ETHIOPIA DEVELOPMENT TRENDS ASSESSMENT

ETHIOPIA PERFORMANCE MONITORING AND EVALUATION SERVICE (EPMES)

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This report was authored by Zachary Donnenfeld, Alex Porter, Jakkie Cilliers, Jonathan D. Moyer, Andrew C. Scott, Joel Maweni and Ciara Aucoin with the support of others at the ISS and Pardee Center.

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ACRONYMS

ACLED	Armed Conflict Location and Event Dataset
AIDS	Acquired Immune Deficiency Syndrome
AfDB	African Development Bank
AQUASTAT	Food and Agriculture Organization global water database
AU	African Union
BRICS	Brazil, Russia, India, China and South Africa
CBR	Crude Birth Rate
CDCS	Country Development Cooperation Strategy
CSP	Center for Systemic Peace
CUD	Coalition for Unity and Democracy
DALYs	Disability Adjusted Life Years
DO	Development Objective
ECI	Economic Complexity Index
EPMES	Ethiopia Performance Monitoring and Evaluation Service
EPRDF	Ethiopian Peoples' Revolutionary Democratic Front
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDI	Foreign Direct Investment
FSC	Food Supply Chain
FY	Fiscal Year
GERD	Grand Ethiopian Renaissance Dam
GIS	Geographic Information System
GDP	Gross Domestic Product
GDPPC	Gross Domestic Product per Capita
GNI	Gross National Income
GoE	Government of Ethiopia
GPS	Global Positioning System
GTP	Growth and Transformation Plan
HDI	Human Development Index
HIV	Human Immunodeficiency Virus
HSTP	Health Sector Transformation Plan

HQ	Headquarters
HDR	Human Development Report
ICD	International Classification of Disease
ICT	Information and Communications Technology
IDA	International Development Association
IFs	International Futures Software
IGAD	Intergovernmental Authority on Development
IGO	Inter-Governmental Organization
IMF	International Monetary Fund
IP	Implementing Partner
ISS	Institute for Security Studies
LE	Life Expectancy
LSPs	Local Service Providers
M&E	Monitoring and Evaluation
MDGs	Millennium Development Goals
MECS	Monitoring and Evaluations Capacity Strengthening
MER	Market Exchange Rates
MFP	Multifactor Productivity
MMR	Maternal Mortality Ratio
MMT	Million Metric Tons
MOE	Ministry of Education
MPI	Multidimensional Poverty Index
NCDs	Non-communicable Diseases
OCA	Organizational Capacity Assessment
ODI	Overseas Direct Investment
OECD	Organization for Economic Co-operation and Development
OEC	Observatory of Economic Complexity
OLF	Oromo Liberation Front
OPDO	Oromo People's Democratic Organisation
Pardee Center	Frederick S Pardee Center for International Futures
PMP	Performance Management Plan
PPP	Purchasing Power Parity
R&D	Research & Development

RPF	Rwandan Patriotic Front
SAM	Severe Acute Malnutrition
SDGs	Sustainable Development Goals
SI	Social Impact, Inc.
SMEs	Small and Medium-Sized Enterprises
SOW	Statement of Work
TA	Technical Assistance
TB	Tuberculosis
TPLF	Tigrayan People's Liberation Front
TFR	Total Fertility Rate
TVET	Technical and Vocational Education and Training
UCDP	Uppsala Conflict Data Program
UN	United Nations
UNDP	United Nations Development Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNPD	United Nations Population Division
USAID	United States Agency for International Development
V-Dem	Varieties of Democracy Project
WASH	Water, Sanitation and Hygiene
WB	World Bank
WDI	World Development Indicators
WGI	Worldwide Governance Indicators
WHO	World Health Organization
YLL	Years of Life Lost

EXECUTIVE SUMMARY

Introduction

Ethiopia's recent history is one of resilient growth in a conflict laden region. The country has made tremendous progress across economic, social and human development indicators, albeit from a low starting point. Since the end of the civil war in 1991, Ethiopia has quadrupled primary school enrollment, halved child mortality rates, and doubled the percentage of people with access to clean water.[1] Ethiopia achieved the most rapid increase in access to improved sanitation facilities of any African country since 1990, moving from just 2.5% access to roughly 29% in 2016.[2] The country has also been able to combine such improvements in service delivery with the third most significant decline in fertility rates and the third largest decline in the undernutrition rate among African countries since 1990.

Since the early 2000's, Ethiopia's economy has been one of the ten fastest-growing in the world. From 2004 to 2013, the country's average annual Gross Domestic Product (GDP) growth rate exceeded 10%, which was more than four percentage points higher than the average for Africa's 26 other low-income countries.[3] Unlike Equatorial Guinea, Chad, Angola and Liberia (the other top five fastest-growing African countries), Ethiopia has achieved rapid economic growth without relying on natural resource exports. Moreover, the Government of Ethiopia (GoE) has accomplished much of this development in the context of the Horn of Africa, a region with a long history of instability and violence.

In its most recent national development document, the Growth and Transformation Plan II (2014/15-2019/20), the government laid out ambitious development targets in health, education, economic growth, and infrastructure, among other areas. It set a target of achieving lower-middle income status by 2025. The modeling presented in this report suggests Ethiopia will likely not achieve that target until closer to 2030.

This report uses the International Futures (IFs) modeling system to explore Ethiopia's current development trajectory. It then considers scenarios that simulate ambitious, but realistic, 5-year interventions (2017-2021) across different development sectors, and explores the effects of these interventions on development outcomes to 2030 or beyond. The goal of this report is to explore Ethiopia's national development trajectory and examine the potential effects and tradeoffs of different policy interventions through the construction of alternative scenarios.

Despite recent progress, Ethiopia maintains some of the lowest levels of access to basic services of any country in the world. It continues to rank near the bottom of the United Nations Development Programme's Human Development Index (HDI), scoring 174th out of 188 countries in 2015.[4] In 2016, Ethiopia was ranked 174th (out of 186 countries) in terms of access to clean water, and 161st in terms of access to improved sanitation. The country has one of the lowest primary education survival rates in the world; nearly half of all students who begin primary school do not reach Grade 8. Lastly, Ethiopia is largely an agrarian society, with close to 70% of the labor force involved in the agricultural sector,

[1] World Bank. Ethiopia Country Report. 2015. http://www.worldbank.org/en/country/ethiopia/overview
[2] This figure is taken from the WHO UNICEF Joint Monitoring Programme and includes a fairly significant reclassification of shared facilities. For more detail see Box 5.5 on p. 87 of this report.
[3] The income groups used in this paper are based on the World Bank country groups, all groups used in this paper can be found in Annex A2. Other World Bank groups can be found here: datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups
[4] United Nations Development Programme. Human Development Report 2015. http://hdr.undp.org/sites/default/files/2015_human_development_report.pdf

primarily as subsistence farmers, making a large proportion of the population vulnerable to climate-related shocks. Despite the significant proportion of labor involved in agriculture, Ethiopia registers some of the lowest agricultural yields globally (ranked 154th).[5] Low agricultural productivity results in a high level of food insecurity and some of the highest burdens of hunger and undernutrition in Africa. Even as Ethiopia continues its development and seeks to transition its economy toward higher value-added sectors like manufacturing and services, agriculture will remain a crucial segment of economic growth, and an important component of Ethiopia's development trajectory.

Ethiopia's recent economic growth has been driven by strategic, government-led, public investment in infrastructure. The government has also benefitted from high levels of foreign aid from its partners in the international community (averaging near 11% of GDP since the mid-1990s). Foreign aid to Ethiopia is, however, forecast to decline (as a percent of GDP) over the next five to ten years, straining the government's capacity to continue delivering public services. Low revenue generation, coupled with a rapidly expanding population (the population grew an estimated 2.6% in 2016 alone), will require improved government capacity to accelerate development and meet the needs of Ethiopia's growing population.

Questions surrounding the GoE's capacity are complicated by the current security situation. Large protests erupted in November 2015 and continued through much of 2016, concentrated in the regions of Oromia and Amhara. Protesters have been demanding increased political and economic inclusion. The government response has largely failed to settle the unrest, and a State of Emergency was imposed in October 2016. These protests have exposed deep rooted horizontal inequalities and tensions between Ethiopia's diverse ethnic groups[6] and brought to the surface longstanding frustrations over perceived systematic political and economic exclusion of a large segment of the population.[7]

Despite reducing poverty by roughly 45 percentage points over the past 20 years, approximately 25 million Ethiopians still live in extreme poverty (less than US$1.90 per day) today. Ethiopia is forecast to reduce the percentage of the population living in extreme poverty to 10% by 2030. Even with that progress, nearly 16 million Ethiopians could be living below the extreme poverty line in 2030. This report explores tradeoffs across strategic investments in key development sectors and their impact on human, economic and social development in Ethiopia.

Policy Choices

All policy choices involve tradeoffs, either explicit or implicit. Investing more money in infrastructure for example, diverts resources that could have been spent on health, agriculture, or education. An investment in infrastructure can pay significant dividends by boosting productivity, access to resources, and welfare. But such investments, as with many policy initiatives take time to improve welfare and require long-term considerations. Furthermore, the policies that have enabled Ethiopia to improve human development over the past 20 years may not be the same policies that will help it to make a rapid transition to lower-middle-income status. In order to sustain gains made across human development indicators, the GoE will need to take a number of strategic policy decisions with long-term objectives in mind.

Managing investments in key natural systems and improving basic human development should be cornerstones of the Ethiopian development strategy. Over the next five years, the GoE and development partners should collaborate to:

[5] Out of 186 countries contained within the International Futures system.
[6] According to the Government's 2007 census, there are more than 80 ethnic groups in the country, the largest being the Oromo and Amhara groups (2007 Population and Housing Census of Ethiopia: Statistical Report for Country level. Population & Census Commission. 2007.)
[7] AK Allo, The Oromo Protests have Changed Ethiopia, Al Jazeera, 21 November 2016, Retrieved from http://www.aljazeera.com/indepth/opinion/2016/11/oromo-protests-changed-ethiopia-161119140733350.html

- **Improve agricultural yields.** As available land for agriculture diminishes, improvements in agricultural yields will be necessary in order to keep up with increasing food demand. Improving yields will help to meet this demand, thereby reducing reliance on food imports, increasing food security, reducing hunger, and growing incomes in the agriculture sector.
- **Improve access to safe water and sanitation.** Ethiopia's reduction in communicable disease rates has been a success story, but communicable disease rates are still high (especially among children). Expanding access to safe water and improved sanitation facilities will reduce the prevalence of communicable disease and help to shrink Ethiopia's very high undernutrition rates, eventually reducing stunting and enhancing economic growth and productivity.
- **Increase primary school survival and completion.** Ethiopia's primary school survival rate is among the lowest in the world. Ethiopia has improved primary enrolment (now around 85%), but only about half of the students who enroll in primary school make it to the final grade. Improving survival rates will expand the number of students moving through the education system, grow the stock of education across the population, and better position Ethiopia to expand its human capital resources and take advantage of its significant demographic dividend.
- **Maintain the pace of fertility rate reductions.** Ethiopia must continue to reduce fertility to accelerate the demographic transition and stem the growth of an already large population. Ethiopia is the second most populous country in Africa, and close to 80% of the population lives in rural areas, creating challenges for delivery of public services and basic infrastructure.

To both maintain past improvements and harness the benefits of continued investment, the GoE and the aid community need to ensure that economic growth continues, and that governance quality and capacity is improved.

- **Improve domestic revenue collection.** The GoE must increase tax revenues to sustain high levels of public investment as aid revenues (as a percent of GDP) decline.
- **Carefully manage its hydroelectric investments.** Due to Ethiopia's various hydroelectric projects (such as the Grand Ethiopian Renaissance Dam), the country is poised to become a net energy exporter over the next decade. Ensuring that export revenues are invested back into the country, while simultaneously expanding rural electricity access, will ensure that Ethiopia sees the broad development benefits from these investments.
- **Maintain the pace of economic structural transformation.** Ethiopia must continue the shift toward higher value-added service and manufacturing sectors. Shifting labor and production into higher value-added activities will help Ethiopia pursue inclusive growth and continue on the path toward lower-middle income status.
- **Promote social and political inclusion.** Recent protests have highlighted the need for greater social, economic and political participation. A lack of progress in this domain will likely drive instability, which, in turn, would undermine progress in economic development.

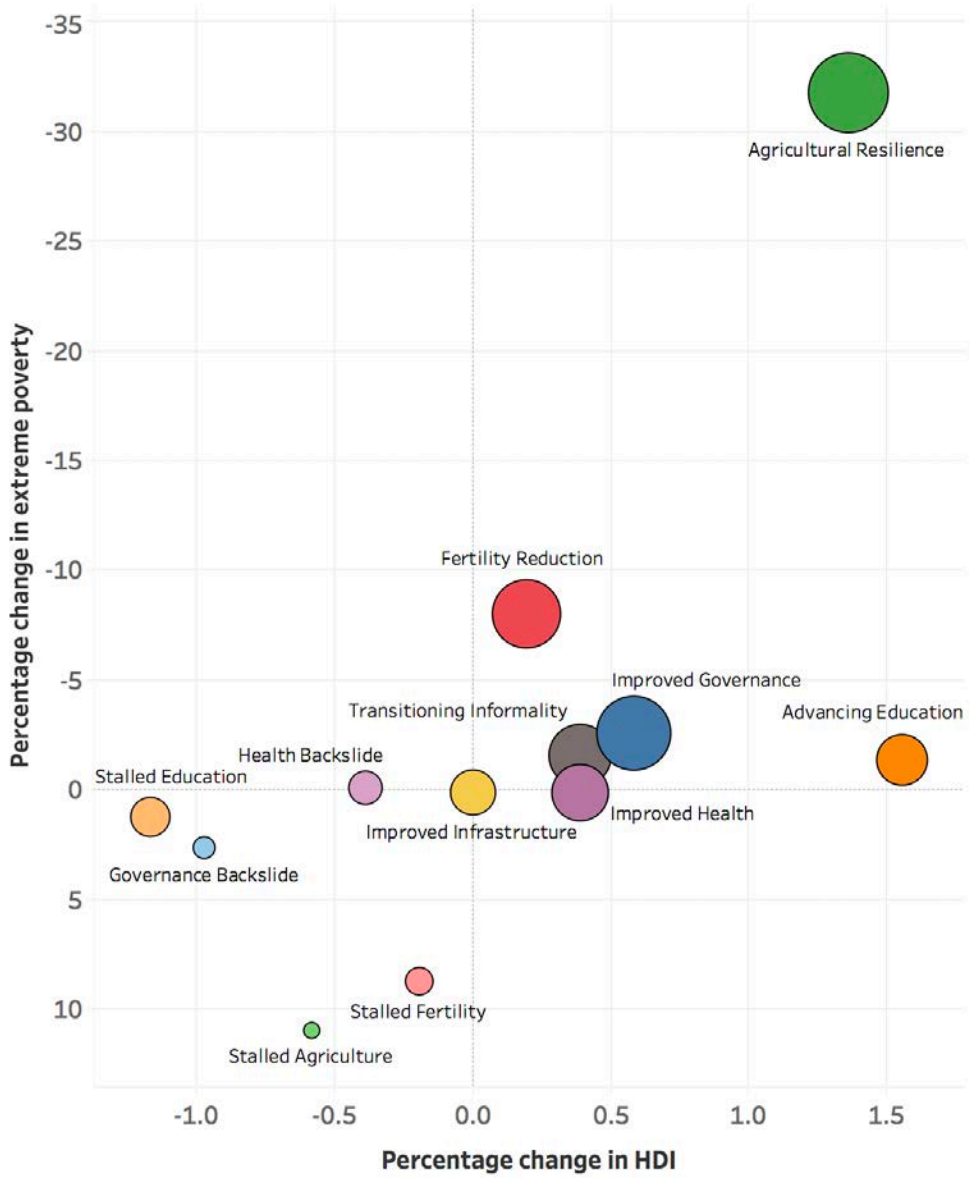
This report explores policy interventions across each of the areas described above. Figure 1 compares the effects of 12 policy interventions against the Current Path forecast in the year 2030 across three outcome indicators. The percentage change in the number of people population living in extreme poverty (less than US$1.90 per day) is represented on the vertical axis, the percentage change in the HDI is represented on the horizontal axis, and the percentage change in Gross Domestic Product per capita (GDP per capita) is represented by the bubble size.[8] The Current Path represents a baseline scenario for the future of Ethiopian development, and the bubbles shown in Figure 1 represent changes from that expected value in the year 2030. The key drivers and specific interventions in each sector

[8] Because all the negative scenarios cause a reduction in GDP per capita (relative to the Current Path) in 2030, the smallest bubble represents the most severe reduction in GDP per capita, rather than the least significant improvement.

will be explored in each of the respective sections of this report, but some key takeaways can be gleaned from the figure below.

Due to the importance of agriculture to Ethiopian society and the economy, efforts to improve agricultural production and demand have the largest effects on poverty, HDI, and GDP per capita. But, improvements in governance, education, health and informality all have significant effects on human development, and, to varying degrees, GDP per capita and poverty reduction. Meanwhile, a lack of progress in any of these sectors could significantly reduce human development and growth outcomes. While agriculture seems to have the largest effect on development across these three indicators, it is important to recognize that there is no silver bullet for development. Ethiopia will need to maintain, and, in some cases, accelerate progress across these various development sectors to successfully move into lower-middle-income status. Investing in human development now will help Ethiopia sustain economic growth and improve the lives of its people over the long-term.

Figure 1: Comparing the effects of sectoral interventions on selected development indicators in 2030



Source: IFs version 7.27

CHAPTER 1: PURPOSE, SCOPE AND METHODOLOGY

1.1 Purpose

This report presents a forward-looking analysis of Ethiopia's likely development trends to 2030 and explores policy tradeoffs through alternative future scenarios using the International Futures (IFs) forecasting system (see section 1.4). These scenarios investigate how USAID can support Ethiopia in advancing human development outcomes and hopes to inform USAID's five-year Country Development Cooperation Strategy (CDCS)[9] for 2016 to 2021, currently under development. The report has a short-term horizon of 2021 (the time horizon for the scenario interventions), as well as a longer outlook to 2030 that allows exploration of the expected impact of the various interventions.[10] Chapter 2 presents a brief history and introduction to Ethiopia. Subsequent chapters contain long-term forecasts and interventions on demographics (Chapter 3), agriculture/food security and climate change (Chapter 4), health (Chapter 5), education (Chapter 6), the economy (Chapter 7), infrastructure (Chapter 8) and governance (Chapter 9). The analysis is done in an integrated and interconnected manner, with the intention of unpacking the broader return to development between different policy interventions. Chapter 10 concludes with a number of integrated scenarios to illustrate the collective impact of specific combinations of policies/developments.

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1.2 Background

A first version of this report, the draft *Current Path Trends Report* (dated 21 October 2016), was presented to USAID and complemented by a scenario planning workshop in Addis Ababa on 25 October that was organized with the support of the USAID Global Development Lab.[11] The Report presented a preliminary analysis based on the IFs Current Path forecast (see sections 1.4 and 1.5), and subsequently served as a reference and discussion document for an Ethiopia Development Trends Assessment workshop hosted by USAID in Addis Ababa on 27 and 28 October 2016. During that workshop and subsequent engagement, additional sources of information were identified and incorporated to update the historical data within IFs, generating an amended Current Path forecast. That process culminated in a draft *Trends Assessment Report* submitted to USAID on 20 January 2017, ahead of various presentations and discussions with several dozen stakeholders in Addis Ababa from 23 to 25 January 2017. Although that report includes some aspects from the previous *Current Path Trends Report,* it was comprehensively revised to include additional data series and analysis, and also includes interventions, scenarios and policy recommendations. During these briefings and subsequent correspondence, the authors received additional comments and feedback on the draft report, which they have sought to address to the extent possible in this final version of the *Trends Assessment Report.* Annex A and B present the data updates and project data used within IFs for this project, as well as the data sources upon which IFs relies for its analysis and forecasts.

[9] The current CDCS (Breaking the Cycle of Famine) for 2011-2015 builds on the Government of Ethiopia's (GoE) Growth and Transformation Plan (GTP) with the overarching goal of helping the country achieve its development priorities.

[10] Because education and demographics are slow moving systems, those sections are explored to 2040, to more fully capture the effects of policies designed to improve outcomes in those sectors.

[11] M. Bobick and R. Williams, Ethiopia 2025: An Analysis of Four Future Scenarios, USAID, no date.

1.3 The African Futures Project

The Ethiopia Development Trends Assessment is a project managed by the Institute for Security Studies (ISS) on behalf of the African Futures Project. The African Futures Project is a partnership between the ISS and the Frederick S Pardee Center for International Futures at the University of Denver (Pardee Center) that aims to provide in-depth, multi-method research to map out potential future paths of Africa and its countries.

ISS (www.issafrica.org) is an African organization with a substantial legacy of policy work on human security, peace, and development across the continent, with its head office in Pretoria, South Africa. Amongst others, the Institute has a regional office in Addis Ababa, Ethiopia, and an associated agreement with the Government of Ethiopia.

The Frederick S. Pardee Center for International Futures (pardee.du.edu) at the University of Denver brings decades of quantitative modeling expertise through their IFs platform, which integrates trend and forecasting data across many development sectors.

The partnership between ISS and the Pardee Center represents a unique set of research capabilities and data expertise within the African context that can be leveraged to produce critical, data-driven, and forward-looking analysis.

1.4 The International Futures forecasting system (IFs)

This report primarily uses the International Futures forecasting system (IFs) for data analysis and forecasting.

IFs, hosted and developed by the Frederick S. Pardee Center for International Futures (see http://pardee.du.edu/understand-interconnected-world), is a free and open-source quantitative tool for thinking about long-term futures. It was originally created by Professor Barry B. Hughes. IFs integrates forecasts across different sub-models, including agriculture, demographic, education, economy, environment, governance, health, infrastructure, international politics, and technology. These sub-models are dynamically connected; IFs simulates how changes in one system lead to changes across all other systems. As a result, IFs endogenizes a large number of relationships from a wide range of global systems.

There are three main avenues for analysis in IFs: historical data analysis (cross-sectional and longitudinal), Current Path analysis (where systems seem to be developing), and alternative scenario development (exploring if-then statements about the future). This report uses all three sources of analysis.

IFs leverages historical data (over 3,500 historical series), identifies and measures trends, and models dynamic relationships to forecast hundreds of variables for 186 countries for every year from 2014 to 2100. It provides forward-looking, policy-relevant material that frames uncertainty around the future of countries (or groups of countries) and across development systems. It also helps users to think systematically about potential futures, as well as development goals and targets.

IFs forecasts are informed extensions of current trends and dynamics built upon our existing knowledge of development patterns and are not attempts to predict the future. While there are limits to any modeling endeavor, forecasting is still a necessary human activity. The IFs platform is designed to help people and organizations adopt a more integrated view of global systems and how policy interventions could unfold across them, rather than serve as a predictive exercise.

Thinking systematically about the future, with the assistance of quantitative models, creates a platform for users and policymakers to plan their future(s) more effectively. When forecasts are explicit and transparent, such models can present policy planners with maps of how development works. Armed with this information, they will ideally make more informed, and, hopefully better, decisions.

1.5 The IFs Current Path and project adjustments

The IFs Current Path is a dynamic forecast both within and across key development systems, representing a continuation of current policy choices and environmental conditions. Although the Current Path generally demonstrates continuity with historical patterns, it generates a wide range of non-linear, dynamic, and endogenous forecasts, rather than simple extrapolations of historical trends. The Current Path assumes no major paradigm shifts, seismic policy changes, or transformative "black swans" (very low probability but high impact events). Given that the Current Path is built from initial conditions of historical variables and is calibrated against other forecasts, it is a good starting point with which to conduct scenario analysis and construct alternative future scenarios.

Unless mentioned otherwise, this report was completed using IFs model version 7.27, supported with an external project data file with additional and/or updated data series. The data series included in the project file and project data additions are reflected in annexes A and B.

While IFs is a dynamic tool that incorporates the best available international data, there remains the need for adjustments to reflect particular issue areas or specific data needs. For example, the IFs Current Path forecast was adjusted to reflect expected growth in hydroelectric production associated with the Grand Ethiopian Renaissance Dam (along with several smaller hydro projects) (see Chapter 8 on infrastructure). There is also a land use adjustment to the Current Path forecast (see Chapter 4 on agriculture). Because land use and electricity exports are fundamental to the GTP II, an analysis that excluded these developments would likely be a misrepresentation of Ethiopia's expected future. These alterations to the Current Path forecast have implications for the analysis presented in this report, and create noticeable changes in some key indicators from the previous *Current Path Trends Report*. They do not, however, significantly alter the story of Ethiopia's historical development, or of its expected future.

Although the time horizon of this report is to 2030, there are some sectors (i.e. demographics and education) that are detailed out to 2040. This is primarily due to the nature of these sectors; trends in demographics and education are slow-moving phenomena which can often take up to 15 years or more in which to detect noticeable changes. Finally, in this report, all US$ figures are in constant 2011 values unless otherwise indicated.

1.6 Ethiopia's Growth and Transformation Plans (GTP)

In its engagement in Ethiopia, USAID seeks to support the local development efforts of the Government of Ethiopia (GoE). The second five-year Growth and Transformation Plan (GTP II) is Ethiopia's fourth macro-economic development plan since 1995, all of which have primarily been designed to reduce poverty. The central objectives of these national strategies are to address the human development needs, achieve the MDGs and now Sustainable Development Goals (SDGs), and move Ethiopia towards a middle-income economy by 2025. The successive national development plans since 1995 are summarized in Figure 1.a below.[12]

[12] Federal Ministry of Education, Education Sector Development Programme V (ESDP V) 2008 - 2012 E.C. 2015/16 - 2019/20 G.C, Programme Action Plan, August 2015, 12.

Figure 1.a: Ethiopian National Development Plans, 1995-2020

Years	Prevailing plan	Themes
1995 to 2005	Sustainable Development and Poverty Reduction Programme	Devolution to regions
		Government establishment at all levels
		Open economy
		Develop social sectors
2005 to 2010	Plan for Accelerated and Sustained Development to End Poverty	Pro-poor growth
		Poverty reduction
		Government strengthening
		Aid management
2010 to 2015	First Growth and Transformation Plan	Economic growth
		Industrial development
		Infrastructure development
		MDG attainment
2015 to 2020	Second Growth and Transformation Plan	Economic growth and diversification
		Industrialisation and mechanisation
		Advanced sciences and technologies
		Sustainable development goals' attainment

The overarching objective of the GTP II is the realization of Ethiopia's vision to become a lower-middle-income country in which democracy, good governance, and social justice are maintained through people's participation. The realization of this vision calls for creating "[a] competitive, productive and inclusive economy in all its aspects."[13]

Some of the distinguishing features of GTP II include the recognition of the agricultural sector as the main driver of growth and development, while highlighting the need to move up the productivity chain to promote high value crops, establish Ethiopia as a leader in light manufacturing in Africa, improve productivity and competitiveness, redress macroeconomic imbalances, and engage in better management of the construction industry, sustainable urban development, human capacity development, and climate resilience.[14]

GTP II identifies the following four specific objectives:

- Achieve an annual average real GDP growth rate of 11% within a stable macroeconomic environment … while pursuing comprehensive measures towards narrowing the saving-investment gap and bridging the widening trade deficit;
- Develop domestic engineering and fabrication capacity and improve productivity, quality, and competitiveness of the domestic productive sectors (agriculture and manufacturing industries) to speed up structural transformation;

[13] National Planning Commission, Growth and Transformation Plan II (GTP II) (2015/15-2019/20), May 2016, Addis Ababa, 76.
[14] Ibid, 78-80.

- Further solidify the on-going public mobilization and organized participation to ensure the public become both owners and beneficiaries from development outcomes; and
- Deepen the hegemony of developmental political economy by strengthening a stable democratic developmental state.[15]

Where appropriate, this report comments on the likelihood of Ethiopia to achieve some of the key goals set out in the GTP under different conditions.

[15] Ibid, 80-81.

CHAPTER 2: ETHIOPIA IN SUMMARY CONTEXT

2.1 A violent history in a turbulent region

Apart from a five-year partial occupation by Italy under Benito Mussolini in the 1930s, Ethiopia has never been fully colonized. The last monarchy, under Emperor Haile Selassie, was characterized by successive decades of violence, crop failures, and famine. His reign included a long internal secessionist conflict after Eritrea, hitherto an autonomous region, was absorbed into Ethiopia in 1962. In 1974, following the imperial government's attempt to hide the effect of the most recent famine, a popular movement initially carried out by students, peasants, and workers led to the breakdown of Selassie's forty-year-old monarchy. In the revolutionary disarray that followed, a military junta, the "Derg" (formally the Provisional Military Administrative Committee), led by Colonel Mengistu Haile Mariam, seized power. In 1977, the regime suspended the constitution, dissolved parliament, and, until 1988, embarked upon a campaign of systematic human rights violations that included sexual abuse, arbitrary arrest and detention, summary executions and torture.

During the Red Terror from 1977 to 1978, the Derg "liquidated" an entire generation of mostly young intellectuals (figures range between 150,000 to 500,000 deaths).[16] Violent resistance followed until, in 1991, the Ethiopian People's Revolutionary Democratic Front (EPRDF) succeeded in ousting Mengistu, who fled to Zimbabwe. Meles Zenawi emerged as a national leader and head of the EPRDF (an alliance of four parties) within which Zenawi's Tigrayan People's Liberation Front (TPLF) and the Oromo Liberation Front (OLF) played particularly important roles. Following its victory over the Derg, the EPRDF and TPLF have dominated Ethiopian politics.[17]

The EPRDF had cooperated with Eritrean separatists in their military campaign, and, upon ousting Mengistu, Eritrean leaders initiated preparations for independence. Following a referendum in 1993, Eritrea gained formal independence from Ethiopia, but relations soured quickly. The two countries fought a bloody war over the delimitation of their common border between 1998 and 2000, though subsequent border clashes remain ongoing.

Ethiopia has also been involved in ongoing conflicts with Somalia over the Ogaden region, and has recently acted in support of the United Nations/African Union (UN/AU) backed Somali government.[18] Since 1994, there have been attempts to reunite Greater Somalia, mainly from the Western Somali Liberation Front (WSLF) and the Ogaden National Liberation Front (ONLF).

In 2017, the situation in the region is much changed; a transitional government has been installed in Somalia, the insurgency in the Ogaden has been quelled, and there is relative stability along the border with Eritrea. Furthermore, Ethiopia is steadily emerging as a key player in the Horn of Africa, though it has also been beset by periodic riots that, in October 2016, led to the declaration of a state of emergency (still in effect as of this writing).

[16] See, for example, K Tronvoll, C Schaefer and G A Aneme (editors), The Ethiopian Red Terror Trials, African Issues, J Currey, 2009

[17] Previously the Shoan-Amhara (with the modern Ethiopian capital Addis Ababa at its center) was the grouping that had presided over much of Ethiopia's political history and were ousted from power in 1991 with the fall of the Derg.

[18] In 1996 al-Qaeda agents infiltrated the Ogaden leading to Ethiopian operations against Al-Itihaad al-Islamiya in Somalia.

2.2 Ethiopian exceptionalism?

Ethiopia is often compared to Rwanda, Africa's other economic development success guided by an authoritarian regime (despite the large differences in population size, climate and territory between these two countries). The two are outpacing other low-income countries in Africa in terms of growth and improvements in various human development outcomes. This comparison has sparked considerable debate in the development community over the purported advantages of an authoritarian development model compared to that of early democratization. Whereas Ethiopia had Meles Zenawi, the EPRDF and the TPLF, Rwanda has Paul Kagame and the Rwandan Patriotic Front (RPF). The two countries have a shared history of organized mass violence (the Red Terror and the Rwandan Genocide) that make them stand out in the modern African context. The results are strong, developmentally-focused parties, and what some refer to as "centralized patrimonialism," which is more developmentally successful compared to the competitive patrimonialism to be found in nominally democratic countries such as Kenya or Uganda.[19] A common legacy of an exceptionally violent past appears to have forged both the EPRDF/TPLF and the RPF in a manner quite different from that of former liberation parties still governing some African states.

2.3 Ethiopia within the region

Ethiopia is a member of the Intergovernmental Authority on Development (IGAD) – alongside Djibouti, Eritrea, Kenya, Somalia, Sudan, South Sudan and Uganda – and holds considerable weight within that body.[20] It hosts all peace and security related institutions in Addis Ababa (instead of Djibouti, with the rest of the secretariat), has chaired the organization without interruption since 2008. Ethiopia has also played a key role in Sudan-South Sudan mediation and stabilization activities in Somalia.

As a landlocked nation, positive regional relations are integral to Ethiopia's political and economic security. Once Eritrea became independent, all of Ethiopia's imports and exports became dependent on its neighboring countries. The port of Djibouti is particularly essential; in January 2017, the GoE opened a 750km railway from Addis Ababa to the port of Djibouti at a total cost of just over US$4 billion.[21] The rail should limit travel time to around 12 hours (compared to three days previously), and the line is expected to eventually carry cargo trains, along with passenger cars.

Since 2012, Ethiopia has been Africa's largest contributor of military and police to UN peacekeeping operations, despite a modest defense budget. Its contribution comprises 8% of the world total. As of August 2016, Ethiopia contributed 8,326 troops, police and military experts to a number of UN and AU peacekeeping operations. Its largest contribution is to AMISOM in Somalia, but it is also currently active in UNAMI (Darfur), UNISFA (South Sudan), UNMIL (Liberia) and UNOCI (Côte d'Ivoire).[22]

[19] See D. Booth, Development as a collective action problem - Addressing the real challenge of African governance, Africa Power and Politics Programme, Overseas Development Institute, October 2012, www.institutions-africa.org/filestream/20121024-appp-synthesis-report-development-as-a-collective-action-problem,and J. Cilliers, The Future of Democracy in Africa, African Futures Paper 19, October 2016, https://issafrica.org/research/papers/the-future-of-democracy-in-africa

[20] IGAD's mandate is to promote cooperation on macroeconomic policies; the free movement of goods, services, and people; regional food security; drought resilience; complementary infrastructures; peace and stability in the subregion; programs in the social, technological and scientific fields; and the objectives of Common Market for Eastern and Southern Africa (COMESA) to which all its members belong.

[21] All Africa News, Ethiopia: Djibouti-Ethiopia Railway Inaugurated. January 2017, http://allafrica.com/stories/201701100710.html

[22] D. Djinnit, Ethiopia's contribution to global and African peacekeeping operations, Institute for Peace in Partnership, 7 April 2016, https://ippjournal.wordpress.com/2016/04/07/ethiopias-contribution-to-global-and-

Due to its sizeable contribution to global peacekeeping, Ethiopia's strategic location, and the fact that the AU Commission is in Addis Ababa, Ethiopia is able to exert significant influence on regional and African politics beyond what could otherwise be expected. It has the right to attend all AU meetings, and controls which agencies are granted liaison offices in its capital.[23] The city hosts almost 100 embassies (most of which have dual accreditation to the country and the AU) whilst the Ethiopian Government itself only has 35 embassies around the world.

Ethiopia's strategic location in the Horn, contribution to regional peacekeeping, and influence on the AU tempers international criticism and pressure for political reform and adherence to human rights standards. Critics have also been quieted by the significant advances that the country has been able to make on key human development outcomes.

african-peacekeeping-operations-2/ and
http://www.un.org/en/peacekeeping/resources/statistics/contributors.shtml

[23] S Allison, "How Ethiopia exploits AU role to suppress international criticism," Daily Maverick, 28 January 2016, http://www.dailymaverick.co.za/article/2016-01-28-how-ethiopia-exploits-au-role-to-suppress-international-criticism/#.V_y2fdw1Chd .

CHAPTER 3: DEMOGRAPHICS

3.1 Introduction

The old adage "demographics is destiny" appropriately captures the deep, dynamic, and interrelated effects of population structure on a country's development trajectory.[24]

The demographic transition is a process whereby countries move from high birth rates and high death rates towards an older, more stable population structure characterized by low fertility rates, low infant mortality and other improved health outcomes. Although trends vary across countries, Africa's progress through the demographic transition has been historically slower than other regions of the world.[25] Countries that have been unable to manage the demographic transition struggle to address challenges of severe poverty and large disease burdens.[26]

Notable declines in fertility and mortality rates characterize the recent history of demography in Ethiopia. As a result, the population is maturing more rapidly than other low-income African countries, presenting the country with both opportunities and challenges. The changing demographic pattern means that the country is experiencing a relatively large, but declining, youth bulge (defined as the share of the population between the ages of 15 and 29, relative to those aged 15+). A large and persistent youth bulge can be potentially destabilizing, but if Ethiopia can manage to expand public service delivery, create economic opportunities and foster inclusion for young people, it can transition its relatively large youth bulge into a demographic dividend. Falling fertility rates (and consistent improvements in life expectancy) will cause the population to age, subsequently transitioning Ethiopia into a demographic dividend, a period of accelerated economic productivity that occurs as the number of dependents (children below 15 and people over 64 years of age) declines relative to the working age population (15-64 years).[27]

Navigating the potentially destabilizing youth bulge period and capitalizing on the demographic dividend requires investment in human capital development to produce a workforce capable of maximizing its economic potential.[28] But, it also requires sustained economic and employment growth; without economic opportunity, Ethiopia's youth could become the source of internal conflict rather than economic and political progress. In other words, without investments in both human capital and inclusive economic growth, Ethiopia risks becoming engaged in internal conflict and squandering its demographic dividend.

This chapter has the following subsections:

- Basic demographic trends
- Social stability and the youth bulge
- The demographic dividend
- Population growth and service delivery
- Migration

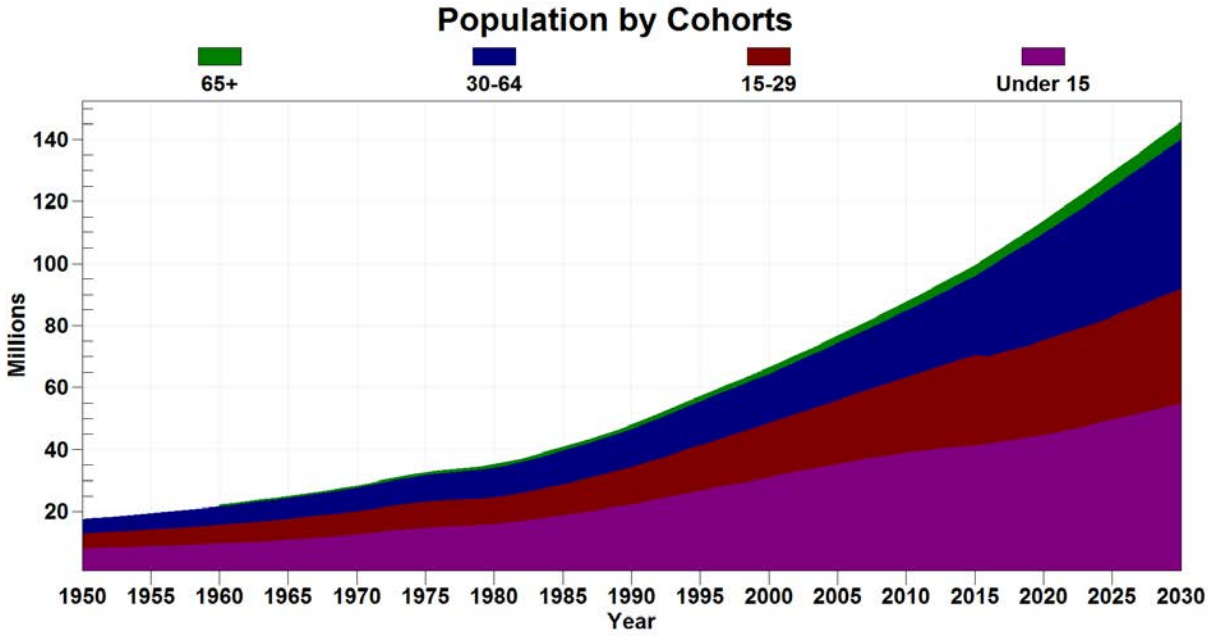
[24] R Greenhill, Demographics is Destiny, World Economic Forum, 2 September 2011, https://www.weforum.org/agenda/2011/09/demography-is-destiny/
[25] J Bongaarts and J Casterline, Fertility Transition: Is sub-Saharan Africa Different?, Population Development Review, 38: 154, 2014.
[26] P Drummond, V Thakoor, and S Yu, Africa Rising: Harnessing the Demographic Dividend, IMF Working Paper, 2014.
[27] A Hailemariam, Demographic Transition and Demographic Dividend in Ethiopia: Opportunities and Challenges, Addis Ababa University, Ethiopia, 2012.
[28] P Drummond, V Thakoor, and S& Yu, Africa Rising: Harnessing the Demographic Dividend, International Monetary Fund Working Paper, 2014.

- Key takeaways
- Demographics interventions

3.2 Basic demographic trends

Since the 1960s, Ethiopia's population has grown at an average of 2.5% annually, increasing from 22 million people in 1960 to just over 102 million in 2016. Ethiopia's population first doubled to over 44 million in 1987, and then doubled again, reaching over 89 million people in 2011. Along the Current Path forecast, the country's population will increase to 116.7 million by 2021 and 145.7 million by 2030. Today, approximately 55% of Ethiopia's population is working age (56 million people), a figure that is forecast to grow to 58% (85 million) by 2030. Of those 56 million, close to 30 million are under the age of 30. Conversely, nearly 40 million people are under the age of 15, a figure that could rise to 55 million by 2030. About three percent of Ethiopia's population is of retirement age, which is not forecast to change significantly by 2030.

Figure 3.a: Ethiopia's population by age cohort, 1960-2030



Source: IFs version 7.27, historical data from UN Population Division

Box 3.2: Forecasting demographics in IFs v. GoE data

"The population sub-model of IFs uses the cohort component analysis approach of many population models, including the studies done by the United Nations (United Nations, 1956). The approach relies upon age, fertility, and mortality distributions for each country/region with 22 cohorts: one for infants, 20 of five-year size, and one for all individuals of age 100 or older. The dominant population formulation is a simple addition of births at the bottom of the cohort distribution, subtraction of deaths from each population cohort, and advance of people to the next cohort over time...Births are modeled as a function of the total fertility rate (TFR), which in the longer term responds especially to the level of education in the adult population. Deaths are primarily a function of life expectancy, itself computed within the IFs Health model where, like fertility, it responds in the long run to adult education and also to GDP per capita and technology change. The larger demographic model in combination with the health model provides representation of migration; the fertility impact of infant mortality and contraception use rates; and the mortality impact of many factors including undernutrition, smoking rates, and indoor air pollution from open burning of solid fuels."[29]

IFs forecasts are initialized using widely accepted population data from the UN Population Division because they meet international standards and are comparable across countries and time. The table below compares available data and forecasts on population, fertility rates, and life expectancy from the GoE and the IFs model.

Figure 3.b: Demographics estimates from GoE and IFs, 2015 and 2020

	Ethiopian Government		International Futures	
	2014/2015	2019/2020	2015	2020
Population (millions)	90	--	99.5	113.8
TFR (Births per woman)	4.1	3	4.6	4.3
Life Expectancy (years)	64.6	69	64.9	65.9

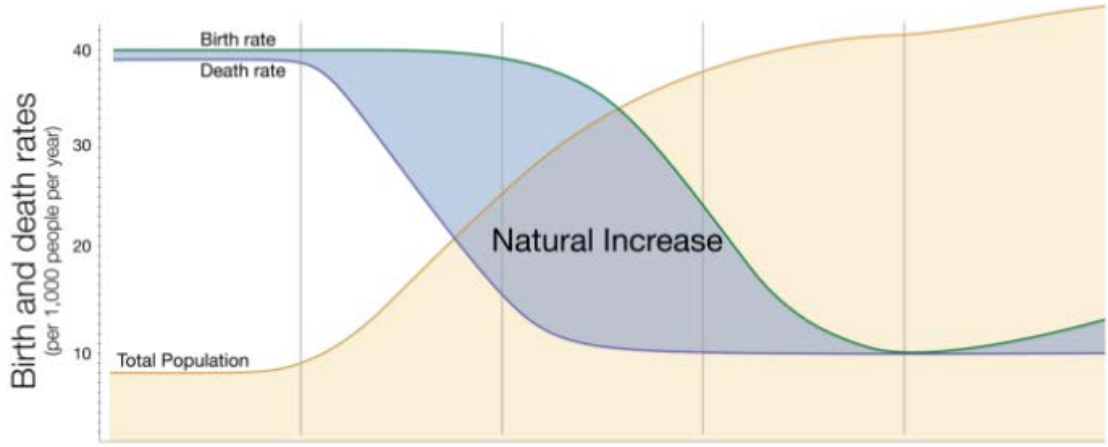
In 2015, IFs fertility rates are approximately 12% higher than Ethiopia's figures and are initialized from data taken from USAID DHS surveys. Life expectancy estimates from the GoE and IFs in 2015 are very similar. No GoE forecasts of migration trends were found (understandable because long-term forecasting of migration is challenging).

IFs estimates Ethiopia's population to be around 99.5 million in 2015, compared with estimates of around 90 million from the GoE in 2015 and close to 94.3 million in 2017. If we impose a fertility rate of 4.1 in IFs in 2015, the model estimates Ethiopia's population to be around 98 million in 2014/2015, rising to 104 million in 2017 and 111.5 million by 2020. In this scenario, IFs suggests the GoE's population forecasts would be met if there were a net out-migration of close to 10 million people between 2017 and 2021.

[29] B. Hughes et al, (Eds.), Patterns of Potential Human Progress 1: Reducing Global Poverty, Denver: Boulder: New Delhi: Pardee Center for International Futures, University of Denver; Paradigm Publishers; Oxford University Press India, 2009, Retrieved from http://pardee.du.edu/pphp-1-reducing-global-poverty

Assuming migration remains constant, and as long as Ethiopia's birth rate continue to exceed its death rate, the population will continue to grow. Growth will only begin to level out when birth rates decline to an equilibrium point (Figure 3.c). As we have seen above in the population cohort distribution, Ethiopia has a predominantly young population. As Ethiopia continues to develop, improvements in fertility and mortality will cause the population to mature, moving Ethiopia rapidly through the demographic transition. According to a paper by professor Assefa Hailemariam, at Addis Ababa University, Ethiopia is in Stage 3 of the standard demographic transition.[30] Stage 3 is characterized by falling birth rates due to factors such as improvements in access to contraception, increases in wages and urbanization, shifts in economic structure away from subsistence agriculture, changes in the status of women, reductions in child labor, and larger investments in female education.[31]

Figure 3.c: The demographic transition: stylized representation



	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Birth rate	High	High	Falling	Low	Rising again
Death rate	High	Falls rapidly	Falls more slowly	Low	Low
Natural increase	Stable or slow increase	Very rapid increase	Increase slows down	Falling and then stable	Stable or slow increase

Source: Roser, 2011.[32]

In 1960, Ethiopia's fertility rate was estimated to be 6.7 births per woman. Following reductions beginning in the 1990s and since the early 2000's, fertility has reduced in Ethiopia from 5.5 children in 2000 to 4.6 in 2016. While fertility rates have consistently declined, Ethiopia's fertility rate still ranks among the highest in the world (26th out of 186 countries) and is nearly twice the global average of 2.4. Along the Current Path, Ethiopia's fertility rate is forecast to decline to 3.7 children by 2030.

[30] A Hailemariam, Demographic Transition and Demographic Dividend in Ethiopia: Opportunities and Challenges, Addis Ababa University, Ethiopia, 2012.
[31] Population Education, Stage3 of the demographic transition, 2016, www.populationeducation.org/content/stage-3-demographic-transition-model (accessed 23 December 2016).
[32] M Roser and E Ortiz-Ospina – 'World Population Growth', 2017, published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/world-population-growth/ [Online Resource].

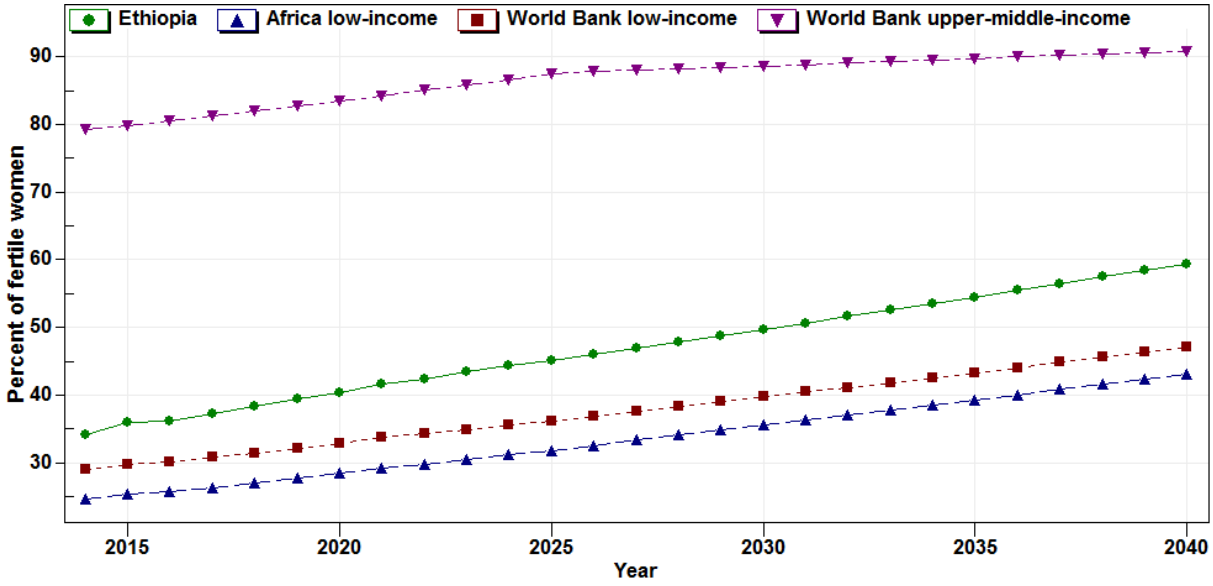
Figure 3.d: Total fertility rate, Ethiopia and regional peers, 1960-2030

	1960	1970	1980	1990	2000	2010	2016	2021	2030
Ethiopia	6.9	7.1	7.4	7.1	5.5	4.9	4.6	4.2	3.7
Kenya	8	7.9	7.2	5.7	5	4.4	4.1	3.9	3.4
Rwanda	8.2	8.3	8.3	6.7	5.4	4.1	3.7	3.4	2.9
Tanzania	6.8	6.8	6.6	6.2	5.7	5.4	5	4.7	4.1
Uganda	7	7.1	7.1	7.1	6.8	6.1	5.6	5.3	4.7

Source: IFs version 7.27, historical data from USAID Demographic Health Surveys (Ethiopia) and UNPD

Availability of, and sufficient access to, contraception is an important determinant of changing fertility rates.[33] Modern contraception use among women in Ethiopia quadrupled from about 6% in 2005 to more than 27% in 2011, reaching 36% in 2016. Part of the growth in contraception coverage is the result of a concerted push in GoE policy to expand access. Beginning in 2002, Ethiopia's Ministry of Health began expanding distribution at the community level through teams of community health volunteers that distributed low-cost contraceptive measures. The Ministry also successfully rolled out a package of policies aimed at expanding healthcare infrastructure and targeting women at the community level.[34] Contraception use in Ethiopia is about six percentage points higher than the average prevalence rate among low-income countries globally, and almost nine percentage points higher than in Africa's other low-income countries.

Figure 3.e: Contraceptive prevalence rates (percent of fertile women, 15-49), 2014-2040



Source: IFs version 7.27, historical data from World Development Indicators

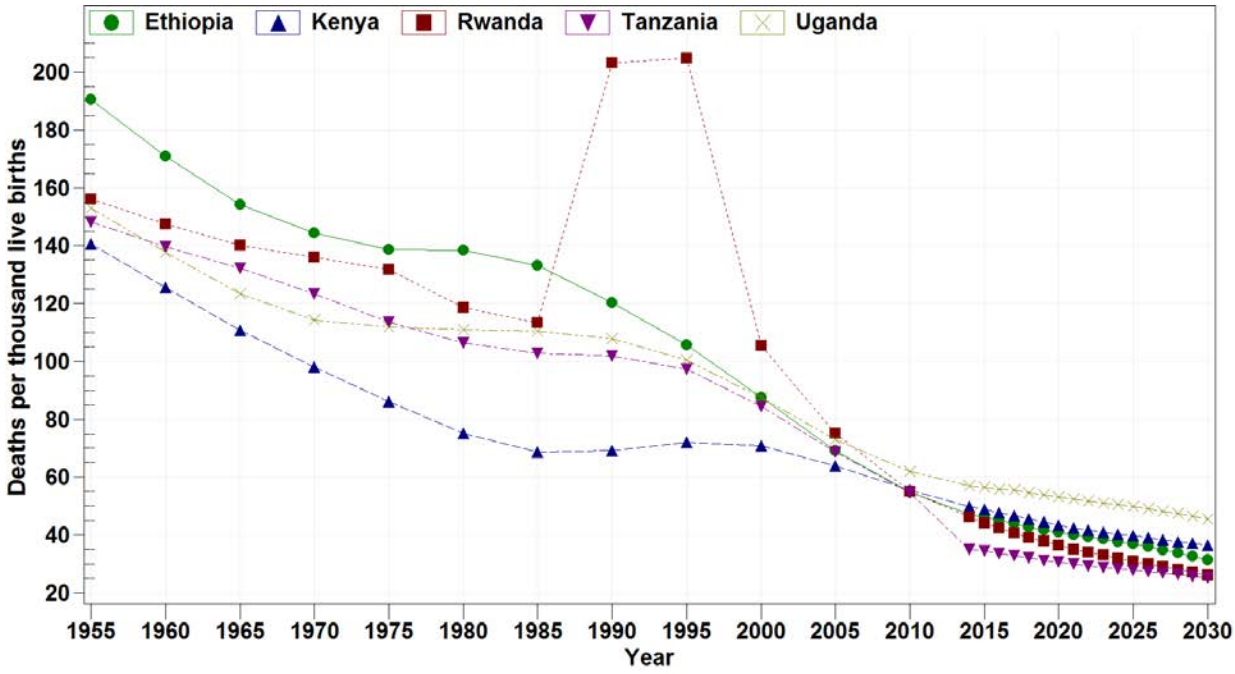
Improvements in contraception use have been coupled with reductions in infant mortality. Ethiopia's infant mortality rate has declined steadily since the mid-1980s, down from approximately 120 deaths per thousand live births in 1990 to 45 deaths per thousand live births in 2016. This continued decline is important because reducing infant mortality will eventually also impact fertility rates, leading to a more rapid stabilization of population growth.[35] As more children survive their early years, families

[33] J Bongaarts, The fertility-inhibiting effects of the intermediate fertility variables. Studies in Family Planning, 13: 6/7, 1982, 179-189.
[34] USAID and FHI, Three Successful Sub-Saharan Africa Family Planning Programs: Lessons for Meeting the MDGs, 2012, http://pdf.usaid.gov/pdf_docs/PA00HQSV.pdf
[35] K Raivio, How Does Infant Mortality Affect Birth Rates? Duodecim, 106:17, 1990.

are less likely to continue to have children, as the need to replace children that would have otherwise died diminishes.

Ethiopia has made progress bringing levels of infant mortality in line with its peer countries. By 2030, the infant mortality rate is forecast to fall to roughly 31 deaths per thousand live births, down from nearly 200 deaths per thousand births in 1955. Regionally, Ethiopia's infant mortality rate is below that of Uganda and Kenya, but above Tanzania and Uganda (in 2016). Ethiopia's infant mortality is approximately 24 percent lower than the average among low-income countries in Africa (56 per thousand live births).

Figure 3.f: Infant mortality rates, Ethiopia and regional peers, 1960-2030

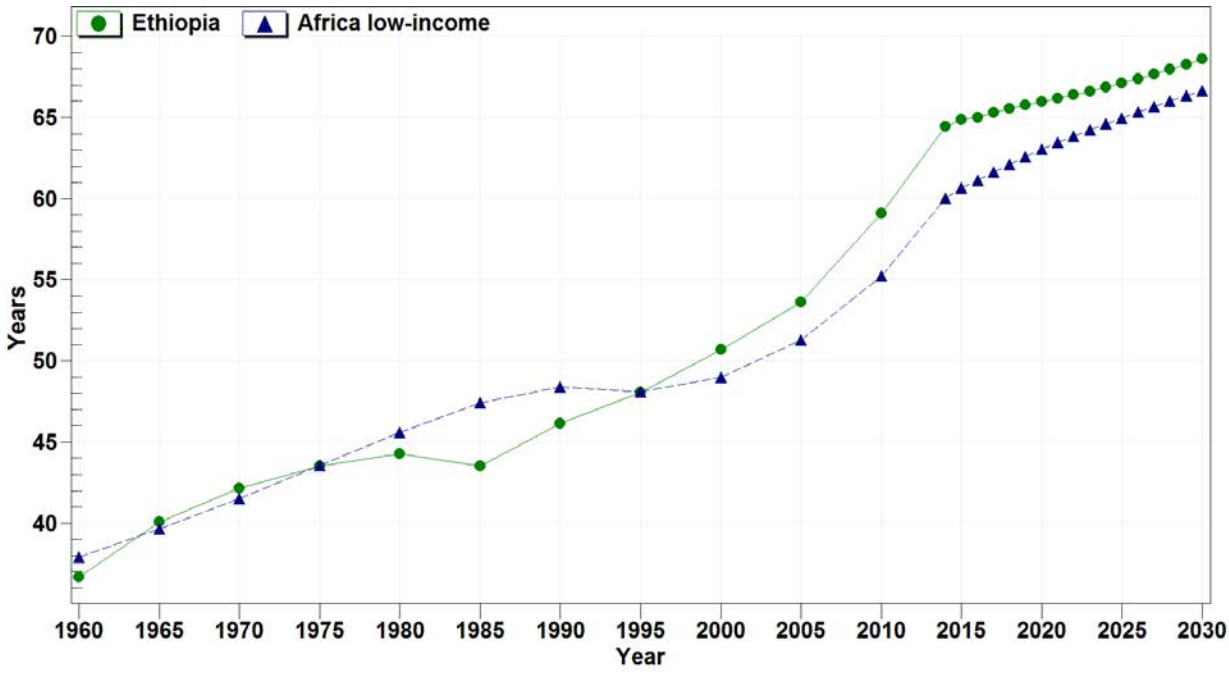


Source: IFs version 7.27, historical data from UNPD

Alongside declining fertility rates, Stage 3 of the demographic transition is characterized by a reduction in overall mortality rates. Over the past 25 years, Ethiopia's government has expanded access to health services and overseen reductions in the spread of communicable diseases, particularly malaria, HIV/AIDS, and tuberculosis (see Chapter 5 for a broader discussion of these trends). Mortality rate reductions are reflected in improvements in life expectancy; from 1960 to 2016, Ethiopia's overall life expectancy increased from 37 years to 65 years, with a gradual slowdown during the 1980s due to widespread famine and multiple conflicts. Today, female life expectancy (67 years) is about four years higher than males (63 years), although this discrepancy is fairly typical across countries.

Between 1960 and 1990, Ethiopia's average life expectancy was below other low-income African countries. Since 1995, there has been an increase in life expectancy such that Ethiopia's average life expectancy at birth now outpaces its peer low-income countries, many of whom suffered more heavily from the AIDS epidemic. This trend is forecast to continue through to 2030; by 2030, Ethiopia's life expectancy is forecast to be just under 69 years, compared to an average in low-income Africa of about 67 years.

Figure 3.g: Life expectancy, Ethiopia and low-income Africa, 1960-2030



Source: *IFs version 7.27, historical data from UNPD*

Despite improvements, Ethiopia's fertility and mortality rates remain relatively high in a global context. The global fertility rate is approximately 2.4, and average life expectancy around 72 years. As such, Ethiopia is forecast to see a rapidly growing, youthful population over the time horizon. This slow progression through the demographic transition will make it difficult for the GoE to continue to expand access to basic services and create economic opportunities for a rapidly growing young population. A failure to continue to expand services and opportunities on pace with population growth, could act as a catalyst for instability.

3.3 Social stability and the youth bulge

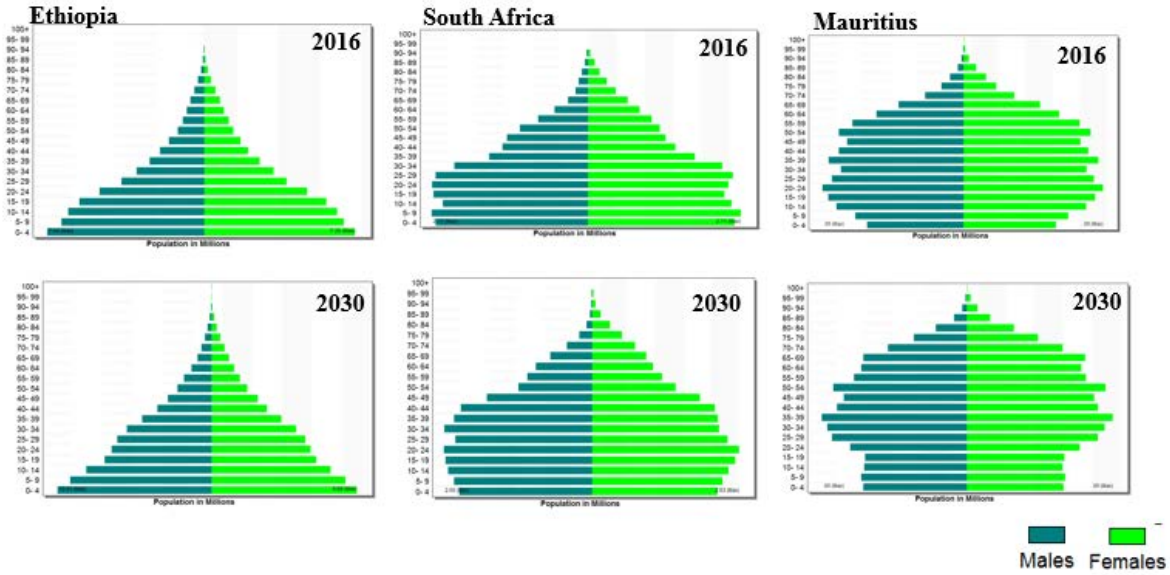
Young, rapidly growing populations can be both a boon and a challenge for countries like Ethiopia. A young, healthy, and productive population could help power Ethiopia's growth over the coming decades. But, the existence of a large "youth bulge" can also be a harbinger of political and social instability if not properly managed. Harnessing the benefits of an expanding, maturing population requires greater service delivery to ensure that these additional people have access to new opportunities for economic growth.

In the absence of inclusive growth, large young populations entering working age without jobs or economic opportunity can be a significant driver of social unrest. Youth unemployment has been identified as a key driver of social instability that precipitated the Arab Spring in 2011.[36,37] One study found that populations with a youth bulge of 40% or more, are 2.3 times more likely to experience conflict.[38]

[36] TF Azeng and T Yogo, Youth Unemployment and Political Instability in Selected Developing Countries, African Development Bank, Working Paper No. 171, 2013.
[37] D Lagraffe, The Youth Bulge in Egypt: An Intersection of Demographics, Security, and the Arab Spring, Journal of Strategic Security, 5: 2, 65-80, 2012.
[38] RP Cincotta et al, The Security Demographic: Population and civil war after the cold war, Population Action International, Washington D.C, 2003.

Ethiopia's demographic structure is relatively more developed than its peer countries, but is still younger than more developed countries on the continent (see the population pyramids in Figure 3.h). Ethiopia's current demographic structure remains skewed toward a youthful distribution. The median age in Ethiopia is approximately 19 years, whereas the median age in South Africa's is 26 years, and in Mauritius it is closer to 35 years. By 2030, the median age in Ethiopia is forecast to rise to more than 21 years, but remain well shy of the median age in more developed countries. By then, approximately 37% of the population will be under 15 years, while close to 58% will be of working age.

Figure 3.h: Population pyramids, Ethiopia, South Africa, and Mauritius, 2016 and 2030

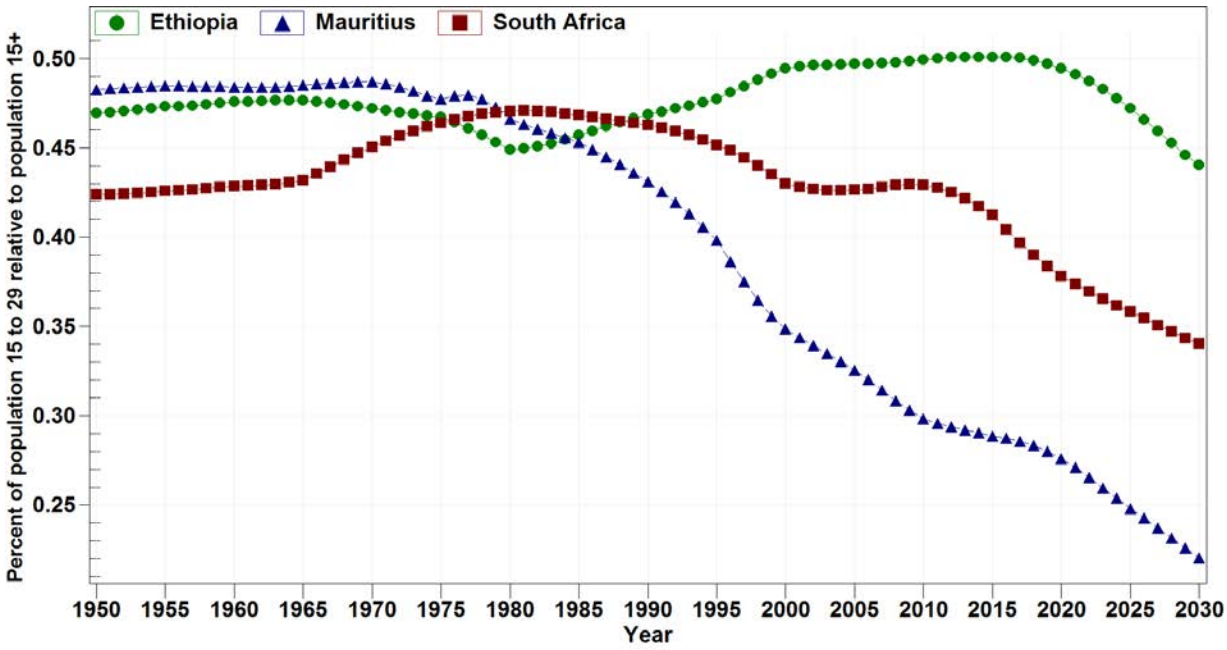


Source: IFs version 7.27, historical data from UNPD

Currently, an estimated 30 million people are between the ages of 15 and 29, and by 2030, that number could be as high as 40 million. In 2016, Ethiopia had the 14th highest youth bulge in the world, but that is forecast to drop to 33rd globally by 2030.

Because Ethiopia started to reduce fertility rates over 20 years ago, the youth bulge is forecast to decrease more rapidly than in other low-income African countries. Yet, because demographic changes are slow-moving, the youth bulge is forecast to remain fairly high until around 2020. Thus, Ethiopia will need to continue to invest in, and extend services to, a large and increasingly urban, young population in order to mitigate risks of instability over the long-term. The graph in Figure 3.i compares the youth bulge in Ethiopia with Mauritius and South Africa. By 2030, Ethiopia's youth bulge (0.44) will still be twice as large as that of Mauritius (0.22), and almost 30% larger than South Africa (0.34). In other words, the risk of instability emanating from these demographic trends will persist over the medium-term.

Figure 3.i: Youth bulge, Ethiopia, Mauritius and South Africa, 1960-2030



Source: IFs version 7.27, historical data from UNPD

A significant youth bulge, coupled with high unemployment, can be both a hindrance to economic growth and productivity, as well as a source of social instability. But, the youth bulge need not necessarily generate social instability. Good governance and the expansion of economic opportunity can help overcome the challenges associated with a young population. If properly managed, the youth bulge can transform into a demographic dividend, capable of powering sustained economic growth. If poorly managed the youth bulge could be a driver of instability. The ability of the GoE to harness these demographic opportunities of the future will depend, in no small way, on the policies and decisions made by the government and its partners today.

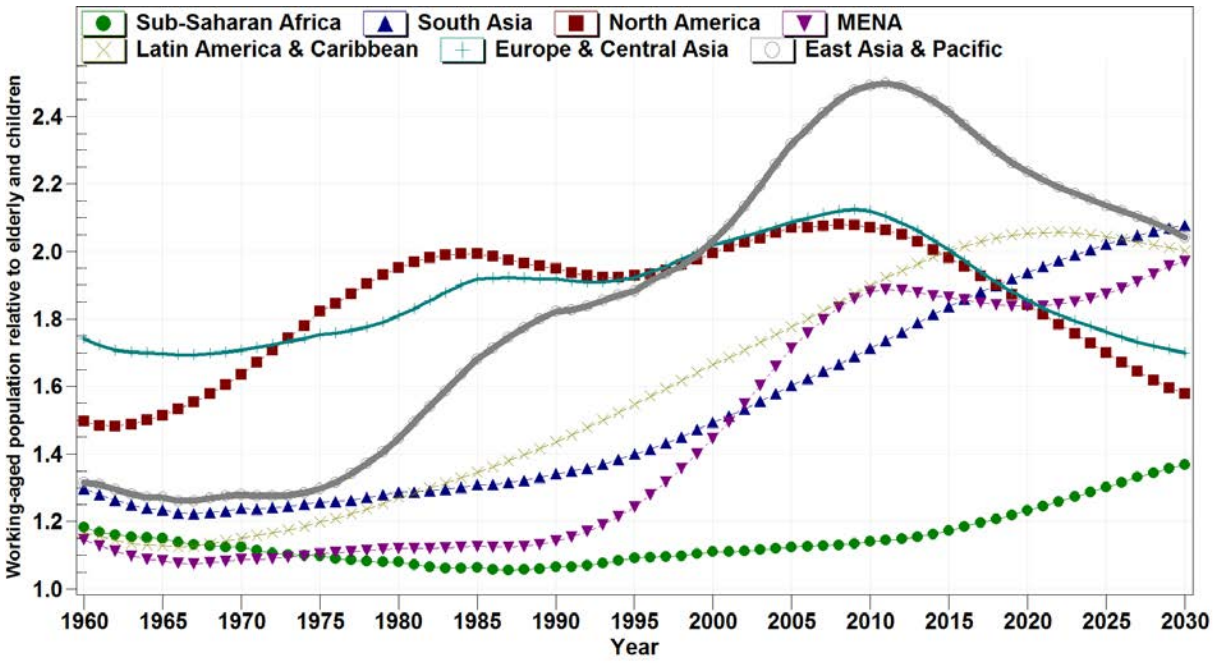
3.4 Demographic dividend

Due to the steady progress in reducing mortality and fertility rates, Ethiopia is approaching a favorable demographic dividend at a more rapid pace than many of its peers. The demographic dividend, defined as the ratio of the working-age population (15-64 years) to the dependent population (over 65 years and under 15 years) is a powerful driver of economic growth. The demographic dividend can help drive growth through a growing labor force and increased productivity.[39] In East Asia, the demographic dividend has been estimated to account for between nine and fifteen percent of the region's economic growth between 1960 and 2000.[40]

Sub-Saharan Africa's demographic dividend has historically been lower than other regions of the world. Whereas other regions of the world have moved through the demographic transition fairly swiftly, high fertility rates and a large communicable disease burden have resulted in persistently young populations across the African continent (see Figure 3.j). The high peak seen in East Asia and the Pacific was largely driven by China, where the dramatic reduction in fertility associated with the one-, and two-child policies, created one of the largest demographic dividends any country has yet experienced.

[39] Ahmed et al, How Significant is Africa's Demographic Dividend for its Future Growth and Poverty Reduction, World Bank Policy Research Paper, 2014.
[40] A Mason and T Kinugasa, East Asian Economic Development: Two Demographic Dividends, Journal of Asian Economy; 19: 5-6, 2008, 395.

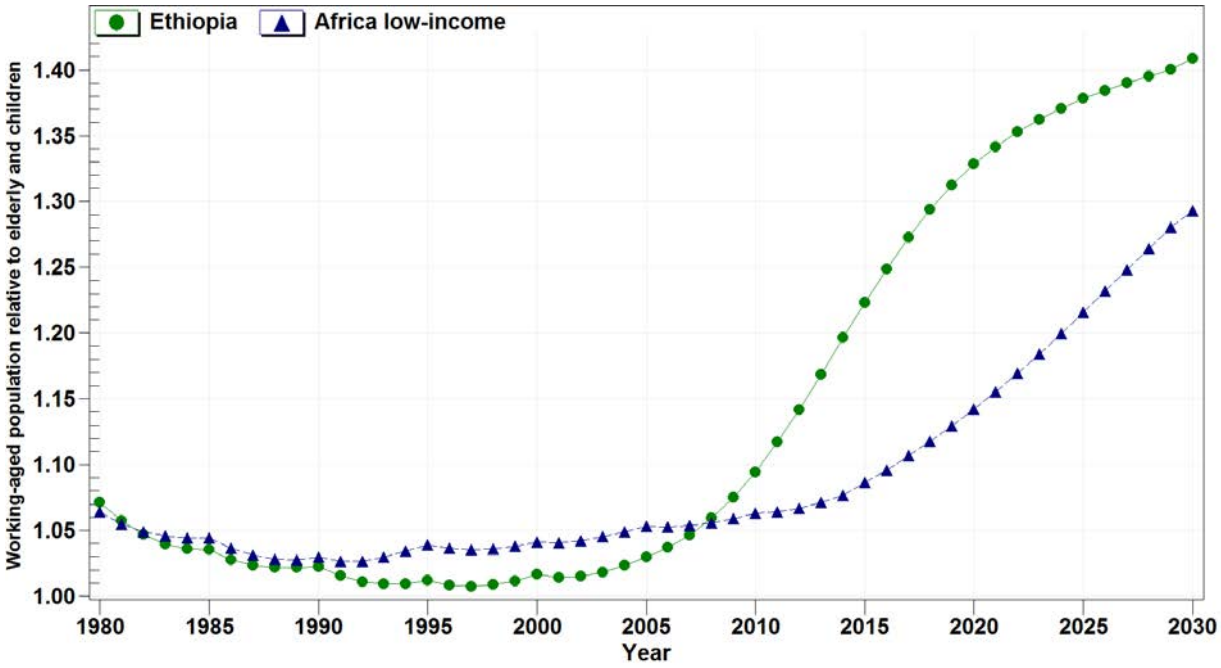
Figure 3.j: Demographic dividends by World Bank regions, 1960-2030



Source: IFs version 7.27, historical data from UNPD

As Figure 3.k below shows, a larger percentage of Ethiopia's population will be working age relative to its peers across the forecast horizon. Even though the demographic dividend will last for decades (IFs forecasts continued growth in the demographic dividend to 2050), concurrent long-term investments in human capital must be implemented to ensure that Ethiopia does not squander this favorable demographic period.

Figure 3.k: Demographic dividend, Ethiopia and low-income Africa, 1980-2030



Source: IFs version 7.27, historical data from UNPD

A continued and accelerated reduction of fertility rates is important. Potential policies to reduce fertility include supply-side policies, like an expansion of healthcare and family planning services. A community-based, nurse outreach program in rural Ghana led to decrease in fertility of around 15% relative to comparable communities over three years.[41] Fertility reduction could also include demand-side policies which focus on reducing the need for additional children among families and may include policies aim at improving female education, healthcare, participation in the labor force and age of first marriage.[42] Female education (particularly secondary level) is particularly important. A UNICEF study of DHS survey data in Ethiopia found that in 2011, women with no education had an average fertility rate of 6.0, whereas women with secondary education or above had an average fertility rate of only 3.1.[43]

Family planning policies alone are insufficient to capitalize on the dividend however. These policies should be coupled with strategies to promote an inclusive, entrepreneurial economic environment that allows communities to harness opportunities for growth. These may include improvements to physical infrastructure (electricity, roads), diversification of the export sector, and improved governance and incentives to encourage foreign investment.[44]

Many East Asian countries (notably China and South Korea) benefitted from significant demographic dividends in the 1990s and 2000s. During this period, East Asian economies were able to expand their labor forces by an average of 2.1% per annum, while overall population grew at 1.9% per annum. By contrast, sub-Saharan Africa's labor force only expanded at 0.9% annually, while its population growth rate was closer to 2.7%. Ethiopia's own labor force grew at around 2.2% per annum over the same period, but the population growth rate also averaged a rapid 2.7%.[45]

The East Asian countries were also successful in expanding employment through new industries and jobs, particularly in the manufacturing sector. The contribution of the manufacturing sctor to GDP in the region grew from an average of 13% in 1960, to 28% by 1990.[46] Successful export promotion policies ensured that there was demand for cheap labour in the manufacturing sector. Alongside an expansion of manufacturing were improvements in agricultural productivity, which allowed these countries to produce more food with fewer farmers. The agricultural labor force declined in Japan, South Korea, and Taiwan during this time.[47]

Prolonging the demographic dividend also requires human resource development and human capital investment to prolong growth. Such policies should seek to increase education opportunities, particularly at the secondary and tertiary level, improve the quality of the education system, promote graduates in science, technology, engineering and mathematics, and expand opportunities for female education and employment.[48] Education was an important building block of economic growth in many of the fast-growing East Asian economies. Between 1960 and 1990, massive improvements were made to education attainment in many of these countries. China's average education attainment went from

[41] FN Blinka, A Nazzar, and JF Phillips. The Navrongo Community Health and Family Planning Project, Studies in Family Planning, 26(3), 1995, 135.
[42] Gates Foundation. Creating and Capitalizing on the Demographic Dividend for Africa. Paper prepared for Industrialization for an Emerging Africa, Abijan, Cote d'Ivoire. 21-26 March, 2013.
[43] UNICEF, Components of Fertility Change in Ethiopia, 2013, www.unicef.org/ethiopia/Components_of_Fertility_Change_in_Ethiopia.pdf
[44] Ibid. 31.
[45] Data taken from Ifs 7.27. Original labor data from World Development Indicators and population data from UNPD.
[46] Data taken from Ifs 7.27. Original data from Global Trade Analysis Project (GTAP).
[47] A Mason, Capitalizing on the Demographic Dividend, UNFPA, 2002, 15, www2.hawaii.edu/~amason/Research/UNFPA.PDF.
[48] UNICEF, Components of Fertility Change in Ethiopia, 2013, 31, www.unicef.org/ethiopia/Components_of_Fertility_Change_in_Ethiopia.pdf

2.3 years in 1960 to 5.6 years in 1990. South Korea saw average education rise from 4.3 years to 9.4 years over that same time period. Similar improvements were seen in Singapore and Taiwan.[49]

A large and rapidly expanding demographic dividend represents a favorable opening for sustained economic growth in Ethiopia, one that could potentially last decades. Significant progress has been made in reducing infant mortality, disease burdens, and fertility rates, while simultaneously improving life expectancy. The demographic dividend presents a long window of opportunity for inclusive and sustained economic growth, higher savings and more productive investments, and significant improvements to human capital that result in healthier and better educated populations. Nevertheless, the demographic dividend is not guaranteed. Capturing the demographic dividend will require that Ethiopia pursue policies to further reduce fertility rates, expand investments in sectors that can create jobs for unskilled youth (particularly agriculture and manufacturing), while expanding education and the stock of skilled labor. Female education should also be a priority (see Chapter 6), both to contribute to further fertility reductions, and to empower females to enter the labor force.[50] The GoE should further pursue economic policies that help create an inclusive and competitive economic environment to stimulate foreign investment. Just as the demographic dividend can last for decades, the policies and investments required to harness that dividend are similarly long-term. Thus, Ethiopia must not only be aware of this demographic opportunity, but actively plan and invest accordingly.

3.5 Population growth and service delivery

Over the past 20 years, the Ethiopian population has grown by nearly 80%, from 57 million people in 1995 to 102 million in 2016. Between 2015 and 2016 alone, Ethiopia added an estimated 2.7 million people to its population. Ethiopia is already the second most populous country in Africa, and it will still see significant population growth over the next 14 years. The country's population growth rate is declining at a more rapid rate than its peers, but it is still significantly higher than the world average (1.1%). Over the next 14 years the Ethiopian population is expected to increase by 40%, growing from 102 million in 2016 to 145 million in 2030.

An important implication of a rapidly expanding population is that it strains the government's ability to provide basic services such as electricity, clean water and sanitation, sufficient food, and infrastructure. Ethiopia already struggles to provide universal access to basic services, particularly in rural areas; adding an additional 45 million people to the population by 2030 will only compound this challenge. Figure 3.1 below lays out the Current Path forecast of service demand for calories, water connections, and electricity connections[51] in Ethiopia between 2016 and 2030. Infrastructure challenges are described throughout this report; but the table below provides an indication of the challenges facing the Ethiopian government in meeting service delivery for a population forecast to continue growing at a rapid rate.

[49] Data taken from IFs 7.27. Original data from Barro & Lee education data set.
[50] UNICEF, Components of Fertility Change in Ethiopia, 2013, 32, www.unicef.org/ethiopia/Components_of_Fertility_Change_in_Ethiopia.pdf ibid. 2013. 32.
[51] Connections represents an approximation of the number of service connections needed based on the size of the population, percent of the population with access, and the average household size. Crop demand reflects forecasts of actual consumption.

Figure 3.I: Service demand in Ethiopia 2016-2030

	2016	2021	2030
Total Crop Demand (million metric tons)	40	44.6	60
Improved Sanitation Connection Needed (millions)	5.1	6.9	12.7
Piped Water Connections Needed (millions)	13.5	22.6	49.9
Electrical Connections Needed (millions)	5.1	7.5	13.9

Source: IFs version 7.27

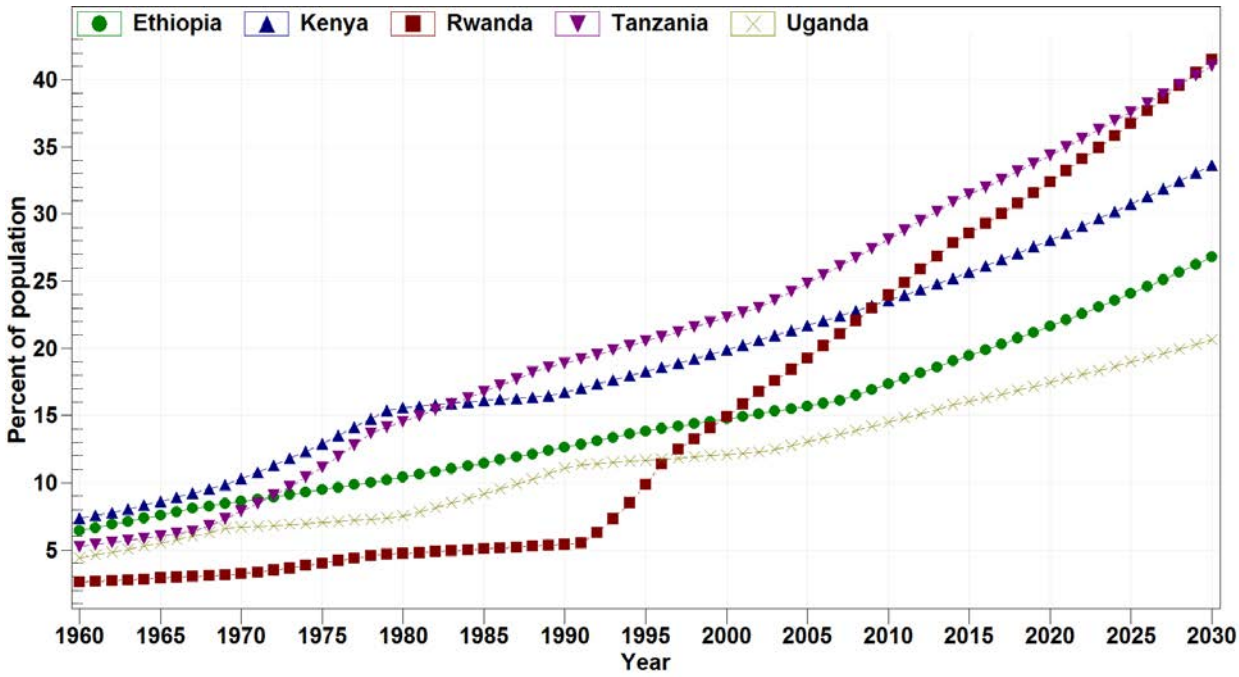
Urbanization will also be an increasingly important factor for the country's development path. Cities are positively correlated with economic productivity both in developing and developed countries, particularly through agglomeration effects of concentrating workers and businesses in the same area.[52] Cities have also been found to have a positive effect on innovation and knowledge creation.[53] Moreover, cities can help facilitate increased access to basic infrastructure because increased population density reduces the per capita cost of infrastructure construction.

Rapid urbanization is not without its pitfalls, as it can leave public services strained and unable to meet rising demand. Urbanization, if not properly managed, often leads to overcrowding, poor living conditions and slums, as well as urban unemployment.[54] Moreover, the stress of rapid urbanization often causes environmental degradation.[55] Evidence suggests that urbanization is happening in Africa at lower levels of income than in other regions of the world and with less investment in infrastructure.[56]

Ethiopia is one of the least urbanized countries in Africa. The capital, Addis Ababa, is the only city in Ethiopia with a population greater than 1 million people and in 2016, only about 20% of the population lived in urban areas. For a country of Ethiopia's relative level of development, the urban population is expected to be closer to 30% (benchmarked against GDP per capita). By comparison, Nigeria and Egypt, the first and third most populous countries in Africa, have closer to 45-50% of the population living in urban centers.[57]

[52] G Duranton, Growing through Cities in Developing Countries, World Bank Working Paper 6818, 2014; Pierre-Philippe Combes et al, Urbanisation and Migration Externalities in China, Marseille School of Economics, Working Paper, 2013.
[53] G Carlino and R Hunt, What Explains the Quantity and Quality of Local Inventive Activity? Federal Reserve Bank of Philadelphia, 2009.
[54] H Buhaug and H Urdal, 'An Urbanization Bomb? Population Growth and Social Disorder in Cities, Global Environmental Change, 23: 1, 2013.
[55] E Brennan, Population, Urbanization, Environment, and Security: A Summary of the Issues Woodrow Wilson Center, Washington D.C., 1999.
[56] ME Freire et al, Africa's Urbanization: Challenges and Opportunities, World Bank Working Paper No. 7, 2014.
[57] Data on urbanization is taken from the World Bank World Development Indicators. According to the WDI, urban population refers to people living in urban areas as defined by national statistical offices.

Figure 3.m: Urban population (percent of population), Ethiopia and regional peers, 1960-2030



Source: IFs v. 7.27, historical data from World Development Indicators

Ethiopia's urban population has more than tripled since 1991, growing from 6.4 million in 1991 to approximately 19 million today, representing an average growth rate of about 4.7% over that period. Growth is expected to continue, and by 2030, close to 39 million people (26% of the population) are expected to live in urban areas.

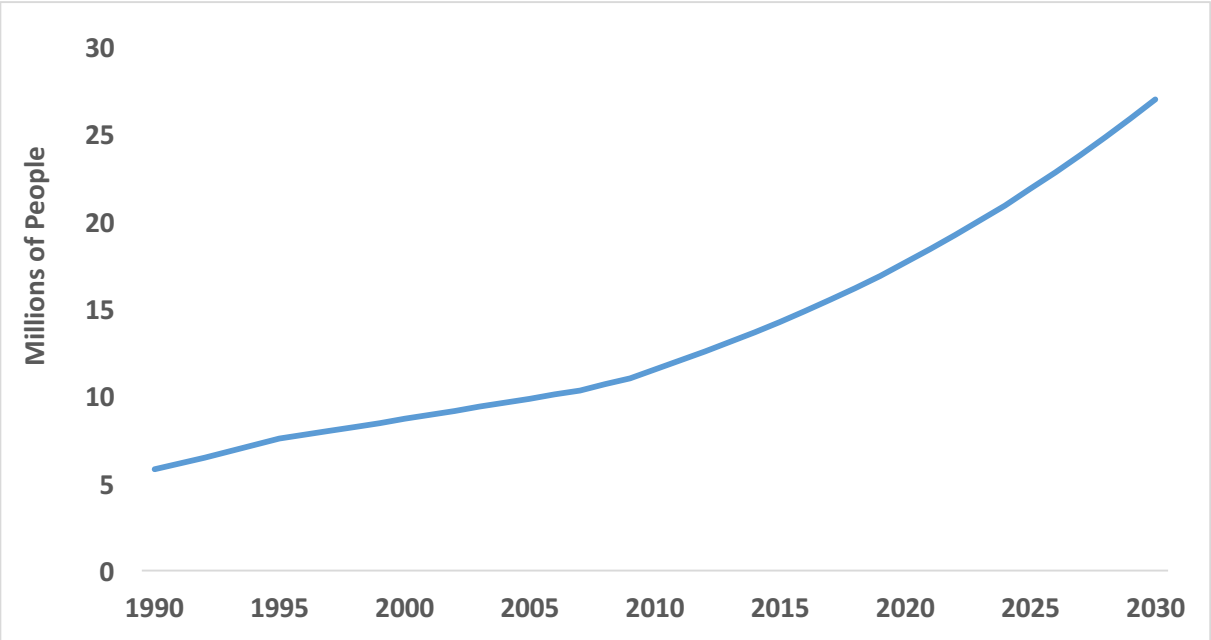
Urbanization produces large swathes of urban poor, who often face a different set of challenges than their rural counterparts. Despite rapid economic growth since 2003, Ethiopia is still combatting high levels of poverty. Today, as much as 25% of Ethiopia's population (26 million people) live on less than US$1.90 per day (the international threshold for extreme poverty). Along the Current Path forecast, as much as 10% of the population (15 million people) are forecast to still be living on less than US$1.90 per day, even by 2030. Urban poverty presents a unique set of challenges. The urban poor often do not produce their own food, and are therefore more at-risk of shocks to food prices. They may suffer from limited access to proper sanitation and clean water, and be more susceptible to violence, crime, and unrest.[58] Many urban poor often take up residence in substandard housing, or slums, which sometimes house hundreds of thousands of people.

In 1990, approximately 95% of classified urban dwellers in Ethiopia lived in slum housing. By 2009, that number had fallen to 76%.[59] Despite a decline in the share of those living in slum housing, the absolute number of Ethiopians living in informal settlements has increased from approximately five million in 1990 to ten million in 2010. Figure 3.o below provides a forecast of Ethiopia's population that could be living in informal housing/slum conditions by 2030, and provides a rough picture of the impact of continued population growth and rapid urbanization along the Current Path. By 2030, there could be as many as 27 million Ethiopians living in urban slum housing.

[58] S. Commins, Urban Fragility and Security in Africa, Africa Center for Strategic Studies. Washington D.C., 2011, Retrieved from http://africacenter.org/wp-content/uploads/2016/06/ASB12EN-Urban-Fragility-and-Security-in-Africa.pdf

[59] UNHabitat. Data. 2016. http://unhabitat.org/

Figure 3.o: Forecast of urban slum population in Ethiopia 1990-2030



Source: Author's own calculations using data from UNHabitat[60]

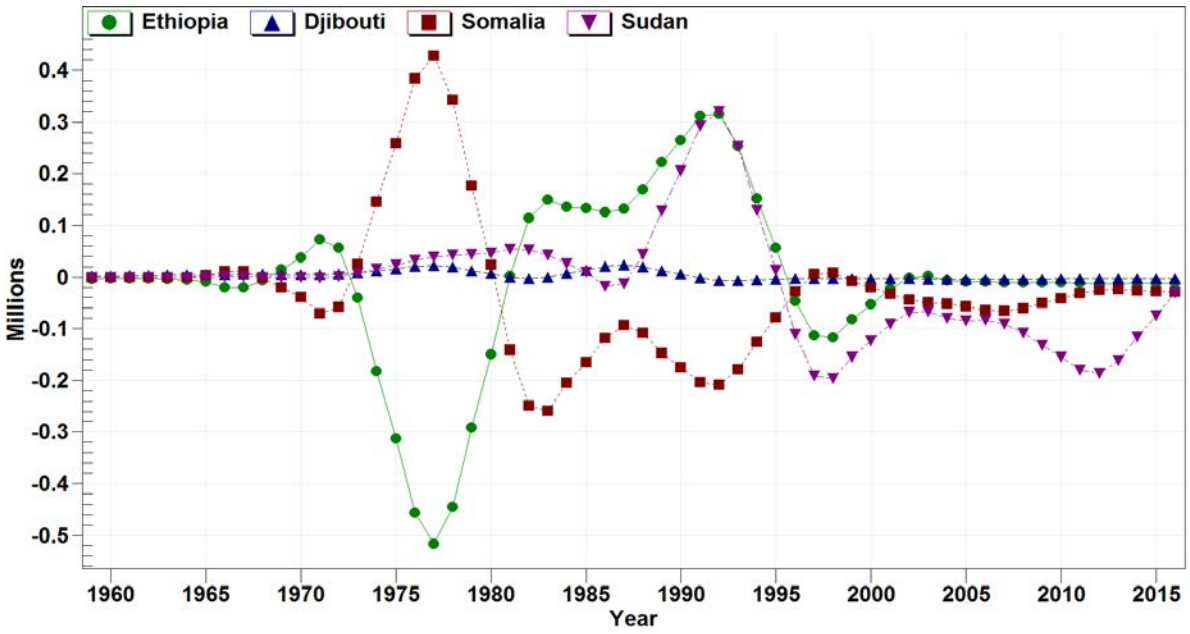
A rapidly growing population will strain the ability of the government to deliver services and meet the needs of its population. If service provision remains an issue, it will be exacerbated by the pressures of a large and youthful share of the total adult population. Strong service delivery will allow Ethiopia to take advantage of its rapid population growth through sustained and inclusive economic growth.

3.6 Migration

Ethiopia's historical migration patterns have largely been the result of its history of violent conflict. Large scale emigration occurred in the mid-1970s as many Ethiopians escaped drought and famine and life under the communist regime of the Derg. Many immigrants began returning to Ethiopia in the late 1980s and early 1990s following the end of the Ethiopian civil war and the establishment of the government under the EPRDF. The volatility in migration patterns seen in Ethiopia and some of its direct neighboring countries underscores the instability that has plagued the Horn of Africa region for decades. Figure 3.p shows a history of net migration for select countries in the Horn of Africa.

[60] Forecasts of the size of urban slum populations use data from UNHABITAT which measures the slum population as a percent of the total urban population. There is data for Ethiopia roughly every 5 years between 1990 and 2014. A weakness of the forecast is that it relies on a similar linear extrapolation of the percent of the urban population living in slums based on this data. IFs population forecasts of total urban population (millions) is then used to estimate the total population living in slums. These numbers should be treated with caution but are designed to provide a picture of how rapid population growth alone can create significant urban pressures.

Figure 3.p: Net migration (millions), Ethiopia, Djibouti, Somalia, and Sudan, 1960-2016



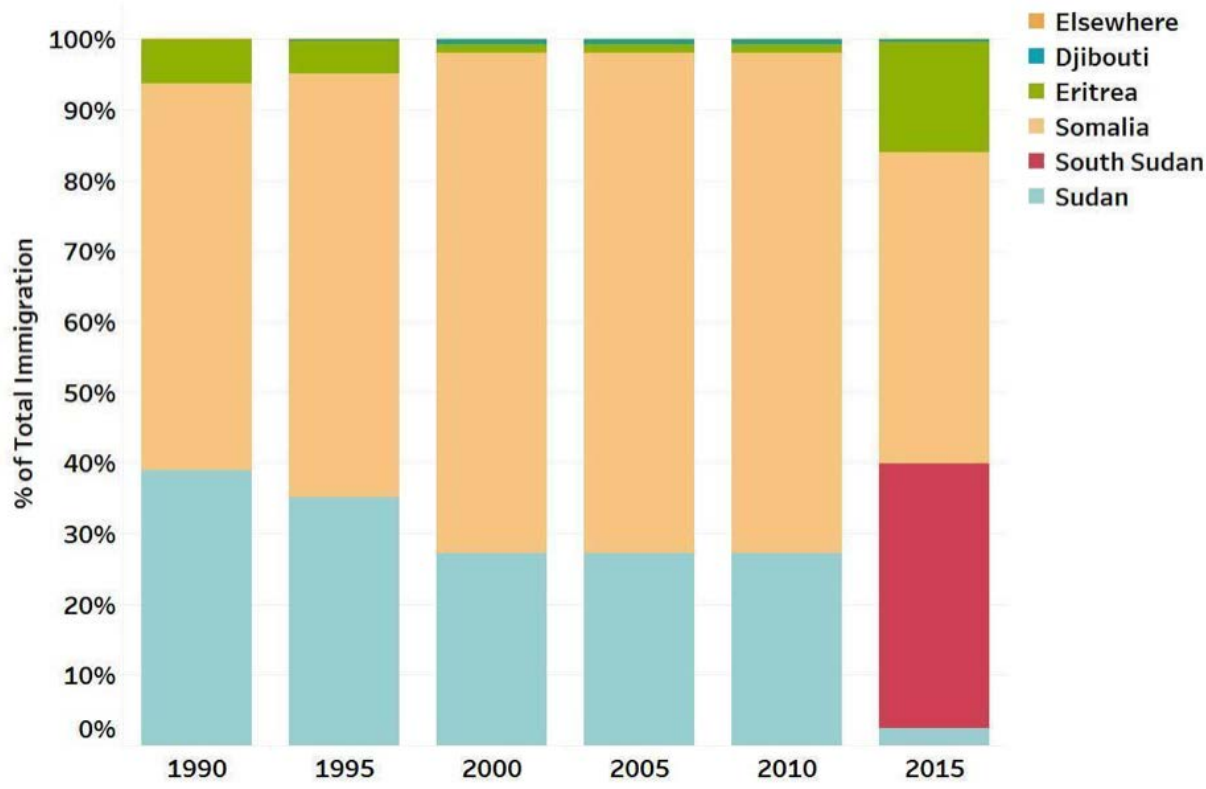
Source: IFs v. 7.27, historical data from UNPD

Figure 3.q provides an indication of where foreign born migrants into Ethiopia originate.[61] In 1990, an estimated 1.1 million migrants were living in Ethiopia. By 2015, that number was up to 1.7 million. Ethiopia also hosts a significant refugee population, and in 2014, overtook Kenya as the largest refugee-hosting country in Africa, with more than 700,000 refugees.[62] The refugee population may account for as much as 40% to 45% of the total stock of foreign-born migrants in Ethiopia. Much of the recent growth in Ethiopia's refugee population has come from South Sudanese citizens escaping the current conflict, and from Eritreans escaping political persecution.[63]

Since 1990, close to 50% of the foreign-born population in Ethiopia originated in Somalia (many of whom are refugees), and between 30 to 35% have come from Sudan. Between 2010 and 2015, there has been a surge in the number of South Sudanese migrants, an estimated 75% of whom may be refugees, and also Eritrean migrants who accounted for 10-15% of the total foreign born stock in 2015. More than 60% of Eritreans in Ethiopia in 2015 may be refugees.

[61] This data represents aggregated estimates of foreign born population (both migrants and refugees) in Ethiopia. Disaggregated estimates were not available.
[62] S Prandi, Eritrean Refugees in Ethiopia. Al-Jazeera, 10 March 2016, www.aljazeera.com/indepth/inpictures/2016/03/eritrean-refugees-ethiopia-160306065928790.html
[63] L Dobbs, Ethiopia overtakes Kenya to become Africa's largest refugee-hosting country. UNHCR. 19 August 2014, www.unhcr.org/en-us/news/latest/2014/8/53f31ebd9/ethiopia-overtakes-kenya-africas-biggest-refugee-hosting-country.html

Figure: 3.q: Top countries of origin for migration to Ethiopia (includes refugees), 1990-2015



Source: UN migrant stock database, 2016.

Ethiopia also has a large diaspora; there may be as many as three million Ethiopians living and working abroad. Top destinations for Ethiopian emigrants include the U.S. (17%) and Saudi Arabia (12-15%). Emigration to the U.S. has grown from approximately 3% percent in 1990 to over 17% in 2015. Saudi Arabia has also seen similar growth across the time period. In 1990, almost 60% of Ethiopian emigrants went to Sudan, but that number has dropped to around 10%, as of 2015.

3.7 Key takeaways

- Ethiopia has made progress (particularly in relation to its low-income African peers) in reducing fertility and mortality rates since the early 1990s. Life expectancy is forecast to continue rising and fertility rates will continue to fall across the forecast horizon
- Ethiopia is approaching its demographic dividend at a more rapid pace than many of its low-income African peers. This could have positive effects on economic growth if Ethiopia is able to capitalize of the demographic dividend by investing in health and education, and by promoting inclusive economic growth.
- Ethiopia's population has a significant youth bulge (population aged 15-29), which could be a potential source of social instability if not properly managed. While Ethiopia's youth bulge is past its peak, it is still forecast to have a large portion of people aged 15-29 through 2030.
- Despite reductions in fertility, Ethiopia's population is forecast to grow to around 145 million by 2030. This population growth will place a strain on the government's capacity to provide basic services like water and sanitation, electricity, food, and education

3.8 Demographics interventions

In this section, we explore the effects of alternative interventions, and their cumulative impact out to 2030 and 2040. As demographic shifts tend to occur slowly, we have explored some scenario results out to 2040 to isolate the longer-term impacts. The interventions in focus are: 1) Reduced Fertility; 2) Stalled Family Planning; 3) Increased Contraceptive Prevalence; and 4) Decreased Contraceptive Prevalence. We also include combined scenarios to simulate the integrated impact of these dimensions. The goal of the section is to outline some of the potential tradeoffs in policy choices and interventions with respect to fertility and family planning over the long-term.

3.8.1 Continued Fertility Reduction

A first intervention reduces fertility rates by 10% relative to the Current Path between 2017 and 2021. This is similar to fertility decreases seen in Rwanda, where fertility rates were reduced by close to 15-20% between 1995 and 2005. In this intervention, Ethiopia's fertility rate reaches 3.3 births per women by 2030 as compared to 3.7 in the Current Path. In this scenario, a cumulative 4.7 million fewer births occur in Ethiopia between 2016 and 2030.

3.8.2 Increased Contraception Access

Ethiopia has increased access to contraception significantly since the early 1990's, when access to modern contraception was available to less than three percent of women of childbearing age. Data from the World Development Indicators suggest that access to modern contraceptives more than doubled between 1990 and 2000, and doubled again between 2000 and 2005.[64] Between 2011 and 2014, modern contraceptive use grew by about 22%, and from 2014 to 2016 there was about an 11% increase. A second intervention simulates an increase in contraceptive prevalence of 12% relative to the Current Path over five years. This magnitude is in line with recent expansion in Ethiopia, as well as historical improvements across sub-Saharan Africa. The intervention results in a nearly 6.8 percentage point increase in contraceptive prevalence in 2030 relative to Ethiopia's Current Path. As a result, there are a cumulative 2.3 million fewer births in Ethiopia between 2016 and 2030.

3.8.3 Fertility Reduction Stalls

A third intervention explores the effects of stalling fertility rate reductions in Ethiopia. In this intervention, fertility reductions do not occur as rapidly as forecast in the Current Path. Even though Africa as a whole has seen its fertility rate fall over time, reductions have not been uniform. Niger, for instance, has seen a slight increase in fertility rates since the 1960s, while many other countries have only seen modest reductions. Similarly, while most countries have seen an increase in contraception use, some countries have seen periodic stagnation and/or declines in contraception use rates. In this scenario, fertility rates are about 11% higher relative to the Current Path in 2030. Consequently, there are close to 4.6 million more (cumulative) births in Ethiopia relative to the Current Path scenario by 2030.

3.8.4 Contraception Access Stalls

Notwithstanding Ethiopia's expansion of contraceptive prevalence in recent years, we modeled an intervention that explored the impact of a reversal in contraceptive access. This intervention reduced access to contraception by 12% relative to the Current Path over five years. This results in a decrease in contraceptive prevalence of six percentage points by 2030 (43.6%), relative to Ethiopia's Current Path (49.7%).

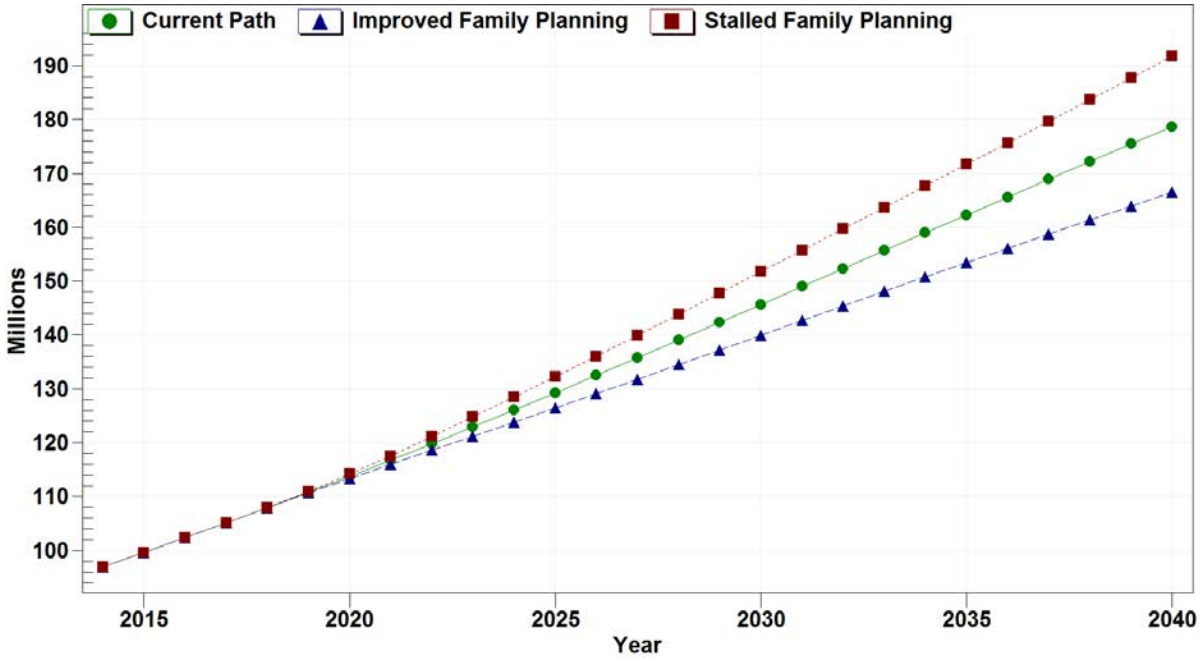
[64] World Bank Databank, 2016.

3.8.5 Combined Scenarios

Two final scenarios were constructed to explore the impacts of fertility reduction on a number of other critical development outcomes. The first, Improved Family Planning, represents a package of policies aimed at improving family planning in Ethiopia. These policies may include better sex education and improved access to contraception. The second, Stalled Family Planning, represents a scenario where the gains seen in fertility rates proceed slower than we expect in the Current Path forecast.

The Current Path forecast estimates that, by 2030, the population of Ethiopia will be close to 145 million people. Under the Stalled Family Planning scenario, the population could be as high as 151 million by 2030, whereas an Improved Family Planning scenario could reduce the population to 140 million by 2030. In this combined Improved Family Planning scenario, the population growth rate falls to 1.9% in 2030, compared to 2.3% in the Current Path. Under the Stalled Family Planning scenario, the population growth rate is 2.6% in 2030, a 0.3 percentage point increase relative to the Current Path scenario.

Figure 3.r: Ethiopia population under combined demographics scenarios, 2014-2040



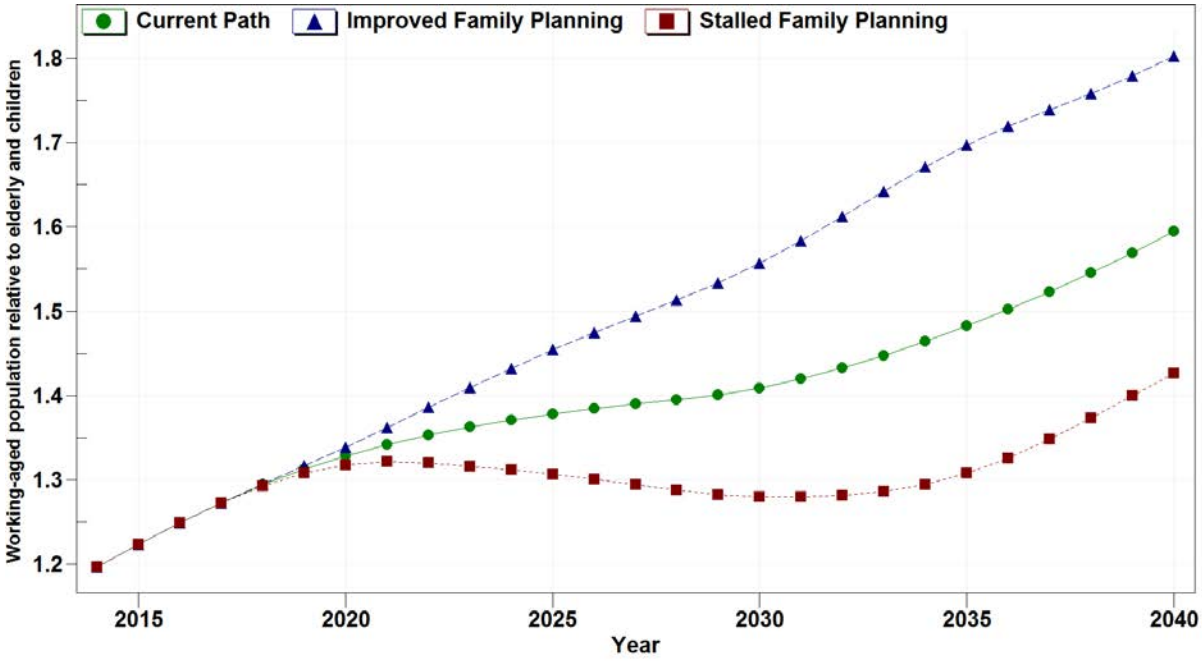
Source: IFs v. 7.27, historical data from UNPD

These interventions also play out in different ways in terms of the population distribution in Ethiopia. Reduced Fertility means the population matures more rapidly, whereas slowdowns in fertility rate reductions means the population remains young. We can see this in the corresponding downstream impact on median age, which in some ways is an oversimplification of the population age distribution, but provides an important insight into a country age structure.[65] In the Current Path scenario, Ethiopia's median population age will reach 21.5 years in 2030 and 23.3 years in 2040, up from 18.8 years today. In the Improved Family Planning scenario, the median age of Ethiopia is closer to 22.5 years by 2030 and 25.3 years in 2040, or roughly on par with South Africa today. Under the Stalled Family Planning scenario, Ethiopia's median age is forecast to be 21.3 years in 2040, making it the 11th youngest country in Africa (by median age) in 2040.

[65] RPR Cincotta et al, Demography as Early Warning: Gauging Future Political Transitions in the Age-structural Time Domain, The Stimson Center: Washington D.C, 2013.

This has forward impacts on the size and timing of Ethiopia's peak demographic dividend. IFs estimates that the demographic dividend is almost 22% larger in the Improved Family Planning scenario than under the Stalled Family Planning scenario by 2030, and almost 26% larger by 2040.

Figure 3.s: Ethiopia demographic dividend under combined demographics scenarios, 2014-2040

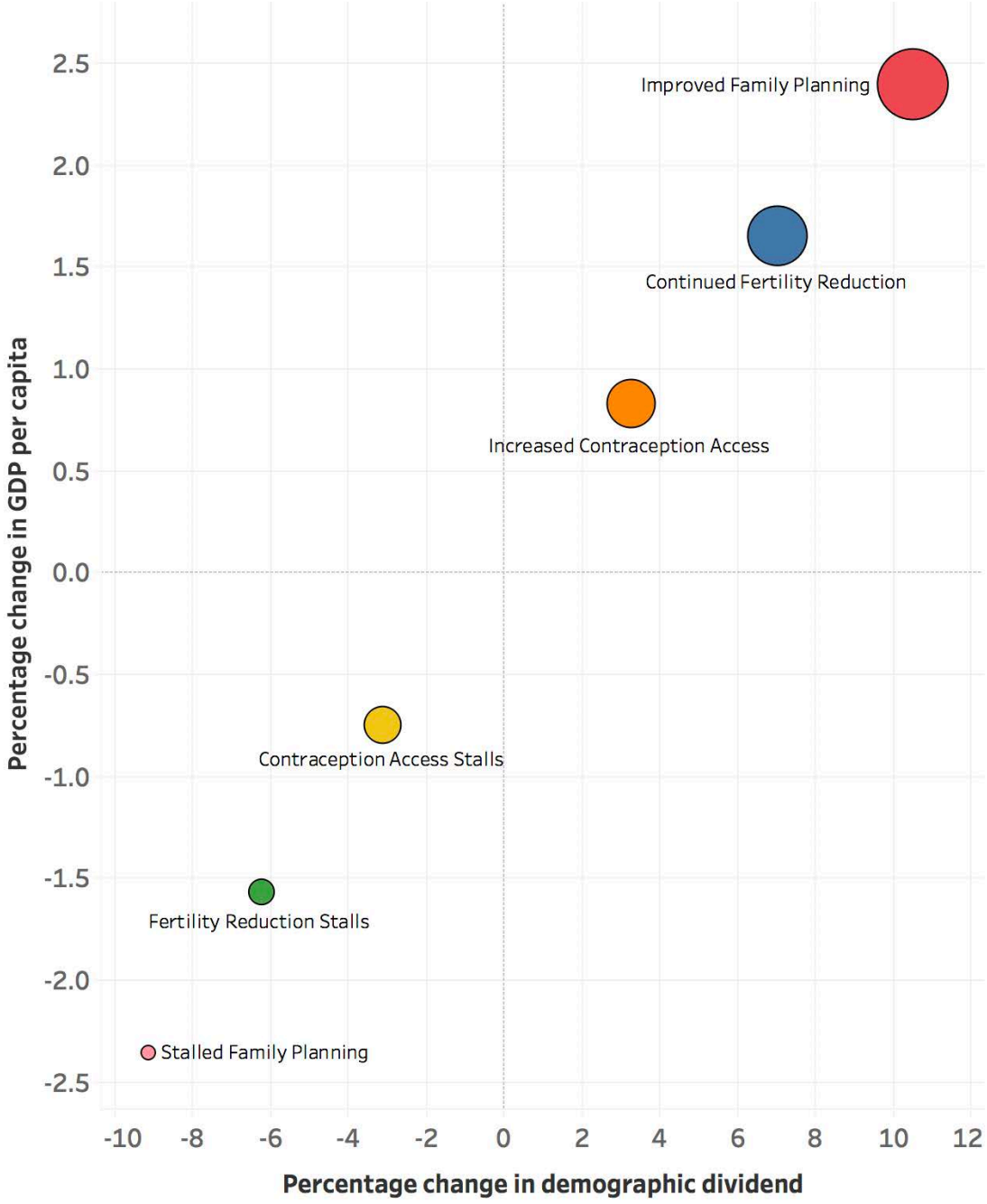


Source: IFs v. 7.27, historical data from UNPD

Under the Improved Family Planning scenario, the youth bulge is three percentage points smaller than in the Stalled Family Planning scenario. Even with the improvements modelled in the Improved Family Planning scenario, an estimated 39% of the population will be between in the ages of 15 and 29 in 2040, compared with 40% in the Current Path.

A quicker transition into the demographic dividend will likely increase economic growth. Along its Current Path, Ethiopia's GDP per capita (PPP) is forecast to grow from US$1,523 in 2016 to US$2,419 by 2030. Under the Improved Family Planning scenario, GDP per capita reaches US$2,477 by 2030 and US$3,456 by 2040, compared with US$3,357 in the Current Path. Under the Stalled Family Planning scenario, we see GDP per capita reach only US$2,362 by 2030 and US$3,253 in 2040.
Figure 3.t presents a comparison of the impact of each scenario in 2030 along three outcomes indicators: the percentage change in GDP per capita (vertical axis), and the percentage change in the demographic dividend (horizontal axis). The size of the bubble represents the percentage change in the number of people living on less than US$1.90 per day. All values are expressed as percentages relative to Current Path in 2030.

Figure 3.t: Comparing different demographic interventions across selected indicators in 2030



Source: IFs version 7.27

Under the Improved Family Planning scenario, Ethiopia's GDP per capita could be more than 3% larger by 2040 relative to the Current Path, while the size of population living on less than US$1.90 per day could be reduced by close to 14%. At the same time, Ethiopia's demographic dividend is an estimated 13% larger in 2040 relative to Current Path. Under the Stalled Family Planning scenario, Ethiopia's GDP per capita is more than 3% smaller and its demographic dividend is 10% smaller, while the percent of the population living in extreme poverty could be close to 12% larger. Fertility reductions alone could boost GDP per capita by more than 2% and reduce poverty by nearly 9%. The scenarios where reductions in fertility slow down, demonstrate a similar story; rapid population growth keeps the population young and chronically poor, reduces the demographic dividend and results in a drop in GDP per capita by 2030.

CHAPTER 4: AGRICULTURE, FOOD SECURITY, CLIMATE CHANGE

4.1 Introduction

The agricultural sector has historically been the foundation of the Ethiopian economy, in part due to its reliance on rain-fed, subsistence farming. Ethiopia employs about 70% of the formal workforce in agriculture, while the sector accounts for about 40% of total value-added to the economy and roughly half of total exports.[66] Because agriculture is an important source of income for a significant proportion of the population, improving the productivity of the agriculture sector could have a powerful impact on poverty reduction. Ethiopia's agriculture sector has also periodically suffered from devastating drought and famine; thus, creating a sustainable, resilient domestic agricultural sector could also create a buffer against adverse climatic events and improve domestic food security.

Ethiopia has been plagued by a history of drought and famine, including major famines from 1973-74 and 1983-85, and more recent droughts in the mid 2000's. Ethiopia's frequent susceptibility to drought is due in part to variable rainfall, a dependence on rain-fed agriculture, smallholder farming, and limited infrastructure for food distribution. Downturns in economic growth have historically been correlated with droughts. Most recently, the drought of 2015-2016, one of the worst in decades, has again led to a sharp decline in Ethiopia's growth. In 2016 GDP growth rates fell to 4.5% (down from 10.4% in 2015), the lowest since 2003.

Because Ethiopia has suffered from periodic drought and famine throughout its history, agricultural reform, land use and associated resettlement programs have been a recurring feature of government (and donor) policies. Examples include the resettlement and "villagization" efforts under the Derg that were abandoned in March 1990, and the more recent voluntary resettlement programs of the EPRDF that were eventually terminated in 2013. A common focus of these efforts has been to facilitate access to basic services and improve agricultural production, although critics have claimed that the programs undermine livelihoods and negatively affect food security.[67]

This section presents the expected trajectory of the agricultural sector in Ethiopia and contains the following sections:

- Agriculture in the Ethiopian economy
- Supply including total production, land use, agricultural yield and food loss.
- Demand
- Undernutrition and food security
- Climate Change
- Key takeaways
- Agriculture interventions

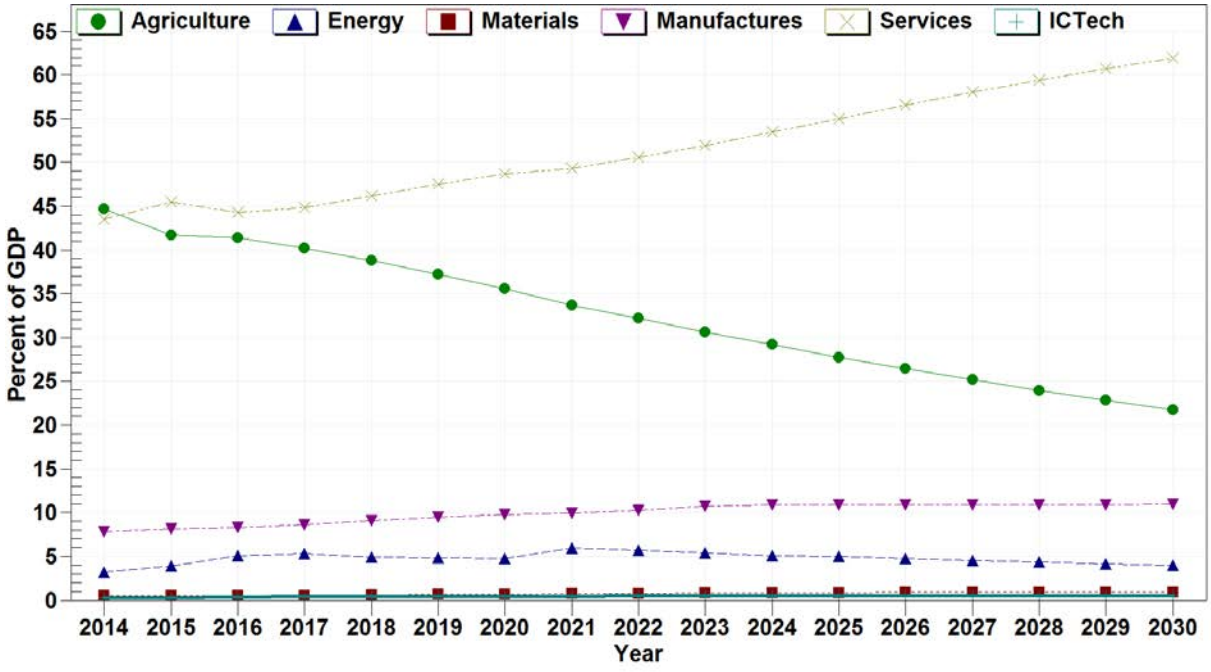
[66] The World Bank, Ethiopia's Great Run: The Growth Acceleration and How to Pace it, 2016, 43, documents.worldbank.org/curated/en/693561467988949839/pdf/99399-REVISED-PUBLIC-thiopia-Economic-Update-2-11-16-web.pdf.
[67] Human Rights Watch, Ethiopia: Forced Relocations bring hunger, hardship, January 2012, www.hrw.org/news/2012/01/16/ethiopia-forced-relocations-bring-hunger-hardship.

4.2 Agriculture in the Ethiopian economy

According to the World Bank, the number of people employed in the agricultural sector in Ethiopia increased by nearly 11 million between 1999 and 2013, growing from 19.9 million to 30.8 million.[68] Over this period, the agricultural sector absorbed more than 70% of the total increase in employment. While the agricultural sector did account for the majority of additional employment in an absolute sense, the size of the agricultural labor force relative to other sectors has declined slightly, from about 80% in 1999 to 77% in 2013.[69] This trend of a larger number of agricultural workers accounting for a smaller share of the total workforce underscores other structural shifts in Ethiopia's economy, notably the growing importance of the service sector (see Chapter 7 for a broader discussion of the economy). As Ethiopia's economy has matured, the contribution of the service sector to total value add has increased significantly, despite the agricultural sector seeing the largest growth in employment. Thus, while the growth in the labor force between 1999 and 2013 was overwhelmingly absorbed by agriculture (73%), half (50%) of growth in value added has come from services. The agricultural sector now contributes the least value added (per worker) of any sector of the Ethiopian economy (although this trend is fairly consistent across countries and time).[70]

In other words, while the growth of output (measured in value added) has shifted considerably away from agriculture toward services over the last fifteen years, the change in employment has been more muted. Nonetheless, because agriculture today represents the bulk of both employment and exports, along with being an important contributor to general economic growth, agriculture is and will continue to be a crucial segment of the Ethiopian economy for the foreseeable future. According to IFs, the agricultural sector accounted for roughly 41% of total value added to Ethiopia's economy in 2016 slightly below the contribution from services (43%), the fastest growing sector of Ethiopia's economy.

Figure 4.a: Value added by sector in Ethiopia, 2014 – 2030



Source: IFs v 7.27, historical data from World Bank WDI

[68] World Bank Group, Ethiopia's Great Run: The Growth Acceleration and How to Pace It, 2016, documents.worldbank.org/curated/en/693561467988949839/pdf/99399-REVISED-PUBLIC-thiopia-Economic-Update-2-11-16-web.pdf

[69] Ibid. 43.

[70] Ibid. 44.

Agriculture's contribution to value add is forecast to decline across the horizon, in response to continued growth in the services sector and an increase in manufacturing. Among the 27 low-income economies in Africa, Ethiopia had the 4th highest value-added (as a share of GDP) from agriculture in 2016, but is forecast to drop to 10th highest in 2030.

Since the early 1990s, the Ethiopian government has relied on a policy of Agricultural Development Led Industrialization (ADLI) to promote growth, reduce poverty and diversify its economy.[71] The ADLI policy in Ethiopia has focused on improving productivity by 'applying chemical inputs, diversifying production, utilizing improved agricultural technologies'.[72] Although this is a national strategy, it is implemented regionally and specific recommendations vary based on the type of land in question. In areas of abundant rainfall, the focus is on harvesting water and promoting irrigation (where feasible), in pastoral areas the emphasis is generally on livestock and in arid areas the focus is on off-farm activities and resettlement.[73] ADLI is also being done alongside targeted investments in infrastructure, notably electricity, roads and irrigation. The long-term goal of this strategy is to promote market access for both commercial and smallholder agriculture, encourage a shift toward higher value-added crops and to promote the export of agricultural commodities, such as coffee.

The ADLI program also emphasizes education and technological improvement, which constitutes part of a larger poverty reduction strategy - the Plan for Accelerated and Sustained Development to End Poverty (PASDEP) - that preceded the Growth and Transformation Plans (GTPs). The goal of the PASDEP (and subsequent GTPs) was to enable the takeoff of commercial farming in Ethiopia as a catalyst for rural growth. A more productive agricultural sector will help Ethiopia move closer to achieving food security, as well as potentially reduce the need for school-age children to drop out of the education system to work on farms or pastures.

4.3 Supply

Domestic food supply is a direct function of the amount of land under cultivation of consumable crops, average yields and transformation losses.[74] If the domestic supply of food is insufficient to meet domestic demand, the gap that arises will need to be met through imports. Supply-side policies to reduce hunger and ensure sufficient nutrition depend on a country's ability to produce sufficient calories to feed its population, but also the ability to distribute those calories equitably.

4.3.1 Total production

IFs forecasts agricultural production in three categories: crops, meat, and fish. Ethiopia currently (2016) produces an estimated 42.3 million metric tons (MMT) of agricultural products, 88% of which is crops and 12% is meat production.[75] Agricultural production is forecast to increase by about 19 MMT, to around 61 million metric tons by 2030, with approximately 66% of that increase (12 MMT) coming from crops and 34% coming from increased meat production. Figure 4.b below shows the dominance of crop production in Ethiopia's agricultural sector.

[71] United Nations Economic and Social Council, The Agricultural Development Led Industrialization (ADLI) Strategy, 2014, webapps01.un.org/nvp/indpolicy.action?id=124
[72] Ibid.
[73] Ibid. see also Y Gebremeden, Ethiopia: The ADLI Still Mobilizing Ethiopia's Economy, The Ethiopian Herald. February 2016, allafrica.com/stories/201602151234.html
[74] Transformation losses can occur at 3 stages during the food supply chain: 1) crops lost before harvest; 2) food lost between harvest and sale and consumption; and 3) post-purchase food waste.
[75] Fish production accounts for a tiny fraction of overall agricultural production.

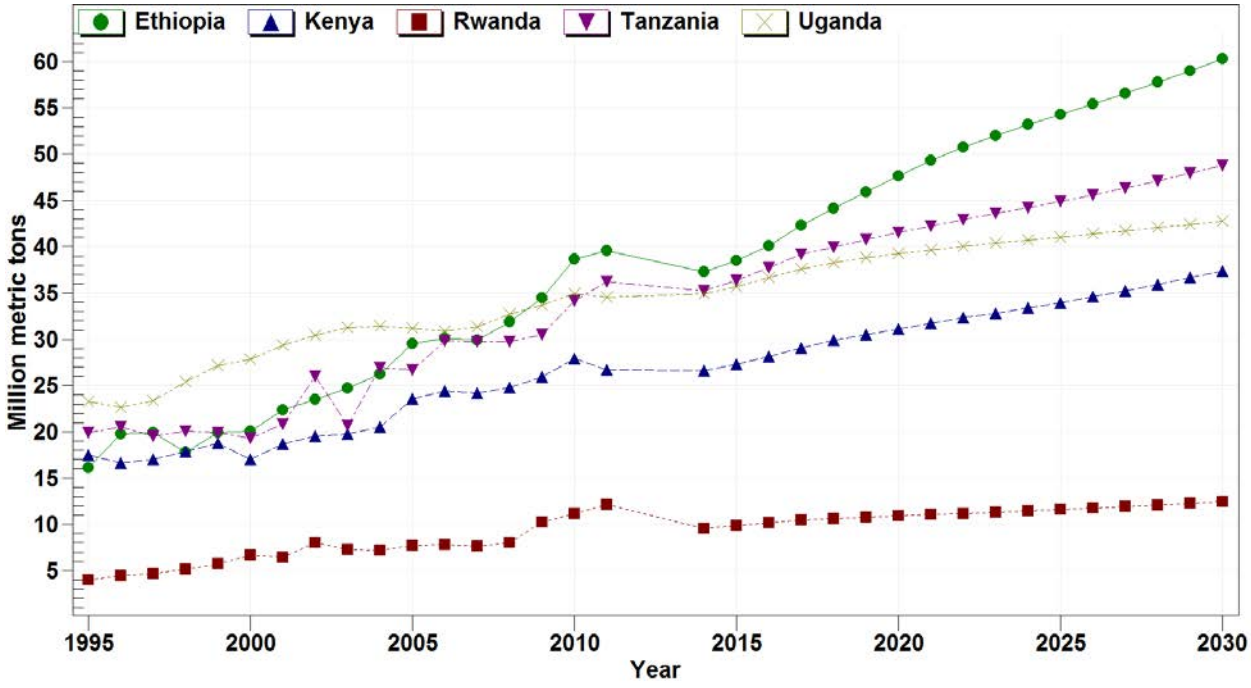
Figure 4.b: Agricultural production (MMT) by type in Ethiopia, 2016-2030

	2016	2021	2030
Crop	34.9	42	48.9
Meat	5.2	7.3	11.3
Fish	0.02	0.02	0.02

Source: IFs v. 7.27, historical data from FAO

In absolute terms (measured by total weight), Ethiopia's agricultural sector is the fourth largest in Africa, behind Nigeria, Egypt, and South Africa. This is a function of Ethiopia's large population, land area, and high percentage of the overall workforce engaged in agricultural production, rather than an indication of the general efficiency of Ethiopia's agricultural sector. Figure 4.c below shows total agricultural production in Ethiopia relative to regional peers Kenya, Rwanda, Tanzania and Uganda. While Ethiopia's total production was about on par with Kenya and Uganda in the late 1990s (and well behind Tanzania), it has increased since the early 2000s, enabling Ethiopia to overtake each of them.

Figure 4.c: Total agricultural production of comparison countries 1995-2030



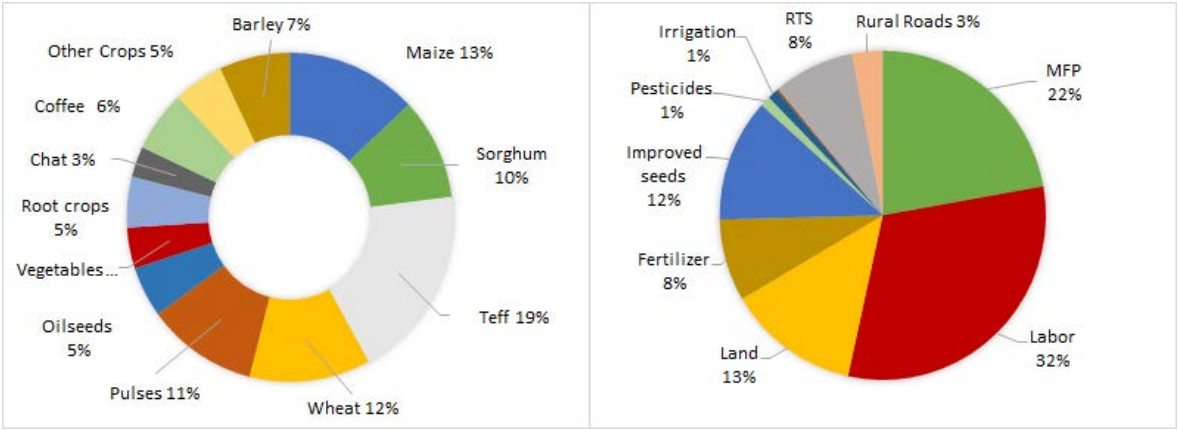
Source: IFs v. 7.27, historical data from FAO

From 2004 to 2014, total land area, crop yield, and total production increased by an average of 2.7%, 7%, and 9.4%, respectively.[76] An increase in land used for crop production is the result of a concerted effort by the GoE to bring more land under cultivation for both small-holder and commercial farmers, but land cultivation growth has slowed significantly over the past 5 years. Meanwhile, crop yields have been consistently rising, reflecting land intensification efforts, the adoption of improved agriculture technologies and far reaching agricultural extension programs.[77] The pie chart in Figure 4.d shows the composition of growth for crops over the past decade. Labor and Multifactor Productivity (MFP)

[76] FNN Bachewe et al, Agricultural Growth in Ethiopia (2004-2014): Evidence and Drivers, International Food Policy Research Institute Working Paper 81, 2014.
[77] World Bank Ethiopia's Great Run, 2014; FNN Bachewe et al, Agricultural Growth in Ethiopia (2004-2014): Evidence and Drivers, International Food Policy Research Institute Working Paper 81, 2014.

improvements drove the majority of crop output increases, but land use, improved inputs (seeds, fertilizer), and infrastructure also contributed significantly to crop growth.

Figure 4.d: Crop output growth factors (left); Crop output by type in Ethiopia (right) 2004 to 2014



Source: International Food Policy Research Institute 2015

Ethiopia's agricultural sector is heavily focused on grain and cereal production, which made up over half of total production and over a quarter of GDP output over the past decade.[78] Figure 4.d (above) shows that the majority of crop output is concentrated in maize, sorghum, teff, wheat, and pulses. These crops are overwhelmingly consumed domestically (roughly 87%), which is encouraging given the low levels of caloric availability, discussed below.[79] Meanwhile, crops produced for export, such as coffee and oilseeds, make up a smaller portion of total output. Nonetheless, the agricultural sector (mostly coffee, cut flowers, pulses, and oilseed product) accounts for over 80% of merchandise exports and nearly half of total exports.[80]

4.3.2 Land use

The growth in total agricultural output over the last 15 years was driven largely by changes in land use. Figure 4.e shows the increase in the amount of land under cultivation for crop production that began in the early 2000s. Between 2003 and 2015, Ethiopia increased its land under cultivation for crops by more than six million hectares - an increase of more than 50%. In 2016, IFs estimates that Ethiopia has approximately 16.4 million hectares (or 16% of total land area) under cultivation, compared with 9 million hectares in Uganda (53% of total land), 6 million in Kenya (10% of total land), and 1.8 million hectares in Rwanda (42% of total land). This means that between 2002 and 2016, Ethiopia has added almost as much land for crop production as the entire nation of Kenya had in 2016. While Ethiopia does have significantly more land area than these countries (it is nearly twice the size of Kenya), the increase in the land devoted to crop production over the last 15 years remains noteworthy, but also raise questions about the sustainability of that policy.

Increasing the amount of land under cultivation will becomes increasingly expensive as time goes on. In Ethiopia (or any other country) there is a finite amount of land that is well suited for agricultural production. It is possible to convert marginal land into agriculturally productive land, but that generally

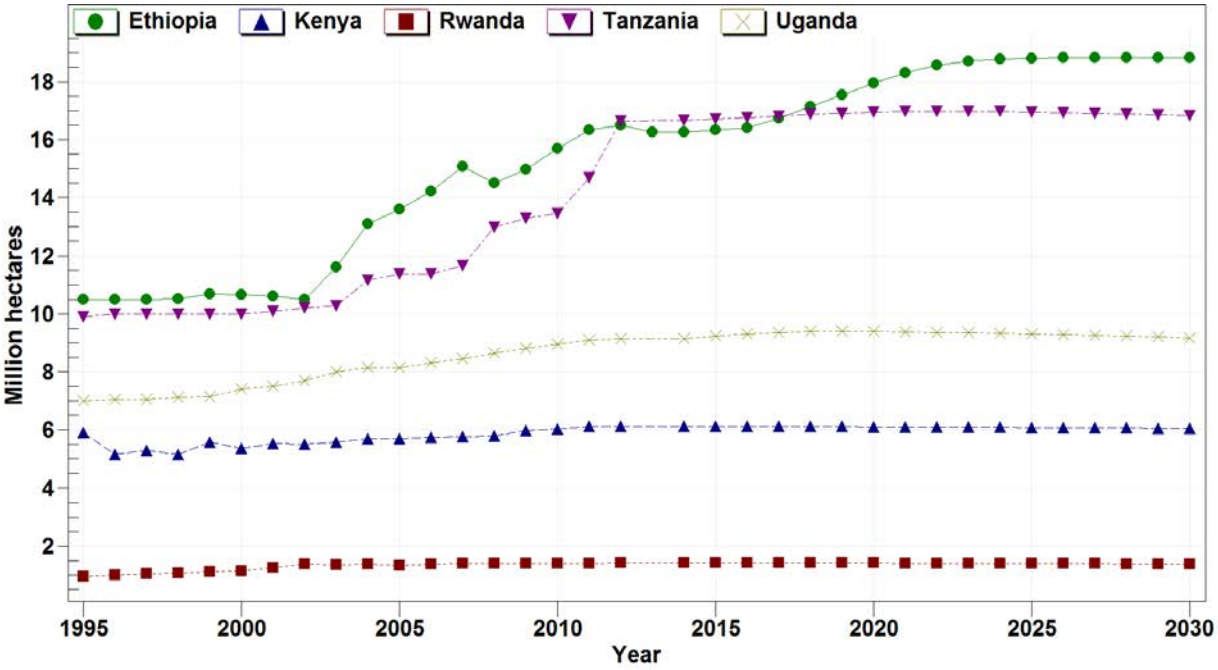
[78] The World Bank, Ethiopia's Great Run: The Growth Acceleration and How to Pace it, 2016, documents.worldbank.org/curated/en/693561467988949839/pdf/99399-REVISED-PUBLIC-thiopia-Economic-Update-2-11-16-web.pdf

[79] FNF Bachewe et al, International Food Policy Research Institute. Agricultural Growth in Ethiopia (2004-2014) : Evidence and Drivers, 2015. http://www.ifpri.org/publication/agricultural-growth-ethiopia-2004-2014-evidence-and-drivers

[80] The World Bank, Ethiopia's Great Run: The Growth Acceleration and How to Pace it, 2016. documents.worldbank.org/curated/en/693561467988949839/pdf/99399-REVISED-PUBLIC-thiopia-Economic-Update-2-11-16-web.pdf

requires additional investment, either through expanding irrigation infrastructure or investing in other more expensive inputs like seeds or fertilizers. Countries may also convert forests to crop land, but this is also expensive monetarily – and entails significant environmental costs as well.

Figure 4.e: Land use for crop cultivation, Ethiopia and regional peers, 1995-2030



Source: IFs v. 7.27, historical data from FAO

Box 4.3: Land use in Ethiopia

Land use in Ethiopia is a complex issue. Private ownership of land is illegal. Although it is relatively straightforward to lease land from the state, actual ownership is forbidden as per article 40 of the 1995 Ethiopian constitution, which states that 'the right to ownership of rural land and urban land, as well as of all natural resources is exclusively vested in the state and the peoples of Ethiopia. Land is a common property of the nations, nationalities and peoples of Ethiopia'.[81] There is also no federal land use policy.[82] While there is a national registry for large commercial farms, smallholder plots are not accounted for in any systematic way at the national level.[83] In an effort to facilitate agricultural development however, the GoE has implemented a policy whereby anyone over the age of 18, provided they currently reside in the area and intend to farm the land in question, is permitted to formally apply for a land title. The process for land allocated has been described as follows: 'The conditions attached to this right are first, the person must want to engage in agricultural activities. In other words, agriculture must be his/her main means of livelihood or profession. Secondly, s/he must reside in the area where the agricultural land is located'.[84] Because land is allocated by sub-provincial government units, is not recorded in any systematic way and follows no unified policy, it is difficult to estimate how much land is available to continue this fairly aggressive policy of expanding land under cultivation.

[81] Quoted in Z. Gebeyehu, Toward Improved Transactions of Land Use Rights in Ethiopia, World Bank and USAID, 2013. https://www.usaid.gov/sites/default/files/documents/1860/Towardspercent20Improvedpercent20Transactionspercent20ofpercent20Landpercent20Usepercent20Rightspercent20inpercent20Ethiopia.pdf

[82] There is a Federal Land Use document from 1988, but that was issued during the Derg regime and was before land was nationalized.

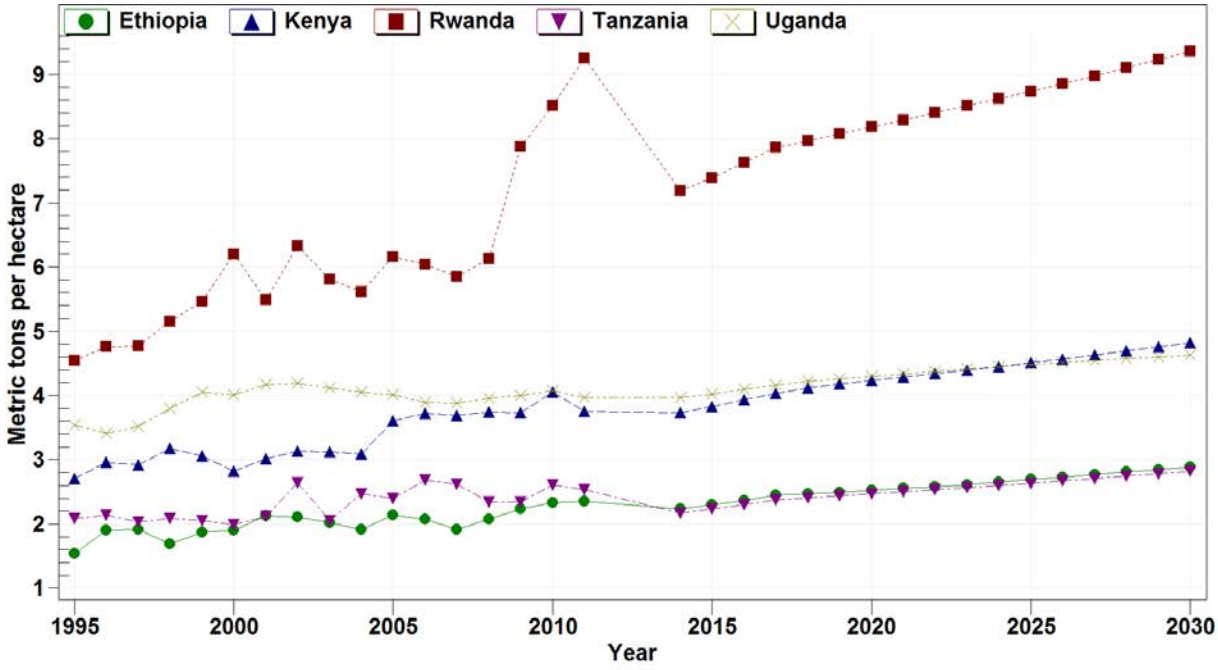
[83] Ministry of Agriculture, http://www.moa.gov.et/land-leased

[84] D. Ambaye, Land Rights in Ethiopia: Ownership, Equity, and Liberty in Land Use Rights, 2012, https://www.fig.net/resources/proceedings/fig_proceedings/fig2012/papers/ts02d/TS02D_ambaye_5521.pdf

4.3.3 Yields

While Ethiopia has managed to significantly increase the number of workers in the agricultural sector and the total land under cultivation for crop production, improvement in agricultural yields has been less remarkable. Crop yields are an important indicator of the efficiency and technological sophistication of the agricultural sector. Average yields also have important implications for food security. Despite improving average yields from 1.5 MMT per hectare in 1995 to roughly 2.3 MMT in 2016, Ethiopia is still only producing on par with other low-income African countries, and significantly behind regional peers Kenya and Uganda, reflected in Figure 4.f.

Figure 4.f: Agricultural yields, Ethiopia and regional peers, 1995-2030



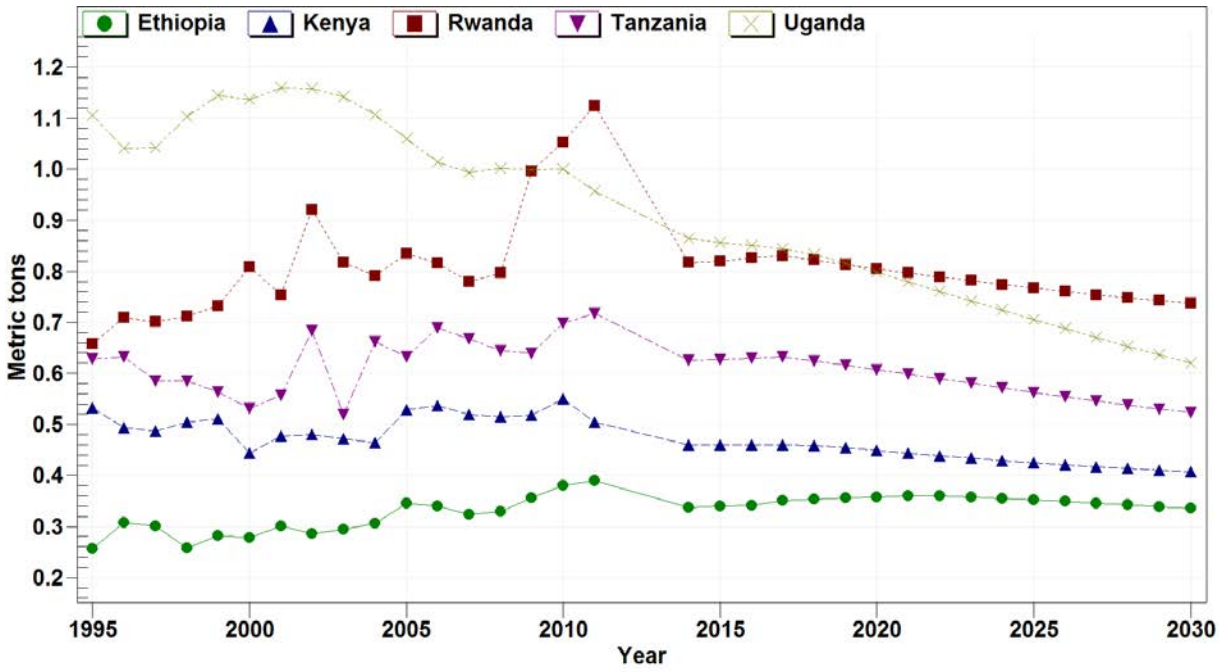
Source: IFs v. 7.27, historical data from FAO

Yields are determined in part by the sophistication of agricultural inputs. While soil fertility is important, there are also ways to reliably and sustainably increase yields; for example, farmers may employ more advanced forms of fertilizer, plant drought resistant seeds or shift from rain-fed to irrigated production. In Ethiopia, the use of dung as a source of fuel is a potential waste of valuable agricultural inputs, as well as a driver of increased risk of respiratory infections linked to the inhalation of traditional fuels used for cooking (see Chapter 5). A 2010 report from the Ministry of Agriculture in Ethiopia found that "the annual phosphorus and nitrogen loss nationwide from the use of dung for fuel is equivalent to the total amount of commercial fertilizer applied."[85] This represents a large cost to the agricultural sector and a source of negative health outcomes and could be addressed by an expansion of modern fuels, potentially even electrification, particularly in rural areas.

Another way to view productivity in the agricultural sector is to examine per capita production. Measured on a per capita basis, the agricultural sector in Ethiopia significantly underperforms relative to its regional peers. In 2016, per capita production in Ethiopia was less than half of per capita production in Rwanda and Uganda, and still significantly below Tanzania and Kenya.

[85] Ethiopian Ministry of Agriculture, Ethiopia's Agricultural Sector Policy and Investment Framework (PIF) 2010-2020, 2010, 3.

Figure 4.g: Agricultural production per capita (post-loss), Ethiopia and regional peers, 1995-2030



Source: IFs v. 7.27, historical data from FAO

Thus, Ethiopia's high level of overall production is a function of its relatively large population and the dominance of the agricultural sector as a share of total employment. Because Ethiopia has such a large number of people working in the agricultural sector, they are able generate high overall production relative to other African countries. Yet the agricultural sector is constrained by yields and per capita production when compared to regional peers, with important implications for food security and nutrition.

4.3.4 Food loss

Food lost along the food supply chain (FSC) (from initial harvest through to consumption) has the potential to offset any improvements in yield or total production. The FAO defines food loss as "wholesome edible material intended for human consumption, arising at any point in the FSC that is instead discarded, lost, degraded or consumed by pests."[86] This occurs at any of three stages:

- Production: crop losses before harvest;
- Transformation: food lost between harvest and sale and consumption; and
- Consumption: food waste.

Developing countries face major issues with production and transformation loss, with 40% of waste occurring during the transformation stage.[87] Ethiopia lost an estimated 2.1 million metric tons (MMT) of total production in 2016, or approximately five percent of all agricultural output. The Ethiopian Ministry of Agriculture estimated that in 2010, 30% of food waste could be attributed to inadequate transportation, storage and pest-control.[88] In the Current Path forecast, transformation loss in Ethiopia is forecast to increase from 2.2 million tons in 2016 to 3.1 MMT in 2030. While food loss increases in an absolute sense, it remains constant at about five percent of total production. Thus

[86] S Hedden et al, Ending Hunger in Africa, 2016.
[87] FAO, Global Food Losses and Food Waste, 2011, http://www.fao.org/docrep/014/mb060e/mb060e.pdf
[88] Ethiopia Ministry of Agriculture, Ethiopia's Agricultural sector policy and investment framework, 2010. gafspfund.org/sites/gafspfund.org/files/Documents/Ethiopia_5_of_6_CAADP_Post_compact_Investment_Plan_(PIF)_0.pdf

transformational loss is not improving (as a percentage), but is also not getting worse across the forecast horizon. This trend holds for most regional comparison countries as well, as shown in figure 4.h below.

Figure 4.h: Transformation losses, Ethiopia and regional peers, 2014-2030

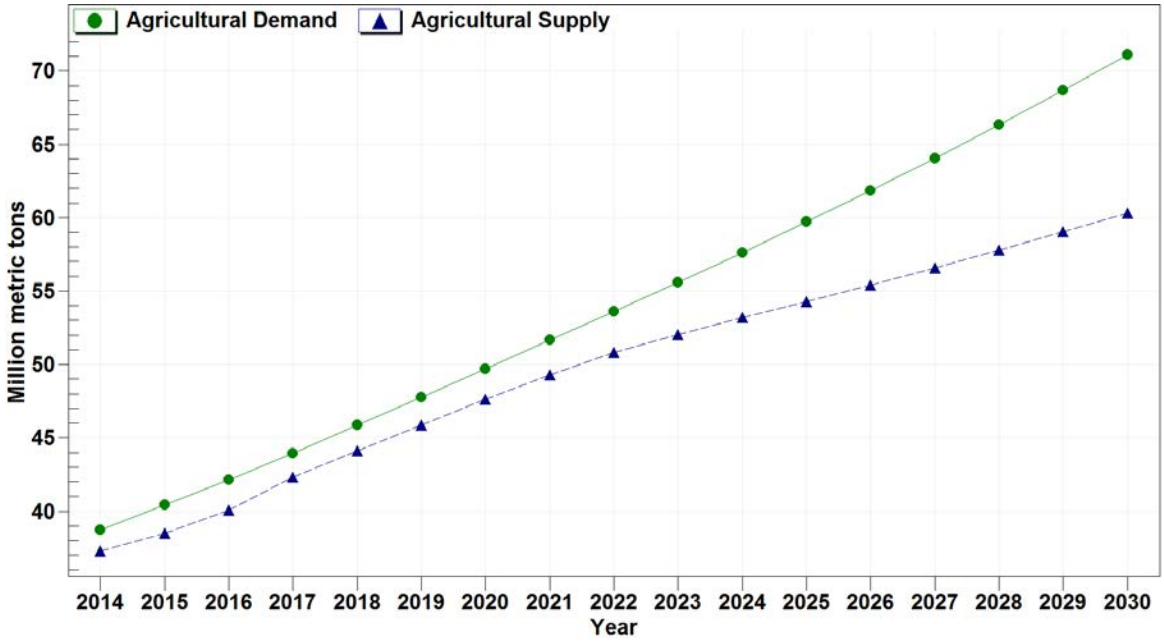
	2016	2021	2030
Ethiopia	2.1	2.5	3.1
Kenya	1.1	1.3	1.6
Rwanda	0.7	0.8	1
Tanzania	5.1	6	7.8
Uganda	3.9	4.6	6.2

Source: IFs v. 7.27, historical data from FAO

4.4 Demand

Food demand, or access to calories for consumption, is a function of population size and income.[89] As people in Ethiopia become richer, they will consume more calories and the profile of their caloric intake will likely change. Meat consumption will likely rise (*ceteris paribus*) and crop consumption will likely fall when measured as a percentage of total calories consumed. Food demand in Ethiopia already outpaces domestic supply, and the gulf widens across the Current Path forecast, as shown in Figure 4.i. In 2016 food demand was around 42 MMT, while total supply was around 40 MMT. By 2030, total demand is forecast to be 72 MMT, compared with supply closer to 55 MMT, suggesting the gap will widen. In the absence of growing supply, Ethiopia will need to meet this demand through imports, which has implications for food security.

Figure 4.i: Food demand and production in Ethiopia 2014-2030



Source: IFs v. 7.27, historical data from FAO

[89] Within IFs food demand is comprised of two equally important components: access to calories and the ability to purchase and consume those calories.

From 2016 to 2030 in Ethiopia, demand for meat and fish products is forecast to more than double, while crop demand is expected to increase by roughly 60%. Nevertheless, crops will continue to dominate caloric consumption in Ethiopia, accounting for over 85% of total demand in 2030, down just slightly from 87% of total demand in 2016.

Figure 4.j: Agricultural demand by type in Ethiopia (MMT)

	2016	2021	2030
Crop	37	44.6	60
Meat	4.6	7	11.1
Fish	0	0	0.1

Source: IFs v. 7.27, historical data from FAO

4.5 Undernutrition and food security

According to the United Nations Food and Agriculture Organization (FAO), hunger (synonymous with chronic undernutrition) is defined as, "a state, lasting for at least one year, of inability to acquire enough food, defined as a level of food intake insufficient to meet dietary energy requirements".[90]

Alternatively, a state of food insecurity reflects a situation that exists when people lack secure access to sufficient amounts of safe and nutritious food for normal growth and development and an active and healthy life. It may be caused by a lack of food, insufficient purchasing power, inappropriate distribution or inadequate use of food at the household level. Food insecurity may be chronic, seasonal or transitory.[91]

Throughout its history, Ethiopia has been plagued by a series of droughts that have adversely affected agricultural production - occasionally resulting in widespread famine - and that have left the country in a semi-permanent state of food insecurity. In 2015-2016, the country suffered a severe drought that required the delivery of US$1.7 billion in food assistance to nearly 17 million people.[92] Meanwhile, in January 2017, the United Nations appealed to the General Assembly for an additional US$900 million to support roughly five million more people.[93] While last year (2016) the drought was concentrated in crop producing regions in the north and west, this year (2017) the impact is expected to be most severe in the pastoral areas in southern Ethiopia. This geographic variation makes anticipating droughts and preparing appropriate policy responses significantly more complicated.

[90] United Nations Food and Agriculture Organization Glossary. http://www.fao.org/hunger/glossary/en/ The FAO defines this as follows, 'Dietary energy requirements differ by gender and age, and for different levels of physical activity. Accordingly, minimum dietary energy requirements, the amount of energy needed for light activity and minimum acceptable weight for attained-height, vary by country, and from year to year depending on the gender and age structure of the population.' Correspondingly, the minimum caloric intake for Ethiopia in 2006-2008 was 1740 calories per capita per day. Malnutrition is an outcome of undernourishment/hunger.
[91] S Hedden et al, Ending hunger in Africa: The elimination of hunger and food insecurity on the African by 2025: Conditions for success, New Partnership for Africa's Development, 2016, www.nepad.org/resource/ending-hunger-africa-elimination-hunger-and-food-insecurity-african-2025-conditions-success (accessed September 29, 2016).
[92] K Migiro, New drought strikes millions in Ethiopia, still reeling from El Nino. Reuters. 2017. http://uk.reuters.com/article/uk-ethiopia-drought-aid-idUKKBN1511UH
[93] Ibid.

Ethiopia has made substantial progress in reducing undernutrition across the population in recent decades, but much work remains to be done.[94] In 2016, 24% of children and 30% of the total population were undernourished according to IFs, down from 45% of children and 75% of the total population in the early 1990s.[95] Among other low-income economies in sub-Saharan Africa, Ethiopia ranks 7th highest in terms of the percentage of the population that is undernourished. Ethiopia is forecast to continue to endure relatively high levels of undernutrition throughout the forecast horizon (see Figure 4.k).[96]

Access to and consumption of food across a national population is calculated in IFs using the size of the population, the number of calories available, and the distribution of said calories.[97] The resulting measure, calories per capita, provides an indication of caloric consumption available per day across the population, or a rough measure of access to food. In 2016, the average number of calories per capita per day for the entire Ethiopian population was estimated to be 2,175, among the lowest caloric availability for low-income African countries (highest was The Gambia with 2,859 calories; lowest was Madagascar with 2,090). Across the horizon, available calories in Ethiopia is forecast to grow to 2,425 by 2030. This remains below the average of low-income economies in Africa, where the forecast rises from 2,356 in 2016 to 2,553 in 2030. As the Figure 4.l below shows, Ethiopia remains the comparison country with the fewest available calories per person until the end of our forecast horizon.

Figure 4.k: Percentage of malnourished children and total malnourished population, Ethiopia and other low-income African countries, 2016, 2021 and 2030

	2016	2021	2030
Ethiopia (Children)	24	21	16
Ethiopia (Total)	30	24	16
Africa Low-income (Children)	21	19	15
Africa Low-income (Total)	23	19	15

Source: IFs v. 7.27, historical data from WHO

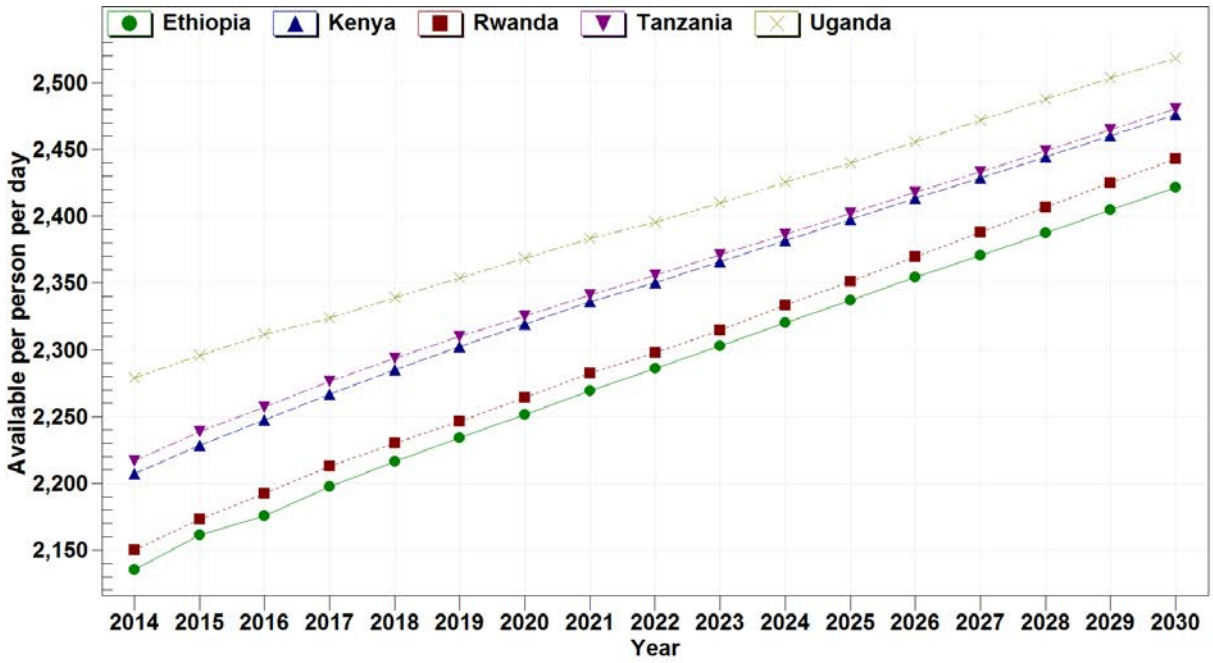
[94] While hunger and undernourishment are used synonymously by the FAO (and in this report), undernourishment is defined by the FAO as, 'The outcome of undernourishment, and/or poor absorption and/or poor biological use of nutrients consumed as a result of repeated infectious disease. It includes being underweight for one's age, too short for one's age (stunted), dangerously thin for one's height (wasted) and deficient in vitamins and minerals (micronutrient malnutrition)'.
FAO. State of Food Security in the World. www.fao.org/hunger/glossary/en/

[95] Historical data taken from IFs, data pulled from World Bank World Development Indicators, originally compiled by the World Health Organization

[96] For reference, Burundi has some of the highest levels of undernutrition at approximately 71 percent in 2015, followed by the Comoros with 65 percent. Among the lowest levels include The Gambia (5.2 percent) and Mali (4.8%).

[97] S Hedden et al, Ending hunger in Africa: The elimination of hunger and food insecurity on the African by 2025: Conditions for success, New Partnership for Africa's Development, 2016, www.nepad.org/resource/ending-hunger-africa-elimination-hunger-and-food-insecurity-african-2025-conditions-success

Figure 4.l: Available calories per capita, Ethiopia and regional peers, 2014-2030



Source: IFs v. 7.27 initialized from FAO

4.5.1 Import dependency

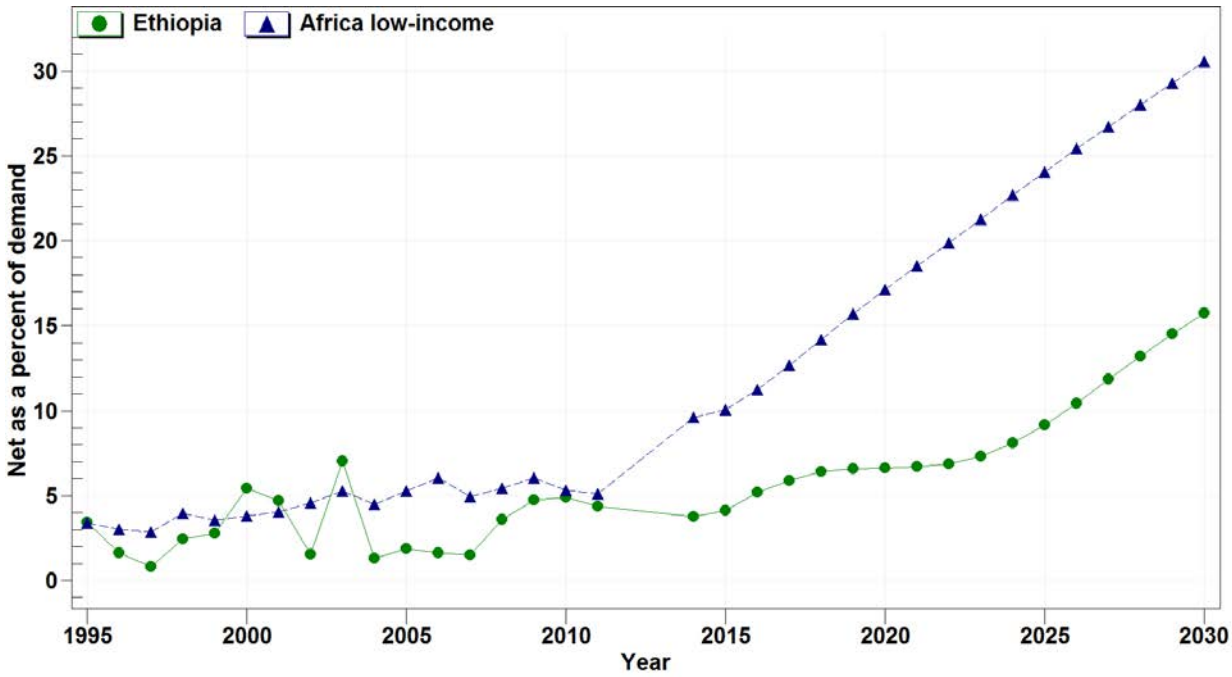
If domestic food supply is less than domestic demand, countries must import food to cover prevailing shortages. Countries that rely on imported food (like Ethiopia) are more vulnerable to international price shocks (as happened from 2009-2011), and are also more exposed to adverse climatic events that disrupt food production cycles.[98] If the price of food increases, or, if countries are forced to import more than anticipated due to a drought or fire, budgets can be squeezed with very little notice. Ethiopia's dependence on food imports has fluctuated since the 1990s, with net food imports accounting for between one and seven percent of total demand.

In the IFs Current Path forecast, Ethiopia trends towards greater import dependence (see Figure 4.m). Net food imports (as percent of total demand) are expected to grow from approximately 5% in 2015 to 16% by 2030. Without an increase in supply (or production), Ethiopia will see more and more of its food come from imports in order to meet growing demand. This trend is consistent across Africa, with low-income countries on average expected to see import dependence grow from 11% of total demand in 2016 to 30% by 2030. This is partly a function of agricultural yields not increasing at the same pace as the population, which will increase the reliance on imports.[99] Ethiopia's own projections are in line with this trend, though less severe.

[98] The FAO food price index jumped from about 160 in 2009 to about 230 in 2011.
World Economic Forum, How Have Food Prices Changed Over the Last 15 Years.
https://www.weforum.org/agenda/2015/10/how-have-food-prices-changed-over-the-last-15-years/

[99] Supply could also be increased by either a) decreasing transformation losses or b) increasing the land under cultivation, though the latter policy has obvious limitations around quality of land and total availability.

Figure 4.m: Import dependency, Ethiopia and low-income African countries, 1993-2030



Source: IFs v. 7.27, historical data from FAO

4.6 Climate Change

Climate change is likely to impact both the environment and human development in Africa in disparate ways. Although there are some broad trends that are expected to hold at the regional level, at the country or provincial level, there is far more uncertainty. While some regions in Africa (Southern Africa for example) are expected to become significantly drier over the coming decades, other areas, like East Africa and the Horn, are expected to see increased precipitation over the near to medium-term, relative to 1990 levels.

Figure 4.n: Change in precipitation (percent) and temperature (degrees centigrade) from 1990 levels, Ethiopia and regional peers, 2016, 2021 and 2030

	Temperature Change		Precipitation Change	
	Ethiopia	**Region**	**Ethiopia**	**Region**
2016	.57˚	.51˚	1.3%	2.9%
2021	.74˚	.66˚	1.7%	4%
2030	1.1˚	.95˚	2.4%	5.5%

Source: IFs v. 7.27, historical data from data from the National Center for Atmospheric Research (NCAR)

While Ethiopia can expect more rain in the future, this may not necessarily be a boon to the agricultural sector. The Intergovernmental Panel on Climate Change (IPCC) has warned that "regions

of high or complex topography, such as the Ethiopian Highlands" might also see increased periods of extreme rainfall that could destroy fragile crops or cause flooding.[100]

Although Ethiopia is expected to see a less dramatic increase in precipitation than its regional peers, it is expected to warm slightly more rapidly than comparison countries. Based on the IFs Current Path forecast, Ethiopia is, by 2030, expected to be slightly more than 1◦C warmer than it was in 1990. This also has implications for the agricultural sector as warmer temperatures may affect average yield, harvest times and transformation losses.

The IPCC has confirmed that these trends are already occurring in Ethiopia, with climate models showing "warming in all four seasons across the country, which may cause a higher frequency of heat waves as well as higher rates of evaporation".[101] At the time of writing it is unclear if the higher temperatures and higher evaporation rates will offset the increased precipitation, though this is something that policymakers and development practitioners should keep in mind moving forward.

Another climate-related concern is that changing environmental conditions may allow for the invasion of previously un-encountered pests. In particular, the IPCC has warned that warming in the highlands may allow Hypothenemus Hampei, a coffee berry borer, to invade Arabica producing coffee regions in Ethiopia, Uganda, Rwanda, Kenya and Burundi. If this happens, value-added from agriculture may well be affected with knock-on effects on the balance of trade and GDP, to say nothing of the livelihoods of coffee farmers. There is also some concern that temperature and precipitation changes will allow mosquitoes to spread to areas that have historically had a low incidence of malaria. A pilot study conducted in the Ethiopian highlands indicates that this is a likely outcome "unless disease monitoring and control efforts are boosted and sustained."[102]

4.7 Key takeaways

- Agriculture is a key component of the Ethiopian economy, accounting for more than 75% of formal employment, about 40% of economic value add, and almost 80% of exports. Much of the country, however, remains vulnerable to climatic shocks and reliant on international food relief programs.
- Total production has increased since the mid-2000s, driven largely by a rapid expansion of land under cultivation for crop production, but this cannot continue indefinitely.
- Agricultural yields in Ethiopia remain some of the lowest in sub-Saharan Africa; the high prevalence of dung as a fuel source is a both a waste of valuable agricultural inputs and a potential source of health problems.
- Ethiopia has made progress in combatting undernutrition (75% of the population under-nourished in 1995 down to 30% in 2016), but much work remains to be done. Despite this decrease, levels of undernutrition today are almost double the African average. Reducing undernutrition requires not only improving yields and boosting agricultural supply, but policies aimed at improving demand and access to food for consumption.

[100] Niang, I., O.C. Ruppel, M.A. Abdrabo, A. Essel, C. Lennard, J. Padgham, and P. Urquhart, 2014: "Africa." In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. https://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap22_FINAL.pdf
[101] Ibid.
[102] J Erickson, Warmer temperatures push malaria to higher elevations, University of Michigan News, 6 March 2014, http://ns.umich.edu/new/releases/22032-warmer-temperatures-push-malaria-to-higher-elevations

4.8 Agriculture interventions

This section presents a set of agricultural interventions for Ethiopia that can be grouped into two broad categories: production and consumption. The production scenarios focus on increasing crop yield, increasing land under cultivation and decreasing food loss. The demand scenarios simulate policies boosting access to food and increased caloric consumption. The purpose of these interventions is to illustrate the costs and benefits to development of aggressive but reasonable efforts in the agricultural sector made over the next five years (2017-2021).

4.8.1 Increased Yield

In the Increased Yield intervention, crop production in Ethiopia is increased from 2.4 metric tons per hectare in 2015 to 3.3 metric tons per hectare in 2021. That increase of 0.9 metric tons per hectare represents a 38% increase from 2015 levels and more than a 28% increase from 2021 levels compared to the Current Path forecast. In terms of total crop production in Ethiopia, this intervention increases the countrywide output from nearly 48 million metric tons in the Current Path in 2030, to about 65 million metric tons, a boost of about 35%. This increase in production means that Ethiopia will enjoy a brief period of being a net exporter of agricultural products. But after 2025, population growth begins to outstrip increased production and Ethiopia will be forced to import crops once again.

This growth in agricultural output has important economic impacts for Ethiopia. Value added from the agricultural sector is expected to grow by just over US$8 billion and represent approximately 3% more of GDP in 2030 than in the Current Path forecast. In part, due to a brief stint as a net agricultural exporter, Ethiopia could expect an increase in GDP of more than US$13 billion in 2030 from increasing crop yield. The cumulative growth of GDP over the entire time period could be more than US$150 billion by 2030. This economic growth is sufficient to increase per capita income (measured in PPP) by nearly US$165 in 2030. Perhaps most importantly, by 2030 this intervention could alleviate more than three million people from extreme poverty, relative to the Current Path.

Although increasing yield has the largest economic impacts, this scenario does not drive steep declines in hunger. In this scenario, Ethiopia can expect about 200,000 fewer malnourished people than in the Current Path forecast.

4.8.2 Land Use

In the Land Use intervention, the land under cultivation for crop production increases by nearly one million hectares by 2021, an increase of about five percent.[103] This intervention increases total agricultural production in Ethiopia by nearly 1.5 million metric tons in 2030. Initially, this intervention depresses yields, as investment is directed at expanding production rather than at enhancing its efficiency. While this intervention does reduce Ethiopia's reliance on food imports slightly, Ethiopia ultimately remains a net importer of food throughout the forecast.

Devoting more land to agricultural production does increase GDP by nearly US$1 billion in 2030, and also increases GDP per capita (at PPP) slightly, relative to the Current Path. Here again though, this increased economic growth is not robust enough to create significant reductions in malnutrition, and the number of hungry people in Ethiopia is only about 100,000 fewer than on the Current Path.

[103] This increase is above the adjustment to the Current Path, in which the land under cultivation for crops increases.

4.8.3 Reduced Loss

In the Reduced Loss intervention, transformation losses are decreased by 10% over the five years to 2021, relative to the Current Path. In absolute terms, this intervention results in a decrease of almost 250,000 MMT of food that might have otherwise been lost in the post-harvest, pre-consumption phase. This intervention also marginally decreases Ethiopia's dependence on agricultural imports relative to the Current Path by 2030.

This intervention leads to a slight increase in the trade balance over the forecast horizon and creates modest improvements in GDP and GDP per capita. However, hunger remains essentially unchanged from the Current Path in this scenario, and the reduction in poverty is less dramatic than in the other agriculture scenarios.

4.8.4 Effective Demand

In the Effective Demand intervention, agricultural demand is increased by 15% over five years, raising average calories per capita in Ethiopia from 2,175 in 2021 on the Current Path to a little more than 2,425. However, because there is not a contemporaneous increase in production in this intervention, that demand is met through increasing food imports. In this intervention, agricultural imports increase by more than five percent (as a percentage of net food demand) compared to the Current Path. Because the increase in available calories is met through imports, the effect on GDP is dampened. However, this scenario still increases GDP by roughly US$7 billion in 2030, relative to the Current Path.

This intervention does cause the most significant reductions in hunger of any of the agricultural scenarios. In the demand intervention, hunger is reduced from 31 million people in 2015 to about 20 million people in 2030, against roughly 23 million in the Current Path forecast. In percentage terms Ethiopia can expect a decline along the lines of 18 percentage points from 2015 levels and more than two percentage points below the Current Path. In this intervention, Ethiopia could have roughly 14% of its population considered malnourished in 2030 against approximately 16% in the Current Path forecast.

4.8.5 Agricultural Resilience

The Agricultural Resilience scenario is a combination of the previous four interventions. Overall agricultural production increases as a result of more land being put under cultivation, increased yields and a reduction in transformation losses. Agricultural demand is also increased so that additional production is consumed domestically, rather than being exported. The Combined Scenario creates the largest reduction in hunger, as well as the largest economic gains. Although net agricultural imports are reduced by more in the Improved Yield intervention, the Combined Scenario has the largest impact on hunger relative to the Current Path.

In the Agricultural Resilience scenario GDP is more than 11% higher than in the Current Path forecast, while GDP per capita (PPP) increases by more than 7%. This scenario also has a significant effect on poverty, decreasing the number of people living below US$1.90 per day by nearly 40% relative to the Current Path in 2030. In the Combined Scenario, hunger is reduced to about 8% of Ethiopia's total population, relative to more than 10% in the Current Path forecast. Childhood malnutrition is also reduced by a little more than two percentage points, from about 9.5% in the Current Path to about 7% in the scenario. Importantly, this scenario also drives a reduction in deaths from communicable diseases of more than 30,000 per year throughout the forecast.

4.8.6 Stalled Agriculture

The Stalled Agriculture scenario is designed to represent a future where Ethiopia stops investing in agriculture, and the sector begins to deteriorate. In this scenario, very little additional land is placed under cultivation, yields decline slightly, and transformation losses increase. Because Ethiopia is beginning from such a low base, the magnitude of the increases is generally more significant, since the country has considerable room for improvement. There is no reduced demand scenario because in a country as short on calories as Ethiopia it is hard to envision a set of circumstances in which demand (as opposed to availability) for calories is reduced.

The IFs forecast indicates that a decrease in yields could reduce GDP by roughly US$3 billion, increase reliance on food imports by more than 6% and increase the number of malnourished people by a little more than 50,000 in 2030 relative to the Current Path. The Land Stagnation scenario decreases GDP by nearly US$4 billion, increases reliance on food imports slightly more (7.5%) than the Decreased Yields scenario and drives a similar increase in the number of hungry people in 2030 relative to the Current Path. Finally, the Increased Loss scenario leaves GDP and hunger largely unaffected, while slightly increasing Ethiopia's reliance on imported food (less than 1% of demand).

4.8.7 Scenario Results

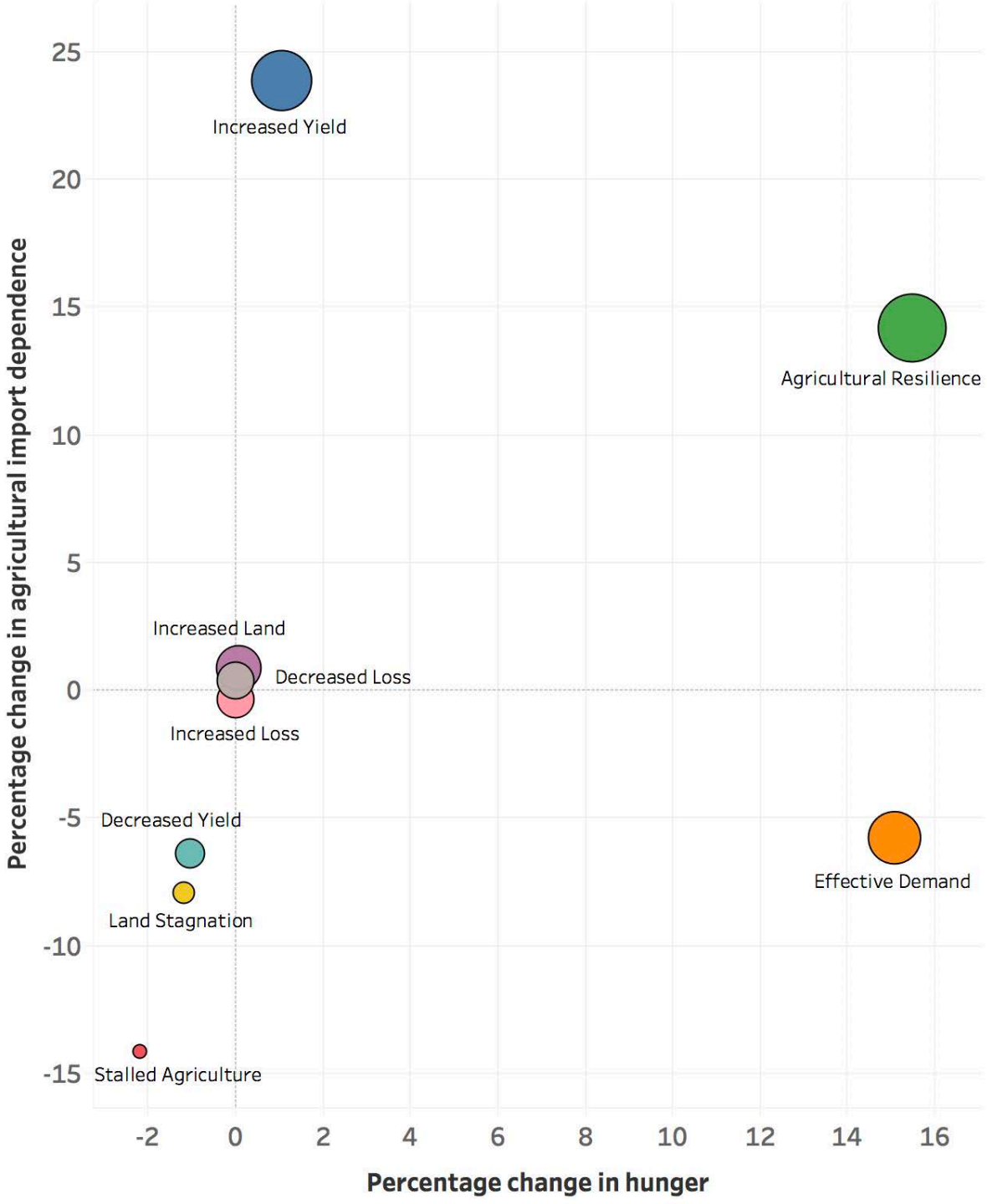
A shared feature of the production scenarios is that they all decrease Ethiopia's dependence on agricultural imports by 2030. The Increased Yield scenario causes the most significant reduction in import dependence, ultimately reducing agricultural imports by more than 20% relative to the Current Path by 2030. This improvement creates an increase in value added from the agricultural sector and improves the balance of trade, relative to the Current Path. This intervention also increases GDP by more than US$13 billion in 2030 alone. Although this intervention does allow Ethiopia to become a net exporter of food in the medium-term, due to its large and growing population, the country is expected to again be a net importer of foodstuffs by 2030. Moreover, without simultaneous improvements to boost demand, much of the additional production in this scenario will be exported (hence the large gains in GDP). As a result, this scenario has a relatively minor impact on hunger, reducing the number of malnourished people by less than 250,000 relative to the Current Path in 2030.

Of these interventions, the most impressive reduction in hunger comes from the consumption based scenario, Effective Demand. In the Effective Demand scenario, nearly three million fewer people will be considered malnourished by 2030. While the Effective Demand scenario has the largest impact on hunger, it has a negative impact on the balance of trade, as it increases agricultural imports by more than five percent of total food demand in 2030 compared to the Current Path. This has serious implications for food security; if Ethiopia becomes increasingly dependent on imported food, it will also become increasingly vulnerable to price shocks and other fluctuations in international commodity markets.

The combined scenarios are a compilation of the more targeted interventions. The Agricultural Resilience scenario results in the largest increase in GDP, the second most significant decline in food imports and the largest decline in hunger. This scenario underscores that effective policies to improve the agricultural sector should focus on boosting both supply and demand. The Stalled Agriculture scenario creates the largest increase in hunger, the most unfavorable position with respect to food imports and a US$7 billion reduction in GDP in 2030. In the Agricultural Resilience scenario, there are roughly 16% fewer hungry people in 2030 compared to the Current Path, GDP is more than 11% larger, and Ethiopia has reduced its dependence on food imports by more than 14% relative to the Current Path by 2030. The results from the various interventions and combined scenarios are shown in Figure 4.o below, where the change in dependence on food imports is measured on the y-axis, change in hunger is measured on the x-axis, and bubble size indicates the magnitude of the change to

GDP from the Current Path forecast.[104] All bubbles in Figure 4.o represent the percentage change in a respective indicator from the expected value of that indicator in the Current Path forecast in the year 2030.

Figure 4.o: Impact of agriculture scenarios on selected indicator in 2030



Source: IFs version 7.27

[104] Because the negative scenarios decrease GDP per capita, smaller bubbles represent a decline in GDP per capita

CHAPTER 5: HEALTH

5.1 Introduction

Over the past 25 years, the GoE and aid organizations have made a concerted effort to extend health infrastructure and services to improve the health of Ethiopians, especially women and children. Over the last two decades the GoE has established 16,440 health posts and 3,547 health centers and has built 311 hospitals.[105] Ethiopia's Health Extension Programme, which has focused specifically on women and children, has deployed more than 38,000 health extension workers (HEWs) throughout the country.[106]

As a result, Ethiopia has made significant gains in a number of health and mortality related indicators over the past few decades. Life expectancy has increased by just under 40% and infant mortality has decreased by over 60% during the past 25 years. Ethiopia also nearly met Millennium Development Goal 4, registering a 64% drop in under-five mortality.[107] Furthermore, Ethiopia has a relatively low death rate compared to its sub-Saharan African peers, which is largely due to its efforts to curb the spread of communicable diseases (especially malaria, TB, and HIV/AIDS). New HIV infections have fallen by 90%, malaria death rates are down 81% and malaria deaths in children under five are down 73% since 1990. Meanwhile, the prevalence of TB has declined by more than 50% over the same time period.[108]

While these gains are impressive, Ethiopia still lags behind its peers in many health indicators and faces significant health and mortality challenges. Globally, Ethiopia ranks 150th (out of 186 countries) in infant mortality and 154th in life expectancy. Lack of access to improved water and sanitation facilities and a high level of food insecurity for much of the population means that Ethiopia also has some of the highest rates of child malnutrition (21st) and stunting (9th) in the world.[109]

Furthermore, in an absolute sense, Ethiopia still has one of the highest burdens of disease in sub-Saharan Africa. The communicable disease death rate has declined significantly (and is now one of the lowest in sub-Saharan Africa), but the sheer size of Ethiopia's population and the nature of the communicable disease burden (nearly 70% of Years of Life Lost or YLLs[110] in Ethiopia are due to communicable disease) means that communicable disease detection and treatment will continue to play a major role in the Ethiopian health system for the foreseeable future.

Moreover, as communicable disease detection and treatment improves and as Ethiopia continues to develop, non-communicable diseases will play an increasingly deleterious role. This looming epidemiological transition means that the Ethiopian health system will need to strengthen its horizontal health systems to deal with wide ranging sources of mortality and morbidity across a large and growing population.

[105] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015.
[106] Ibid.
[107] The MDG 4 target was to reduce by two-thirds, between 1990 and 2015, the under-five mortality rate. (UN)
[108] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015.
[109] Stunting is defined as demonstrating minus two standard deviations or more from median height for age of reference population (WHO).
[110] Defined as number of healthy years lost due to premature death (WHO, Global Burden of Disease, 2007).

This chapter presents the major issue areas and trends in health outcomes in Ethiopia and is composed of the following sections:

- Overview of health outcomes
- Burden of disease
- Patterns of mortality and morbidity
- Water, Sanitation, and Hygiene (WASH)
- Key takeaways
- Health interventions

5.2 Overview of key health outcomes

Ethiopia has made impressive improvements in infant mortality, maternal mortality and life expectancy over the past 25 years. The country currently performs better on many health outcomes than would expected based on its level of economic development.[111] Ethiopia has surpassed the average life expectancy and infant mortality rates in sub-Saharan Africa and African low-income countries, despite a significant lag relative to the world average. For example, Ethiopia ranks 154th (out of 186) in life expectancy in the world, but ranks 11th (out of 54) in sub-Saharan Africa.

Figure 5.a: Table of selected health indicators, Ethiopia and comparison groups, 2016

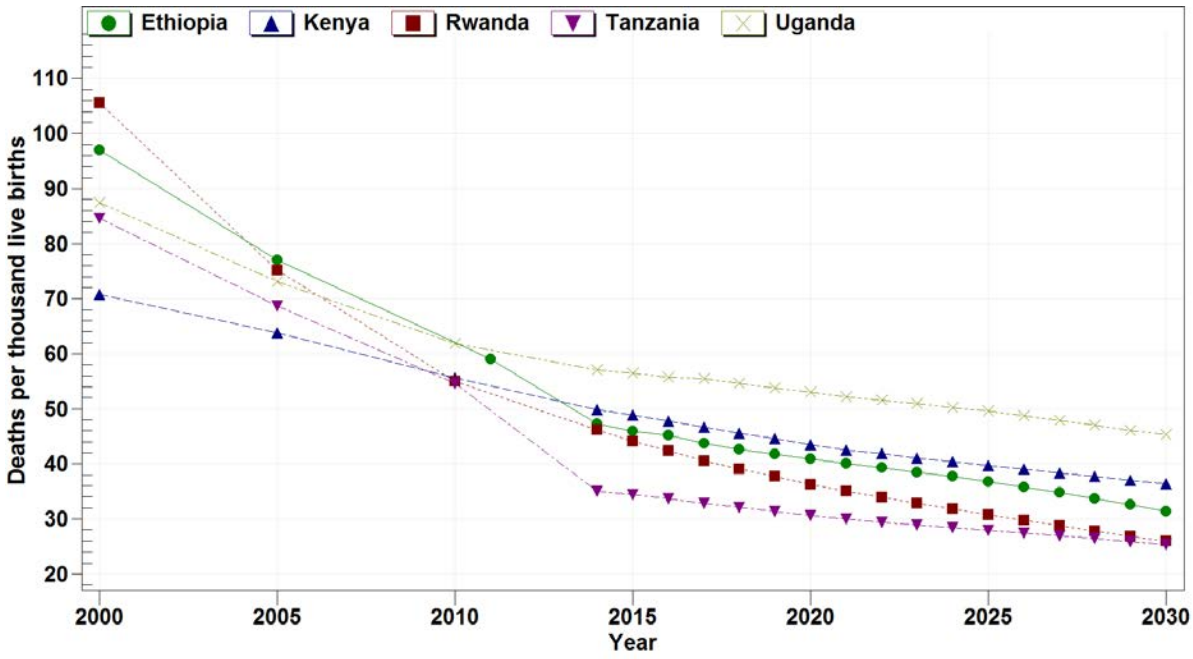
	Ethiopia	Sub-Saharan Africa	Africa Low-income	World
Life Expectancy (years)	65	59	61	72
Infant Mortality (per 1,000)	46	59	56	26
Maternal Mortality (per 100,000)	353	547	436	170
Fertility Rate (births per woman)	4.6	4.9	5.3	2.4
Contraception Use (% of fertile women)	36	28.5	25.8	63.8

Source: IFs v 7.27, historical data from WHO

Ethiopia has decreased infant mortality from 120 deaths per thousand live births in 1990 to 45 in 2016. Currently, Ethiopia's infant mortality rate is 22% lower than that of sub-Saharan Africa and 18% lower than that of other African low-income countries. In 1980, Ethiopia had the 10th highest infant mortality rate in Africa, now it ranks 33rd out of 54 African countries. The rate of decline of infant mortality in Ethiopia has also significantly outpaced its regional peers since 2000 (see Figure 5.b).

[111] Based on GDP per capita.

Figure 5.b: Infant mortality, Ethiopia and regional peers, 2000-2030



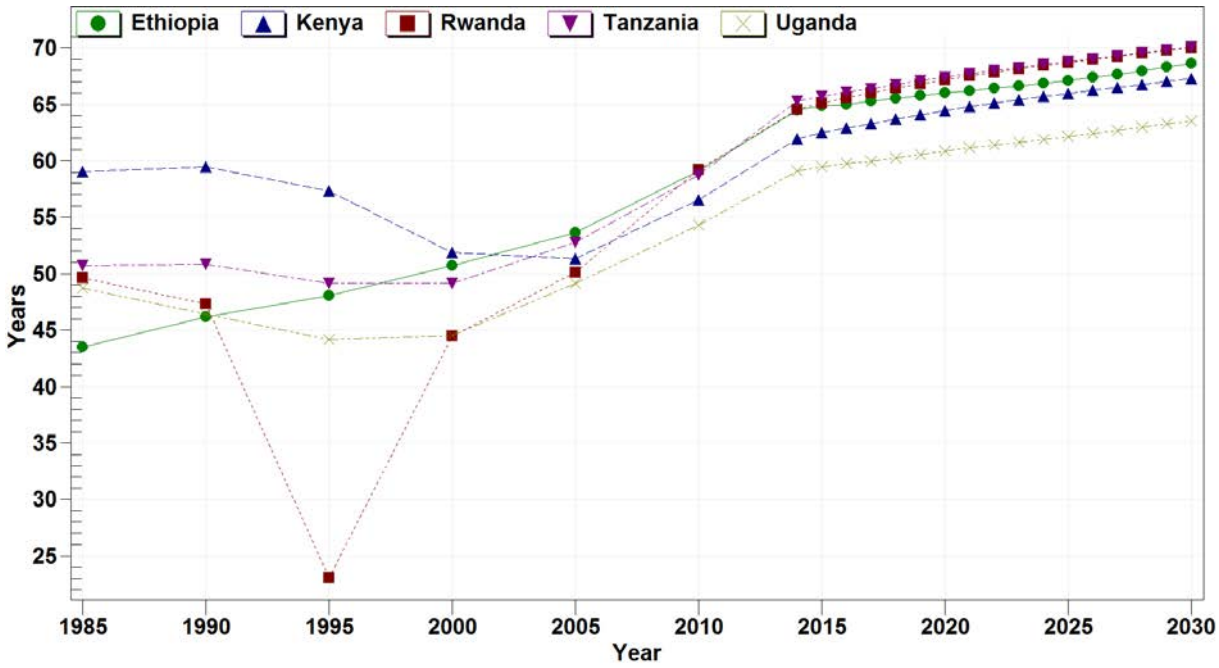
Source: IFs v 7.27, historical data from WHO, USAID

Furthermore, Ethiopia has made huge strides in reducing its maternal mortality rate (MMR).[112] Since 1990, the MMR in Ethiopia has fallen from 1,250 (per 100,000 live births) to 353, which represents a 70% decrease over the past 25 years. Ethiopia's MMR in 2015 is 35% lower than the average for sub-Saharan Africa and 25% lower than the average for other low-income African countries. Within the region, Ethiopia ranks 3rd in MMR, behind Uganda and Rwanda, but ahead of Tanzania and Kenya.[113]

These improvements in infant mortality and MMR reflect a concerted effort by Ethiopian authorities and the international aid community to improve health outcomes for women and children, primarily through the Ethiopia Health Extension Programme.[114] Over 2,500 health centers and 12,000 health posts offer community case management services to millions of Ethiopians, meanwhile immunization coverage and maternal antenatal care service have expanded significantly.[115] The rapid decrease in infant mortality, paired with increases in contraceptive use, has led to a rapid drop in Ethiopia's fertility rate (explained in more detail in the demographic section).

[112] Defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, from any cause related to or aggravated by the pregnancy or its management but not from accidental or incidental causes. (WHO)
[113] MMR data is taken from World Bank World Development Indicators modeled estimates of maternal mortality per 100 000 live births. The data are estimated with a regression model using information on the proportion of maternal deaths among non-AIDS deaths in women ages 15-49, fertility, birth attendants, and GDP.
[114]The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015.
[115] Ibid.

Figure 5.c: Life expectancy, Ethiopia and regional peers, 1985-2030[116]



Source: IFs v 7.27, historical data from WHO

Ethiopia has also outpaced its regional peers in life expectancy gains since 1990 (see Figure 5.c). Ethiopia had the lowest life expectancy of the group in 1990 (46 years), but it is now ranked 3rd (65 years), just below Rwanda and Tanzania. IFs forecasts life expectancy gains for Ethiopia and the region to continue, but at a significantly slower rate than over the preceding 25 or even 10 years. This is due in large part to Ethiopia's forecasted epidemiological transition. Non-communicable diseases are more difficult and costly to prevent relative to communicable disease because there are multiple paths of causation and treatment options tend to be more cost-prohibitive.[117]

Ethiopia's economic development has been accompanied by rapid decreases in infant mortality and commensurate improvements in life expectancy. But, it is important to recognize that Ethiopia still has a long way to go to reaching middle-income levels of infant mortality, maternal mortality, and life expectancy. Thus, it is important that Ethiopia prioritizes continued improvement in these areas to foster a healthy and productive population. As discussed in Chapter 3 on demographics, the rapid decrease in fertility, paired with concurrent increases in life expectancy, has accelerated Ethiopia's path toward its demographic dividend. Harnessing this demographic dividend, however, will depend on the country's ability to successfully extend service delivery and reduce the pernicious effects of malnutrition and stunting.

The prevalence of child and adult undernutrition in Ethiopia has declined from 42% and 58% in 2000 to 24% and 30% in 2016. Nevertheless, Ethiopia still suffers from some of the highest rates of undernutrition in Africa. It currently has the largest number of malnourished individuals in Africa, and is second only to Nigeria in the absolute number of malnourished children. The high number of malnourished people is somewhat a reflection of Ethiopia's population size, but it also reflects persistently high malnutrition rates; it ranks 11th worst (out of 54 African countries) in both adult and child malnutrition rates on the continent. Figure 5.d compares current malnourishment and stunting figures in Ethiopia with averages in selected country groupings.

[116] The large dip and gain in Rwanda's and life expectancy is due the 1994 Rwandan genocide.
[117] K Narayan, and Z Donnenfeld, Envisioning a Healthy Future: Africa's Shifting Burden of Disease, The Institute for Security Studies, 2016, www.issafrica.org/research/papers?page=2.

Figure 5.d: Table of selected malnourishment and stunting indicators, Ethiopia and comparison groups, 2016

	Ethiopia	Sub-Saharan Africa	Africa low-income	World
Malnourished Children (% of children)	24	18.8	21.3	17.6
Malnourished Adults (% of population)	30	18.2	25.6	12.5
Stunting Rate (% of population)	37	23	26.8	21.4

Source: IFs v 7.27, historical data from WHO

Ethiopia has by far the highest rate of childhood malnutrition compared to regional peers.[118] Its rate of child malnourishment is nearly 80% higher than that of the Uganda (second highest in the group). While Ethiopia's childhood malnutrition rate is expected to decline, it will remain significantly higher than its regional peers out to 2030. This high child malnutrition rate has significant effects on infant and under-5 mortality, and can lead to a high incidence of stunting in the general population.

Stunting is a symptom of prolonged undernutrition and results in diminished physical and cognitive development, which hinders an individual's ability to progress through school and/or physically work. This results in reduced productivity, and, therefore, lower output and wages over an individual's lifetime. Moreover, stunted individuals suffer from reduced reproductive capacity and increased risk of degenerative disease (i.e. diabetes), increasing the likelihood of experiencing negative health effects later in life.[119]

Box 5.2: The health sub-module

Building on work by the Global Burden of Disease (GBD), IFs forecasts 15 individual and clustered causes of mortality and morbidity. The causes are grouped along the lines of the three major groups identified in the GBD: i) communicable disease, ii) non-communicable disease, and iii) injuries.

IFs uses a hybrid model formulation integrating both distal and proximate drivers to forecast disease mortality and morbidity and the associated health outcomes. The interplay between distal and proximate factors provides a richer structural analysis of health outcomes. Distal drivers, or deep-driving variables, include: income (using GDP per capita as a proxy), education levels, technology, and smoking rates (impacts select diseases). Distal drivers do not affect health outcomes directly, rather they impact the proximate causes of disease and in doing so indirectly play a role on health outcomes in the model.[120] These drivers and associated coefficients are taken from and used by the GBD program.[121]

IFs enhances the distal formulation through representation and forecasts of additional proximate drivers, or the more immediate causes of morbidity and mortality. Those include: levels of childhood undernutrition, obesity (represented through the Body Mass Index), access to unsafe water and sanitation, indoor solid fuel use and outdoor air pollution.[122] No model can successfully represent all proximate health risks. The hybrid IFs formulation helps to more accurately represent long-term health outcomes in the absence of all proximate risk factors.

[118] Measured as two standard deviations from the mean weight-for-age in children under 5.
[119] WHO, Global Nutrition Targets 2025: Stunting Policy Brief, 2015, 1.

5.3 The burden of disease

The 10th International Classification of Disease (ICD) report separates the disease burden into two main categories: communicable and non-communicable.[123] Communicable diseases are caused by infectious agents outside the body, whereas non-communicable diseases (NCDs) diseases result from genetic, cellular, or organic anomalies or degeneration occurring inside the body. Communicable diseases are preventable, usually have a larger effect on vulnerable populations (especially infants and women giving birth), and present a high risk of infection. NCDs usually affect older populations, manifest themselves as disability rather than death, and are relatively costlier to diagnose, treat and manage.[124]

Ethiopia's communicable disease burden is one of the highest in the world in absolute terms, currently ranked 5th in terms of the absolute number of Years of Life Lost (YLLs) to communicable disease (27 million years).[125] At the same time, Ethiopia's population adjusted YLL's (YLL's per capita) is the 37th highest in the world, and is significantly lower than many of its sub-Saharan African counterparts. While Ethiopia has a significant communicable disease burden in an absolute sense, the picture looks better on a per capita basis.

Figure 5.e shows a death rate forecast for communicable and non-communicable disease in Ethiopia. In less than 15 years, Ethiopia will enter a period in which the disease burden will increasingly be characterized by non-communicable rather than by communicable disease. This shift from communicable disease to NCDs is part of the epidemiological transition that occurs as health and development outcomes improve. While the transition is being driven primarily by rapidly decreasing rates of communicable disease, rather than rapidly increasing rates of NCDs, this "double burden" of disease will put pressure on the health system to manage the divergent prevalence, treatment, and cost of these two distinct types of mortality.

[120] Hughes et al. 2011.

[121] C. Murray, A Lopez, The Global Burden of Disease, World Health Organization, World Bank, Harvard School of Public Health, 1997; most recent update Global, regional, and national age–sex specific all-cause and cause-specific mortality for 240 causes of death, 1990–2013: a systematic analysis for the Global Burden of Disease Study 2013, The Lancet, 17 December 2014.

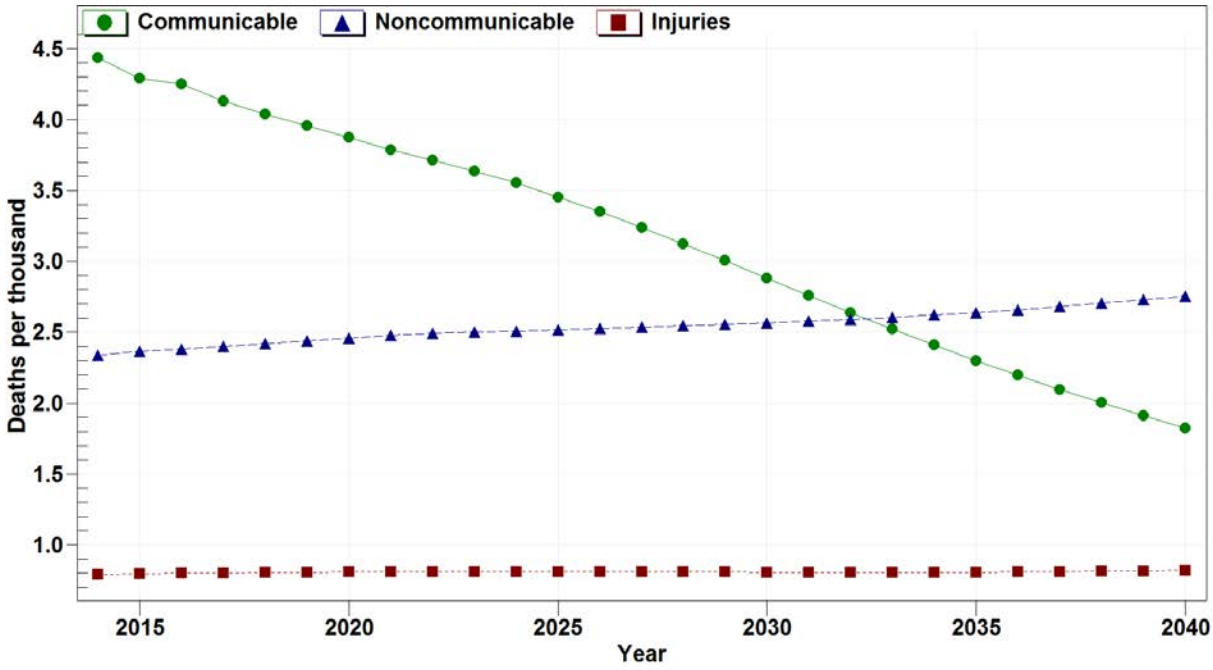
[122] Hughes et al. 2011.

[123] WHO, International Classification of Disease, 2016

[124] K Narayan and Z Donnenfeld, Envisioning a Healthy Future: Africa's Shifting Burden of Disease, The Institute for Security Studies, 2016, https://www.issafrica.org/research/papers?page=2

[125] YLL refers to the sum of all years lost due to premature mortality in the population.

Figure 5.e: Deaths by main ICD categories in Ethiopia, 2014-2040

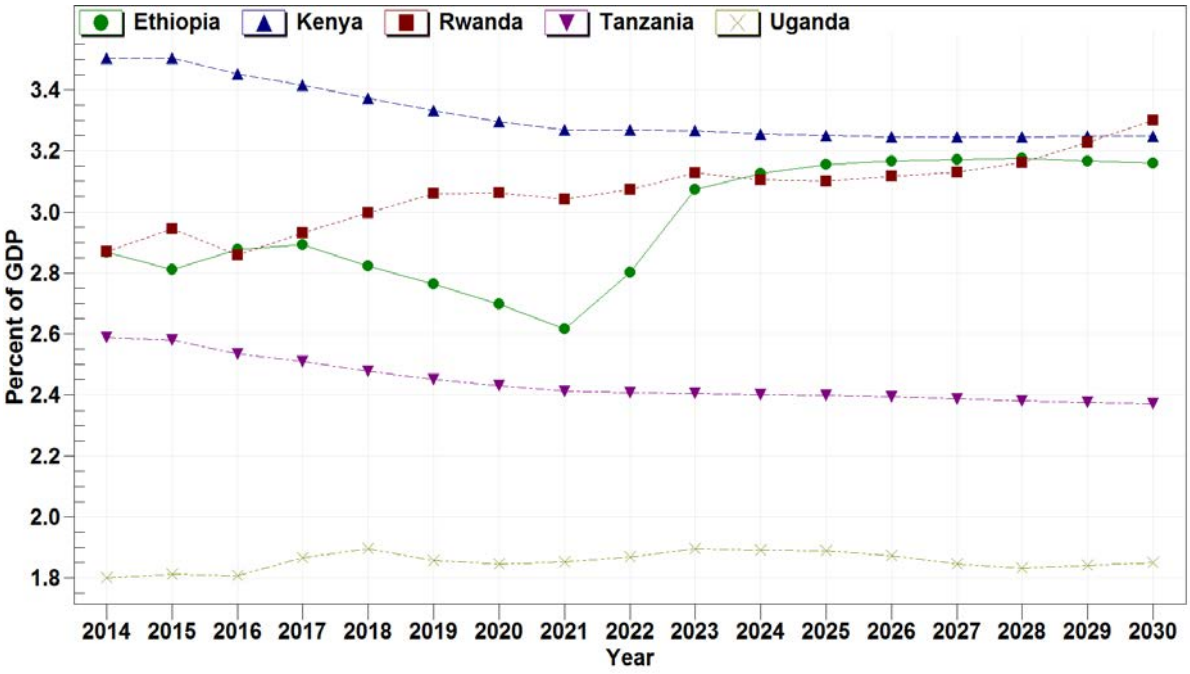


Source: IFs v 7.27, historical data from WHO

Box 5.3: Health spending/finance:

The GoE spends the equivalent of about 3% of GDP on health, which translated to nearly US$1.4 billion in 2016. This is comparable to spending by its regional peers (Figure 5f). The shift toward an NCD dominant disease burden will increase costs associated with healthcare because NCDs are more expensive to diagnose, treat and manage than communicable diseases. IFs forecasts health spending (in absolute terms and as a percent of GDP) to increase over the next 14 years, reaching nearly 3.2% of GDP (or US$4.1 billion) by 2030. But, this increase in spending may be unsustainable due to Ethiopia's heavy reliance on bilateral aid and concessionary lending.

Figure 5.f: Government spending on health forecast, Ethiopia and regional peers, 2014-2030[126]



Source: IFs v. 7.27, historical data from WHO

Over US$600 million in health funding was disbursed by development partners in 2015, which accounts for nearly half of total health spending in Ethiopia. Funding received from development partners is nearly double what the GoE treasury contributes to public health spending. The Health Sector Transformation Plan (HSTP) 2016-2020 estimates that the international donor community will supply about half of the public capital resources necessary to execute the HSTP for FY 15/16.[127] If that health funding were to significantly decrease, the GoE would either need to finance the gap with borrowing or cut programs. This represents a significant risk to the health sector and the GoE fiscal balance, to say nothing of human development in the country.

Ethiopia's challenge will be to continue to make strides in reducing communicable diseases while preparing the health system to deal with a growing burden of NCDs. In this sense, Ethiopia needs to continue to invest in a "horizontal health system," or a health system that has the ability to provide

[126] The shift in 2021 is due to the Current Path adjustment that accounts for increased spending on electricity generation via the GERD and various dam projects.
[127] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015, www.globalfinancingfacility.org/sites/gff_new/files/documents/HSTP%20Ethiopia.pdf

prevention and care for general health problems across the disease spectrum.[128] NCDs generally affect older populations and manifest themselves in years of life lost to disability (YLDs),[129] rather than premature deaths.[130] Further investments in health infrastructure and training targeted at emerging NCD health issues will be integral in fostering the transition to a NCD dominated burden of disease. The continuation of the Ethiopian Health Extension Programme could play a large role in smoothing the shifting burden of disease.

Despite the predominance of communicable disease in Ethiopia today, communicable disease death rates are low compared to sub-Saharan Africa and other low-income economies in Africa. Communicable disease death rates in Ethiopia are 30% lower than in sub-Saharan Africa and 14% lower than in other low-income African countries. Concurrently, Ethiopia's non-communicable death rates are significantly lower than in other low-income African economies (20%).

Figure 5.g: Table of death rates by main category, Ethiopia and comparison groups, 2016 and 2030

	Ethiopia		Africa low-income		World	
	2016	2030	2016	2030	2016	2030
Communicable	4.3	2.9	5	3.2	1.7	1.2
Non-communicable	2.3	2.6	2.9	2.7	5.3	6.3
Injuries	0.8	0.8	0.9	0.9	0.7	0.8

Source: IFs v 7.27. Historical data from WHO

On one hand, Ethiopia has done well to catch up and surpass many of its income and regional peers in nearly every major health category. On the other hand, because of its relatively low starting point, it still lags far behind world averages. Moreover, much of Ethiopia's progress compared to sub-Saharan Africa can be attributed to the relatively low prevalence of both HIV/AIDS and malaria.

The table in Figure 5.i shows death rates by cause for Ethiopia, sub-Saharan Africa, and African low-income economies. Ethiopia's other communicable disease, cardiovascular, and diarrhea are significantly lower than in either country grouping. Meanwhile, death rates from cancer, respiratory disease, and respiratory infection are on par or higher than in sub-Saharan Africa and other low-income countries in Africa. Finally, the table shows that Ethiopia's AIDS and malaria death rates are much lower than in Africa's other low-income economies.

[128] Health systems are made up of a 'horizontal system' of general services, providing prevention and care for prevailing health problems, and of 'vertical programmes' for specific health conditions. World Health Organization, Vertical–horizontal synergy of health workforce, www.who.int/bulletin/volumes/83/4/editorial10405/en/.

[129] Calculated by multiplying the prevalence of a disorder by the short- or long-term loss of health associated with that disability (the disability weight).

[130] K Narayan and Z Donnenfeld, Envisioning a Healthy Future: Africa's Shifting Burden of Disease, The Institute for Security Studies, 2016, https://www.issafrica.org/research/papers?page=2

Figure 5.i: Table of death rates by cause, Ethiopia and comparison groups, 2016 and 2030

	Ethiopia		Africa Low-income	
	2016	2030	2016	2030
Other Communicable	2.3	1.6	2.6	1.6
Cancer	0.5	0.6	0.4	0.5
Cardiovascular	0.7	0.8	0.9	1.1
Digestive	0.4	0.4	0.3	0.3
Respiratory	0.3	0.3	0.2	0.2
Other Non-communicable	0.5	0.5	0.6	0.6
Diabetes	0.1	0.1	0.1	0.2
AIDS	0.2	0.1	0.5	0.3
Diarrhea	0.5	0.3	0.6	0.3
Malaria	0.2	0.1	0.5	0.3
Respiratory Infection	1.1	0.9	1	0.6

Source: IFs v 7.27, historical data from WHO

These differences in disease death rates between Ethiopia and the rest of its African peers represents Ethiopia's health sector effectiveness, environmental factors, and specific mortality and morbidity profile. While the general disease burden reflects Ethiopia's level of economic, human, and technological development disease specific rates are largely driven by factors such as access to water and sanitation, undernutrition, air pollution, and other health specific drivers.

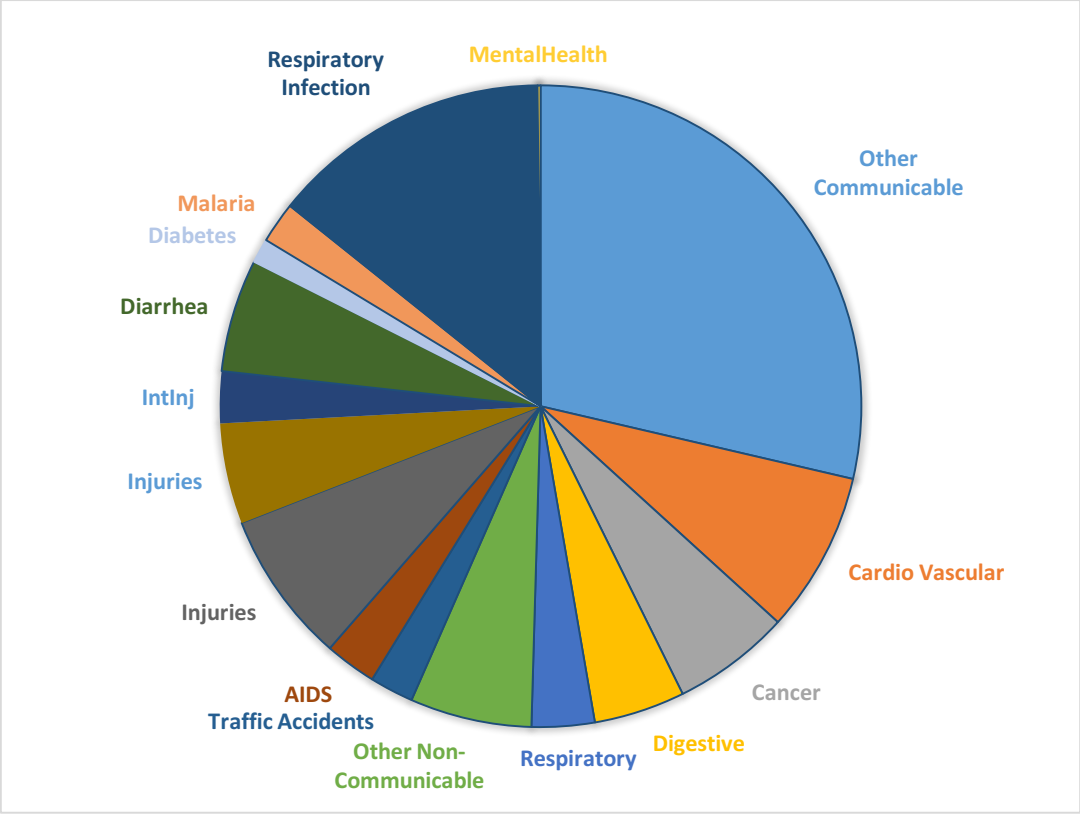
5.4 Patterns of mortality and morbidity

In terms of total YLLs, other communicable diseases account for nearly 40% of all YLLs while respiratory infections account for 14% and diarrhea accounts for 7.5%. The main causes of morbidity (measured by years of life living with a disease/disability) in Ethiopia come from the other non-communicable diseases and other communicable diseases.[131] Over half of all years living with disability (19.7 million) are due to diseases from the other NCD category (7.8 million) and other communicable diseases (6 million).

Figure 5.j shows Ethiopian death rates disaggregated by cause. Other communicable diseases, a catch-all category for communicable diseases, account for the most deaths in Ethiopia, followed by respiratory infections and cardiovascular disease. Other communicable diseases register the highest death rate in Ethiopia (2.28 per thousand), which is far higher than the death rate from respiratory infections (1.13 per thousand) or cardiovascular disease (0.65 per thousand).

131

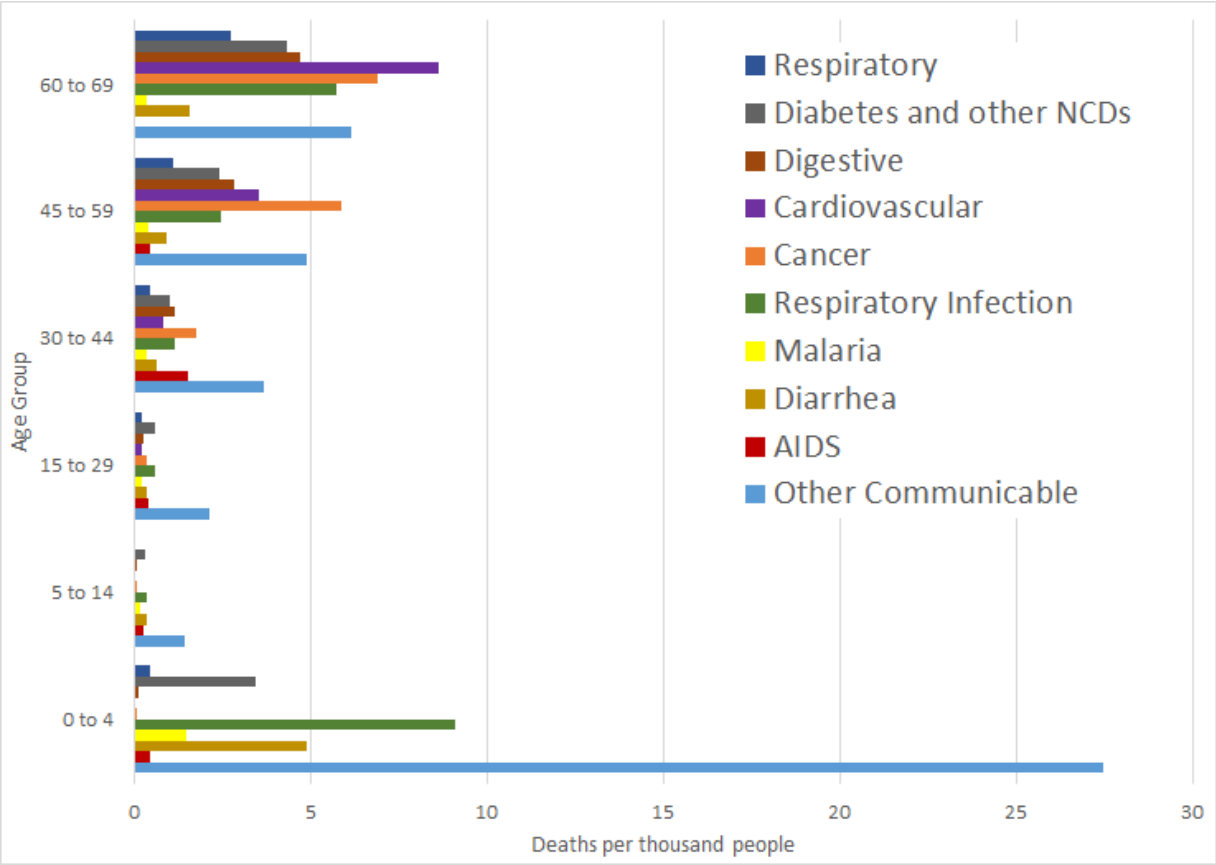
Figure 5.j: Death rate distribution by cause in Ethiopia, 2016



Source: IFs v 7.27, historical data from WHO

A breakdown of Ethiopia's death rates by age cohort provides a more nuanced picture of the country's disease burden: Communicable diseases predominate in infants and children (in particular other communicable disease, respiratory infections, and diarrhea), while cardiovascular disease, cancer, and other NCDs are dominant in older populations. Figure 5.k shows that the 0 to 4 age cohort is most affected by deaths from other communicable disease (27 per thousand), diarrhea (5 per thousand), and respiratory infections (9 per thousand). Death rates due to NCDs (such as cancer and cardiovascular disease) become much more prevalent in older populations. The malaria death rate is fairly small, with the exception of the 0 to 4 age cohort. The AIDS death rate is also fairly low in all cohorts (relative to the sub-Saharan average), with the exception of the 30 to 44 age cohort.

Figure 5.k: Death rates by cause and cohort in Ethiopia, 2016



Source: IFs v 7.27, historical data from WHO

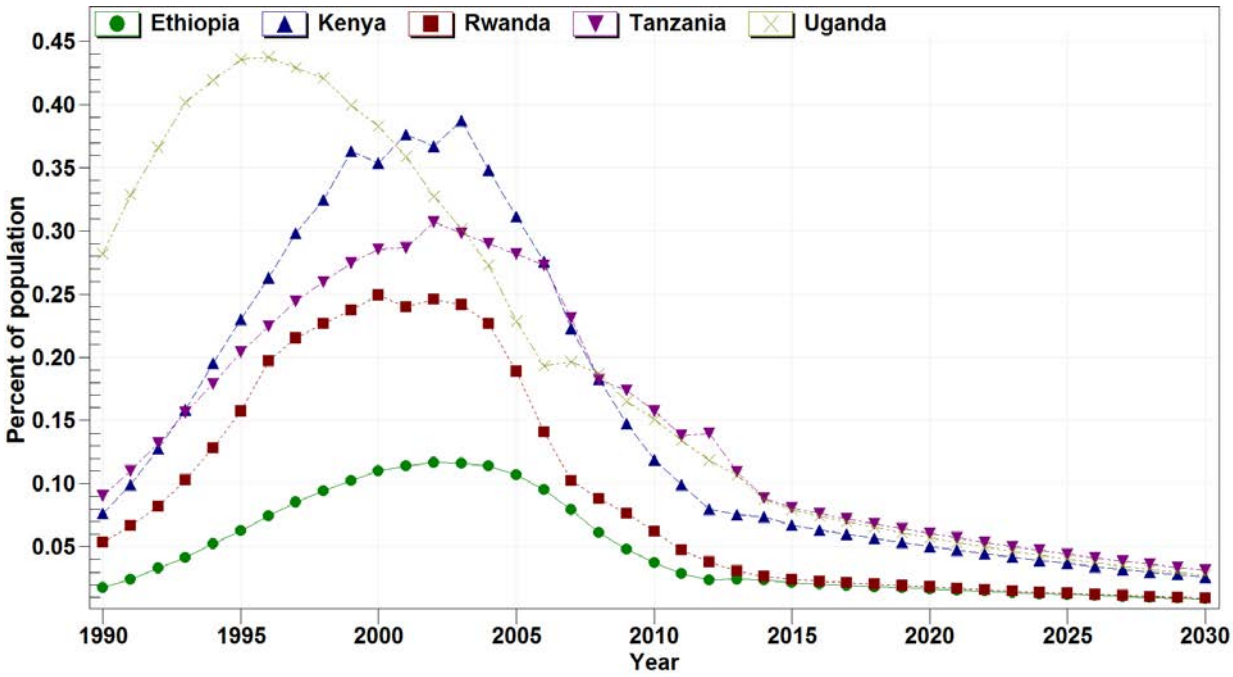
This type of cohort breakdown of the disease burden is close to what we would expect from a country at Ethiopia's level of development: high burden of communicable disease in children and mothers paired with a slowly growing burden of NCDs as the population ages. Nonetheless, there are specific disease areas where Ethiopia differs from its African and regional peers.

5.4.1 HIV/AIDS

Currently, Ethiopia's AIDS death rate is 75% lower than in sub-Saharan Africa, and 65% lower than in Africa's other low-income economies. While recent reductions in HIV prevalence and AIDS deaths are due to concerted effort to curb the spread of the disease, it is also important to note that Ethiopia has historically had relatively low HIV prevalence and death rates (by sub-Saharan African standards).[132] This difference becomes more stark when Ethiopia is compared to its regional peers. Ethiopia's HIV prevalence rate and AIDS death rate has historically been anywhere from half to a fourth lower than the other countries in the region (see Figure 5.l).

[132] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015, www.globalfinancingfacility.org/sites/gff_new/files/documents/HSTP%20Ethiopia.pdf.

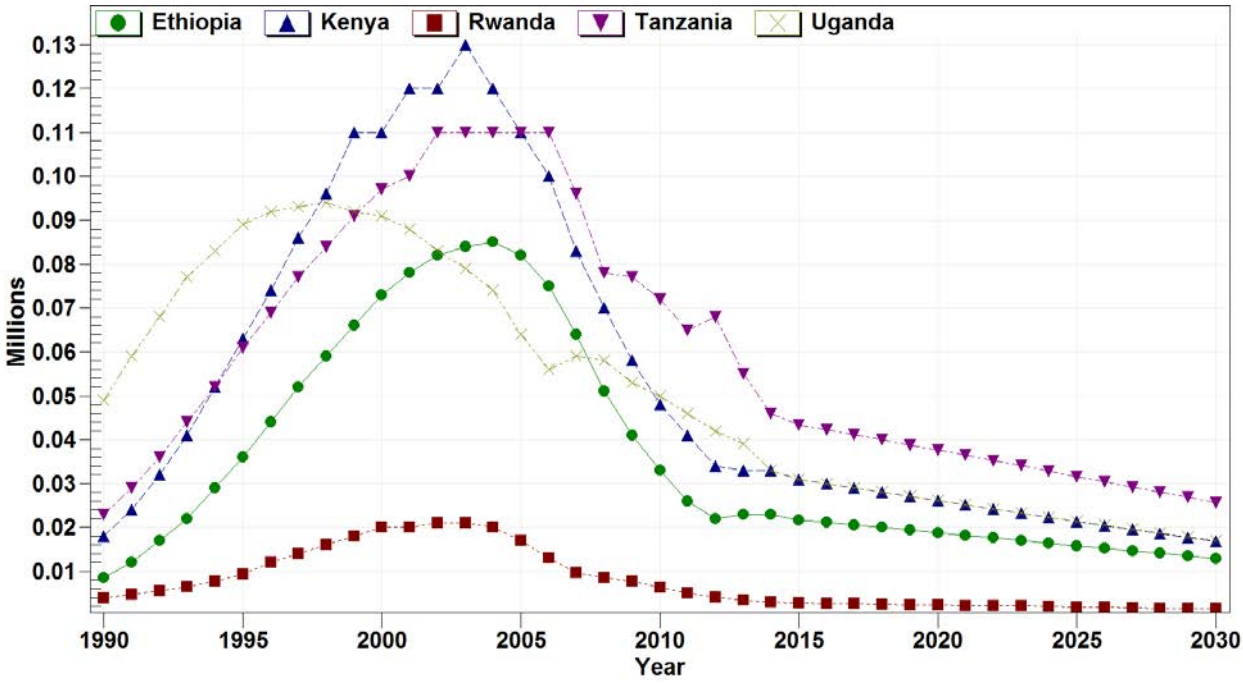
Figure 5.l: AIDS death rates, Ethiopia and regional peers, 1990-2030



Source: IFs v 7.27, historical data from WHO

Because Ethiopia has a large population, however, the total number of AIDS deaths has been on par with, or only slightly lower than most of its regional peers (see Figure 5.m). Moreover, Ethiopia is still in the top twenty in the world in terms of the number of AIDS deaths (due to its large population) and has the 11th largest number of AIDS related deaths per year within sub-Saharan Africa. Nonetheless, the AIDS death rate and number of AIDS deaths have fallen by 82% and 75%, respectively, since 2004.

Figure 5.m: AIDS deaths, Ethiopia and regional peers, 1990-2030



Source: IFs v 7.27, historical data from WHO

An important reason for the rapid decrease in AIDS deaths since the mid-2000s has been the increase in the number of health facilities providing HIV counseling and testing (HCT), prevention of mother to child (PMTCT) transmission, and antiretroviral therapy services (ART). From 2010 to 2014 alone, the number of facilities offering HCT, PMTCT and ART services has increased by 60%, 84%, and 90%, respectively.[133] In 2014, an average of 10 million HIV counseling and testing services are being provided and over 800,000 people were starting or continuing ART treatments.[134]

One important side effect of a reduction in AIDS deaths via ART treatment is that it can actually increase HIV prevalence; as ART prolongs the lives of people living with HIV, HIV prevalence appears higher than if AIDS deaths removed those people from the population outright. In Ethiopia's case, peak prevalence occurred in 1998 (1.75% of the population) and has been steadily declining since. HIV prevalence is about 0.7% in 2016 and is forecast to decline to 0.5% by 2030. Nonetheless, a high prevalence of HIV leads to higher incidence of other diseases, especially TB. The HIV/TB coinfection rate is 8 per 100,000, which means that continued monitoring of those with HIV is crucial.[135]

5.4.2 Malaria

Seventy-five percent of Ethiopia's land is malarious, and over 65% of the population is at risk of contracting malaria. Nevertheless, Ethiopia is considered a low to moderate malaria transmission intensity country.[136] Ethiopia's malarial exposure is greatly affected by climate change, as malaria transmission cycles are highly contingent on weather conditions in lowland areas.[137] This means that the transmission of malaria is often cyclical; an epidemic has historically occurred approximately every five to eight years.[138]

That said, Ethiopia has not seen a malaria epidemic since 2003, and malaria prevention and treatment capacity has grown significantly over the past 15 years. Between 2001 and 2011, the total number of malaria related hospital admissions and deaths decreased by over 50% and admission and death for under-five children fell by 81% and 73%, respectively.[139] Currently, over 90% of health facilities and 77% of health posts offer malaria treatment services, though only around half have diagnostic capabilities.[140]

Ethiopia has the lowest malaria death rate (0.167 per thousand) in its peer group, and is forecast to maintain the lowest death rates out to 2030. Furthermore, Ethiopia's malaria death rate is 73% lower than the average across sub-Saharan Africa and 69% lower than in other African low-income economies. Improvements in malaria prevention and treatment have been impressive and we expected those improvements to result in steadily declining malaria death rates. But, due to the highly cyclical and climate-contingent nature of malaria in Ethiopia, is it important that authorities continue to protect against malaria epidemics.

Furthermore, there is some concern that temperature and precipitation changes from climate change will allow mosquitoes to occupy geographies that have historically seen low incidence of malaria. A

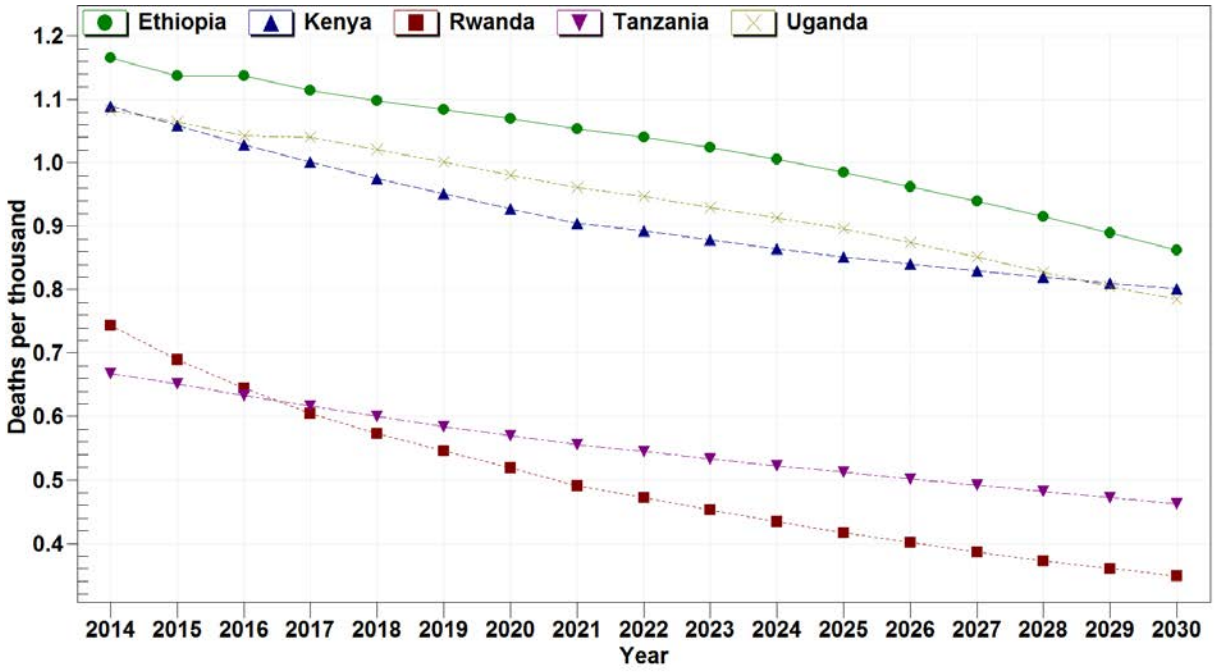
[133] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015, 33, www.globalfinancingfacility.org/sites/gff_new/files/documents/HSTP%20Ethiopia.pdf
[134] ibid
[135] WHO Global Tuberculosis Report, 2016
[136] WHO Country Cooperation Strategy 2012-2015: Ethiopia, 2015, p. 7.
[137] Current Status of Malaria in Ethiopia: Evaluation of the Burden, Factors for Transmission and Prevention Methods, 2016
[138] Ibid.
[139] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015, 32, 35
[140] Ibid.

pilot study conducted in the Ethiopian highlands suggests that prevalence will likely rise unless disease monitoring and control efforts in those regions are boosted and sustained.[141] This means that malaria monitoring and treatment facilities would need to be expanded in these previously unaffected areas to prevent or manage a future outbreak.

5.4.3 Respiratory infection, respiratory disease, and tuberculosis

Ethiopia's death rates from respiratory infection and respiratory disease are generally higher than regional peers and other sub-Saharan African countries. Figure 5.n shows the relatively high respiratory death rates in Ethiopia compared to its regional peers. The high death rate, paired with Ethiopia's large population, means that Ethiopia has the second highest number of respiratory infection related deaths in sub-Saharan Africa.

Figure 5.n: Respiratory infection death rate, Ethiopia and regional peers, 2014-2030



Source: IFs v 7.27, historical data from WHO

The higher prevalence of respiratory infection is largely due to Ethiopia's relatively high burden of tuberculosis (TB) and acute lower respiratory infections (ALRI). Acute lower respiratory infections are the number one cause of death in Ethiopia and accounted for over 15% of all deaths (103 000 people) in Ethiopia in 2012.[142] ALRI predominantly affects children under five years old; it accounted for 27% of all under-5 deaths in 2013.[143] ALRI in children is caused by a range of factors linked to communicable disease transmission, but two large risk factors are childhood undernutrition and household air pollution. According to a recent WHO study, nearly a quarter of all under-5 ALRI deaths in Africa were attributable to undernutrition.[144] The WHO also estimates that exposure to indoor household air pollution doubles the risk of ALRI and that over half of under-5 ALRI deaths are

[141] J Erickson, Warmer temperatures push malaria to higher elevations, University of Michigan News, 6 March 2014, http://ns.umich.edu/new/releases/22032-warmer-temperatures-push-malaria-to-higher-elevations
[142] Latest data on specific causes of death from the WHO is from 2012 (WHO: Ethiopia statistical profile, 2012)
[143] Ibid.
[144] DE Roth et al, Acute Lower Respiratory Infections in Childhood, Bulletin of the World Health Organization, 86: 5, 2008, 356-364.

attributable to particulate matter inhaled from indoor air pollution from household solid fuels.[145] Both of these risk factors are highly prevalent in Ethiopia; the Ethiopian childhood malnutrition rate is high, and over 95% of the population still relies on traditional solid fuels for cooking.

Figure 5.o: Traditional cook stove use forecast; Respiratory disease death rates forecast, Ethiopia and regional peers, 2016 and 2030

	Traditional cook stove use (percent of population)		Respiratory disease death rate (per 1,000)	
	2016	2030	2016	2030
Ethiopia	93.4	76.4	0.3	0.3
Kenya	75.1	63.5	0.1	0.1
Rwanda	91.8	73.8	0.1	0.1
Tanzania	88.3	76.1	0.1	0.1
Uganda	90.5	81.3	0.1	0.1

Source: IFs v 7.27, historical data from WHO

While most of the population in the region relies on traditional fuels (i.e. wood, dung) for cooking, Ethiopia has the highest rate of traditional fuel use (over 93% of households). The high use of traditional cook stoves not only contributes to ALRI in children under five, it likely contributes to Ethiopia's relatively high respiratory disease death rates (disproportionately impacting women). Ethiopia's respiratory disease rates are significantly higher than other sub-Saharan African countries and regional peers (see Figure 5.p). Over 20% of all deaths from chronic obstructive pulmonary disease (COPD) are attributable to indoor household pollution from solid fuel use.[146] Moreover, use of traditional cook stoves also contributes to other NCDs such as ischemic heart disease, stroke, and lung cancer. Finally, there are links between indoor household air pollution and TB prevalence.

Ethiopia has a high, but declining, prevalence and burden of TB. It has achieved TB prevention and control targets outlined by the WHO, reducing mortality and prevalence rates by more than 50% since 1990.[147] This improvement is partly due to TB/HIV collaborative policies and the decline of HIV prevalence in Ethiopia; TB incidence and prevalence is correlated with HIV infection. The TB/HIV co-infection rate is about 8 per 100,000, which is lower than the global and the African average (11 and 31 per 100,000, respectively).[148] Nonetheless, Ethiopia is still a high TB burden country and has a high number of undiagnosed cases of TB.

In 2015, the TB prevalence rate was 192 (per 100 000) and death rate was 26 (per 100 000).[149] Meanwhile, the TB case detection rate was only about 54% in 2014, down from 59% in 2013. Low detection rates and the emergence of multi-drug resistant (MDR) TB are the largest TB related issues in Ethiopia.[150] While the number of health centers providing TB testing and detection has risen, community-based care is short of the 80% target and only about 29% of health posts are involved in TB screening and treatment.[151]

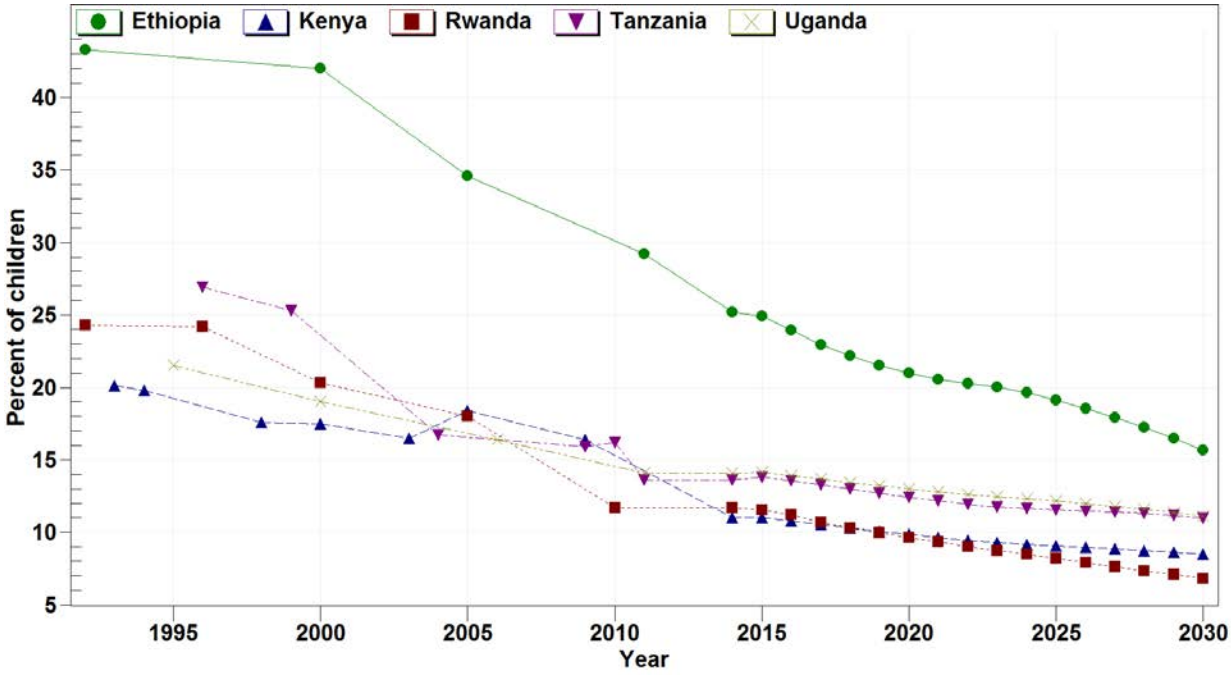
[145] WHO Household Air Pollution Factsheet (updated Feb. 2016)
[146] Ibid.
[147] WHO, Global Tuberculosis Report, 2016.
[148] WHO, Ethiopia Tuberculosis Profile, 2015.
[149] Ibid.
[150] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015, 34.
[151] The Federal Democratic Republic of Ethiopia Ministry of Health, Ethiopia Health Sector Transformation Plan, 2015, 34.

5.4.4 Other communicable disease and diarrhea

The "other communicable disease" category is predominantly made up of communicable diseases related to maternal, neonatal and nutritional deficiencies, but also includes a range of infectious and parasitic disease (i.e. measles, meningitis, etc.).[152] As the cohort death rates data (in Figure 5.k) shows, other communicable disease predominantly affects infants and under five children, but also carries a significant death burden after age 15. Other communicable diseases are by far the leading cause of neonatal mortality and are just ahead of respiratory infections as the main cause of post neonatal deaths. In 2013, other communicable diseases account for about 30% of all under-5 deaths, followed by ALRI (27%) and diarrheal disease (16%).[153] This means that nearly 50% of all under-5 deaths are due to other communicable diseases or diarrhea.

The high burden of disease from other communicable diseases and diarrhea is closely tied to a lack of improved water and sanitation facilities. Poor water and sanitation access facilitates the transmission of various infectious diseases, especially among infants or children under-5. A high burden of communicable disease among children under-5 contributes to child undernutrition and stunting. Contracting infectious diseases early in life can inhibit nutritional absorption and in a crucial phase of physical and cognitive development. Alternatively, undernutrition itself can make children more vulnerable to communicable disease onset. So, when the high prevalence of communicable disease in under-5 children is paired with low availability of calories for consumption, it is easy to see why Ethiopia has one of the highest rates of childhood malnutrition in the region and in all of Africa.

Figure 5.p: Malnourished children, Ethiopia and regional peers, 1990-2030



Source: IFs v 7.27, historical data from WHO

Figure 5.p presents the percentage of malnourished children in Ethiopia and its regional peers. Ethiopia's childhood malnutrition rate, while declining, is still nearly 50% higher than the next closest country in the region (Uganda). The decrease in malnourished children has likely been driven by the combination of a rapid increase the available calories due to increases in total agricultural production in Ethiopia and improvements in water and sanitation access over the past 15 years.

[152] WHO, Global Burden of Disease, 2004
[153] WHO, Ethiopia Neonatal and Child Health Profile, 2013

5.5 Water, Sanitation, and Hygiene (WASH)

Ethiopia made more rapid progress on access to improved sanitation than any other African country from 2000 to 2015, improving access by roughly 19 percentage points. Despite that progress, Ethiopia ranks 32nd among 54 African countries and 162nd in the world in terms of the percentage of its population with access to improved sanitation facilities (see Figure 5.q).

Figure 5.q: Table of WASH indicators, Ethiopia and comparison groups, 2016 and 2030

	Ethiopia		Africa Low-income		World	
	2016	2030	2016	2030	2016	2030
Improved Sanitation Access (% of population)	29	46	24	38	68	82
Improved Water Access (% of population)	57	65	65	73	91	93

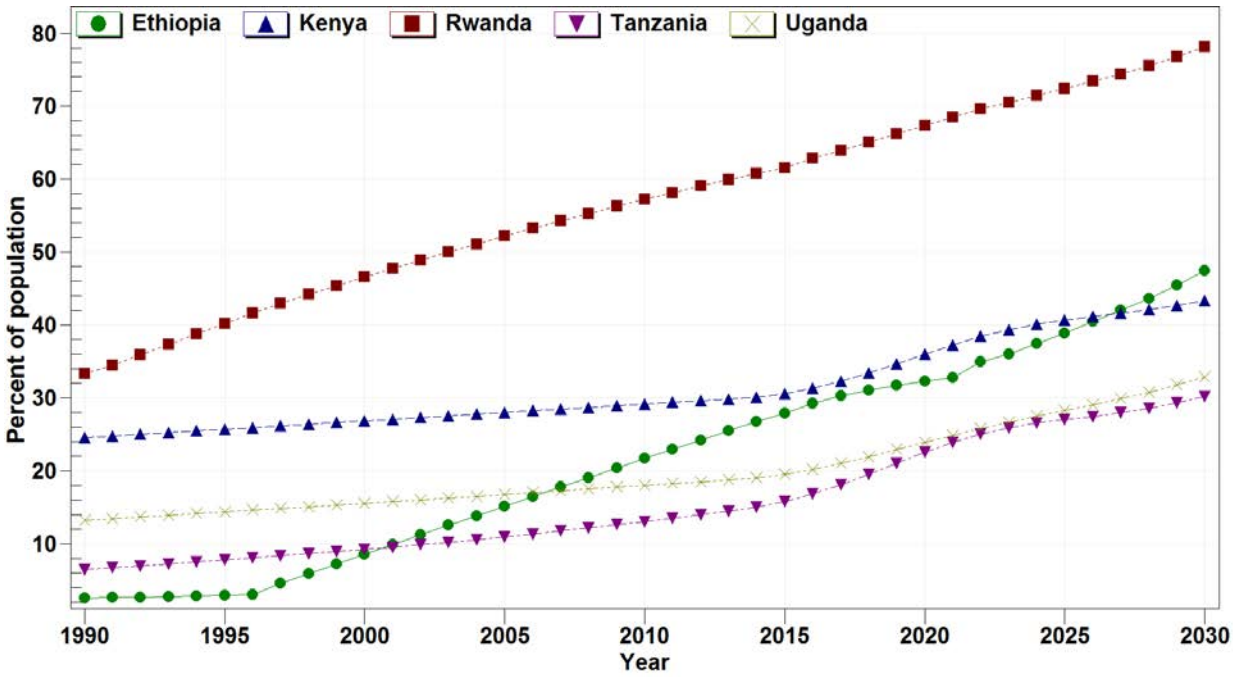
Source: IFs v 7.27, historical data from WHO

As outlined previously, insufficient access to clean water and improved sanitation facilities is a key driver of mortality in Ethiopia. While Ethiopia has made significant strides in providing water and sanitation access, it still lags behind in both access indicators when compared to the world average and most of its African peer groups. Ethiopia remains significantly behind its African peers in access to improved water sources and lags behind the rest of sub-Saharan Africa in improved sanitation access. Figure 5.r below shows access to improved sanitation facilities as a percentage of the total population for Ethiopia and regional peers.

Box 5.5: WHO sanitation reclassification in Ethiopia

The WHO Joint Monitoring Program for Water Supply and Sanitation's (JMPWSS) adjusted its definition of improved sanitation in Ethiopia. Improved sanitation facilities are generally defined by the JMPWSS as access to a flush toilet (to piped system or septic tank), a flush or ventilated pit latrine, a pit latrine with slab, and or a composting toilet. Shared generally refers to any shared sanitation and other unimproved is generally any other form of sanitation (i.e. no facilities, bucket, or pit latrine without slab). But, after consultation with Ethiopian authorities, the JMP shifted its definition of improved sanitation in Ethiopia to include half of all pit latrines without slabs. This means that a significant number of sanitation facilities that are classified as other unimproved in other countries are classified as improved sanitation sources in Ethiopia. Data from the USAID Demographic and Health Survey (DHS) on sanitation access does not include this adjustment and the definitional discrepancy means that the DHS's data shows a much smaller percent of the population with access to improved sanitation.

Figure 5.r: Improved sanitation access, Ethiopia and regional peers, 1990-2030

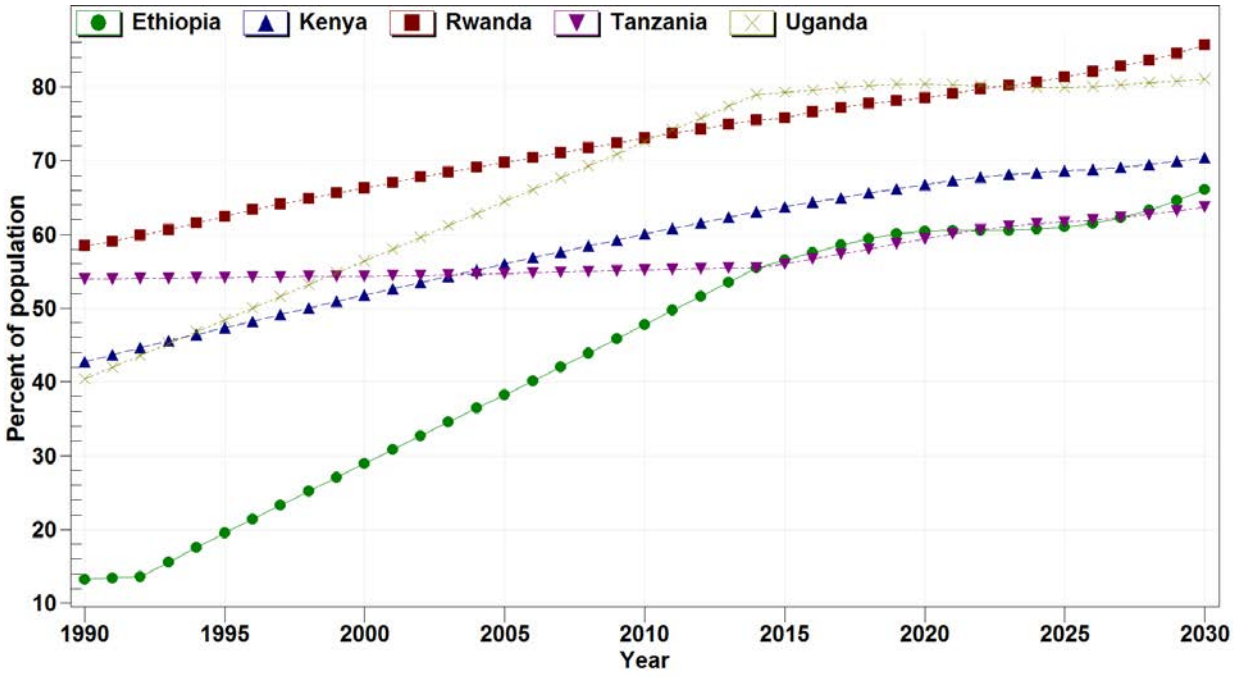


Source: IFs v 7.27, historical data from WHO

There has been a rapid, sustained rise in improved sanitation facilities over the past 25 years, but over 60% of the population in Ethiopia still relies on unimproved facilities. Even with continued progress, more than 40% of the population is expected to rely on unimproved sanitation facilities in 2030. This means that more than 27 million people will still lack access to improved sanitation in 2030.

Ethiopia has also made rapid progress on improving access to clean water, but still lags behind much of the world. Ethiopia ranks 174th in the world and 45th (out of 54) in Africa in terms of the percent of its population with access to improved water sources. At 57% access to improved water sources, Ethiopia still has one of the lowest access rates in the region (ahead of only Tanzania).

Figure 5.s: Improved water access, Ethiopia and regional peers, 1990-2030



Source: IFs v 7.27, historical data from WHO

IFs forecasts that more than 25% of Ethiopians will still not have access to improved water sources by 2030, and another 25% will rely on "other improved sources." But, "other improved" sources are prone to a number of quality issues with one study finding that the JMP may be significantly underestimating (by as much as 100%) the number of people drinking water with fecal contamination.[154] Moreover, improved water sources are often mismanaged, particularly in rural areas. The transportation and storage of water in rural areas makes it vulnerable to contamination, and many households also combine improved and unimproved sources in those areas.

Improvements in water and sanitation access should be an integral part of Ethiopia's health and infrastructure development plan. Lack of access to water and sanitation facilities is a core driver of Ethiopia's communicable disease burden, especially for infants and young children. Given Ethiopia's heavy burden of other communicable diseases, diarrhea, and respiratory infections, interventions that increase water and sanitation access will significantly lower death rates from those communicable diseases and help reduce undernutrition and stunting.

5.6 Key takeaways

- Ethiopia's gains in major health indicators (infant mortality, life expectancy, communicable disease prevalence) have outpaced many of its peers since 1990. Currently, Ethiopia has some of the lowest communicable and non-communicable death rates within the continent and in the region.
- Lack of access to water and sanitation services and indoor air pollution are significant drivers of Ethiopia's relatively high rates of other communicable disease (largely MMR and infant mortality), respiratory infection, and respiratory disease.

[154] K Onda et al, Global Access to Safe Water: Accounting for Water Quality and the Resulting Impact on MDG Progress, International Journal of Environmental Research and Public Health, 2012, 9.

- Ethiopia has one of the highest rates of childhood malnutrition in the world. Lack of access to improved water and sanitation (paired with low caloric availability) is a major driver of Ethiopia's high rate of childhood malnutrition.

5.7 Health interventions

The core of the health interventions' focus is on improving water and sanitation infrastructure, reducing traditional solid fuel use, and reducing under-5 and maternal mortality. Each of the interventions targets a driver of the core health issues facing Ethiopia. Improving water and sanitation facilities decreases the prevalence of communicable diseases, thereby reducing deaths from communicable diseases in young children and reducing the number of malnourished children. Reducing traditional fuel use lowers death rates from respiratory infections and respiratory disease by minimizing indoor air pollution. Lastly, targeted interventions on under-5 mortality and communicable disease deaths for females between the ages of 15-45 are meant simulate further investment and extension of childbirth and childcare extension services in Ethiopia.

We also introduce a set of interventions that show the negative effects of stalled progress in improved WASH access, continued high use of solid fuel sources, slow improvements in under-5 and maternal mortality, and an outbreak of malaria. The malaria intervention is meant to simulate an increase in malaria deaths due to a climate related shift in rainfall and prevalence. The under-5 and maternal mortality intervention simulates slow progress in extending health extension services for childbirth, early childhood care, and maternal care.

5.7.1 Water and sanitation

The water and sanitation intervention represents a five-year policy push to increase water and sanitation access above the Current Path and maintain that increase through the time horizon. The intervention increases access to improved sanitation and water facilities by 20% and 10%, respectively, over the Current Path by 2021, and maintains that increase through 2030. By 2030, over 10 million more Ethiopians have access to improved sanitation and nearly 13 million more people have access to clean water compared with the Current Path.

The increases in access to water and sanitation has significant effects on health and mortality outcomes in Ethiopia, especially those related to childhood mortality and malnourishment. The intervention reduces other communicable disease, malaria, respiratory infection and diarrhea related death rates and decreases infant mortality over the time horizon. By 2030, death rates from communicable disease drop by 3.5% and infant mortality drops by nearly 6% compared to the Current Path. Furthermore, the intervention decreases childhood malnutrition by nearly 19% compared to the Current Path by 2030. This means that, by 2030, 600,000 fewer children will have suffered from malnutrition.

The negative WASH scenario simulates stalled growth in access to improved water and sanitation facilities. The intervention slows improved access to water and sanitation to less than 1% and 5%, respectively, by 2021. This stalled growth means infant mortality is over 2% higher and that 240 000 more children will be malnourished compared to the Current Path in 2030.

5.7.2 Traditional fuel use

The traditional fuel use intervention reduces the use of traditional cook stoves by 15% by 2021 and maintains that decrease through the 2030 time horizon. By 2030, there are nearly 3.2 million fewer traditional cook stoves in use compared to the Current Path and only 65% of households still use traditional cook stoves (compared to 76% in the Current Path). This means that Ethiopia will have reduced household use of solid fuels by 30% by 2030. This reduction in solid fuel use, and thus indoor household air pollution, has significant effects on respiratory disease and infections. The reduction in

traditional fuel use results in a 5% decrease in respiratory disease deaths and 3.5% decrease in respiratory infection deaths by 2021.

The negative solid fuel use intervention simulates a continuation of current traditional cook stove use for the next 5 years. By 2021, Ethiopia reduces traditional cook stove use by only about 0.8%, which means that almost 93% of the population will still be using traditional fuel sources by 2021 (compared to 89% in the Current Path).

5.7.3 Under-5 and maternal mortality

For the positive under-5 and maternal mortality intervention, we decrease under-5 mortality and female communicable disease mortality while increasing government spending on health. This intervention simulates a GoE push to increase the health extension program and improve maternal and early life care in order to decrease under-5 and female communicable disease death rates. The intervention reduces the other communicable disease, malaria, and diarrhea death rate by about 5% each by 2021 and maintains that decrease out to 2030. It also decreases infant mortality by 6% compared to the Current Path by 2030.

The negative under-5 and maternal mortality intervention simulates a regression in maternal and early child care. It increases the communicable disease death rate by 4.5% over the Current Path by 2021 and maintains that increase out to 2030. It also increases infant mortality by 6% over the Current Path by 2021.

5.7.4 Malaria

The malaria intervention simulates an outbreak of malaria in 2019. It increases malaria deaths by 30% over the Current Path in 2019 and 2020, then decreases the malaria death rate back to the Current Path by 2022. The intervention results in about 12,000 additional malaria deaths from 2019 to 2021 and causes a slight increase in infant mortality over the same time period.

5.7.5 Combined scenarios

The Integrated Health Push scenario includes the interventions on water and sanitation, solid fuel use, and under-5 and maternal mortality and represents an integrated policy push across the key health problems in Ethiopia. The Health Backslide scenario shows the negative effects of stalled progress in WASH, solid fuel use, and under-5 and maternal mortality.

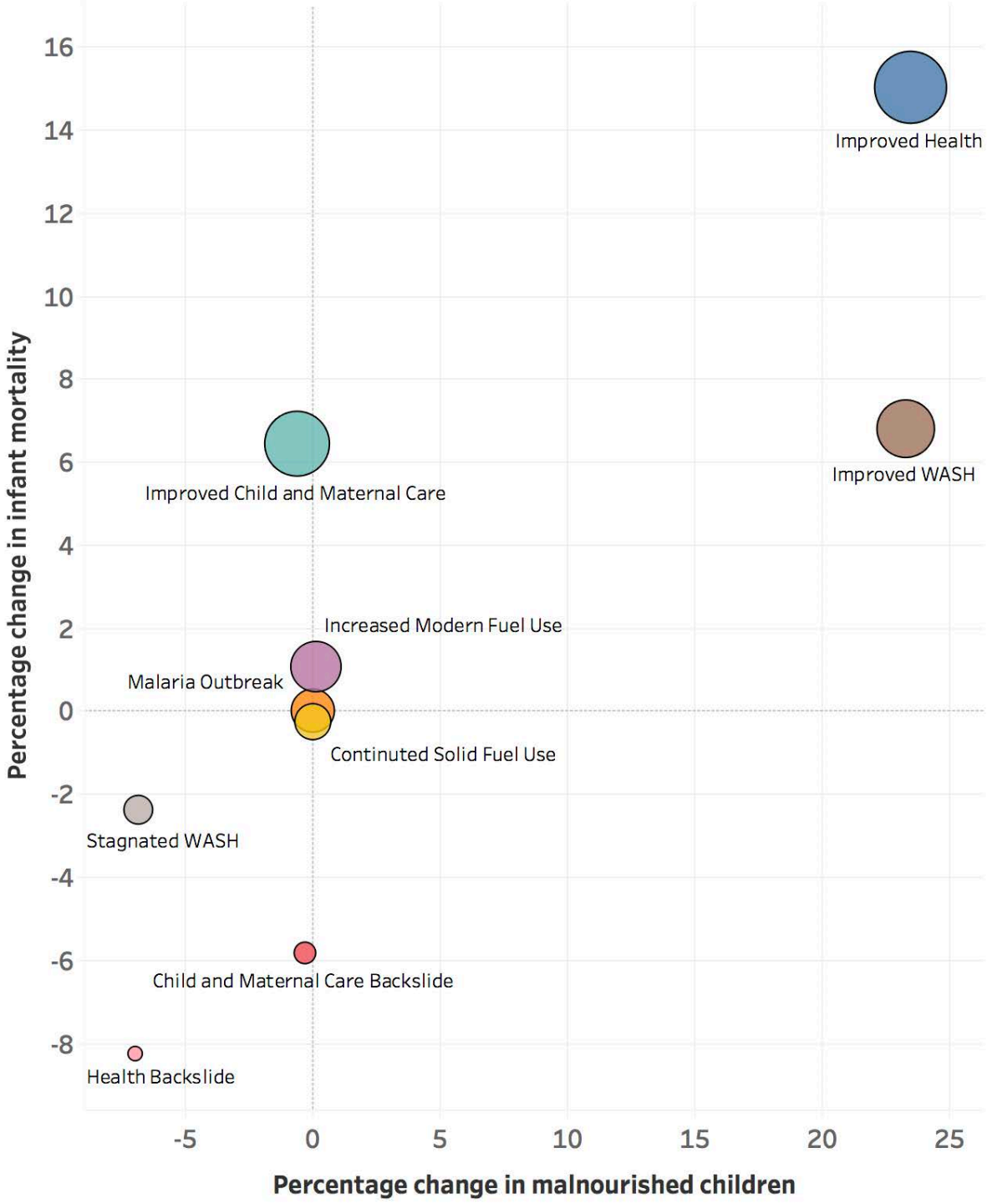
Figure 5.u below shows the effects of each of the interventions outlined above on three main health indicators: life expectancy, infant mortality, and childhood malnutrition. Each effect is presented as the percentage change in 2030, relative to the Current Path forecast. The x-axis represents the percentage change in malnourished children, the y-axis shows the percentage change in infant mortality, and the bubble size represents the percentage change in life expectancy compared to the Current Path.[155]

Improving WASH access has by far the largest effect on the number of malnourished children. Meanwhile, the Improved Child and Maternal Care and Improved WASH interventions also lead to significant improvements in infant mortality and life expectancy. The increase in child malnutrition in this scenario happens because, while it reduces the number of children dying from communicable diseases it does not address the underlying causes of undernutrition like access to water and sanitation and sufficient calories.

[155] Here again, where the scenarios create a decrease in the respective indicator, the smallest bubble represents the most significant negative impact

The Integrated Health Push combines the positive intervention into a comprehensive scenario that improves infant mortality by nearly 13% and decreases childhood malnutrition by nearly 19% compared to the Current Path. The negative/stalled health outcome interventions have the opposite effect; the Health Backslide scenario increases infant mortality by 7%, and increases the share of children who are malnourished by 9% over the Current Path.

Figure 5.t: Impact of health interventions on selected health indicators in 2030



Source: IFs v 7.27

While the effects of the positive health interventions significantly improve major health indicators in Ethiopia, they still fall far short of the stated health goals in the GTP II. Even with ambitious increases in water and sanitation access and large reductions in childhood communicable disease death rates, the Integrated Health Push comes nowhere near the 2021 GTP II targets. Life expectancy falls more than four years short, infant mortality is still nearly 14 deaths per 1,000 live births short, and access to improved sanitation is 41 percentage points less that the GTP target. Childhood malnutrition comes the closest to the GTP target, but is still nearly six percentage points less than the 2021 GTP target.

Figure 5.u: Table comparing GTP II health targets, the Current Path forecast, and the Integrated Health Push scenario, 2021

	GTP Target	Current Path	Integrated Health Push
Life Expectancy	69	66.2	66.8
Infant Mortality (per 1,000)	20	40.7	35.7
Childhood Malnutrition (% of children)	13	20.6	18.7
Stunting Rate (% of population)	26	35	35
Access to Improved Sanitation Facilities (% of population)	82	32.8	39.2

Source: IFs v 7.27, GTP II

It is very important for authorities to set both ambitious and realistic targets. It is fairly clear from the results of the health scenarios that the GTP II's health targets are unrealistic. While Ethiopia has been able to improve health outcomes rapidly in the past, it will become increasingly difficult to maintain that rate of improvement. As Ethiopia continues to develop and grow, improvements in key drivers of disease will face pressure as the extension of health infrastructure and services will become increasingly more difficult and expensive. This is especially applicable considering the inevitable rise of NCDs as the predominant source of death in Ethiopia.

CHAPTER 6: EDUCATION

6.1 Introduction

One of the development objectives (DO 3) of USAID's current Country Development Cooperation Strategy (2011-2016) is to improve learning outcomes.[156] The CDCS links education to a broad array of other development outcomes including quality of the civil service and the entrepreneurial capacity of the labor market. It recognizes education as inherently desirable and cites literature confirming "a causal relationship between education attainment and increased economic growth."[157]

Enhancing education can render broad social and economic benefits. Improved education outcomes leads to improved productivity, increases wages, and powers economic development by improving human capital.[158] Economic downturns are less likely to occur in countries with high levels of secondary and tertiary education.[159] In the case of middle-income countries, individuals who complete primary and secondary education are more likely to find formal employment and less likely to commit crimes or place strain on public healthcare systems.[160] Improving education can also improve health outcomes, lowering infant mortality and fertility rates.[161]

Ethiopia has made significant improvements across the education sector since the early 1990s, but along its Current Path, total educational attainment (for the population aged 15 and older) is still nearly 20% lower than in the rest of low-income Africa. Primary enrolment rates have improved markedly, with net primary enrollment climbing from near 40% in 2000 to 85% by 2014.[162] Secondary school enrolment and completion, however, has not seen the same rate of progress. In 2000, close to 12% of age appropriate children were enrolled in secondary education, by 2014 that number had grown to approximately 15%. In other words, over the past 15 years, primary enrolment has increased by more than 110% while secondary enrolment has only increased by around 25%. Thus, primary survival (defined here as the percentage of children that enroll in primary school that reach the final year of primary school) remains a significant challenge in Ethiopia.

While government expenditure on education has climbed from 2.3% of GDP in the early 1990s to nearly 4.5% in 2016, the education system faces persistent challenges with respect to access, quality, and equity. Male students consistently outperform their female counterparts in terms of education opportunity and performance.

Ethiopia's education sector challenges represent a major drag on economic and human development. As Ethiopia's demographic dividend grows (see Chapter 3), it will become increasingly important to

[156] USAID/Ethiopia, Country Development Cooperation Strategy 2011 – 2016 (extended to 6/2017). Accelerating the Transformation toward Prosperity. https://www.usaid.gov/sites/default/files/documents/1860/Ethiopia_CDCS_June_2017.pdf
[157] K Hull, Understanding the Relationship between Economic Growth, Employment and Poverty Reduction Promoting pro-poor growth, OECD, 2009, www.oecd.org/dac/povertyreduction/43280288.pdf
[158] GS Becker, Investment in Human Capital: A Theoretical Analysis, 1962, www-vip.sonoma.edu/users/c/cuellar/econ421/humancapital.pdf
[159] B Eichengreen, P Donghyun, and S Kwanho, Global Slowdowns Redux: New Evidence on the Middle Income Trap (NBER Working Paper Series No. 18673). Cambridge, Mass.: National Bureau of Economic Research, 2013, www.nber.org/papers/w18673.pdf
[160] Ibid. 3.
[161] B Weldearegawi et al, Infant mortality and causes of infant deaths in rural Ethiopia: a population-based cohort of 3684 births. BMC Public Health, 15, 2015. https://doi.org/10.1186/s12889-015-2090-x
Pradhan, E. Link between Education and Fertility in Low and Middle Income Countries, 2016, Retrieved from http://www.un.org/en/development/desa/population/events/pdf/expert/25/2016-EGM_Elina%20Pradhan.pdf
[162] Data from IFs, Historical data from UNESCO Institute for Statistics, 2015.

have a well-educated workforce to take advantage of that dividend and propel economic growth. Education investments are long-term and can take decades to pay off in terms of economic growth; therefore, it is imperative Ethiopia begin considering those investments now.
This chapter is structured as follows:

- National education attainment
- Moving through Ethiopia's education system
- Gender parity
- Education quality
- Key takeaways
- Education Interventions

6.2 National education attainment

Average national level of education attainment is a measure of the stock of education access in a country. As of 2016, IFs estimates the average years of education for adults (aged 15+) in Ethiopia to be 3.8 years, 4.4 years for males and 3.2 years for females. This is lower than the average educational attainment for low-income African countries, which stood at around 4.5 years in 2016. Furthermore, when compared with a subset of neighboring countries, Ethiopia's educational attainment lags far behind. Tanzania, for instance, averaged 6.5 years of education in 2016, which is nearly double Ethiopia's level. By 2040, average years of education (aged 15+) in Ethiopia are forecast to reach 5.1 years, or roughly the level of low-income African countries in 2025 and well below the low-income African countries average of 6.1years in 2040.

Figure 6.a: Average years of education (Population 15+), Ethiopia with Regional Peers, 2014-2030

	Ethiopia	Kenya	Rwanda	Tanzania	Uganda	Low-income Africa
2016	3.8	7.0	4.5	6.5	6.3	4.5
2030	4.4	7.5	5.6	7.2	6.5	5.5
2040	5.1	7.9	6.5	7.6	7	6.1

Source: IFs 7.27, historical data from UNESCO Institute for Statistics.

Currently, an estimated 11 million males and 17 million females (aged 15+) have no formal education or incomplete primary education (approximately 46.6% of the population aged 15+). Even by 2030, there could be as many as 12 million males and 21 million females (aged 15+) who have not completed formal primary education (38% of the population aged 15+).

6.3 Moving through Ethiopia's education system

Growing the stock of education in a country requires interventions to both expand access and encourage students to stay in school and progress through the education system. In IFs, the education system is modeled as a "pipeline," where students flow sequentially through each level of education, from primary to tertiary. This "flow" allows us to analyze and identify potential bottlenecks within the system that constrain education progression and attainment.

Box 6.3a: IFs education sub-module

IFs has a well-developed education sub-module which forecasts levels of enrollment for primary, secondary (upper and lower), and tertiary education. The education module is closely connected to the demographics module such that the rates of entrance, enrollment and graduation, forecast by the education module, can be multiplied with the number of children in the relevant age group to obtain the headcounts of students. Student counts are multiplied with per-student costs — driven mostly by level of national income — to obtain total educational spending. This allows us to forecast intake rates, enrollment levels, and graduation rates for primary, secondary and tertiary education by age and sex.

The number of entrants at the primary level is calculated from an entrance rate, changing with income level of families, applied to the total number of children of that age. A certain portion of primary level students "survive" to the final year of school, a portion of those students graduate, and a portion of those students "transition" to lower secondary school. Year-to-year progression within primary school also accounts for both dropouts and repeaters.

Educational attainment is simply the number of years a student remains in school. The IFs model also calculates average years of education for different aggregations of adult population.

The analysis in this report suggests there are two significant bottlenecks constraining Ethiopia's education system currently: 1) primary survival, and 2) transition from lower secondary education to upper secondary. Spurred by the MDG targets, the GoE has overseen an expansion in primary enrolment from 40% in 2000 to an estimated 85% in 2016. IFs forecasts primary enrolment will continue to increase and will reach nearly 93% by 2030. Despite these improvements in enrolment, in 2016 only 43% of students who entered primary school were expected to survive to the final year, which is approximately 20 percentage points lower than the average of Africa's low-income countries and ranks 184th out of 186 countries globally (in IFs).

Box 6.3b: Net versus gross enrollment

Net enrollment rate is the number of students who enroll in a level of education at the appropriate entry age (usually six for primary school) divided by all children at that age (both in and out of school). Gross enrollment is the total number of students (whether of the appropriate entry age or not) who have enrolled, expressed as a portion of the age-appropriate population – and can therefore be greater than 100%.

Since nearly half of the individuals who enroll in primary school never make it to the last grade, the flow of students through the system is significantly constrained. Lower secondary enrolment rates are necessarily constrained by low primary survival rates, as those who do not survive to the last grade of primary cannot complete primary education and cannot progress further through the pipeline. IFs forecasts primary survival and lower secondary enrolment to increase significantly over the time horizon, but with such a significant lag, more rapid improvements in primary survival could have a significant impact on education outcomes for the current generation.

Figure 6.b: Education flow rates, Ethiopia and low-income Africa, 2016 and 2030

	Primary Enrollment	Primary Survival	Lower Secondary Enrollment	Lower Secondary Survival	Upper Secondary Enrollment	Upper Secondary Survival
2016	**2016**	**2016**	**2016**	**2016**	**2016**	**2016**
Ethiopia - Male	107.4	41.7	44.8	57.8	14.5	95.2
Ethiopia - Female	98.5	44.2	43	56.4	12.7	95.3
Ethiopia - Total	103	42.9	43.9	57.3	13.6	95.2
Low-income Africa - Male	106.2	63.8	50.4	68.5	27.2	76.7
Low-income Africa - Female	101.4	63.7	41.5	67.8	18.9	74.9
Low-Income Africa - Total	103.8	63.8	46	68.2	23.1	76
2030	**2030**	**2030**	**2030**	**2030**	**2030**	**2030**
Ethiopia - Male	110.6	72.3	73.7	65.5	30.1	96.6
Ethiopia - Female	101.3	75.4	67.8	65.1	25.5	97.6
Ethiopia - Total	106	73.7	70.8	65.3	27.9	97
Low-income Africa - Male	102.9	76.2	59.6	71.7	35.9	78.8
Low-income Africa - Female	103.1	79	55.7	71.5	28.7	77.2
Low-income Africa - Total	103	77.5	57.7	71.6	32.4	78.1

Source: IFs 7.27, historical data from UNESCO Institute for Statistics. Colors indicate difference from world averages (green represents above average performance, red-orange indicates below average performance).

Low primary survival rates are a function of a complex range of factors. One reason is high repetition and dropout rates, which point to inefficiencies across the school system. According to a 2014 MDG report from the UN, the repetition rate in Ethiopia (grades 1-8) in the 2009/10 school year was 4.9% and had risen to 8.4% in 2014.[163] Between 2004 and 2013, primary education dropout rates averaged 14% and peaked at 18.6% in 2009. Based on 2013 data, the dropout rate for students after grade 1 may be as high as 25% in Ethiopia.[164] High repetition and dropout rates constrain completion of primary school.[165] Ethiopia's completion rates in 2005 for the first cycle (grades 1-5) were 57% and for the second cycle of primary (grades 6-8), completion was closer to 34%. By 2014, completion rates for the first cycle had risen to 70%, but were still only around 53% for the second cycle.[166]

In addition to internal inefficiencies, primary education survival and completion is also constrained by systemic factors that include: significant distances between homes and schools, limited transportation infrastructure, inability of families to afford school fees and material costs, a demand for labor among Ethiopia's largely subsistence agriculture population and low levels of parental education.[167]

[163] National Planning Commission and the United Nations in Ethiopia, Millennium Development Goals Report 2014 Ethiopia, 2015, Available from: http://www.undp.org/content/dam/ethiopia/docs/EthiopiaMDG%202014%20Final%20final.pdf
[164] Ethiopia: Education for All 2015 National Review. Paper prepared for the World Education Forum, Incheon, South Korea. (19-22 May 2015). Available from: http://unesdoc.unesco.org/images/0023/002317/231724e.pdf
[165] L Cameron, Primary Completion Rates. Technical Paper WP-09-01, Education Policy and Data Center, Washington, DC (FHI 360), 11, 2005.
[166] National Planning Commission and the United Nations in Ethiopia, Millennium Development Goals Report 2014 Ethiopia, 2015, 32, Available from: http://www.undp.org/content/dam/ethiopia/docs/EthiopiaMDG%202014%20Final%20final.pdf
[167] UNICEF, Chapter 6: Education, Investing in boys and girls in Ethiopia: Past, Present, and Future. 2012, 58, https://www.unicef.org/ethiopia/resources_14526.html

The second notable education bottleneck occurs between lower secondary and upper secondary school. Ethiopia's gross enrollment in lower secondary education in 2016 was close to 44%, comparable to an average of 46% across low-income Africa. Of those enrolled, however, approximately 57% survive to the last grade, which is almost 11 percentage points lower than the average (68%) among Africa's low-income countries. Of those that complete lower secondary school, only an estimated 24% of students in Ethiopia made the transition to upper secondary school in 2016, compared with an average of 50% in other low-income African countries. This means that close to three quarters of the student population that completes lower-secondary education does not see the inside of an upper-secondary classroom. Gross enrollment in upper secondary school was only 14% in 2016, nine percentage points lower than the low-income African average of 23%.

Enrolment in lower and upper secondary school is very much linked to poverty and lack of economic opportunity: many families are unable/unwilling to send their children to secondary school. The GoE has identified a number of specific issues that constrain children's ability to pursue secondary education, including a lack of transportation, limited supply of secondary schools relative to the number of students, lack of qualified teachers, the need to work and earn money, and early marriage pressures for females.[168]

Another factor that may be affecting Ethiopia's secondary school bottleneck is the expansion of Technical Vocation and Training (TVET). TVET is institutionally separate and forms a parallel education option which students can enter following national examinations administered during Grade 10. If students pass the national examination in Grade 10, they can continue to preparatory school (grades 11 and 12). If they fail; they are expected to join TVET or enter the labor force. According to the Ministry of Education, approximately 30% of students who reach Grade 10 will continue to higher education.[169] Low upper-secondary enrollment rates are partially tied to high enrollment in and the opportunities offered through TVET outside the formal education system.

The purpose of TVET is to provide participants with trade-based skills.[170] The GoE has identified a large workforce skill gap as a significant drag on economic productivity and believes providing technical training can help reduce the gap.[171] Enrollment in Ethiopia's TVET program has expanded rapidly. Between 2004 and 2009, the annual increase in enrolment in TVET institutions was around 30%. In 2009, there were around 458 TVET institutions in Ethiopia with over 300,000 students enrolled.[172] Students that do not qualify for government-run TVET institutions can go to private TVET institutions that provide training to between 30% and 50% of Ethiopia's TVET graduates. TVET institutions are designed to address demand for skilled labor, improve wages, and help employ youth populations; however, available evidence on the effectiveness of these programs in improving wages or employment is mixed.[173]

[168] Federal Ministry of Education, Education Sector Development Plan V, 2012, 4.
[169] P Krishnan and I Shaorshadze, Technical and Vocational Education and Training in Ethiopia, International Growth Centre, Working Paper. Available from: https://www.theigc.org/wp-content/uploads/2014/09/Krishnan-Shaorshadze-2013-Working-Paper.pdf
[170] Ibid. 11.
[171] Ibid. 5.
[172] Ibid. 13.
[173] G Bechterman, K Olivas, and Dar A, Impacts of Active Labor Market Programs: New evidence from evaluations with particular attention to developing and transition countries, Social Protection Discussion Paper 0402, 2004.

6.4 Gender parity in education

The GoE has made female education a priority, forming an important component of the Ethiopian Government's Education Sector Development Plan, now in its sixth iteration.[174] Accordingly, Ethiopia has made progress improving female education. Between 1990 and 2012, gender parity in primary enrolment increased from 0.65 to 0.98. Between 2000 and 2011 gender parity in secondary education enrollment increased from 0.67 to 0.87. At the same time, policies were implemented across the nation to make schools more conducive to female study, including: construction of separate female bathroom facilities, hiring and assigning female teachers and school counselors to female classrooms, and establishing specific counseling and guidance services to female students.[175]

Despite this progress, gender equality issues remain an obstacle to improving girls' education in Ethiopia. Ethiopia is home to a high incidence of female genital mutilation (FGM), which, when coupled with a lack of separate sanitation facilities, often forces females to leave school. According to a UNICEF (2016) report, between 2004 and 2015, 75% of females aged 15-49 in Ethiopia underwent some kind of FGM.[176]

Gender based violence (GBV) is also pervasive across Ethiopian society. A report issued by the GoE in 2013 estimated that as much as 60% of Ethiopian women experienced GBV in their lifetime.[177] In addition, the country suffers from other serious constraints on gender equality including, but not limited to, unwanted pregnancy and/or childbirth, marriage at a young age, sexual harassment from peers and sometimes teachers, and limited access to appropriate sanitation facilities. These multifaceted social issues and pressures often combine to keep women out of school and treated unequally in society.

At the root of many of these problems is poverty. Extreme poverty restricts the ability of families to afford school fees, purchase supplies, or guarantee that their child can attend school when their help is needed at home to generate income and take care of household tasks. [178] Women tend to be disproportionately responsible for household chores and caregiving, which restricts the time they can commit to staying in school.[179]

These cultural, social, and economic pressures have combined to give Ethiopia among the lowest gender parity ratios in education in the world. Along the Current Path, equal access to education will remain a challenge for Ethiopia across the forecast horizon. In 2016, Ethiopian females (aged 15+) obtained an average of 0.74 years of education for every one year of education males received. This is significantly lower than in regional counterparts Rwanda, Tanzania and Uganda and places Ethiopia 169th out of the 186 countries in 2016. This means the country has some of the highest levels of gender inequality in education in the world. These trends hold for the population aged 25+, where gender parity is 0.71, placing Ethiopia 177th out of 186 countries in 2016.

[174]RD Joshi and A Vespoor, Secondary Education in Ethiopia, World Bank, Washington D.C., 2013.
[175] Ibid. 29.
[176] UNICEF, Female Genital Mutilation/Cutting: A Global Concern, 2016.
[177] Ministry of Women, Children & Youth Affairs. Assessment of Conditions of Violence against Women in Ethiopia. The Government of Ethiopia, 2013, 5.
[178] Extreme poverty has been defined by the United Nations in 1995 as 'a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information.' Considered by the World Bank as a condition for any person living on or earning less than US$1.90 a day.
[179]H Beyene, National Assessment: Ethiopia Gender Equality and the Knowledge Society, Women in Global Society and Technology, 2015.

Figure 6.c: Gender parity (average years of Education 15+), Ethiopia and regional peers, 2016, 2021, 2030

	2016	2021	2030	% Change 2016 to 2030
Ethiopia	0.7	0.8	0.8	2.7
Kenya	0.9	0.9	0.9	4.6
Rwanda	1	1	1	0
Tanzania	0.9	0.9	1	7.7
Uganda	0.9	0.9	0.9	2.3

Source: IFs Version 7.27, historical data from Barro and Lee, 2010.

IFs forecasts only marginal improvements in average educational attainment for females relative to males on the Current Path. By 2030, females are forecasted to only have an estimated 0.76 years of education for every full year of education for males.

6.5 Education quality

A successful education system requires the capacity, infrastructure, and resources to move students through the system and improve educational attainment across the population. In tandem with attainment, education quality becomes important to ensure that students are graduating with the appropriate skills and background to obtain productive employment. Available evidence suggests that education quality has not kept pace with expansion in access and enrollment that has taken place in Ethiopia.[180]

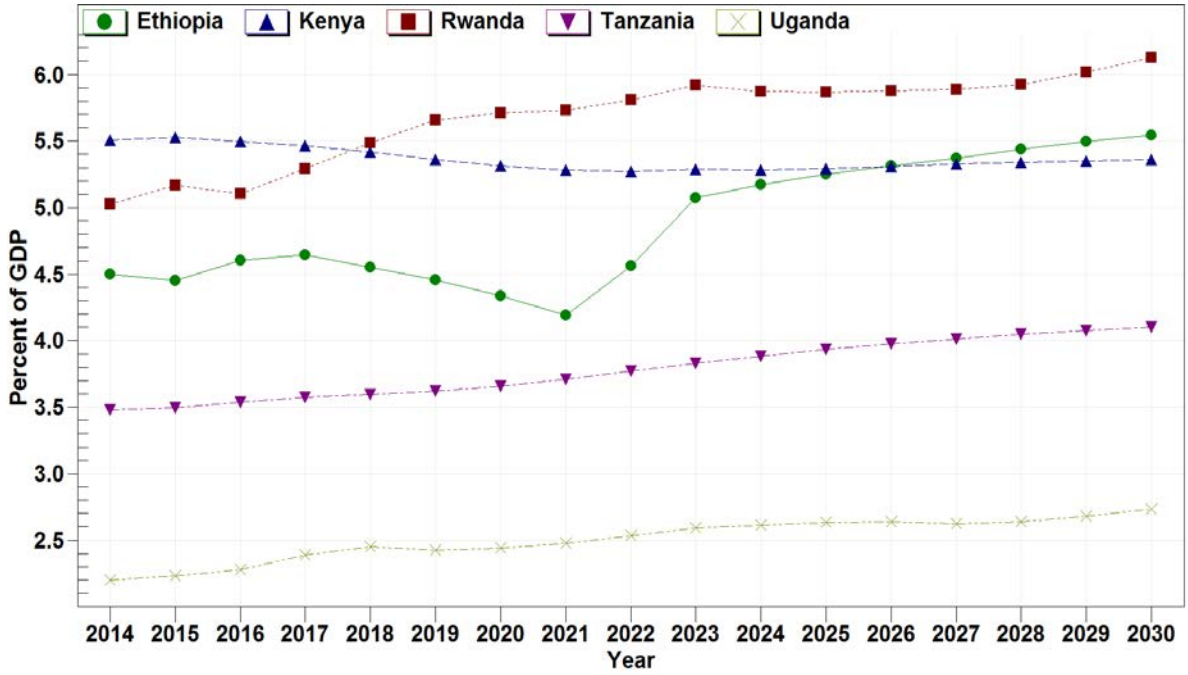
Ethiopia's Prime Minister recently described the country's university graduates as "half-cooked," promising a government review of education policy and standards.[181] Education quality issues are not limited to the tertiary level however. As discussed earlier, Ethiopia suffers from high dropout and repetition rates at the primary school level, an indication of a lack of quality education environments and inadequate materials.[182]

[180] Federal Ministry of Education, Education Development Plan V, 2015, 24.
[181] S. Getachew, Ethiopian 'half-cooked' Graduates, AllAfrica, December 20, 2016.
[182] National Planning Commission and the United Nations, MDG Report 2014, 2015.

Box 6.5: Education spending/finance:

The GoE spent the equivalent of about 4.5% of GDP on education, or about US$2.2 billion in 2016. Figure 6.d illustrates that Ethiopia's spending on education (as a percent of GDP) is in line with the region (just below Rwanda). IFs forecasts education spending (in absolute terms and as a percent of GDP) to increase over the next 14 years, reaching 5.5% of GDP (US$7.1 billion) by 2030.

Figure 6.d: Government spending on education, Ethiopia and regional peers, 2014-2030[183]



Source: IFs v. 7.27, historical data from WHO

A shortage of qualified teachers, particularly in rural areas, is also a concern. Between 2010 and 2015, primary school pupil-to-teacher ratios in Ethiopia fell from 51:1 to 47:1, compared with an average ratio of 42:1 across sub-Saharan Africa and 26:1 globally.[184] Despite the large classroom sizes, improvements in teacher training and qualification have been made. Under the Education Sector Development Plan IV (2010-2015), the number of primary school teachers holding appropriate qualifications (teaching diplomas) increased from 38% to 71%.[185] An estimated 93% of secondary teachers are appropriately qualified.[186]

Analysis of the quality of education in Ethiopia can also be gleaned from its National Learning Assessment and national examination results. The National Learning Assessment, first delivered at the close of the 2009/2010 school year, found that close to 82% of students in Grade 10 scored below 50% - the minimum proficiency benchmark established by the GoE. Close to 60% of students in Grade 12 scored below 50%.[187]

[183] The shift in 2021 is due to the Current Path adjustment that accounts for increased spending on electricity generation via the GERD and various dam projects.
[184] Taken from IFs v. 7.27. Original data from UNESCO Institute for Statistics.
[185] Federal Ministry of Education, Education Development Plan V, 2015 available: http://www.unesco.org/education/edurights/media/docs/574e244af3e39b830d278a2c367304af5b603109.pdf
[186] Federal Ministry of Education, Education Development Plan V, 2015, 19. and IFs v,7.27
[187] RD Joshi and A Vespoor, Secondary Education in Ethiopia, World Bank, Washington D.C., 2013.

Moreover, the National Examination results from 2009/2010 (the most recent comprehensive set of results available) found that close to one-third of all students failed the exam, and almost half of all females failed.[188] The results of the national entrance examination have also suggested a distinct bias toward males. Approximately 70% of students in Grades 11 and 12 are male.[189]

6.6 Key takeaways

- Access to education is heavily skewed towards males; female enrollment and completion is lagging at every level.
- Enrollment rates have improved significantly over the past decade, bringing Ethiopia in line with low-income Africa. But, primary survival rates have remained stubbornly low; Ethiopia ranks 2nd to last in the world in primary survival, and is nearly 20 percentage points behind the average for other low-income African countries.
- While tertiary and secondary education outcomes also lag behind peers, Ethiopia should prioritize moving students through the education pipeline. This means the most significant interventions will be to improve primary education survival and upper lower to upper secondary transition. These interventions should have positive impacts on gender parity.

6.7 Education interventions

The analysis thus far has identified three significant challenges within the education system: low primary survival rates, stalled transition from lower secondary to upper secondary school, and low female education attainment. This section explores a number of scenarios aimed at improving education outcomes in Ethiopia. Drawing from the discussion above, the interventions below have been designed to simulate a future in which Ethiopia successfully transitions students through the education system. These interventions include: (1) increasing primary survival rates, (2) improving enrollment in lower secondary education, (3) increasing lower secondary education survival rates, (4) improving enrollment in upper secondary education, (5) increasing upper secondary education survival rates, and (6) improving enrollment in tertiary education. These interventions are designed to address the flow of students through the education pipeline at different levels. The table in Figure 6.e shows the number of people (millions) who will have completed secondary education in Ethiopia in the Current Path and scenarios in 2021, 2030, and 2040. Advancing Education, a scenario simulating an integrated push to improve education at each level (described below) could result in 1.6 million more people completing secondary education by 2030 relative to the Current Path. By 2040, there may be as many as 4.7 million more individuals who have completed secondary education in Ethiopia than expected on the Current Path.

[188] Ibid.
[189] Ibid.

Figure 6.e: Completed secondary education (millions of people), Current Path and scenarios, 2016, 2021, 2030 and 2040

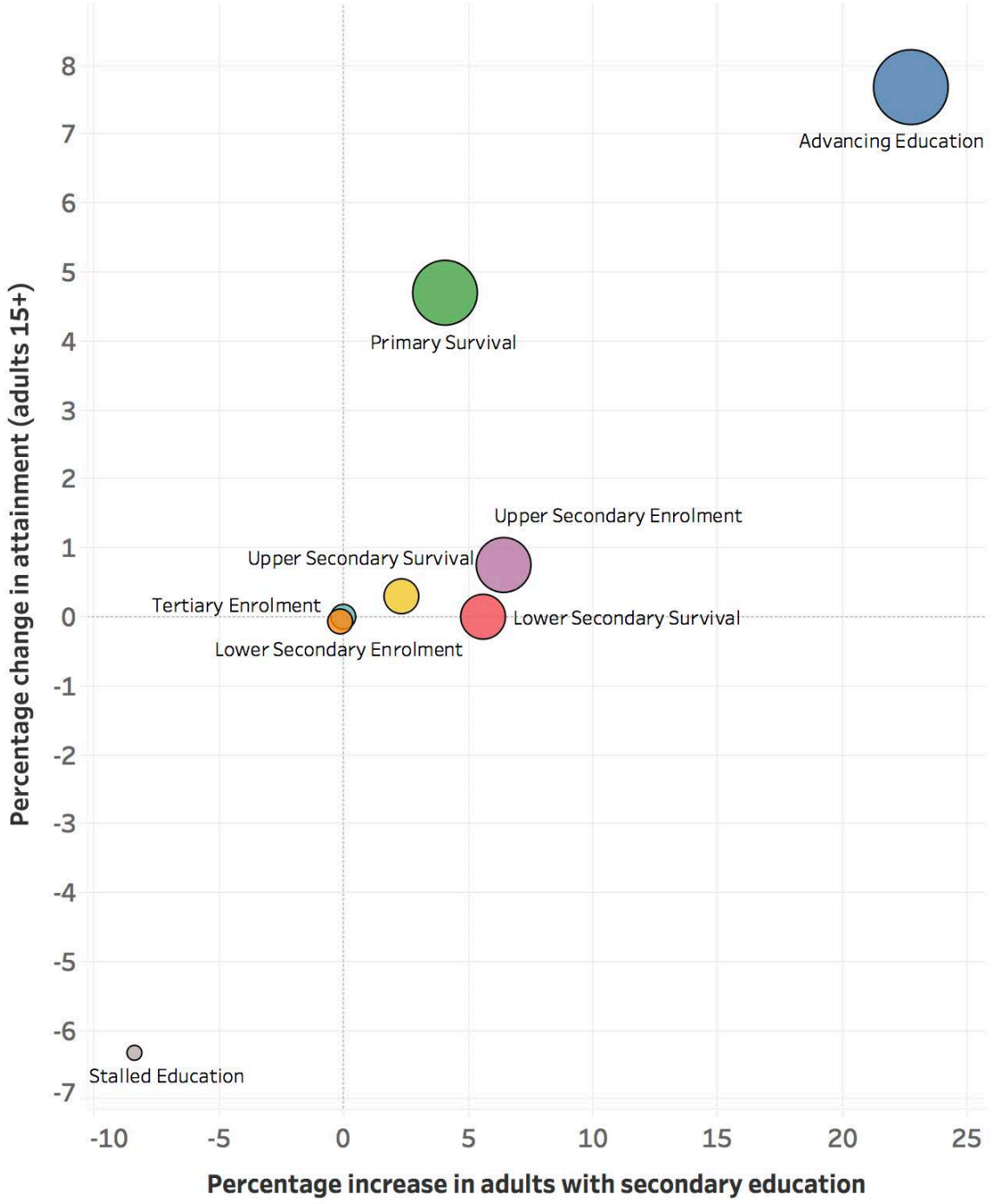
	2016	2021	2030	2040
Current Path	5	6.2	10.3	19.1
Advancing Education	5	6.4	11.9	23.8
Primary Survival	5	6.2	10.5	20
Lower Secondary Enrolment	5	6.2	10.3	19.1
Lower Secondary Survival	5	6.2	10.7	20.3
Upper Secondary Enrolment	5	6.3	10.8	20.5
Upper Secondary Survival	5	6.2	10.5	19.6
Tertiary Enrolment	5	6.2	10.3	19.1
Stalled Education	5	6.1	9.7	17.4

Source: IFs 7.27, color indicates the most (green) and least (red) effective scenarios for increasing the number of people who have completed secondary education.

Figure 6.f below compares the impact of each intervention in 2040.[190] The y-axis shows the percentage increase in average years of education across the adult (aged 15+) population, the x-axis shows the percentage increase in population completing secondary education. The size of the bubbles represents the absolute difference in years of education across the population (aged 15+). All bubbles represent the change from where Ethiopia is expected to be in 2040 in the Current Path forecast.

[190] Because investing in education take such a long time to materialize, the interventions in the education chapter are extended to 2040, in order to demonstrate their impact more realistically.

Figure 6.f: Impact of education interventions on selected education indicators in 2030



Source: IFs v 7.27

The improvements modeled in the Primary Survival intervention could increase average years of education in Ethiopia by more than four percent by 2040, while expanding the total years of education across the population by close to 28 million. Improving transition and enrolment in upper secondary school understandably has the largest impact on the percent of the population that has completed secondary education, and yet, these impacts are modest because they are constrained by existing low primary survival and completion. Tertiary Enrollment interventions have a negligible impact along either metric, because such a small percentage of the population is reaching and/or enrolling in tertiary education, both now, and in the forecast.

The Advancing Education scenario represents an integrated push to improve education at multiple levels throughout the system. An integrated education push could increase education attainment across the population by more than seven percent relative to the Current Path in 2040 and increase the total number of years of education across the population by close to 46 million in 2040.

6.7.1 Primary Education Survival

This intervention increases Ethiopia's primary survival rates from around 43% in 2016 to almost 61% in 2021. These improvements are in line with similar increases seen in Eritrea between 2000 and 2005 and Kenya between 2003 and 2007. By 2040, primary survival rates in Ethiopia are forecast to be about 98% in this scenario, compared with 86% along the Current Path.

6.7.2 Primary to Lower Secondary Education Transition

In this scenario, we simulate a 10% increase in the lower secondary transition rate (representing improvements to secondary enrolment) by 2021 relative to the Current Path. This is similar to improvements made by Tanzania between 2000 and 2004. However, due to high primary to lower secondary school transition rates of around 98% in 2017, lower secondary enrollment rates are around 77% in both the Current Path and the scenario by 2040.

6.7.3 Lower Secondary Education Survival

The lower secondary survival intervention increases secondary survival rates from around 57% in 2016 to 66.5% in 2021. These improvements are roughly in line with improvements that Eritrea made in lower secondary survival from 2010 to 2014. By 2040, lower secondary survival rates are forecast to be 79% compared with 70% in the Current Path. Even under the scenario, by 2040 approximately 21% of all students who enter secondary school still drop out before entering the last grade.

6.7.4 Lower to Upper Secondary Education Transition

We created a scenario that increased lower to upper secondary transition (simulating improvements in upper secondary enrolment) from 13.6% in 2016 to 18.2% in 2021. This intervention is similar to improvements made by Kenya between 2000 and 2004, when they improved upper secondary enrollment from around 24% to 28%. In this scenario, by 2040 upper secondary enrollment is close to 44%, or nearly four percentage points higher than the Current Path. Even under this scenario, close to 55% of students who graduate from lower secondary school fail to progress to upper secondary.

6.7.5 Upper Secondary Education Survival

Since the upper secondary survival rate is already high in Ethiopia (around 95%), the upper secondary survival scenario simulates a modest five percent increase over the Current Path between 2016 and 2021. In this scenario, Ethiopia sees a four percentage point increase in upper secondary transition from 2016 to 2021, and achieves a survival rate near 100% in the mid-2020s. Along the Current Path, upper-secondary survival rates are only forecast to be 98% by 2040. Because survival measures the number of students that continue in school to the final grade (i.e. the denominator for this figure is enrolled students not total age-appropriate students), these figures present a slightly skewed picture of education in Ethiopia.

6.7.6 Tertiary Enrollment

This tertiary enrolment scenario simulates a 20% increase in enrolment relative to the Current Path scenario. Tertiary education access across sub-Saharan Africa remains low in comparison to other

regions around the world. This intervention is ambitious, but it may also be reasonable, given Ethiopia's already low base and recent improvement along earlier stages of the education pipeline. In this scenario, Ethiopia's tertiary enrolment (gross) rate improves from about 8.3% today to nearly 16% in 2040, which is in line with improvements expected among Ethiopia's neighboring countries.

6.7.7 Advancing Education

The Advancing Education scenario simulates an integrated education push combining all the education interventions outlined above into one comprehensive push to improve education outcomes.

The Advancing Education scenario has a significant impact on education outcomes relative to each individual scenario. In this scenario, by 2040 more than 21% of the population has completed secondary education, compared with about 17% along the Current Path. Boosting upper secondary enrollment could see the percent of the population completing secondary education grow to 13.5% by 2030, and to 18.5% in 2040. Improving tertiary enrollment has little impact, due to the small percentage of the population in Ethiopia that successfully completes secondary education.

Figure 6.g compares average years of education among young people aged 15-24 along the Current Path compared with interventions from 2016 to 2040. Along the Current Path, average education attainment among this group is expected to reach six years in 2030. Under the Advancing Education scenario, education attainment reaches 6.5 years by 2030. The primary survival intervention also results in significant improvements, reaching 6.4 years of education by 2030.

Figure 6.g: Average years of education (population 15 to 24), Current Path and scenario interventions, 2016, 2021, 2030 and 2040

	2016	2021	2030	2040
Current Path	4.6	4.9	6	6.9
Advancing Education	4.6	5	6.5	7.5
Primary Survival	4.6	5	6.4	7.4
Lower Secondary Enrolment	4.6	4.9	6	6.9
Lower Secondary Survival	4.6	4. 9	6	6.9
Upper Secondary Enrolment	4.6	4.9	6	6.9
Upper Secondary Survival	4.6	4.9	6	6.9
Tertiary Enrolment	4.6	4.9	6	6.9

Source: IFs 7.27

The integrated scenario also demonstrates the broader economic effects of improving education in Ethiopia, reflected by changes in GDP, GDP per capita and the number of people living in extreme poverty. Figure 6.h below shows performance in these areas compared with the Current Path. The table underscores the long-term nature of education interventions. Significant economic benefits from investing in education do not begin to accrue until closer to 2040.

Figure 6.h: GDP at MER, GDP per capita at PPP, and population living on less than US$1.90 per day, Advancing Education and Current Path scenarios, 2016, 2021, 2030 and 2040

		2016	2021	2030	2040
GDP MER (billion US$)	**Current Path**	48	71	129	250
	Advancing Education	48	71	130	254
GDP per Capita PPP (thousand US$)	**Current Path**	1,532	1,851	2,419	3,357
	Advancing Education	1,532	1,851	2,428	3,398
Extreme poverty (million people)	**Current Path**	26	22	15	15
	Advancing Education	26	22	15	15

Source: IFs 7.27. MER refers to market exchange rates; PPP indicates purchasing power parity.

With these interventions in education, Ethiopia stands to gain an additional (cumulative) US$1.4 billion in GDP by 2030 over the Current Path and nearly US$19 billion cumulatively by 2040. Meanwhile, roughly 200,000 fewer people will be living in extreme poverty by 2030, and 380,000 fewer in 2040, relative to the Current Path.

6.7.8 Stalled Education

To explore the effects of a scenario under which current efforts to improve education are reversed, a negative scenario, Stalled Education, was created. The Stalled Education scenario represents a combined reversal of many of the gains laid out in the Advancing Education scenario. In this pessimistic scenario, a lower percentage of the adult population completes all levels of school than in both the Current Path and the Advancing Education scenario.

Overall, educational attainment remains relatively flat over time in this scenario. The average Ethiopian adult obtains an estimated 4.2 years of education by 2030 and 4.7 years by 2040 compared with Current Path values of 4.4 years and 5.1 years respectively. Only 16% of the population has completed secondary education by 2030, compared with 17.4% along the Current Path. Tertiary enrolment rates have fallen from 12.4% in 2030 in the Current Path to 11.3%. In this scenario, Ethiopia also sees a reduction of approximately US$300 million in annual GDP relative to the Current Path by 2030, and US$2 billion by 2040. Also, GDP per capita declines slightly by 2030 and ultimately by about US$30 in 2040. Finally, roughly 200,000 more people are forecasted to live in extreme poverty than in the Current Path, as shown in Figure 6.i.

Figure 6.i: GDP at MER, GDP per capita at PPP, and population living on less than US$1.90 per day, Stalled Education and Current Path scenarios, 2016, 2021, 2030 and 2040

		2016	2021	2030	2040
GDP MER (billion US$)	**Current Path**	48	71	129	250
	Stalled Education	48	71	129	248
GDP per Capita PPP (thousand US$)	**Current Path**	1,532	1,851	2,414	3,357
	Stalled Education	1,532	1,851	2,428	3,327
Extreme poverty (million people)	**Current Path**	26	22	15	15
	Stalled Education	26	22	15	16

Source: IFs 7.27, historical data from UNESCO Institute for Statistics and World Development Indicators of the World Bank

Improving education remains an essential component of sustaining inclusive and rapid economic development. Ethiopia has seen significant improvement in the state of its education system over the past 25 years, and yet many challenges remain. Education bottlenecks in primary survival and lower to upper secondary school constrain the progress of students through the education system, resulting in fewer years of education across the population than in many of its peer countries. Continuing to improve education access and attainment is essential for Ethiopia to take advantage of its favorable demographic dividend, reduce the demographic pressures of instability related to a large youth bulge, and progress toward lower-middle and eventually upper-middle-income status.

While addressing bottlenecks is fundamental, a combined push to improve education outcomes could yield significant returns. By 2030, an additional 1.6 million adults could have completed secondary education in the Advancing Education scenario. Education improvements could result in an additional US$19 billion in GDP cumulatively by 2040 and close to 400,000 fewer people living in extreme poverty by 2040. Education interventions are inherently long-term, and take time to improve economic and education outcomes. Some of the interventions in this section have been extended to 2040 to try to better capture these long-term benefits of improving education outcomes. Policymakers would be wise to begin looking at ways to improve education in the near-term, but must be aware of the long-term nature of investments in education.

CHAPTER 7: ECONOMY

7.1 Introduction

Ethiopia has sustained rapid and stable economic growth over the past decade. But, as it came from such a low base, Ethiopia is still one of the poorest countries (on a per capita basis) in the world. GDP growth averaged 10.4% between 2004 and 2015, which propelled Ethiopia from the 2nd poorest country in the world to the 11th poorest.[191] Over that time period, the size of the Ethiopian economy has nearly tripled (from US$17.2 billion to US$45.8 billion in MER).[192] GDP per capita (at PPP) doubled (from US$730 to US$1,500) and the portion of the population living under US$1.90 per day has decreased by 25%.

Ethiopia's rapid and sustained growth has been driven by agriculture and service sector growth, paired with massive public investment. A strong developmental state has utilized heterodox financing mechanisms to build economic infrastructure and promote agriculture and industry in order to increase multi factor productivity.[193] These investments fostered structural change within the Ethiopian economy, thereby shifting Ethiopia from an economy where agriculture was the main driver of value added toward an economy powered by the service sector. Meanwhile, productivity improvements in smallholder farming (over 70% of the labor force is employed in agriculture) helped reduce poverty, while exports from commercial farming helped bolster Ethiopia's trade balance.

It is unlikely that Ethiopia will be able to duplicate the type of rapid sustained growth it has seen over the past 10 years. As it moves up the income ladder, sustaining growth while transforming its economy from a low value-added, agrarian economy to a high value-added manufacturing and high end services economy will become increasingly difficult as low hanging productivity gains begin to disappear. Ethiopia will need to sustain high levels of investment - while providing increasingly expensive education and health services - in order to continue labor and capital productivity gains. Accelerating structural adjustments, increasing savings and credit for the private sector, and finding more sustainable ways to finance public infrastructure investment will be crucial for Ethiopia's future growth.

This chapter is structured as follows:

- GDP and GDP per capita
- Economic growth and growth accounting
- Sectoral breakdown of growth and output
- Trade by type and destination
- Investment and finance
- Government finance and aid
- Labor force
- Informal sector
- Key takeaways
- Informal interventions

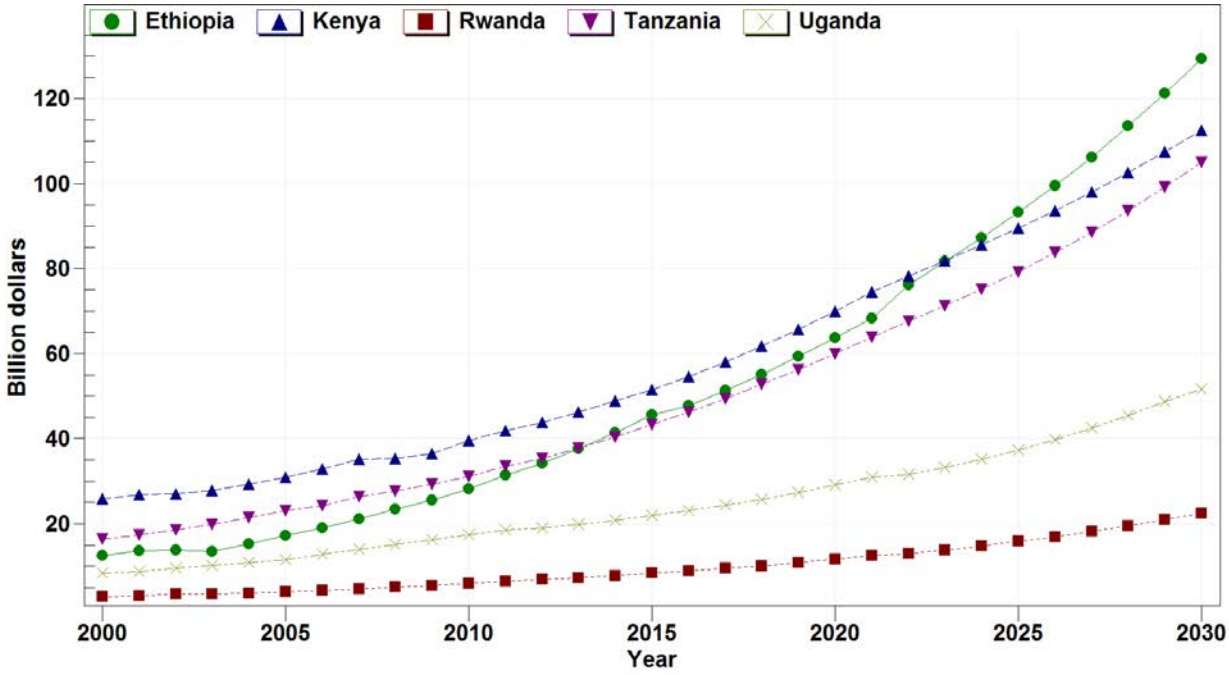
7.2 GDP and GDP per capita

The Ethiopian economy has seen significant improvements in GDP and GDP per capita over the past 10 years. GDP (MER), which measures the absolute size of an economy, has increased nearly threefold since 2005. GDP is expected to increase by 40% over the next five years and nearly double by 2030.

[191] World Bank, Ethiopia's Great Run, 2014.
[192] MER is Market Exchange Rate
[193] Ibid.

IFs forecasts that Ethiopia will have moved from the 11th largest economy in Africa (2016) to the 7th largest (2030) and will overtake Kenya as largest economy in the larger Horn region around 2025. While this absolute GDP growth is important, it is largely a function of Ethiopia's large population; in general, countries with more people are able to produce more.

Figure 7.a: GDP (MER), Ethiopia and regional peers, 2000-2030



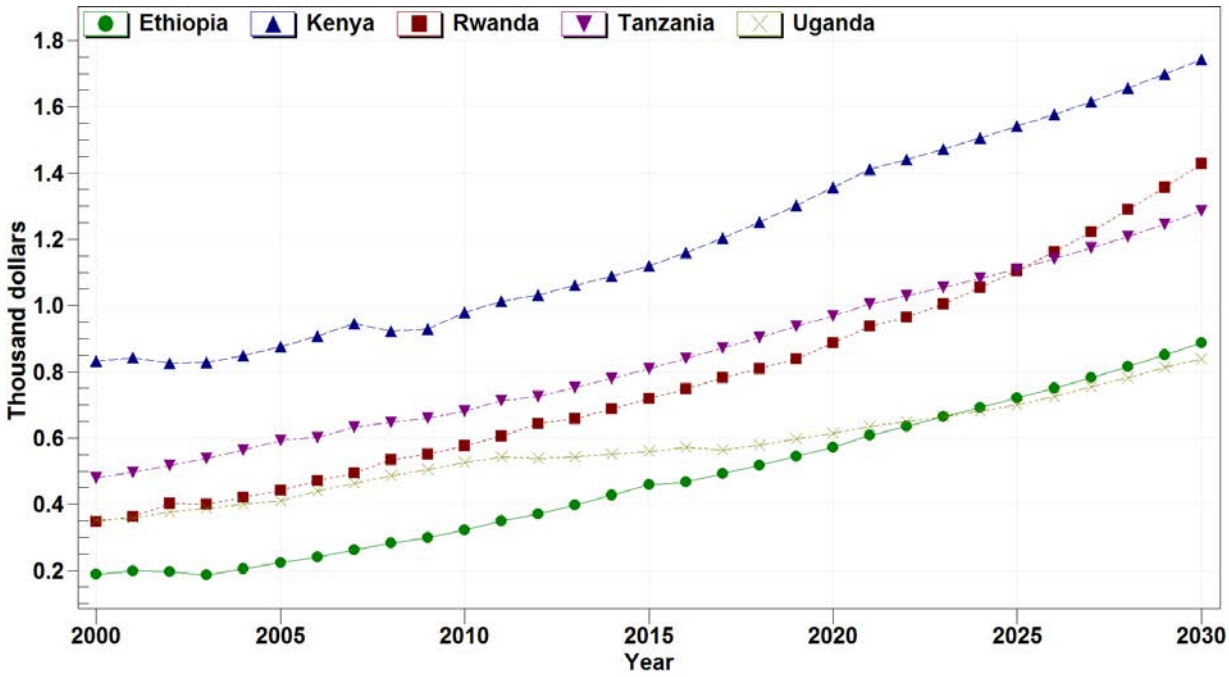
Source: IFs v. 7.27, historical data from WDI indicators

GDP per capita, a measure of economic sophistication, is a common indicator of overall development. GDP per capita is generally measured in two ways: at purchasing power parity (PPP), or at market exchange rates (MER).[194]

Ethiopia's GDP per capita (MER) stands at US$450, which ranks 177th in the world and 45th in Africa. Ethiopia has the lowest GDP per capita (MER) of its regional peers, and is forecast to barely overtake Uganda by 2030. Adjusting for domestic purchasing power, Ethiopia's GDP per capita at PPP stands at US$1,500, which places it at 40th in African and 172nd in the world.

[194] MER measures nominal GDP per capita while PPP measures GDP per capita based on the ability to purchase a core basket of goods in the domestic market. In other words, PPP adjusts for differences in exchange rates and currency values in order to better reflect purchasing power across countries.

Figure 7.b: GDP per capita (MER), Ethiopia and regional peers, 2000-2030



Source: IFs v. 7.27, historical data from WDI indicators

The GTP II targets lower-middle-income status by 2025, classified by the World Bank as GNI US$1,025 per capita in current US dollars (using the Atlas Method).[195] The differences in measurement make it difficult to translate IFs forecasts of GDP per capita (MER) into the World Bank classification method, but a rough adjustment based on forecasted GDP per capita growth rates suggests that Ethiopia will likely not reach low-middle income status before 2028 along the Current Path.[196]

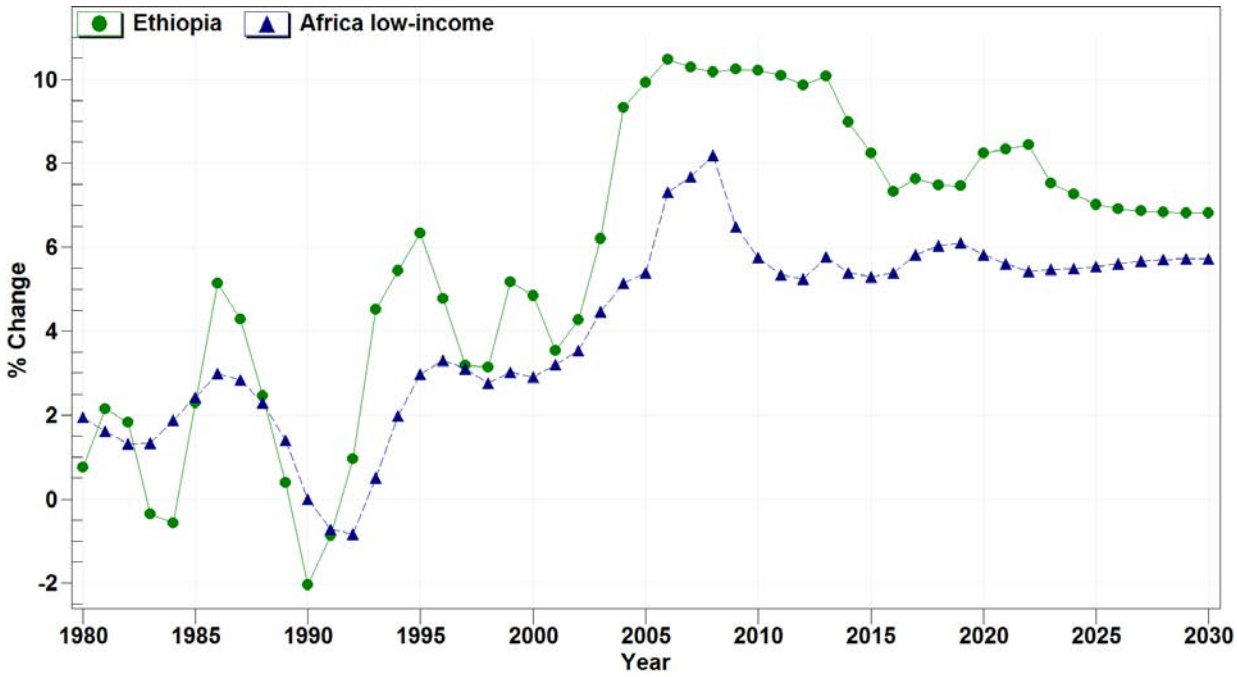
7.3 Economic growth and growth accounting

Figure 7.c below compares Ethiopia's economic growth rate since 1980 with the average growth rate of its low-income African peers. Prior to 2005, Ethiopia's average growth rate tracked fairly closely with it African peers, but was extremely prone to shocks (war, drought, famine). Since 2005, Ethiopian growth rates have stabilized and significantly outpaced its African peers. The average growth rate of low-income African countries was just over 5.7%, compared to over 10% in Ethiopia. The IFs Current Path forecast is that Ethiopia's growth will slow (to 7.4% per year) over the next 10 years, but will continue to significantly outpace low-income African countries (5% per year).

[195] The World Bank threshold uses GNI (Atlas Method) instead of GDP to classify income levels. GNI includes net receipts of income from abroad, while GDP does not; the Atlas Method of calculation adds a price conversion factor in order to control for price and exchange rates fluctuations. Furthermore, IFs uses 2011 US dollars, while the World Bank calculates GNI at current US dollars.

[196] This is calculated by using the average GDP per capita growth rate over the next fourteen years and applying a linear extrapolation to the 2016 GNI per capita figure.

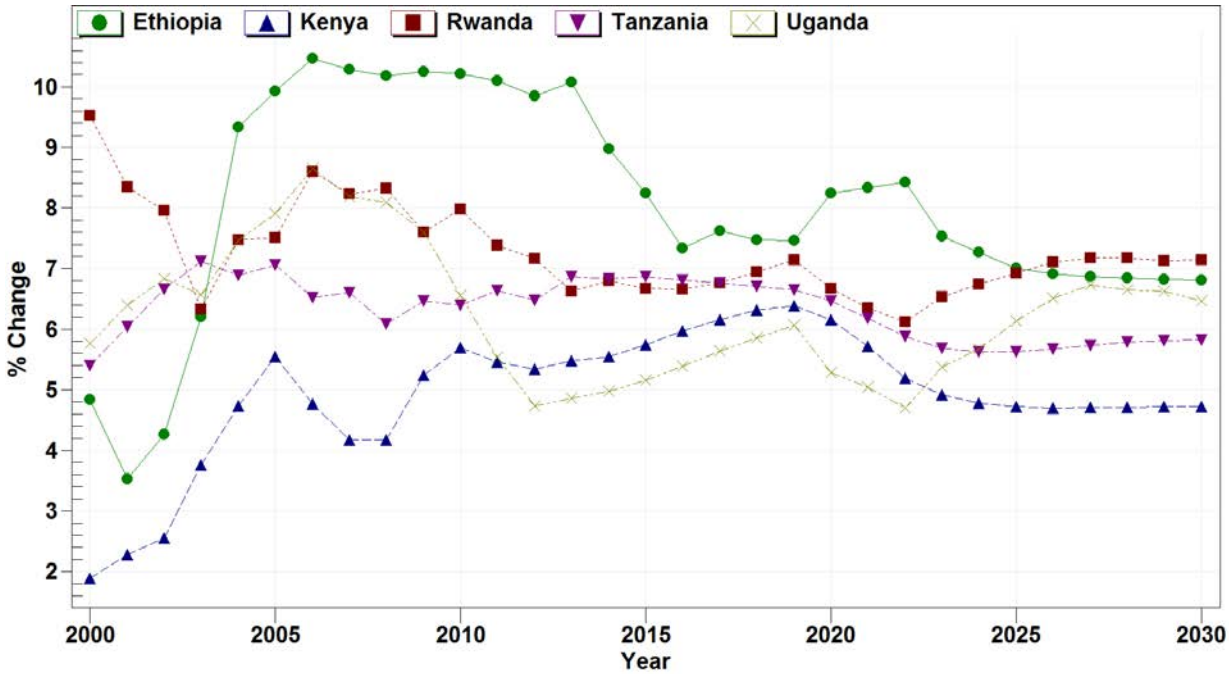
Figure 7.c: GDP growth rate (five year moving average), Ethiopia and low-income Africa, 1980-2030



Source: IFs v. 7.27, historical data from IMF

Within the region, Ethiopia has also registered the highest annual GDP growth over the past 10 years. The IFs Current Path forecasts that Ethiopia will remain the fastest growing economy (on average) in the region for the next 14 years. Although Rwanda overtakes Ethiopia near the end of the 2020s, as shown in Figure 7.d, the average for the duration of the forecast is still higher for Ethiopia than for any of the comparison countries.

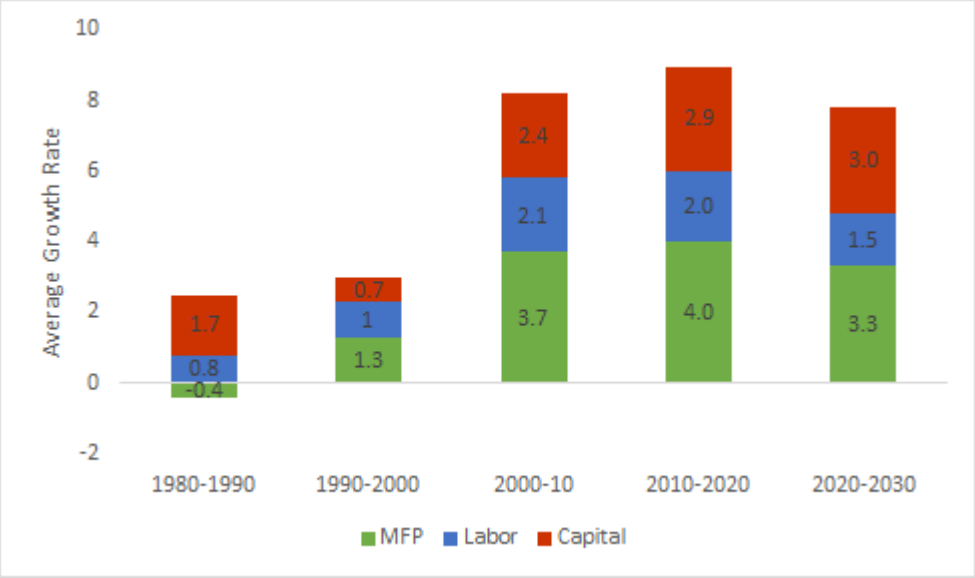
Figure 7.d: GDP growth rates (five year moving average), Ethiopia and regional peers, 2000-2030



Source: IFs v. 7.27, historical data from IMF

The graph in Figure 7.e presents the contributions of the factors of production, labor, capital, and technology (or multifactor productivity),[197] to Ethiopia's growth over the past three and a half decades and a forecast to 2030. Much of Ethiopia's recent growth can be attributed to a rapid increase in multifactor productivity (MFP), along with significant growth in capital and labor. We forecast this trend to shift as the Ethiopian economy climbs the income and productivity ladder. The contributions from MFP and labor are forecast to fall as Ethiopia's economy becomes more sophisticated and moves away from labor-intensive activities.

Figure 7.e: Solow decomposition of growth in Ethiopia, 1980-2030



Source: World Bank, Brookings, IFs version 7.27, and authors calculations

Ethiopia's rapid growth has been driven by marked increases in MFP inputs, along with more modest increases in capital and labor's share of output. While it is difficult to pinpoint exactly where the MFP gains are accruing, these trends are consistent with Ethiopia's shift away from agriculture and toward an economy dominated by services.

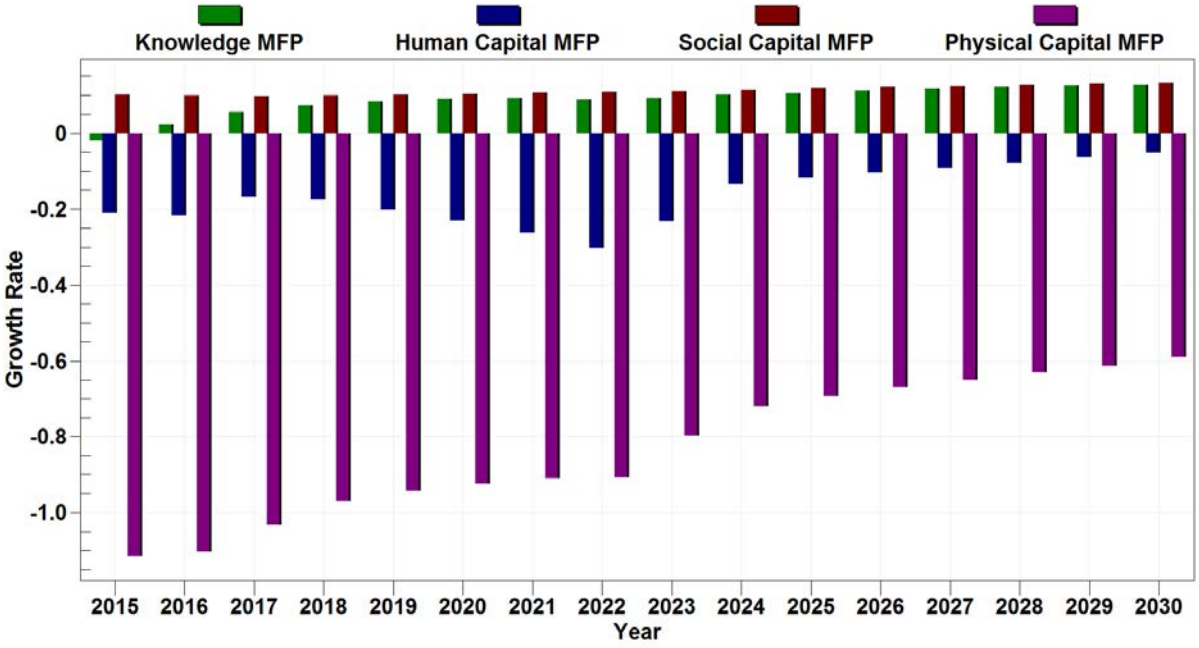
[197] Multifactor productivity is sometimes referred to as total factor productivity.

Box 7.3: Multifactor productivity in IFs:

The IFs conceptualization of growth and productivity decomposes MFP into four categories: human capital, physical capital, social capital, and knowledge capital. Human capital is based on education and health indicators (i.e. years of education, life expectancy). Contributions from physical capital depend on natural environmental systems and physical infrastructure (i.e. energy, roads). Social capital is driven by institutional and social factors (i.e. governance, economic and political freedom), and knowledge capital is driven by knowledge diffusion from technology transfers, brought on by trade, research and development.[198]

Figure 7.f shows a forecast of each of the four components contribution to MFP from 2016 to 2030. Each component is calculated based on the contribution we would expect, relative to a country's level of economic development. A zero score for each component means the contribution to MFP is where we would expect, given the country's GDP per capita. Component scores greater than zero deliver a positive boost to overall productivity (MFP), while component scores below zero act as a drag on growth. As we can see in the figure below, human capital and physical capital are forecast to reduce Ethiopia's MFP, whereas levels of social and knowledge capital are higher than we would expect based on Ethiopia's level of development and thus contribute positively to productivity.

Figure 7.f: Growth accounting forecast, contribution of the four components of MFP, 2014-2030



Source: IFs v. 7.27

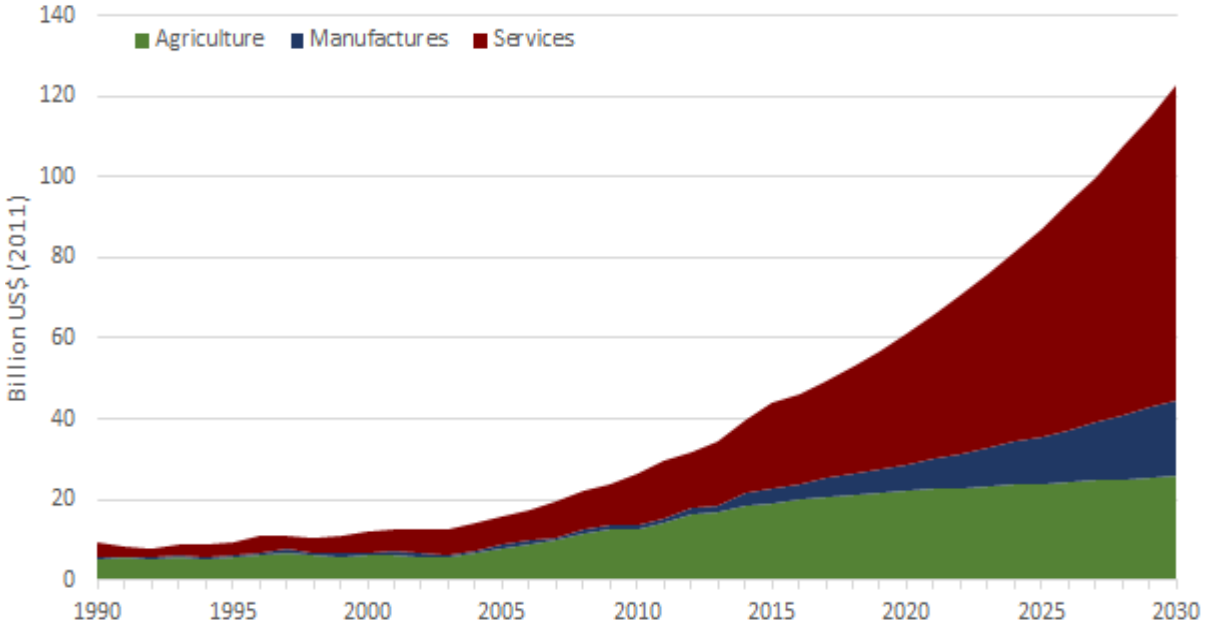
7.4 Sectoral breakdown of growth and output

Over the past 10 years, economic growth has been driven by growth in agriculture and services. Between 2004 and 2014, the agriculture and service sectors accounted for 3.6% and 5.4% of average annual growth, respectively.[199] Over the same period, industry and manufacturing accounted for 1.7% of annual growth. But, less than 40% of that industrial growth contribution could be attributed to the manufacturing sector; the other portion is mainly attributable to growth in the construction sector.[200] Since 2000, value added from agriculture has tripled, and value add from services has quadrupled. In 2016, agriculture and services contributed US$41.7 billion to GDP and accounted for 87% of total

[198] BB Hughes, IFs Approach to Forecasting Economic Growth, 2007
[199] World Bank, Ethiopia's Great Run, 2014, 7.
[200] Ibid.

value add in the Ethiopian economy. Meanwhile, the size of the manufacturing sector has quintupled since 1990, but still only accounts for 8.5% of total value add in Ethiopia. IFs forecasts that value add from services and manufacturing will continue to increase. Value add from the agricultural sector is expected to continue to grow in absolute terms, but the rate of growth will slow significantly.

Figure 7.g: Value added by sector (US$ billion) in Ethiopia, 1990-2030



Source: IFs v. 7.27, historical data from WDI

Figure 7.h shows value add by sector as a percent of GDP in Ethiopia and in African low-income countries over the past 50 years, along with the IFs forecast out to 2030. In both Ethiopia and across low-income Africa, the agricultural share of GDP has been steadily declining while the service sector's share of GDP has been growing. Meanwhile, the share from manufacturing value add has slowly been declining. In low-income Africa, services have been the largest source of value add for the past few decades, whereas the shift toward a services dominated economy has been more recent. In 2016 the Ethiopian service sector accounted for about 43% of GDP while agriculture and manufacturing accounted for 41% and 4%, respectively.

Figure 7.h: Ethiopia value added by sector (percent of GDP) in Ethiopia, 1990-2030

	Ethiopia			Low-income Africa		
	Agriculture	**Manufactures**	**Services**	**Agriculture**	**Manufactures**	**Services**
1990	52	5	38	36	12	44
2000	48	6	40	32	11	46
2010	45	4	45	33	9	47
2015	41	4	43	31	8	47
2020	36	10	49	25	16	50
2030	22	11	62	17	17	56

Source: IFs v. 7.27, historical data from Global Trade and Analysis Project

This shift from an agrarian economy to a service economy reflects both a structural shift in the Ethiopian economy as well as a general shift in economic production globally. Traditionally, governments have sought to pursue a development path from an economy dominated by agricultural production that induces shifts of labor and capital into labor-intensive manufacturing, and finally into high-end services. But, in Ethiopia and elsewhere, the trend reflects a shift from agricultural production directly into service sectors.[201]

7.4.1 Agriculture

In 1991, Ethiopia embarked upon a strategy of Agricultural Development Led Industrialization (ADLI) that emphasized increases in small-holder farm production through investments in improved inputs (i.e. fertilizer), public infrastructure, and farmer education and extension services.[202] This strategy was intended to boost agricultural output and exports, and to provide a path to industrialization by fostering inter-sectoral linkages to light manufacturing.[203] The ADLI has led to increases in agricultural production, export promotion and diversification, as well as contributing to poverty reduction, but has not led to the type of industrial and manufacturing spillovers that officials were expecting. Nonetheless, these increases in agricultural production were integral to the Ethiopian growth acceleration in the 2000s, accounting for about 45% of supply side growth from 2004 to 2014.[204]

Even though the agricultural sector is no longer the main driver of value-added, it still employs a vast majority of Ethiopian labor. Agriculture has employed over 77% of the workforce and accounted for 72% of employment growth over the last 15 years.[205] Labor productivity has grown by about three percent on average since 1999, but is still quite low compared to industrial and service sectors.[206] Because of its importance for employment and wages, gains in the agricultural sector have been one of the major reasons Ethiopia has been able to reduce the percentage of those under the poverty line (US$1.90 per person per day) by 50% over the past 15 years.

While the agricultural sector is no longer the main driver of economic growth, agriculture remains an integral part of Ethiopia's productivity growth, exports, and labor. The Ethiopian agricultural sector has made steady gains in output and productivity since 1990 and it is important that these trends continue. ADLI policies have increased land under cultivation and improved yields, while helping to increase labor productivity and reduce poverty. Increased production of grain and cereal crops has helped to stem import dependence and increases in coffee and oilseed crops has boosted exports. Labor absorption in the agricultural sector has helped increase land intensification and reduce poverty. But, given the failure of ADLI policies to successfully shift labor and capital into the manufacturing sector, the GoE will need to supplement ADLI policies with industrial policy in order to grow the manufacturing sector.

7.4.2 Manufacturing

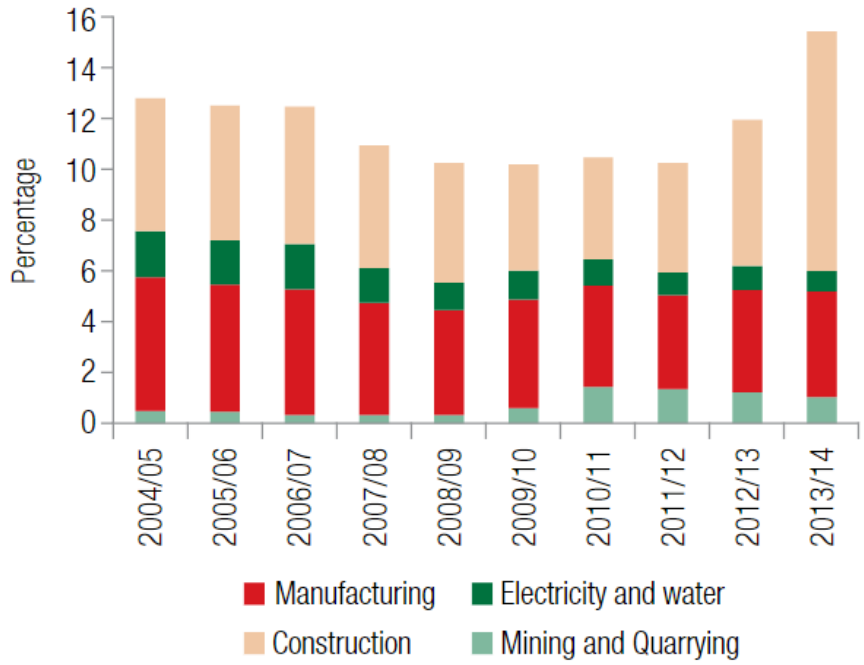
Beginning in the mid-2000s, Ethiopia's ADLI strategy was supplemented with investment in various light manufacturing sectors, with mixed effects. In some areas (i.e. cut flowers), the strategy was successful, and in other areas (i.e. agribusiness and leather processing), it was less successful. The

[201] D Rodrik, Premature Deindustrialization, November 2015, http://drodrik.scholar.harvard.edu/files/dani-rodrik/files/premature_deindustrialization_revised2.pdf
[202] N Bachewe et al, Agricultural Growth in Ethiopia (2004-2014): Evidence and Drivers, International Food Policy Research Institute Working Paper 81, 2014.
[203] Ethiopia's Great Run, World Bank, 2014.
[204] Ibid.
[205] World Bank, 3rd Economic Update: Strengthening Export Performance through Improved Competitiveness, 2014.
[206] World Bank, Ethiopia's Great Run, 2014.

manufacturing sector has been, and is still, dominated by food and beverage manufacturing, which accounted for almost half of all manufacturing output in 2011, followed by non-metallic minerals (17%) and chemicals (11%).[207]

The manufacturing industry has averaged 10.9% growth per year since 2004, but has fallen significantly short of the GTP goal of 22% growth annually. Manufacturing growth barely kept up with Ethiopia's overall economic growth rate, so as a share of GDP the manufacturing sector has hovered around 4.5% over the past decade. Figure 7.j shows the breakdown of the industrial sector's contribution to growth from 2004 to 2014. The figure shows that the manufacturing sector's contribution to overall growth has not only stagnated in relation to other sectors, but has begun to decline over the past 10 years.

Figure 7.i: Decomposition of industrial growth in Ethiopia, 2004 to 2014



Source: World Bank 4th Economic Update: Growth and Transformation through Manufacturing, 2015, pp. 25

The GTP II outlines a plan to push manufacturing and industry to jump-start industrialization in Ethiopia and follow the development path of China and the East Asian Tigers by moving workers from agriculture into higher value-added manufacturing activities.

However, Ethiopia faces significant barriers to manufacturing growth. First, while labor productivity in Ethiopian firms is generally on par with low-income peers, it is propped up by high capital intensity rather than human capital contributions.[208] Second, the business environment for Small and Medium-Sized Enterprises (SMEs) and other private firms is hindered significantly by low access to finance, unreliable supply of electricity, and lack of access to the land.[209] A lack of credit for SMEs hinders productivity and constrains their ability to scale up. Finally, electricity shortages and land constraints (due to lengthy wait times and complicated application processes) complicate firms' ability to operate in a smooth and efficient manner.

[207] African Development Bank Group, Eastern Africa's Manufacturing Sector: Promoting Technology Innovation, Productivity and Linkages - Ethiopia Country Report, 2014, 9.
[208] Ibid.
[209] Ibid.

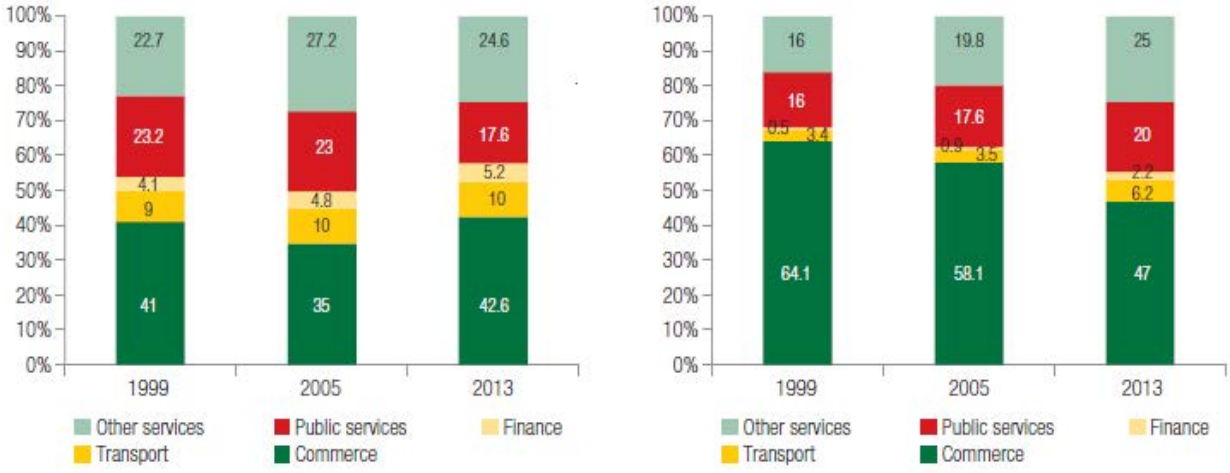
In order to offset the poor business environment for industry and SMEs, the GoE has embarked on an Industrial Parks (IP) development program along the lines of those instituted in East Asia. The IP strategy is meant to create industrial zones with business-friendly incentives for land acquisition, electricity supply, and financing in order attract FDI and create a manufacturing base. While initial IPs outside of Addis Ababa (i.e. Bole Lemi) have been rolled out on an ad hoc basis, issues with the IP policy framework and implementation have limited the effectiveness of the program.[210]

7.4.3 Services

The growth of the service sector accounted for about half of Ethiopia's total economic growth between 2004 and 2014. Growth in the service sector has supported Ethiopia's structural transition by absorbing a portion of agricultural labor into higher value added sectors. The share of employment in services increased by 1.5% from 2004 to 2014 (while agricultural employment fell by 3%).[211] Furthermore, the shift from agriculture to services has produced significant gains in labor productivity (i.e. commerce services are five times more productive than agriculture).

Much of the shift toward services has come from more traditional services (commerce, transport, public services, and "other services"), rather than modern services. Modern services include sectors like finance, communications, and ICT, whose growth over the last 10 to 15 years has been relatively minimal. Traditional services, on the other hand, grew from 31% to 42%.[212] Commerce (wholesale and retail services) accounted for 42% of the total increase in value add within services, while public services (administration and social services) and "other services" (private households, personal services, real estate, business) accounted for 25% and 18% of the growth in value add, respectively.[213] Together they account for around 85% of sector value and 92% of jobs in services.

Figure 7.j: Breakdown of service share of value add (left) and share of labor (right) in Ethiopia, 1999, 2003, 2013



Source: World Bank, Ethiopia's Great Run, 2015, pp. 48

In summary, while Ethiopia's growth in services has positively impacted productivity and growth, much of the growth has occurred in comparatively low value add services. At Ethiopia's level of development,

[210] World Bank, 4th Economic Update: Growth and Transformation through Manufacturing, 2015.
[211] World Bank, Ethiopia's Great Run, 2015.
[212] Commerce includes activities related to wholesale and retail trade, restaurant and hotels; public services include public administration, social service, health, and education; other services includes real estate, other community social and personal services, etc.
[213] World Bank, Ethiopia's Great Run, 2014.

shifting labor to these services and away from agriculture is important. Service-driven growth has contributed to the expansion of both the size of the domestic market and international trade. In order to make the transition to lower-middle-income status though, growth in high-value add sectors such as finance, ICT, and transport sectors must accelerate.

7.5 Trade

Ethiopia's volume of trade has also expanded rapidly over the past 15 years. Since 2003, Ethiopia has increased the value of total exports over fivefold. Exports of goods have doubled in nominal terms every four years since 2001, which translates to a 20% average annual growth rate.[214] This growth was helped by high commodity prices, notably for coffee, gold, and oilseeds, which make up the majority of Ethiopia's export basket. Meanwhile, service export was largely driven by the growth of Ethiopian Airlines, the country's flagship airline carrier.

Over the same time period, imports have also grown. Ethiopia's public investment strategy resulted in high demand for significant quantities of capital and construction equipment, leading to a persistent trade deficit of between 16% and 22% over the past decade. The trade deficit currently sits at about 18% of GDP, which is a bit higher than the African low-income average and significantly higher than regional peers. Along the Current Path, the trade balance will improve in the short term, before growing to 22% of GDP by 2030. The short term reduction in the deficit is derived from anticipated energy exports from the GERD, while the long-term downward trend tracks with the forecast of an increase in agricultural import dependence.

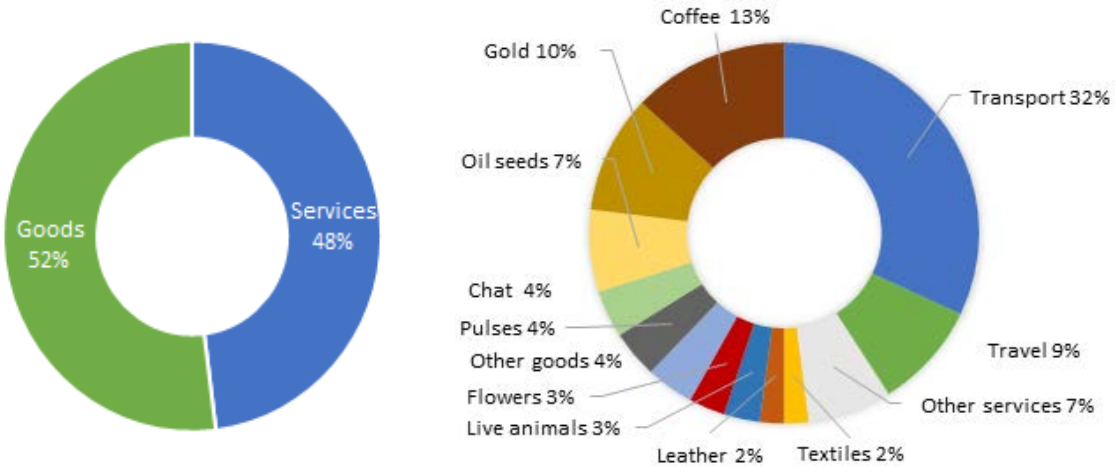
A heavy reliance on primary product exports, massive investment in public infrastructure, and rising agricultural import dependence mean that Ethiopia is unlikely to improve its trade balance significantly along the Current Path. Ethiopia's export sector is also hampered by an overvalued exchange rate and poor trade logistics, making Ethiopian goods more expensive compared to other low-income economies.[215] Efforts to diversify exports within and across sectors will help Ethiopia increase its export value and protect against adverse commodity shocks.

7.5.1 Trade breakdown

Ethiopian exports are equally balanced between goods and services. Goods exports are concentrated in primary and agricultural goods, while service exports are dominated by transportation. In 2012, food and beverages accounted for 77% of total exported goods and approximately 40% of total exports. Transportation service exports accounted for 62% of service exports and about 32% of total exports. Meanwhile, manufacturing exports accounted for less than 10% of the total. Figure 7.m shows the portion of exports attributable to services and goods as a whole, along with a breakdown of exports by category.

[214] World Bank, 3rd Economic Update: Strengthening Export Performance through Improved Competitiveness, 2014.
[215] IMF, The Federal Democratic Republic of Ethiopia: Selected Issues Paper, 2014.

Figure 7.k: Exports by sector (left) and by category (right) in Ethiopia, 2012



Source: World Bank, 3rd Economic Update: Strengthening Export Performance through Improved Competitiveness, 2014

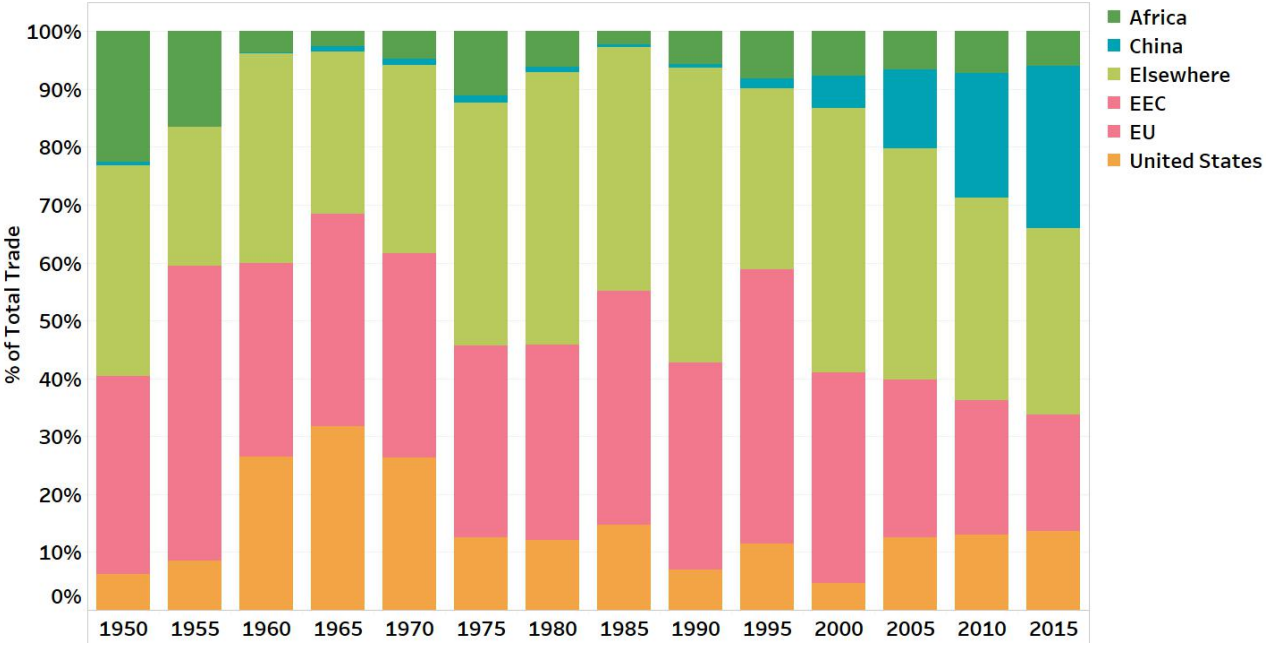
Ethiopia's largest goods export is coffee, which accounts for about three percent of world coffee trade, making Ethiopian a top 10 coffee exporter.[216] In 2012, Ethiopia exported about US$890 million worth of coffee, which was nearly double the value of the next highest exported good (oil seeds). Other major goods exports include vegetable crops, gold, and cut flowers. Ethiopia's largest annual import is petroleum, which accounts for over US$2 billion, followed by motor vehicles, wheat, and chemical fertilizers.[217] Ethiopian Airlines is worth nearly US$1.7 billion in export value and accounts for nearly all of the country's transportation exports (and 62% of service exports).[218] Ethiopia's largest service import is transportation, which is a product of the high costs of transporting goods for export as a landlocked country.

7.5.2 Trade by destination

Figures 7.l depicts Ethiopia's trading partners from 1950 to 2015. Two trends stand out: 1) the low percentage of intra-African trade as a portion of Ethiopia's overall trade; and 2) the substantial growth in trade with China between 2000 and 2015. In 1990 China accounted for less than 1% of Ethiopia's total trade, but by 2015 it had grown to 28%, making it one of Ethiopia's largest trading partners. Meanwhile, U.S. trade with Ethiopia grew only a fraction of that over the same time period.

[216] World Bank, 3rd Economic Update: Strengthening Export Performance through Improved Competitiveness, 2014.
[217] UNComtrade, UNServicetrade.
[218] Ibid

Figure 7.I: Ethiopian trade distribution, 1950-2015 (Percentage of Total Trade)



Source: IMF direction of trade statistics

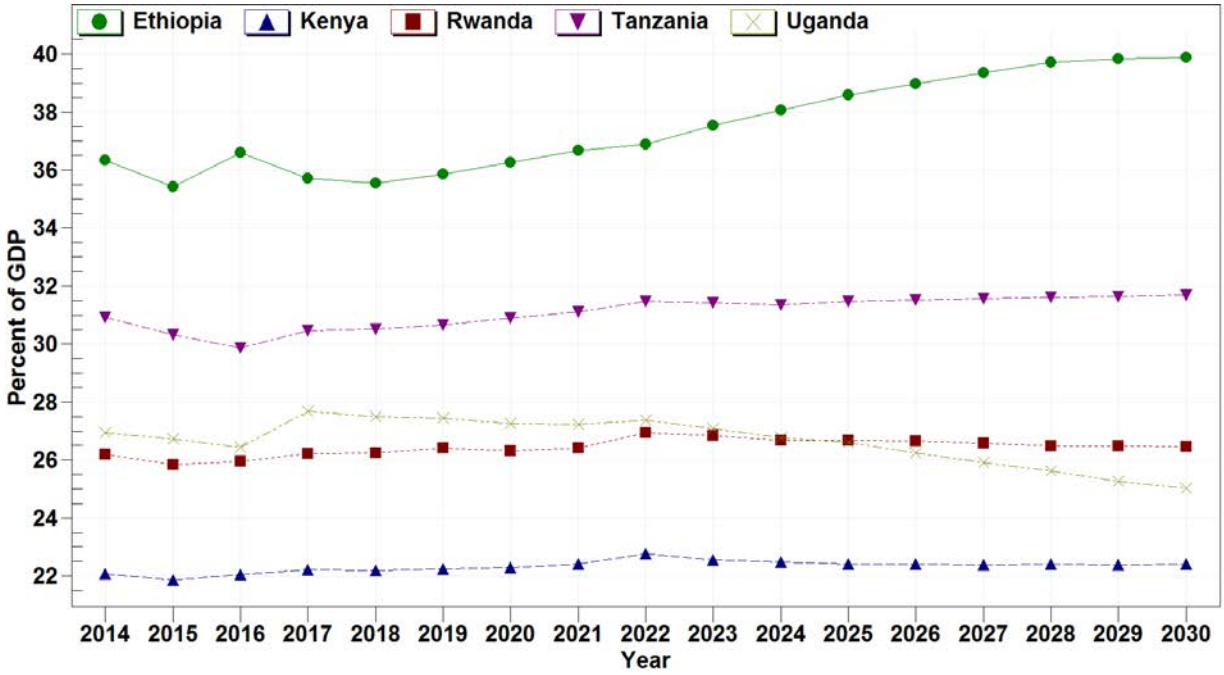
Underscoring China's growing trade relationship with Ethiopia, imports from China have grown from US$200 million in 2005 to over US$2 billion in 2015. During that period, China overtook the EU, Saudi Arabia, and the United States as the leading exporter to Ethiopia. Ethiopia's imports from China primarily consist of textiles and machinery (often tied to large infrastructure projects). The second biggest exporter to Ethiopia is the EU, which exported an estimated US$1.6 billion in 2015. Since 1980, the EU has remained the leading export destination for Ethiopia, constituting the majority of Ethiopia's total export value. Over 70% of the US$700 million in Ethiopian exports to Europe consisted of agricultural products in 2015. Meanwhile, China became the second largest importer around 2010, surpassing both the U.S. and Saudi Arabia.

7.6 Investment and finance

Much of Ethiopia's economic growth over the past 25 years has been driven by high rates of investment and capital formation. At 37% of GDP, Ethiopia ranks 14th in the world and 7th in Africa in gross capital formation as a percentage of GDP.[219] Within its peer group, Ethiopia has the highest ratio of gross capital formation by nearly 22% (Tanzania is the next closest at 29.8%).

[219] According to the World Bank, gross capital formation, 'consists of outlays on additions to the fixed assets of the economy plus net changes in the level of inventories'. http://data.worldbank.org/indicator/NE.GDI.TOTL.ZS

Figure 7.m: Gross capital formation, Ethiopia and regional peers, 2014-2030



Source: IFs v. 7.27. Historical data from WDI indicators

Most of this investment has been in a series of public infrastructure projects and public works programs. In 2011, Ethiopia's public investment rate (as a percentage of GDP) stood at 18.6%, a nearly threefold increase from the early 1990s, and the 3rd highest public investment rate in the world at the time. The GoE has funneled most of this investment into energy, transport, communications and social sectors. Most recently, public investment has focused on major hydropower projects (namely the Grand Ethiopia Renaissance Dam discussed in Chapter 8) and transport projects (such as the rail link to the port of Djibouti), as well as upgrades in ICT networks (via Ethio Telecom).[220] The GoE has also invested heavily in service delivery and infrastructure in the education, health (via the HSTP), and agricultural (via ADLI policies) sectors.

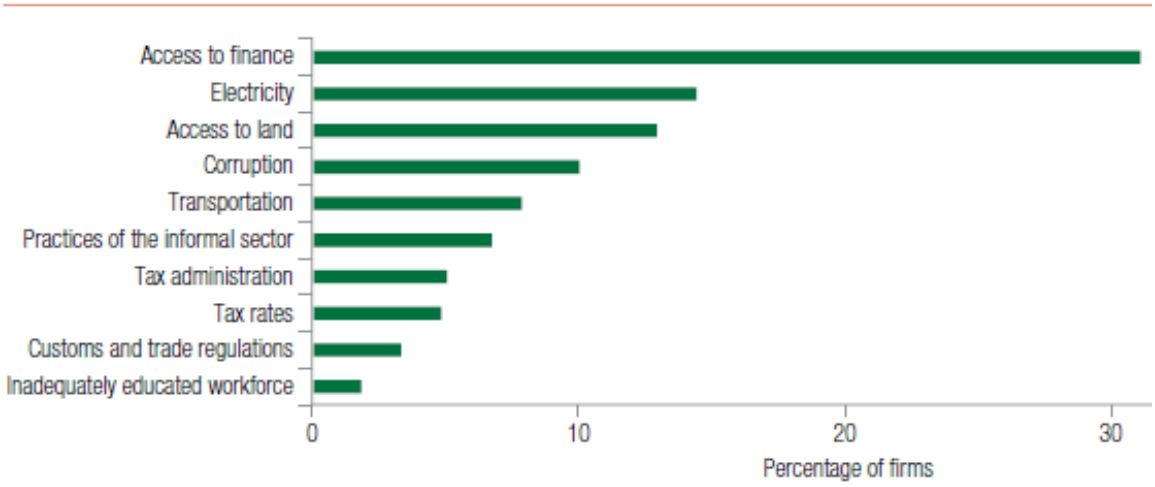
This massive public investment program has been largely financed through a mix of national lending to state-owned enterprises (SOEs), compulsory bond purchases by state-owned and private banks, and concessional loans from external sources.[221] The large amount of public lending and SOE activity has resulted in a financial sector that is heavily skewed toward public financial institutions. The Central Bank of Ethiopia (CBE) accounted for over 60% of deposits and SOEs accounted for 62% of the domestic credits stock in 2014 (up from only 14% in 2007).[222] Ethiopia's publicly dominated finance sector and heterodox financing arrangement has allowed the GoE to finance massive infrastructure investment projects at relatively low interest rates, but has also crowded out private credit and investment. Ethiopia's ratio of private credit to GDP declined from 15% in 2004 to 11% in 2014 and remains below the sub-Saharan African average.[223]

Increasing access to private credit will help support private sector growth and SME formation. Access to credit is cited as one of the top barriers to doing business in Ethiopia and credit constraints significantly reduce firm employment and productivity gains (see Figure 7.n).[224] Ethiopia may benefit from either financial liberalization or a public financing model that places greater emphasis on extending

[220] IMF, The Federal Democratic Republic of Ethiopia Article IV, 2015; Ethiopia's Great Run, WB, 2014.
[221] World Bank, Ethiopia's Great Run, 2014.
[222] Ibid.
[223] Ibid.
[224] World Bank, 4th Economic Update: Growth and Transformation through Manufacturing, 2015.

credit to SMEs. Ensuring that domestic firms have better access to credit is an important step towards creating a more business-friendly environment.

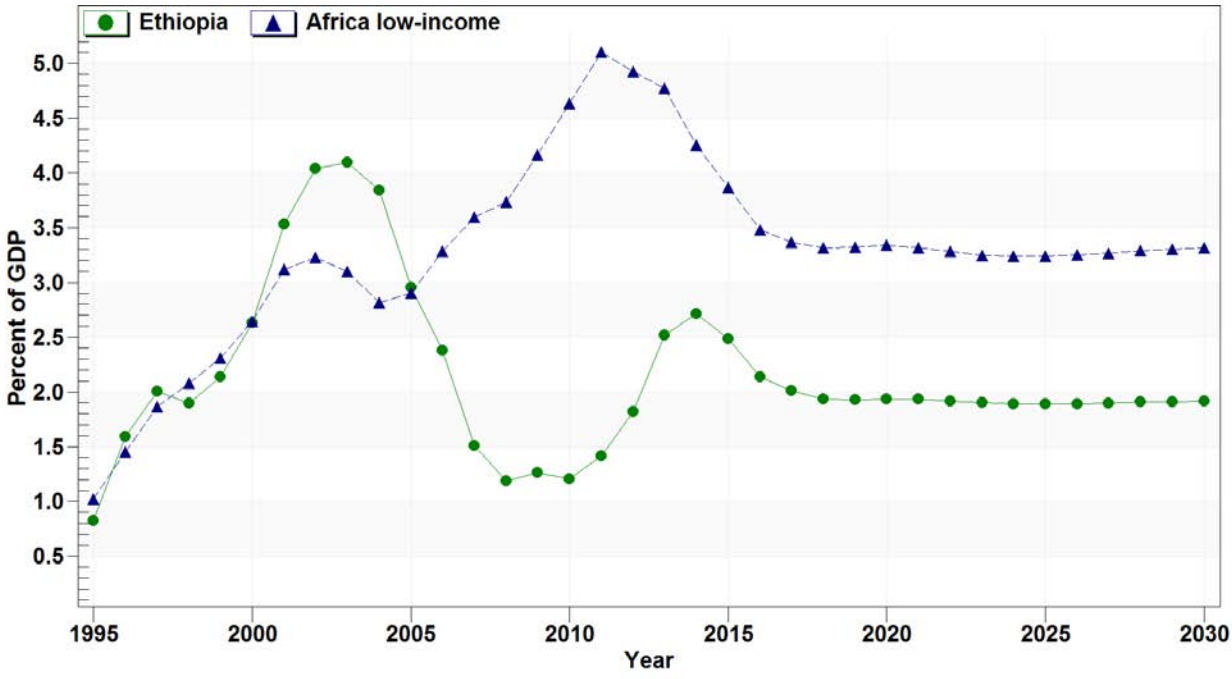
Figure 7.n: Top 10 business environment constraints in Ethiopia, 2011



Source: World Bank, 4th Economic Update, 2015; Enterprise Survey, 2011

From 1990 to 2006, Ethiopia's ratio of FDI to GDP kept pace with other low-income economies in Africa, but over the past 10 years, it has been significantly lower than its peers. Even with an uptick in recent years (2014, 2015), Ethiopia's FDI as a percentage of GDP has been near three percentage points less than that of other low-income economies. IFs forecasts this gap to narrow; FDI inflows as a percentage of GDP are expected to remain below two percent across the forecast horizon while inflows into low-income African economies is forecast to remain above three percent of GDP.

Figure 7.o: FDI as percent of GDP (five-year moving average), Ethiopia and African low-income economies, 1995-2030

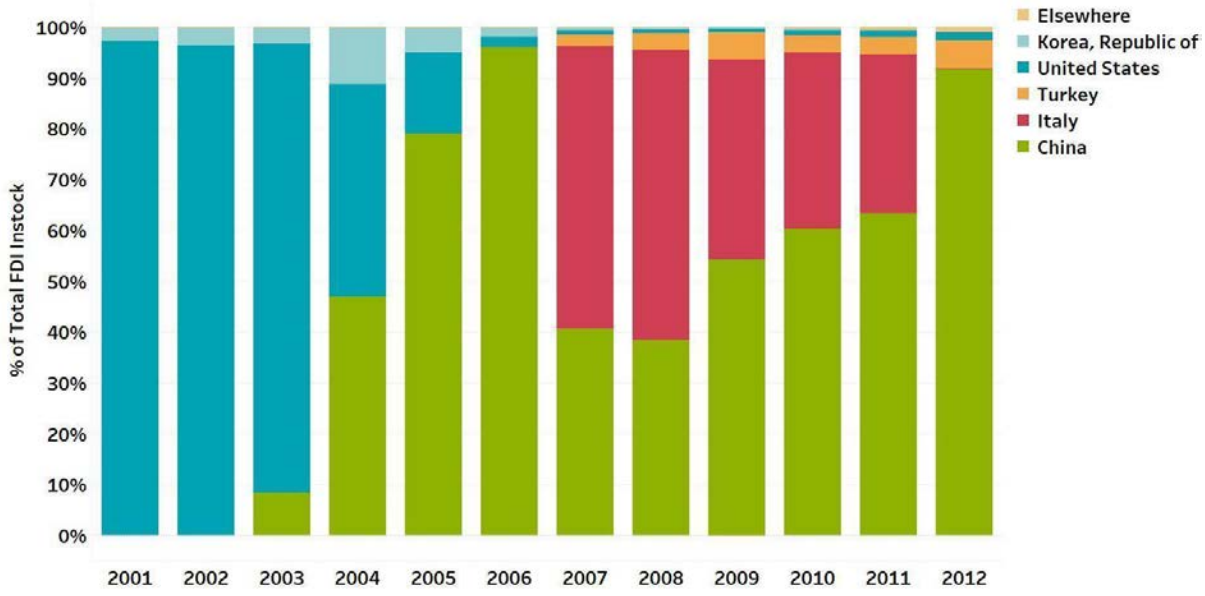


Source: IFs v. 7.27, historical data from WDI

The country's ability to attract FDI will be increasingly important as Ethiopia's economy transitions. Currently, FDI represents about nine percent of gross capital formation in Ethiopia (as opposed to just over two percent in 2012),[225] meaning that it makes up about a quarter of total investment. The recent spike in FDI (as a percentage of GDP and as a percentage of total investment) may be a reflection of the GoE's concerted effort to establish industrial parks to reduce business and regulatory barriers to FDI, but it is yet to be seen whether the increased FDI flows are a reflection of GoE policies.

Figure 7.p (below) depicts the composition of FDI into Ethiopia between 2001 and 2012. In 2001, the United States accounted for nearly all FDI into Ethiopia, but has since been overtaken by China, partly because of China's significant support for state-financed infrastructure investment.

Figure 7.p: FDI by source country for Ethiopia, 2001-2012



Source: IMF direction of trade statistics

Ethiopia's public investment strategy has been an integral part of its growth story. Extremely high levels of gross capital formation, largely financed by the GoE and SOEs, has resulted in the construction of a number of large, visible and expensive infrastructure projects. But, this public financing strategy has also benefited heavily from supplemental funding from concessional loans and external aid.

7.7 Government finance and aid

The Ethiopian government both spends less and generates less revenue than would be expected based on its level of economic development. In 2016, Ethiopia's government expenditure amounted to 16% of GDP, while revenues accounted for close to 22% of GDP, both lower than the rates seen in other low-income African countries. Even though expenditure is lower than many of its peer countries, GoE's debt levels are on par with its peers.

[225] UNCTAD, World Investment Report, 2016.

Figure 7.q: Ethiopian fiscal indicators, 2016

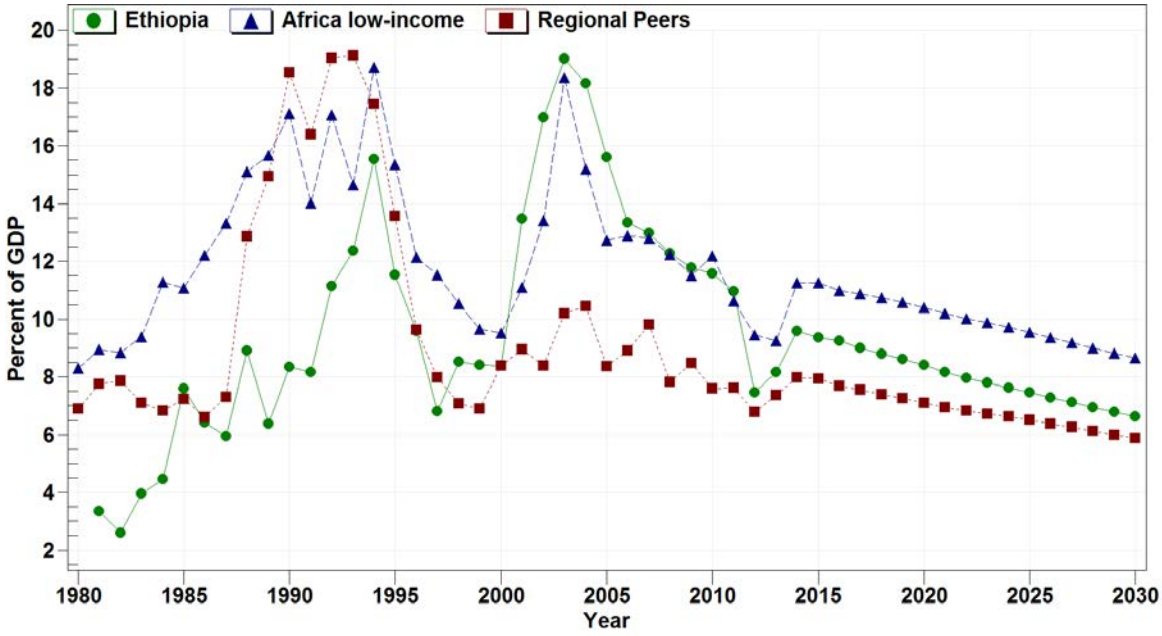
	Ethiopia	Africa Low-income	Regional peers
Government Expenditure (% of GDP)	16.7	21.1	20.8
Government Revenue (% of GDP)	22.1	27.9	24
Government Revenue minus Aid (% of GDP)	12.9	16.9	16.4
Government Debt (% of GDP)	77.3	79.2	56.9

Source: IFs v. 7.27, historical data from IMF

The Ethiopian government, like many other low-income African countries, runs a persistent budget deficit. Over the past three years, Ethiopia has run an average budget deficit of 3.8%, and IFs forecasts the budget deficit to stay between three to four percent out to 2030. Low domestic revenue generation means Ethiopia relies on external debt, (concessional lending and aid), to fill the persistent budget gap. But, Ethiopia's ability to finance the spending gap with aid will become increasingly difficult as aid receipts as a ratio of GDP and total government spending decreases.

Prior to 2000, Ethiopia received on average less aid (as a percentage of GDP) than other African countries. But, since 2000, Ethiopia's net receipts of aid as a percent of GDP have tracked closely with that of other African low-income economies and outstripped that of its regional counterparts. From 2001 to 2011, Ethiopia aid receipts averaged just over 14% of GDP, while its regional peers only averaged about 9%. IFs forecasts that Ethiopia's aid receipts (as a percentage of GDP) will decline from 9% in 2016 to 6.6% in 2030.

Figure 7.r: Aid receipts (as a percentage of GDP), Ethiopia, African low-income economies, and regional peers, 1980-2030



Source: IFs v. 7.27, historical data from WDI

IFs forecasts that aid receipts (in US$ billion) will nearly double (from US$4.4 billion to US$8.5 billion) between 2016 and 2030. But, it also forecasts that GDP will nearly triple over that same time period. In other words, even as aid receipts are growing in absolute terms, aid will shrink as a percent of GDP. Figure 7.s below shows the forecasted average GDP growth rate, aid receipts (in US$ billion), and total government revenue (in US$ billion) between 2016 and 2030. IFs forecasts that GDP growth will outstrip aid growth by an average of nearly 2.5 percentage points per year out to 2030.

Figure 7.s: Average annual growth rate for selected indicators, Ethiopia, 2016 to 2030

GDP	Aid Receipts	Government Revenues
7.4	4.9	6.9

Source: IFs v. 7.27, historical data from WDI, IMF

More importantly, as aid receipts as a portion of GDP decline, so too will aid as a percent of total government revenue. Currently, aid accounts for nearly 42% of total government revenue in Ethiopia, compared to 39% in other low-income African economies. IFs forecasts this gap to narrow over the next 5 years and for aid as a share of total government revenue to fall to about 32% by 2030 – in both Ethiopia and other low-income African economies.

Much of the influx of aid dollars over the past 10 years has gone toward social, health, agricultural, and humanitarian programs. From 2010 to 2014, more than half of all aid dollars went to social infrastructure and service, health and population, and humanitarian aid (see below).[226] As aid declines (as both a share of GDP and total government revenue), it will become increasingly difficult for Ethiopia to fund government projects and programs without significantly increasing tax revenue or debt levels. Figure 7.t below shows the breakdown of government spending (as a percent of GDP) by major spending categories. Compared to other low-income African economies, Ethiopia spends a larger portion of its on education, health and core infrastructure (WASH, energy, roads), and spends less on military, other infrastructure, and other expenditure.[227]

Figure 7.t: Government spending by destination (percent of GDP) in Ethiopia, 2016 and 2030

		Military	Health	Education	R & D	Core Infra-structure	Other Infra-structure	Other
Ethiopia	**2016**	0.7	2.9	4.6	0.1	5.4	1.8	0.1
	2030	0.8	3.2	5.5	0.11	3.5	2	0.2
Africa low-income	**2016**	2	2.4	3.8	0.11	3.8	1.8	3.7
	2030	1.6	2.4	4.5	0.12	3.7	1.8	3.4

Source: IFs v. 7.27, historical data from WDI, IMF

Ethiopia's steady inflow of aid, paired with its government spending priorities, have allowed the country to invest generously in education, health and infrastructure. But, as aid shares decline (as a percent of GDP), the Ethiopian government will need to replace those resources through improved tax administration and domestic revenue collection in order to maintain or even accelerate investment in these key development sectors.

Ethiopia has made incremental gains in revenue collection, but is still far below the GTP target of 15% of GDP by 2015. Since 2010, Ethiopia has increased tax revenue as a percent of GDP from 11.5 to 12.9, a 12% increase over the past 6 years.[228] Domestic tax collection is quite weak and foreign taxes account for nearly one third of total tax revenue.[229] The fact that much of the population is engaged in smallholder agricultural production and/or informal economic activities, could undermine Ethiopia's domestic revenue generation efforts.

[226] OECD, Development and Assistance Report, 2016.
[227] The other spending category in IFs is a catch- all category for all other miscellaneous government activities including administrative costs and all other expenditure than do not fall under the core spending categories.
[228] IMF, The Federal Democratic Republic of Ethiopia Article IV, 2015.
[229] World Bank, Ethiopia's Great Run, 2015.

7.8 Labor force

The Ethiopian labor force grew from 29 million in 2000 to just over 50 million in 2016, which represents a 75% increase over that time period. Along the Current Path, 77 million people are forecast to be in the labor force by 2030. Due to a steadily aging population, the labor force has grown at a faster rate than the overall population. Since 2000, the labor force has grown at an average of 3.5% per year, while population growth has averaged 2.7% per year. IFs forecasts the trend to continue as the population ages further and the population growth rate slows. By 2030, the labor force will account for 53% of the total population, compared to 49% today.[230]

Recent growth in the labor force has also been aided by an increase in the percentage of women participating in the labor force. From 1999 to 2013, the overall labor force participation rate increased from 80.5% to 83.6%, bolstered by a growing rate of participation by rural women. [231] Between 1999 and 2013, the rural female participation rate increased from 72.3% to 80.8%.[232] The percentage of women in the workforce rose from 44.7% in 1999 to 47.6% in 2016 and IFs forecasts that this will increase to 49.5% by 2030. While this growth in female labor force participation is a positive trend, there is still much work to be done to ensure that growth in the size of the workforce is met with formal employment opportunities. Women often make up a large portion of the informal labor force, and suffer higher formal unemployment rates than males.[233]

Unemployment rates tend to be higher in urban areas of Ethiopia. While the total unemployment rate in 2013 was 8.2%, the urban unemployment rate was 21%.[234] Women made up close to 67% of the unemployed, even though they account for less than 50% of the total labor force.[235] Along its Current Path, Ethiopia is forecast to see significant growth in its urban population, which could potentially accentuate urban unemployment. Policies to tackle unemployment could include expanding sectors capable of absorbing young workers, such as manufacturing or agriculture, expanding labor market flexibility and job training to allow laborers to adapt to changing workplace demands, expanding female employment opportunities, and promoting small business and entrepreneurship.

Recent and continued improvements in productivity and women's participation in the workforce will help Ethiopia take advantage of the demographic dividend and sustain economic growth. But, further increases will rest on investments in human capital – reducing childhood malnutrition and stunting, moving children through the education system, and investments in vocational training to improve human capabilities – and continued economic growth and job creation. Furthermore, formalizing the informal sector will help improve productivity, reduce women's unemployment, and increase the GoE's ability to collect revenue and provide social services.

7.9 Informal sector

The informal sector is an umbrella term for economic activity produced by "unincorporated enterprises and/or informal units" that have some market production.[236] At higher levels of economic development, the existence of a large informal sector is, in general, costly for society. The informal

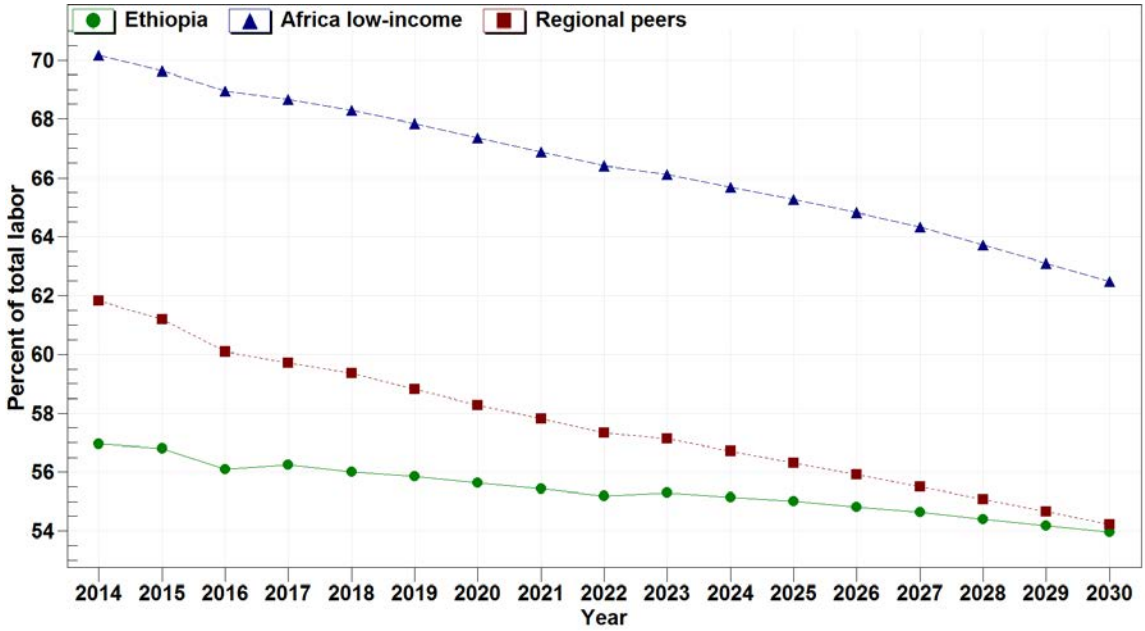
[230] IFs initializes labor force forecasts using data from the World Bank Development Indicators and the International Labor Organization.
[231] Ethiopian National Labor Force Surveys (1999, 2005, 2013). Central Statistics Agency.
[232] Ibid.
[233] Ibid.
[234] Ibid.
[235] IFs initializes estimates of the percent of women in the workforce using International Labor Organization estimates. These estimates differ from the estimates given by the Ethiopian NLFS.
[236] G. Gyomai & P. van de Ven (2014). "The Non-Observed Economy in the System of National Accounts." OECD Statistics Brief. No. 18.

sector is demonstrably less productive than its formal counterpart and a large informal sector also reduces the government's ability to collect taxes and police effectively, increases costs of doing business in the formal sector, creates barriers to entry encouraging entrepreneurs to operate informally, reduces incentives to invest in education, and congests public infrastructure.[237]

At lower levels of development however, the informal sector can provide basic income for the poor and absorb unskilled, undereducated individuals into the workforce.[238] In this sense, individuals often operate within the informal economy as a means of economic survival.[239] Although it would be preferable to have individuals working in the formal sector (*ceteris paribus*), informal employment is preferable to economic inactivity, especially in a country like Ethiopia. As Ethiopia's labor force becomes more productive, the GoE should consider policies that encourage the formalization of previously informal economic activities. However, at its current level of development, Ethiopia's large informal sector is likely acting as a lifeboat for millions of struggling families and actively discouraging informal activity may have negative consequences for human development and economic growth.

According to IFs, the informal economy accounted for US$13.5 billion of economic activity in 2016, or roughly 30% of total GDP. IFs estimates that around 12.4 million Ethiopians were engaged in the (non-agricultural) informal sector in 2016, or about 57% of the total labor force.[240] Initial indications would be that Ethiopia has a smaller informal sector than comparable countries at similar levels of income, both in Africa and globally. Figure 7.u compares the size of the informal labor sector in Ethiopia with other low-income countries in Africa and globally.

Figure 7.u: Informal labor (percent of total labor), Ethiopia, African low-income countries, and regional peers, 2014-2030



Source: IFs v. 7.27

[237] The productivity gap between the informal and formal sectors can be nearly 200% in developing and emerging economies. (Bohl et al,, Final Report to CEPLAN, 2015).
[238] Ibid
[239] J Cilliers, A Porter, and Z Donnenfeld, FuturesCape Policy Research Paper: The Role of the Informal Economy in Inclusive Growth, 2016
[240] The Ethiopian National Labour Force Survey (2013) has significantly lower estimates of the size of the informal labor force (25.8%) than the IFs estimate. It is notoriously difficult to estimate the size of the informal labor force. There are various ways to define and measure informal labor and national surveys often underestimate informal labor.

Over half of Ethiopia's labor force (outside the agricultural sector) operates informally. IFs forecasts that the Ethiopian informal economy will grow to US$38.9 billion by 2030 in absolute terms, but as a percent of total GDP will shrink from 30% in 2016 to 26.6% in 2030. Informal labor outside the agricultural sector is forecast to rise in absolute terms (from roughly 12 million in 2016 to about 18 million in 2030), but will fall as a percentage of the labor force (from 57% in 2015 to 54% in 2030). Even in 2030, more than half of Ethiopia's labor force is forecast to be operating informally.

7.10 Key takeaways

- IFs forecasts that the average GDP growth rate in Ethiopia will slow to about 7.4% per year over the next 10 years, roughly 3.5% lower than the GTP II target. Thus, it is unlikely that Ethiopia will reach lower-middle-income status by 2025 along the Current Path.
- The Ethiopian economy is transitioning away from agriculture and directly towards services, while manufacturing has remained at around 10% of GDP over the past decade and is forecast to remain around this level throughout the forecast. The recent growth in services (over the past decade) has been in traditional sectors like commerce and the public sector, rather than in modern services such as finance, communications or ICT.
- Even though agriculture as a share of GDP is steadily falling, the agricultural sector remains a core driver of growth and exports and still employs over 70% of the Ethiopian labor force.
- Ethiopia's state-led growth and investment strategy has drawn heavily on the GoE's ability to fund and finance large scale infrastructure investment and service delivery extension projects. While much of the investment has been funded using domestic heterodox financing arrangement between the Central Bank of Ethiopia and SOEs, the GoE has also relied heavily on bilateral aid and concessional loans from international institutions (i.e. World Bank) to support spending on infrastructure and public works.

7.11 Informal interventions

The informal scenarios simulate a policy push to improve business regulation, increase economic freedom, and expand social benefits, while reducing the proportion of total output originating in the informal sector. Improving business regulation and economic freedom incentivizes businesses to formalize and expanding social benefits will encourage informal workers to move into formal employment. These interventions simulate a shift to a more productive economy, while also helping to lift survivalist informal workers out of poverty and into the formal sector.

These interventions are not prescriptive. There is no silver bullet or isolated policy for reducing the size of the informal labor market and it remains a difficult task constrained by a number of interrelated developmental conditions. Moreover, there is no clear threshold at which a relatively large informal sector becomes a drag on growth and it is difficult to assess when countries would begin to benefit from policies that incentivize formalization.[241] Nonetheless, the following interventions are designed to explore the impacts of formalizing the informal sector and provide readers with reasonable expectations for interventions in this area.

7.11.1 Strengthening ties between the formal and informal sectors

The first scenario moves informal production into the formal sector. This scenario reduces informal production in Ethiopia by eight percent over the next five years, which is somewhere in between recent five-year average decreases in informal production (as a percent of GDP) in Ethiopia, and the average of its low-income peers. The intervention decreases informal production as a percent of GDP

[241] Bohl et al. 2015

to 26.2% by 2021 (compared to 28.6% along the Current Path) and to 25% by 2030, which represents a more than two percentage point decrease over the time horizon.

7.11.2 Improving economic freedom and business regulation

Many firms and individuals operate in the informal sector due to burdensome government regulations and lack of economic freedom. Reducing the cost of starting and maintaining a business, decreasing other regulatory constraints (such as property rights) and increasing freedom to trade internationally will incentivize production to shift from the informal to the formal sector.

This intervention decreases business regulation by five percent over the next five years and maintains that decrease out to 2030. This brings Ethiopia's levels of business regulation in 2030 to the average seen in southern Africa today. The intervention also increases Ethiopia's level of economic freedom by 10% over the next 5 years and maintains that increase out to 2030. This brings Ethiopia's level of economic freedom up to the level of other low-income African countries, increasing its index score from 5.7 2016 to 6.5 in 2030 (compared to 5.9 in the Current Path).

7.11.3 Expanding social benefits

Often those operating in the informal sector are there because they have few other options. This survivalist segment of the informal sector is generally caught in a poverty trap, working without the social protections that are available to those in the formal sector. This reduces the availability of additional education, training and healthcare services, which limits the ability of those individuals to move into higher wage job opportunities.

This intervention increases government transfers to unskilled households by 10% over the next five years. This is a significant but modest increase when compared to increases in household transfers in other countries in sub-Saharan Africa. Moreover, Ethiopia is already at the low end of the spectrum in terms of social welfare transfers to households. This intervention increases welfare transfers from 1.2% of GDP in 2016 to 2% of GDP by 2030 (compared to 1.8% along the Current Path).

7.11.4 Transitioning Informality

Figure 3.y compares the results of each of the above interventions and a combined Transitioning Informality intervention across 3 indicators.[242] The x-axis is the percentage gain in GDP per capita, the y-axis is the percentage change in poverty, and bubble size represents the percentage change in government revenues. The bubbles represent the difference between the interventions and the Current Path forecast in the year 2030.

Strengthening informal-formal ties and improving the business and economic environment have the biggest impact on GDP per capita and government revenue, while increasing transfers to unskilled workers has the biggest impact on poverty. When combined, these interventions result in a full 2% increase in GDP per capita, about a 1.5% decrease in the portion of Ethiopians living in extreme poverty and a 1% increase in government revenues.

Informality is a complex economic phenomenon with benefits and drawbacks, and the GoE should think carefully about when and how to formulate policies designed to transition informal workers into the formal sector. The scenario presented here is a comprehensive intervention that addresses areas of effective governance extending beyond the informal sector. Improving the business environment and distributing resources (or transfers) more effectively throughout a population could reduce

[242] The Transitioning Informality scenario combines the three informality scenarios outlined in this section.

informality, but could also have positive effects on human development independent of their direct impact on the labor market, e.g. by allowing citizens to more easily access the social benefits provided by the state.[243]

Figure 3.y: Impact of informality interventions on selected indicators in 2030

Source: IFs v. 7.27

[243] Bohl et al. 2015

CHAPTER 8: INFRASTRUCTURE

8.1 Introduction

GTP II contains an extensive list of infrastructure targets. The document frames infrastructure as a cross-cutting investment that can buttress gains made in education, health, economic development, poverty reduction and a number of other important development objectives. A major component of the infrastructure planning revolves around a number of large hydropower projects, most notably the Grand Ethiopian Renaissance Dam (GERD), which together could significantly alter the country's development trajectory. Understandably, improving infrastructure is not a core area of USAID's CDCS for Ethiopia. But, much programming done by the Mission (i.e. in health and education) explicitly recognizes the importance of infrastructure in advancing development outcomes in these sectors.

Investment in infrastructure has been a major driver of economic growth in Ethiopia over the last 10 to 15 years (see Chapter 7). Not only has the GoE invested heavily in hydropower projects such as the GERD and Gilgel Gibe III (GIBE III), but it has also invested in a railway from Addis Ababa to the port of Djibouti, and a light rail in Addis Ababa. This investment has been complemented by improvements in other types of basic infrastructure, such as access to water and sanitation facilities, electricity and ICT. Much of the progress on these latter indicators, however, has been achieved from a very low base, so while Ethiopia has advanced relative to its starting point, in an absolute sense, levels of access are still some of the lowest in the world.

This chapter will explore the trends in infrastructure in Ethiopia, and has the following subsections:

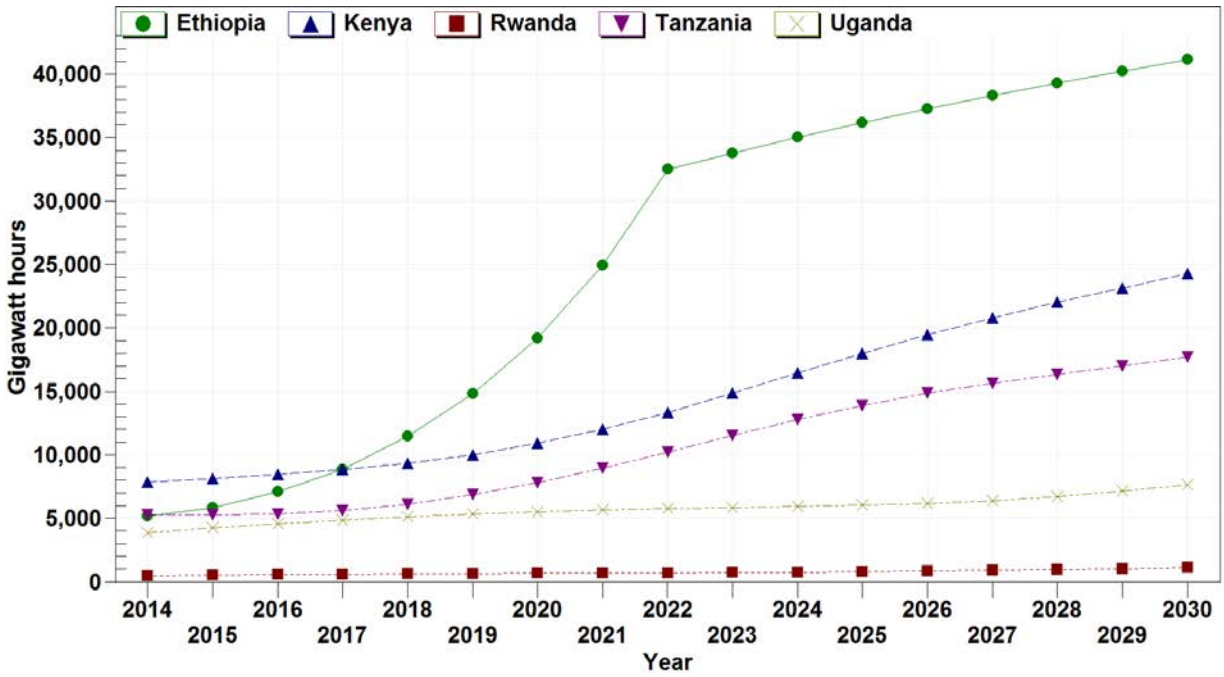
- Electricity
- Grand Ethiopian Renaissance Dam
- Roads
- ICT
- Water, Sanitation and Hygiene
- Irrigation
- Infrastructure finance
- Key takeaways
- Infrastructure interventions

8.2 Electricity

Ethiopia has very ambitious plans to expand electricity production over the next five to seven years. While the GERD is undoubtedly the centerpiece of hydropower in Ethiopia, there are other substantial projects underway. In mid-December 2016 the GoE announced the opening of the tallest dam in Africa (GIBE III) that, by itself, could double electricity generation in Ethiopia.[244] As these smaller hydro projects come online, followed by the GERD in 2021 or 2022, Ethiopia could see electricity production steadily increase from about 8,000 GWH/yr to more than 30,000 GWH/yr by the early 2020s. If these energy production increases are realized, Ethiopia will become by far the biggest producer of energy among its regional peers (Figure 8.a).

[244] The Economist, Ethiopia opens Africa's tallest and most controversial dam, 2016, www.economist.com/news/21712281-gibe-iii-dam-has-capacity-double-countrys-electricity-output

Figure 8.a: Total electricity production, Ethiopia and regional peers, 2014-2030



Source: IFs v 7.27. Historical data from WDI

Some independent studies have raised concerns about the ultimate generation capacity of the GERD and have suggested that the GoE may be overestimating expected electricity production levels.[245] There are also questions around the construction of transmission lines and the ability of the GoE to secure additional contracts with neighboring countries to purchase electricity.[246] Finally, it is unclear how much of this electricity will be consumed domestically, which makes it difficult to establish a reliable export figure. Nonetheless, Ethiopia's electricity production capacity will increase significantly over the next decade and this has the potential to constrain or promote its development in important ways.

The forecasted increase in energy production could have very positive effects on economic and human development in Ethiopia. Hydroelectric energy exports to neighboring countries could provide a boost to economic growth and add an additional revenue stream for the GoE. Further, if Ethiopia can pair the increase in production with increases in domestic access to electricity (especially in rural areas), it could have positive impacts on education and health outcomes. Extending electricity access to underserviced areas can lengthen class and study times, facilitate access to the internet and other mass media and, provided electric stoves are available, reduce indoor fuel use and the health effects associated with smoke inhalation.[247]

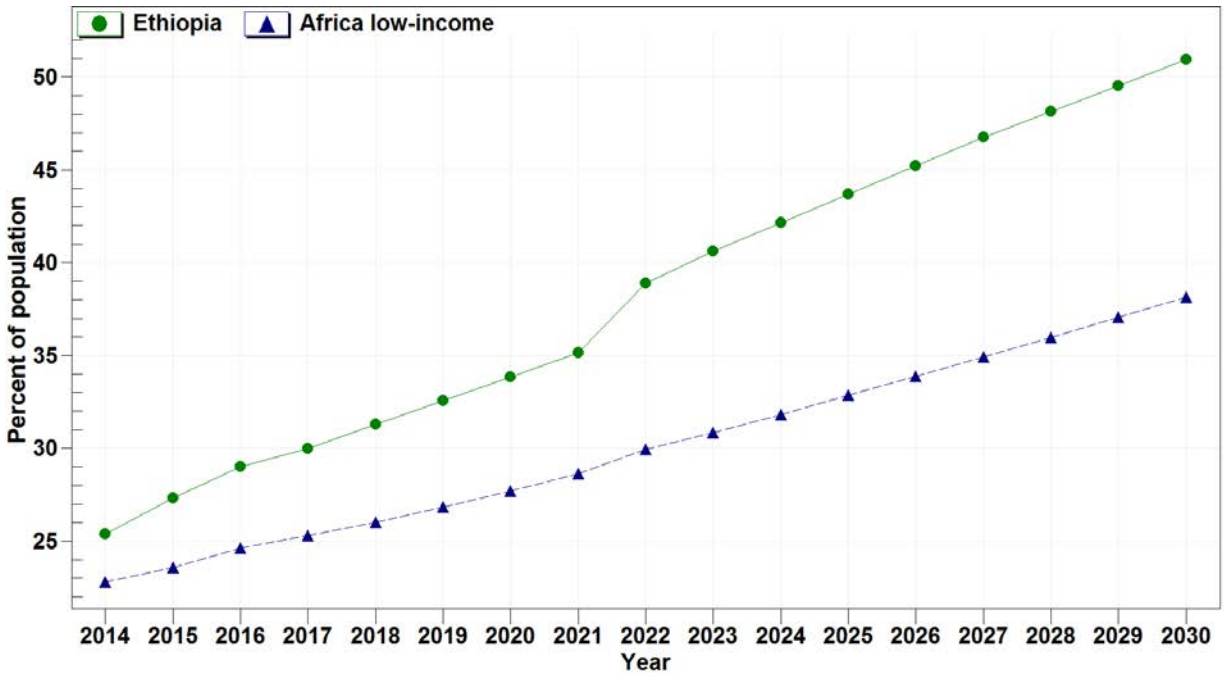
Ethiopia currently has higher levels of access to electricity (as a percentage of the population) than other low-income countries in Africa. The planned expansion of hydropower could significantly widen that gap, provided that electricity production is consumed domestically and not exported. While Ethiopia has publically announced ambitious plans to eventually export electricity, there is less certainty about the planned increase in domestic access. Even if transmission lines are extended to previously underserviced areas, it may not be possible for residents in those areas to afford to pay for that

[245] Grand Ethiopian Renaissance Dam Fact Sheet, International Rivers, 2014. https://www.internationalrivers.org/resources/the-grand-ethiopian-renaissance-dam-fact-sheet-8213
[246] This is explained in more detail in the next section.
[247] Electricity and education: The benefits, barriers, and recommendations for achieving the electrification of primary and secondary schools, UNDESA, December 2014, https://sustainabledevelopment.un.org/content/documents/1608Electricity%20and%20Education.pdf

electricity, meaning the GoE would effectively be using the revenues from exported electricity to subsidize domestic consumption.

On its Current Path, Ethiopia is expected to widen the gap between itself and other low-income African countries in terms of access to electricity, but roughly 50% of the population (i.e. 70 million people) will still be living without access to electricity in 2030.

Figure 8.b: Electricity access (total), Ethiopia and low-income African countries, 2014-2030



Source: IFs v 7.27. Historical data from WDI

Given its potential hydropower capacity, it makes sense that Ethiopia would invest heavily in groundbreaking projects. But, that initial capacity investment still needs to be accompanied by a corresponding increase in access to electricity if human development outcomes are to improve appreciably. However, the lack of transparency around transmission lines, power purchase agreements and domestic consumption raises a degree of uncertainty about the ability of the GoE to successfully realize its vision of being a net energy exporter, while simultaneously maintaining momentum on other, infrastructure related, human development indicators.

8.3 Grand Ethiopian Renaissance Dam

Once complete, the GERD will be the largest hydropower facility in Africa, and among the largest in the world. There is no available "official" cost benefit analysis, but a Massachusetts Institute of Technology (MIT) feasibility study of the GERD offers some cost benefit figures, as do a number of media articles about the dam.[248] The governments of Ethiopia, Egypt and Sudan have commissioned a cost-benefit analysis to be conducted by two French consultancies Artelia and BRL groups, but this work has not been completed or released at the time of writing.[249] Ethiopia has already begun filling

[248] H Jameel, Massachusetts Institute of Technology, 2014, jwafs.mit.edu/sites/default/files/documents/GERD_2014_Full_Report.pdf ; E Kebede, Financing the Grand Renaissance Dam, http://nazret.com/blog/index.php/2015/03/30/ethiopia-the-financing-of-the

[249] Sudan Tribune, Sudan, Egypt and Ethiopia sign contracts on GERD Dam impact studies, 2016, sudantribune.com/spip.php?article60289

the dam, and some reports claim the structure is already close to 70% finished.[250] Ethiopia also has several other planned hydropower projects already completed or in the pipeline.[251]

According to available estimates, Ethiopia will increase its annual generation capacity by roughly 29,000 GWh/yr from its 2016 level of about 5,000 GWh/yr (more than a 270% increase), by around 2022.[252] The MIT report mentions that GoE could expect to earn as much as US$1 billion per year on electricity exports once all the projects are completed and on-line.[253] The GoE itself expects to earn around US$600 million per year by 2020, according to the GTP. Although the dam will likely be completed in 2017, it may take five or more years to fill, so the project will not start running at near capacity until at least 2022.

Assuming the remainder of the construction (including transmission lines) goes as planned, Ethiopia will likely become a net exporter of electricity in less than five years. The GoE has already started construction of transmission lines for export and signed purchase agreements with neighboring countries, including a 500MW deal with Kenya, a 60MW deal with Djibouti and a 100MW deal with Sudan. The GoE also has contracts with South Sudan, Tanzania (with plans for transmission lines to those countries) as well as Rwanda and Yemen and is negotiating a contract with Uganda as well.[254] Provided this exported power is met with an accompanying expansion in domestic access to – and, importantly, the means to purchase – electricity, the planned hydropower projects could be a big boon for Ethiopia.

The GERD is being financed through a combination of mechanisms, few of which are transparent. Without an official cost-benefit analysis, it is difficult to gauge how much the GoE will have to ultimately spend on the dam itself, or how much it will spend on transmission lines to neighboring countries, for which publically available data is also sparse. The contract with the Italian construction firm was signed for US$4.8 billion and the GoE has raised sizeable sums (though likely not enough) through public bond issues.[255] It remains unclear how much of the project will ultimately be funded by debt, and how much will come from direct public spending. The lack of information complicates forecasting the extent to which the associated expenditure will crowd out other priorities, such as spending on health and education, as well as the long-term impacts on government finance.

The GERD project has also raised concerns from downstream riparian states that water from the dam will be diverted toward irrigation for agricultural production in Ethiopia or that water levels in the Nile will be affected when the dam is being filled. Neighboring Egypt is a chronically water scarce country that depends heavily (around 60% of Egypt's total water supplies). on water originating in Ethiopia. Egypt claims it is treaty-protected from overexploitation, but Ethiopia disputes the legitimacy of those agreements. There are also environmental concerns; numerous sources have identified close coordination with the operations of the High Aswan Dam's release as a critical safeguard to ensure that no long-term damage is done to the Nilotic ecosystem.[256]

[250] A Abbas, Ethiopia close to finishing 70% of Grand Ethiopian Renaissance Dam, Daily News Egypt, 2016. www.dailynewsegypt.com/2016/05/28/ethiopia-close-to-finishing-70-of-grand-ethiopian-renaissance-dam/
[251] Please see the MIT report for a full list of planned hydropower projects in Ethiopia.
[252] T Mogessie, All Africa, July 2016, http://allafrica.com/stories/201607051153.html
[253] This figure is based on Ethiopia exporting roughly 15 000 GWH/yr at US$0.07 per KWH.
[254] EG Woldegebriel, Ethiopia to step up role as power exporter, Reuters, 2015. www.reuters.com/article/us-ethiopia-energy-idUSKBN0NY1EK20150513
[255] Salini Impreglio is the name of the Italian construction firm. http://www.salini-impregilo.com/en/projects/in-progress/dams-hydroelectric-plants-hydraulic-works/grand-ethiopian-renaissance-dam-project.html
[256] H Jameel, Massachusetts Institute of Technology, 2014. jwafs.mit.edu/sites/default/files/documents/GERD_2014_Full_Report.pdf ; E Kebede, Financing the Grand Ethiopian Renaissance Dam Fact Sheet, International Rivers, 2014. https://www.internationalrivers.org/resources/the-grand-ethiopian-renaissance-dam-fact-sheet-8213.

8.4 Roads

The provision of and access to a quality road network is essential for economic development, commerce, and productivity, especially for a largely rural and landlocked country like Ethiopia. Moreover, lack of access to transportation infrastructure, particularly in rural areas, prevents children from attending school, and can limit access to health care.[257] Improved road networks lower transportation costs, which can lower barriers to entry for domestic manufacturing firms, attract FDI, and increase the flow of trade.[258] Furthermore, improved transport infrastructure is a key factor for improving agricultural production and reducing loss.

Road networks also play a key role in improving agricultural production and reducing loss. Improved transport infrastructure can connect farmers to markets, reduce the cost of farming inputs like fertilizer and irrigation systems, and help reduce transport time (thereby reducing production losses). A 2010 report from the Ministry of Agriculture identified transportation as an important component of post-harvest food losses in Ethiopia, estimated to cost up to 30% of total crop production.[259] The minimization of post-harvest pre-consumption loses in the agricultural sector should likely be part of a policy framework designed to address poverty, hunger and food security, such as the GoE's Plan for Accelerated and Sustained Development to End Poverty (PASDEP). Moreover, increases in market access and reduction in input costs could help increase yield and lower food prices, further reducing food security pressures and alleviating poverty.

Ethiopia has an underdeveloped road network. The road network has expanded by roughly 20,000 kilometers since 2010 (an increase of about 40%) its total road network is still well below that of Kenya (a country half the size), as shown in Figure 8.c below. Although Ethiopia is forecast to see the most significant road network expansion (proportionally) of the comparison countries over the forecast horizon, it is still forecast to have fewer kilometers of road than Tanzania, and less than half the length of Kenya in 2030. The GTP II aims to double the total length of roads in the country, from about 110,000 kilometers to about 220,000 kilometers by 2020. By contrast, IFs forecasts a much less rapid expansion to about 115,000 in 2030.

Figure 8.c: Total road length (in kilometers), Ethiopia and regional peers, 2010-2030

	2016	2021	2030
Ethiopia	69,000	79,900	113,000
Kenya	200,000	222,900	242,500
Rwanda	14,900	16,700	19,400
Tanzania	91,800	99,300	119,000
Uganda	74,400	80,300	88,400

Source: IFs v 7.27. Historical data from WDI

Improving the quality of road infrastructure would, among other things, help to stem the rising number of deaths from traffic accidents. Road fatality rates in Ethiopia are currently below other low-income African countries (see Figure 8.d), but traffic deaths are increasing much more rapidly, reaching an

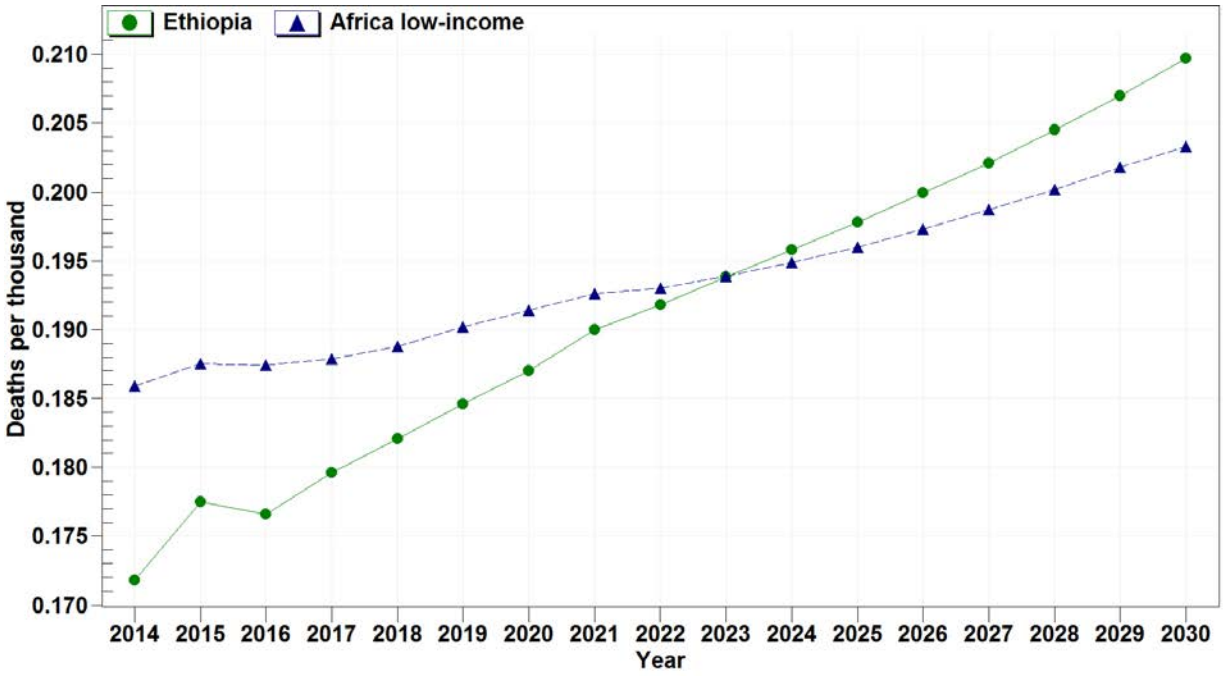
[257] D Rothman et al, Patterns of Potential Human Progress: Building Global Infrastructure,4, 2014, http://pardee.du.edu/sites/default/files/PPHP4_Full_Volume_Corrected.pdf

[258] K Mbekeani, Infrastructure, Trade Expansion and Regional Integration: Global Experience and Lessons for Africa, Journal of African Economies, January 2010; C Hulten et al, A Study of the Indian Manufacturing Industry, World Bank, 2006.

[259] Ethiopia Ministry of Agriculture, Ethiopia's Agricultural sector policy and investment framework, 2010, gafspfund.org/sites/gafspfund.org/files/Documents/Ethiopia_5_of_6_CAADP_Post_compact_Investment_Plan_(PIF)_0.pdf The report also identified storage and pest control as other factors in post-harvest food waste.

inflection point in the early-2020s. While traffic deaths in low-income African countries remain relatively flat, death rates in Ethiopia are expected to increase steadily throughout the forecast.

Figure 8.d: Death rates from traffic accidents, Ethiopia and other low-income African countries, 2014-2030



Source: IFs v 7.27. Historical data from WHO

8.5 ICT

IFs measures access to ICT mainly in terms of subscriptions to various products, which does not adequately account for the rise of pay-as-you-go telecommunications services over the last decade or so. Despite that, there are still some similarities between IFs data and estimates and the targets in GTP II, including mobile broadband. ICT is one of the few areas where technological advancements made over the last few decades in the rest of the world allows for true leapfrogging on the continent. Countries in Africa can expect growth in access to ICT infrastructure that is virtually unprecedented and that will lead to transformational shifts in the way development is understood in theory and approached in practice.[260]

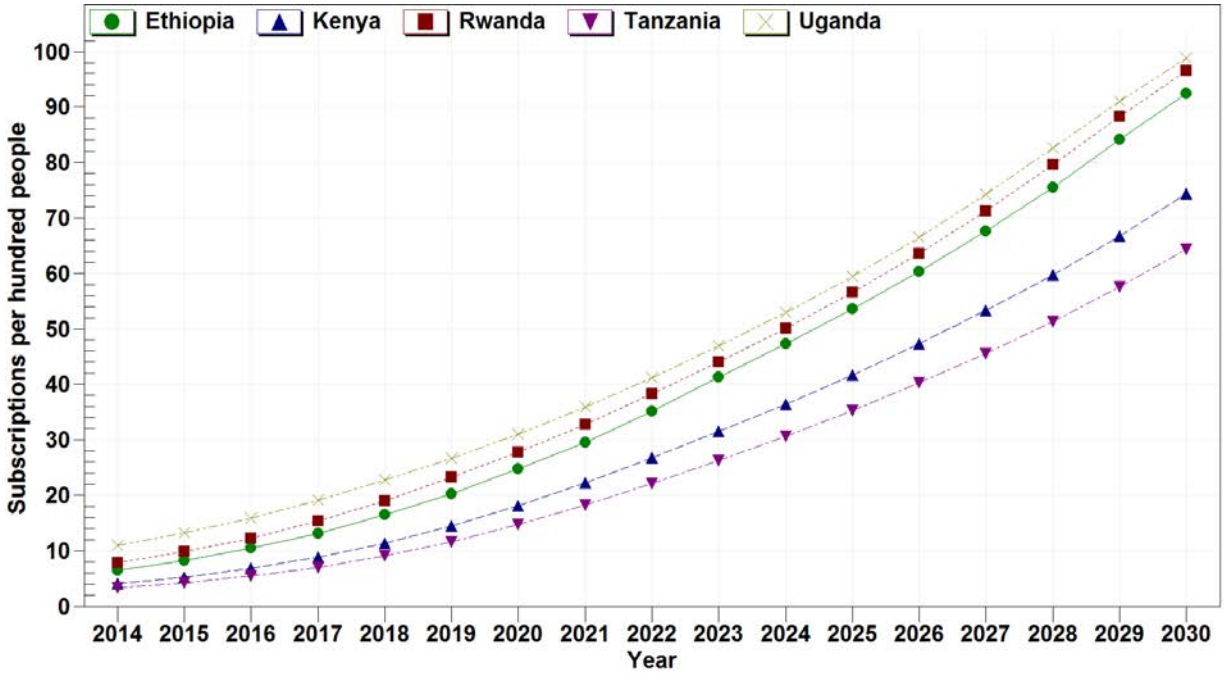
A major issue with ICT in Ethiopia is the lack of competition, given the complete control of the telecommunications industry by the GoE and the subsequent lack of private investment in this sector. While access rates have increased in recent years, quality and availability of service remains a significant constraint to economic development. The internet is generally slower than in other African countries, access to some of the most popular social media sites (Facebook, Twitter, etc.) is periodically restricted, emails are monitored and, since the domestic media is underdeveloped, there is a lack of reputable opposition reporting. The restriction of access to information by the GoE is not only harmful to the development of an informed polity, but also deters investment from the private sector. Although modelling liberalization of the telecoms sector is outside the scope of this report, it is nonetheless worth considering as a mechanism to attract FDI and move toward a more economically inclusive society (also see Chapter 9 on governance).

[260] M Kimyeni and N Moyo, Leapfrogging Development through Technology Adaptation, The Brookings Institution, 2011.

With that caveat, there are some areas where a thriving and open ICT sector could unlock growth. A 2014 report from the World Bank specifically identified health and agriculture as two sectors that would benefit from more advanced ICT infrastructure in Ethiopia.[261] That report identified the development of mobile applications for smallholder farms and the use of remote imagery sensoring to monitor weather patterns as technologies that could potentially increase the productivity of the agricultural sector and reduce its vulnerability to shocks. The same World Bank report also identified electronic medical records as a way to reduce patient waiting times and streamline the delivery of health services, along with more sophisticated Geographic Information Systems (GIS) mapping that could help improve the response to the outbreak of disease and aid with the distribution of medical supplies.[262] While applying ICT in new and innovative ways could be a way to improve service delivery and facilitate growth, the most pressing concerns around ICT in Ethiopia currently center on state monopolization and restricted access.

In terms of mobile broadband, Ethiopia is about on pace with its peers. In 2016, Ethiopia had around 10 subscriptions (per 100 people) and by 2030 is forecast to have around 90 subscriptions per hundred. Along the Current Path, Ethiopia could have a greater subscription rate than Kenya or Tanzania in 2030, but not as high as Rwanda or Uganda.

Figure 8.e: Mobile broadband subscriptions, Ethiopia and regional peers, 2014-2030



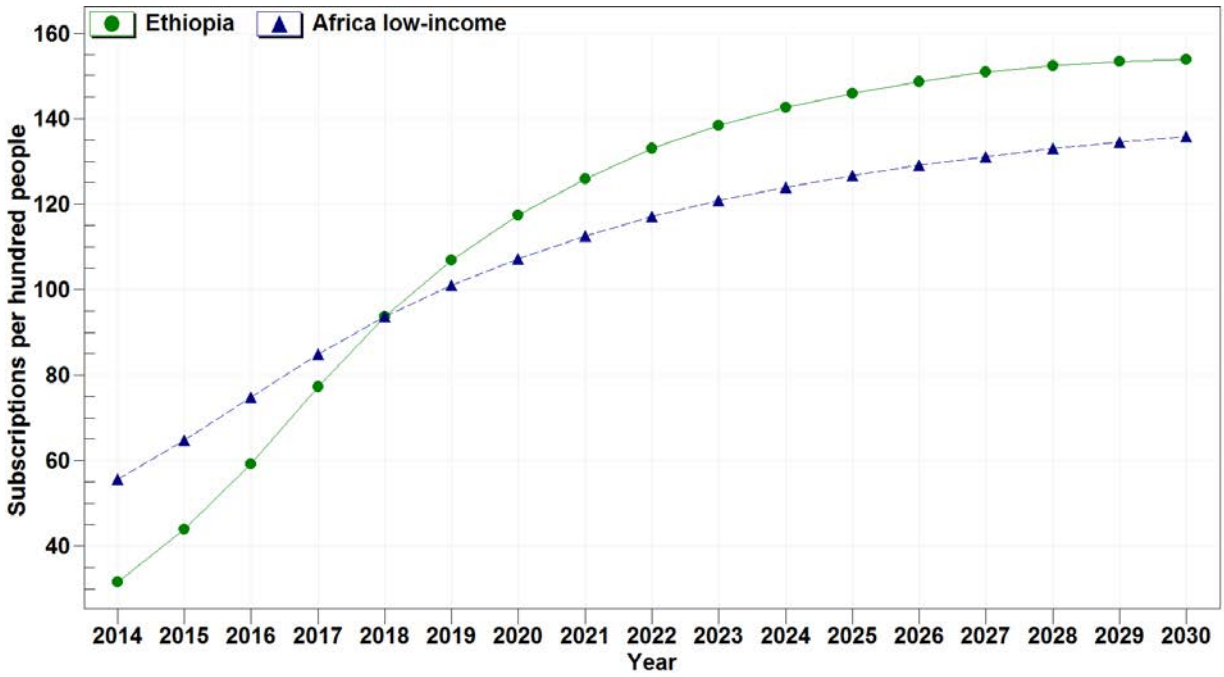
Source: IFs v 7.27. Historical data from International Telecommunication Union

A similar trend holds for access to fixed broadband; Ethiopia tracks closely with low-income African countries in the near-term but beginning in the mid-2020s it accelerates access above that of its low-income African peers. Meanwhile, trends for mobile phone subscriptions look different, but rapid progress is again evident. Currently, Ethiopia underperforms relative to other low-income African countries, but IFs forecasts a significant acceleration of mobile phone usage over the next ten years. In the Current Path, Ethiopia will overtake other low-income African states around 2019 and will continue to widen the gap until the mid-2020s, when the other low-income countries begin to catch up.

[261] M Lixi and M Dahan, ICT as an Enabler of Transformation in Ethiopia. The World Bank, 2014, openknowledge.worldbank.org/bitstream/handle/10986/20076/892890WP0P12390IC00FINAL90060ICTWeb.pdf?sequence=1&isAllowed=y

[262] Ibid. p. X

Figure 8.f: Mobile phone subscriptions, Ethiopia and low-income African countries, 2014-2030



Source: IFs v 7.27. Historical data from International Telecommunication Union

8.6 Water, Sanitation and Hygiene

The details and forward linkages of WASH access are covered in more detail in Chapter 6 on health. But, because water and sanitation access is a component of the infrastructure model in IFs, a brief summary is included here as well.

From 2000 to 2015, Ethiopia made more rapid progress on access to improved sanitation than any other African country, improving access by roughly 19 percentage points. Despite that progress, Ethiopia still ranks 32nd among 54 African countries and 162nd in the world in terms of the percent of its population with access to improved sanitation facilities in 2016.

Ethiopia has also rapidly facilitated access to clean water, but still ranks among the lowest in the world (174th globally and 45th out of 54 in Africa) in terms of the percent of its population with access to improved drinking water.[263] Ethiopia has also expanded access to clean water more rapidly than most other African countries, but because it began from such a low base overall access rates are still very poor. Among the regional comparison countries, only Tanzania has a smaller proportion of people (44%) living without access to clean water.

8.7 Irrigation

Ethiopia has significantly expanded the total land equipped for irrigation over the last 10 to 15 years. According to FAO's AQUASTAT database, Ethiopia had about 650,000 hectares equipped for irrigation in 2015, up from a little more than 150,000 in 2001.[264] Of the total land equipped for irrigation, approximately 70% is actually irrigated. The GTP II plans to increase the land under irrigation

[263] The AFP team is currently working on a project to more fully develop the forward linkages of irrigation to other parts of the model.
[264] FAO AQUASTAT. www.fao.org/nr/water/aquastat/countries_regions/ETH/index.stm

by nearly 200,000 hectares by 2020, an increase of around 12%.[265] Although this is feasible under Ethiopia's current land use considerations and constraints, agricultural production is often located far away from areas with consistent rainfall and an expansion of irrigation on the scale of the GTP II would involve significant infrastructure investment. Because so much money is being spent on hydro-electric power, it is uncertain if the GoE is able to make the necessary investments to meet that goal on schedule.

8.8 Infrastructure finance

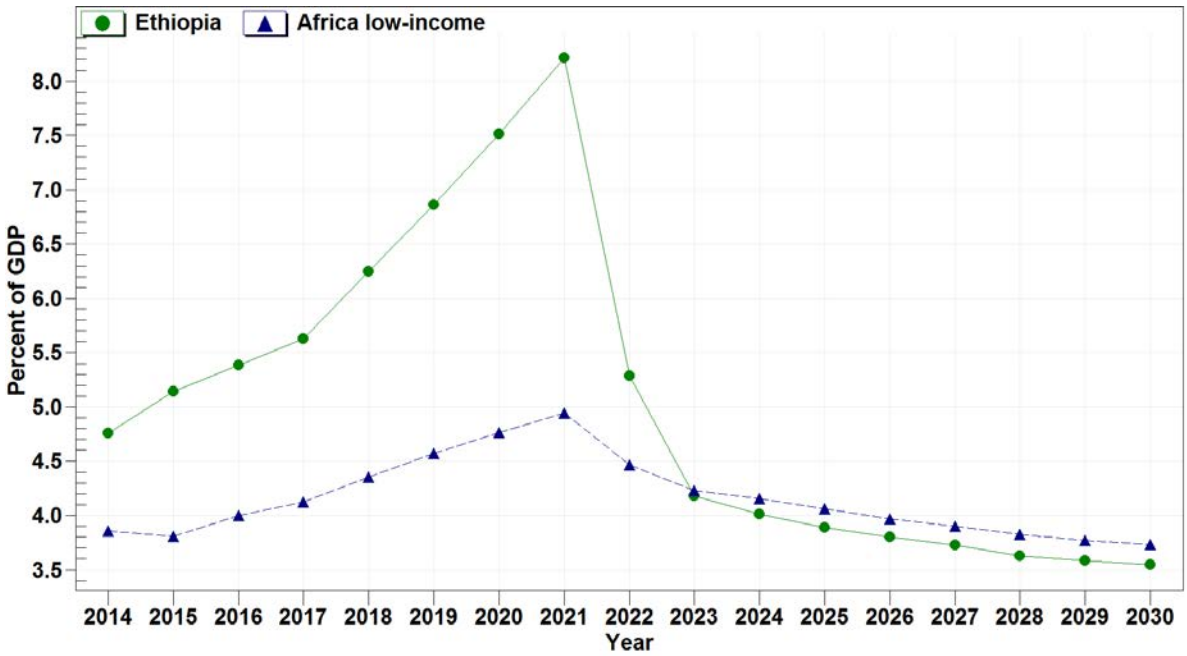
The GoE has been investing heavily in infrastructure and that trend is forecast to continue, at least until the GERD is complete around 2021. In 2016, Ethiopia is spending nearly two percentage points (as percent of GDP) more on infrastructure than other low-income African countries and that gap is expected to widen significantly between now and when the GERD is expected to come online. This is because the GoE has to cover the cost of the dam, as well as the construction of transmission lines and maintenance. There are also several other hydropower projects that are nearing completion. Therefore, we have estimated additional infrastructure spending at roughly US$8.5 billion through to 2030. Much of this will be recovered through the revenues generated from exporting electricity, but it is important to recognize that these investments will necessarily draw funds from other sectors of core infrastructure and other areas of human development such as health and education.

The GoE has raised some funds through public bond issuances, but at this time it is unclear how much of the dam they are planning to finance through debt, and how much through the public purse (see Chapter 7 for more details). This will have implications for government expenditures across the major categories, including infrastructure. The general trend for infrastructure spending (as a percent of GDP) is that it will increase sharply in the near-term (as a function of increased spending on the GERD), and will then decline and eventually dip below its low-income African peers. This trend in infrastructure spending is more or less consistent with development trends. Because a stock of infrastructure is generally costly to construct initially, but relatively less expensive to maintain, countries tend to see total spending on infrastructure (as a percent of GDP) decline over time.[266]

[265] Ibid

[266] D Rothman et al, Building Global Infrastructure: Forecasting the next 50 years, Patterns of Potential Human Progress, 4, Boulder: Paradigm Publishers, 2014.

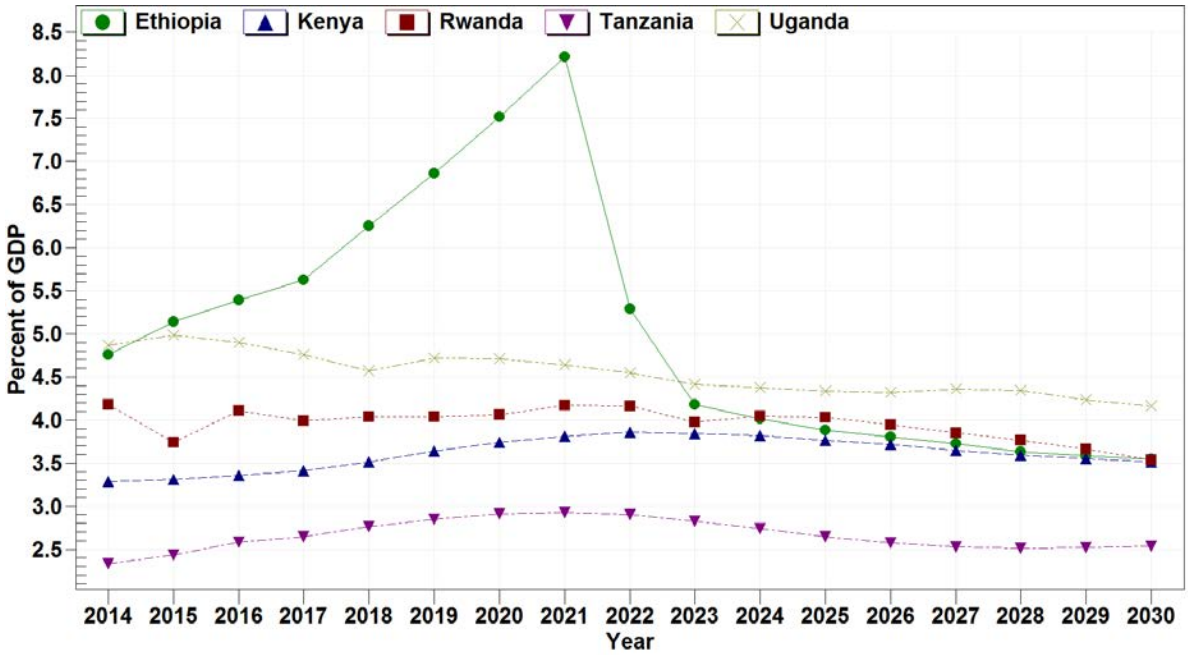
Figure 8.g: Government spending on infrastructure (percent of GDP), Ethiopia and low-income African countries, 2014-2030[267]



Source: IFs v 7.27. Historical data from World Bank

Infrastructure spending as a share of GDP is expected to decline, but because GDP will increase in absolute terms, total spending on infrastructure is also expected to increase over time. By 2030, Ethiopia is expected to spend nearly US$500 million more than the next biggest spender (Kenya) in the regional comparison group.

Figure 8.h: Government spending on infrastructure (US$ billions), Ethiopia and regional peers, 2014-2030



Source: IFs v 7.27. Historical data from World Bank

[267] The large increase in infrastructure spending is a result of funds being directed at GERD and other large infrastructure projects and the subsequent decline in spending once those projects are complete

The highest levels of infrastructure spending are currently being directed at electricity (mostly dam construction), followed by roads and then mobile broadband. The forecast anticipates that spending on broadband and roads will become the primary destinations for infrastructure spending after completion of the GERD in the early 2020s and remain the leading destinations until 2030.

Other low-income African countries are spending far less (as a percent of GDP) on electricity and more on other areas of core infrastructure, such as roads or water and sanitation. If Ethiopia is not able to compensate for the additional funds set aside for hydropower and electricity, there could be tradeoffs in other areas of human development. This problem will be complicated in the context of declining foreign aid budgets, as discussed in Chapter 9. For example, other low-income African countries are forecast to increase spending on improved sanitation more rapidly than in Ethiopia over the course of the forecast.

8.9 Key takeaways

- Hydropower could be a major driver of economic growth going forward, but it is still unclear how much power will actually be generated, how much will be consumed domestically, when the projects will come online, how it will affect relations with downstream riparian states (notably Egypt and Sudan) and if cost estimates will prove accurate
- Hydropower projects have the potential to draw expenditures away from other areas of core infrastructure (as well as health and education) and the GoE will need to be diligent in order to maintain progress in some of those key areas of human development.
- Liberalization of the ICT sector will be instrumental in attracting foreign investment and will be a big step toward a more open and inclusive economy.

8.10 Infrastructure interventions

8.10.1 Electricity Access

This intervention explores the impact on human development of expanding domestic electricity consumption beyond what is forecast in the Current Path.

The electricity access intervention increases the proportion of people with access to electricity by 2030 by nearly 17%, from about 50% of the total population in the Current Path to about 60% in the electricity access intervention. Because access to electricity is already near 100% in urban areas, the majority of that increase is directed at rural households, where access increases by about 35% relative to the Current Path forecast in 2030. A benefit of increased access to electricity is that is decreases reliance on traditional fuel sources, which are a major cause of respiratory disease and infections in certain situations. The Electricity Access intervention reduces the number of disability adjusted life years (DALYs) from respiratory infections and diseases by about 150,000 in 2030 when compared to the Current Path.

8.10.2 Road Network

Ethiopia also has an underdeveloped road network, which may complicate efforts to attract foreign investment in sectors that the GoE is interested in developing, such as manufacturing and agro-processing. A poor road network also has negative impacts on the agricultural sector, as a significant portion of post-harvest food waste has been attributed to transportation by the Ministry of Agriculture.

The road network intervention increases the total amount of roads (in kilometers) by roughly 30% in 2030 relative to the Current Path, and the amount of paved roads by approximately 25%. This

intervention also has a slight impact on GDP, increasing it by a cumulative total of about US$200 million by 2030.[268]

8.10.3 Traffic Fatalities

The IFs forecast indicates that traffic fatalities are a rapidly growing problem in Ethiopia. In contrast to other low-income African countries, where traffic deaths remain relatively constant to 2030, Ethiopia is expected to see an increase in road deaths of a little less than 25% in the Current Path forecast. There are many factors behind this increase, including a rapidly urbanizing population, an underdeveloped road network and rapid economic growth that has fueled growing demand for private transportation. It is also possible that investment in hydropower has absorbed some of the public expenditure that might have otherwise been spent improving roads, which would also contribute to the problem.

This intervention decreases the number of traffic fatalities by a cumulative total of more than 45,000 deaths between 2017 and 2030. The intervention also reduces the number of DALYs from traffic accidents by nearly 300,000 in 2030 and adds a cumulative total of more than US$2 billion to GDP over the course of the forecast.

8.10.4 Mobile Broadband

The story of ICT in Africa is one of a rapid acceleration of access. In Ethiopia, however, the story is as much about freedom of access and state monopolization of the industry, as it is about rolling out more sophisticated networks. That said, advancing the technological sophistication of ICT is important and will have positive effects on many areas of human development. In this intervention, access to mobile broadband increases by roughly 20%, raising the number of subscriptions per 100 people to 111 in 2030, compared to 92 on the Current Path.

This intervention widens the gap between Ethiopia and other low-income African countries from ten subscriptions (per hundred people) to more than 28 by 2030. This intervention also increases GDP by a cumulative total of just under US$500 million by 2030.

8.10.5 WASH

Despite substantively improving WASH access since 1990, Ethiopia still ranks near the bottom in terms of the proportion of people who lack access to improved facilities, so much work remains to be done. In the water intervention, access to clean drinking water improves by about nine percentage points from 2017 to 2030, from 65% access in the Current Path to 74% in the intervention. In the sanitation intervention access to improved sanitation will have increased by about eight percentage points by 2030, from 46% access in the Current Path to about 54% in the intervention.
The impacts of these interventions are explored in more detail in the health section but are presented here as a way of illustrating the trade-offs across different types of infrastructure. It should also be noted that the WASH interventions are not included in the combined infrastructure intervention outlined below.

[268] The gains from this scenario accelerate significantly after 2030, with the cumulative total by 2040 adding up to more than US$6 billion.

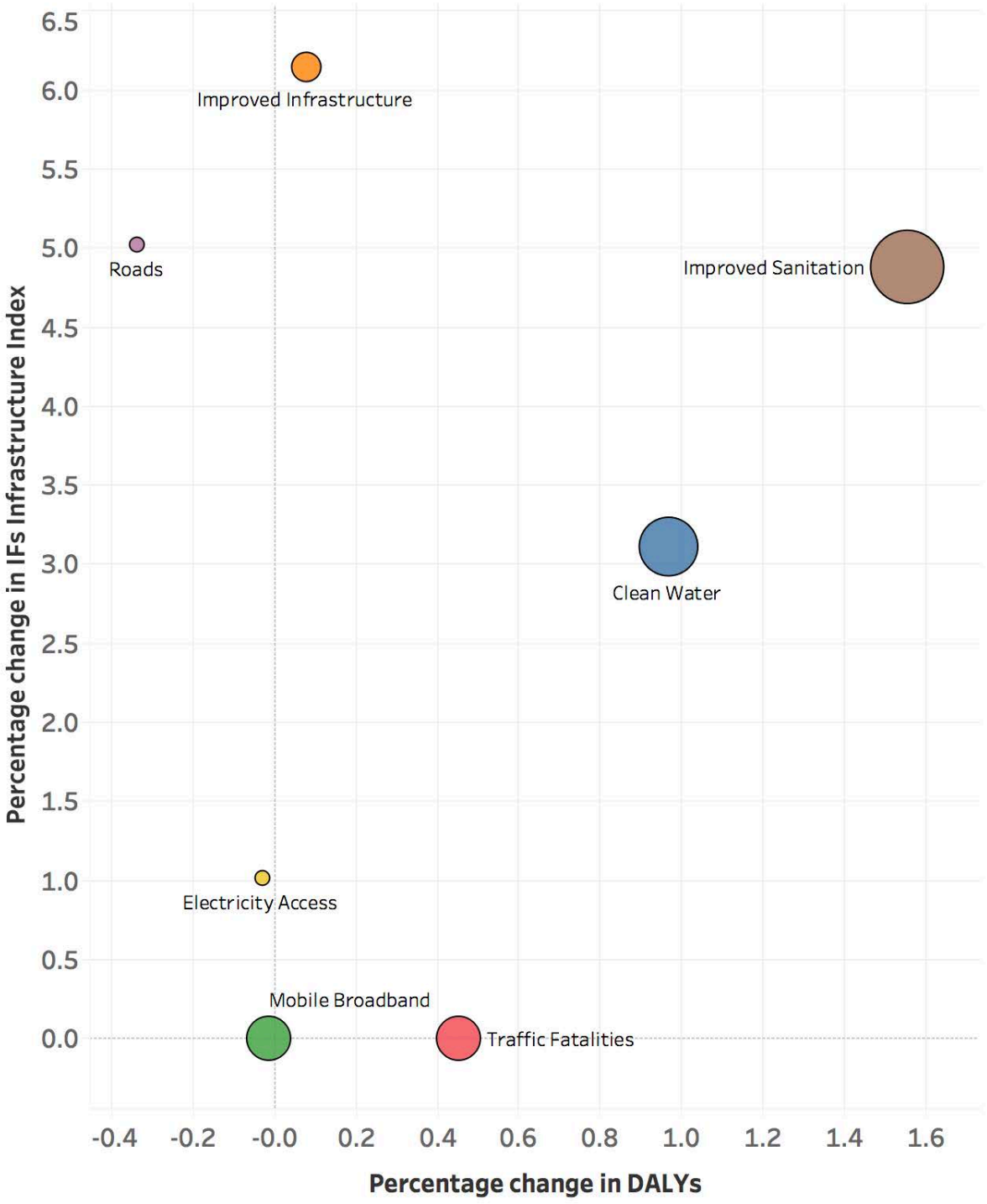
8.10.6 Improving Infrastructure

The Improving Infrastructure scenario is a composite of the above components (save for WASH), with the interventions applied in the same direction and with the same magnitude. This scenario has the largest impact on the IFs infrastructure index, but underperforms relative to the other interventions in terms of economic impact. Ranked in order of cumulative increase in GDP, the Improving Infrastructure scenario comes behind Improved Sanitation (best growth), Clean Water, Mobile Broadband and Traffic Fatalities.

Figure 8.i explores how these interventions play out across different indicators by 2030. The x-axis illustrates the change in overall morbidity and mortality (in millions of years) using the DALYs measure. The y-axis indicates the percent change in IF's Traditional Infrastructure Index, which is a composite index measuring the level and quality of physical infrastructure (water and sanitation, transportation, and electricity), where a positive value indicates that a country ranks above the global average, and a negative value indicates a below-average level of traditional infrastructure.[269] Bubble size in this graphic represents the cumulative change in GDP by 2030 relative to the Current Path.

[269] Despite showing increases on the Infrastructure Index, Ethiopia still ranks well below the global average in each scenario

Figure 8.i: Impact of infrastructure interventions on selected indicators in 2030



Source: IFs v 7.27

CHAPTER 9: GOVERNANCE

9.1 Introduction and scope

The difference between a productive demographic dividend and a potentially destabilizing youth bulge will be determined, in part, by the ability of the government to expand access to basic services, provide health care, ensure that children remain in school and that they have opportunities for employment after graduation. Therefore, the efficiency and capacity of government to roll out services in a non-discriminatory manner across the country is important, as are the perceptions that accompany service delivery among an increasingly connected and better educated population. The nature of governance, its style, structure, and the extent to which it is able to respond to demands that follow the progress achieved over the last two decades is likely to emerge as a paramount consideration in determining Ethiopia's future prospects. On the one hand, Ethiopia may emerge as a healthier, more prosperous, food-secure country and a source of stability and growth in the region. Alternatively, continued authoritarian and exclusive governance could eventually slow economic growth and lead to a less resilient society.[270]

Against that background, this chapter has the following sections:

- Conceptualizing governance in IFs
- Regional and internal security including history, trend and forecasting instability
- Capacity including government revenues, corruption and effectiveness
- Inclusion including comparative perspective, results from various other datasets and gender and ethnicity
- Key takeaways
- Governance interventions

9.2 Conceptualizing governance in IFs

Broadly speaking, the governance of a country refers to the way society organizes and manages itself and the extent to which the government is perceived to be legitimate domestically and accepted as such by the broader international community. For the purposes of modelling and forecasting governance, IFs conceptualizes governance as having historically developed along three primary transitions in line with broad modernization theory: a security transition, followed by a capacity transition and finally a transition towards greater inclusion.[271]

The security transition "begins with overcoming anarchy through the consolidation of territorial governing authority to establish sovereignty."[272] After achieving sovereignty over a defined territorial area and a monopoly on the use of legitimate violence, governments can shift their focus to building capacity to effectively administer that territory. The third transition is one of inclusion, where a society develops the social contract required to sustain progress, and is generally associated with higher levels of income and average levels of education. Although governance is conceptualized largely as a series

[270] Nick Cheeseman, Democracy in Africa: success, failures and the struggle for political reform, New York, Cambridge University press, 2015
[271] Barry B Hughes, Devin K Joshi, Jonathan D Moyer, Timothy D Sisk and José Solórzano, Patterns of Potential Human Progress volume 5: Strengthening Governance Globally, Paradigm, Oxford University Press, Boulder, 2014, p 6; and J Cilliers and J Schunemann, The future of intrastate conflict in Africa - more violence or greater peace? Institute for Security Studies, paper 246, May 2013, 10.
[272] Hughes et al, Strengthening Governance Globally: 2014, 6.

of sequential transition, in practice, progress along each of the three dimensions occurs contemporaneously and often in fits and starts – as the recent history of Ethiopia demonstrates. From a modernization perspective, pressures for inclusive governance tend to occur after states have made the security and capacity transition. However, other pressures for inclusive governance (stemming from domestic constituents, pressure from international rights groups or development partners) can also lead to advances in inclusion and the broad global trend is towards greater inclusion at lower-levels of income.[273]

IFs models and forecasts each of the three dimensions along an index from 0 to 1. A composite governance index is composed of a simple average of the three.[274] In addition to a probabilistic forecast of conflict, security is modeled based on vulnerability to intrastate conflict as set out below.[275] Capacity is measured as a function of the ability of the state to mobilize revenue, the level of perceived corruption, and standardized measures of government effectiveness.[276] Inclusion represents a measurement of regime type, the degree of political and economic freedom, and gender equality.[277] Figure 9.a below shows Ethiopia's score across each of the three dimensions of governance in comparison to other low-income countries in Africa as well as to OECD countries in 2016. Ethiopia falls short (as expected) when compared with OECD countries, but is in line (though slightly below) the average scores of other low-income African countries. Ethiopia's scores are highest in the security dimension, followed by inclusion and then capacity.

[273] See J Cilliers, The future of democracy in Africa, African Futures Paper 19, Institute for Security Studies, October 2016, 16-17, https://issafrica.org/research/papers/the-future-of-democracy-in-africa

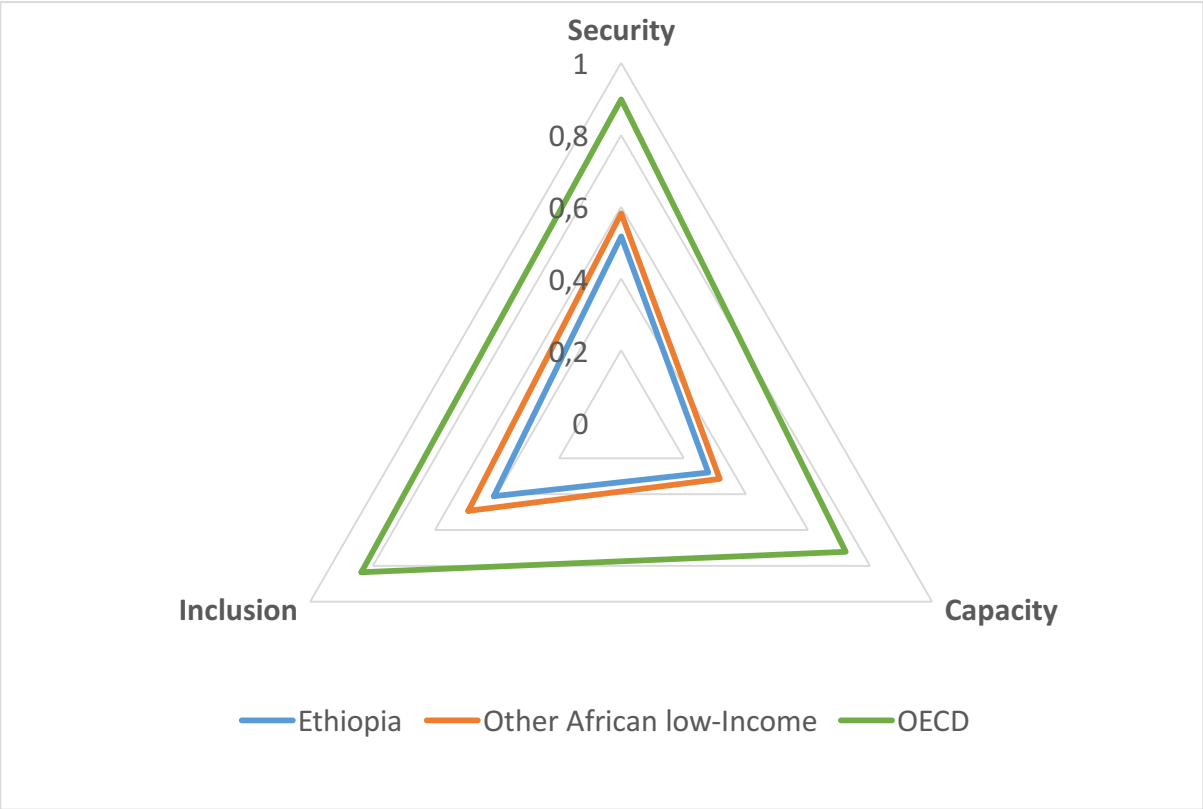
[274] Ibid, Chapter 2 for additional detail. IFs also forecasts several indices related to governance, including the World Bank measurement of government effectiveness and regulatory quality but these do not drive the forecasts.

[275] Probability of intrastate conflict is a function of past conflict, neighborhood effects, economic growth rate (inverse), trade openness (inverse), youth bulge, infant mortality, democracy (inverted-U), state repression (inverse), and external intervention. Vulnerability to intrastate conflict is a function of energy trade dependence, economic growth rate (inverse), urbanization rate, poverty level, infant mortality, undernutrition, HIV prevalence, primary net enrollment rate (inverse), intrastate conflict probability, corruption, democracy (inverse), government effectiveness (inverse), freedom (inverse), and water stress. Hughes et al., Forecasting Governance, 81.

[276] Government revenues are a function of past revenue as percentage of GDP, GDP per capita, and fiscal balance (inverse). Corruption is a function of past corruption level, GDP per capita (inverse), energy trade dependence, democracy (inverse), gender empowerment (inverse), and probability of intrastate conflict. Ibid.

[277] Democracy is a function of past democracy level (using Polity), youth bulge (inverse), gender empowerment, and dependence on energy exports (inverse). Gender empowerment is a function of past gender empowerment level (using UNDPs GEM), GDP per capita, youth bulge (inverse), and primary net enrollment rate. Ibid.

Figure 9.a: IFs governance triangle, Ethiopia, other low-income Africa, and OECD countries, 2016



Source: IFs v 7.27

These dimensions are expected to steadily improve along Ethiopia's Current Path. By 2030, Ethiopia's overall governance score (an average of the three components) is forecast to improve from 0.4 in 2016 to 0.45 by 2030, roughly the same level as Pakistan today. Ethiopia's overall governance score is forecast to improve more rapidly than other low-income African countries (Figure 9.b).

Figure 9.b. IFs Governance Index, Ethiopia, other low-income African countries, and OECD countries, 2016 and 2030

	Security			Capacity			Inclusion		
	2016	2030	% Change	2016	2030	% Change	2016	2030	% Change
Ethiopia	0.5	0.6	5	0.3	0.3	2.7	0.4	0.5	6
Africa low-income	0.6	0.6	4.8	0.3	0.3	2.2	0.5	0.5	1.2
OECD	0.9	0.9	1.7	0.7	0.8	11.6	0.8	0.9	2.2

Source: IFs v7.27

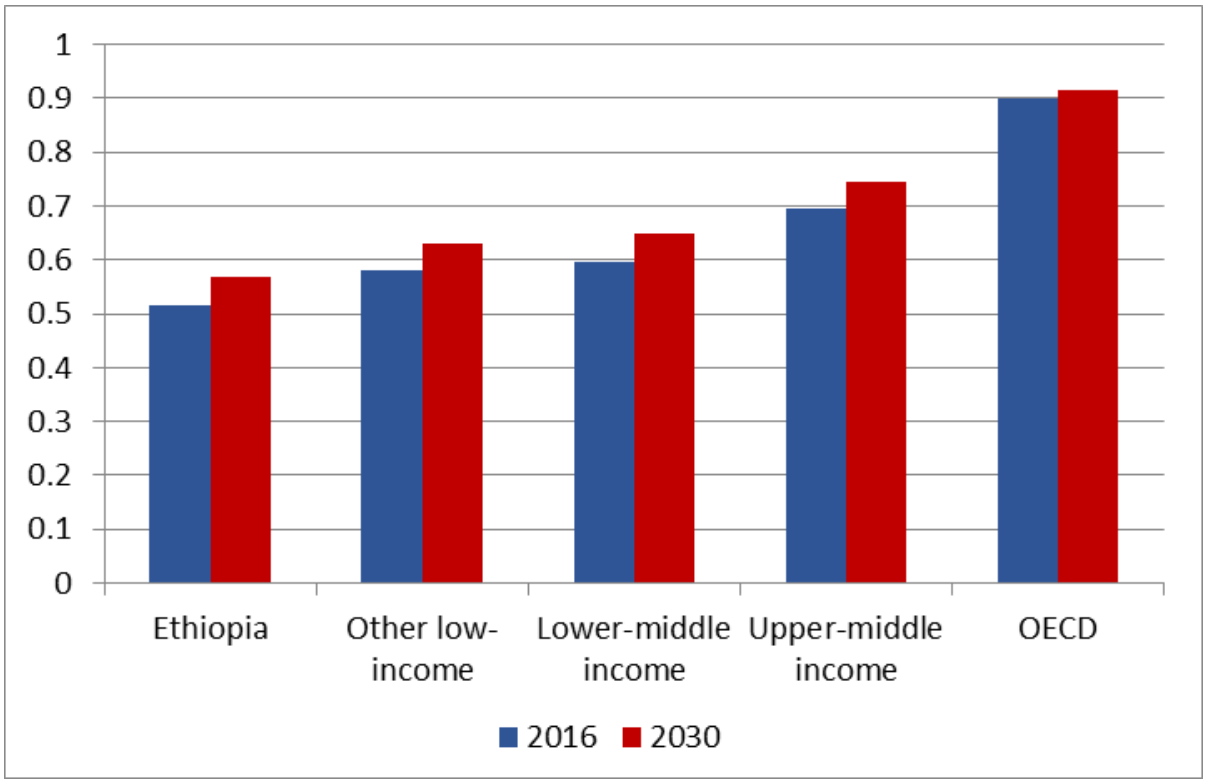
9.3 Regional and internal security

9.3.1 History and trends in conflict

Ethiopia's recent history has been characterized by periods of violent internal conflict as well as ongoing external clashes with neighbors (also see Ethiopia: Summary Context). Ethiopia's relatively low security score (Figure 9.c) is partly the result of this recent history of regional and internal conflict,

which is often a strong indicator of future armed conflict.[278] According to the *World Development Report (*2011), '90 per cent of the last decade's civil wars occurred in countries that had already had a civil war in the last 30 years'.[279] Cycles of war tend to repeat themselves in the same countries, inhibit development, and hinder others in the region. The same World Development Report found that a 'country making development advances, such as Tanzania, loses an estimated 0.7% of GDP every year for each neighbor in conflict'.[280] Often neighboring countries at high risk of conflict are more likely to offer safe havens for rebel groups and insurgents.[281] As a result of its volatile neighborhood, Ethiopia is the largest refugee-hosting country in Africa, with almost three quarters of a million refugees.[282]

Figure 9.c: IFs Security Index scores, Ethiopia and comparison groups, 2016 and 2030



Source: IFs v 7.27

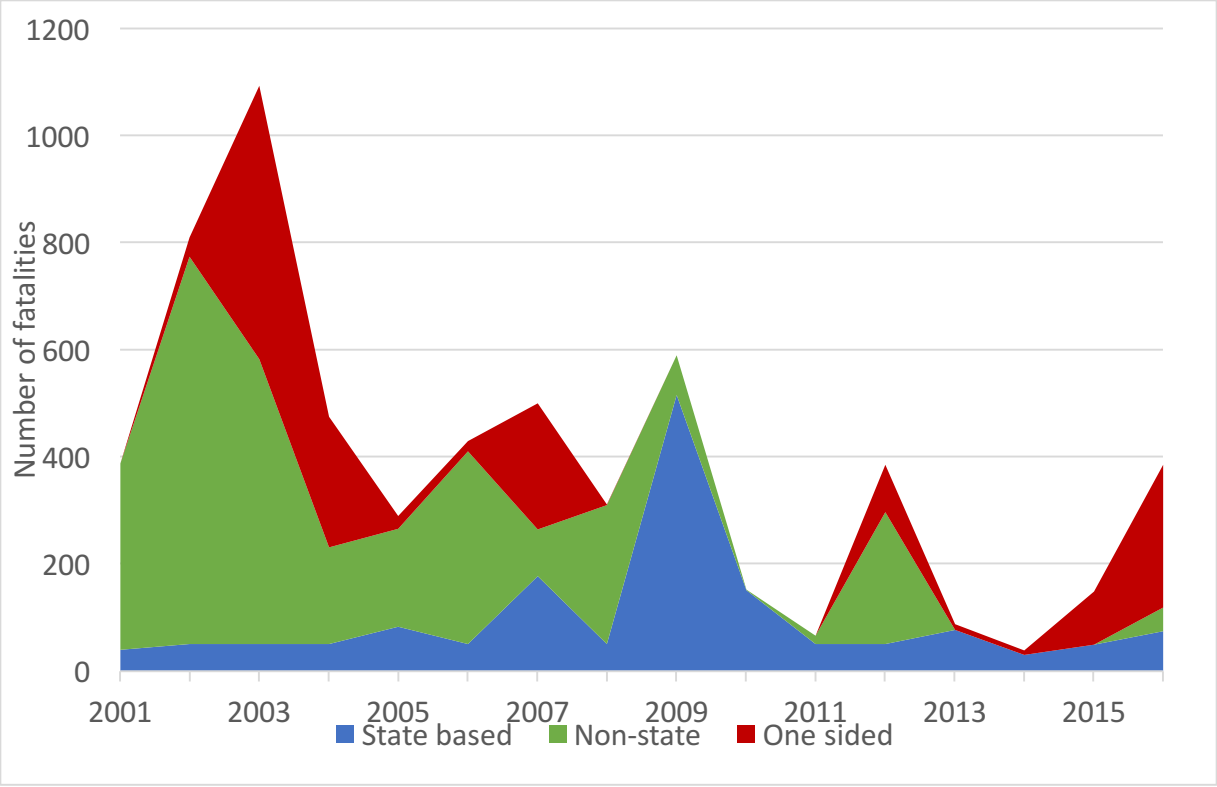
The Uppsala Conflict Data Program (UCDP), which measures acts of armed conflict between state actors, non-state actors, and violence against civilians, shows a rapid decline in fatalities due to state-based violence, non-state violence and one-sided violence from a peak in 1990 to a low point in 1997, where after fatalities increased to 48,257 in 2000 (see Figure 9.d).[283] Fatalities from state-based

[278] H Hegre, J Karlsen, H Strand and H Urdal, Predicting armed conflict, 2010-2050, International Studies Quarterly, 2012.
[279] World Bank, World development report 2011: Conflict, Security and Development, 2011, 2.
[280] Ibid, 5.
[281] H Hegre, J Karlsen, H Strand and H Urdal, Predicting armed conflict, 2010-2050, International Studies Quarterly, 2012, 7.
[282] Most refugees are from Eritrea, Somalia, Sudan and South Sudan. UNHCR, Ethiopia Country page, http://www.unhcr.org/afr/ethiopia.
[283] UCDP defines conflict as: "a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths." A non-state conflict is defined as "the use of armed force between two organized armed groups, neither of which is the government of a state, which results in at least 25 battle-related deaths in a year." One sided violence is the use of armed force by the government of a state or by a formally organized group against civilians which results in at least 25 deaths. Extrajudicial killings in custody are

violence increased to 515 in 2009 before declining again to 30 in 2014. Fatalities from state-based violence had moderately increased in the period surrounding the May 2005 elections, where the Coalition for Unity and Democracy (CUD) made considerable ground. Eventually, when final results were announced several months later, the CUD had won 109 out of the 546 seats in the House of People's Representatives.[284] Despite an overwhelming victory in Addis Ababa, however, (with 137 out of 138 seats), the parties could not agree to the terms under which the opposition would assume their seats.[285]

After their strong showing in 2005, the opposition have been weakened with each subsequent election cycle. The May 2015 election results saw the EPRDF win 500 of the available 547 seats with the remaining seats all won by its allies, including the one seat previously held by an opposition party. According to human rights organizations such as Amnesty International (disputed by the government), members of the opposition Semayawi Party, the Medrik coalition and the Oromo Federalist Congress all experienced arrests and extrajudicial killings.[286]

Figure 9.d: Fatalities by type according to UCDP, Ethiopia, 1997-2016



Source: UCDP. Data includes events where at least one fatality has been recorded

excluded. Data, codebook and methodology available at Uppsala Conflict Data Program (UCDP) http://www.pcr.uu.se/research/ucdp/datasets/
Incidents would be armed conflict between the government of Ethiopia and one or more groups that results in at least 25 battle-related deaths per dyad per calendar year. UCDP/PRIO Armed Conflict Dataset Codebook, Version 4-2016.

[284] The CUD is coalition consisting of the Ethiopian Democratic League, All Ethiopian Unity Party (AEUP), United Ethiopian Democratic Party-Medhin Party and Rainbow Ethiopia: Movement for Democracy and Social Justice. https://en.wikipedia.org/wiki/Ethiopian_general_election,_2005

[285] http://africanelections.tripod.com/et_2005state.html

[286] Amnesty International, Ethiopia Report 2015- 2016, 155. https://www.amnesty.org/en/countries/africa/ethiopia/report-ethiopia/

Having seen their representation decimated after the 2005 and 2010 elections, the May 2015 election results left many groups feeling further disenfranchised, especially in parts of the northern Amhara and central-western Oromo regions, where the opposition parties expected a strong showing. Not surprisingly, these two areas are hotbeds of the protests that started in October/November 2015.
In previous years, clashes between organized armed groups were largely confined to Eastern Oromia and the Somali region. The protest events that started in November 2015 have, however, been largely concentrated in other parts of the Oromia region, spreading across the middle of the country from West to East, including in the capital, Addis Ababa. Since April 2016, the Amhara region in the northwest has also been host to a large number of protest events as recorded by independently sourced conflict datasets like ACLED and UCDP.[287]

Although private land ownership has been outlawed since 1975, land is still closely tied to heritage and identity in Ethiopia. In 2015, the government announced a large increase in the size of the capital in the Addis Ababa Master Plan. Critics accused this plan of benefiting foreign and domestic investment projects at the cost of the surrounding Oromia region. Subsequent protests started in Ginchi and spread to several other cities before reaching Addis Ababa. Thereafter, violence expanded to rural areas, resulting in several flower farms being burnt down, among other acts of violence. Even after the government announced its intention to scrap the Master Plan in January 2016, demonstrations continued.[288]

Under the state of emergency, declared on October 9th 2016 and still in effect at the time of writing, all forms of social media, certain broadcast media channels, protests and even some gestures (such as the symbolic crossed arms) were banned. Websites like Facebook, Whatsapp and other social media platforms such as Twitter were routinely disabled and e-mail services intercepted and disrupted. Some cultural and youth groups were placed under government surveillance or closed down. Diplomats' movements were temporarily limited and restricted access to farms, factories and government institutions was temporarily imposed.[289] In December 2016 the GoE announced the release of 9,800 individuals out of a total of 24,000 that were arrested since the start of the state of emergency. The GoE also announced that it planned to charge 2,449 others accused of destabilizing the country.[290]

Land conflicts - with ethnic undertones - have the potential to fuel perceptions of inequality.[291] The allocation of large swathes of land for foreign commercial use by the federal government is increasing social tensions, where, according to Jon Abbink: "ethnicity, in the form of ethnic self-determination claims, is well-developed in political rhetoric but seen as expendable when great national development ventures (dams, resettlement, foreign land acquisitions/plantations) are undertaken."[292]

Religious tensions have also been traditionally tied to land but analysts are increasingly concerned over deeper political and ethnic ideology, inequality, and fundamentalist doctrine.[293] Violence in 2006 and 2011 was marked by attacks on Protestant churches in Oromia, and 2012 and 2013 were host to a

[287] The UCDP data cites significantly lower casualty figures than ACLED, mostly reflecting differences in coding protocol
288 Ibid. Also BBC, What is behind Ethiopia's wave of protests? 22 August 2016. http://www.bbc.com/news/world-africa-36940906
[289] BBC World news, Seven things banned in Ethiopia's state of emergency, 17 October: http://www.bbc.com/news/world-africa-37679165 Human Rights Watch (HRW), Such a brutal crackdown: Killings and arrests in response to Ethiopia's Oromo protests, June 2016, pp 1-3
[290] Tesfa-Alem Tekle, Ethiopia to release suspects arrested under state emergency decree, 18 December 2016, SudanTribune, http://www.sudantribune.com/spip.php?article61153
[291] Ibid
[292] J Abbink, Ethnic-based federalism and ethnicity in Ethiopia: reassessing the experience after [20] years, Journal of Eastern African Studies, 22 February 2012.
[293] ICG, Governing the faithful, Briefing no 117, 22 February 2016 https://www.crisisgroup.org/africa/horn-africa/ethiopia/ethiopia-governing-faithful

number of religious protests by Muslims. While Christians (Orthodox, Protestant and Catholics) make up the majority of the population, Oromia has one of the largest Muslim populations in the country. A lack of representation of Oromia Muslims in government and wider social and economic life has been a historical source of tension for the region; for example, Christians dominate the Oromo People's Democratic Organisation (OPDO).

GoE remains suspicious of its neighbors and any meddling in its domestic affairs, stating publically that recent protests were supported by dissidents in Eritrea, Egypt and others. However, there is no public evidence of an armed insurrection fed by Ethiopians from the diaspora and/or other foreign entities. According to terrorism data from the Global Terrorism Database (GTD) at the University of Maryland, there were only two terrorist incidents in Ethiopia in 2014, five in 2013, three in 2012, and five in 2011.[294]

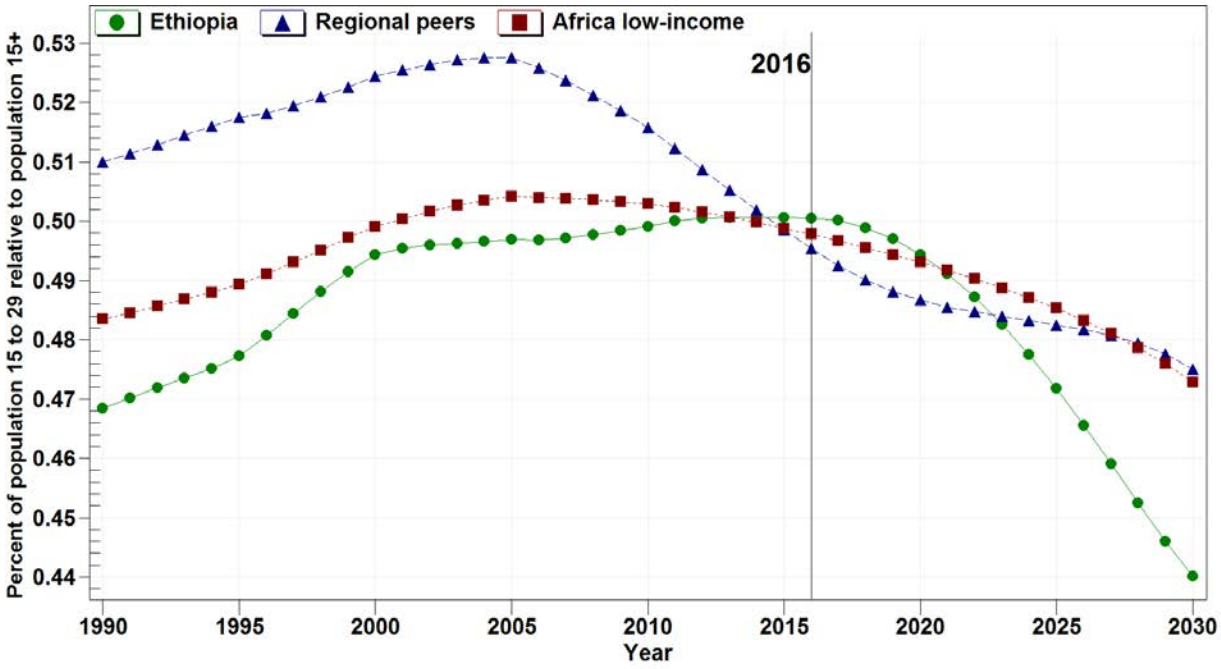
9.3.2 Forecasting conflict and instability[295]

IFs models the probability of future conflict or instability using two outcome measures: adverse regime change, and internal war.[296] Both are initialized using data from the Political Instability Task Force (PITF) and forecast using commonly accepted correlations of instability including infant mortality, trade openness, regime type, (with a particular emphasis on anocratic states - also see section 9.5.1), youth bulges, average economic growth rates and the path dependency of a history of conflict.[297]
In the case of Ethiopia, the most important drivers of future violence (amongst those used within IFs) are the country's long history of intrastate violence, its violent neighborhood, position as an anocratic (or mixed regime - see section 9.5.1) state and its large youth bulge.

Ethiopia is currently experiencing a peak in the size of its youth bulge (see Figure 9.e below). The youth bulge is potentially most destabilizing when it occurs alongside rapid expansions of education and rising unemployment (i.e. increased relative deprivation) and when specific ethnic groups are systematically excluded from political and economic opportunities.[298] Ethiopia is therefore fortunate in that its economic growth forecasts are high, and that the next few years will see a reduction in the size of the Ethiopian youth bulge, relative to the average for low-income Africa by 2021.

[294] Global Terrorism Database, University of Maryland. For more information on the criteria for a terrorist event, see the project codebook at: https://www.start.umd.edu/gtd/downloads/Codebook.pdf
[295] IFs uses two methods to evaluate and forecast domestic security of the state. Neither of these methods attempt to forecast exactly when states will fail, rather they seek to forecast state vulnerability across time. The first is a probabilistic forecast of intrastate conflict based on commonly accepted drivers of instability. The second is an index-based approach that uses generalized indices of vulnerability to conflict. The IFs Country Performance Risk Index uses comparable variable inputs. Hughes et al, 2014, 105.
[296] http://www.systemicpeace.org/inscrdata.html
[297] Anocratic or mixed regime types combine democratic with autocratic features and are significantly more unstable than other regime types.
[298] H Urdal, The Devil in the Demographics: The Effect of Youth Bulges on Domestic Armed Conflict, 1950-2000, Social Development Papers, Paper no 14, June 2004, pp 2 and 4.
http://www.eldis.org/vfile/upload/1/document/0708/doc14714.pdf , also Also see H Urdal, A clash of generations? Youth bulges and political violence, United Nations Expert Group Meeting on Adolescents, Youth and Development, New York, 21-22 July 2011, http://www.un.org/esa/population/meetings/egm-adolescents/p10_urdal.pdf

Figure 9.e: Youth bulge, Ethiopia, regional peers and low-income African economies, 1990-2030



Source: IFs v 7.27, historical data from UNPD

Compared to its neighbors, the social magnitude of war in Ethiopia has declined significantly since 1990 and the IFs forecast reflects a significantly reduced future risk of large scale social conflict to 2030 compared to Sudan, Somalia and Eritrea.[299]

Although the historical impetus towards future violence declines over time, other factors such as regime type continue to drive future levels of potential instability. The current period is, therefore, one of continued risk. In addition, the analysis in the preceding chapters highlighted the extent to which government resources – that would otherwise have been used to provide education, health and other types of core infrastructure – may temporarily not be fully available to support the ongoing roll-out of services due to the costs of funding large projects like GERD (see Chapter 8).

Ethiopia is at some risk of what the Polity project identifies as an adverse regime change, which is defined as a "distinct break or discontinuity in institutionalized political authority patterns."[300] But, it is likely that this depends upon the nature of future elections and the careful management of greater political inclusion and service delivery. Elections in Africa have become a flashpoint for instability and there are recurrent concerns surrounding the extent to which elections in Ethiopia are free and fair, given the lack of transparency, control of the press, and restrictions placed on opposition parties. If the quality of future elections is questioned (likely accompanied by a pre-election clampdown), the potential for subsequent violence will increase substantially, as was indeed the case in 2010 and 2015.

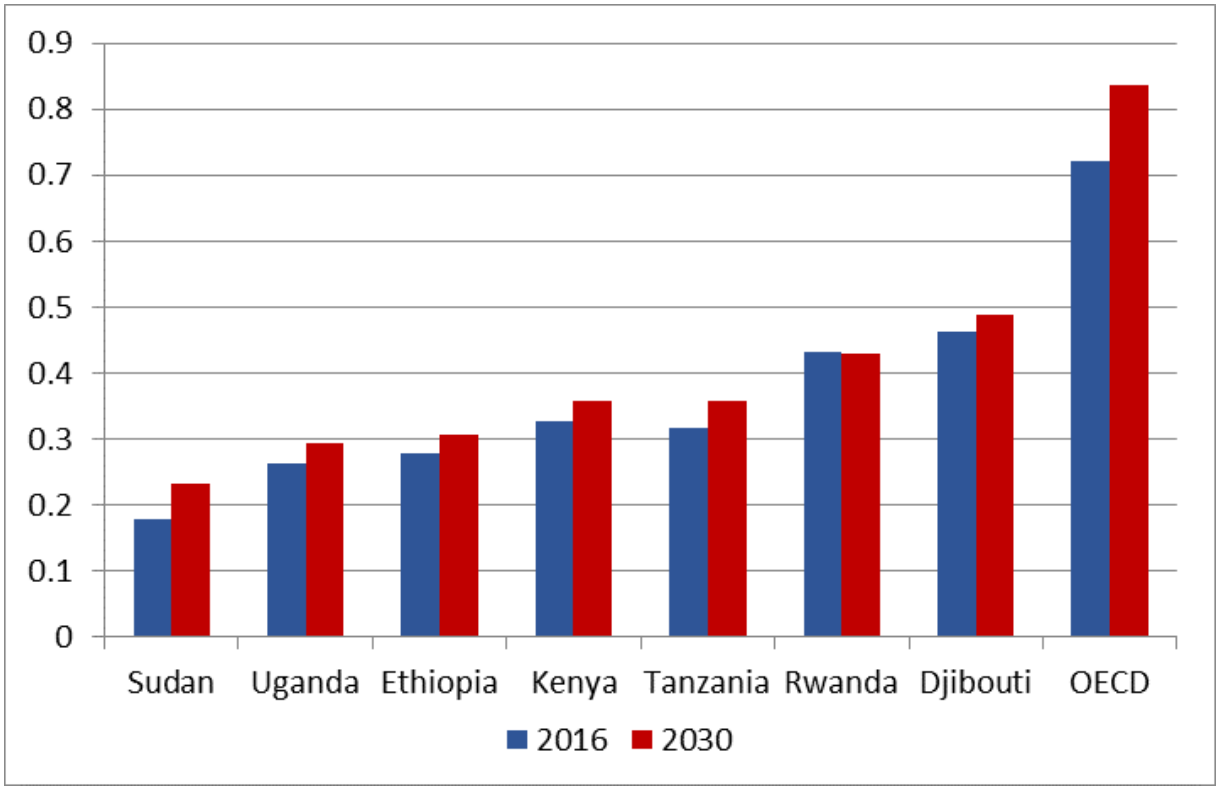
[299] The Center for Systemic peace uses the concept of "societal effects of warfare" based on what it terms a comprehensive assessment of warfare and then converts that into a ten-point scale for assessing the magnitude. See Monty G Marshall, Major Episodes of Political Violence (MEPV) and Conflict regions, 1946-2015 available at www.systemicpeace.org.
[300] Polity IV, 2002, p. 29

9.4 Capacity

Generally, state capacity in Ethiopia appears to be commensurate with its level of development. But, this impression could be misleading given the share of revenue (as a percent of GDP) that is accrued through foreign aid. Foreign aid enhances governance capacity by expanding the pool of funds available to the government to invest in the provision of services such as health and education. However, revenue is only one dimension of capacity. Also important is the ability of the government to effectively distribute those resources throughout society in an equitable and effective manner, while minimizing corruption and other rent-seeking behavior. Finally, even while governments may distribute resources relatively equitably, public perception and mobilization by political and other elites may present an alternative, destabilizing narrative. IFs does not model this third dimension and the IFs Capacity Index uses the ability of the state to mobilize revenues (from tax, foreign aid, etc.) and the effective use of these revenues (transparency) as a proxy for state capacity.[301]

Figure 9.f presents the IFs Capacity Index for seven countries in the Horn in 2016 as well as the OECD average. Ethiopia does relatively poorly in comparative context, performing only slightly better than Uganda and Sudan and significantly worse than Rwanda and Djibouti. The main reason for this relatively poor showing is its relatively low tax revenues, high levels of corruption, and poor governance effectiveness.

Figure 9.f: IFs Capacity Index scores, Ethiopia, regional peers and OECD countries, 2016 and 2030



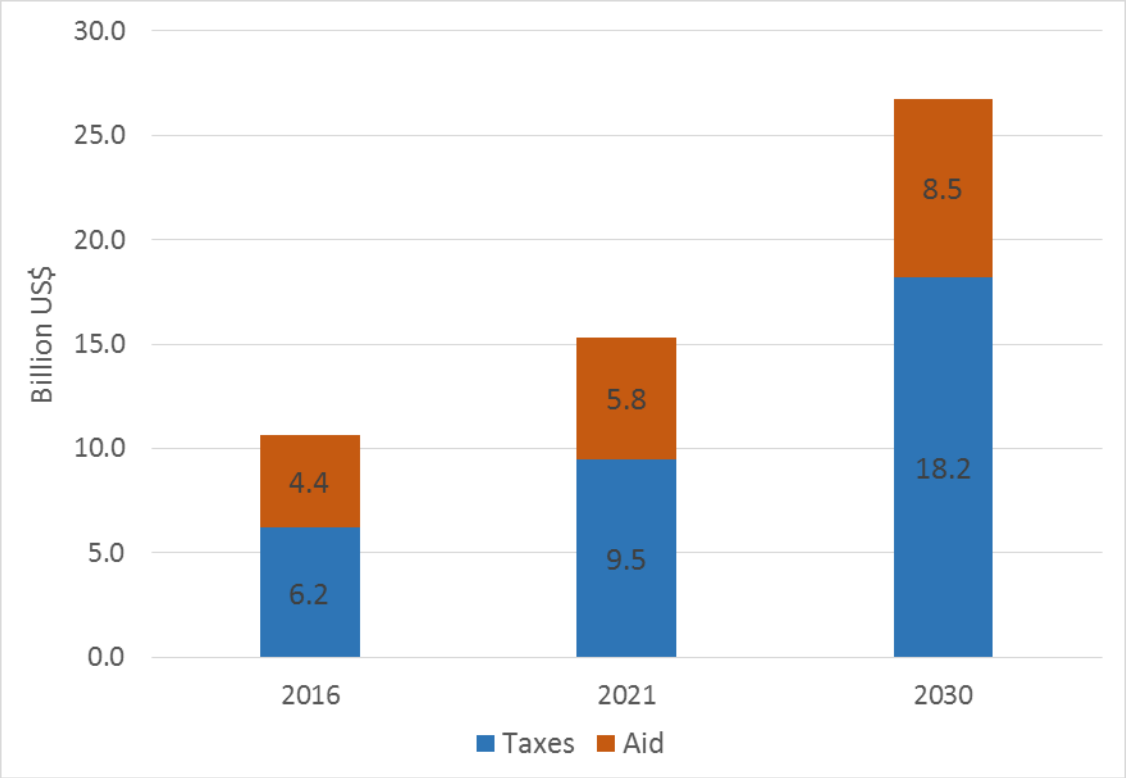
Source: IFs v 7.27

9.4.1 Government revenue

[301] The capacity measure combines data on tax collection from the Organisation of Economic Cooperation and Development (OECD), the World Bank's World Development Indicators (WDI) project and uses the Control of Corruption Index from Transparency International as a proxy for capacity to manage those resources.

In many sub-Saharan African countries, the ability of states to collect tax is weak, and Ethiopia is no exception. Figure 9.g shows the current breakdown of government revenue (between aid and taxes) and provides a forecast of the composition of government revenue for 2016, 2021 and 2030. With foreign aid's contribution to revenue (as a share of GDP) expected to decline over time, Ethiopia must increase tax collection across all categories if it is to maintain its ability to fund expenditures. Currently, foreign aid (US$4.4 billion in 2016) represents 42% of Ethiopian government revenue - a figure that will decline to 38% by 2021 and 32% by 2030. Within total tax revenue, the largest contributions are from household taxes and indirect tax, followed by firm and social security taxes. Foreign aid currently constitutes the largest single component of Ethiopia's government revenues at 9.2% of GDP.

Figure 9.g: Government revenue (US$ billions), Ethiopia, 2016, 2021 and 2030



Source: IFs v 7.27, historical data from IMF

Wagner's Law posits that as countries develop, governments require more revenue (as a share of GDP) to invest in the provision of services such as health, education, and infrastructure.[302] As a result, state spending steadily increases as a portion of GDP, suggesting a strong relationship between governance capacity and GDP per capita. The global averages of government revenue as a percent of GDP for each of the four World Bank country income groups and for Ethiopia (a low-income country) is set out in Figure 9.h. Ethiopia's government revenue is low by comparable standards, with and without aid.[303]

[302] B. Hughes, D Joshi, J Moyer, T Sisk and J Solorzano, Patterns of potential human progress: Strengthening governance globally, Frederick S. Pardee Center for International Futures, University of Denver, Volume 5, 2014, 28.
[303] The table includes all countries in the world, not only the country groupings in Africa.

Figure 9.h: Comparative data on government revenues, Ethiopia and comparison groups, 2016[304]

	Government revenue as percent of GDP	Average of net aid receipts as a percent of GDP
High income countries (global average)	37%	0
Upper middle-income countries (global average)	29%	0
Low-middle income countries (global average)	18% (19% with aid)	1%
Low-income countries (global average)	16% (27% with aid)	11%
Ethiopia	13% (22% with aid)	9%

Source IFs v. 7.27, historical data from the IMF

Without revenue, governments are unable to deliver on their mandates, particularly in low-income countries such as Ethiopia where the demand for basic services from a rapidly increasing population is high and where the current stock of infrastructure, education and health facilities and other services is still very low.

Ethiopia consistently ranks among the top aid recipients globally (at number five in 2016) at an absolute level. However, as a percent of total revenue, it is in the middle of the pack. Reflected in Figure 9.h, the impact of foreign aid serves to increase government revenues for low-income countries by an average of 11% of GDP, raising the average from 16% of GDP (without aid) to 27% (including aid). Government revenues (before aid) in Ethiopia constitute only 13% of GDP, some three percentage points below the average for low-income Africa.

Currently, Ethiopia's government revenues are forecast to increase from an estimated US$10.6 billion in 2016 to US$15.3 billion by 2021 and US$26.7 billion by 2030. However, as a percent of GDP, government revenues are set to decline marginally from 22.1% of GDP in 2016 to 21.5% in 2021 and to 20.7% in 2030. The main driver of this is an expected decline in the contribution of foreign aid to government revenues as a proportion of GDP, despite expected increases in total amounts of aid to 2030. The Current Path forecasts that foreign aid to Ethiopia will grow in absolute figures from US$4.4 billion in 2016 to US$8.5 billion by 2030 (a growth of 93%). But, foreign aid (as percent of GDP) will decline to 6.6% by 2030, from 9.3% in 2016 (see Chapter 7 for further analysis). Since sectors like health have historically benefited from overseas development aid, it is likely that these trends will negatively impact government service delivery in those areas.

It is imperative the GoE increase domestic revenue collection in order to offset the forecasted decline in aid (as a percent of GDP). Improving tax administration and reducing corruption (outlined in the next section) are two avenues by which the government can improve capacity. Furthermore, as mentioned in Chapter 7 (Economy), the existence of a relatively large informal sector constrains government revenues by limiting the tax pool. Thus, interventions improving tax collection and corruption can be paired with interventions on reducing informality to further improve government capacity.

[304] Groups are based on World Bank income groups

9.4.2 Corruption and government effectiveness

A previous section noted that IFs uses the Transparency International Corruption Perceptions Index as a proxy for how efficiently governments are able to use revenues.[305] With a TI score of 33 out of a possible 100, Ethiopia ranks 103rd globally in the most recent version of the Index. It does slightly better on transparency than the average for low-income Africa, although still below the average for lower-middle-income countries in Africa.

Another measure of government capacity is the Government Effectiveness Index, which is maintained by the World Bank's Worldwide Governance Indicators (WGI) project. This index combines a measure for quality and effectiveness of public service delivery, quality of civil society and the degree of its independence from political pressures, quality of policy formulation and implementation, and the credibility of its commitments to such policies. Improved government effectiveness will, for example, increase revenue (tax collection) as well as lead to more effective use of revenues. Looking at state capacity or effectiveness in this way, Ethiopia is a relatively effective state at its level of development, and surpassed only by Rwanda (the most effective low-income government in Africa according to the World Bank), Senegal and Uganda.[306]

The IFs Current Path forecast is that Ethiopia's Government Effectiveness is expected to improve more rapidly than most other comparable countries over the next 14 years, surpassing Uganda in 2020 and nearly reaching the level of Senegal by 2030. In a recent publication, the World Bank argues that improvements in the effectiveness of government will largely depend upon leveraging the ICT sector as a means towards improved service delivery, lowering cost and improving governance.[307]

9.5 Inclusion

9.5.1 Polity and inclusion within IFs

The IFs model forecasts its Inclusion Index based on regime type and a measure for gender empowerment (GEM).[308] GEM is used as a proxy for horizontal inclusion and is briefly discussed in section 9.5.3 below.

For regime type, IFs relies upon the Polity IV Composite Index developed and maintained by the Center for Systemic Peace (CSP) to categorize countries according to their institutional characteristics as well as the GEM from the UNDP. The Polity measure consists of a spectrum of governing authority

[305] http://www.transparency.org/cpi2015#results-table
[306] The World Bank WGI combines 31 sources of public perception data and expert analysis. For more information see: http://info.worldbank.org/governance/wgi/#home.
[307] M Lixi and M Dahan, ICT as an Enabler of Transformation in Ethiopia, World Bank report 89289, January 2014, p vii.
[308] Polity focuses on the authority characteristics of regimes, with attention to six component measures: regulation of executive recruitment, competitiveness of executive recruitment, openness of executive recruitment, constraints that exist on executive action, regulation of political participation, and competitiveness of political participation. See http://www.systemicpeace.org/polityproject.html Earlier Hughes et al found GEM to have an advantage over the two highly correlated long-term development variables that are traditionally associated with measures of expected democracy namely GDP per capita and average years of educational attainment by adults. Hughes et al, Governance volume, p 92. The formulation used within IFs to forecast GEM is at p 95

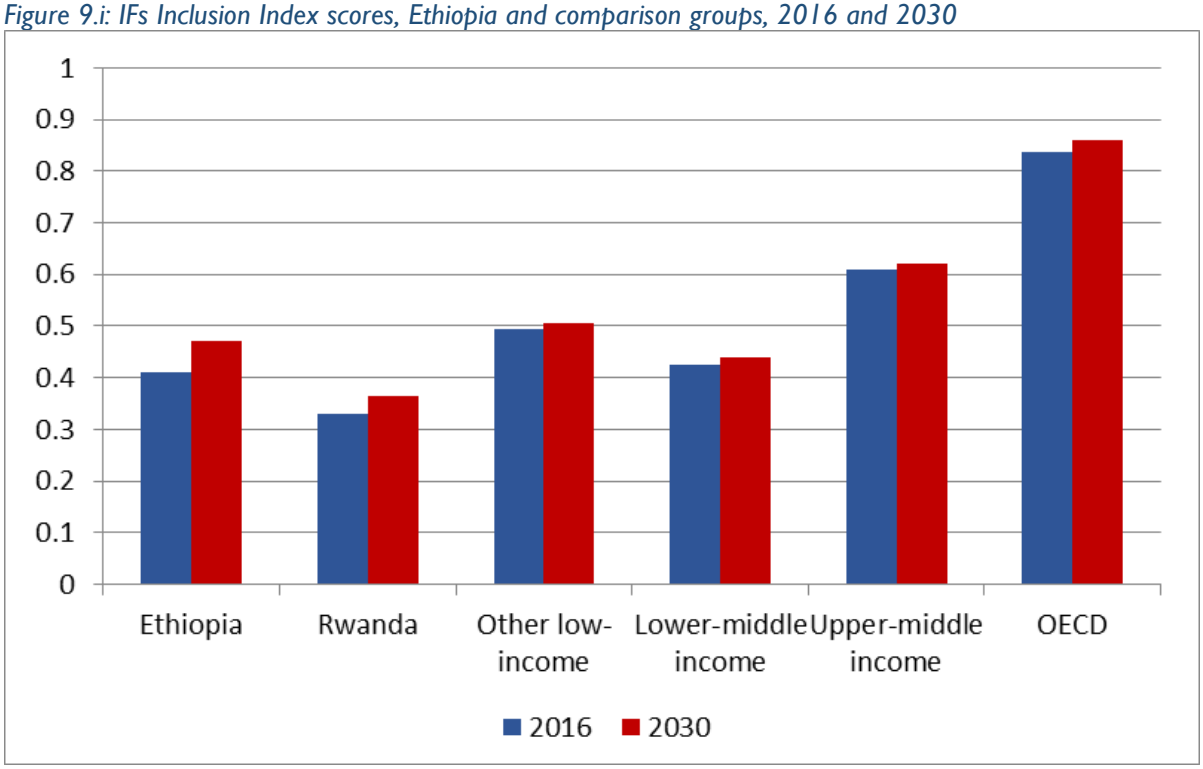
types from full autocracies, to mixed democratic/authoritarian systems (or anocracies) to fully institutionalized democracies. Mixed (or anocractic) regime types are inherently more unstable than democracies or autocracies, making them more prone to internal conflict and abrupt regime changes.[309]
Ethiopia was scored at a 7 out of 20 in the 2014 Polity index (where 20 is a full multiparty democratic and 0 a hereditary monarchy). Rwanda is at the same level as Ethiopia and these two countries (together with Chad, The Gambia and Eritrea) are some of the most anocratic states in the African low-income group. Work done by the Polity IV Project indicates that anocracies are about six times more likely than democracies and 2.5 times more likely than autocracies to experience a major regime change within five years and over 70% more likely within ten years.[310]

Research by Goldstone et al. reveals that partial democracies with factionalism (that is, where one particular group is advantaged), are an exceptionally unstable type of regime.[311] Factionalism occurs when "parochial or ethnic-based political factions that regularly compete for political influence in order to promote particular agendas and favor group members to the detriment of common, secular, or cross-cutting agendas," similar to the perceived Tigrayan dominance of Ethiopia's political system. Countries characterized by this kind of inter-group competition are significantly more prone to instability. That study found that partial democracies with a high degree of factionalism are more than 30 times more likely to experience a destabilizing event.

It is for these reasons that IFs also includes regime type in its forecast of the probability of violence (section 9.3.2). Figure 9.i below presents the IFs Inclusion Index (0 to 1) for Ethiopia and Rwanda, and the average levels of inclusion for Africa's low-, lower-middle- and upper-middle-income countries. As discussed in Chapter 2, Rwanda and Ethiopia are often used as examples of authoritarian developmental models in Africa that have been able to rapidly extend service delivery.[312] While scoring higher on the Index than Rwanda, inclusion in Ethiopia is below the average for Africa's low-income countries. IFs forecast that Ethiopia will see steady improvements in inclusion by 2030, passing the average for lower-middle-income African countries but falling short of the average for other low-income countries globally. Earlier work by the ISS postulates that the higher levels of inclusion in low-income African countries compared to lower-middle-income countries may be the result of Western donor conditionalities.[313] In addition, it is likely that globalization (where Africans are increasingly aware and exposed to the freedoms and lifestyle in Western societies) serves to stimulate the high demand for democracy in Africa, as witnessed by successive rounds of the Afrobarometer opinion surveys.[314]

[309] JR Vreeland, The Effect of Political Regime on Civil War, Journal of Conflict Resolution, Volume 52, Number 3. June 2008, 401-425.
[310] Polity IV Project: political regime characteristics and transitions, 1800–2011, http://www.systemicpeace.org/polity/polity4.htm Monty G. Marshall and B. R. Cole, Global report 2011, Conflict, governance, and state fragility, Center for Systemic Peace, 2001, 12.
[311] JA Goldstone, RH Bates, DL Epstein, TR Gurr et al., A global model for forecasting political instability, American Journal of Political Science, 54(1) (2010), 190–208. Goldstone et al., A global model for forecasting political instability, 195f.
[312] See, for example, H Matfess, Rwanda and Ethiopia: Developmental Authoritarianism and the New Politics of African Strong Men, African Studies Review, 58:2, September 2015, 181 – 204.
[313] J Cilliers. The Future of Democracy in Africa: How do different levels of democracy affect Africa's future economic and human development? Institute for Security Studies. October, 2016.
[314] See Policy paper no 36, by R Mattes and M Bratton, Do Africans still want democracy? http://afrobarometer.org/publications/pp36-do-africans-still-want-democracy

Figure 9.i: IFs Inclusion Index scores, Ethiopia and comparison groups, 2016 and 2030



Source: IFs v 7.27

In its engagement with development partners, the GoE insists that it first needs to build up the capacity of the state and the size of the Ethiopian middle-class before improving human rights and democracy. Thus, the objective of GTP II is to "establish democratic and good governance through enhancing the implementation capacity of the public sector and mobilization of public participation."[315] Since the death of Prime Minister Zenawi in 2012, then both chairman of the TPLF and head of the EPRDF, a number of senior party members have stepped in to maintain his vision and development pathway. That continuity was, however, shaken with the 2015/16 protests. For the time being, further political and economic liberalization appears to be on hold as the party discusses the way forward. [316]

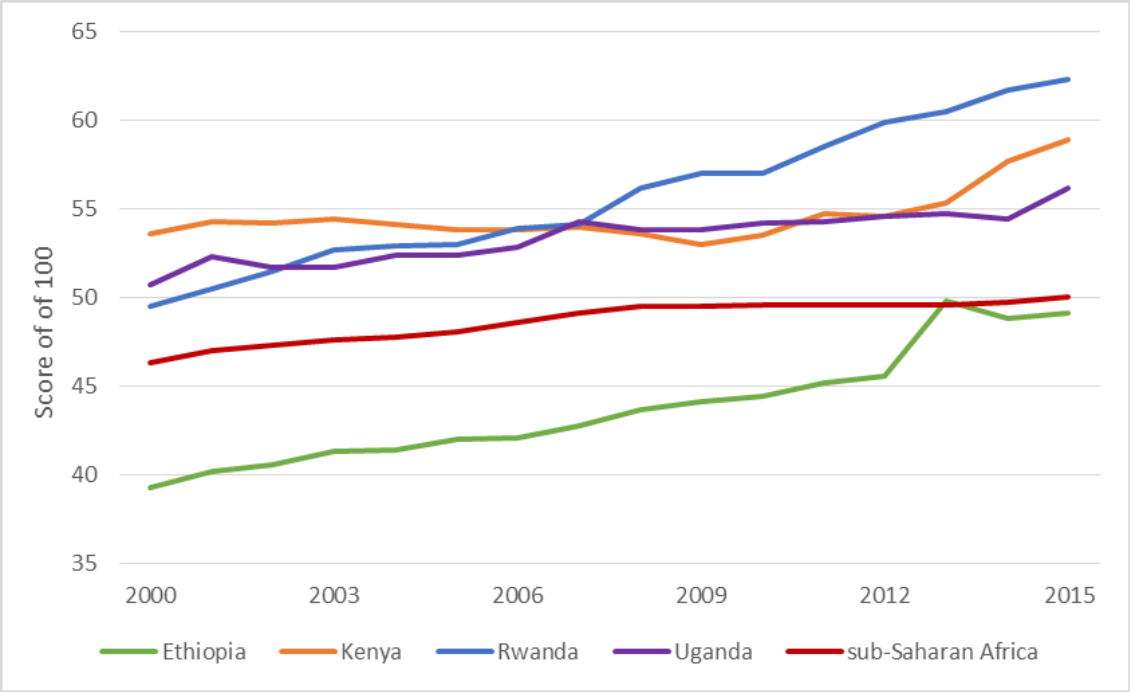
Using Polity IV within IFs it is possible to review the "democratic deficit or surplus" of a country – the difference between the expected level of democracy elsewhere in the world (or in Africa) based on income and education levels and the level as measured by Polity. Ethiopia is expected to score 11 on the range from 0 to 20 but only achieves a score of 7, indicating that it has a "democratic deficit" of 4 points on the 20-point scale. Put differently, the level of democracy in Ethiopia is about 20 percent lower than that for other countries in the world at similar levels of education and income. When this gap becomes too large, as was indeed the case in most North African countries before the Arab spring, discontent and frustration can turn violent.[317] Given the importance of this finding for the future development and stability of Ethiopia, a next section attempts to validate these findings using other data providers.

[315] GTPII, 2015, p. 91
[316] Ibid. 31.
[317] See J Cilliers and J Schunemann, Africa's current and future stability, ISS Paper 246, Institute for Security Studies, May 2013, p 7 https://issafrica.org/research/papers/the-future-ofintrastate-conflict-in-africa-more-violence-or-greater-peace

9.5.2 Comparative perspectives from the Ibrahim Index, Freedom House, V-Dem and Afrobarometer

The Mo Ibrahim Foundation's Ibrahim Index of African Governance (IIAG) measures governance (i.e. not democracy) in Africa across four pillars: safety and rule of law, participation and human rights, sustainable economic opportunity, and human development.[318] Ethiopia ranks 41st out of 54 African countries in 2016.[319] Ethiopia is weakest in the areas of participation and human rights but has improved significantly since 2006. Compared to its neighbors, Ethiopia has one of the most improved overall governance scores since 2006, and since 2013, has been roughly on par with the average of sub-Saharan Africa (see Figure 9.j), but still does poorly when compared to others in the greater Horn. The subcomponents of the IIAG related to democracy and state effectiveness would indicate that Ethiopia is generally most comparable to Rwanda, but scores significantly lower with respect to control of corruption (2.70 compared to 5) and regulatory quality (1.52 to 2.68).

Figure 9.j: IIGA overall governance scores, Ethiopia and regional peers, 2000-2015



Source: Ibrahim index 2016

The Freedom House International index, which classifies countries according to their political rights and civil liberties (on a scale of 1 being most free, and 7 least free), scores Ethiopia 7 in political rights and 6 on civil liberties, for a total score of 13 out of 14 (or almost the lowest possible).[320] Ethiopia

[318] The Foundation defines governance as 'the provision of the political, social and economic goods that a citizen has the right to expect from his or her state, and that a state has the responsibility to deliver to its citizens.' http://mo.ibrahim.foundation/iiag/

[319] Mo Ibrahim Foundation, A decade of African governance 2006-2015: Index report, http://s.mo.ibrahim.foundation/u/2016/10/01184917/2016-Index-Report.pdf?_ga=1.161470269.1474294274.1472199415

[320] Freedom House has two scales for civil liberties and political freedoms, both on a 1-7 scale. In Ifs, the two measures are combined to give a 0-14 scale. For more information see the Freedom House International methodology, at https://freedomhouse.org/report/freedom-world-2016/methodology.

performs below average within the Africa low-income group, and is considered one of the ten least free countries in the world according to this measure. According to Freedom House, civil liberties and political freedoms have been declining in Ethiopia since 2007, dropping the country below Kenya, Rwanda, and Uganda by 2010. In November 2016, Ethiopia ranked fourth on Committee to Protect Journalists (CPJ) 2015 list of the 10 Most Censored Countries and is the third most prolific jailer of journalists in Africa, according to CPJ's 2015 prison census.[321]

An important new dataset that evaluates the state of democracy globally, and over time, is the Varieties of Democracy project (V-Dem). According to V-Dem, the core tenets of democracy in Ethiopia have been declining since 2005, likely due to the fallout from the elections in that year.[322] In 2015, relative to Kenya, Rwanda and Uganda (which have all been improving since 2012), Ethiopia is the lowest scoring country, and also shows the least improvement. Compared to the average of low-income African countries in 2015 (0.38), Ethiopia performs significantly worse (0.25) and has been declining for the last decade or so, while others show improvement (see Figure 9.k).[323]

Figure 9.k: V-dem polyarchy measure of democracy score, Ethiopia and regional peers, 2000-2015

	2000	2005	2010	2015
Ethiopia	0.3	0.3	0.3	0.3
Kenya	0.4	0.5	0.5	0.5
Rwanda	0.1	0.2	0.3	n/a
Uganda	0.4	0.4	0.4	0.4

Source: V-dem version 6 polyarch scores

Public perception data on democracy in Ethiopia, compiled by Afrobarometer, offers interesting insight on Ethiopians' unique understanding of democracy. Despite consistently scoring low on international indices, Afrobarometer Round 5 survey results (conducted in 2013) found that 81% of survey respondents had confidence that their country was either a 'full democracy' or 'democracy with minor problems'.[324]

In a subsequent paper analyzing this disconnect between citizens' view of the state of democracy in Ethiopia and its performance on international rating systems, Mattes and Teka offer some interesting assertions.[325] Firstly, out of 35 participating countries in Africa, Ethiopians were more likely to answer "I don't know" to questions on economic and political performance, indicating a severe reluctance to respond and a high degree of suspicion of the interviewers.[326]

[321] https://cpj.org/2016/11/ethiopian-newspaper-editor-bloggers-caught-in-wors.php#more

[322] This is using the V-Dem electoral democracy index (v2x_polyarch). V-Dem measures six 'properties' of democracy (liberal, consensual, deliberative, majoritarian, egalitarian and participatory) that are each disaggregated into numerous lower-level components and indicators such as regular elections, judicial independence, direct democracy and gender equality. See https://www.v-dem.net/en/

[323] Although Ethiopia fares badly, its poor score is reflective of a bad human rights neighborhood where countries such as Eritrea, South Sudan, Sudan and Somalia all do badly. It is also important to note that Freedom House relies upon a single understanding and interpretation of political and civil rights that rates rich and poor countries along common criteria.

[324] Afrobarometer Round 5 Results, Ethiopia, 2013, http://www.afrobarometer.org/countries/results-round.

[325] R Mattes and M Teka, Ethiopians' views of democratic government: Fear, ignorance or unique understanding of democracy?, Afrobarometer, Working Paper no 164, 1 May 2016 http://afrobarometer.org/sites/default/files/publications/Working%20papers/afropaperno164_ethiopia_democracy.pdf

[326] For example on the question of how often the Prime Minister ignores the courts and laws of the country 50% of respondents replied "I don't know". To the question on the perceived identity of the Afrobarometer interviewer, 51% of Ethiopians answered "government". Only 18% answered "from an NGO" or "Research company". R Mattes and M Teka, 2016.

These different indices show that the GoE has long operated as an anocratic developmental state and validate the general findings from Polity used within IFs. The current situation already presents serious challenges with respect to free and credible elections, restrictions on civil liberties and lack of political freedoms. Other sections of this report detail the challenges (low average educational attainment, inequality of access to education across social groups, limited press freedom and internet censorship) that constrain the developmental potential of an informed and participatory citizenry over the long-run.
The move towards greater inclusion is inevitably complex and a difficult process to manage. This and the previous section has focused on the low levels of political inclusion evident from a variety of datasets. Although democratization is an important part of the movement towards inclusion, there are also other components such as greater economic and social inclusion, sometimes referred to as horizontal (or de facto) inclusion. Eventually, Ethiopia has to democratize at a pace that is commensurate with its domestic political culture and unique national circumstances. But, at its current low levels of inclusion compared to others at similar levels of income, the lack of inclusion is a source of concern, evidenced by the need for a national state of emergency at the time of writing.

9.5.3 Gender and ethnicity

IFs also uses GEM as a second important variable in measuring inclusion. GEM is based on estimates of women's relative economic income, participation in high-paying positions with economic power, and access to professional and parliamentary positions. Although GEM was replaced by the Gender Inequality Index (GII) in 2011, IFs continues to use GEM, as it has more temporal coverage.[327]

In addition to lack of civil liberties and limited political freedom, Ethiopia is constrained by the lack of gender parity in education, employment and other sectors, discussed elsewhere in this report. For example, as discussed in Chapter 6, high-school dropout rates are significantly higher for adolescent females, due to inadequate sanitation facilities in schools, high early marriage rates and outright discrimination.

Section 9.3.1 mentioned the ethnic undertones evident in recent waves of violence that have swept through Ethiopia. Generally, protests appear to primarily rail against the lack of political and civic freedoms, inequities in the land use system, and issues pertaining to social injustice.[328] The perceived entrenchment of the party across state institutions means the state apparatus is viewed as an instrument of a small elite and perceived to defend the party's interests above that of the nation.

9.6 Key takeaways

- Ethiopia has made some progress along the first governance transition - the creation of a national "security community" within defined and internationally accepted boundaries under a single national authority - although it still lacks key dimensions of domestic stability. Given its history and neighborhood, the country remains at risk of instability.
- Ethiopia has also made progress along the capacity transition, although it remains donor dependent for the delivery of important services and has below average domestic revenue collection.
- The country lags behind other low-income countries in Africa in the development of more inclusive economic and political systems, which could prove destabilizing since it is also classified as a mixed regime – the least stable regime type.

[327] GII includes reproductive health, empowerment and labor market participation.
[328] J Abbink, Ethiopia's Unrest Sparked by Unequal Development Record September 13, 2016, https://theglobalobservatory.org/2016/09/ethiopia-protests-amhara-oromiya/

- Should Ethiopia maintain progress, these dimensions are expected to steadily improve across the forecast horizon. However, internal considerations may require that the pace of reforms proceed more rapidly along economic and social dimensions.

9.7 Governance interventions

The three subsections that follow present a number of positive and negative interventions relating to security, capacity and inclusion. A fourth sub-section combines these interventions into three combined scenarios, an Improved Governance, Governance Backslide and Governance Crisis scenario. The parameters that are used for each of the various interventions within IFs are summarized in an annexure.

9.7.1 Interventions related to security

Compared to its violent past, Ethiopia in 2017 is a more stable country. Instability in the region is arguably also decreasing, including in Somalia. However, Ethiopia's violent past, relatively low levels of development, mixed-regime type and large youth bulge means that the risk of a future violent rupture remains high. The large investment in hydroelectric schemes in the next few years could reduce the ability of the government to continue to expand the provision of electricity, housing, education and health services in the context of a rapidly growing and increasingly urban population. This could lead to further discontent in a country currently under a national state of emergency that was enacted as a measure to control widespread violence.

Three interventions look at the impact of a generally improved security picture (Improved Security), a deteriorating security context (Reduced Security) and, a rapidly deteriorating situation (Security Crisis).

In the Reduced Security intervention, violence increases to 2021 and remains persistent across the time horizon to 2030. In the Security Crisis intervention, the much more violent situation sees commensurate increases in military expenditure to 2021 that are maintained to 2030. In the Improved Security intervention, the probability of conflict declines more steeply than the Current Path. Since Ethiopia has a low level of military spending, the Improved Security intervention does not include a reduction in that category.

GDP per capita increases under all interventions, but in the Security Crisis intervention, the average income per capita for other low-income countries surpasses Ethiopia in 2027. In this scenario, average income levels in Ethiopia remain essentially stagnant from 2021 to 2030.

9.7.2 Interventions related to capacity

The discussion in section 9.4 highlights four important considerations that impact on the future of Ethiopia's governance capacity; tax collection rates, changes in the level of aid, levels of corruption and changes in the efficacy of government. The interventions regarding Ethiopia's government capacity can be summarized as follows:

- Improved Capacity: consisting of improvements in firm tax revenue, increased aid, and improvements in government effectiveness and regulations
- Reduced Capacity: consisting of reduced aid, steady declining government effectiveness and quality of government regulations
- Capacity Crisis: consisting of a collapse in aid, even less government effectiveness and poorer quality of government regulations

Revenue collection in Ethiopia is below the average of other low-income African countries. As part of Improved Capacity, the intervention raises firm taxes. At Ethiopia's low levels of income tax, increases in other categories would increase poverty.

In respect to aid, the IFs forecast of development assistance is that the total amount is expected to increase over time, but at a lower rate than average GDP growth in low-income economies. The result is that while aid increases in absolute terms, as a percentage of GDP, it declines. The Current Path indicates that aid will increase over the forecast horizon (from US$4.4 billion in 2016 to US$8.5 billion by 2030). Whereas on the Current Path, aid as percent of GDP was falling slightly more rapidly in Ethiopia than in low-income Africa (but from a lower base), aid to Ethiopia falls less rapidly. In the Improved Capacity intervention, the rate of decline in foreign aid receipts as a percent of GDP slows. Instead of declining from 9.3% to 6.6% of GDP by 2030, aid declines to only 7.1% of GDP. The Reduced Capacity intervention simulates a rapid decline in aid levels (the inverse of the increase in aid). In this intervention aid only contributes 6.1% of GDP in 2030 instead of 6.6% in the Current Path. Finally, in the Capacity Crisis scenario, foreign aid declines to roughly 5.5% of GDP by 2030.

Much of the literature on governance indicates that high levels of corruption undermine government capacity. The Improved Capacity scenario reduces levels of corruption in Ethiopia to almost that of Tanzania in 2021. The Reduced Capacity intervention increases corruption to levels comparable to Uganda. Under the Capacity Crisis intervention, corruption increases more rapidly and stabilizes at the levels of Kenya by 2021.

A final set of interventions on government capacity improves the effectiveness of government regulations. Ethiopia does well by government effectiveness standards compared to other low- and low-middle countries as measured by the World Bank and others. The Improved Capacity intervention halves the gap between Ethiopia and Rwanda by 2021, while Reduced Capacity moves Ethiopia below Tanzania by 2021 and somewhat closer to the average for other low-income African countries. Finally, the Capacity Crisis intervention decreases government effectiveness to the level of Malawi by 2021. The impact of these interventions on total government revenue in 2021 and 2030 compared to 2016 is presented in Figure 9.m and reflect an increase in revenue of -25% (in the worst Capacity Crisis intervention compared to +2% (in the Improved Capacity intervention) compared to the Current Path forecast for 2030.

Figure 9.m: Ethiopian government revenues, Current Path and scenarios, 2016, 2021 and 2030

	Current Path	Improved Capacity	Reduced Capacity	Capacity Crisis
2016	10.6	10.6	10.6	10.6
2021	15.3	16.0	14.6	14.0
2030	26.7	28.4	25.1	23.9

Source: IFs v7.27, historical data from IMF World Economic Outlook

9.7.3 Interventions related to inclusion

The interventions around inclusion focused on the following two dimensions:

- Simulate a more or less inclusive economy by changing the levels of economic freedom, government regulation of business and the cost of starting a business. Since the potential for greater economic inclusions is large, the positive (more inclusive) intervention is more aggressive than the closed or repressed interventions.
- Improvement or decrease in social inclusion is done using gender as a proxy. Ethiopia is already above the average for low-income Africa on UNDPs GEM index, hence scope for further improvements is limited. The positive intervention takes Ethiopia above the level of Tanzania

by 2030. The negative scenarios reduce levels of gender inclusion below Eritrea by 2021. In the Crisis scenario, gender inclusion dips below Madagascar by 2021.

Economic, social and political inclusion are interconnected. It is difficult to move towards a more inclusive economy that allows for greater opportunity without simultaneously allowing greater political freedom. In fact, there is a large body of literature that points to the fact that the direction of causality runs from political inclusion to economic inclusion, (i.e. without the former the latter is difficult to sustain over long periods of time).[329]

Democratization is often unstable - but instability will follow the absence of reform, for Ethiopia will likely only be able to buy off the demand for political liberalization with very high growth rates (which appear unlikely) and/or repression. Economic growth generally also increases inequality; therefore, it is expected that the sense of relative deprivation could increase over time. Eventually a more open and dynamic political system should accompany economic growth and the associated improvements in productivity. The challenge is how to accompany much-needed economic liberalization with greater political participation, media freedom and the like in a deliberate, targeted and structured manner that does not endanger stability.

9.7.4 Scenarios and comparisons

This section combines the various interventions set out above into three scenarios, Improved Governance, Governance Backslide and a Governance Crisis scenario. Figure 9.n sets out the various elements of each combined scenarios

Figure 9.n: Summary of interventions used in combined governance scenarios

	Improved	Backslide	Crisis
Conflict	↓	↑	↑↑
Military spend	→	↑	↑↑
Firm Tax Collection	↑	→	→
Corruption	↓	↑	↑↑
Aid	↑	↓	↓↓
Investment	→	→	↓↓
Government Effectiveness	↑	↓	↓↓
Regulatory Quality	↑	→	↓
Economic Freedom	↑	↓	↓↓
Gender Inclusion	↑	↓	↓↓

Figure 9.o presents the scores for each of the three scenarios for each of the three governance dimensions in 2030 compared to the situation in 2016, as well as the percent change from 2016. In the Governance Backslide scenario Ethiopia would, by 2030, have a total governance rating very similar to that in 2016.

[329] See, for example, D Acemoglu and JA Robinson, Why Nations Fail – the origins of power, prosperity, and poverty, Profile Books, London, 2013

Figure 9.o: IFs governance indicators, Current Path and combined scenarios, 2016 and 2030

	Security			Capacity			Inclusion		
	2016	2030	% Change	2016	2030	% Change	2016	2030	% Change
Improved Governance	0.5	0.7	28.9	0.3	0.3	17	0.4	0.5	24.3
Governance Backslide	0.5	0.5	-7.6	0.3	0.3	0.2	0.4	0.4	7.3
Governance Crisis	0.5	0.3	-50	0.3	0.3	-7.1	0.4	0.4	2.4

Source: IFs v 7.27

The table in Figure 9.p compares a forecast of the composite governance index within IFs (composed of an average of the three sub-indices on security, capacity and inclusion) under the Improved Governance, Governance Backslide and a Crisis in Governance with the average for other low-income countries in Africa. In the Improved Governance scenario, Ethiopia closes the gap with the average of its African peers. In all other scenarios, the country loses ground or retains its current deficit.

Figure 9.p: The composite IFs governance index: Ethiopia combined scenarios vs low income Africa

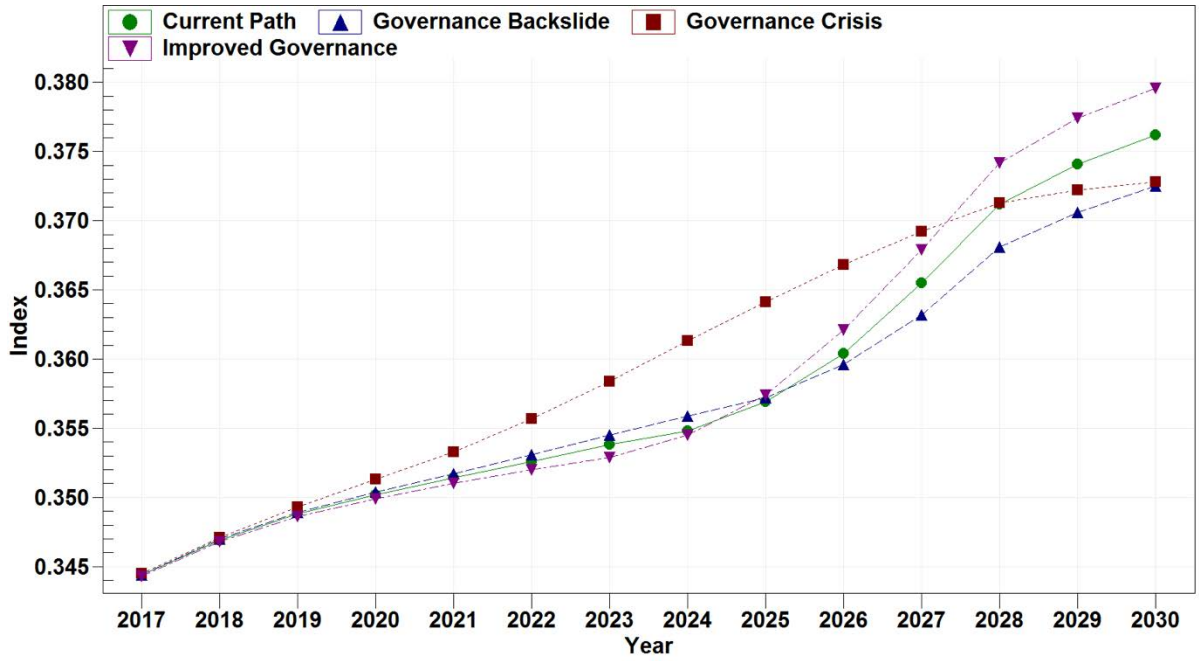
	Improved Governance	Governance Backslide	Governance Crisis	Low-income Africa
2016	0.4	0.4	0.4	0.5
2021	0.5	0.4	0.3	0.5
2030	0.5	0.4	0.3	0.5

Source: IFs v 7.27

Ethiopia has considerable growth potential given the size of its working age population and the low base from which it departs. The country grows under all scenarios - although at very different rates - to 2030. Average growth rates are for the time horizon 2017 to 2030 is 4.1% in the Crisis in Governance scenario, 7% in the Governance Backslide scenario, 7.4% in the Current Path and 7.7% in the Improved Governance scenario. These rates are, however, significantly below the almost 11% average that the country achieved for several years before the 2015-16 drought. They are also below the target set in the GTP.

One of the reasons for the rapid progress that Ethiopia has been able to make in terms of poverty alleviation is that it came from low levels of inequality (see Figure 9.q). Looking ahead, inequality in Ethiopia is set to increase under all scenarios, as is to be expected given the historical patterns according to which increased income disparities accompanies economic growth. Until 2027, inequality is highest in the Governance Crisis scenario, but thereafter, is highest in the Improved Governance scenario.

Figure 9.q: Inequality in Ethiopia under different scenarios (5-year moving average)



Source: IFs v 7.27

Figures 9.r and 9.s (below) explores the effects of various governance interventions and combined scenarios across different indicators to 2030. In each figure, the x-axis illustrates the percent change in GDP per capita compared to the Current Path by 2030 and the y-axis the percent change in the IFs Governance Index. The bubble size represents percent change in total government revenue compared to the Current Path forecast by 2030.

As expected, the impact of the combined Improved Governance scenario outperforms the individual scenarios; Improved Security, Improved Capacity and Improved Inclusion. In the Improved Governance scenario, GDP per capita increases by more than 3% and total government revenue improves by more than 8%. Ethiopia improves its score on the IFs Total Governance index by more than 11% compared to the Current Path by 2030. The improvements in the other interventions diverge. The Improved Capacity scenario increases GDP per capita (2%) and government revenue (6%) more than the Improved Inclusion and Security interventions, but has less impact on improving the IFs Governance Index. The largest positive impact on the IFs Governance Index comes from the Improved Security scenario.

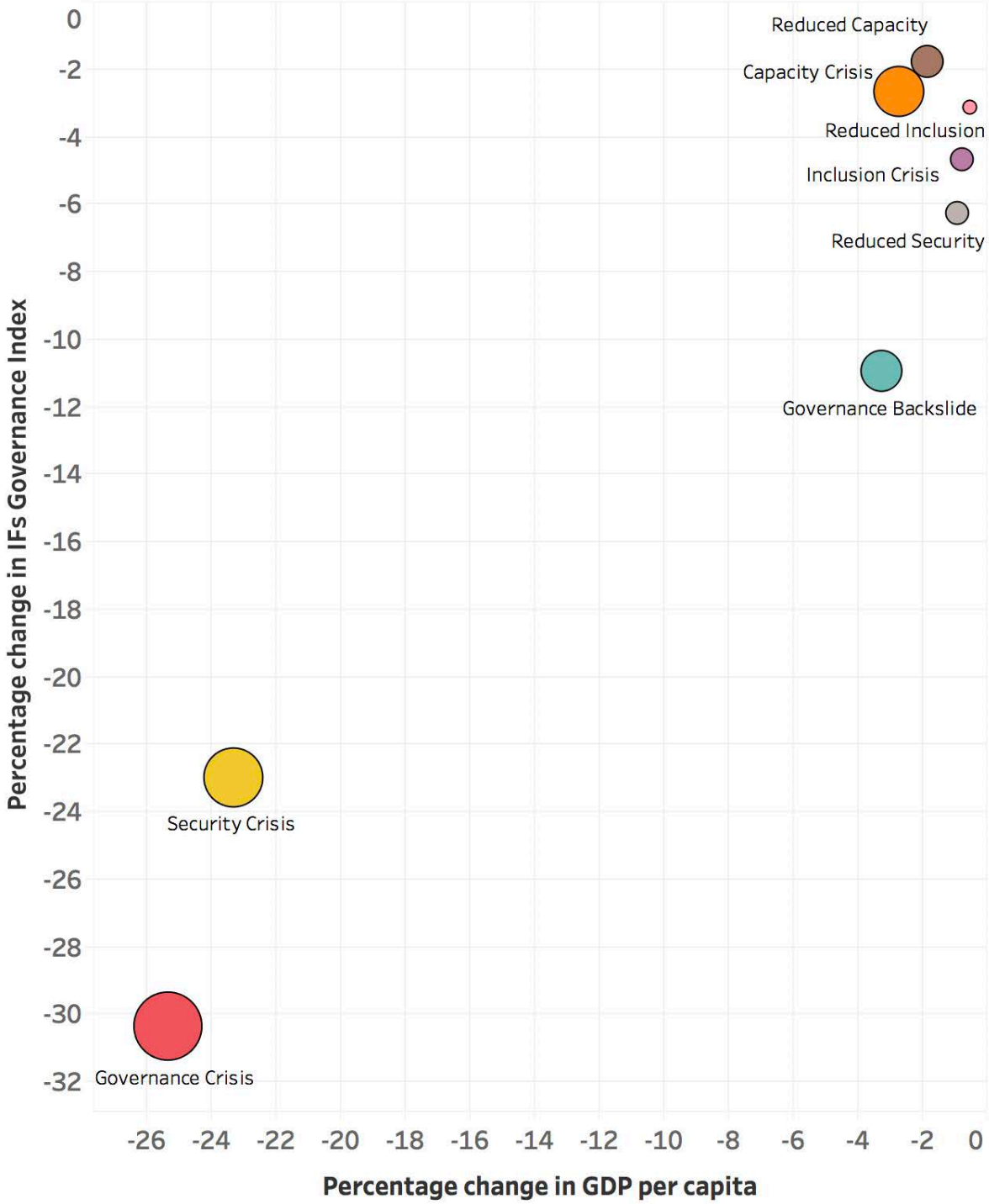
Figure 9.r: Comparison of positive governance interventions on selected indicators in 2030

Source: IFs v 7.27

Figure 9.s shows the effects of the negative governance scenarios compared to the Current Path in 2030. The Governance Crisis scenario is a combined scenario that includes the Security Crisis, Capacity Crisis and Inclusion Crisis scenarios. The Governance Backslide scenario is a combined scenario that includes the Reduced Security, Reduced Capacity and Reduced Inclusion scenarios. The Security Crisis and Governance Crisis have the largest negative impacts across all indicators. The Security Crisis scenario lowers Ethiopia's score on the IFs Governance Index by 23% and reduces GDP per capita by more than 23%, while the Governance Crisis scenario lowers Ethiopia's score on the IFs Governance Index by more than 30% and GDP per capita by more than 25%. The Governance

Backslide scenario registers the next largest effects, reducing Ethiopia's Governance score by nearly 11% and reduces GDP per capita by over 3%.

Figure 9.s: Comparison of negative governance interventions, Governance Backslide and Governance Crisis scenarios on selected indicators in 2030



Source: IFs v 7.27

CHAPTER 10: THE ROAD AHEAD

A central question that emerges from this analysis is how effectively the Government of Ethiopia will be able improve service delivery and create a more inclusive political and economic environment in the midst of growing fiscal constraints. While Ethiopia's state-led public investment model has produced impressive economic and developmental gains over the past 15 years, it has relied heavily on public debt, concessional loans, and aid dollars to fund these programs. Going forward, aid funds for Ethiopia (as a percent of GDP) will decrease and concessional loans will begin to dry up.

Ethiopia is heavily invested in major infrastructure projects, including large scale road projects, a railway connecting Addis Ababa to the port of Djibouti, and a number of massive hydroelectric dams (in particular the Grand Ethiopian Renaissance Dam). Concurrently, the GoE, with the help of development partners, has also expanded spending on health, education, and agricultural services.

As this report has shown, fundamental challenges remain with respect to improving basic human development outcomes. Ethiopia has high levels of undernutrition relative to its peer countries and lags in terms of average levels of educational attainment, particularly among females. The country is expected to see rapid population growth over the forecast horizon, further straining government capacity and service delivery. Available investment in these sectors could be limited in the near term, due to the prioritization of large infrastructure projects.

Alongside demands for accelerated investment in human development, Ethiopia is approaching a favorable demographic dividend, with significant implications for economic growth and development if it can be managed appropriately. Around 40% of Ethiopia's population today is under the age of 15, and many will be entering the labor force over the next five to ten years. Without commensurate investment in human capital, that same youthful population structure could be a force for social instability.

Despite Ethiopia's significant developmental progress over the past two decades, much of the labor force and economy remain dependent on the agricultural sector. Policies to improve agricultural productivity and output will have significant impacts on poverty reduction, food security and human development more broadly. Agriculture as a share of total economic output is forecast to decline along with Ethiopia's development, but it remains a crucial segment of the economy – currently employing over 70% of the labor force.

Improving governance capacity will be key to meeting many of Ethiopia's development challenges. Tax revenues in Ethiopia are an estimated three percentage points lower (as a percent of GDP) than the average for other low-income African countries, constraining the ability of the government to meet basic needs. Improving governance capacity will allow the GoE to increase its ability to deliver services in a more comprehensive and equitable manner. Moreover, the recent social unrest and subsequent State of Emergency suggest that governance is at a crossroads. Improving government capacity, expanding economic freedom, empowering women, whilst promoting inclusive growth will help the GoE address many of the challenges it faces and promote a future of broad-based, sustainable economic growth.

10.1 Scenario Outcomes: Tradeoffs

Thus far, we have explored the effects of broad sectoral interventions on a range of indicators within each issue area (i.e. health scenarios measured against gains in life expectancy, or fertility reductions measured against demographic dependencies). But, it is also important to look at the effects of each sectoral intervention across a range of indicators. Below is a summary table showing the impact of each scenario relative to the Current Path across a range of development indicators in 2030. The strengths and weaknesses of each scenario, as well as the relative costs and benefits, are dependent on the goals defined for evaluating "development."

Figure 10.a: Comparison of all positive sectoral scenarios across indicators

	Extreme Poverty	Education years (15+)	GDP (MER)	GDP per capita	Gov't Revenue	HDI	Infant Mortality	Life Expectancy	Malnutrition (% children)
Agriculture Resilience	-31.8	0.6	11.4	7.6	10.1	1.4	-10.8	0.7	-25.1
Improved Infrastructure	0.1	-0.3	0.0	0.0	0.0	0.0	0.1	0.1	0.6
Improved Family Planning	-8.0	-0.5	-0.5	2.4	-0.7	0.2	-0.4	0.1	-14.4
Improved Governance	-2.6	0.5	4.6	3.1	8.4	0.6	-3.6	0.3	-5.6
Advancing Education	-1.4	4.8	0.4	0.4	0.4	1.6	-1.5	0.3	0.3
Improved Health	0.1	-0.3	0.7	0.4	0.6	0.4	-13.1	0.8	-19.0
Transitioning Informality	-1.6	0.3	3.4	2.3	4.5	0.4	-1.7	0.1	-2.3

Source: IFs v 7.27

An integrated policy to improve agricultural production and demand could have significant impacts on poverty reduction, but a resilient agriculture push does little to improve average years of education. Meanwhile, a concerted push to improve infrastructure has limited impact on most of the selected outcome indicators. The Ethiopian government is already investing heavily in infrastructure; thus, improvements relative to the Current Path are marginal, and the size and cost of the GERD and other large-scale hydroelectric projects will likely constrain domestic funding for other types of much-needed infrastructure. While an integrated health push boosts life expectancy and infant mortality, it also increases poverty relative to the Current Path by 2030. In isolation, health interventions will indeed save lives (which is inherently valuable), but will not significantly affect the economic status of those saved lives.

Each of these positive sectoral scenarios has specific benefits and drawbacks, but an integrated development push across sectors will help mitigated these tradeoffs and push Ethiopia into a virtuous cycle of development. On the other hand, a regression across sectors or a crisis in governance could lead to a downward development spiral.

10.2 Scenario Outcomes: An Integrated Development Push

In this section we explore the potential impacts of integrated sectoral interventions on key development outcomes to 2030. We also introduce 3 scenarios that represent 1) **an Integrated Development Push** across all sectors, 2) a **Stalled Development** scenario, and 3) a **Governance Crisis (+Stalled Development)** scenario.

The Integrated Development Push scenario pulls together each positive combined intervention from each section to represent a five-year policy push to improve human, economic, social development across each sector outlined in this report. The Stalled Development represent a cross-cutting stagnation in development progress, combining the negative or stalled development scenarios from various sections in this report. Finally, the Governance Crisis (+Stalled Development) scenario simulates a rapid deterioration of government security, capacity, and inclusion paired with Stalled Development.

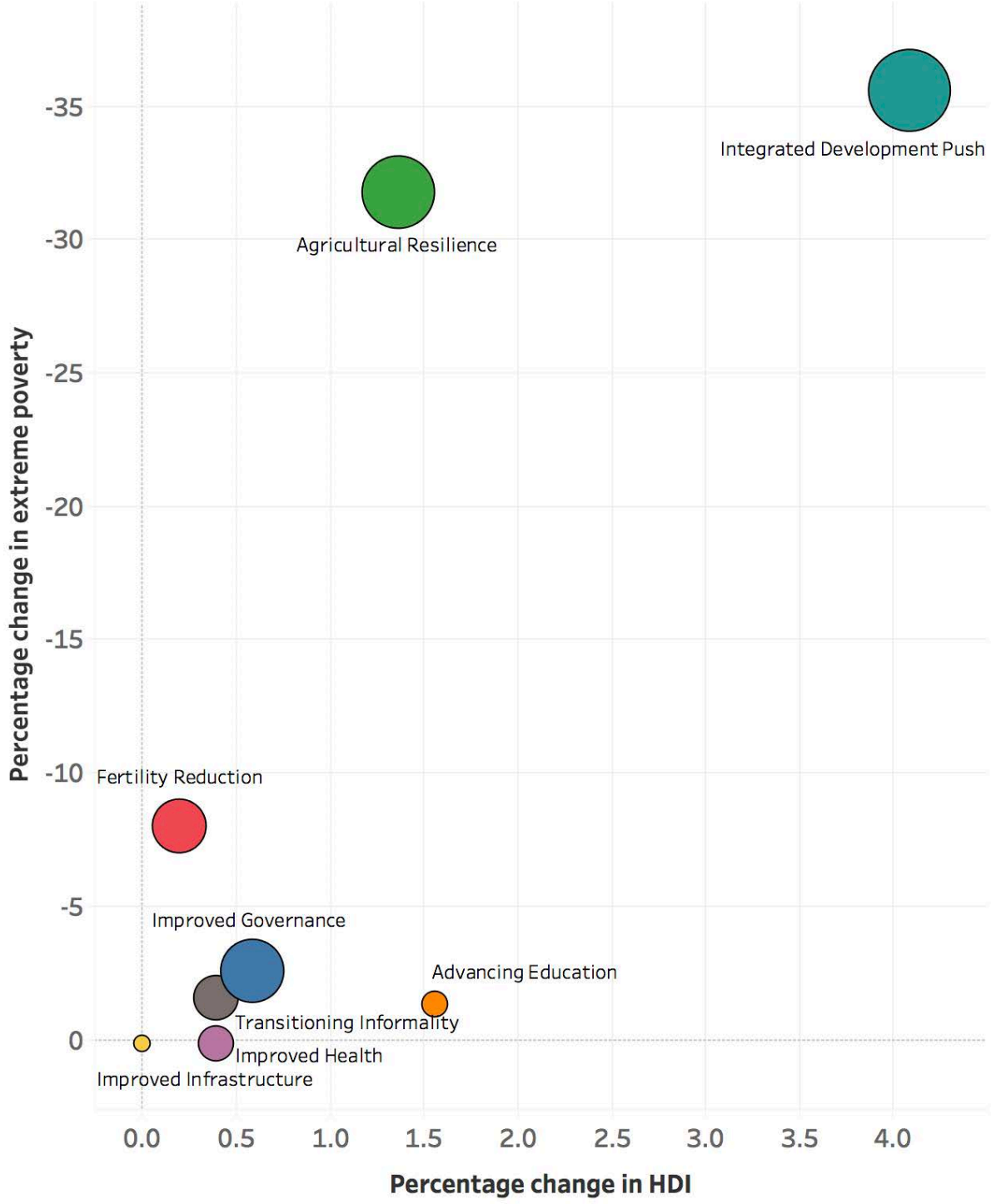
Figure 10.b presents impact of the positive sectoral interventions and the Integrated Development Push across three key development indicators: the percentage decrease in people living in extreme poverty (*y*-axis), the percentage change in the Human Development Index (x-axis) and the percentage change in GDP per capita (bubble size). In all instances, the change is relative to the Current Path in 2030.

Of the sectoral scenarios, the Agricultural Resilience scenario causes the most significant reduction to the percent of people living in extreme poverty by 2030, reducing poverty by about 32% relative to the Current Path. The Agricultural Resilience scenario also results in the largest increase in GDP per capita in 2030 and improves HDI relative to most other scenarios. Given the central role of agriculture to the Ethiopian economy, it is not surprising that a comprehensive push on agriculture produces impressive results.

Although the Agricultural Resilience scenario stands out, other scenarios also produce important, positive results. The Advancing Education scenario causes the most dramatic improvement in the HDI, a minor reduction in poverty and an above average increase in GDP per capita. The Improved Governance Scenario leads to a sizeable increase in GDP and reduction in poverty, and the second largest improvement in HDI. The Continued Fertility Reduction scenario has strong effects on GDP per capita and reduces the percentage of people living in poverty, but it does not have much of an impact on HDI.

The Integrated Development Push shows that coordinated policy intervention across sectors will massively reduce the percent of those living in extreme poverty, significantly increase human development, and boost growth. This scenario delivers nearly a 34% reduction in extreme poverty, a more than 4% improvement in HDI and a 15% increase in GDP per capita by 2030, relative to the Current Path.

Figure 10.b: Comparison of all positive sectoral scenarios with the Integrated Development Push scenario in 2030



Source: IFs v 7.27

On the other hand, if Ethiopia's development stagnates, and/or a lack of economic, social and political progress leads to an internal governance crisis, the country could see a significant backslide in human development and growth. Figure 10.c shows the negative effects of stalled development or backsliding in each sector and in the Stalled Development and Governance Crisis (+Stalled Development) on extreme poverty, HDI, and GDP per capita. In contrast to Figure 10.b, the bubble size in this graph represent a percent decrease in GDP per capita from the Current Path (i.e. a larger bubble means fewer dollars per person in 2030).

While the positive scenarios frame an optimistic picture of Ethiopia's future, a series of policies that fail to actively promote growth and human development could have profoundly negative consequences for Ethiopia's future. Notably, all of the combined negative scenarios decrease GDP per capita relative to the Current Path, although the change seen in the Health Backslide and Stalled Education scenarios are less severe by comparison. All of these scenarios, with the exception of the Health Backslide, increase the number of people living in extreme poverty by 2030 relative to the Current Path. Stalled Agriculture causes the largest increase in poverty, increasing the number of people living in that condition by about 11% relative to the Current Path in 2030. Stalled Education has the most severe consequences on HDI, decreasing Ethiopia's score by more than 1% by 2030 relative to the Current Path.

The possible consequences of the Crisis and Stalled Development scenarios paint an alarming picture. In the Stalled Development scenario, there could be roughly 14% more Ethiopians living in poverty, GDP per capita could be approximately 8% lower and Ethiopia's HDI score could be nearly 3% lower in 2030 relative to the Current Path. In the Governance Crisis scenario, there could be about 25% more people living in poverty in Ethiopia, GDP per capita could be 25% lower, and the country's HDI score could dip by more than 4%, relative to Ethiopia's current development trajectory. Finally, in the combined Crisis Scenario, Ethiopia could be facing more than a 50% increase in extreme poverty, a 29% reduction in GDP per capita and a 6% reduction in its HDI score, relative to the Current Path in 2030.

Figure 10.c: Comparison of all stalled sectoral scenarios with the Stalled Development and Governance Crisis (+Stalled Development) scenarios in 2030

Source: IFs v 7.27

In short, a failure to embrace inclusive, progressive policies that aim to improve the lives of all Ethiopians could have profound consequences for the entire country. An integrated development push could propel growth rates to between 8 and 11% across the forecast horizon, while a governance crisis coupled with stalled human development could see growth rates fall to 2% by 2030. Under the Integrated Development Push, Ethiopia nearly reaches the GTP II target of 11% annual growth through 2020, whereas along the Current Path growth is forecast to average about 7% annually.

The interventions in this report aim to be both ambitious and realistic. Pushing on the leverage points outlined above will help to sustain economic growth and improve human development outcomes by 2030. While the interventions above represent a five-year policy push, many of the effects of investments in human development will not be realized for many years. Moreover, the danger of institutional inertia - a situation where policymaking fails to evolve because existing strategies have been successful in recent memory - remains. The Government of Ethiopia must build on past successes and have the foresight to enact policies that help to provide a path to long-term growth. All policymaking involves tradeoffs, and no one intervention is a panacea. However, an integrated push across sectors can help foster economic growth, improve human development outcomes and put Ethiopia on a path to long-term sustainable development.

ANNEX A: DATA AND INTERVENTIONS USED IN IFS

A.1 Overview of data used in IFs

The International Futures (IFs) forecasting system contains 3 618 data series which cover 186 countries over time.[330] Of these, 652 primary series are read into the model and used for forecasts. These data come from a variety of sources, particularly large international organizations (see Annex B). We try to collect data from the fewest number of sources for the following reasons:

- International organizations compile data from many sources must standardize the results to ensure comparability and quality. By collecting standardized data directly, we avoid some time-consuming data validation processes.
- Time-series data is imperative for long-term forecasting. In our experience, international organizations tend to collect data across time (annually) and commit to frequent updates.
- Third, by limiting the number of data sources, we limit the amount of time and organizational resources required to collect new data every year.

A.2 Comparisons and country groups

During the course of this report Ethiopia's history and future is compared with the following country groupings:[331]

- **Africa low-income:** Benin, Burkina Faso, Burundi, CAR, Chad, Comoros, DRC, Eritrea, Ethiopia, Gambia, Guinea, Guinea-Bissau, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Rwanda, Senegal, South Sudan, Tanzania, Togo, Uganda and Zimbabwe.
- **Other Africa low-income countries:** the same as above, except that it does not include Ethiopia.
- **Africa low-middle income:** Cameroon, Côte d'Ivoire, Djibouti, Egypt, Ghana, Kenya, Lesotho, Mauritania, Morocco, Nigeria, Republic of Congo, Sao Tomé and Principe, Sudan, Swaziland, Tunisia and Zambia.
- **Regional peer countries:** Kenya, Rwanda, Tanzania, and Uganda
- **sub-Saharan Africa:** Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Cape Verde, Central African Republic, Chad, Comoros, Democratic Republic of Congo, Republic of Congo, Cote d'Ivoire, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome & Principe, Senegal, Sierra Leone, Somalia, South Africa, Sudan, South Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia and Zimbabwe.

A.3 Reconciling data across different sources

The 652 series required to initialize the model may have missing values and/or sometimes the data between countries can be contradictory. Some series may report different values for the same observation. Before the model can be run, a "preprocessor" algorithm reconciles all data for all countries for the initial year. This requires "preferencing" particular data series among which must be determined given the data's credibility and coherence with other observations.

[330] As of November 20th, 2016 using IFs v 7.26
[331] http://blogs.worldbank.org/opendata/new-country-classifications-2016

A.4 Data update process

We keep documentation on the data used in the model (metadata). Basic metadata can be accessed through the model: the source, definition, last update, units, etc. The Pardee Center also keeps detailed internal documentation on the methodologies used to create the data to allow for easy adjustment or alterations to the model accordingly.

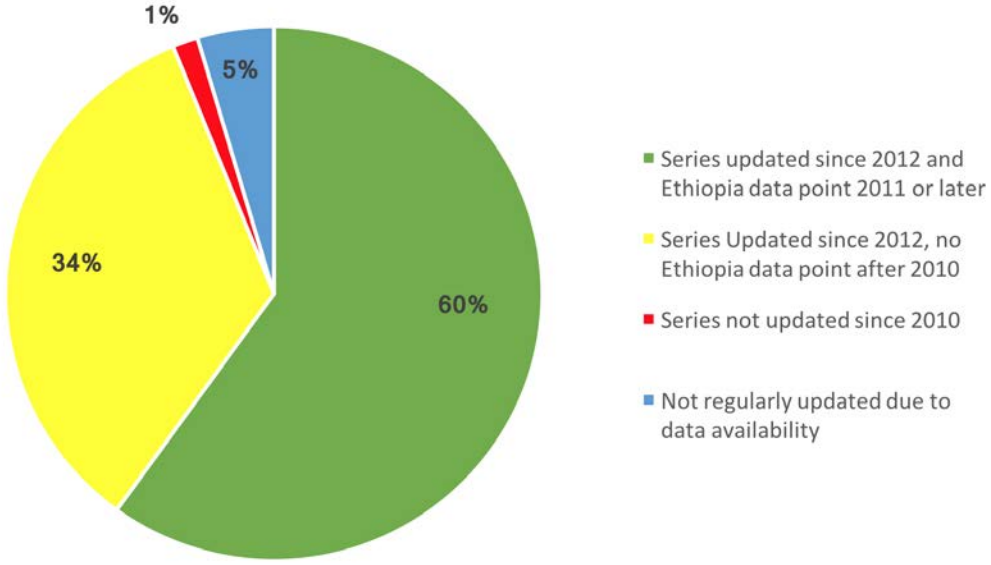
A.5 Data coverage for Ethiopia

Figure A.1 shows the data coverage for the 652 series for which IFs has data for Ethiopia. The data composition is classified into four buckets:

- **Green** corresponds to series for which there is Ethiopia country data in 2011 or later, AND for which the latest IFs series update happened in or since January 2012.
- **Yellow** corresponds to series that have been updated since 2012 but for which there is no country data later than 2010 for Ethiopia. Some of these were updated.
- **Red** corresponds to series that had not been updated since 2011 and that were updated.
- **Blue** corresponds to series that appear out of date but have not been updated because data updates are not readily available or they are used in variables that do not change rapidly across time, or for other internal circumstances.[332]

Approximately 1% of the data (10 data series) for Ethiopia needs to be updated. 34% of the series do not have data after 2010 for Ethiopia, even though the whole data series has been updated since 2012 (yellow). This means that the organizations whose data we use have not updated data for Ethiopia, or do not report on Ethiopia. FAO series from FAOSTAT fall into the green category. The latest batch of FAOStat data was pulled and incorporated in December 2017.

Figure A.1: Data series by Type (%)



A.6 Alternative project data file

The IFs model keeps its historical data series in a master database file named IFsHistSeries.mdb located in the Data folder in the IFs main installation folder (IFs\Data). The data in this file are taken from standard multi-country sources such as the World Bank's World Development Indicators and the Food and Agriculture Organization's FAOSTAT database (see Annex B).

[332] Some of these are calculated within the model, some require additional model enhancements, and some do not need to be updated.

A special feature in IFs allows users to override IFsHistSeries.mdb with historical data from other sources without affecting the master database's original contents.
For this report, we have prepared an alternative data file, "IFsProjectDataEthiopia" that was imposed on the model to rebuild an alternative base case in IFs. Figure A.2 below outlines the different series collected for the initial project data file, coverage, and the source of the data. Much of the data comes from Demographic and Health Surveys conducted at the national level by USAID and its partners. These surveys began in 2000 and are conducted every 5 years.

Figure a.2: Data series included in the alternative project file for Ethiopia

Series Name	Source	Notes
GDP	IMF/IFs	Calculated GDP forecasts for 2016-2021 using IMF 5-year growth forecasts
GDP Growth Rates	IMF	IMF 5-year growth forecasts (2016-2021)
Traffic Deaths	UNStats	Annual Traffic deaths (thousands)
Cropland	FAO	Land under cultivation (millions of hectares)
Forest land	FAO	Forest land (millions of hectares)
Grazing Land	FAO	Land used for grazing (millions of hectares)
Other Land	FAO	Marginal land
Road Network	GoE and External Reports	Total Length of Road (KM)
Total Fertility Rate	USAID	Total Fertility Rate from DHS survey

A.7 Interventions

All interventions were created using IFs version 7.27 and all interventions start in 2017. The following contain tables with each intervention, parameter and target for each chapter. Unless otherwise noted, each scenario is interpolated to the target value from 2017 to 2021 and then maintained through the forecast horizon.

A.7.1 Demographic scenarios

Scenario	Parameter(s)	Target value
Improved Family Planning	tfrm	0.9
Fertility Reduction Stalls	tfrm	1.1
Contraception Increase	contrausem	1.12
Contraception Decrease	contrausem	0.8
Continued Fertility Reduction	tfrm, contrausem,	0.9, 1.12
Stalled Family Planning	tfrm, contrausem,	1.1, 0.8

A.7.2 Agriculture scenarios

Scenario	Parameter(s)	Target value
Yield	ylm	1.35
Land	ldcropm	0.325
Loss	aglosstransm	0.9
Demand	clpcm	1.15
Welfare Transfers	govhhtrnwelm	1.1
Agricultural Resilience	All of the above	Same targets
Reduced Land	IFs Base Case	1
Decreased Yield	ylm	0.9
Increased Loss	aglosstransm	1.1
Stalled Agriculture	Above interventions	Same targets

A.7.3 Health scenarios

Scenario	Parameter(s)	Target Value
Improved Sanitation	sanitatoinm (improved)	1.3 to 1.2 (2022)
Improved Water	watsafem (unimproved)	0.64 to 0.75 (2022)
Decreased Solid Fuel Use	Ensolfuelm	0.85
Under-5 Mortality	hlmortcdchldm	0.925
Maternal Mortality	hlmortcdadltm (female)	0.9
Improved Health	All of the above	Same Targets
Stalled Sanitation	sanitatoinm (improved)	0.9
Stalled Water	watsafem (unimproved)	1.06
Continued Solid Fuel Use	ensolfuelm	1.035
Under-5 Backslide	hlmortcdchldm	1.075
Maternal Mortality Backslide	hlmortcdadltm (female)	1.1
Health Backslide	All of the above	Same Targets
Malaria Outbreak	hlmortm	1.3

A.7.4 Education scenarios

Scenario	Parameter(s)	Target value
Primary Survival	edprisurm	1.18
Lower Secondary Survival	edseclowrsurm	1.12
Upper Secondary Transition	edsecupptranm	1.15

Upper Secondary Survival	edsepprsurm	1.05
Lower Secondary Transition	edseclowrtranm	1.1
Tertiary Intake	edterintm	1.2
Advancing Education	All scenarios	Same Targets
Primary Survival	edprisurm	0.82
Upper Secondary Transition	edsecupptranm	0.88
Tertiary Intake	edterintm	0.8
Stalled Education	Edterintm, edsecupptranm and edprisurm	Same Targets

A.7.5 Informal scenarios

Scenario	Parameter(s)	Target value
Improving economic freedom and business regulation	govbusregindm	0.95
	econfreem	1.1
Stregthening Ties	gdpinformshrm	0.935
Expanding social beneifts	edsepprsurm	1.2
Transitioning Informality	All of the above	Same Targets

A.7.6 Infrastructure scenarios

Scenario	Parameter(s)	Target value
Electricity Access	infraelecaccm	1.15
Road Network	infraroadm	1.3
Traffic Fatalities	deathtrpvm	0.85
Mobile Broadband	ictbroadmobilm	1.2
Improving Infrastructure	All of the above	Same Targets
Improved WASH	sanitatoinm (improved)	1.3 to 1.2 (2022)
	watsafem (unimproved)	0.64 to 0.75 (2022)

A.7.7 Governance scenarios

Scenario	Parameter(s)	Target value
Improved Security	stfintlwaradd	-0.15
Reduced Security	stfintlwaradd	0.15
	gdsm (military)	1.15
Security Crisis	stfintlwaradd	0.4 in 2017, 0.8 in 2018-2020, 0,74 in 2021
	invm	0.8
	gdsm (military)	1.5
Improved Capacity	firmtaxrm	1.1
	Govregqualm	1.1
	aidrecm	1.1
	govcorruptm	1.1
	goveffectm	1.1
Decreased Capacity	aidrecm	0.9
	govcorruptm	0.9
	goveffectm	0.9
Capacity Crisis	aidrecm	0.8
	govcorruptm	0.85
	goveffectm	0.85
	Govregqualm	0.85
Improved Inclusion	econfreem	1.1
	gemm	1.1
	democm	1.25
Decreased Inclusion	econfreem	0.9
	gemm	0.9
Inclusion Crisis	econfreem	0.85
	gemm	0.85

ANNEX B: DATA SOURCES

Section	Indicator	Source
Demographics	Population	UN Population Division, World Bank World Development Indicators (WDI)
Human Development	Human Development Index	UNDP
	Poverty	WDI
	Poverty gap	PovCalNet
	GINI	WDI
	Life expectancy	UNPD
Health	Disease(s) burden and prevalence	WHO, UN Aids
	DALYs	Global Burden of Disease Project
	Contraception use	WDI and UN Statistics Division
Education	Education and literacy	UNESCO Institute for Statistics (UIS), Barro-Lee
Economy	GDP/GDP PC	World Bank (WDI project)
	ODA/Foreign aid	OECD Development Assistance Cooperation (DAC)
	Imports and exports	MIT Observatory of Economic Complexity
	Government spending	WDI, IMF, OECD
	Savings	WDI
	FDI	UN Conference on Trade and Development
	Trade	IMF Direction of Trade Statistics
	Productivity	United Nations Industrial Development Organization
	Labour	International Labour Organisation and WIEGO
	Informal economy	UN Economic Commission for Europe
Agriculture	Agriculture yields/food/hunger	FAO
	Water	AquaStat
	Malnourishment	WDI
	Undernourishment	International Food Policy Research Institute

Section	Indicator	Source
Infrastructure	Electricity	International Telecommunications Union (ICU)
	ICT	ICU
		EuroStat
	WASH	UNICEF/WHO (WSSJMP) Joint Monitoring Project
	Road paved/density	WDI
Governance, conflict, regional relations	Security inclusion capacity	Political Instability Task Force, Center for Systemic Peace, OECD, WDI, Polity IV
	Government effectiveness	World Bank Worldwide Governance Indicators (WGI)
	Regime characteristics	Polity IV
	African governance index	Ibrahim Index 2016
	Ibrahim variables	Polity IV, Freedom House International, UNDP, Transparency International, WGI
	Civil liberties and political freedoms	Freedom House International
	Control of corruption	Transparency International
	Democracy "polyarchy" measure	Varieties of Democracy Project (V-Dem)
	Conflict events since 1989	Uppsala Conflict Data Project (UCDP)
	Conflict events since 1997/riot and protest data/fatalities	Armed Conflict Location and Event Dataset (ACLED) Version 6
	Geographical location of conflict events	ACLED RealTime data
	Terrorism	Global Terrorism Database, University of Maryland
	Peacekeeping	United Nations of Peacekeeping Operations (UNDPKO)
	Bilateral Trade	IMF Direction of Trade Statistics (DOTS) and CEPI- BACI International Trade Database
	Bilateral Migration Data	UN Migration
	Influence Index	Calculated internally by the Pardee Center. Underlying data is taken from a number of sources: Correlates of War Project, FDI: UNCTAD, AidData, WTO Regional Trade Agreements, IMF Direction of Trade Statistics, SIPRI

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United States Agency for International Development
Entoto Street
Addis Ababa, Ethiopia