

Shaping the future

Strategies for sustainable development in Kenya



Kenya's future offers both opportunities and significant challenges. It is a continental leader in information technology and has well-developed health and education systems relative to other lower-middle-income African countries, despite average incomes being at the low end of that threshold. However, access to other basic services is poor and various corruption scandals have cast a shadow over development prospects. To shape a better future Kenya must improve the quality of governance and accelerate service delivery without sacrificing gains in other areas.

Key findings

- ▶ Kenya performs better than expected on many health and education indicators, based on its level of income. However, education outcomes have begun to stagnate in recent years.
- ▶ Since 2012 the country has accomplished one of the most rapid increases of access to electricity globally, but levels of access to other basic services such as water and improved sanitation are well below average for lower-middle-income African countries.
- ▶ Despite being central to the Kenyan way of life, the agricultural sector is relatively inefficient and, owing to a rapidly growing population, the country is likely to become increasingly dependent on imported food. In order to reduce vulnerability to international commodity price shocks, Kenya must improve average yields, reduce losses and implement new technologies.
- ▶ Kenya has an abundance of renewable energy. However, the construction of a coal plant in Lamu and excitement around the discovery of oil leave a cloud of uncertainty about the country's energy future.
- ▶ Kenya is unlikely to reach upper-middle-income status by 2030, even in our positive scenario. However, a coordinated push across five key areas can still meaningfully improve livelihoods in the country.
- ▶ Corruption and poor governance remain impediments to more inclusive economic growth and improved human development outcomes.

Recommendations

- ▶ **Maintain gains in health and education:** Health and education outcomes in Kenya are favourable relative to those of other lower-middle-income African countries, but education outcomes have been stagnating in recent years and the government must keep these sectors on track.
- ▶ **Address corruption:** The issue of corruption is well known and the country must reduce rent-seeking and address the more fundamental issue of poor implementation. The government must also manage oil revenues effectively and transparently going forward.
- ▶ **Expand access to basic infrastructure:** Recent efforts at electrification have been impressive but service delivery must also expand in other areas – such as clean water, affordable housing and improved sanitation facilities.
- ▶ **Improve efficiency in the agricultural sector:** Agriculture will remain critical to the livelihoods of most Kenyans. The government should promote efficiency by improving yields, reducing losses and pursuing climate change adaptation strategies.
- ▶ **Balance competing priorities:** Aggressively pursuing some goals (e.g. electrification) at the expense of other priorities such as water and sanitation is a trade-off that the government of Kenya should manage carefully going forward.

Introduction

Kenya faces a variety of risks and opportunities in the coming years. The country is a continental leader in information and communications technology (ICT) and boasts relatively well-developed health and education systems compared to other lower-middle-income African countries.¹ For instance, in 2015 Kenyans over the age of 15 had about the same number of average years of education and could expect to live about five years longer than people in other lower-middle-income African countries, despite Kenya's falling at the very low end of the World Bank lower-middle-income threshold.²

However, Kenya suffers from a significant infrastructure deficit and has been plagued by extensive corruption that constrains progress in human development as well as future economic growth prospects. The country also has a young and increasingly urban population, which will complicate efforts to expand access to basic services and may serve as a spark for social instability. Kenya has further embarked on a complex process of devolving responsibility for the delivery of a number of services – including healthcare and various education functions – to the county and municipal level. The devolution process presents substantial challenges and will take time to stabilise.

Individuals in other lower-middle-income countries in Africa were nearly 65% more likely to have access to improved sanitation facility

Expanding access to basic services in Kenya presents a formidable challenge, considering the low levels of access relative to other lower-middle-income African countries. In 2015, for example, individuals in other lower-middle-income countries in Africa were nearly 65% more likely to have access to an improved sanitation facility and roughly 25% more likely to have access to clean water than people in Kenya.

Poor service delivery notwithstanding, the country scores above average compared to other lower-middle-income African countries on the World Bank Government Effectiveness measure, the World Bank Regulatory Quality measure and the Economic Freedom Index from

Fraser House. This contradiction likely stems in part from the comparatively high levels of corruption that have come to characterise Kenya.

Kenya has somehow managed to support the development of its human potential relatively well despite having a substantial deficit of basic infrastructure such as potable water, improved sanitation facilities, housing and, until recently, electricity.

With steady improvements in health and education and a significant push to improve access to core infrastructure and reduce corruption, Kenya could achieve meaningful improvements across a number of dimensions of economic and human development. If service delivery stagnates, however, and the quality of policy implementation in the public sector wanes, Kenya may experience increased social tension and instability around the 2022 elections.

Purpose and scope

In an effort to better understand the bedrock of Kenya's development landscape, the Pretoria office of the Institute for Security Studies (ISS) – in collaboration with the Kenya Business Guide (KBG) – has compiled an analysis and forecast of Kenya's likely development trajectory to 2040, along with two alternative scenarios.

The project was implemented as part of the African Futures Project (AFP) – a collaboration between the ISS and the Frederick S. Pardee Center for International Futures (Pardee Center) at the Josef Korbel School of International Studies at the University of Denver. The study was funded by the Hanns Seidel Foundation (HSF) and the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) through the Employment for Sustainable Development in Africa (E4D) Programme. This report highlights the major findings of a larger reference document based on several months of research and a number of roundtable discussions with stakeholders from government, academia, civil society and the private sector.³

The project used the International Futures (IFs) forecasting tool – developed and housed at the Pardee Center – for the analysis presented here. IFs is a dynamic, global model that integrates data (more than 4 000 series) and outcomes across several key development systems, including agriculture, demographics, economics, education, energy, the environment, governance, health, infrastructure, socio-political and technology. IFs is an

integrated assessment model, meaning that it draws on a number of other modelling approaches (e.g. econometric modelling, computer-generated equilibrium models, social accounting matrices, etc.).⁴ The model integrates a vast amount of data across a wider range of development systems than any other publicly available tool.⁵ The tool is open source and can be downloaded for free at <http://pardee.du.edu>.

IFs allows for three main types of analysis. First, users can analyse historical trends and relationships to understand how a country or region has developed over time. Second, these relationships are formalised in the model to produce a Current Path scenario, which provides a useful indication of where a country seems to be heading under current circumstances and policies, and in the absence of any major shocks to the system.⁶ Third, scenario analysis augments the Current Path forecast by exploring the leverage that policymakers may have to push systems toward more desirable outcomes.

This report draws on all three of these avenues of analysis. The first section uses historical data, research and interviews to paint a picture of how Kenya arrived at where it is today, as well as to identify areas where the country is underperforming relative to its level of economic development.⁷ It then analyses the Current Path forecast to understand where Kenya is likely to be in 2030 – the timeline for Kenya’s major national development plan – and in 2040. For this report, a number of adjustments were made to the IFs Current Path scenario, and hereafter the Current Path scenario will be referred to as the Stuck in Traffic scenario.⁸

The report concludes with a scenario section that explores the implications of the successful implementation, over a five-year period, of policies designed to improve development outcomes in specific areas – the Tuko Kazi Scenario. This section also presents a negative scenario – the Bila Hopes Scenario – before comparing the outcomes of these two alternative futures with the Stuck in Traffic scenario.⁹

Kenya’s progress to date and priorities going forward

Kenya is generally seen as a bastion of peace and prosperity in an otherwise turbulent and often unstable neighbourhood. There is some truth to this narrative, but

embracing it wholeheartedly may obfuscate the array of challenges facing the country. While Kenya can boast some development outcomes that are much more favourable than its immediate neighbours, in a continental – and more so global – context, the country trails behind most of the comparison groups used in this report.¹⁰ Moreover, recent declines in the number of average years of education and the failure to improve access to water and sanitation facilities raise questions about the sustainability of its progress.

That Kenya trails behind other lower-middle-income countries is not all that surprising, given that it falls at the bottom end of the lower-middle-income threshold. In 2016, gross national income (GNI) per capita in Kenya – calculated using the Atlas method in current US\$ – was US\$1 380 according to the World Bank, while the band for lower-middle-income countries currently ranges from US\$1 006 to US\$3 955.¹¹

A decline in the number of average years of education and the failure to improve access to sanitation facilities raise questions about sustainability

Put another way, if GNI per capita in Kenya were to triple overnight, the country would just barely achieve upper-middle-income status (by about US\$170) – the headline goal in its Vision 2030 planning document.¹² A mere doubling would leave the country about US\$1 200 short.

Even in the Tuko Kazi scenario, Kenya will likely not achieve its goal of becoming an upper-middle-income country by 2030. Nonetheless, a healthy, relatively well-educated population, along with high levels of technological adaptation and the recent expansion of electricity access, could foreshadow a more optimistic future – where service delivery expands more rapidly in other areas – than that envisioned in the Stuck in Traffic scenario.

Since 2008, Kenya’s development strategy has largely been guided by Vision 2030, an aspirational document that aims to transform Kenya into an upper-middle-income country by 2030. This feat was to be achieved by the country’s attaining a 10% annual growth rate over that time period.¹³

Vision 2030 is based on three pillars: economic, social and political, with a number of ‘enablers and macros’ that

have been identified as potential springboards to more robust growth.¹⁴ It is implemented according to a series of sequential five-year Medium Term Plans (MTPs).

Along with Vision 2030 and the associated MTPs, the current administration has announced the ‘Big Four’ initiative, a flagship programme that aims to deliver in four key areas: supplying affordable housing, providing universal healthcare, increasing the share of manufacturing in the economy, and improving food security.

The following section gives an overview of progress and challenges in Kenya across five key development areas, namely health and education, demographics, agriculture, energy and infrastructure, and governance and the economy. The penultimate section contrasts the Stuck in Traffic scenario with Tuko Kazi and Bila Hopes. Tuko Kazi is a scenario where Kenya accomplishes ambitious but realistic improvements in certain highlighted areas over the next five years, while Bila Hopes is a future where service delivery stalls and the quality of governance deteriorates, leading to increased social tensions around the 2022 elections.

Maintain gains in health and education

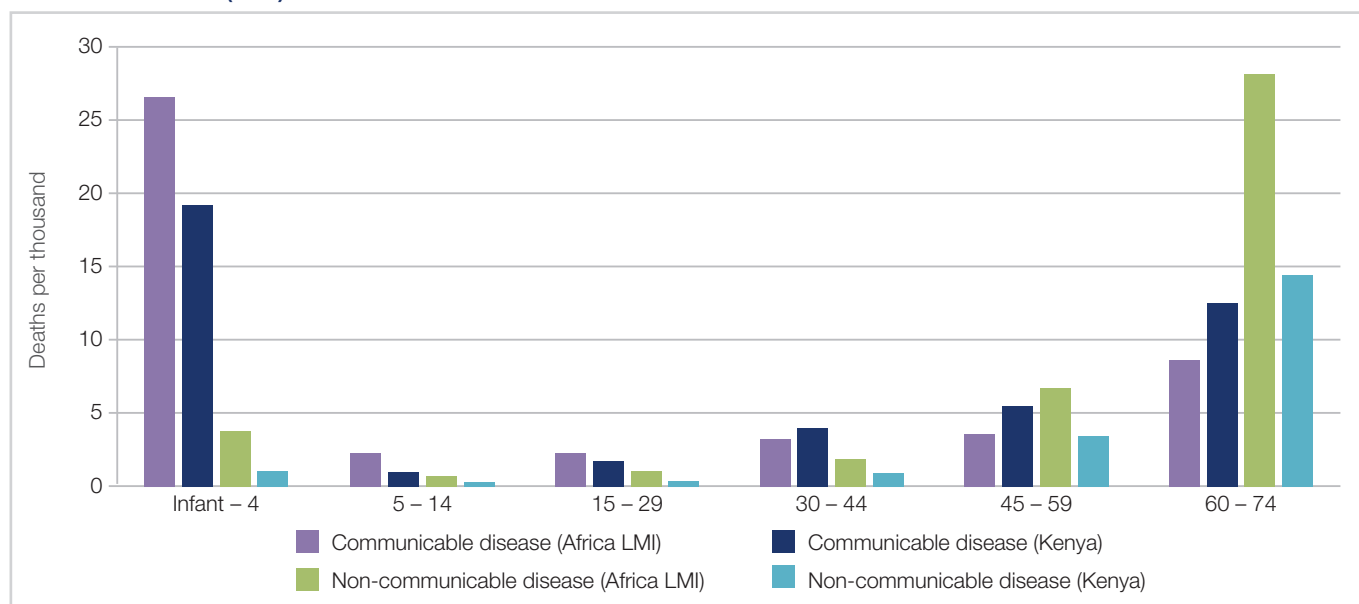
At a national level, health and education outcomes are generally better in Kenya than in other lower-middle-

income African countries – although there are still substantial challenges. This is particularly obvious in the health sector, where Kenya significantly outperforms other lower-middle-income countries in Africa. It has achieved this despite being severely affected by the HIV/AIDS pandemic. At the pandemic’s height, around 2001, the death rate from AIDS was more than four times higher in Kenya than in other lower-middle-income African countries.¹⁵

Against that backdrop it is remarkable that health outcomes in Kenya are now quite impressive. In 2015, life expectancy in Kenya (about 66 years) was about five years higher than in other lower-middle-income African countries (about 61 years). Kenya also had lower levels of infant mortality (37 deaths per 1 000 live births, against 51) and a lower proportion of undernourished children (10%) than other-lower-middle-income countries (12%) in Africa in 2015. However, recent declines in some education indicators – primary completion rates, gender equality and average years of education – warrant consideration about the long-term sustainability of these outcomes.

Figure 1 shows death rates by major subtype, as categorised by the International Statistical Classification of Diseases (ICD) of the World Health Organization (WHO).¹⁶ It shows that people in Kenya are less likely to die from a non-communicable disease – across all age

Figure 1: Death rates by communicable and non-communicable diseases for Kenya and other lower-middle-income (LMI) African countries in 2015



Source: IFS version 7.33 using data from the Institute for Health Metrics and Evaluation (IHME).

groups¹⁷ – and less likely to die from a communicable disease, at least in younger age cohorts. Below the age of 30, people in Kenya are less likely to succumb to a communicable disease than people in other lower-middle-income African countries.¹⁸

Death rates from communicable diseases in the under-five cohort are significantly lower in Kenya than the average for other lower-middle-income countries in Africa in 2015. Globally, the under-five cohort is the most susceptible to communicable diseases,¹⁹ although vulnerability increases dramatically at lower income levels.²⁰ Children under five are over 20 times more likely to die from a communicable disease in low-income versus high-income countries. Given that Kenya falls towards the lower end of the income threshold for lower-middle-income countries, the expectation would be for the country to have a higher communicable disease burden.

Along with a health sector that performs better than would be expected based on its average level of income, Kenya’s education system also does relatively well when compared to that of other African countries with similar income levels, particularly at lower levels of the education system.

Within IFs, education is conceptualised as a pipeline where, in a broad sense, the goal is to move as many students through the system as possible. However, for various reasons there are typically leakages along the pipeline, with high average enrolment and completion

rates in primary and relatively lower average enrolment and completion rates at tertiary level – even in developed countries.

In Kenya, a far higher percentage of students completed primary school than in other lower-middle-income African countries in 2015, and that trend continues through enrolment in lower secondary school (in Kenya called Forms 1 and 2).²¹ However, a large bottleneck between Forms 2 and 3 inhibits progress through the pipeline, along with a smaller bottleneck in upper secondary completion.

The Kenyan education system does well at enrolling students in primary but begins to show cracks at higher levels

These bottlenecks suggest that the Kenyan education system does very well at enrolling students in primary school and retaining them through enrolment in Form 1.²² After Form 1, however, the system begins to show some cracks, with a relatively low number of pupils at the lower secondary level moving on to upper secondary (Forms 3 and 4), and even fewer completing Form 4. To improve secondary completion and tertiary enrolment figures, Kenya will have to maintain the rate of progress achieved at lower levels while simultaneously focusing on alleviating the bottlenecks in lower secondary transition (i.e. moving from Form 2 to Form 3) and upper secondary completion (i.e. completion of Form 4).

Table 1: Education flows in Kenya and comparison groups in 2015¹⁴

	Primary		Lower secondary		Upper secondary		Tertiary	
	Enrol (gross)	Completion	Enrol (gross)	Transition	Enrol (gross)	Completion	Enrol (gross)	Completion
Kenya	109.0	108.5	97.5	73.6	44.1	19.8	4.0	3.4
Peer group	105.9	68.2	67.9	83.4	40.7	23.5	10.7	3.0
Other lower-middle-income Africa	109.3	76.7	80.3	87.3	41.4	23.5	24.9	4.0
Africa	104.7	62.3	60.4	84.0	26.2	19.9	22.7	2.5

Source: IFs version 7.33 using data from UNESCO Institute for Statistics (UIS).

Note: for a list of countries in the Peer Group see endnote 9.

While the concept of an education pipeline may partly obscure the important issue of quality of education,²³ there are important social benefits from having high enrolment rates, particularly at the primary and lower secondary levels.²⁴ Other things being equal, more education increases the productivity of time spent in the home, promotes active engagement in civic activities and has a relationship with improved health outcomes – such as a lower propensity to smoke.²⁵ Identifying bottlenecks in the pipeline allows for more targeted education interventions, and should help improve the overall stock of education more rapidly over time.

Although there are certainly challenges facing Kenya, the health and education sectors are examples of areas that have benefited from progressive policymaking and successful implementation. The rollout of universal primary education in 2003 – and the subsequent push for universal secondary education in 2014 – along with the implementation of the Kenya AIDS Strategic Framework (KASF) are successful examples of expanding access to basic services.²⁶

However, the Kenyan education system may already be experiencing limitations. The country has seen a slight stagnation in the number of average years of education in the adult population over the age of 15 since 2010, along with similar stagnations in primary completion and in gender parity measures. While this could be caused by a number of factors, these are worrying trends that require urgent attention from policymakers.²⁷

In general, a key challenge over the coming years will be to design and implement policies that continue to expand access to services, without sacrificing the recent progress made in areas like health and education.



Manage the demographic transition

Although Kenya has achieved positive outcomes in health and education, its rapidly growing population may be straining the government's ability to maintain the gains of the previous decades. In 1963, Kenya was the 53rd most populous country globally, but by 2015 it had the 29th largest population. Between 1963 and 2000, Kenya's population grew at about 3.3% per year, significantly higher than the average for sub-Saharan Africa (2.6%) and the world (1.7%) during the same time period.²⁸ To capitalise on Kenya's existing endowment of education and its relatively healthy population, the government ought to extend family planning initiatives and aim to reduce the total fertility rate (TFR) below what is projected in the Stuck in Traffic scenario.

Between 1963 and 2000 Kenya's population grew significantly faster (3.3% per year) than both sub-Saharan Africa (2.6%) and the world (1.7)

Kenya managed to reduce its TFR from more than 8 births per woman in 1965 (second highest in the world at that time) to around 4 births per woman in 2015, which is lower than the average (4.5 births per woman) for other lower-middle-income African countries. However, the TFR in Kenya is still about 40% higher than in other lower-middle-income countries globally and in the Stuck in Traffic scenario will not reach replacement rate (2.1 births per woman) until after 2040.²⁹ Given the population growth projected in the Stuck in Traffic scenario, Kenya is forecast to become the 22nd most populous country globally by 2040, with a population of nearly 78 million people.

This rapid population growth may already be testing the government's ability to roll out basic services quickly enough to meet increased demand. For example, the proportion of people with access to an improved sanitation facility declined slightly (from 31% to 30%) between 2000 and 2010, despite the country's adding nearly 700 000 new connections. Moreover, this trend is forecast to continue out to 2030. In the Stuck in Traffic scenario, Kenya is forecast to have over half a million more people without access to piped water, nearly 3 million more people without access to an improved

sanitation facility and about 300 000 additional people surviving on less than US\$1.90 per day in 2030.³⁰

This happens despite the proportion of people with access to all of these services increasing over that same time period. This seemingly paradoxical trend is illustrated in Figure 2, which shows the percentage of the population living in extreme poverty (blue line) against the absolute number of people living on less than US\$1.90 per day (orange bars), from 2000 to 2030. Figure 2 shows that even though the percentage of the population living in extreme poverty is forecast to decline from 29% in 2015 to about 22% in 2030, the absolute number of people living in extreme poverty will increase over that same time period, by more than 300 000 individuals.

In other words, despite a seven-percentage point reduction in the extreme poverty rate, the absolute number of people living in that condition will still grow by more than a quarter-million by the end of the Sustainable Development Goal (SDG) period.

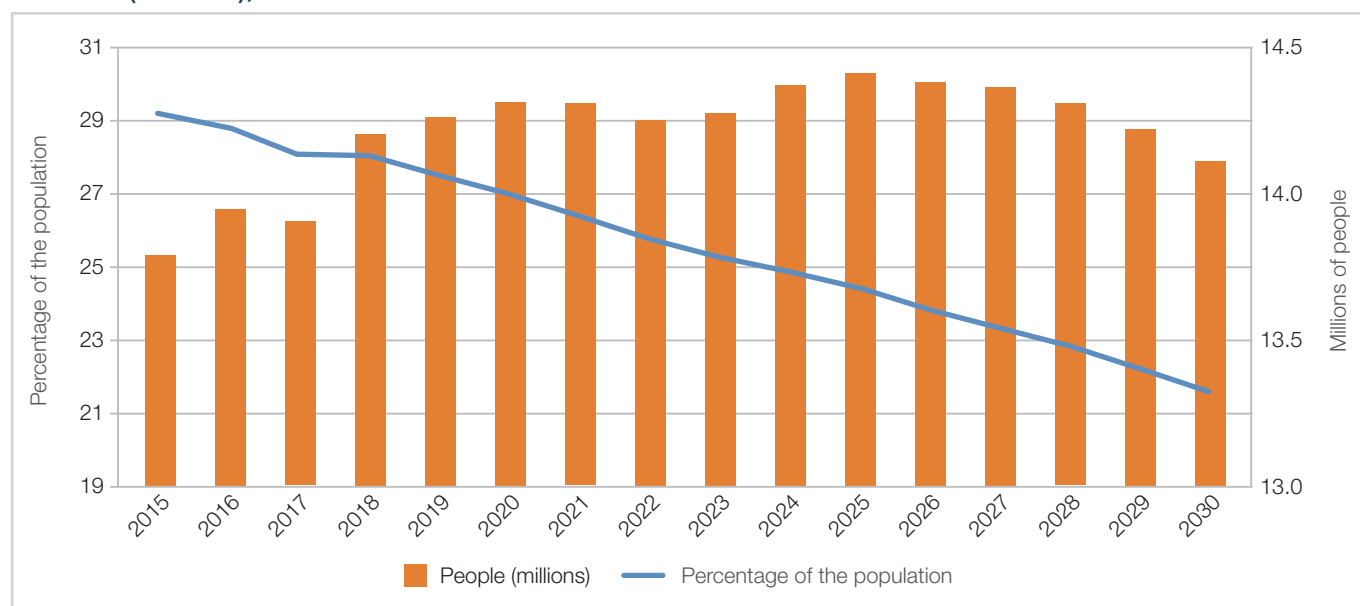
Successfully mediating population growth will not only facilitate more effective service delivery but will also enable Kenya to move more rapidly through the demographic transition and stem some of the potential hazards associated with the youth bulge (defined as the proportion of the population between 15 and 29

relative to the population over the age of 15).³¹ A large and protracted youth bulge is a potentially destabilising phenomenon (explored in more detail in the governance section) that has a strong relationship with the onset of conflict.³²

However, if that large young population can be properly harnessed it can potentially lead to enormous benefits. A growing working-age population that can access the appropriate education, healthcare, basic infrastructure and employment opportunities can translate into a rapidly expanding economy.³³ Provided the necessary preconditions exist, a large working-age population can buttress sustained periods of robust economic growth and lead to a demographic dividend.³⁴

In the Stuck in Traffic scenario, Kenya may experience some benefits of a large working-age population towards the end of the forecast period, as the median age begins to increase.³⁵ Kenya is not forecast to hit its peak demographic dividend until around 2060, although policymakers do have some leverage to change both the timing and the magnitude of this potentially powerful structural transition. To do so will require both improved family planning efforts and policies designed to improve outcomes in other areas of human development as well – female education in particular.

Figure 2: People living in extreme poverty in millions (orange bars) and as a percentage of the population (blue line), 2015–2030



Source: IFs version 7.33 initialised from UNICEF/WHO data.

Improve agricultural efficiency

Agriculture is fundamental to the Kenyan way of life, both economically and culturally. About 70% of all Kenyans depend on subsistence farming for their livelihood.³⁶ In 2015, agriculture accounted for nearly 33% of value added of gross domestic product (GDP) in the Kenyan economy and about half of all export revenue.³⁷ Although the relative contribution of agriculture to GDP is forecast to decline in the Stuck in Traffic scenario, agriculture will remain an important part of Kenyan life for the foreseeable future.

There are several ways to improve overall agricultural output: by increasing the amount of land under cultivation; improving average yields; reducing losses in production, transportation and consumption of food products; or planting more drought-resistant crops.³⁸

In Kenya, inefficiency across the entire value chain constrains more rapid development of the agricultural sector.

According to the United Nations (UN) Food and Agriculture Organization (FAO), the amount of land in Kenya under crop cultivation did not increase between 2011 and 2015, and, owing to other competing factors, it is possible that there may not be much additional land available for agricultural purposes.³⁹ Kenya is urbanising relatively rapidly and some prime agricultural land is being converted for housing or other commercial development.⁴⁰ Moreover, the variable effects that Kenya (and the rest of East Africa) is likely to experience from climate change make it difficult to anticipate the impact on the agricultural sector.

The Intergovernmental Panel on Climate Change (IPCC) forecasts that, at the national level, Kenya is likely to become warmer and receive more rain on an annual basis in the coming decades, relative to 1990 levels.⁴¹ Precipitation is, however, likely to be highly variable, and the country may be at increased risk of flooding during the wet season while droughts will become less predictable.⁴²

This means that improving the efficiency of the agricultural sector – from which crops are planted to

how they are transported and sold – is paramount if the country hopes to achieve food security in line with the Big Four agenda.⁴³

In 1980, average yields in Kenya were about 50% higher than in other lower-middle-income African countries and nearly 20% higher than in other lower-middle-income countries globally. However, by 2013, agricultural yields were about 10% lower in Kenya than in other lower-middle-income countries in Africa, and more than 25% lower than in other lower-middle-income countries globally.

In other words, average yields in Kenya essentially failed to improve between 1980 and 2004, with the increase in total production in that time period the result of increased land under cultivation. During that period, the amount of land under crop cultivation grew by 33%, while average yields only increased by 6%.

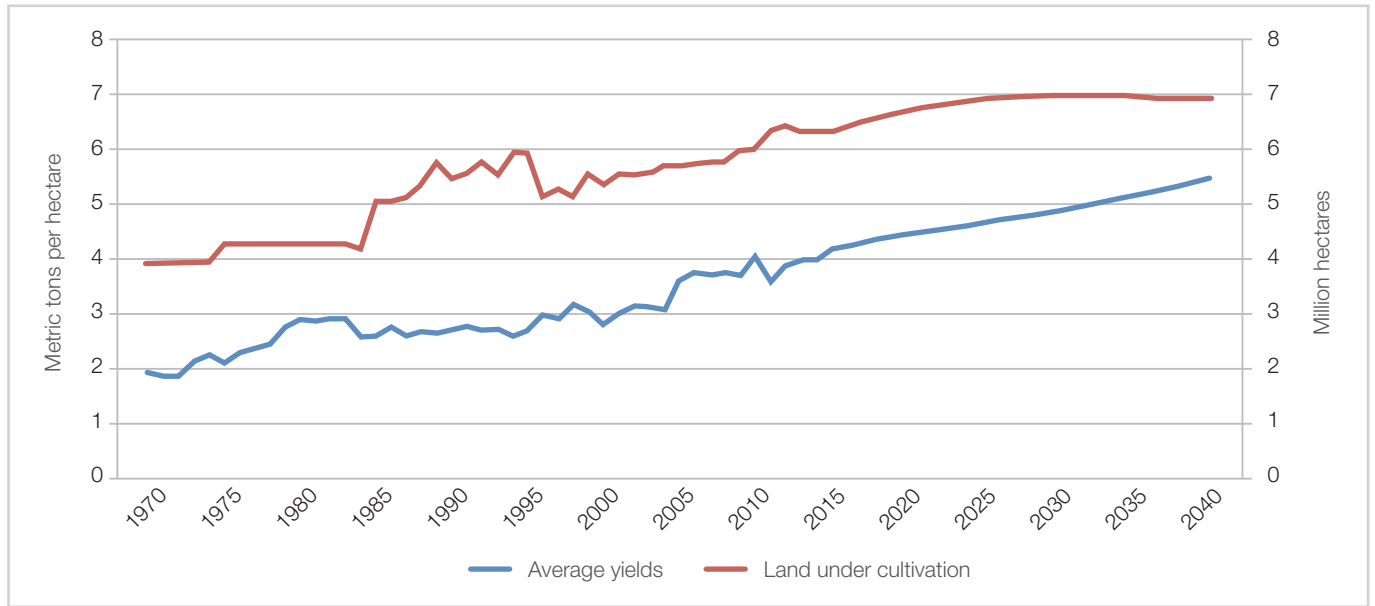
Figure 3 shows the average yields and amount of land under crop cultivation in Kenya from 1970 to 2040, and highlights the shift toward land conversion becoming the primary engine of growth in the agricultural sector beginning around 1980. In the Stuck in Traffic scenario, most of the increase in production is projected to come from improved yields, as the amount of land available for crop production levels off around 2030.

On average, warmer temperatures are likely to outweigh increased precipitation, leaving the country drier by the end of the century

Yields have rebounded slightly since 2005 – despite a sharp decline during the 2011 drought – but remain well below the African and global averages for lower-middle-income countries. Accelerating these improvements is critical, as Kenya's rapidly growing population is already outpacing the country's ability to produce enough food to satisfy domestic demand.

According to FAO data, Kenya's demand for agricultural products has been outstripping supply since around 2005, but the gap started to widen from 2010. In 2013 the gap between production and demand was about 7%, but by 2040 the demand for agricultural products is

Figure 3: Average yields and land used for crop cultivation in Kenya, 1970–2040



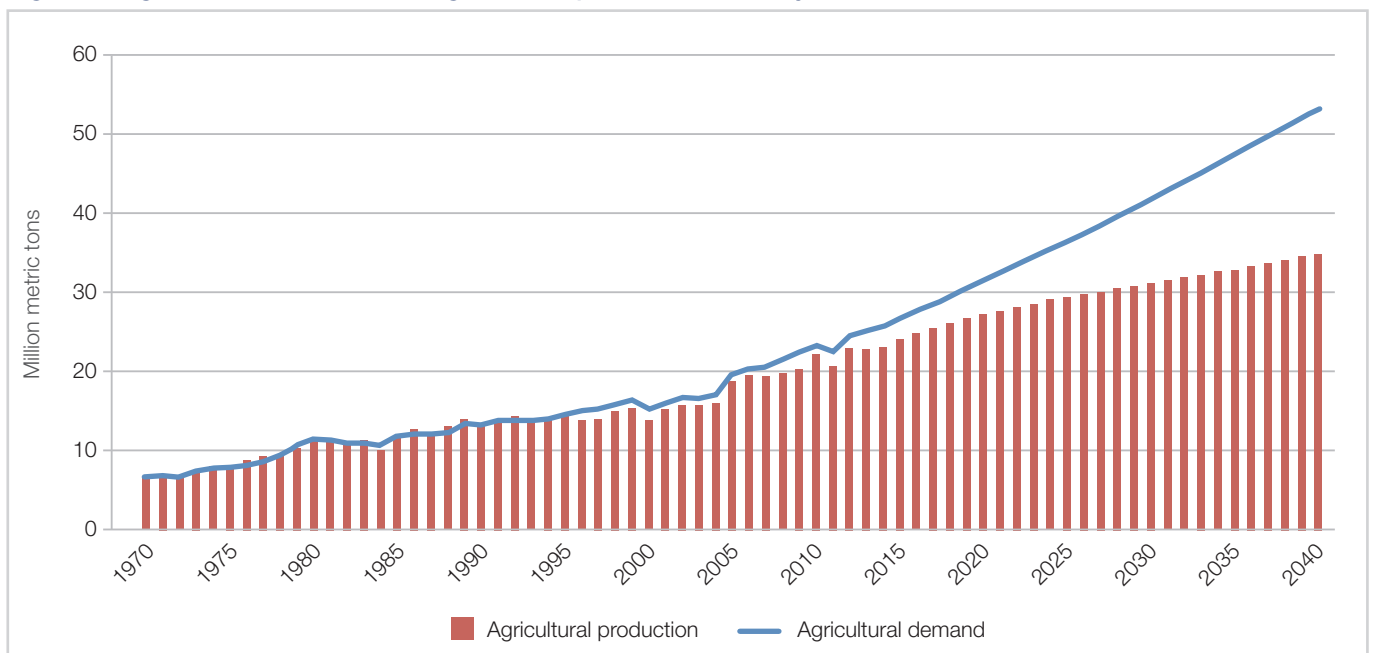
Source: IFs version 7.33 initialised from FAO data.

forecast to be more than 35% higher than what Kenya is able to produce domestically, as shown in Figure 4. This will lead to an increased dependence on imported food and leave the country more vulnerable to drought and international commodity price shocks.

In mid-2017 the World Food Programme estimated that drought and food insecurity have displaced more than

300 000 Kenyans, while the UN Children’s Fund (UNICEF) estimates that around 3.4 million people in the country are food insecure.⁴⁴ Improving agricultural yields is a critical policy outcome if Kenya hopes to achieve food security by 2022, but even a fairly aggressive increase in yields will likely be insufficient given the growing gap between supply and demand.

Figure 4: Agricultural demand and agricultural production in Kenya, 1970–2040



Source: IFs version 7.33 initialised from FAO data.

To make more meaningful progress toward food security, Kenya can focus on improving efficiency elsewhere in the agricultural sector, e.g. minimising losses along the food supply chain.⁴⁵

Along with struggling to improve average yields, Kenya has fairly high levels of food loss relative to other lower-middle-income countries globally – although levels of loss are below the average for other lower-middle-income African countries. Still, nearly 20% of Kenya’s total agricultural production is lost to waste, the majority of which occurs during the production phase. Food loss and waste is a serious problem that can undermine human development across a number of important dimensions.⁴⁶ If Kenya were able to move toward the global food loss average of about 15%, it would add more than 2.5 million metric tonnes of food to its domestic supply in 2040 alone. Combining that with improved yields would be even more powerful.

Make smart investments in infrastructure and energy

Interestingly, Kenya has managed to achieve favourable health and education outcomes despite having a significant deficit of core infrastructure, meaning improved water and sanitation facilities (WASH), electricity and roads.⁴⁷ As shown, Kenya fares relatively well on health and education outcomes compared to other lower-middle-income countries, but its levels of access to basic infrastructure more closely resemble those of low-income African countries. The government is currently taking aggressive strides to facilitate electrification, reduce the cost of electricity and attract manufacturing. However, pursuing electrification at the expense of other core infrastructure such as improved WASH facilities may compromise gains in other areas of human development over the long run.

In 2015, only about two-thirds (67%) of all Kenyans had consistent access to a source of clean water, while in other lower-middle-income countries in Africa and globally the figures were 82% and 90% respectively. To place this in context, about 66% (or roughly the same proportion) of people living in low-income African countries had access to clean water in 2015. Only about 30% of people living in Kenya had access to an improved sanitation facility in 2015, compared to 50% and 54% in other lower-middle-income countries in Africa and globally.

Moreover, the proportion of the population with access to an improved sanitation facility has declined slightly, falling from about 31% in 2000 to below 30% in 2015. In the Stuck in Traffic scenario, only 52% of the country will have access to an improved sanitation facility in 2040, leaving more than 37 million people at increased risk of exposure to a waterborne disease.⁴⁸

Access to improved sanitation facilities has powerful forward linkages to other aspects of human development, such as health and education, and can be a strong enabler of long-term economic productivity.⁴⁹ Although Kenya is forecast to improve access to clean water more rapidly than sanitation facilities, more than 14 million Kenyans are forecast to be living without access to potable water in 2040.

One area of core infrastructure where the country has already begun to take aggressive strides is electricity access. As recently as 2013 levels of access to modern electricity were more than twice as high in other lower-middle-income African countries. However, due to an aggressive rollout of the national grid and uptake of off-grid solutions, Kenya moved from roughly 20% access in 2010 to about 58% in 2018.⁵⁰ The government aims to achieve universal access by 2020: if accomplished, this would be one of the most rapid expansions of electricity access ever seen in a developing country.⁵¹

Kenya moved from roughly 20% access to electricity in 2010 to about 58% in 2018

Rapid electrification over the last five years has been a remarkable success story in Kenya, demonstrating that an aggressive expansion of service delivery is possible provided there is sufficient fiduciary commitment and the requisite political will. In this case, improving access to affordable, reliable electricity also marries with the government’s goal of promoting manufacturing exports, in line with the Big Four agenda. It is also an area that is still fully within the purview of national government, and so is less affected by the process of devolution than other aspects of development such as healthcare and early childhood education. Access to electricity also has positive impacts on human development by reducing

the use of traditional fuels in the home, thereby reducing respiratory infections and disease, and by allowing children to study longer at night.⁵²

In order to facilitate electrification, reduce the cost of electricity and attract more manufacturing into Kenya, the government has also invested in some ambitious energy projects in recent years. In 2017, construction of the Lake Turkana Wind Farm – in Turkana county in the north-west of the country – was completed. Lake Turkana is the largest wind farm in Africa, capable of supplying 310 MW to the grid at peak performance.⁵³ The government is also in the process of building a 1 000 MW coal plant in Lamu, which, if completed, would supply much-needed base load capacity to Kenya's electricity grid and potentially help drive down the per kWh cost of electricity.

Electricity in Kenya is currently very expensive, even by developing country standards.⁵⁴ At approximately US\$0.15/kWh, electricity in Kenya is a bit more expensive than the African average of US\$0.14/kWh, and far more than the averages of US\$0.04/kWh and US\$0.07/kWh in South and East Asia, respectively.⁵⁵

Reducing the price of electricity will be critical if Kenya hopes to significantly increase the share of manufacturing in its economy, particularly since neighbouring Ethiopia provides electricity at about US\$0.04/kWh even before completing Africa's largest hydroelectric facility – the Grand Ethiopian Renaissance Dam.⁵⁶ Moreover, expanding access to the grid will do little to improve people's lives if electricity does not become more affordable. In addition, intensive investment in the electricity grid may be crowding out spending on other important areas of human development, such as investment in WASH infrastructure and education.

While reducing the price of electricity is an important development priority, there is some uncertainty

surrounding the wisdom of the specific projects being undertaken. For instance, the Lake Turkana Wind Farm has been complete since mid-2017 but has not been providing power to the grid because the necessary transmission lines are not in place. Grid connection has been delayed owing to complications in the land compensation process and the closure of the contracting company because of financial difficulties.⁵⁷ The government has since contracted a Chinese firm to complete the lines by September 2018, having already been fined 5.7 billion Kenyan shillings (about US\$56 million) by the developers for the oversight.⁵⁸

Electricity in Kenya is very expensive, even by developing country standards

The Lamu coal plant was initially justified on the grounds that Kenya had coal reserves that it could exploit.⁵⁹ However, current plans seem to indicate that the plant will run on coal imported from South Africa for the foreseeable future, which will drive up energy imports and make it difficult to meaningfully reduce the price of electricity except through heavy subsidies.⁶⁰ Construction of the plant is also being hindered by an ongoing court case.⁶¹

Kenya is blessed with one of the most diverse and abundant endowments of renewable energy of any country in Africa. It is the fourth leading producer of geothermal globally and the leader in Africa.⁶² Lake Turkana boasts the continent's largest wind farm and there is significant potential for distributed generation from photovoltaic solar panels as well. Unfortunately, most of this potential energy is located far from where it is needed and, as the Lake Turkana project demonstrates, supplying the necessary connecting infrastructure can be complicated.

Average price of electricity



Despite these setbacks, Kenya has the potential to become more energy independent and set an example for the continent and the world, by achieving that independence through a progressive, sustainable mix of energy inputs.

In 2012, commercially viable petroleum reserves were discovered in Kenya for the first time, in the Lokichar Basin of Turkana county. Since then, a number of other discoveries have been made and the prospector (the United Kingdom's Tullow Oil) estimates that the find can yield about 750 million barrels of recoverable reserves.⁶³ However, the government has struggled to secure the necessary pipeline agreements with neighbouring countries and, given the fairly modest amount of potential reserves, it is increasingly uncertain when production might come online.

Considering that there are already significant challenges with accountability and effective allocation of state resources, it is crucial that any additional oil revenues be managed transparently and effectively. There is a wide body of literature suggesting that the presence of natural resources 'heightens competition for control of the state' and undermines the promotion of good governance and the creation of strong institutions by an 'implicit reliance on extraction in economic life'.⁶⁴ Although the reserves are not globally significant, they could be enough to weaken institutions and promote an unhealthy reliance on commodity revenues.

Kenya certainly needs to improve both access to electricity and the level of installed generation capacity on its electrical grid. Furthermore, the production of oil is not inherently precarious. However, the country also requires millions of additional water and sanitation connections, improvements in the quality of roads in rural areas and more pervasive access to technological infrastructure such as fixed and mobile broadband.

Pursuing electrification or the exploitation of modest oil reserves at the expense of these other development priorities may be counterproductive in the long run.

Improve governance and balance the economy

Volatility in the Kenyan economy has been linked to the prospect of political violence in the last three presidential election cycles. Post-election violence, and indeed the mere threat of it, is now regularly cited as a key factor influencing economic growth by international organisations such as the International Monetary Fund and the World Bank, as well as the Kenyan National Bureau of Statistics.⁶⁵

Politics and the economy are so interlinked in Kenya that it is almost a cliché to trot out the laundry list of corruption scandals – Anglo Leasing, NYS and Afya House, to name a few – that have impacted investor confidence and economic growth prospects.⁶⁶ In 2016 PricewaterhouseCoopers (PwC) reported that corruption in public procurement was quickly becoming Kenya's leading economic crime.⁶⁷ Yet the public sector still has a tremendously important role to play in Kenya's future, particularly given the country's deficit in core infrastructure.

Despite corruption, the public sector still has an important role to play in Kenya's future

Within IFs, economic growth is conceptualised in line with traditional growth accounting, which is driven by labour, capital and a residual that is sometimes called technology, total factor productivity or, in IFs, multifactor productivity (MFP). IFs disaggregates MFP into four categories: human, social, physical and knowledge capital. Broadly, human capital is a proxy for levels of health and education in a society, social capital refers to quality of governance, physical capital measures the relative development of core infrastructure, and knowledge capital refers to research and development spending and technology transfers through trade.⁶⁸

Of the four components of MFP measured by IFs, physical capital is by far the biggest constraint on economic growth in Kenya. Lack of access to sanitation facilities and, to a lesser extent, clean water, are likely significant impediments to better development

outcomes in the country. Although many governments have successfully developed some aspects of core infrastructure (e.g. roads, electricity, ports) through public–private partnerships, there are still few successful examples of private investment in WASH infrastructure. This means that it is probable that the financial burden for providing these services will rest with the Kenyan government. That said, recent improvements in electricity access point to the government’s ability to implement policies quickly and effectively – even with some help from the private sector.

In 2016 economic growth in Kenya was driven mainly by agriculture and real estate, with transportation, financial services, construction, ICT and manufacturing contributing more modest amounts.⁶⁹ The most visible economic priority of the government going forward is the Big Four initiative to increase the share of manufacturing in exported goods. In the Stuck in Traffic scenario, by 2040 manufacturing is forecast to be the economic sector that experiences by far the most growth – measured in billions of US\$ – from 2015 levels. While agriculture increases by about 75% and services increase nearly six-fold, manufacturing grows more than eight-fold by 2040.

Kenya, like many countries, will have to follow a less traditional path to industrialisation

Even with that growth, of the three sectors, manufacturing will only surpass agriculture to become the second largest sector in the Kenyan economy sometime after 2030 in the Stuck in Traffic scenario. Moreover, absolute growth in services is likely to be nearly three times as large as the absolute growth of the manufacturing sector between 2015 and 2040. Finally, while agriculture’s share of value added in the economy will decline over time (from about 33% in 2015 to about 12% in 2040) the sector will still grow by about US\$10.6 billion over that time period.

This means that Kenya, like many developing countries, will have to follow a less traditional path to industrialisation.⁷⁰ As the fourth industrial revolution⁷¹ – along with a global trade regime that inhibits the ability of a country to protect its infant industries – disrupts the

manufacturing industry, developing countries will have to find creative ways of leveraging growth opportunities across a number of different sectors.⁷²

The ‘traditional’ path to industrialisation (i.e. agriculture to manufacturing to services) has always been oversimplified. However, it is becoming increasingly difficult to separate those sectors at all. Even within the agricultural sector, countries must now focus not only on improving the efficiency of agricultural production but also on progressively adding value to those products through agro-processing (manufacturing), on minimising losses during the transportation phase and on finding a cost-effective way to export some of those goods overseas (services). Kenya will also have to handle a number of other structural pressures along the way.

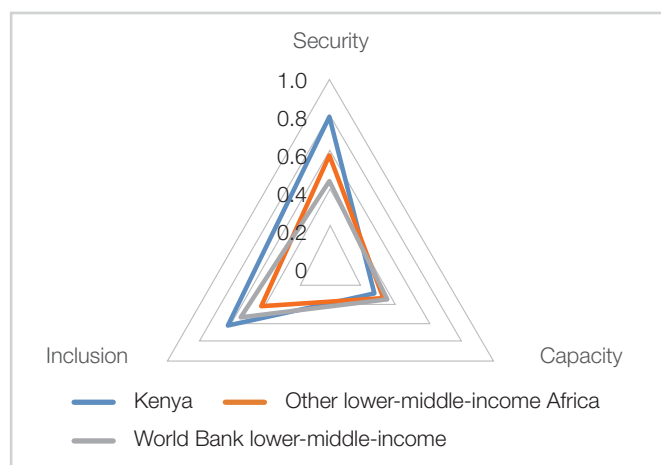
Kenya has a large youth population relative to other lower-middle-income African countries. This ‘youth bulge’ is associated with an increased risk of social instability, and navigating the process of service delivery expansion and economic transformation in that context will be challenging. One study has concluded that countries experiencing a youth bulge above 40% of the total adult population are more than twice as likely to experience conflict.⁷³ In 2015, Kenya’s youth bulge was nearly 50%.

Other research suggests that countries exhibiting a high degree of factionalism, with ‘parochial or ethnic-based political factions that regularly compete for political influence in order to promote particularist agendas and favour group members to the detriment of common, secular, or cross-cutting agendas’, are significantly more likely to experience conflict.⁷⁴ While Kenya is likely not at risk of large-scale instability, these structural drivers of conflict will have to be carefully managed going forward.

There are no blanket solutions for development but, given the right policy framework, enabling environment and political will, there is likely some combination of industries capable of promoting inclusive growth in each country. The challenge is to determine which industries to prioritise, how to support the private sector to create jobs and attract investment, and how to support human development enough to keep pace with economic growth.

Of course, the key question underpinning all of this is the capacity of the government to design and effectively

Figure 5: Three dimensions of governance in IFs for Kenya and other lower-middle-income countries in 2015



Source: IFs version 7.33.

implement those selected policies. Figure 5 shows Kenya's score on three dimensions of governance (security, capacity and inclusion) as conceptualised in IFs, compared to the average for other lower-middle-income countries in Africa and globally – with scores closer to 1 (i.e. the outside of the triangle) indicating a higher value.⁷⁵

Figure 5 shows that Kenya scores well above the average for other lower-middle-income countries on the security dimension, and a bit better on the inclusion dimension. However, Kenya has less capacity than other lower-middle-income countries in Africa and globally, a trend that is forecast to remain relatively constant in the Stuck in Traffic scenario. Altering this forecast will require policymakers in Kenya to break with the status quo and diligently focus on increasing domestic tax revenues, reducing corruption and implementing policies that improve basic service delivery.

That said, a national picture necessarily obscures regional differences and some parts of the country are clearly experiencing more rapid development than others. In general, the arid and semi-arid counties of northern Kenya consistently record significantly higher rates of poverty and lower incomes than the humid or semi-humid counties such as Kiambu, Murang'a, Nairobi and Lamu.⁷⁶ Moreover, as more government functions are devolved to the county level, it will become increasingly important to monitor performance at the sub-national level. It is vital that the government balance the dual challenges of building government capacity across all

tiers of government while delegating specific functions to the local level if it hopes to improve development outcomes beyond what is anticipated in the Stuck in Traffic scenario.

Kenya has a mountain of planning documents. In addition to those, the country has undergone a number of important changes to the structure of government – such as the adoption of a new constitution in 2010 – that have strengthened the institutional characteristics of governance. Moreover, the bitterly contested 2017 presidential election – that many feared would result in more post-election violence – was expediently handled by the supreme court, with the opposition candidate eventually accepting the decision of the judiciary.

While Kenya may have the institutional characteristics of a liberal democracy and the planning documents to suggest the government is serious about improving human development in the country, the reality on the ground has occasionally been quite different.

As more government functions are devolved to the county level it will be increasingly important to monitor progress at the sub-national level

The most widely publicised scandal thus far is most likely the Anglo Leasing affair, which has dragged on since the early 2000s and involves the misappropriation of at least US\$820 million from the Kenyan taxpayer.⁷⁷ However, not all examples of poor governance involve outright theft or corruption. Many are rooted in the profoundly important variable of government capacity and the ability to successfully implement inclusive policies.

In 2012, for example, there was a widely publicised announcement of the 'laptop project', which aimed to deliver 1.3 million laptops to classrooms nationwide. The project has recently been abandoned, with just over 300 000 tablets being delivered in the five years since the project's inception. The funds for the project have been shifted from the Ministry of Information, Communication and Technology for the purposes of developing the Konza Complex – a special economic

zone meant to attract foreign investment.⁷⁸ If Kenya hopes to substantially improve development outcomes and public trust in government, it must carefully consider the implications of decisions such as this.

Kenya must combat these two corrosive elements as vigorously as possible. Improving the quality of implementation and rooting out corruption should be the primary goals of the government going forward if it hopes to achieve inclusive economic growth that bolsters human development.

Shaping the future

The previous sections have highlighted some notable success stories, and a few shortcomings, of Kenya's development to date. The report has also identified some areas on which the government could focus to improve human development outcomes and support more robust economic growth. This section explores the impact of two alternative scenarios on Kenya's future.

Tuko Kazi is a future where Kenya implements successful, five-year interventions (i.e. from 2019 to 2023) in specific areas. The Bila Hopes scenario is a future where progress in key areas of development stalls, governance in the country erodes and Kenya is at increased risk of social instability. For a full list of the interventions used in IFs for each scenario see Annex B.

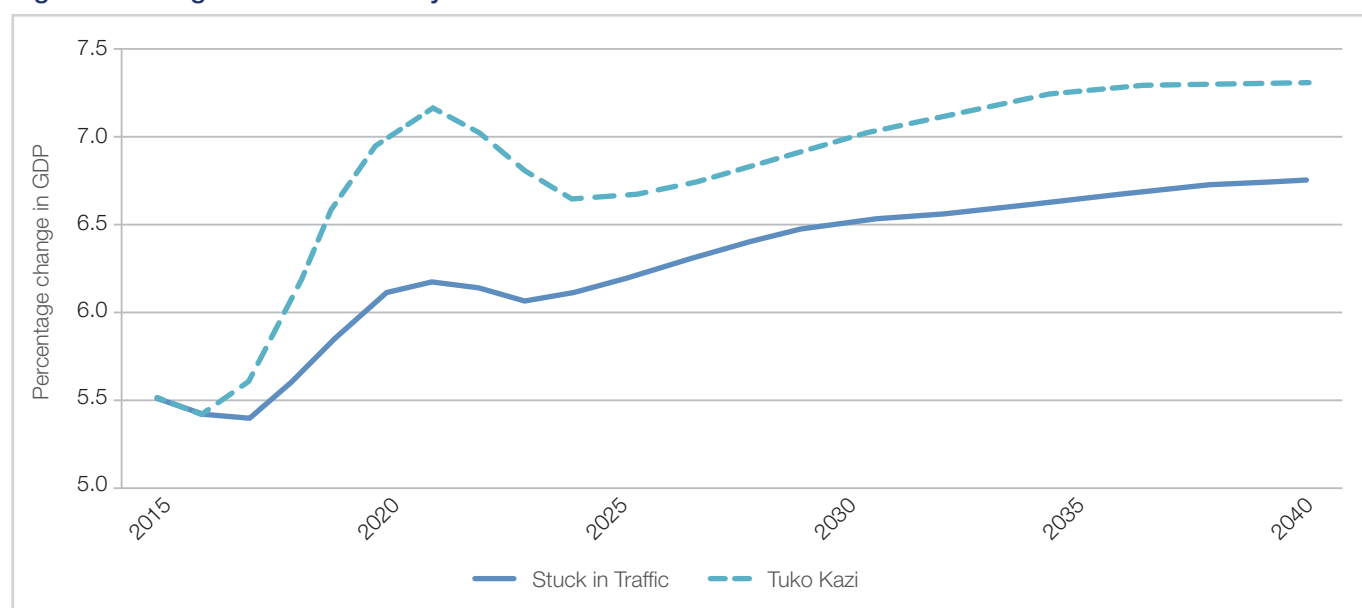
Tuko Kazi

In the Tuko Kazi scenario the Kenyan government formulates and implements policies designed to improve outcomes in the areas highlighted in this report over the next five years, then sustains that trajectory until the end of the forecast horizon. The interventions have been benchmarked against what other developing countries have achieved in the past, and thus represent aggressive but realistic policy achievements. In this scenario, Kenya experiences significant improvements in a number of key indicators by 2040 relative to the Stuck in Traffic scenario.

The Tuko Kazi scenario is a future where the government focuses on promoting efficiency in the agricultural sector, alleviating the bottlenecks in its education system, improving family planning, increasing housing subsidies and reducing corruption. The country also effectively manages its oil revenues and makes headway in the rollout of improved WASH facilities relative to the Stuck in Traffic scenario. This is an ambitious agenda but Kenya's own recent experience with electricity access – in the midst of a hotly contested and protracted election season – as well as continued success in healthcare and education, is a good example of what is possible given the right policy environment and sufficient political will.

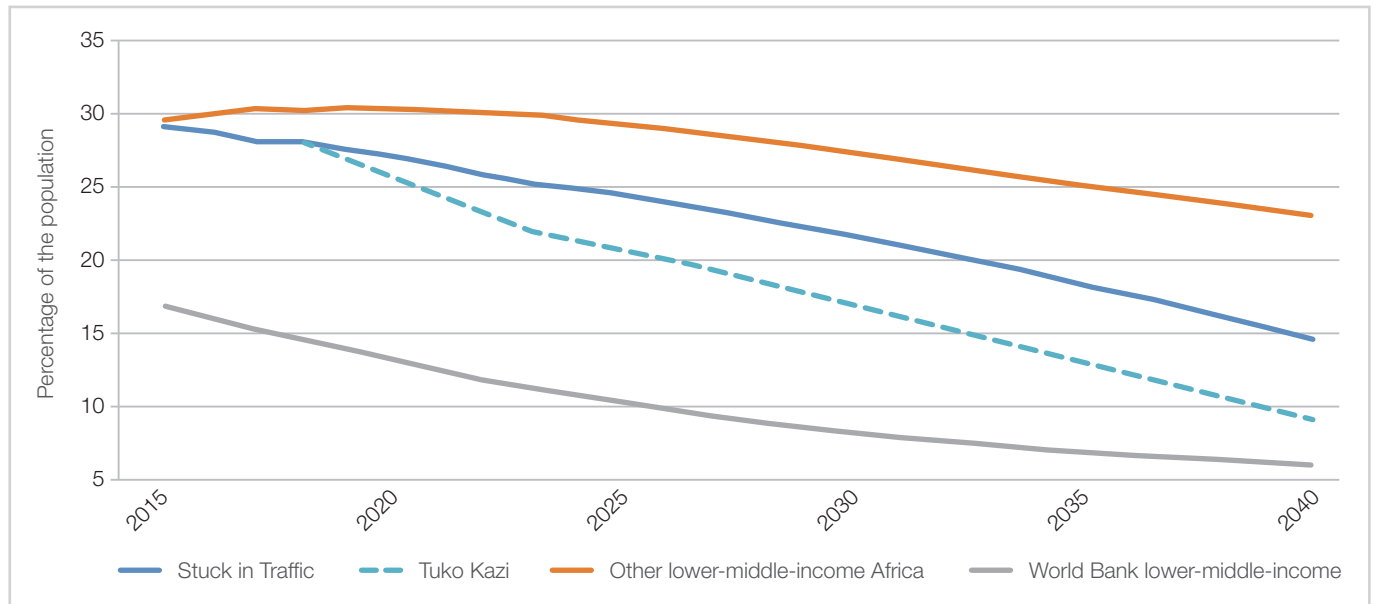
In the Tuko Kazi scenario, Kenya undergoes some transformative changes. For one, the country enjoys

Figure 6: GDP growth rates in Kenya in the Stuck in Traffic and Tuko Kazi scenarios



Source: IFs version 7.33 initialised from IMF data.

Figure 7: Effect of Tuko Kazi scenario on extreme poverty



Source: IFs version 7.33 initialised from World Bank data.

growth rates that are, on average, more than 0.6% higher per year over the course of the forecast. Figure 6 shows the average annual growth rate in Kenya using a five-year moving average and demonstrates that, even in this scenario the country falls shy of the 10% annual growth target set by the government.

Along with more robust economic growth, the country also enjoys significant improvements in a number of areas of human development. For instance, Figure 7 shows the impact of the Tuko Kazi scenario on the proportion of the population living in extreme poverty in Kenya out to 2040. In the Tuko Kazi scenario, the percentage of people living in extreme poverty is reduced from close to 15% in the Stuck in Traffic scenario to almost 9% in 2040. This translates into roughly 4.5 million fewer people. Furthermore, it brings the country much closer to the 6% average for other lower-middle-income economies globally.

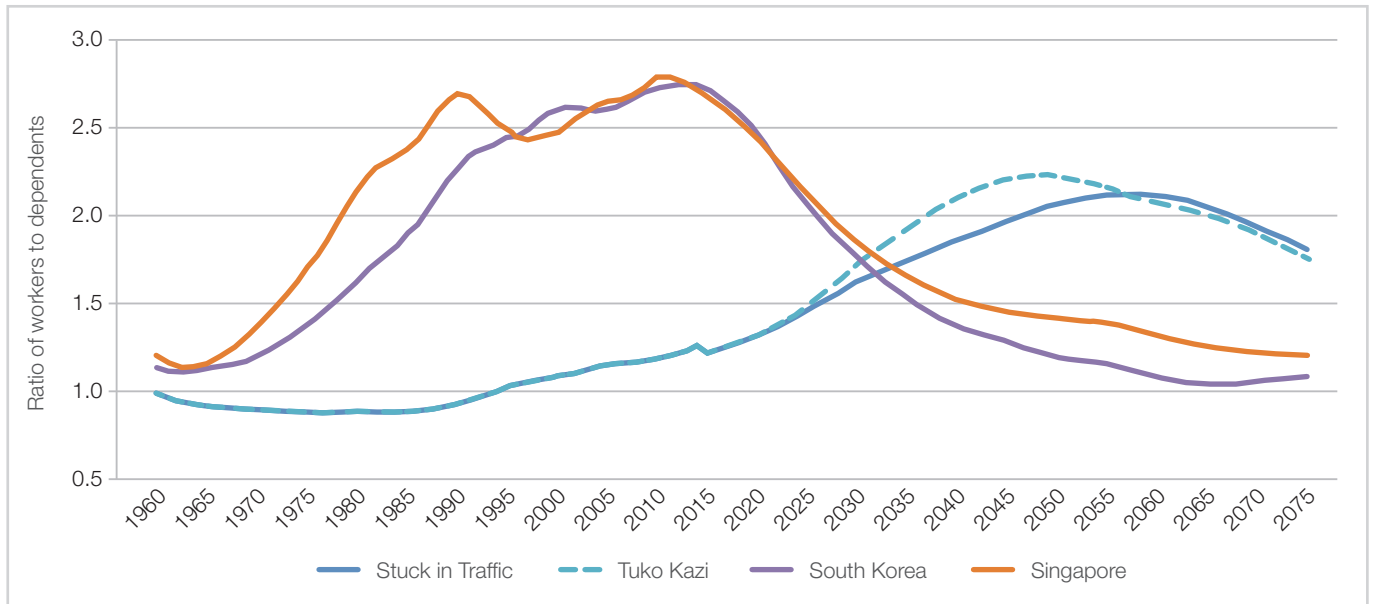
The country also experiences a more than 20% decline in infant mortality in the Tuko Kazi scenario and the average Kenyan has nearly US\$825 additional dollars in his or her pocket in 2040 relative to the Stuck in Traffic scenario. The overall economy is about US\$36 billion larger in 2040 alone in the Tuko Kazi scenario and Kenya's dependence on imported food (as a share of demand) declines by about 20%.

However, extending the forecast out a bit further allows for a deeper interrogation of the impact of family planning on the timing and size of the demographic dividend. Some systems, such as demographics and education, take decades, if not generations, to meaningfully change and so an extended forecast helps to illuminate the effect of the interventions in those areas. Figure 8 shows the demographic dividend in Singapore, South Korea and Kenya – in the Stuck in Traffic and Tuko Kazi scenarios – from 1960 to 2075.

In the Tuko Kazi scenario, the average Kenyan has nearly US\$825 additional dollars in his or her pocket

The improving family planning aspect of the Tuko Kazi scenario advances the onset of the peak demographic dividend by about 10 years and increases its magnitude from about 2.13 workers per dependent to about 2.23 workers per dependent. Although this scenario does provide Kenya with a more favourable demographic structure, its peak demographic dividend will still be significantly smaller than in either Singapore or South Korea. If Kenya hopes to further increase the magnitude of the demographic dividend it will need to accelerate reductions in TFR beyond what is modelled here.

Figure 8: Demographic dividend in the Stuck in Traffic and Tuko Kazi scenarios, 1960–2075



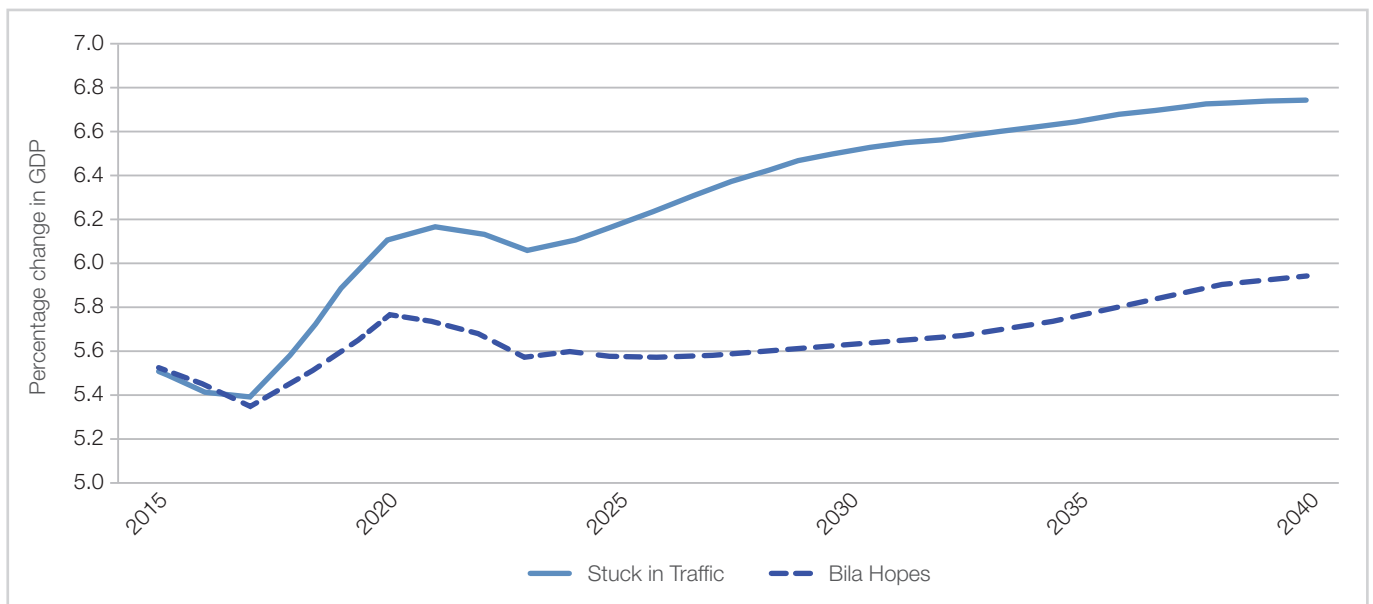
Source: IFs version 7.33 initialised from UNPD data.

As mentioned before, capitalising on the demographic dividend requires significant investments in basic infrastructure, healthcare and education, along with opportunities for employment in the formal sector. Otherwise, that same large young population could be a catalyst for instability and development outcomes that fall well below the Stuck in Traffic scenario.

Bila Hopes

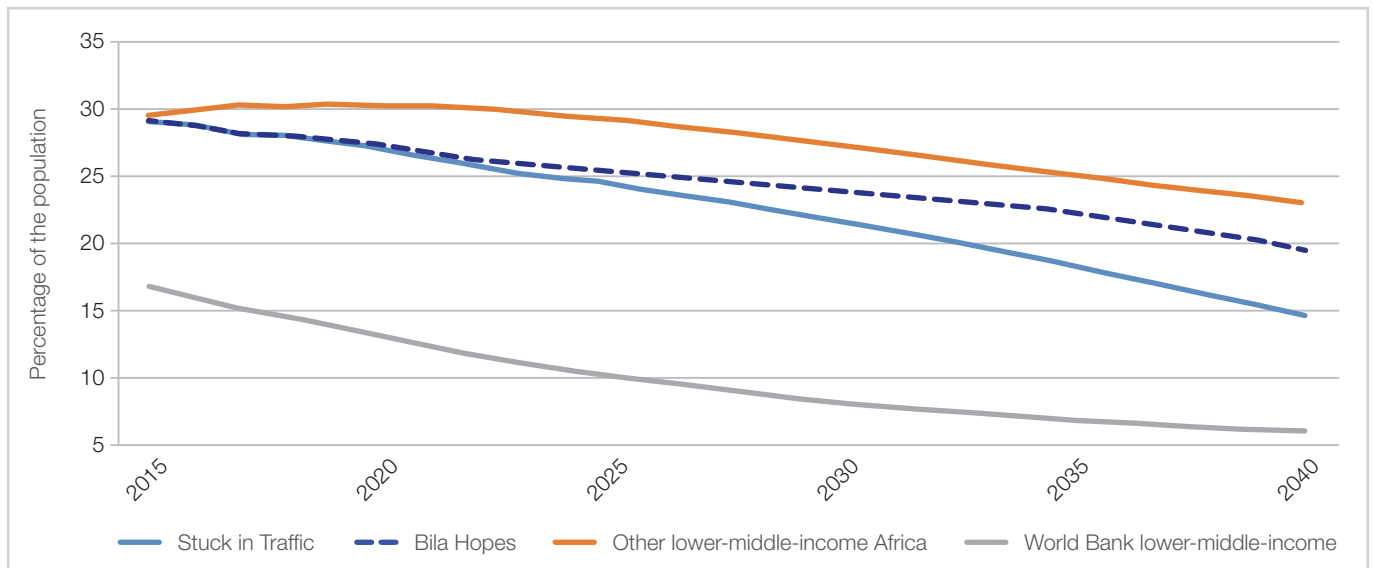
The Bila Hopes scenario provides some insight into what could happen should the Kenyan government fail to implement meaningful reforms, where the prospect of political violence escalates and where progress across the areas mentioned above stalls relative to the Stuck in Traffic scenario.

Figure 9: GDP growth rates in the Stuck in Traffic and Bila Hopes scenarios



Source: IFs version 7.33 initialised from IMF data.

Figure 10: Extreme poverty in Kenya and other lower-middle-income countries in the Stuck in Traffic and Bila Hopes scenarios



Source: IFs version 7.33 initialised from IMF data.

The Bila Hopes scenario is a future where the quality of governance deteriorates, oil revenues increase rent-seeking and corruption, and progress on various human development indicators stalls. This is a scenario where the pace and quality of service delivery declines relative to the Stuck in Traffic scenario over the next five years, leading to increased social tension and a greater probability of violence surrounding the 2022 election cycle.

In the Bila Hopes scenario Kenya is at greater risk of food insecurity, political instability and has a far smaller economy than the Stuck in Traffic scenario

In the Bila Hopes scenario Kenya is at greater risk of food insecurity and political instability, and has a far smaller economy, both overall and in a per capita sense, than in the Stuck in Traffic scenario. In the Bila Hopes scenario, GDP growth rates are an average of 0.7% slower per year than in the Stuck in Traffic scenario. Figure 9 shows GDP growth rates in the Bila Hopes and Stuck in Traffic scenarios using a five-year moving average, underscoring the negative economic consequences of stalled development.

Along with poor economic performance, there are strong implications for human development in the Bila Hopes

scenario. Kenya's score on the Human Development Index declines by 2%, the country is nearly 30% more dependent on imported food and there are more than 170 000 additional children suffering from undernourishment relative to the Stuck in Traffic scenario in 2040. Life expectancy is also more than one-half a year lower in the Bila Hopes scenario and each Kenyan has slightly fewer years of education than in the Stuck in Traffic scenario in 2040.

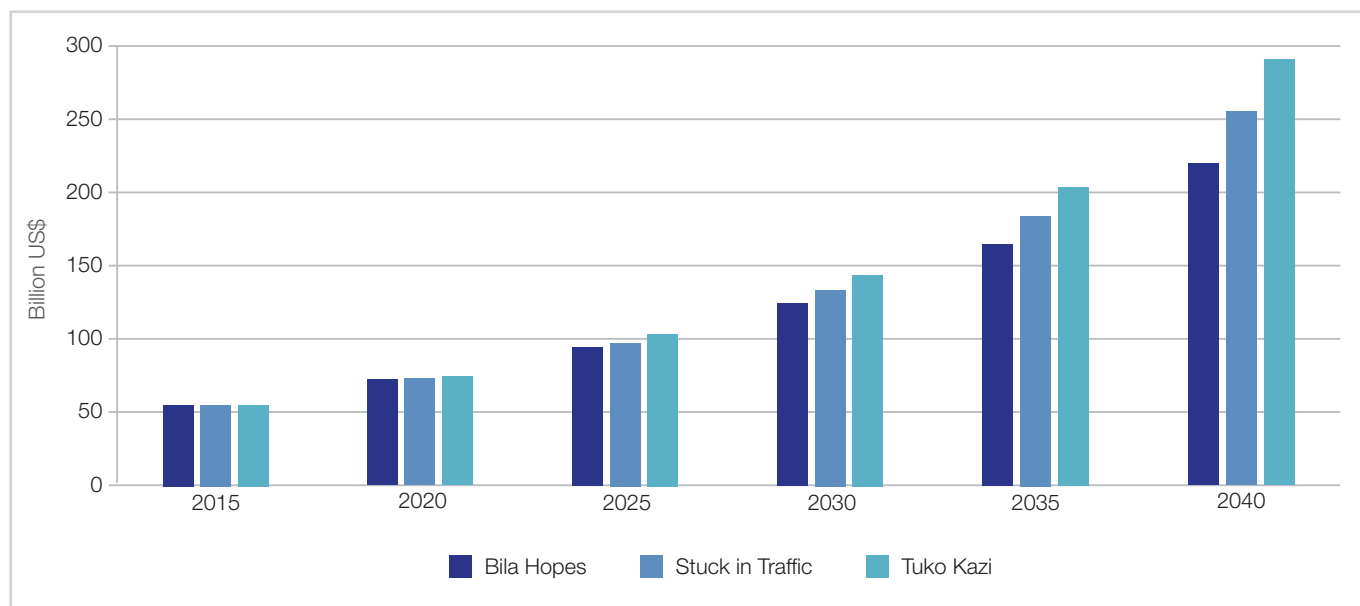
Furthermore, the Bila Hopes scenario drives a steady increase in the proportion of people living in poverty. Figure 10 shows the nearly five percentage point increase in the proportion of people living in extreme poverty in Kenya, a figure which translates into more than 4.4 million people in 2040.

Comparison

This report has framed a band of possibilities surrounding the future of development in Kenya. A brief comparison of the Tuko Kazi, Stuck in Traffic and Bila Hopes scenarios serves to underscore the leverage policymakers have to shape a better future for Kenya. Figure 11 shows a forecast of GDP (in billion US\$) in the Stuck in Traffic scenario and the two scenarios.

At an absolute level, Kenya's GDP is nearly US\$72 billion larger in the Tuko Kazi scenario in 2040 alone. The cumulative economic output in the Tuko Kazi scenario

Figure 11: Absolute GDP in Kenya in the different scenarios

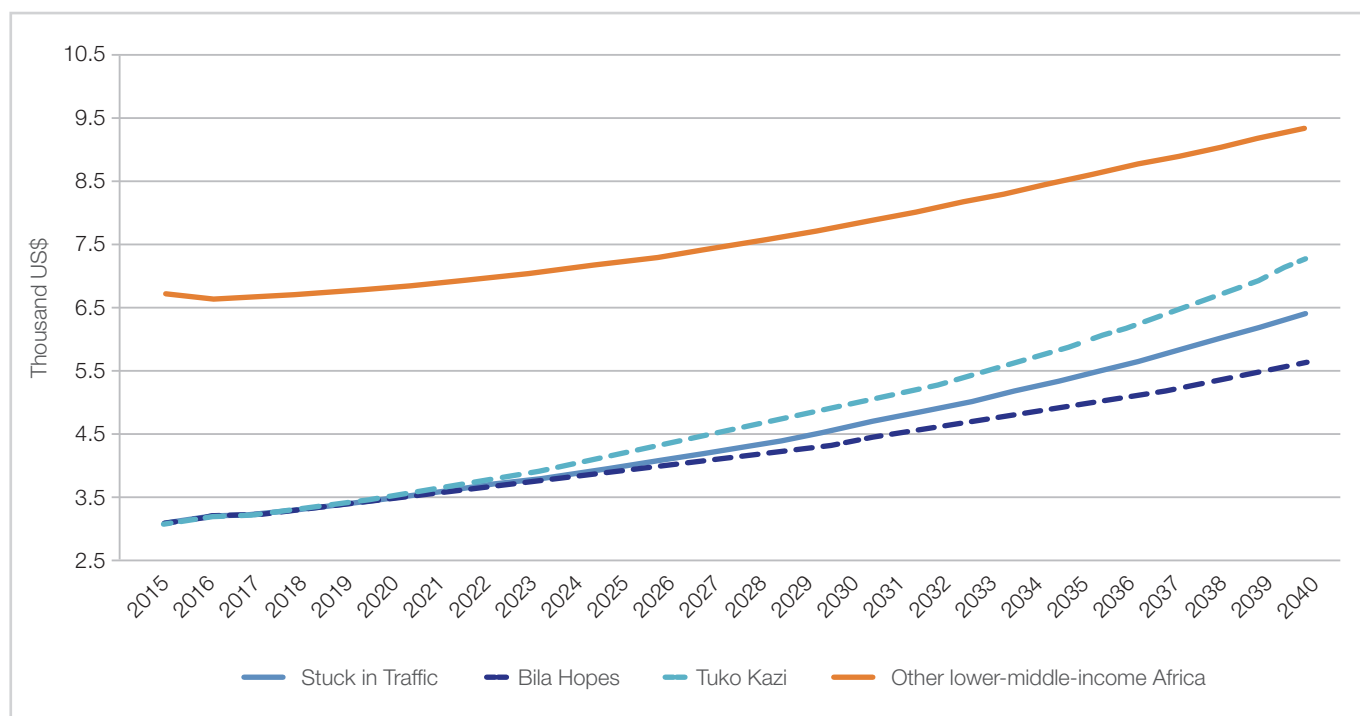


Source: IFs version 7.33 initialised from IMF data.

is nearly US\$550 billion higher over the duration of the forecast, relative to the Bila Hopes scenario. In addition to increased economic output, the reduction in population size from the improved family planning initiative drives substantial improvements in per capita metrics.

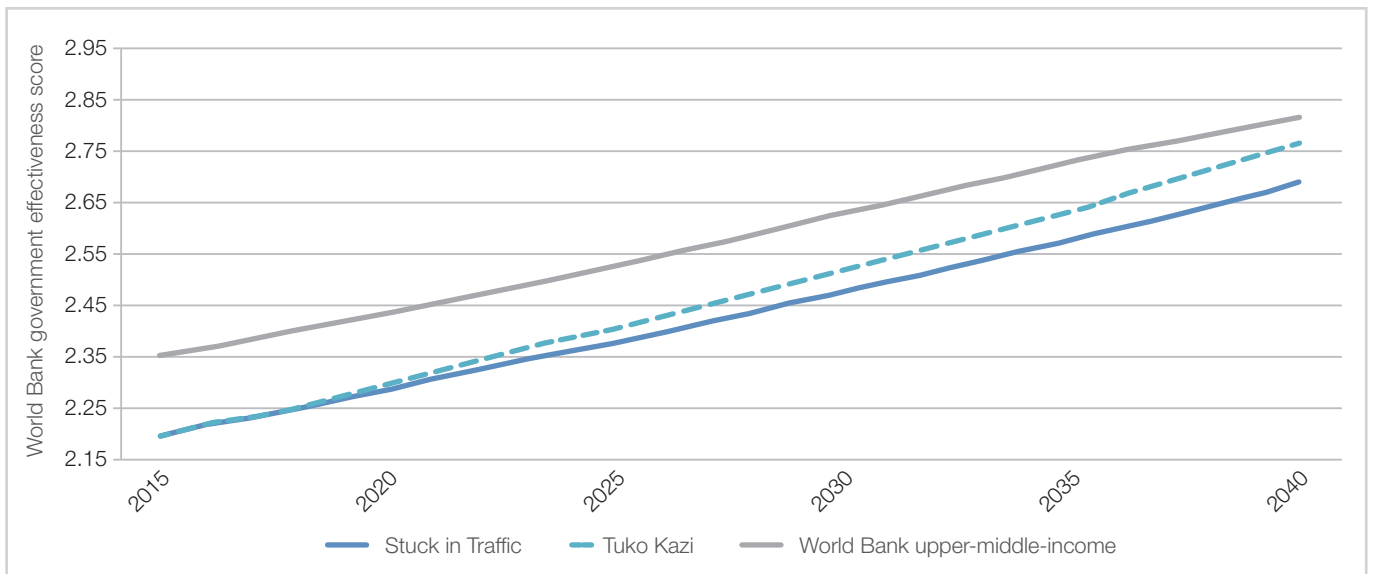
In the Tuko Kazi scenario, GDP per capita grows by nearly 120% compared to 2018 levels, against less than 70% in the Bila Hopes scenario and about 90% in the Stuck in Traffic scenario. This means that the common *mwananchi*⁷⁹ has roughly US\$1 600 additional dollars

Figure 12: GDP per capita in Kenya and other lower-middle-income African countries in different scenarios



Source: IFs version 7.33 initialised from World Bank data.

Figure 13: Change in government effectiveness in the two scenarios relative to World Bank upper-middle-income countries globally



Source: IFs version 7.33 initialised from World Bank data.

in his or her pocket in 2040, relative to the Bila Hopes scenario. There is also a difference of about 9 million people living above or below the extreme poverty line in the two scenarios. Although the Tuko Kazi scenario does put Kenya on a track to faster economic growth and improved human development outcomes, it is not sufficient to raise income levels in Kenya to the average for upper-middle-income countries by 2030.

In fact, despite the robust growth experienced in the Tuko Kazi scenario, GDP per capita in Kenya is still forecast to be below the average for other lower-middle-income countries in Africa in 2040, although the interventions do narrow the gap between the two. In the Stuck in Traffic scenario GDP per capita is nearly 50% higher in other lower-middle-income African countries than in Kenya in 2040, while in the Tuko Kazi scenario it is less than 30% higher. Figure 12 shows the evolution of GDP per capita in the Stuck in Traffic scenario and the two scenarios for Kenya and other lower-middle-income African countries.

In the Tuko Kazi scenario, Kenya’s score on the HDI is about 5% higher, the country spends about US\$42 billion less on imported food over the duration of the forecast and infant mortality declines by about 35% relative to Bila Hopes. Compared to the Bila Hopes scenario, the average person in Kenya can expect to live about 1.2 additional years and have nearly a quarter-year of

additional education in the Tuko Kazi scenario by 2040. Finally, the interventions used here result in a fairly significant improvement in the World Bank’s Government Effectiveness measure, reaching levels close to those of upper-middle-income countries globally.

This scenario may not propel Kenya far enough to reach its headline goal of achieving upper-middle-income country status by 2030, but it does produce meaningful improvements across a number of areas of economic and human development. Moreover, the benchmarks used are meant to highlight that these changes are realistic and have in fact been achieved elsewhere.

Conclusion

The principal challenge for policymakers in Kenya in the coming years will be to maintain the relatively favourable outcomes in areas where the country is performing well, while simultaneously expanding access to basic services and shepherding the transformation of the economy. The recent decline in the average years of education in the adult population indicates that balancing these competing priorities may be the defining challenge for the Kenyan government in the period ahead.

Realising the vision sketched out in the Tuko Kazi scenario will require the diligent application of targeted policies by the government over the long term. The

country must improve family planning services, address the bottlenecks in education and improve access to basic infrastructure while improving the quality of governance and reducing corruption. This includes the transparent and efficient management of revenues from oil production, along with a rollout of government services – including housing – that cuts across regional and ethnic lines. The country must also carefully manage the residual impact and pressures associated with climate change and the consistent risk of instability in the region.

This report has made broad recommendations on which general areas the government can prioritise to shape a better future for the country. However, the specific policies and methods of implementation should be debated and discussed by all relevant sides before arriving at more detailed recommendations. Particularly in light of devolution, it is paramount that a diverse group of stakeholders – with detailed knowledge of the local context – are consulted in a process that ultimately informs more precise policy recommendations.

Annex A: Current Path adjustments (i.e. Stuck in Traffic scenario)

The modelling and adjustments were done using IFs version 7.33.

- *Electricity generation capacity:* This adjustment increased Kenya's electricity generation capacity to approximately 3 500 MW in 2022, which is close to the median peak demand projected by USAID and a number with which stakeholders were comfortable. This increased electricity generation capacity reflects new projects such as the Lake Turkana Wind Farm, which is expected to be capable of generating about 370 MW, a 1 000 MW coal plant and some additional geothermal. There is, however, uncertainty around timelines for some of these projects, particularly coal.
- *Coal imports and production:* This intervention changed Kenya's production and imports of coal to reflect plans to develop a 1 000 MW coal plant in Lamu. Adjustments include increasing energy imports for Kenya beginning around 2022 until 2033, when it begins producing coal and imports taper off. Although there is a pending court case to halt the development of the plant on environmental grounds, the consensus appears to be that the government is intent on developing the coal plant nonetheless.
- *Government debt:* The project team increased public debt's share of GDP to roughly 62% in 2018. This reflects Kenya's recently issued Eurobond, although it is uncertain how that will affect levels of government debt. The government is probably going to use some of the Eurobond money to pay off existing debt, but this is unclear.
- *Land use:* There has been consistent growth in the amount of land dedicated to the cultivation of crops, so there was some uncertainty about the sustainability of that trend. When we talked to local stakeholders, they seemed to think that there was absolutely no way that Kenya had much land to convert, so we eventually tampered down the land use forecast slightly. Also, the government's emphasis seems to be on converting existing land to commercial farming and increasing productivity, but there is not much of a strategic plan.

- *Electricity access*: This intervention increased electricity access in Kenya to approximately 46% in 2018. This adjustment reflects more recent data from the World Development Indicators and USAID.
- *Other renewables*: There was some scepticism about the potential of geothermal in Kenya. For one, some believe that estimates of how much geothermal power is available in the Rift Valley generally have been overstated. More practically, however, much of this energy is not located anywhere near major population centres – or areas of major economic activity – and would require a massive investment in grid infrastructure. Renewables are still likely to be the dominant source of power in the country; the forecast has just been tempered.
- *Lower secondary transition*: There is an initialisation problem with lower secondary transition so an adjustment was created to present a more realistic forecast.
- *Improved sanitation access*: Due to recent methodological changes in the UNICEF and WHO Joint Monitoring Project, Kenya’s WASH data looks significantly different. Based on historical trends the researchers felt the forecast was a bit aggressive, particularly in light of large investments in electricity, so have tempered it down a bit.

Specific parameters used within IFs

Parameter	Parameter definition	Intervention target value
edsecupprtranm ⁸⁰	Education, upper secondary, transition rate, multiplier	Multiply by 1.125 for duration of forecast
enml	Energy imports, limit - billion barrels of oil equivalent	Change repeat at 100 from 2015 to 2040
ldcropm	Crop land, multiplier	Multiply by 0.9 in 2017 and 2018, interpolate from 0.9 in 2018 to 0.65 by 2040
infraelecgenapm	Electricity generation capacity per person, multiplier	Multiply by 1.225 in 2018 and 2019; reduce to 1.0104 by 2028; increase to 1.0269 by 2033; reduce back to 1 by 2040. Note that these values are not interpolated; look to the Current Path .sce file for exact values
infraelecaccm	Electricity access, multiplier (both urban and rural)	Multiply by 2 in 2015, interpolate to 2.75 by 2020, interpolate to 1 by 2040
infraelecaccm	Electricity access, multiplier (rural)	Multiply by 2.25 in 2015, interpolate up to 2.75 by 2020, interpolate down to 1 by 2040
eprodr	Energy production (coal), growth rate	Interpolate from 0 in 2015 to 0.5 in 2040
enpm	Energy production (coal), multiplier	Interpolate from 0 in 2015 to 2 in 2065
enpm	Energy production (other renewable), multiplier	Interpolate from 0 in 2015 to 0.92 in 2050
sanitationm	Per cent of population with access to improved sanitation, multiplier	Interpolate from 0 in 2015 to 0.85 in 2023
GOVDEBT ⁸¹	Solvency – government debt as per cent of GDP, initial condition	Set at 60.5 in 2015, maintain through time horizon

Annex B: Tuko Kazi benchmarks and scenario interventions

Tuko Kazi scenario			
Series	2018 value	Target value (2023)	Benchmark
Lower Secondary transition	77%	86%	Ghana achieved a similar increase between 2003 and 2008
Upper Secondary graduation	53%	60%	Turkey achieved a similar increase between 2005 and 2010
Infrastructure			
Clean water	68%	79%	Ethiopia and Laos achieved similar increases between 2010 and 2015
Improved sanitation	31%	42%	Cambodia achieved a similar increase between 2010 and 2015
Energy			
Oil production	0	25.5 million barrels per year (70 000 per day)	These interventions are benchmarked against expected oil production in Kenya (see infrastructure section)
Governance			
Corruption	2.3	3	This intervention was benchmarked against the average value for lower-middle-income African countries in 2018
Economy			
Housing subsidy			This intervention is estimated to cost about US\$2.6 billion (cumulatively) over the course of the intervention
FDI	12% GDP	15% GDP	This intervention increases FDI by about 1% of GDP over the forecast; Cambodia increased FDI by 4% of GDP between 2008 and 2014 relative to the period 1994–2000
Health			
Under-5 mortality	50 deaths per thousand	15% decrease	Several African countries (Niger, Malawi, Angola) equalled this feat between 2010 and 2015
Maternal mortality	500 per 100 000 live births	20% decrease	A similar feat was achieved by Tanzania between 2010 and 2015
Demographics			
Contraceptive use (benchmarked to fertility rates)	3.7 births per woman	3.2 births per woman	Malawi achieved a similar decrease between 2015 and 2010
Agriculture			
Yields	4.2 MMT	5.3 MMT	Bangladesh achieve a similar increase between 2009 and 2013
Loss	19.8% (total food production)	19.2%	This was benchmarked to approximate the level of food loss in Peer Group countries (see endnote 10)
Effective demand		14%	This intervention shifts demand for food by about 14% over five years

Specific parameters used for the Tuko Kazi scenario

Scenario	Parameter	Intervention length/magnitude
Yields	ylm	Interpolated from 2018 (1) to 2023 (0.9). Change repeat to 2040
Contraception use	Contrusm	Interpolated from 2018 (1) to 2023 (0.95455). Change repeat to 2040 (0.8)
Maternal mortality	hlmortcdadltm	Interpolated from 2018 (1) to 2023 (1.07). Change repeat to 2040
Under-5 mortality	hlmortmcdchldm	Interpolated from 2018 (1) to 2023 (1.0725). Change repeat to 2040
Upper Secondary vocational share	edsecupprvocadd	Interpolated from 2018 (0) to 2023 (-1). Change repeat to 2040
Lower Secondary vocational share	edseclowrvocadd	Interpolated from 2018 (0) to 2023 (-1). Change repeat to 2040
Upper Secondary transition rate	edsecupprtranm	Interpolated from 2018 (1) to 2023 (1.02841). Change repeat to 2040
Upper Secondary graduation	edsecupprgram	Interpolated from 2018 (1) to 2023 (0.99384). Change repeat to 2040 (0.97)
Transparency	govcorruptm	Interpolated from 2018 (1) to 2023 (0.875). Change repeat to 2040
Agricultural loss from producer–consumer	aglosstransm	Interpolated from 2018 (1) to 2023 (1.1). Change repeat to 2040
Access to safe water (unimproved)	watsafem	Interpolated from 2018 (1) to 2023 (1.07). Change repeat to 2040
Improved sanitation	sanitationm	Interpolated from 2018 (1) to 2023 (0.725). Change repeat to 2040
Democracy level	democm	Interpolated from 2018 (1) to 2023 (0.7). Change repeat to 2040

Specific parameters used for the Bila Hopes scenario⁸²

Scenario	Parameter	Intervention length/magnitude
Yields	ylm	Interpolated from 2018 (1) to 2023 (0.9). Change repeat to 2040
Contraception use	Contrusm	Interpolated from 2018 (1) to 2023 (0.95455). Change repeat to 2040 (0.8)
Maternal mortality	hlmortcdadltm	Interpolated from 2018 (1) to 2023 (1.07). Change repeat to 2040
Under 5 Mortality	hlmortmcdchldm	Interpolated from 2018 (1) to 2023 (1.0725). Change repeat to 2040
Upper Secondary vocational share	edsecupprvocadd	Interpolated from 2018 (0) to 2023 (-1). Change repeat to 2040
Lower Secondary vocational share	edseclowrvocadd	Interpolated from 2018 (0) to 2023 (-1). Change repeat to 2040
Upper Secondary transition rate	edsecupprtranm	Interpolated from 2018 (1) to 2023 (1.02841). Change repeat to 2040
Upper Secondary graduation	edsecupprgram	Interpolated from 2018 (1) to 2023 (0.99384). Change repeat to 2040 (0.97)
Transparency	govcorruptm	Interpolated from 2018 (1) to 2023 (0.875). Change repeat to 2040
Agricultural loss from producer-consumer	aglosstransm	Interpolated from 2018 (1) to 2023 (1.1). Change repeat to 2040
Access to Safe Water (unimproved)	watsafem	Interpolated from 2018 (1) to 2023 (1.07). Change repeat to 2040
Improved sanitation	sanitationm	Interpolated from 2018 (1) to 2023 (0.725). Change repeat to 2040
Democracy level	democm	Interpolated from 2018 (1) to 2023 (0.7). Change repeat to 2040

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Notes

- 1 The group of other World Bank lower-middle-income countries consists of Angola, Armenia, Bangladesh, Bhutan, Bolivia, Cape Verde, Cambodia, Cameroon, Republic of Congo, Côte d'Ivoire, Djibouti, Egypt, El Salvador, Georgia, Ghana, Guatemala, Honduras, India, Indonesia, Jordan, Kiribati, Kosovo, Kyrgyz Republic, Lao PDR, Lesotho, Mauritania, Micronesia, Moldova, Mongolia, Morocco, Myanmar, Nicaragua, Nigeria, Pakistan, Papua New Guinea, Philippines, São Tomé and Príncipe, Solomon Islands, Sri Lanka, Sudan, Swaziland, Syria, Tajikistan, Timor-Leste, Tunisia, Ukraine, Uzbekistan, Vanuatu, Vietnam, West Bank and Gaza, Yemen and Zambia. For the purposes of comparison Kenya has been excluded from this group, as well as from the group of other lower-middle-income African countries and the EAC.
- 2 Unless otherwise noted, all figures are taken from IFs version 7.33. If the original data source is not noted it can be found within the model, which can be found at University of Denver, Joseph Korbel School of International Studies, Frederick S Pardee Center for International Futures, Understand the interconnected world, <http://pardee.du.edu/understand-interconnected-world>.
- 3 The full report is available on the websites of the ISS (<https://issafrica.org>), the KBG (<https://kenyabusinessguide.org>), the HSF (<https://www.hss.de/en/>) and GIZ (<https://www.giz.de/en/html/index.html>).
- 4 This series of algorithms provides a stylised representation of how the world might unfold given a continuation of current policies and environmental conditions.
- 5 Unless otherwise noted, all figures are taken from IFs version 7.33. If the original data source is not noted it can be found within the model at <http://pardee.du.edu/understand-interconnected-world>.
- 6 The Current Path forecast is not simply a linear extrapolation of historical trends but rather a dynamic forecast that integrates thousands of variables across a number of key development systems. It does not anticipate low-probability, high-impact events such as wars or pandemics, but is meant to provide a 'most likely' future trajectory.
- 7 To calculate the 'expected' value for a country based on its level of economic development, IFs allows users to run bivariate regressions (with GDP per capita as the independent variable) to fit a regression line. If the actual value falls below the expected value, then it can be said a country is 'underperforming' relative to its level of economic development.
- 8 Based on desktop research and interviews with stakeholders in Kenya, a number of adjustments were made to the IFs Current Path. For a full list of these adjustments (and the specific parameters used in IFs), please see Annex A.
- 9 Tuko Kazi means hard at work or we are working
Bila Hopes means bleak or unpromising
Unless mentioned, all US\$ amounts are in constant 2016 values.
- 10 For the larger report a group of peer countries was used for the purposes of comparison. This group included Bangladesh, Cambodia, Cameroon, Côte d'Ivoire, Pakistan and Uganda. Although none of these countries is typically thought of as an aspirational target, the average GDP per capita (PPP) in the comparison group (US\$3 700) was about 27% higher than that in Kenya (US\$ 2 900) in 2015. Other lower-middle-income countries in Africa and globally are also frequently used, while the group of World Bank upper-middle-income countries serves as a useful aspirational peer group.
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- 13 Ibid.
- 14 The enablers and macros identified by Vision 2030 and subsequent documents are macroeconomic stability, infrastructure, energy, science technology and innovation, land reform, human resources development, security and public sector reforms.
- 15 It is difficult to overstate the magnitude of the HIV/AIDS crisis in Africa. To wit, the death rate in other lower-middle-income African countries was more than four times higher than the global average in the late 1990s, while the death rate in Kenya was about 18 times the global average during that time period.
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- 18 Beyond the age of 75, communicable disease deaths in Kenya are significantly higher than in other lower-middle-income African countries, which aligns more closely with expectations given Kenya's relatively low level of economic development within the lower-middle-income country group.
- 19 The death rate (globally) from communicable diseases in the under-5 cohort is roughly 15.3 deaths per 1 000 people, which is only surpassed in the 95–99 cohort (21.3 deaths per 1 000).
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- 29 The replacement rate is the TFR at which a population will more or less remain constant. In countries with TFRs below 2.1, population size will eventually decline, and this creates problems associated with a high number of dependents relative to the size of the working population.
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- 31 The demographic transition is the process by which a population moves from having high birth and death rates to an older, more stable population structure characterised by low fertility and infant mortality rates and longer life expectancy. For more information, see
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- 34 There is a specific period in the demographic transition (i.e. as countries move from having high birth and death rates to low fertility rates and long life expectancy) that can be potentially favourable to economic growth. This can be measured either as a share of working age people (those 15 to 64) relative to children and people over 65, or by the median age of the population. See R Cincotta, Opening the demographic window: age structure in sub-Saharan Africa, *New Security Beat*, October 2017, <https://www.newsecuritybeat.org/2017/10/opening-demographic-window-age-structure-sub-saharan-africa/>
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- 82 Because there is, very generally speaking, little precedent for a significant stagnation in service delivery these scenarios are not benchmarked as precisely as those in the Tuko Kazi scenario. The interventions in this scenario reduce progress below the Stuck in Traffic scenario although, in some cases, they still result in overall improvements to the selected indicator.

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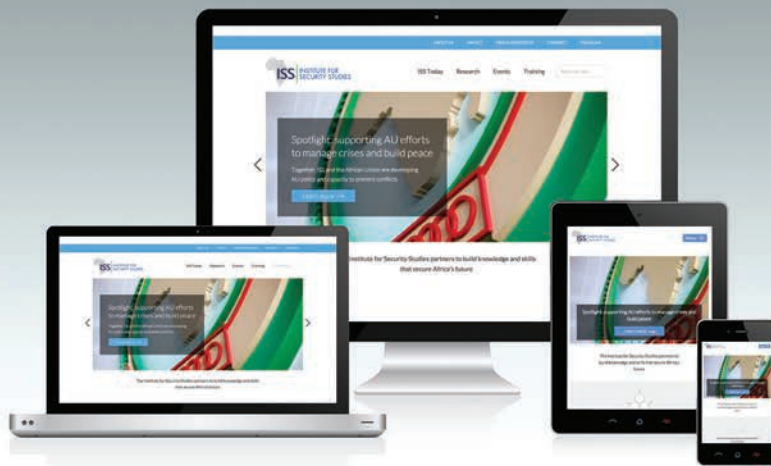
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About the Kenya Business Guide

The Kenya Business Guide is a think-tank that seeks to support the improvement and strengthening of the business environment in Kenya by providing access to information on key features of both the private and public sector prerequisites in the effective functioning of business. The KBG works in the intersection of the private and public sectors developing curated and value-added information to assist leaders in making more effective decisions.

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