/marker to write	97.8	99.0	98.8	98.0	100	99.7	100	98.8	94.6	99.7	97.2	94.7	99.2	100	98.1
Working electricity connection	6.0	24.8	32.3	7.6	17.7	11.9	55.6	3.1	4.6	5.4	2.2	6.0	15.7	26.9	10.8
Children's work on walls	8.5	19.6	15.3	10.7	24.3	3.4	33.5	0.0	10.6	2.6	1.4	17.1	13.6	24.0	11.3
Other materials on walls	38.5	44.2	86.8	33.2	56.5	34.4	93.5	33.1	29.3	30.1	16.6	33.5	53.6	70.3	39.9
Hygiene in the class-room	77.9	70.8	91.1	73.9	70.2	61.8	100	85.9	86.3	74.9	69.4	84.6	71.2	80.8	76.1
Blackboard good for reading	86.3	90.4	89.8	87.0	87.6	72.3	100	97.3	93.4	87.5	84.1	92.2	85.1	87.9	87.4
Enough light for reading	95.8	95.6	98.0	95.4	92.7	93.1	90.3	98.1	99.8	94.7	95.7	95.1	95.1	98.3	95.7
Enough light for reading at back	90.7	90.2	88.1	90.9	85.5	82.0	79.0	97.3	99.3	90.5	91.3	94.4	90.1	86.1	90.6

Classroom environment index

Mean	0.336	0.388	0.526	0.324	0.405	0.311	0.625	0.300	0.337	0.289	0.259	0.357	0.367	0.493	0.349
Median	0.268	0.268	0.409	0.268	0.337	0.268	0.599	0.268	0.268	0.268	0.268	0.268	0.332	0.441	0.268
Inspection, SMC, PTA															
Share with functioning PTA	69.1	38.9	69.0	60.2	58.2	60.4	46.2	46.3	73.8	46.6	54.6	72.6	78.4	55.2	61.3
Share with functioning SMC	76.2	50.8	78.8	68.3	54.8	66.3	66.4	77.9	81.5	69.9	69.9	76.3	65.4	65.9	69.6
At least one inspection (%)	98.1	82.5	100	93.2	92.1	99.2	100	98.5	89.0	99.1	85.4	99.3	89.5	97.0	94.1
Number of inspections, mean	5.3	3.6	7.7	4.4	4.0	6.0	5.5	3.9	5.1	4.1	4.6	6.4	3.0	6.2	4.8
Number of inspections, median	4	4	6	3	3	4	3	3	5	3	3	5	3	4	4

Source: Staff calculations using the 2013 SDI and the UNHS 2013 surveys.

Table A2.2: Health facilities—caseload, workers, management, and drug availability

	Provider		Location		Region				Welfare				National	
	Public	Priv.	Urb.	Rur.	Central	Eastern	Kampala	Northern	Western	Q1	Q2	Q3		Q4
Caseload														
Mean	10	2	2	8	7	8	1	6	10	8	5	11	3	3
Median	6	2	1	5	4	5	1	6	5	6	4	5	2	3
Absenteeism rate (%)														
Absent including off duty	51.2	52.2	50.7	52.4	59.3	52.2	50.4	54.2	48.0	54.8	55.1	46.7	51.2	64.2
Absent excluding off duty	44.0	38.6	36.9	45.8	51.0	43.0	36.3	48.3	42.3	49.1	50.4	37.4	37.5	48.3
Reason for being absent														
Sick/maternity	8.2	4.1	4.2	8.4	5.9	8.7	4.7	11.0	5.6	11.3	7.7	3.5	5.4	0.0
In training/seminar	11.7	5.7	5.4	12.3	23.6	4.4	5.0	8.5	13.0	8.4	7.6	17.1	6.7	28.9
Official mission	7.4	4.6	4.9	7.3	6.9	14.8	1.9	8.0	4.9	11.9	12.0	3.6	2.5	13.0
Approved absence	13.8	18.7	17.7	14.3	21.4	13.4	17.8	11.7	13.4	11.8	17.9	15.6	17.1	5.4
Not his/her shift	26.1	44.8	45.5	24.4	30.6	30.6	46.2	21.1	23.4	19.7	20.6	32.3	45.4	48.0
Doing fieldwork	0.3	0.3	0.0	0.5	0.0	1.1	0.0	0.0	0.4	0.8	0.2	0.4	0.0	0.0
Not approved absence	20.7	6.8	8.8	20.0	6.5	21.9	9.5	18.8	21.8	21.8	17.0	19.4	9.6	3.5
Gone to retrieve salary	0.7	0.0	0.0	0.7	0.0	0.7	0.0	0.7	1.1	0.7	0.4	1.2	0.0	0.0
Outreach	2.1	2.9	0.9	3.6	1.0	1.9	0.0	6.2	6.0	4.0	4.9	2.6	0.7	0.0
Other	8.9	12.2	12.6	8.4	4.0	2.7	14.7	14.1	10.5	9.6	11.6	4.4	12.6	1.2
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Management														
Health facility management committee	73.9	29.2	19.3	72.3	84.8	67.7	11.7	67.0	70.9	75.6	74.9	67.7	20.8	85.8
Finance committee	13.9	23.3	12.3	22.2	37.7	15.6	9.2	34.4	14.0	21.4	18.7	24.1	13.6	39.5

Procurement committee	2.1	9.9	4.7	6.6	20.0	3.0	5.4	6.6	0.6	6.4	4.1	9.6	4.7	0.0	5.9
Audit committee	2.6	9.9	5.4	6.6	14.1	5.5	5.5	9.0	1.5	6.7	1.0	12.4	5.0	12.6	6.2
Disciplinary Committee	22.8	25.2	13.4	30.3	27.8	31.9	11.8	52.3	16.1	37.8	25.0	26.0	14.7	17.1	24.0
Quality Assurance Committee	13.6	11.6	11.9	13.0	4.9	18.6	9.7	22.1	10.6	17.0	13.4	13.6	9.3	12.6	12.6
Push or pull facility															
Push	90.1	6.9	12.2	74.7	44.0	73.9	5.7	89.5	77.0	86.6	74.5	65.1	14.2	43.5	54.0
Pull	3.2	83.7	82.7	16.0	37.4	19.7	90.9	3.8	14.4	8.8	11.2	24.8	80.4	56.5	38.1
Both	6.7	9.4	5.1	9.3	18.6	6.4	3.5	6.7	8.6	4.6	14.4	10.1	5.4	0.0	7.9
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Drugs availability (6)	46	15	19	38	23	24	17	69	40	41	32	44	17	39	31
Availability by drug															
ACT	90.9	89.1	91.4	89.1	89.3	81.1	94.7	89.1	91.6	82.6	89.8	97.6	90.7	74.7	90.0
Cotrimoxazole	80.2	89.1	87.2	82.8	74.2	72.5	87.6	89.9	92.7	80.5	89.9	84.0	84.5	82.9	84.5
Measles vaccine	76.1	33.5	29.6	71.3	73.9	61.7	24.3	87.5	66.5	70.9	65.5	79.6	30.3	65.8	55.6
ORS sachets	78.8	81.5	81.9	79.0	74.3	67.4	81.7	90.7	85.4	77.0	82.4	77.4	82.0	87.4	80.1
Depo-Provera	98.5	66.0	81.6	83.6	61.1	85.2	82.2	94.2	87.5	90.3	78.0	85.1	79.8	73.1	82.8
Fansidar	84.4	70.8	70.5	82.3	88.7	80.4	68.2	94.4	73.9	86.8	81.0	78.0	71.2	87.4	77.9

Source: Staff calculations using the 2013 SDI and the UNHIS 2013 surveys.

Note: ACT = Artemisinin combination therapy.

Table A2.3: Health facilities—infrastructure and equipment

Infrastructure/equipment	Provider		Location		Region				Welfare					National	
	Public	Priv.	Urb.	Rur.	Central	Eastern	Kampala	Northern	Western	Q1	Q2	Q3	Q4	Q5	
Electricity	55.6	88.6	90.0	60.4	80.6	47.7	92.7	58.4	63.5	49.7	64.5	68.5	88.4	85.8	71.5
Piped water	12.9	50.3	60.2	13.3	19.8	8.3	65.1	4.1	23.0	5.6	22.1	16.6	56.3	57.4	31.0
Flush toilet for outpatients	4.1	34.5	48.9	0.5	1.1	0.0	55.8	1.3	1.4	0.0	0.0	1.6	46.4	22.4	18.7
Flush toilet for staffs	2.6	16.8	20.4	2.8	3.5	2.8	21.9	1.3	5.2	1.0	4.9	3.3	19.2	22.4	9.4
Functioning land phone	4.8	15.8	18.6	5.0	14.3	4.4	19.1	1.6	4.7	3.1	3.0	11.8	16.5	17.1	10.1
Functioning cellular	6.8	25.2	26.8	8.9	8.5	23.3	26.3	0.5	6.7	5.2	7.1	16.2	25.0	25.2	15.6
Functioning shortwave radio	2.0	0.9	0.0	2.4	0.0	3.1	0.0	4.0	1.6	3.4	1.9	1.9	0.0	0.0	1.5
Functioning computer	5.5	22.9	26.5	6.3	6.9	4.0	28.2	9.3	8.4	5.2	10.4	5.7	24.2	39.5	13.9
Access to email or internet	2.6	16.7	20.7	2.6	6.0	3.2	21.8	0.7	3.7	1.1	5.0	3.5	18.7	35.0	9.4
Functional ambulance	2.8	17.3	18.7	4.4	9.9	2.4	18.9	0.0	8.7	0.6	5.7	8.2	17.5	26.8	9.8
Maternity antenatal room	24.5	23.3	14.0	29.9	32.0	38.8	11.5	30.9	20.6	24.1	28.3	40.2	13.6	29.7	23.9
Adult weighing scale	70.4	80.6	78.5	73.4	86.4	64.5	77.0	68.2	79.8	58.3	79.1	88.5	76.3	100	75.3
Thermometer	74.0	92.5	94.6	75.8	94.2	60.0	96.0	79.4	78.8	67.2	84.4	77.3	93.6	100	82.9
Child weighing scale	78.1	48.3	36.4	80.3	73.4	85.1	28.8	76.1	83.4	77.2	90.5	84.0	33.4	95.5	63.8
Stethoscope	79.9	93.2	93.1	82.2	82.5	73.2	95.0	84.1	88.3	76.6	93.1	80.8	91.3	100	86.3
Infant weighing scale	48.6	33.5	28.3	49.3	79.1	48.2	22.2	32.5	46.9	38.1	51.3	54.6	31.8	59.4	41.3
Microscope	32.2	63.9	64.6	37.1	53.8	32.9	65.4	29.1	41.0	24.5	45.2	44.0	63.2	56.1	47.5
Glucometer	18.3	50.5	56.9	19.9	39.8	11.6	57.0	27.0	19.9	15.6	22.6	25.7	53.0	60.6	33.8
Malaria Test kit	80.8	62.0	54.6	82.1	76.1	66.5	53.6	87.4	90.5	75.9	84.7	83.0	58.1	57.7	71.7

Urine Dip kit	28.7	47.3	50.5	29.9	46.4	24.4	50.3	34.1	27.8	24.9	40.9	28.4	47.9	48.0	37.6	
HIV Test kit	50.4	67.3	73.4	49.6	71.2	44.6	74.8	47.3	46.2	40.7	57.7	49.1	73.5	82.9	58.6	
Tuberculosis test kit	20.7	11.3	17.2	15.6	15.2	22.8	14.1	20.2	11.9	16.5	16.4	17.4	15.2	30.8	16.2	
Autoclave	15.7	22.9	30.7	12.3	11.4	11.1	30.0	20.0	14.5	14.3	20.1	6.6	27.8	25.3	19.2	
Electric boiler/steamer	1.5	10.0	12.7	1.3	2.8	4.1	13.3	0.0	0.5	1.7	0.5	1.9	11.9	0.0	5.6	
Electric dry heat sterilizer	1.6	12.6	16.7	1.0	4.2	0.0	17.8	0.7	2.3	0.4	0.5	2.2	15.8	14.2	6.9	
Non-electric pot	51.6	59.1	57.1	54.1	58.8	52.2	57.0	44.1	59.6	43.0	64.0	60.6	55.4	50.8	55.2	
Incinerator	9.9	12.6	7.9	13.2	14.0	2.4	6.7	26.8	14.4	14.8	12.4	11.1	8.6	9.7	11.2	
Facilities index																
Mean	0.187	0.347	0.381	0.193	0.262	0.171	0.389	0.187	0.207	0.156	0.228	0.217	0.363	0.417	0.264	
Median	0.133	0.275	0.287	0.159	0.213	0.123	0.284	0.157	0.163	0.118	0.215	0.170	0.281	0.329	0.208	

Source: Staff calculations using the 2013 SDI and the UNHIS 2013 surveys.

Table A2.4: Assessment of teacher knowledge and teaching quality

	Provider		Location		Region				Welfare					National	
	Public	Priv.	Urb.	Rur.	Central	Eastern	Kampala	Northern	Western	Q1	Q2	Q3	Q4	Q5	
Teacher knowledge															
English	59	58	63	58	62	60	64	56	56	56	57	59	60	62	59
Numeracy	64	66	70	63	70	66	69	58	61	59	62	64	67	68	64
Pedagogy	26	24	28	25	28	24	29	26	23	26	23	23	26	28	25
Overall	45	45	48	45	49	45	49	43	43	44	43	45	47	48	45
Teaching quality															
Mean	0.671	0.665	0.746	0.658	0.642	0.634	0.754	0.705	0.699	0.646	0.690	0.746	0.597	0.667	0.670
Median	0.704	0.734	0.757	0.700	0.686	0.687	0.785	0.702	0.784	0.667	0.746	0.785	0.592	0.722	0.707

Source: Staff calculations using the 2013 SDI and the UNHS 2013 surveys.

Table A2.5: Assessment of health worker knowledge

	Provider		Location		Region					Welfare					National
	Public	Priv.	Urb.	Rur.	Central	Eastern	Kampala	Northern	Western	Q1	Q2	Q3	Q4	Q5	
Diagnostics															
Acute diarrhea	45.3	50.6	58.2	39.2	45.3	41.0	61.0	28.8	41.5	36.1	40.7	38.3	59.2	50.6	47.5
Pneumonia	56.3	65.9	75.4	48.4	54.3	58.3	74.8	42.5	50.1	44.5	57.2	47.7	73.7	85.3	60.2
Diabetes Mellitus	57.8	66.6	76.6	49.7	51.2	51.9	77.2	57.7	50.4	49.1	55.2	50.0	74.5	62.3	61.4
PTB	86.9	89.5	91.9	84.9	91.2	91.7	90.7	77.4	84.0	81.6	87.5	87.4	91.0	94.8	87.9
Malaria/Anemia	95.3	97.9	96.6	96.1	99.9	98.7	96.0	95.6	93.2	96.4	94.5	97.1	96.6	97.8	96.3
Share correct															
All 5 Cases	25.9	28.7	39.4	17.5	17.1	21.7	41.3	11.3	21.8	16.4	14.4	20.0	39.7	39.6	27.1
Exactly 4 Cases	27.2	34.9	38.1	24.3	26.8	35.5	36.4	27.6	18.8	24.2	37.6	20.7	34.9	26.0	30.3
Exactly 3 Cases	21.4	21.5	12.0	28.8	42.2	14.4	11.6	26.6	29.6	23.7	26.6	30.1	14.3	24.3	21.5
Exactly 2 Cases	16.1	9.0	5.8	18.9	8.9	20.3	5.4	21.2	18.4	23.3	11.9	20.1	6.1	7.8	13.2
Only 1 Case	6.8	4.7	1.7	9.3	5.0	7.2	1.7	12.5	9.2	11.4	8.8	7.2	2.1	0.0	6.0
No Case	2.6	1.1	3.0	1.2	0.1	0.9	3.5	0.6	2.1	1.0	0.6	1.9	3.0	2.2	2.0
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Clinical knowledge															
PPH	68.6	76.0	71.7	71.5	69.7	74.7	71.2	74.2	69.3	67.6	72.3	71.5	72.9	84.6	71.6
Respiratory	62.8	73.6	75.5	60.7	74.0	48.6	80.5	74.5	52.3	65.3	50.6	57.0	79.4	58.3	67.2
Share correct															
All 2 Conditions	48.1	63.3	58.0	51.4	58.2	40.0	61.6	64.0	46.3	53.6	41.9	47.8	62.4	55.3	54.3
Only 1 Condition	35.3	23.0	31.2	29.5	27.4	43.4	28.4	20.8	29.0	25.8	39.0	32.9	27.5	32.3	30.3
None of the conditions	16.7	13.7	10.8	19.1	14.5	16.7	9.9	15.3	24.7	20.6	19.1	19.3	10.1	12.4	15.5
Total	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Staff calculations using the 2013 SDI and the UNHS 2013 surveys.

Note: PTB = Pulmonary Tuberculosis/Pneumonia/Chronic Bronchitis. PPH = Post-partum Hemorrhage. Respiratory = Respiratory distress syndrome/Birth asphyxia.

Table A2.6: Assessment of student performance

	Provider		Location		Region				Welfare					National	
	Public	Priv.	Urb.	Rur.	Central	Eastern	Kampala	Northern	Western	Q1	Q2	Q3	Q4		Q5
English	43	67	63	42	68	35	85	35	54	31	29	55	62	69	46
Numeracy	42	53	48	42	52	40	56	37	47	38	37	47	50	50	43
Non-verbal reasoning	56	62	60	56	62	56	67	51	59	52	56	60	59	60	57
Overall score	43	65	61	43	66	37	80	36	54	34	31	55	61	66	47

Source: Staff calculations using the 2013 SDI and the UNHS 2013 surveys.

Table A2.7: Correlates of pupil achievement (Probit model)

	Model 1: English		Model 2: numeracy		Model 3: Non-verbal reasoning		Model 4: overall score		Model 5: English		Model 6: numeracy		Model 7: Non-verbal reasoning		Model 8: overall score	
	Coef	t	Coef	t	Coef	t	Coef	t	Coef	t	Coef	t	Coef	t	Coef	t
School absence rate	-0.264*	0.154	-0.219***	0.071	-0.000	0.099	-0.231*	0.125	-0.317**	0.155	-0.265***	0.079	-0.030	0.123	-0.392**	0.173
Classroom absence rate	-0.303**	0.123	-0.063	0.056	-0.065	0.076	-0.245**	0.098	-0.263**	0.123	-0.056	0.062	-0.062	0.095	-0.286**	0.134
There is a PTA	-0.009	0.063	0.018	0.028	0.120***	0.040	-0.004	0.050	0.001	0.063	0.019	0.028	0.120***	0.040	0.000	0.051
There is a SMC	0.070	0.064	0.010	0.029	0.044	0.042	0.060	0.051	0.074	0.064	0.013	0.029	0.047	0.041	0.067	0.050
Number of inspections	0.009*	0.005	0.010***	0.002	0.007**	0.003	0.009**	0.004	0.009*	0.005	0.010***	0.002	0.007**	0.003	0.009**	0.004
Index classroom environment	1.072***	0.148	0.278***	0.061	0.081	0.088	0.828***	0.116	1.062***	0.148	0.277***	0.061	0.084	0.088	0.826***	0.116
Index teacher behavior	0.371***	0.137	-0.031	0.065	0.044	0.089	0.292***	0.111	0.366***	0.137	-0.029	0.065	0.054	0.089	0.293***	0.111
Teacher score English	0.992***	0.249			0.156	0.161	0.804***	0.207	0.917***	0.249			0.119	0.161	0.743***	0.208
Teacher score numeracy			0.426***	0.079	0.306***	0.108	0.061	0.138			0.408***	0.080	0.273**	0.108	0.018	0.139
Age	-0.190***	0.021	-0.014	0.009	-0.027**	0.012	-0.146***	0.017	-0.189***	0.021	-0.013	0.009	-0.025**	0.012	-0.145***	0.017
Age squared	0.002***	0.000	0.000	0.000	0.000*	0.000	0.001***	0.000	0.002***	0.000	0.000	0.000	0.000	0.000	0.001***	0.000
Girl	-0.054	0.047	-0.123***	0.021	-0.066**	0.029	-0.067*	0.037	-0.054	0.047	-0.121***	0.021	-0.066**	0.029	-0.068*	0.037
Has breakfast	0.157***	0.050	-0.013	0.023	0.001	0.031	0.111***	0.041	0.147***	0.050	-0.016	0.023	-0.004	0.031	0.102**	0.041
Public school	-0.626***	0.072	-0.328***	0.032	-0.171***	0.044	-0.545***	0.057	-0.531***	0.081	-0.293***	0.035	-0.107**	0.047	-0.458***	0.064
Urban area	0.146	0.095	0.063	0.041	0.131**	0.058	0.133*	0.077	0.137	0.095	0.063	0.041	0.132**	0.058	0.131*	0.076
Region																
Central	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Eastern	-0.784***	0.132	-0.319***	0.061	-0.370***	0.086	-0.699***	0.111	-0.705***	0.133	-0.291***	0.061	-0.322***	0.087	-0.635***	0.111
Kampala	0.267*	0.137	-0.037	0.050	0.061	0.078	0.144	0.099	0.291**	0.138	-0.035	0.050	0.063	0.078	0.155	0.100
Northern	-0.333**	0.150	-0.259***	0.068	-0.452***	0.095	-0.354***	0.125	-0.249	0.152	-0.231***	0.069	-0.399***	0.096	-0.288**	0.126
Western	-0.145**	0.068	0.001	0.032	-0.159***	0.043	-0.119**	0.056	-0.122*	0.069	0.009	0.032	-0.144***	0.043	-0.100*	0.057
Welfare quintile																
Q1	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.	ref.
Q2	-0.157**	0.079	-0.156***	0.036	0.008	0.048	-0.145**	0.063	-0.141*	0.079	-0.150***	0.036	0.013	0.049	-0.129**	0.063
Q3	0.233*	0.142	-0.036	0.066	-0.112	0.090	0.159	0.120	0.208	0.142	-0.054	0.066	-0.145	0.090	0.124	0.120
Q4	0.631***	0.143	0.049	0.065	-0.288***	0.093	0.488***	0.120	0.612***	0.143	0.033	0.065	-0.315***	0.093	0.460***	0.120
Q5	0.590***	0.144	0.033	0.066	-0.206**	0.091	0.447***	0.121	0.555***	0.145	0.012	0.066	-0.244***	0.091	0.405***	0.121
Pupil to teacher ratio (PTR)									-0.005***	0.002	-0.002***	0.001	-0.004***	0.001	-0.004***	0.001
Constant	1.310***	0.308	0.062	0.135	0.586***	0.197	1.053***	0.261	1.445***	0.308	0.120	0.136	0.709***	0.199	1.215***	0.262
Number of observations	3,565		3,576		3,546		3,546		3,555		3,566		3,536		3,536	

Source: Staff calculations using the 2013 SDI and the UNHS 2013 surveys.

Note: 0.01 - ***, 0.05 - **, 1 - *

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