FORESIGHT AFRICA

Top priorities for the continent 2020-2030

B | Africa Growth Initiative
at BROOKINGS

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FOREWORD

For over 10 years, the Brookings Institution's Africa Growth Initiative (AGI) has been at the forefront of a diverse array of policy debates impacting the African continent. The initiative houses some of the very best scholars Brookings has to offer, and its director, Dr. Brahima S. Coulibaly, serves as one of the brightest thought leaders not only at Brookings, but across the entirety of this discipline. Impact is not simply an objective for AGI—it's a regular outcome—and the Initiative's work has consistently been foundational in framing the most pressing issues facing Africa in the present moment.

At the pinnacle of AGI's success is the team's flagship publication, ***Foresight Africa***, which has, for many years, operated as a platform for some of the most influential and innovative thinkers of our time. This year's publication is, however, something truly special—a trend-setting assessment of the top priorities for Africa over the next decade. From the prospects of the Sustainable Development Goals to opportunities for greater job creation and the embracing of technologies like artificial intelligence, ***Foresight Africa 2020*** provides the depth of expertise that has defined AGI for over a decade.

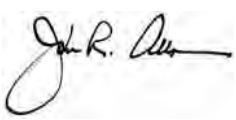
What's more, this document acts as an important knowledge resource for Africa and its global partners as they work to lift Africa up and empower entire generations with the tools necessary to better their communities and environment.

Foresight Africa is a serious and important publication, and it couldn't come at a more opportune time. Challenges—from corruption and authoritarianism to food shortages, health crises, poverty, and extremism—linger in hot spots across the continent. Africa's population continues to grow at an exponential rate, with the U.N. projecting that 40 percent of the world's population will live on the continent by the end of the century. Here, AGI's role as a leading source for policy solutions—and for opportunity—for this increasingly youthful continent shines through.

The list of priorities for African development over the next decade is significant, but through high-quality policy research and analysis, and by amplifying the voices of African experts and leaders, meaningful progress can be achieved. AGI will continue to be at the leading edge of those critical policy conversations, with ***Foresight Africa 2020*** serving as the flagship document paving the way and inspiring all that will follow.

It is my sincere hope that you read this publication with intent and share it widely among your peers, other thought leaders, and decisionmakers. Together, we can make a difference for the continent of Africa. It is one of the great moral imperatives of our time.

My very best,



John R. Allen
President
The Brookings Institution

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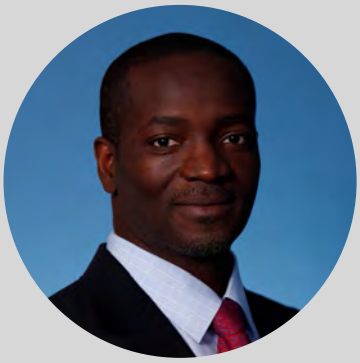


Brahima S. Coulibaly
Senior Fellow and Director, Africa Growth Initiative,
Brookings Institution

The new year 2020 marks the beginning of a promising decade for Africa. Through at least the first half of the decade, economic growth across Africa will continue to outperform that of other regions, with the continent continuing to be home to seven of the world's 10 fastest-growing economies.[1] Collective action among African and global policymakers to improve the livelihoods of all under the blueprint of the Sustainable Development Goals and the African Union's Agenda 2063 is representative of the shared energy and excitement around Africa's potential. With business environments improving, regional integration centered around the African Continental Free Trade Agreement progressing, and the transformational technologies of Fourth Industrial Revolution spreading, never before has the region been better primed for trade, investment, and mutually beneficial partnerships. The recent, unprecedented interest of an increasingly diversified group of external partners for engagement with Africa highlights this potential. Despite the continent's promise, though, obstacles to success linger, as job creation still has not caught up with the growing youth labor force, gaps in good and inclusive governance remain, and climate change as well as state fragility threaten to reverse the hard-fought-for gains of recent decades.

I am hopeful, though, that Africa will rise to the challenges of the next decade through renewed determination and a great sense of urgency. This special edition of *Foresight Africa* highlights the triumphs of past years as well as strategies from our experts to tackle forthcoming, but surmountable, obstacles to a prosperous continent by 2030.

In Chapter 1, our experts discuss how the next 10 years of the **Sustainable Development Goals** (SDGs) will shape policy priorities for African governments and their partners. Progress has been uneven both across countries and across goals, often hindered by a lack of coordination across national and local governments as well as the global system at large. Notably, while the progress in areas such as health and education show promise, persistent gaps in other areas, such as service delivery and infrastructure, hold the continent back from making true, long-lasting gains. Given that financing continues to be the biggest hindrance to global success, our authors explore resource mobilization strategies that can push Africa over the finish line.

For Africa to accomplish the ambitious but laudable SDGs, **strong institutions and good governance** must be in place. In Chapter 2, our experts discuss not only how African countries can build and sustain peace and end corruption, but also how the global community can support institution-building efforts. More broadly, good governance must be inclusive, so our experts share how support for widespread

1 Based on the projections in the International Monetary Fund's World Economic Outlook Database, October 2019.

democracy as well as the empowerment of women can and will bring gains for all.

Among the top challenges facing the continent continues to be the mismatch between **demographic trends and job creation**. With rapid population growth and urbanization, African leaders must fashion and implement policies to encourage job creation and maintain service delivery. The authors in Chapter 3, then, offer strategies for governments to invest in sectors primed to grow and create jobs, prepare young people for the jobs of the future, and improve the quality of living in Africa's rapidly growing cities.

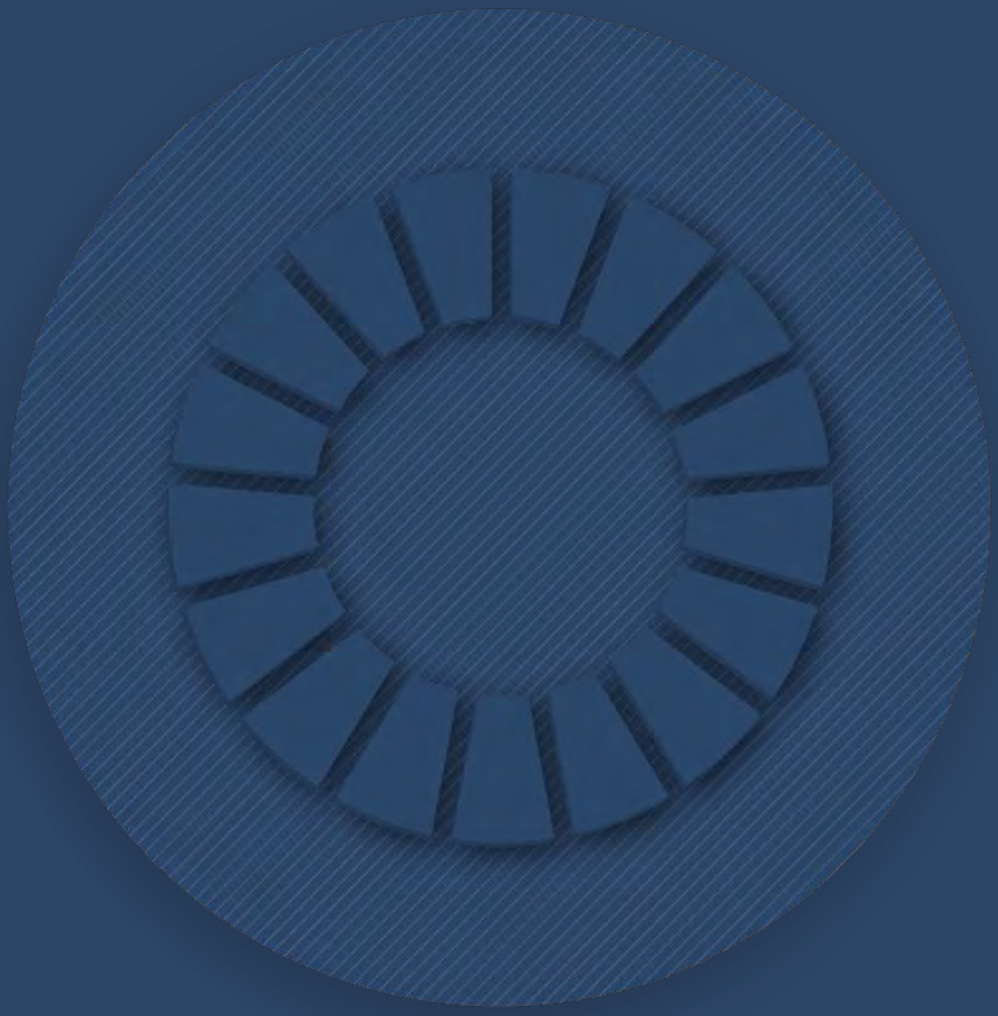
Overshadowing all of these challenges is the threat of **climate change**. Food security is particularly in the crosshairs as climate change threatens means of production and the nutrition of the continent's people. At the same time, the perils of increasing and strengthening natural disasters loom over the millions of people living in low-elevation coastal zones. As the authors argue in Chapter 4, without aggressive and comprehensive global and local action, other reforms addressing economic growth and human development will be for naught.

Many leaders see the **Fourth Industrial Revolution** and its accompanying **technologies** as a pathway for many solutions to the challenges facing the continent. Progress towards goals such as education access, climate change mitigation, and service delivery can all be enhanced by digital tools both already available and on the horizon. In Chapter 5, the authors explore how groundbreaking technology—such as artificial intelligence—can, hand-in-hand with enabling and empowering policies, improve business, health care, and the livelihoods of all. The Fourth Industrial Revolution is already ushering in a new, empowered future for **Africa as it steps out on to the world stage**. Bolstered by the newly implemented African Continental Free Trade Agreement, policies to encourage innovation and integration can propel the continent into new frontiers of business and human development. In Chapter 6, our experts explore the new commercial and diplomatic opportunities Africa is creating as it empowers itself from within and suggest how the continent might respond to new foreign partners looking to tap into this potential.

Unlike past editions of Foresight Africa, ***Foresight Africa 2020*** is a special edition focusing on the top priorities for the continent over the next decade. This approach allows our experts to explore key trends that will affect the region's pursuit of better livelihoods for all and suggest solutions for policymakers to navigate potential obstacles. As with each edition, we continue to highlight the top priorities for the region in the coming years, offering recommendations for African and international stakeholders to create and support a strong, sustainable, and prosperous continent. In so doing, we hope to promote and inform a dialogue on economic development that will generate sound strategies for sustaining economic growth and broadening its benefits in the years ahead.

Over the course of the year, we look forward to further exploring Africa's priorities through high-profile events at Brookings and across the continent, informed by research reports, commentary, engagement, and action.

We would like to express our gratitude to our donors, Brookings leadership, and you for all your support and commitment to AGI.



ACHIEVING THE SUSTAINABLE DEVELOPMENT GOALS

The state of play and policy options

Strategies to deliver on the Sustainable Development Goals in Africa

Belay Begashaw, Director General, The Sustainable Development Goals Center for Africa
@SDGCAfrica

With one-third of the 2030 Agenda journey already complete, it is an opportune time to examine Africa's progress on the Sustainable Development Goals (SDGs) so far as well as assess what adjustments to strategies are needed to overcome the remaining obstacles. The SDGs provide time-bound targets in key sectors—including health, education, employment, energy, infrastructure, and the environment—for all nations to achieve. Nowhere is the need to achieve these targets larger than in Africa. While progress in some areas and countries is encouraging, overall, the region will need to redouble its efforts if it is to achieve the SDGs by 2030. To be successful, there is need for effective and coordinated partnerships to domesticate the SDGs—i.e., to fully transpose the SDG ecosystem into national and regional planning and implementation mechanisms—as well as the African Union's (AU) Agenda 2063, and to bridge the large financing and data gaps.

Progress so far on the SDGs has been notable but falls significantly short

Progress so far on the implementation of the SDGs has been uneven across countries, goals, and targets. According to the Africa SDG Index and Dashboard 2019, the best-ranked country, Mauritius, had an aggregate score of 66.19—implying that the country is, on average, 66 percent of the way to the best possible outcome across the 17 SDGs.[1]

Other top performers include Botswana, Ghana, and Rwanda (for more insights on how Rwanda is approaching the SDGs, see page 14). However, 18 countries (of 46 total) in sub-Saharan Africa are, on average, less than 50 percent on the way towards meeting the best possible outcome on all SDGs. Overall, at the indicator level, these countries are off track on most of the SDGs, reiterating the urgency for countries and global partners to jointly accelerate reforms and implementation.

Gains in health and education show promise, but gaps linger

Notably, the under-five mortality rate for Africa (excluding North Africa) has fallen from 85 deaths per 1000 in 2015 to 76 deaths per 1000 in 2018,[2] an encouraging sign, but still double the global average of 38. Neonatal deaths have also improved from 29 per 1000 to 27 per 1000 over the same period. North Africa had already reduced under-five mortality rates to fewer than 35 deaths per 1000 births by 2015, and is likely to meet the goal of fewer than 25 deaths per 1000 births by 2030. With an intensified and accelerated response, the other African regions could feasibly meet this target.[3] Large-scale

1 The Africa SDG Index and Dashboards includes *inter alia* countries' specific performance and trends for each of the 17 goals, the overall country aggregate SDG index score ranking, as well as the trend analysis showing the respective countries' distance to achieving the SDGs. For example, if a country has a score of 100 percent, that country has attained the 2030 goals across all SDGs. Note that this score is not reflective of progress since 2015, the SDG inception year. In other words, countries did not start 2015 with a score of zero.

2 "Under-five mortality rate—Total", *United Nations Inter-Agency Group for Child Mortality Estimation,* 2019, https://childmortality.org/data.

3 Enock Nyorekwa Twinoburyo et al., *Africa 2030: Sustainable Development Goals Three-Year Reality Check* (Kigali: Sustainable Development Goals Center for Africa, 2019).

progress on both health and education remain a concern, though, given that most Africa countries have not carried out demographic health and national surveys over the SDG period.

The net enrollment rate for primary school in sub-Saharan Africa has increased marginally from 77.4 percent in 2015 to 77.6 percent in 2017. More than half of the countries in Africa have a primary school enrollment rate of over 90 percent and are likely to meet the target of 100 percent by 2030 if current efforts are sustained. In particular, North Africa is poised to meet the 2030 target, and the other African regions are also within range. However, the net enrollment rate for lower secondary education has fallen slightly from 28.9 in 2015 to 28.3 in 2017.

At the same time, African urban areas will need 565 million additional housing units between 2015 and 2030 just to keep up with rapid population growth and urbanization.[4] This is about 40 million new houses per annum over that time.

Poverty and hunger persist, exacerbated by climate change

As of 2015, sub-Saharan Africa had the highest concentration of the world's poor, with 41.3 percent of people living under the poverty line.[5] An estimated 600 million people do not have access to electricity, and millions die every year from preventable diseases.[6] Relentless population growth and climate change also present two major threats to continued economic progress. Thirty-one African countries need food aid, and more than 30 percent of the 830 million people worldwide suffering from inadequate food supply are in Africa.[7] The prevalence of undernourishment, in fact, increased from 234.6 million in 2016 to 256.1 million in 2018.[8] In addition, experts predict that a temperature change of two degrees Celsius could contribute to farmers losing 40 to 80 percent of cropland conducive to growing maize, millet, and sorghum by the 2030s-2040s.[9] (For more on combatting climate change, see Chapter 4 on page 48).

Firmly determined to take its future into its own hands, Africa is growing out of adopting agendas to, instead, setting the agenda.

Infrastructure and service delivery improved but needs are apparent and pressing

To house and serve Africa's young and fast-growing population—expected to increase from 1.3 billion today to over 2.5 billion by 2030—governments must address sorely needed infrastructure and service requirements quickly. There have been improvements in recent years: For example, access to clean drinking water in sub-Saharan Africa has increased from 59 percent of the population in 2015 to 61 percent in 2017. Access to electricity increased from 39.4 percent to 44.6 percent over the same period.

4 Afdhel Aziz, "The Power of Purpose: Unlocking Africa's $10 Trillion Opportunity in Housing," *Forbes*, September 12, 2019.
5 "PovcalNet," *World Bank*, October 29, 2019.
6 "Electricity for All in Africa," *Sustainable Energy for All*, accessed December 2, 2019.
7 Food and Agriculture Organization of the United Nations et al., *The State of Food Security and Nutrition in the World: Safeguarding Against Economic Slowdowns and Downturns* (Rome: Food and Agriculture Organization of the United Nations, 2019).
8 Ibid.
9 "What Climate Change Means for Africa, Asia, and the Coastal Poor," *World Bank*, June 19, 2013.

Figure 1.1

SDG progress projections by country

All sub-Saharan African countries are expected to make some progress towards the SDG targets by 2030. However, 18 out of 44 countries are expected to get less than halfway to the absolute targets by 2030. In particular, Central African Republic, Chad, and South Sudan, which are starting furthest behind, are expected to make limited progress by 2030.

Note: Average across 18 absolute indicators.
Source: Homi Kharas, John McArthur, and Krista Rasmussen, *How many people will the world leave behind?* (Washington, D.C.: Brookings Institution, 2018).

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Main obstacles to progress

Given the complexities caused by rapid population growth and climate change, African nations must attempt to achieve the SDGs with urgency, as many of the challenges will become harder to manage if left unattended.[10]

Even with Africa's enthusiasm, without a robust global and localized governance structure the SDG agenda will falter

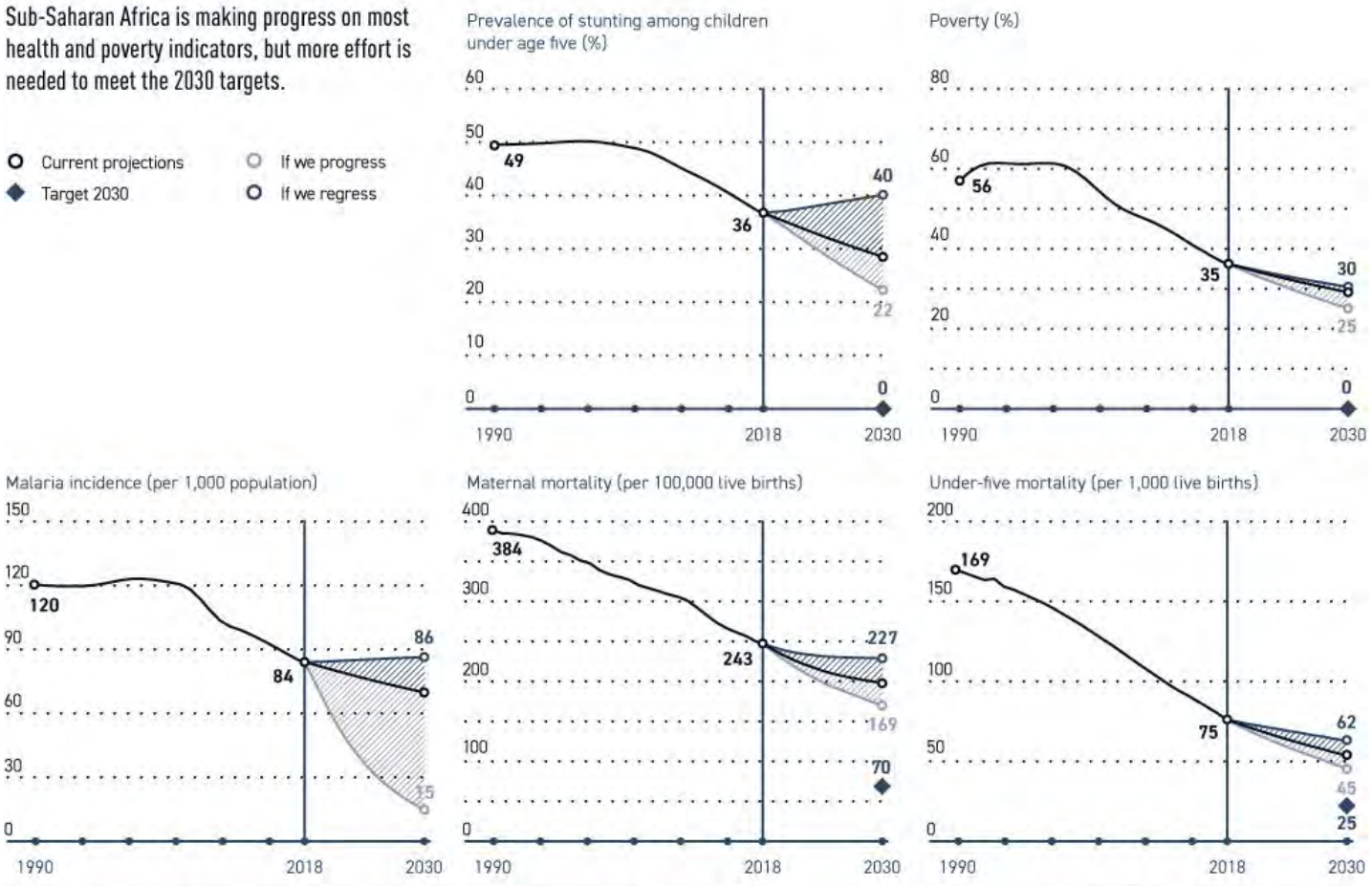
One major reason to be hopeful for Africa's progress is that the SDGs are in direct alignment with the African Union's Agenda 2063—the continent's long-term social and economic transformational blueprint for a prosperous continent. In fact, the two ambitious agendas align on over 85 percent of their goals, and African countries have shown enormous enthusiasm and endeavors in implementing the SDGs, with 90 percent of countries mainstreaming the SDGs into their national development plans.

At the same time, many weak links in the SDGs—largely due to the lack of a global governance structure—are waiting to be addressed. Despite data innovations embedded in the SDG

Figure 1.2

Poverty and healthcare SDG projections in sub-Saharan Africa

Sub-Saharan Africa is making progress on most health and poverty indicators, but more effort is needed to meet the 2030 targets.



Note: The "if we progress" and "if we regress" scenarios, are based on Institute for Health Metrics and Evaluation's determination of the 85th and 15th percentiles of the observed district-level annualized rate of change for the period 2000 to 2017. For more on the methodology behind these projections, see www.gatesfoundation.org/goalkeepers.
Source: Gates Foundation, Goalkeepers Report (Seattle: Gates Foundation, 2019).

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10 Eve de la Mothe Karoubi et al., *2019 Africa SDG Index and Dashboards Report* (Kigali: Sustainable Development Goals Center for Africa, 2019).

formulation, the data gap remains wide and manifests into poor planning and, consequently, poor decisionmaking and results. There is neither a defined reporting nor accountability mechanism, nor clarity on pathways and interventions, and little experience or scalable practice when it comes to social inclusiveness. Not much has been done in changing mindsets; we are continuing to do new things the old way. Like in decades past, key stakeholders continue to work in silos, duplicating interventions with little coordination. Finally, the world only agreed on goals and targets, leaving solutions to be developed locally.

State fragility and large financing gaps hinder progress

The continent is disadvantaged with a low starting point. Fragility—which manifests in many forms such as weak institutions and economic, political, and social insecurity—remains prevalent in parts of the region, with 80 percent of the world's fragile states found in Africa. Despite being one of the fastest-growing regions in recent decades, 40 percent of African countries are still classified as "low income", with a GNI per capita of below $1,025 per year.[11]

Financing continues to be a constraint as well. The financing gap for SDGs is large for low-income countries, estimated to be, on average, in excess of 14 percent of GDP.[12] Alone, sub-Saharan Africa's annual additional spending requirements are estimated at 24 percent of the continent's GDP, approximately $420 billion.[13] This financing gap is a sizeable challenge for many Africa countries given that, as of 2018, over 20 of the 54 African countries are either in or at a high risk of debt distress. Compounding this challenge, official development assistance, though rising overall, is declining in per capita terms, and foreign direct investment has been dwindling in recent years. Furthermore, while more than a third of the required financing for the SDGs was expected to come from the private sector, the actual contributions from the private sector so far are significantly smaller, at only 4 to 8 percent. (For more on financing the SDGs, see the viewpoint on page 17).

Looking ahead: The time for action is now

Going forward, leaders at all levels must tackle the SDGs head-on with a comprehensive and interconnected approach to effectively optimize resources. Since such an approach seeks high-level horizontal and vertical coordination, it requires persistent and logically framed action plans for ensuring synergies. The domestication process must thus go beyond just mainstreaming the SDGs into national plans; it must now strive to contextualize both the target and its indicators to local socio-economic realities. Our strategy must be changed from the conventional present-to-future to future-to-present planning, cascading from 2030 backward.

Firmly determined to take its future into its own hands, Africa is growing out of adopting agendas to, instead, setting the agenda. Agenda 2063 is one mechanism for doing so. So is the African Continental Free Trade Area, which will integrate a market of 1.2 billion people with a GDP of over $3.4 trillion, creating new opportunities for Africa and its business partners. In addition, many African countries are embarking on ambitious development plans that are driving the adoption of technologies and new sources of energy. Countries are also showing a greater appetite for information technology and knowledge.

While Africa should remain committed to working with its development partners over the next decade and beyond, achieving the SDGs should primarily be its own responsibility.

11 "GNI per capita, Atlas method (current US$)," *World Bank*, accessed December 2, 2019, https://data.worldbank.org/indicator/NY.GNP.PCAP.CD.

12 Vitor Gaspar et al., "Fiscal Policy and Development: Human, Social, and Physical Investments for the SDGs," *IMF Staff Discussion Notes* 19/03 (2019).

13 Twinoburyo et al., *Africa 2030*.

Viewpoint

Strategies for delivering on the Sustainable Development Goals: Some lessons from Rwanda

Uzziel Ndagijimana, Minister of Finance and Economic Planning of Rwanda @undagijimana @RwandaFinance

The Sustainable Development Goals (SDGs) is the most ambitious and comprehensive global development agenda in history. It succeeded the Millennium Development Goals, whose implementation was rather uneven.

For the SDGs to succeed in Africa, leaders must remember that the continent's context matters. The SDGs were adopted in 2015 at a moment when African economies were slowing down, mainly due to commodity price shocks that particularly affected resource-dependent countries. At the same time, a number of African countries are fragile due to insecurity and instability and must thus spend a disproportionate share of their resources on security—to the detriment of social and investment spending. At the global level, rising trade tensions are projected to negatively impact global growth and investment, and Africa will not be immune.

Despite this difficult environment, Africa has the potential to achieve most of the SDGs if proper strategies are adopted and implemented. Here in Rwanda, we have made progress on many of the goals, especially around poverty reduction, education, health, and access to basic infrastructure (see Figures 1.3).

Although there is no one-size-fits-all formula, African countries do share some common features and advancing on the following priorities could help the African continent achieve the SDGs.

> The SDGs should not be treated as a stand-alone project from New York. They should be fully owned by countries and integrated in national plans and strategies, domesticated and adapted to the national context.

First, national ownership and domestication of the SDGs: The SDGs should not be treated as a stand-alone project from New York. They should be fully owned by countries and integrated in national plans and strategies, domesticated and adapted to the national context. In the case of Rwanda, this approach helped achieve many Millennium Development Goals by 2015, and it

Figure 1.3

Rwanda's immense progress towards the SDGs

Rwanda had made immense progress towards many of the Millennium Development Goals and is continuing that success under the Sustainable Development Goals.

Source: National Institute of Statistics of Rwanda.

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underlies our strategy for the SDGs. Indeed, the SDGs have been integrated into the National Strategy for Transformation 2017-2024 and Vision 2050 in order to ease planning prioritization, resource allocation, and monitoring of progress.

Second, strengthening statistical capacity and monitoring: Countries need to strengthen their statistical capacity to measure SDG indicators. They also need to build a robust monitoring system that continuously evaluates and monitors progress so that policymakers are informed in real time about any challenges that require intervention.

Third, increasing implementation capacity: We've found that this recommendation seems to be the most critical area for improvement. It requires institutional capacity (both systems and human resources), proper planning, transparency and accountability in implementation, and attention to anti-corruption measures. Without tackling the issue of governance in Africa, it would be impossible to expect significant achievement of the SDGs.

Fourth, resource mobilization and ease of doing business: SDG financing is a serious challenge. None of the commitments made under the Addis Ababa Action Agenda has been met so far. Domestic resource mobilization is still low, and the commitment of developed countries to allocate 0.7 percent of GNI to official development assistance has not been met. African countries need to make policy reforms aimed at improving the investment climate to attract private investment, reform their tax systems to increase domestic revenues, and adopt measures to reduce tax evasion and illicit financial flows. In the case of Rwanda, improvement of the business environment over the past 10 years has paid off: Rwanda's ranking in the World Bank's Doing Business index has risen from 150th in 2008 to 29th in 2018, and this has contributed to the increase of private investment, particularly foreign direct investment. Indeed, total private investment in Rwanda increased threefold between 2009 and 2018, and FDI increased nearly fourfold.

Fifth, human capital development and job creation: Africa has the youngest and fastest-growing population in the world. Over 40 percent of the population is under age 15 and 20 percent is between 15 and 24, presenting the potential for a demographic dividend. However, to realize those gains, there is a need for firm commitment from African governments to invest more in people by increasing access to quality health and education services. A more educated, healthier, and productive population will only increase the chances of SDG success.

Sixth, implementation of the African Continental Free Trade Agreement (AfCFTA): Though at first seemingly unrelated, the recently concluded AfCFTA presents an outstanding opportunity for accelerated progress on the SDGs, as expanded intra-African trade, investment, and job creation will lead to greater economic and social development overall. While trading under the AfCFTA will commence in July 2020, the agreement's promise will only be fulfilled if African governments work together to accelerate the pace of its implementation.

Implementation of the SDGs in Africa is possible, despite the challenging national, regional, and global contexts. What matters most is the resolve and commitment of Africa's governments, with the support of our private sector.

Viewpoint

Approaches for better resource mobilization to finance Africa's Sustainable Development Goals

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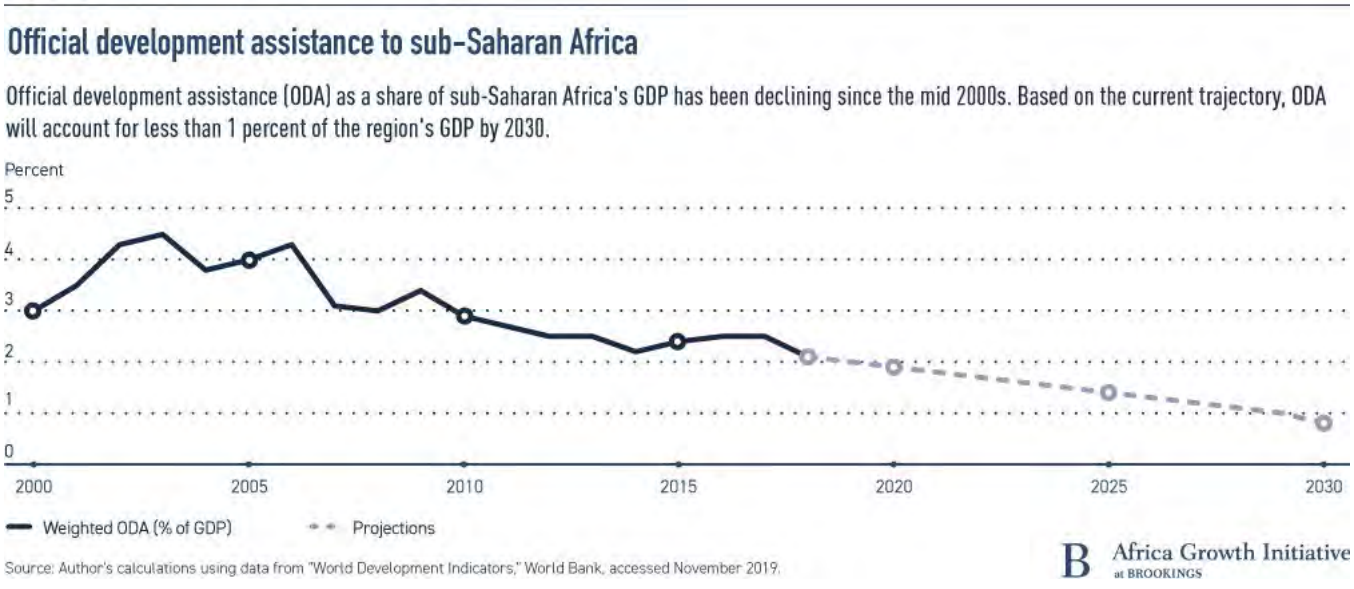
Undoubtedly, one of the key challenges to achieving the Sustainable Development Goals (SDGs) over the next decade will be the ability to mobilize resources to finance them. Indeed, estimates by the Brookings Institution suggest that sub-Saharan Africa will need $574 billion dollars per year until 2030 to finance the SDGs.[1] While projected spending in a few countries, such as Botswana or Mauritius, will meet their SDG financing needs, for the vast majority of countries in the region, there is a substantial financing gap totaling $256 billion per year. Meanwhile, the future of official development assistance (ODA), which has been an important source of financing for several countries, is increasingly uncertain as discontent with globalization and changing political environments are causing governments in many advanced economies to revisit their commitments. Net ODA is not keeping up with the growing financing needs of the region; in fact, as a percent of GDP, it has been declining steadily. Worryingly, given current trends, ODA will likely become insignificant by 2030 (Figure 1.4). Against this backdrop, it is even more imperative that policymakers step up efforts to mobilize domestic resources. The beginning of a new decade offers opportunities for renewed commitments and redoubling of efforts on this front.

Figure 1.4



1 Annual average for 2015-2030 in constant 2015 U.S. dollars. Author's calculations using data from Homi Kharas and John McArthur, Building the SDG Economy: Needs, spending, and financing for universal achievement of the Sustainable Development Goals (Washington, D.C.: Brookings Institution, 2019).

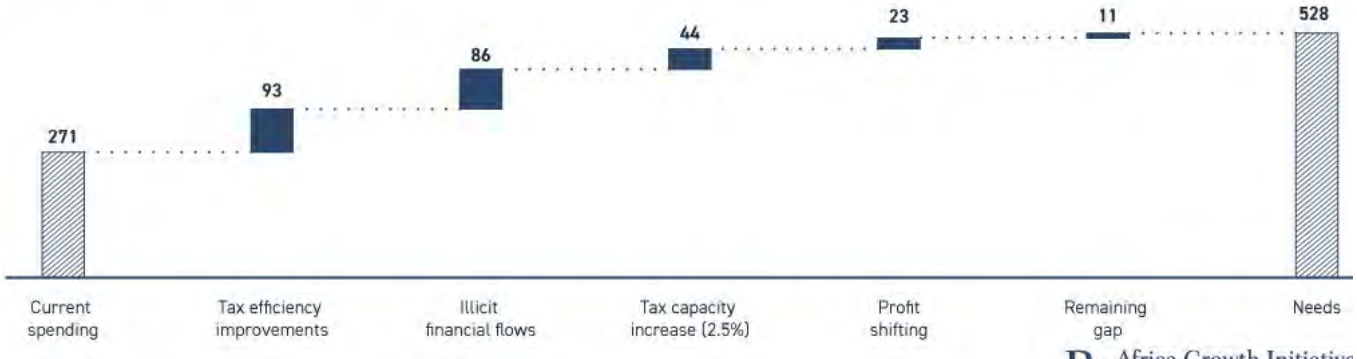
Tax revenues are the most important component of domestic resources, and raising them has been at the center of many domestic reforms and regional and international initiatives.[2] Indeed, these efforts helped boost non-resource tax revenues from 11 percent of GDP in the early 2000s to 15 percent more recently. Even so, Africa's tax ratios are still among lowest in the world, largely due to both low taxation capacities—about 20 percent of GDP on average (compared with 30 percent in OECD countries)—and to inefficiencies in revenue collection.[3] The good news is that there is scope to raise tax revenues above current levels over the next decade by further strengthening tax capacity, such as through reducing informality or broadening the tax base, and by improving governance in revenue collection. A study by the Africa Growth Initiative at the Brookings Institution shows that tax capacity has already been improving, and, in fact, grew by 2.5 percentage points between 2000 and 2015. This pace is admittedly too slow. Even so, assuming the same pace is sustained through 2030, it will generate an additional $44 billion a year in revenues. More importantly, improving governance around tax revenue collection can help close the gap between current taxes and tax capacity on the continent, and raise tax revenues by $93 billion a year through 2030. If, in addition, governments—with the cooperation of external partners—stem illicit capital flows successfully, the continent can raise up to 5 percent of GDP per year. This is equal to an average of $86 billion annually over the next decade.[4] In fact, developing countries lose 1.3 percent of GDP in tax revenues to companies shifting profits to low-tax locations,[5] meaning that the region will lose an average of $23 billion per year over the next 10 years. International cooperation on taxation of multinational companies can help combat this practice and contribute to the mobilization of domestic resources.

All told, additional efforts to boost tax revenue collection and stem illicit capital flows would mobilize an additional $246 billion and narrow the region's SDG financing gap substantially, to over $10 billion per year (Figure 1.5).

Figure 1.5

Financing the SDGs in sub-Saharan Africa

Efforts to boost tax revenue collection and stem illicit capital flows can mobilize an additional $246 billion and narrow the region's SDG financing gap substantially, to just over $10 billion per year.



Note: Includes only the 36 countries with a SDG financing gap. Data is available for 40 countries.
Source: Author's calculations using Kharas and McArthur, Building the SDG economy; Signe, Madden, and Sow, "Illicit Financial Flows"; Keen et al., "Capital Taxation"; Coulibaly and Gandhi, "Mobilization of tax revenues"

2 Some of these initiatives include the 2002 Monterrey Consensus, the 2011 Busan Agreement, the Addis Tax Initiative launched in 2015, and the Platform for Collaboration on Tax launched in 2016.

3 Brahima Coulibaly and Dhruv Gandhi, Mobilization of tax revenues in Africa: State of play and policy options (Washington, D.C.: Brookings Institution, 2018).

4 Landry Signe, Payce Madden, and Mariama Sow, Illicit financial flows: Drivers, destinations and policy options (Washington, D.C.: Brookings Institution, forthcoming).

5 Michael Keen et al., "Corporate Taxation in the Global Economy," *International Monetary Fund Policy Paper* 19/007 (2019).

Despite the continent's vast endowment of natural resources, inefficient management of those resources has prevented Africa from capitalizing on them, and addressing issues of weak governance in the sector will raise additional domestic resources. According to the Natural Resource Governance Institute, except for Ghana and Botswana, all African countries have "weak" or "poor" governance ratings, and seven of the world's bottom 10 performers with "failing" governance scores are in Africa. Encouragingly, some countries, like Guinea and Liberia, are taking important steps to enhance transparency in the natural resource sector. In addition, governments should resort to more innovative financing mechanisms, such as blended finance or public-private partnerships and other risk mitigation mechanisms, to crowd in more private sector funds and help preserve the solvency of public sector balance sheets.

The run-up in debt that the region has experienced in past years and the current debate about another looming systemic debt crisis in the region reflect the fact that the issue of sustainable financing for Africa's development remains unaddressed.

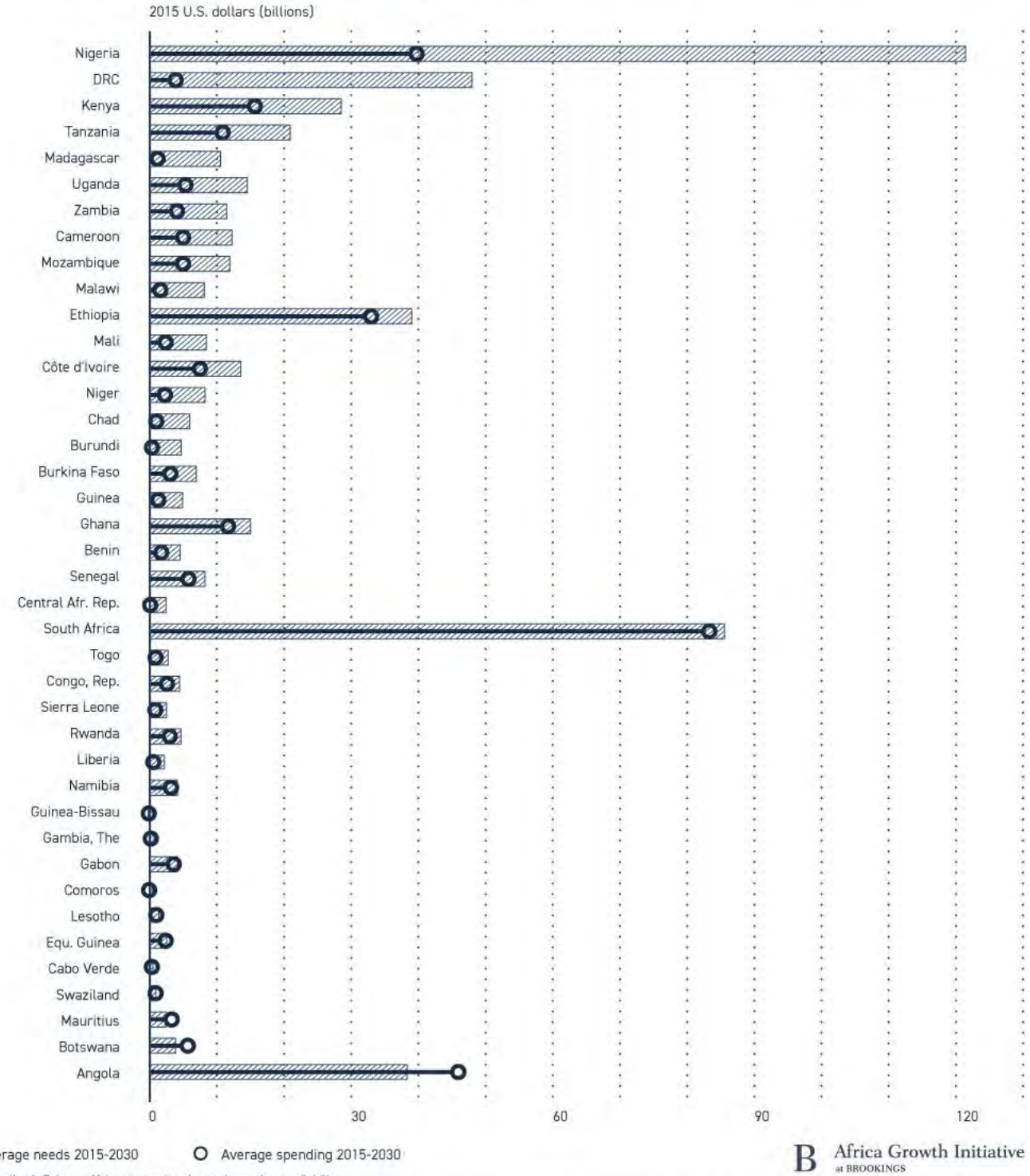
The run-up in debt that the region has experienced in past years and the current debate about another looming systemic debt crisis in the region reflect the fact that the issue of sustainable financing for Africa's development remains unaddressed. The policy priorities to mobilize domestic resources outlined above will reduce the need for external financing and help avoid another systemic debt crisis. Policymakers should also enhance equity in tax systems and increase the efficiency of public spending; citizens are more likely to comply with tax collection when they trust that tax revenues are managed well.[6] As African policymakers and external partners move forward on the domestic revenue mobilization agenda, it will be important to ensure that tax systems are more equitable and supportive of the SDGs.

6 Guglielmo Barone and Sauro Mocetti, "Tax morale and public spending inefficiency," International Tax and Public Finance 18, no. 6 (2011): 724-49.

Figure 1.6

Annual SDG financing gap by country

Current SDG-related spending in most sub-Saharan African countries is not enough to meet the targets by 2030. Only a few countries, such as Angola, Botswana, and Mauritius have sufficient spending. Nigeria and the Democratic Republic of the Congo face the largest financing gaps, with the two countries alone accounting for just under half of sub-Saharan Africa's financing shortfall.



Note: Not all sub-Saharan African countries shown due to data availability.
Source: Homi Kharas and John McArthur, Building the SDG economy: Needs, spending, and financing for universal achievement of the Sustainable Development Goals (Washington, D.C.: Brookings Institution, 2019)

Figure 1.7

Top African economic performers, 2015–2019 and 2020–2024

Strong growth rates will be essential for Africa to achieve the SDGs. Economic growth will continue to be strong at least through the first half of the decade, with the region's economy expanding at a faster pace than the global economy. In fact, seven of the world's 10 fastest-growing economies will be in the region, but performance will vary. While economies of countries like Senegal, Rwanda, and Niger will grow at over 7 percent, the largest three economies (Angola, Nigeria, South Africa) will continue to struggle. In low-performing economies, policy priorities will be to revive economic growth, while in the high growth economies, policymakers must ensure that growth is inclusive so the living conditions of all can improve.

Top performers based on 2015–2019 growth estimates		Top performers based on 2020–2024 growth estimates	
Country	GDP growth, 2015–2019	Country	GDP growth, 2020–2024
Ethiopia	8.7%	Senegal	8.3%
Côte d'Ivoire	7.9%	Rwanda	7.9%
Rwanda	7.5%	***Niger***	***7.3%***
Guinea	***7.2%***	***Uganda***	***7.2%***
Senegal	6.5%	***Mozambique***	***6.9%***
Tanzania	6.4%	Ethiopia	6.9%
Burkina Faso	5.8%	Côte d'Ivoire	6.8%
Kenya	***5.7%***	***Benin***	***6.7%***
Ghana	***5.5%***	Tanzania	6.2%
Mali	***5.4%***	Burkina Faso	6.0%
Sub-Saharan Africa	2.8%	Sub-Saharan Africa	3.9%
The Big Three (Angola, Nigeria, South Africa)	0.9%	The Big Three (Angola, Nigeria, South Africa)	2.3%
Sub-Saharan Africa excluding "the Big Three"	4.9%	Sub-Saharan Africa excluding "the Big Three"	5.5%
World	3.5%	World	3.5%

Source: Brookings Africa Growth Initiative using data from the International Monetary Fund, World Economic Outlook, October 2019.

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DEEPENING GOOD GOVERNANCE

Inclusion, democracy, and security

Good and inclusive governance is imperative for Africa's future

John Mukum Mbaku, Nonresident Senior Fellow, Africa Growth Initiative, Brookings Institution & Brady Presidential Distinguished Professor of Economics, Weber State University

Among the seven key aspirations listed in *Agenda 2063: The Africa We Want*[1]—the African Union's (AU) shared 50-year development and transformation program for realizing the full potential of the continent—one stands out in its interconnectedness: "[a]n Africa of ***good governance***, democracy, respect for human rights, justice and the rule of law" [emphasis added].[2] The key to Africa's political and economic transformation in the next decade is found in this aspiration. Indeed, as former United Nations Secretary-General Kofi Annan said, "Good governance is perhaps the single most important factor in eradicating poverty and promoting development."

Progress on good governance has been encouraging, but challenges remain

African countries continue to build on the governance gains that they have achieved since the early 1990s. According to the African Development Bank, good governance should be built on a foundation of (i) effective states, (ii) mobilized civil societies, and (iii) an efficient private sector. The key elements of good governance, then, are accountability, transparency, combatting corruption, citizen participation, and an enabling legal/judicial framework.[3]

Since then, many African countries have undertaken institutional reforms that have significantly changed their governance architectures and put in place a new set of leaders. Since the early 1990s, for example, Ghana has diligently undertaken governance reforms, including the design and adoption of a new democratic constitution, which places emphasis on the separation of powers with checks and balances to transform its political system. Ghana subsequently became a role model in the institutionalization of democratic rule, as illustrated by the quick acceptance of defeat by incumbent President John D. Mahama during the 2016 elections.

More broadly, over the past decade, Kenya, Morocco, and Côte d'Ivoire have led the way.The Ibrahim Index of African Governance indicates that between 2008 and 2017, these countries experienced significant improvements, particularly in overall governance.[4] Specifically, Côte d'Ivoire registered the greatest improvement in overall governance during the period 2008–2017 (+12.7 points), followed by Morocco (+7.3 points) and Kenya (+6.1 points).[5]

But Africa has a long way to go: Too many countries have not yet achieved the type of reforms that can prevent dictatorship, corruption, and economic decline. Due to

1 African Union Commission, *Agenda 2063: The African We Want: First Ten-Year Implementation Plan, 2014–2023* (Addis Ababa: African Union Commission, 2015).

2 Rachel Gisselquist, "What Does 'Good Governance' Mean?" *United Nations University*, January 2012.

3 African Development Bank, *Bank Group Policy on Good Governance (Abidjan: African Development Bank, July 2000).*

4 According to the Ibrahim Index of African Governance for 2018, between 2008 and 2017, Kenya moved from 19th to 11th position, Morocco moved from 25th to 15th and Côte d'Ivoire moved from 41st to 22nd. Mo Ibrahim Foundation, *2018 Ibrahim Index of African Governance 2018 (London, UK: Mo Ibrahim Foundation, 2018), p. 17.*

5 Overall governance is scored out of 100 possible points. Mo Ibrahim Foundation, *2018 Ibrahim Index*, p. 17.

continued sectarian violence, weak and ineffective leadership, and lack of political will, countries like the Central African Republic, Eritrea, Somalia, and South Sudan remain saddled by poor-functioning governance structures.[6] The absence of good governance in many African countries has been extremely damaging to the government's corrective intervention role, particularly in the maintenance of peace and security, as well as the promotion of economic growth and the creation of the wealth needed to confront poverty and improve human development.

Without good and inclusive governance, Africa will not achieve its social and economic targets

It is imperative that countries entrench mechanisms that promote constitutionalism, accountability, democracy, and good governance if Africa is to achieve its development goals. For example, although there has been a substantial decline in the share or proportion of Africans living in extreme poverty—from 54 percent in 1990 to 41 percent in 2015—the number of Africans living in poverty has actually increased from 278 million in 1990 to 413 million in 2015.[7] Unless ***effective*** anti-poverty and pro-poor policies are implemented in African countries, global poverty will become increasingly African. Indeed, the least developed countries in the world (as determined by the United Nations Development Program's Human Development Index) are also countries with relatively weak, dysfunctional, or ineffective governance structures (as determined by the Ibrahim Index of African Governance). These include the Central African Republic, Chad, the Democratic Republic of the Congo, Equatorial Guinea, Eritrea, Libya, Somalia, South Sudan, and Sudan.[8]

Fighting poverty and improving human development in Africa must begin with the creation of wealth, a process that requires the existence of a robust entrepreneurial class. In order to achieve these goals, there must be peace and security—especially the peaceful coexistence of the various ethnocultural groups that inhabit each African country. Unfortunately, weak and dysfunctional governance structures continue to prevent many African countries from creating and sustaining the necessary enabling environment for peaceful coexistence, entrepreneurship, and wealth creation. In fact, in countries such as Cameroon, the DRC, and South Sudan, the absence of governance structures undergirded by the rule of law has failed to halt ethnic-induced violence. That violence stunts entrepreneurship and economic growth in these countries. Peace and security, which are a *sine qua non* for entrepreneurial activities and the creation of wealth, are unlikely to return to these countries without the provision of participatory and inclusive governance structures.

Fighting poverty and improving human development in Africa must begin with the creation of wealth, a process that requires the existence of a robust entrepreneurial class.

6 Ibid., p. 16.

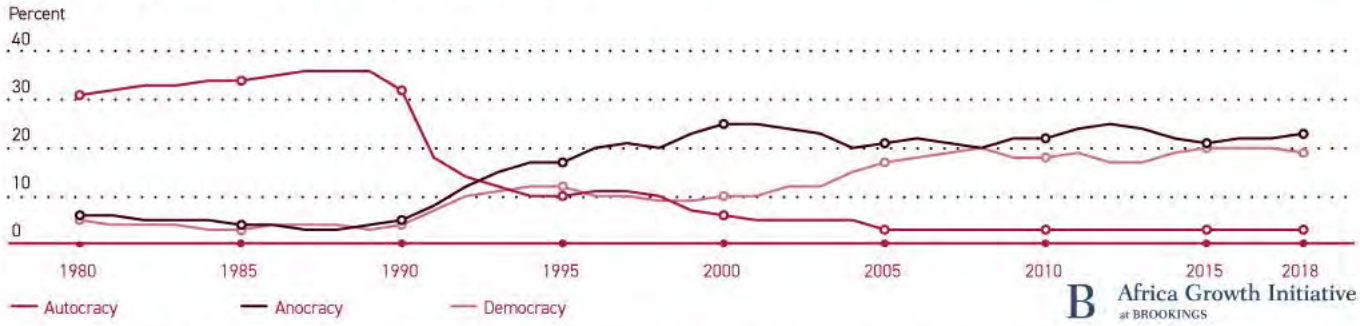
7 "Accelerating Poverty Reduction in Africa: In Five Charts," *World Bank*, October 9, 2019

8 See United Nations Development Program, *Human Development Index 2018* (New York: Oxford University Press, 2018) and Mo Ibrahim Foundation, *2018 Ibrahim Index*.

Figure 2.1

Spread of democracy in sub-Saharan Africa has stagnated since the mid-2000s

Sub-Saharan Africa has seen significant democratic progress since the 1980s with 19 democracies in 2018 compared to 5 in 1980. However, democratic progress has stagnated since the mid-2000s. There has been an even greater decline in autocratic regimes as some countries have moved from autocracies to anocracies - a hybrid form of government that exhibits both democratic and autocratic tendencies.



Note: Anocracy is a form of government loosely defined as part democracy and part dictatorship or as a "regime that mixes democratic with autocratic features."
Source: Brookings Africa Growth Initiative using data from the Polity IV Project, 2019.

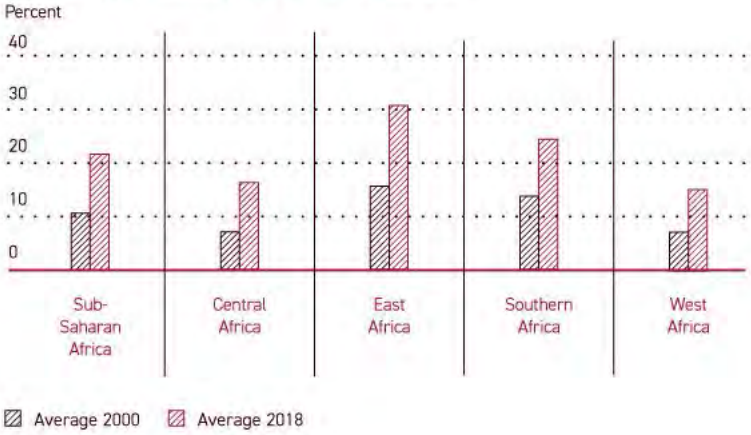
Figure 2.2

Progress on female representation in government

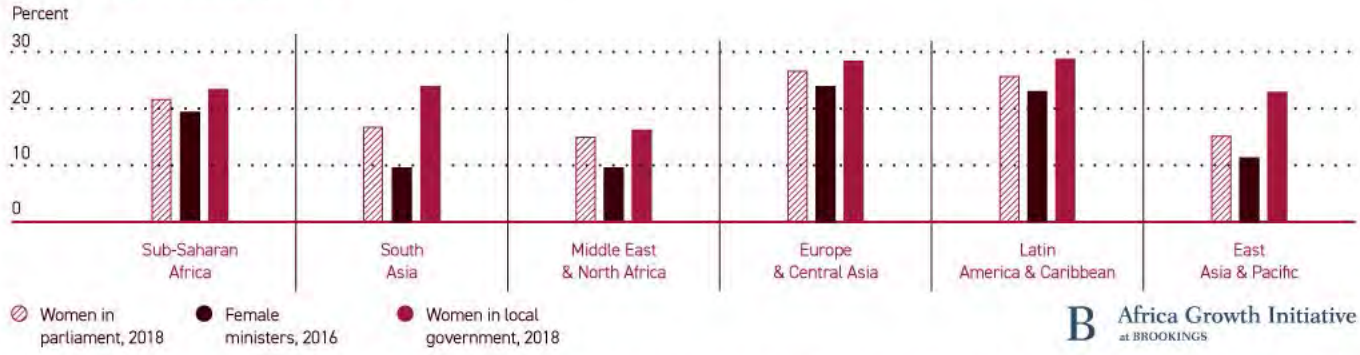
Sub-Saharan Africa has made significant progress on improving women's representation in government. The share of women in parliament has doubled since 2000. In fact, the region is close to the global average for women in parliament and local government as well as female ministers.

At the same time, there is heterogeneity within sub-Saharan Africa. Notably, at 61.3 percent, Rwanda has the highest share of female parliamentarians in the world. In fact, East and Southern Africa have a higher share of women in parliament compared to Central and West Africa. The presence of a quota system also affects female representation in sub-Saharan Africa. In 33 countries with some form of quota system (legislated candidate quota, reserved seats, or voluntary party quotas), female representation in parliament is at 25 percent compared to 13 percent for those without.

Women in parliament by sub-Saharan subregion



Women in governments worldwide



Note: Candidate quotas imply that a rule (legal or voluntary) is installed according to which for instance 20, 30, 40 or even 50% of the candidates must be women. At the third stage, those elected, we find quotas as reserved seats. Here it is decided that a certain percentage or number among those elected must be women. Voluntary party quotas refer to individual political parties setting minimum participation rates for women at any level of participation.
Source: Africa Growth Initiative at Brookings using data from Inter-Parliamentary Union, 2019; United Nations Global SDG database, 2019; The International Institute for Democracy and Electoral Assistance, 2019.

Weak governance manifests itself in other ways as well: Too often dysfunctional governance processes persist, creating environments where civil servants and political elites act with impunity, embezzling scarce public resources that could be used for education, health care, infrastructure, water treatment plants, electricity, farm-to-market roads, or technology. Elites are usually not incentivized to implement pro-poor economic programs that enhance the ability of the poor to participate productively and gainfully in economic growth, such as public investments in primary and secondary education, clean water, basic health care, and child nutrition.

process characterized by the separation of powers, with effective checks and balances, including a robust and politically active civil society; an independent judiciary; and a viable, free, and independent press. The process through which the constitution is designed and adopted must be participatory and inclusive enough to allow for all relevant stakeholder groups to participate—from the development of constitutional principles to the actual design and ratification of the constitution. It is especially important that historically marginalized groups be empowered to participate fully and effectively in the constitution-making process. Each country must also produce a set of

The type of governance structure that each African country should strive for over the next decade is one that should address peaceful coexistence and economic development, inequality, the effects of climate change, health pandemics, and enhanced regional cooperation.

Bolstering good and inclusive governance through 2030 and beyond

The type of governance structure that each African country should strive for over the next decade is one that should address peaceful coexistence and economic development, inequality, the effects of climate change, health pandemics, and enhanced regional cooperation, as well as ensure the full and effective participation in both the economic and political systems of groups that have historically been marginalized (e.g., women, youth, and ethnic and religious minorities). Each country must reflect upon its own governance challenges and engage in robust national dialogue on institutional reforms to enable an effective and inclusive governance system.

First, countries in or recovering from crises must engage in process-driven constitution-making to produce an agreed-upon governing ***constitutional principles*** to inform, guide, and constrain the drafters. Such principles should ensure that the constitution safeguards against abuses of power. Importantly, each constitution should have a robust amendment process, one that can effectively prevent the manipulation of the constitution by opportunistic executives to remain in power indefinitely, as we are currently experiencing in several countries.

Second, the countries that have progressive and inclusive constitutions undergirded by the separation of powers, including Ghana, Kenya, and South Africa, should engage in national dialogues to help their citizens understand and better appreciate the importance of the constitution to governance generally and the protection of human rights in particular. Through this process, citizens can determine how to strengthen their national constitutions (e.g., add a Bill of Rights).

Third, all African countries, with the aid of civil society, should develop and implement education programs to help citizens understand and appreciate the constitution and its provisions, and recognize the law as a tool that they can use to organize their private lives and resolve their conflicts, including those arising from trade and other forms of exchange. Programs for empowering youth and women could be particularly fruitful.

Fourth, each African country should engage in regular dialogue, where necessary, to revisit such important governance issues as the centrality of human rights in the structure of the country's constitution, as well as a strong and independent judiciary. Countries should also ensure that governance is inclusive of women and youth, who have historically been marginalized, as well as cultivate transformative leadership at all levels of government.

Finally, each country's citizens, especially its legal and constitutional scholars, including those in the diaspora, should play an important role in shaping the institutional and legal environment for the transformation of Africa's governance architecture during the next decade.

It is unlikely that the continent will be able to successfully and effectively implement and achieve the Sustainable Development Goals in 2030 or Agenda 2063 unless institutions are reformed to enforce good governance undergirded by the rule of law. The policies outlined will help the region accelerate good governance and support its economic transformation.

Viewpoint

Closing the gender gap in African labor markets is good economics

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Differing levels of economic advancement, social stigma, and religion all govern norms on whether a woman should be in the labor market, her occupation, and compensation. While progress had been made in gender equality in global labor markets thanks to economic and social advancement, progess is more limited in Africa due to high poverty and gender discrimination.

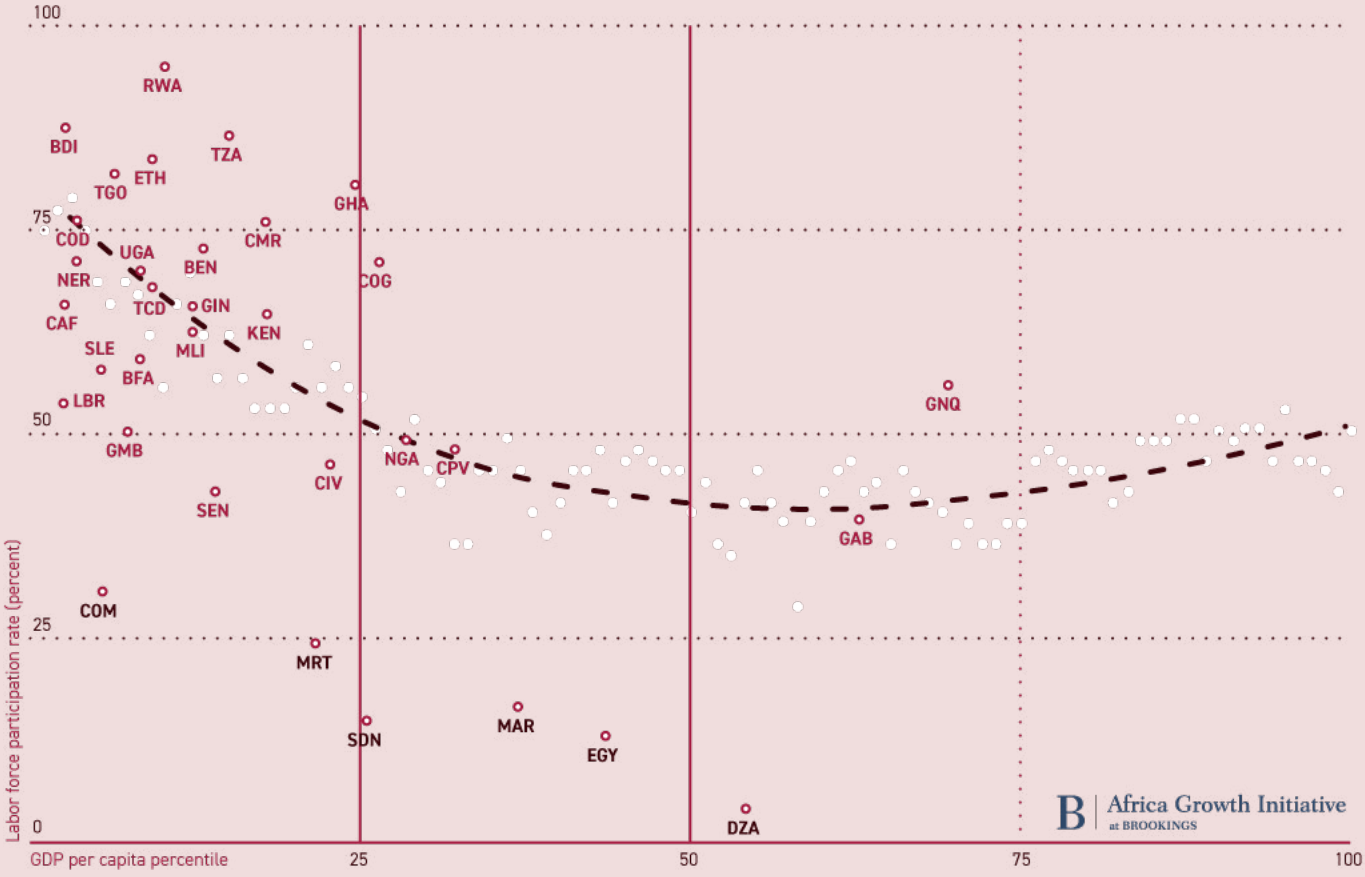
Notably, the relationship between female labor force participation (FLFP) rate and economic development is "u-shaped" (Figure 2.3).[1] At an extremely low level of income, where most African countries fall, women must work at the family farm or in household enterprises. As the economy advances and family income increases, the family "buys" back women's (wives') time for home production, such as care for children and the elderly. The exclusion of women from manual

1 Claudia Goldin, "The U-Shaped Female Labor Force Function in Economic Development and Economic History," *National Bureau of Economic Research Working Paper* 4707 (1994).

Figure 2.3

The "u-shape" function of female labor force participation rates and income per capita, 1990–2017

Historically, women's participation in the labor market has followed a u-shaped curve: At extremely low levels of income, women work at the family farm or in household enterprises. As the country develops, women enter the labor market. On the other end, as the economy advances and family income increases, the family "buys" back women's time for home production, such as care for children and the elderly. However, for many countries in North Africa, including Algeria, Egypt, and Morocco, the participation of women remain very low relative to the their income levels.



Note: The dashed line is a smoothed average line. African countries are labeled with their ISO3 country codes. The countries in black have the lowest FLFP rates for their level of GDP. The income deciles are calculated for each year between 1990 and 2017. The vertical lines represent the 25th and 50th percentiles.
Source: Author's calculations using "World Development Indicators," World Bank and "ILOSTAT," International Labor Organization.

jobs, such as manufacturing and agriculture, due to social stigma as well as discrimination also contribute to the decline in the FLFP. It is only at a higher level of income and women's education that we start to see closing gender gaps in labor markets.

Empowering women in the informal sector

In developing countries, including in Africa, 75 to 90 percent of non-agricultural employment is informal and low-paid work in which women are three times more likely to be employed as contributing family workers than their male counterparts—meaning women are often unpaid and vulnerable for exploitation.[2] In this case, the policy priority should concentrate on gender equality in pay and protecting women from exploitation in the short term and on enabling women to become independent and successful entrepreneurs in the long term.

2 International Labor Organization, *Women and men in the informal economy: A statistical picture*, 3rd ed. (Geneva: International Labor Organization, 2018).

Given that nine out of 10 employed women in sub-Saharan Africa are in the informal sector, policies should encourage more women to enter the formal sector, targeting constraints more acutely felt by women, including low skill and education levels as well as lack of access to finance. Additionally, facilitating forward linkages of women-owned informal enterprises with the formal sector, reducing costs of formalization through tax incentives and the elimination of registration fees, improving access to finance through microfinance, and lowering collateral requirements could empower female entrepreneurs.

Escaping the "middle dip" in female labor force participation

In countries on the decline and in the "middle dip" portion of the FLFP curve, the priority should be to achieve full and equitable participation of women in the labor market. Lack of affordable care for children and the elderly are key factors, as these constraints decrease FLFP rates in developing countries by 4.8 percentage points.[3] Policies that increase access to affordable care could thereby increase female labor force participation rates.

> Gender equality in the labor market is not just a fairness issue. It is good economics.

The stigma against women in manual work is also stronger at this stage in the curve; destigmatizing women's work in factories, construction, and mining is thus an important policy consideration. Notably, a lack of safe transportation for women to and from work is also associated with a 15.5 percentage point lower rate of FLFP in developing countries.[4] Policymakers should improve gender-sensitive transportation systems, institute and enforce strong anti-discrimination labor laws, and work closely with religious leaders and male partners to relax restrictive gender roles.

Policies and business reforms should also address challenges faced by female entrepreneurs in the formal sector, including limited access to finance, poor governance, and lack of infrastructure. In addition, skill and financial knowledge training that targets female entrepreneurs could increase both financial success and managerial confidence. In the long term, increasing girls' access to quality education, particularly secondary and tertiary education, could increase their relative wages, as well as heighten their chances of finding white-collar jobs or becoming successful entrepreneurs.

> Had African countries with lower relative female-to-male participation rates in 2018 had the same rates as advanced countries, the continent would have gained an additional 44 million women actively participating in its labor markets.

3 International Labor Organization, *World Employment and Social Outlook: Trends for Women 2017* (Geneva: International Labor Organization, 2017).
4 Ibid.

Potential gains from full and equitable participation of women in the labor market are substantial

Gender equality in the labor market is not just a fairness issue. It is good economics. Countries that improve gender equality in labor markets through 2030 could see large gains in economic growth. After all, women constitute more than half the productive population.

Had African countries with lower relative female-to-male participation rates in 2018 had the same rates as advanced countries, the continent would have gained an additional 44 million women actively participating in its labor markets.[5] By increasing gender equality in the labor market, the gain in GDP ranges from 1 percent in Senegal to 50 percent in Niger (Figure 2.4).

Figure 2.4

Potential gains in GDP from women's labor market participation

Full and equitable participation of women in the labor market can create substantial economic gains in the entire economy. By increasing gender equality in the labor market, African countries can increase their GDP anywhere between 1 percent (Senegal) to almost 50 percent (Niger).

Source: Author's calculations using "World Development Indicators," World Bank and "ILOSTAT," International Labor Organization.

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5 Andinet Woldemichael, "The Missing Women in African Labor Markets," in *Creating Decent Jobs: Strategies, Policies and Instruments*, ed. Celestin Monga, Abebe Shimeles, and Andinet Woldemichael (Abidjan: African Development Bank, 2019), 94-7.

Viewpoint

Unpacking the implications of future trends for security in Africa

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Imminent changes in climate, demography, and urbanization will reshape Africa's security landscape by the middle of this century. By 2050, parts of the African continent will be much hotter and arid, while others will be prone to flooding and rising sea levels. One in four people on the planet will be African, the continent's demographic structure will still have a stubbornly broad base with a high dependency ratio, and new entrants into the job market will find it difficult to find employment. The majority of Africans will be living in cities and, notably, the number of urban dwellers living in slums is expected to double.

Consequently, security outcomes across the continent will be impacted in various ways. First, these future trends will be collectively reinforcing. Climate trends will influence migration, and urbanization will be driven by population dynamics. Thus, unraveling inter-linkages will become even more important than searching for "root causes" of insecurity. Second, the impacts of these trends will vary over time and space. Clearly, broad initiatives and linear solutions will be unhelpful. Instead, granular, location-specific programs (national, sub-national, and community) will become even more necessary. Third, these trends will affect different types of insecurity differently (see Table 2.1).

The inexorable evolution of Africa's security landscape will clearly change the nature, incidence, and location of violent conflict across Africa. For example, the combined effect of growing population pressures and desertification in the Sahel will heighten land and resource tensions in already fragile communities, making them more susceptible to militia violence and violent extremism. On the other hand, megacities (like Lagos, Cairo, and Johannesburg) with expanding slums are likely to experience an increase in violent protests that could be either social, political, or both.

Table 2.1

Impact of future trends in climate, demography, and urbanization on typologies of violence

	Climate	Demography	Urbanization
Inter-state battles	medium	high	low
Non-state battles (militia)	high	high	medium
Violent extremism/terrorism	medium	medium	high
Violent protests and riots	low	medium	high
One-sided violence (e.g., genocide)	low	high	medium

Source: Author's analysis.

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The diverse pathways and potential impacts of this evolution could inform the design and implementation of relevant policies, as well as the establishment of resilient institutions. More than ever before, the policy response will need to go beyond reacting to the symptoms and instead focus on the drivers and sustainers that reinforce persistent conflict.

Policymakers also face the added challenge of untangling the complicated, and often transnational, milieu of future trends. Furthermore, the almost binary core vs. periphery approach to politics, economics, and insecurity will be a thing of the past, as urban areas become the epicenter and climate variability becomes an even more important determinant of where Africans live, how they earn their livelihoods, and the degree to which groups peacefully coexist.

Addressing the complexities of Africa's emerging security landscape requires careful consideration of the following:

1. *Build capable institutions*. This does not imply training and equipping existing security institutions to address today's problems more efficiently. Instead, it requires targeted investments and strategic partnerships to resolve the multi-dimensional challenges of tomorrow. Also, capacity-building initiatives in Africa's security sector must be matched by efforts to improve institutional capability and diminish politicization.

2. *Leverage technology*. This must go beyond broad conversations about mobile phone ownership and internet access. It should explore ways in which technology (particularly infotech, biotech, and fintech) could address some of the enduring structural challenges that lie at the heart of Africa's emerging and dynamic security landscape.

3. *Strengthen state-society relationships*. Repairing and redefining the social contract between governments and the governed in Africa must be prioritized. Perversions of the social contract, including pseudo-democracy, account for the upsurge of governance-related violence in recent decades. Ensuring critical investments, developing effective partnerships, and countering endemic corruption are essential in this regard.

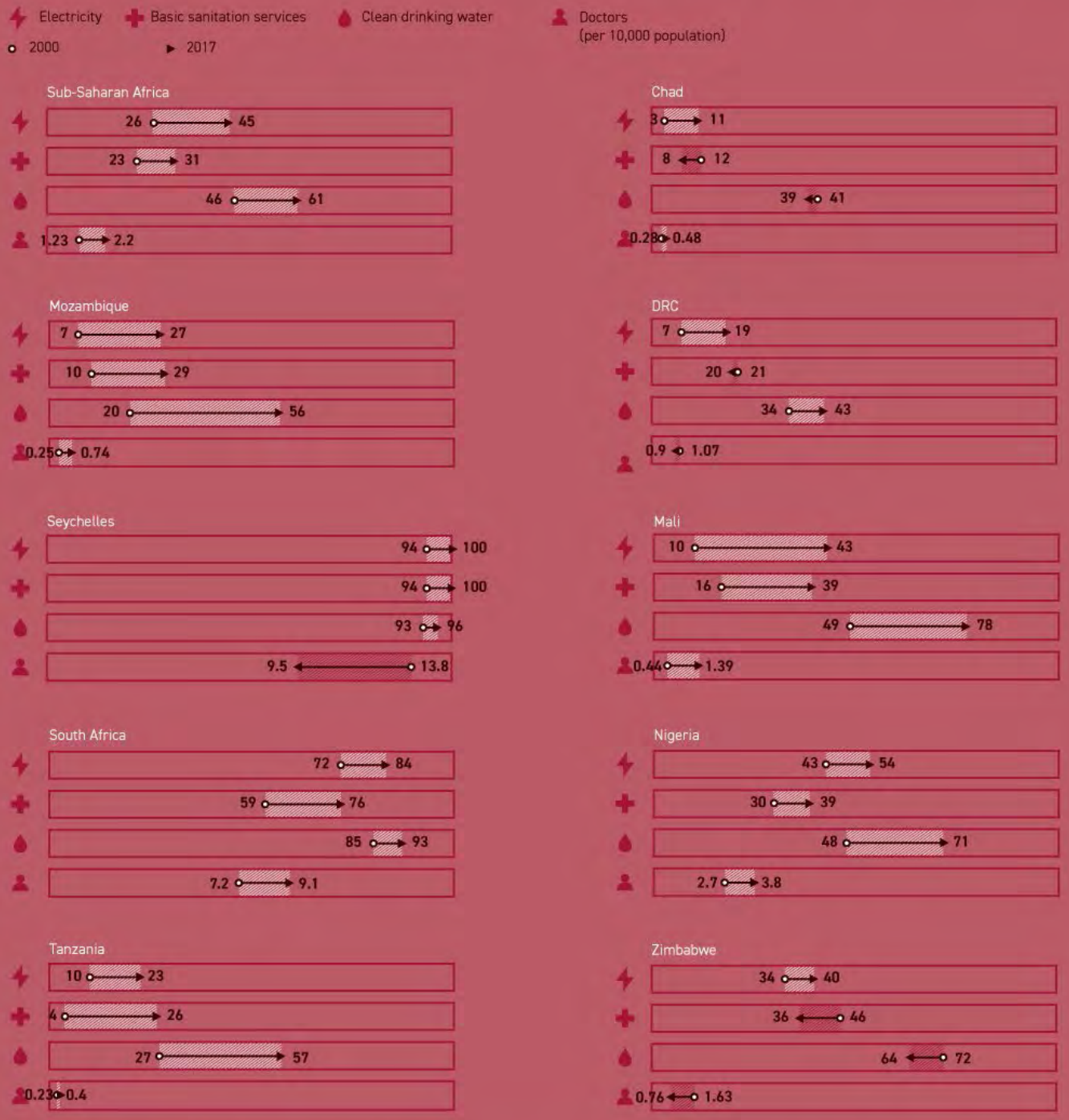
4. *Enhance domestic resource mobilization*. True ownership and effective accountability are only possible if African countries reduce their dependence on external assistance, in all its forms. Central to this goal is the sound governance of the continent's abundant natural resources in order to maximize fiscal benefits. Governments would then be in a better position to invest, strategically, in activities and institutions that address the drivers and sustainers of insecurity. External partners, for their part, would find it easier to align their assistance with programs and activities that are truly country owned.

Future challenges in Africa's security sector are daunting, but not insurmountable. Resolving them is central to the attainment of socio-economic development goals like the 2030 SDGs and the African Union's Agenda 2063. This must start with tangible, collective, and concerted efforts to address the continent's persistent market, governance, and institutional failures.

Figure 2.5

Progress on service delivery in Africa

Sub-Saharan Africa's attempts to address poor service delivery are showing results, as access to electricity, basic sanitation services, and clean drinking water has gone up overall. Then again, performance has varied wildly from country to country, with countries like South Africa and the Seychelles continuing to excel from a relatively higher starting point, Mozambique and Tanzania making remarkable progress, and Chad, the DRC, Mali, Nigeria, and Zimbabwe still struggling, and, in some cases, regressing.



Note: All service delivery numbers except for doctors are in percent of population. Due to data availability, the year range for doctors varies across countries and shows the earliest date since 2000 as the starting number and the most recent date since 2017 as the latest number. For more details, see the World Bank's World Development Indicators.
Source: World Development Indicators

LEVERAGING DEMOGRAPHIC TRENDS FOR ECONOMIC TRANSFORMATION

Job creation, skills development, and urbanization policies

Exploring new sources of large-scale job creation: The potential role of Industries Without Smokestacks

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John Page, Senior Fellow, Africa Growth Initiative, Brookings Institution

Structural change is taking place in Africa, but with a pattern that is distinct from the historical experience of industrialized countries and contemporary East Asia. Export-led manufacturing is playing a much smaller role in the structural transformation of Africa's economies. In fact, on average, the share of manufacturing in Africa's GDP has fallen since 1980. Instead, services—some with quite low productivity—absorb the bulk of African workers leaving agriculture and moving to cities. These changes reflect the impact of technological progress, a changing global marketplace, and natural resource endowments on Africa's industrialization prospects.

At the same time, reductions in transport costs and progress in information and communications technology (ICT) have created services and agri-businesses that share firm characteristics with manufacturing.[1] Like manufacturing, they are tradable and have high value added per worker. They have the capacity for learning and productivity growth, and some exhibit scale and agglomeration economies.[2] Importantly, between 1998 and 2015, services exports grew more than six times faster than merchandise exports across Africa.[3] Notably, firm capabilities—the tacit knowledge and working practices embodied in the firm—play a central role in determining productivity and quality. For lack of a better term, we call these "industries without smokestacks" (IWOSS) to distinguish them from traditional, "smokestacks" industries. We define IWOSS activities as those that (i) are tradable; (ii) have high value added per worker relative to average economy-wide productivity, as well as exhibit capacity for technological change and productivity growth; and (iii) can absorb large numbers of moderately skilled labor. In addition, IWOSS sectors show some evidence of scale or agglomeration economies.

A number of these IWOSS have become increasingly important in Africa, including agro-industry and horticulture, tourism, some business services—including ICT-based services—and transport and logistics.[4]

Does the growth of industries without smokestacks offer an opportunity to address the youth unemployment challenge? Early lessons from South Africa.

1 See William Baumol, "Unbalanced Growth Revisited: Asymptotic Stagnancy and New Evidence," *American Economic Review* 75, no. 4 (1985): 806-17 and Jagdish N. Bhagwati, "Splintering and Disembodiment of Services and Developing Nations," *The World Economy* 7, no. 2 (1984): 133-44.

2 Gunther Ebling and Norbert Janz, "Export and Innovation Activities in the German Service Sector: Empirical Evidence at the Firm Level," *ZEW Discussion Paper* 99-53 (1999); Ejaz Ghani and Homi Kharas, "The Service Revolution," *World Bank Economic Premise* 14 (2010).

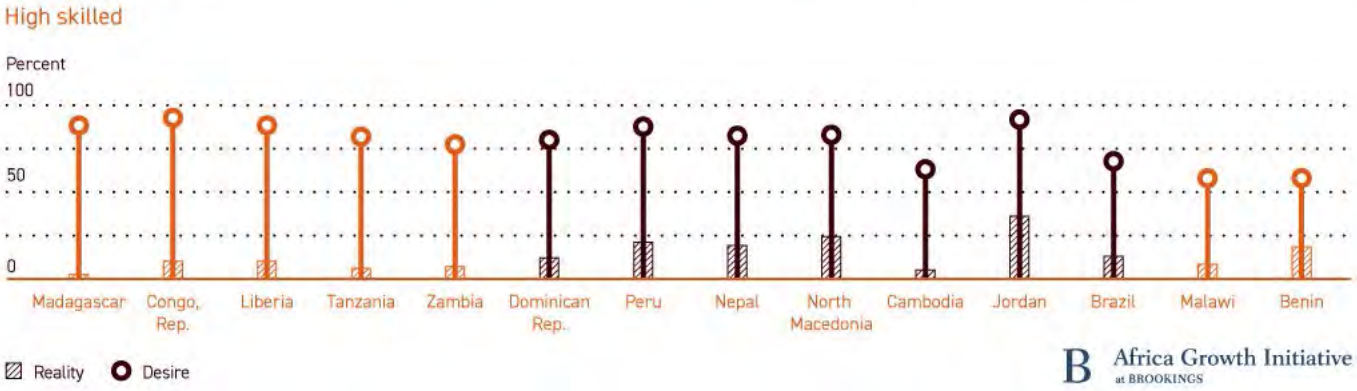
3 John Page, "Rethinking Africa's Structural Transformation," in *Foresight Africa: Top Priorities for the Continent in 2018* (Washington, D.C.: Brookings Institution, 2018), 66-8.

4 Richard Newfarmer, John Page, and Finn Tarp (eds.), *Industries without Smokestacks: Industrialization in Africa Reconsidered* (Oxford: Oxford University Press, 2018).

Figure 3.1

Gaps between jobs aspirations and reality for the youth, selected countries

While the youth in Africa aspires to high-skilled jobs, their reality is that the insufficient number of high-skilled jobs confines them to lower-skilled jobs. This pattern is generally true for other non-African low- and middle-income countries, but the gap between the aspirations for high-skilled jobs and the reality is larger for African youth.



Note: Estimations for Togo do not account for sampling weights as they are missing in the data.
Source: OECD, Youth Aspirations and the reality of Jobs in Developing Countries: Mind the Gap (Paris: OECD Publishing, 2017).

To examine this question, the Africa Growth Initiative at Brookings has initiated a multi-year project to assess the employment creation potential of IWOSS in Africa. In what follows, we present the early findings from the **South Africa pilot case study.**

South Africa has been in a low-growth trap since the onset of democratic rule in 1994. Between 1994 and 2017, real GDP per capita grew at an average rate of only 1 percent per year. As a result, the country has achieved only modest reductions in household poverty levels, coupled with high and rising inequality.

The labor market is a primary driver of inequality, as there are a significant number of zero earners in the income distribution, marked prominently by high youth unemployment rates. South Africa's youth unemployment rate—at close to 55 percent in 2018—is considerably higher than comparable upper-middle-income countries or other countries in sub-Saharan Africa. As is the case with overall unemployment, youth unemployment in South Africa has also been on a clear upward trend since 2008.

Like in many countries across Africa, South Africa's current growth path has failed to provide sufficient jobs for the low-skilled unemployed.[5] The post-apartheid South African economy has been characterized by an eroding primary sector and a stagnant manufacturing sector—a concerning trend (Figure 3.2). Instead, there has been a shift toward services sectors, with finance, transport, construction, and other services experiencing employment growth. Notably, the financial and community services sectors have accounted for over half of the increase in employment between 2000 and 2019.

This shift toward services without manufacturing growth is characteristic of much of Africa. But South Africa is an outlier among other African countries. Elsewhere in Africa, the shift toward services has been largely characterized by a shift into low-productivity services, often in the informal sector. In South Africa, financial and community services are relatively high-productivity sectors. At the same time, though, the shift towards formal sector services has not generated the volume and type of jobs needed to reduce unemployment and inequality. In

5 Around half (48 percent) of the South African labor force in 2019 has not completed secondary schooling.

short, while the shift to services may offer South Africa an opportunity for the type of structural transformation previously anchored by growth in manufacturing, this achievement depends, importantly, on the *type* of services.

Of the 8.9 million formal private sector jobs in South Africa in 2019, IWOSS sectors account for over two-thirds (68 percent), over double the share of non-IWOSS sectors (Figure 3.3).

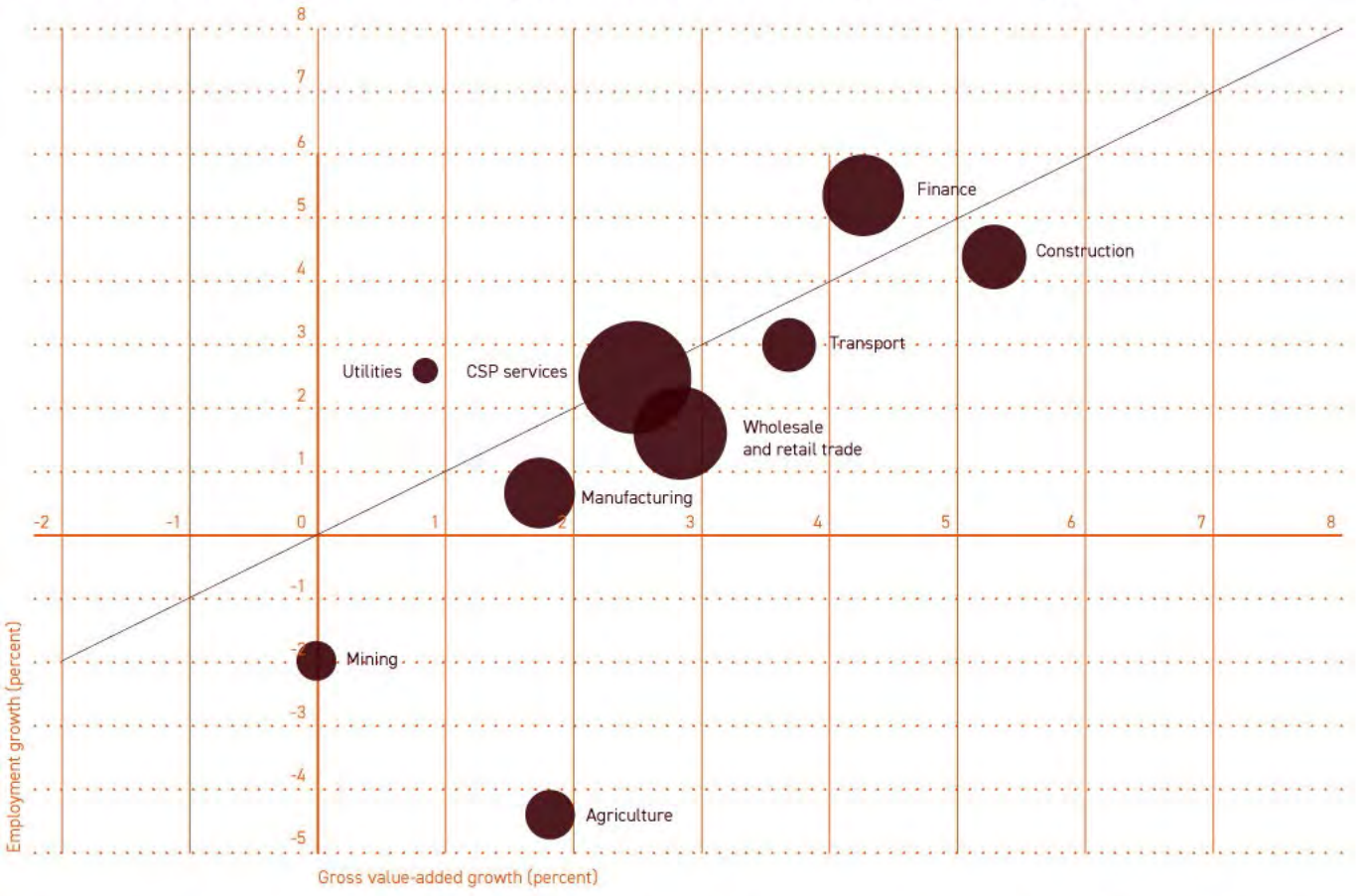
The largest employing IWOSS sectors are financial and business services (23 percent of IWOSS employment) and trade (16 percent). Tourism accounts for 9 percent of IWOSS employment in the formal private sector.

In the absence of growth in the manufacturing sector, then, South Africa already appears to be on a path of structural transformation characterized by a shift toward industries without smokestacks. Within the broader IWOSS category, there are a number of sub-sectors that may be better suited to address South Africa's employment challenges. Although the skills distribution of employment in IWOSS and non-IWOSS sectors is broadly similar, scaling up a number of IWOSS activities that are more labor intensive may offer better opportunities for a labor force that is predominantly low- and semi-skilled.

Figure 3.2

Gross value-added and employment growth in South Africa, by sector, 2000–2018

The post-apartheid South African economy has been characterized by an eroding primary sector and a stagnant manufacturing sector. In their stead, there has been a shift toward services sectors, with finance, transport, construction, and other services experiencing modest employment growth.



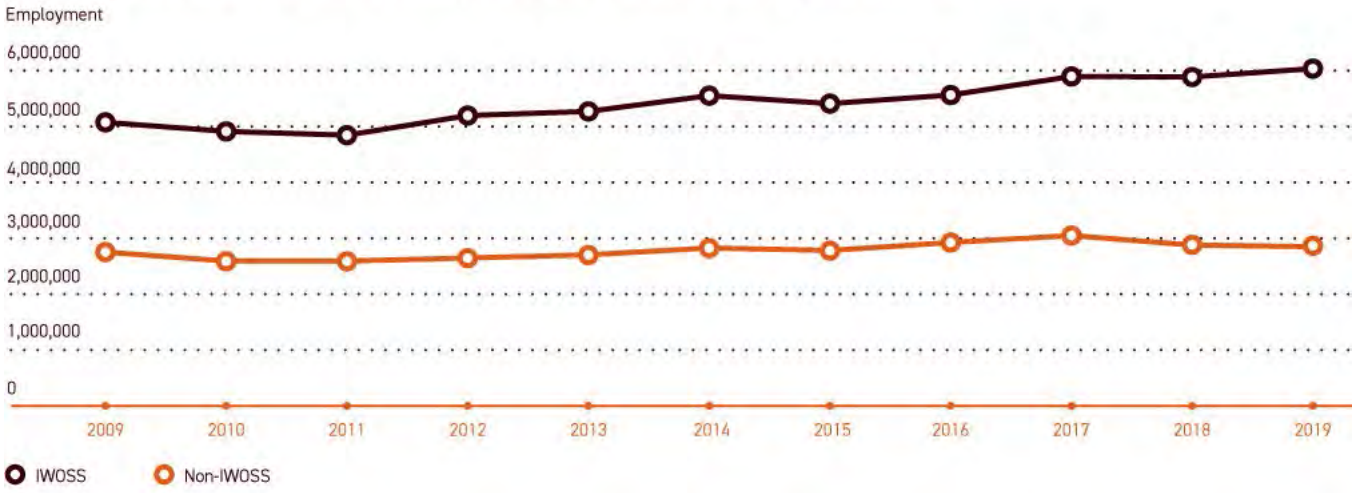
Note: The size of the bubble is determined by the relative size of employment in 2018 (the weight). CSP stands for community, social, and personal services.
Source: SARB (2000, 2018) and StatsSA (2000, 2018).

Africa Growth Initiative at BROOKINGS

Figure 3.3

Formal private sector employment in IWOSS and Non-IWOSS sectors in South Africa

IWOSS sectors accounted for two-thirds (68 percent) of formal private sector employment in South Africa in 2019.



Note: Employment refers to private sector formal employment only.
Source: StatsSA, 2019.

Africa Growth Initiative at BROOKINGS

Notably, the share of high-skilled employment is lowest in IWOSS sectors—under 10 percent in agro-processing, horticulture, and other commercial agriculture (Figure 3.3). The share of semi-skilled employment is similar across sectors at around 65 percent, and the share of low-skilled and semi-skilled employment (combined) is higher for IWOSS—most acutely in tourism, horticulture, and agro-processing (greater than 90 percent of all employment). Thus, these sectors have the potential to generate employment for the low-skilled labor force on a large scale, if the operating scale of these sectors can be increased. Of course, growing the IWOSS sectors requires addressing constraints to unlock their potential.

Realizing the potential: Some policy lessons

The objective of our research is to widen the options for structural change and job growth in Africa.

Notably, efforts to grow IWOSS can have similar or better outcomes on employment as efforts to expand manufacturing in South Africa, as IWOSS sectors are more labor-intensive than manufacturing and the economy overall (Figure 3.3).[6] Indeed, projections from our preliminary results indicate that, over the next decade or so, IWOSS sectors can generate three and half times more new formal sector jobs than non-IWOSS sectors.[7]

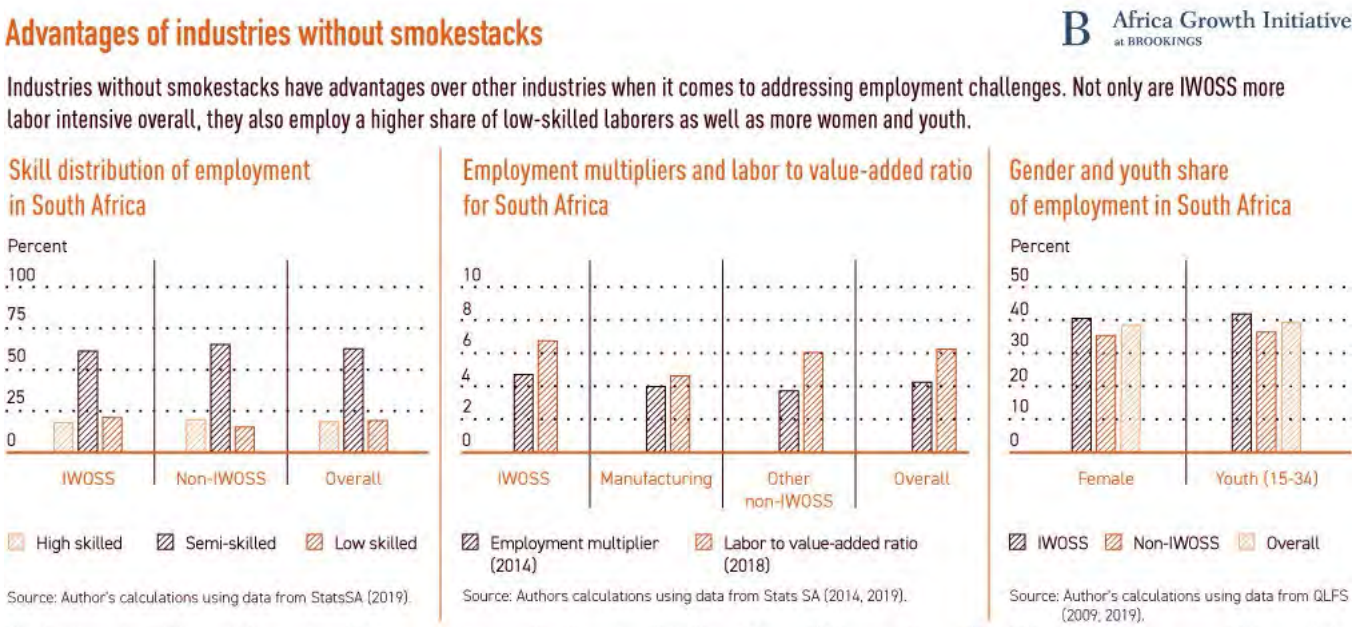
Notably, efforts to expand IWOSS may have employment outcomes that are more inclusive than those achieved from increasing growth in manufacturing and other non-IWOSS sectors. In fact, IWOSS in South Africa seem to be more intensive in the employment of women and youth than non-IWOSS sectors (Figure 3.3). The tourism and agro-processing sectors are particularly intensive in the employment of women,[8] while horticulture and tourism have

6 The available data cannot be disaggregated to calculate IWOSS-specific measures of labor intensity. For this reason, broad sectors have been identified as sectors in which IWOSS are dominant. The measures of labor intensity have been calculated using the most recent available input-output tables for the year 2014 (see Statistics South Africa, *Input-output tables for South Africa, 2013 and 2014* (Pretoria: Statistics South Africa, 2014)) in the case of the employment multipliers, and the most recent available GVA data for the year 2018 (see Statistics South Africa, *GDP P0441, 2019Q2* (Pretoria: Statistics South Africa, 2019)) in the case of the labor-to-value added ratios. The labor-to-value added ratio is expressed in local currency (rand) in 2010 prices.

7 Forthcoming AGI project on South Africa case study on employment creation potential of IWOSS.

8 ICT also has a relatively high share of women of employment. However, ICT accounts for just 1 percent of all IWOSS employment.

Figure 3.4



the highest shares of individuals between the ages of 15 and 34 in employment. This tendency towards inclusivity is another reason governments should enact policies to support the development of these sectors.

Three areas of the investment climate are particularly relevant to industries without smokestacks and manufacturing—infrastructure, skills, and the regulatory environment.[9]

- Poor **infrastructure**, particularly electrical power and transport, is the largest constraint affecting firm productivity, hindering the development of any sector.[10]

- The **inadequately skilled labor force** is also a constraint. Nearly 60 percent of African 15- to 24-year-olds have only completed primary school, and only 19 percent have gone beyond lower secondary.[11] In South Africa in particular, the share of the labor force aged between 15 and 34 with an educational level below secondary education is 46 percent.[12] Skill shortages for South Africa are particularly high for basic skills such as reading comprehension, active listening, speaking, and writing.[13] Monitoring, strategy learning, critical thinking, and active learning skills are also in great shortage in South Africa. While IWOSS presents opportunities for the employment of low-skilled individuals, without a concerted effort to address current skills gaps, the full potential of these sectors will not be realized.

- Because productivity in services has an important impact on productivity levels across the economy, **enabling competition through regulatory reforms** are essential. Removing barriers to foreign entry in services can increase competition, reduce

9 See Carol Newman et al., *Made in Africa: Learning to Compete in Industry* (Washington, D.C.: Brookings Institution Press, 2016) for a discussion of the investment climate.

10 See, for example, Alvaro Escribano, J. Luis Guasch, and Jorge Pena, "Assessing the Impact of Infrastructure Quality on Firm Productivity in Africa: Cross-country Comparisons Based on Investment Climate Surveys from 1999-2005," *World Bank Policy Research Working Paper* 5191 (2010).

11 Deon Filmer and Louise Fox, *Youth Employment in Sub-Saharan Africa* (Washington, D.C.: World Bank, 2014).

12 Statistics South Africa, *Quarterly Labour Force Surveys (QLFS) (various years)* (Pretoria: Statistics South Africa, 2019).

13 "OECD Skills for Jobs Database," *OECD*, accessed December 3, 2019.

Figure 3.5

Reducing fertility rates will be key to harnessing sub-Saharan Africa's demographic dividend

The below figure assesses the prospects for Africa to harness the demographic dividend through a simple comparative analysis with the East Asian experience. The demographic dividend is process of sustained economic gains stemming from increases in the share of working-age population as fertility and mortality rates decline and rising domestic saving rates for more investment. The case of East Asia provides an illustration. East Asia and Africa started in 1965 with similar shares of working-age populations, at 53 percent. The share then rose rapidly in East Asia to peak at over 70 percent in 2010 due largely to lower fertility rates, and the saving rates rose from 15 percent of GDP to peak at 34 percent of GDP in 2010. The increase in saving rates facilitated more investment and East Asia's economic transformation. In contrast, Africa's working-age population remained relatively flat through 2010. Since then it has risen only modestly and, based on population projections, it will peak at around 65 percent in 2065 or 45 years from now. Accordingly, the projected increase in the saving rates remain very gradual, from 16 percent currently to peak at under 25 percent in 2065. The demographic transition in Africa, thus, appears too slow due largely to high fertility rates. To harness the demographic dividend, Africa will need to invest in human capital, create jobs for the working-age population and, importantly, reduce fertility rates.

Source: Brookings Africa Growth Initiative using data from World Development Indicators, World Economic Outlook, and U.N. Population projections, medium variant.

costs, and extend access to a broader range of differentiated services.

For most countries in Africa, regional and global export markets represent the best opportunity for IWOSS. To offset the costs to first movers, African governments need to develop a package of trade and exchange rate policies, public investments, regulatory reforms, and institutional changes aimed at increasing the share of non-traditional exports in GDP—put differently, governments need to mount an East Asia-style "export push".

Like manufacturing, IWOSS sectors benefit from agglomeration, including thick labor

markets, information and knowledge spill-overs, and the ability to share overhead expenses and services. While most African governments have focused on using special economic zones (SEZs) to promote manufacturing, SEZs are relevant to services and agro-based industries as well.

By addressing these constraints to the growth of IWOSS and manufacturing, governments are not forced to choose between an "industrial policy" focused on manufacturing and policies to promote tradable services and high-value agriculture. Both can achieve structural change and job growth.

Viewpoint

Young Africa Works: A strategy to create 30 million jobs for youth over the next decade

Lindsay Wallace, Head of Impact, Mastercard Foundation @LindsayWallace3

Africa is the youngest and fastest-growing continent in the world, which, in a few decades, will also have the largest workforce. While this trend creates unprecedented opportunities for the continent, it will also exacerbate the significant gap between the number of young people seeking work and the limited employment opportunities.

In 2018, the Mastercard Foundation (MCF) launched our new strategy, Young Africa Works. Through this strategy, the Foundation aims to enable 30 million young people to access dignified and fulfilling work by 2030. The Foundation has taken a unique approach in that goes beyond being a funder: It is co-creating strategies with governments, the private sector, entrepreneurs, educators, and young people—strategies that, consequently, resonate with their aspirations. For example, MCF is:

- Strengthening the private sector environment by scaling access to finance for small businesses;
- Partnering with training and education institutions to enhance education and skills development systems to ensure they support the development of market-relevant skills; and
- Ensuring the labor market functions better by supporting platforms that facilitate the job search for young people.

While the strategy is in early stages in seven countries, preliminary lessons are emerging from the initiative in Rwanda. Hanga Ahazaza—"create the future"—is a $50 million program aiming to enable 30,000 Rwandan youth to find employment in the tourism and hospitality sector—a high-growth area and national priority for Rwanda. Since the launch last year, MCF has been working

with partners from the education, development, and the private sector to train, certify, and link more than 2,500 young Rwandans to dignified and fulfilling work in the sector. The following key lessons are emerging from this program:

Start with helping to *create jobs* for skilled labor. MCF recognizes that to effectively address youth un- and underemployment, policymakers and partners need to first understand the root causes of low employment creation. While the strategy in Rwanda started with skills development and training (the supply of skilled labor), it is now helping small businesses in the sector grow and create jobs.

Put young people's needs at the center. Young people in some of our training programs, particularly young women, struggle to find time to complete the full training due to shift work or competing demands at home—a finding consistent with previous research. Across the MCF programs for young people, gender-responsive components are proving effective in gender equality in relation to participation, performance, and opportunities for youth participants.

Promote female role models in the workforce to help shift gender norms. While the tourism sector in Rwanda is poised to grow and create opportunities, it is not viewed as a suitable place to work for young women. As a result, gender balance in recruitment remains a challenge. Through role modelling and increased communications, one partner saw a 16 percent increase in the number of women applying for a position (from 34 percent to 50 percent). Helping potential participants see themselves working in the sector by seeing others work there has been helpful in shifting gender norms.

Facilitate collaboration among partners through shared data platforms and impact measurement approaches. The Foundation is encouraging collaboration and information-sharing among our implementing partners such as Harambee, Horvath, and Inkomoko. A joint platform has allowed our partners to plan events together, share documents, and quickly share programmatic updates and results. With this tool, monthly team and partner meetings are more efficient and focus on key issues rather than updates. The MCF team also created a database called "Touripedia" to provide information on micro-, small-, and medium-sized businesses in Rwanda to help partners coordinate their training and other activities.[1]

Encourage other organizations and institutions to join the movement for greater impact. As the Rwandan example illustrates, most businesses in the tourism and hospitality sector are micro or small in size and rely on friends and family for capital. For that reason, the Foundation encourages financial institutions to take more risk, invest in young entrepreneurs and startups, and develop new products and services to support this growing sector. It also encourages employers to continue to invest time and resources to train and support young job seekers. They must also work closely with education institutions to share experiences, strengthen curricula, and provide internships and other support so that young people can successfully transition to full-time employment.

As the Foundation rolls out the Young Africa Works country strategies elsewhere on the continent, it will continue to learn and share these lessons with partners, stakeholders, and peers. Most importantly, the Mastercard Foundation will continue to listen to young people in Africa.

1 More details on the initiative can be found at https://mastercardfdn.org/all/hanga-ahazaza. Lindsay Wallace is the head of impact for the Mastercard Foundation, which supports AGI's work on youth employment. The views expressed in this article are those of its authors and do not represent the views of the Mastercard Foundation, its officers, or employees.

Viewpoint

Computer science can help Africans develop skills of the future

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Lauren Ziegler, Project Director, Center for Universal Education, Global Economy and Development, Brookings Institution @LaurenR_Ziegler

The world is well into the Fourth Industrial Revolution, and yet education systems have not kept pace. Young people are often not learning the skills they need to succeed in the 21st century and interact with their changing world, such as digital literacy, problem solving, and critical thinking. Despite widespread recognition of the importance of these skills for the future in education policies, very few education systems have adapted to this reality. On the African continent, where 60 percent of the population is under age 25, the teaching of 21st century skills will be necessary for Africa to transform itself into a continent of growth and opportunity.[1] If young people do not learn how to use and create with technology, they are sure to fall further behind.

How can Africa harness the power of technology when only 24 percent of Africans have access to the internet?[2] Despite gains in internet access over the last several years, the region lags behind the rest of world in internet usage. A Pew survey of six African countries finds that internet usage is high among youth, which is good news for schools as it will help them teach 21st century skills; however, the study also finds that internet users tend to be male and have higher incomes and more education, meaning that more needs to be done to ensure all young people, no matter their gender or socioeconomic status, develop skills that enable their future success.[3]

Education systems need to equip their students with basic tech proficiency and, going further, enable students to create with technology. The Center for Universal Education (CUE) at Brookings is interested in how education systems can foster the development of skills for the future through computer science (CS).[4] CS education helps students understand how computers work, use algorithms to create computer programs and apps, and work with their peers to solve complex issues. Given that computers are all around us and technological advances are disrupting every industry, knowing how to use them will be beneficial to anyone, whether or not they wish to become a computer scientist.

1 Mo Ibrahim, "Governance lags behind youth expectations and needs," in *Foresight Africa: Top Priorities for the Continent in 2019*, ed. Brahima S. Coulibaly (Washington, D.C.: Brookings Institution, 2019), 10-14.

2 "ITU releases 2018 global and regional ICT estimates," *ITU*, December 7, 2018.

3 Laura Silver and Courtney Johnson, "Internet Connectivity Seen as Having Positive Impact on Life in Sub-Saharan Africa," Pew Research Center, October 9, 2018.

4 Many similar and related terms exist such as computing, informatics, computational thinking, and coding. We've used computer science here, but the specific term is less important than whether students are learning and understanding how computers work.

Education systems need to equip their students with basic tech proficiency and, going further, enable students to create with technology.

Already, there are many examples of CS education taking place in Africa. For example, the Ghana Code Club is a weekly after-school coding club that has trained more than 1,700 students and 300 teachers across 100 centers,[5] and Teencoders, based in Nigeria, has reached over 5,000 students through after-school and weekend coding classes.[6] While these nonformal education programs give learners critical exposure to the discipline, expanding CS education into formal primary and secondary schooling can ensure that many more young people learn computer science concepts.

Certainly, many constraints exist, including funding for equipment, lack of trained teachers, and lack of time during the school day to teach CS given other curricular priorities. One potentially promising way to overcome resource constraints is to teach without a computer. The platform CS Unplugged uses worksheets, magic tricks, art projects, and games to teach students computer science concepts offline.[7] In one lesson, students learn about the binary system by creating a beaded necklace with their initials in binary numbers. While the teacher will need internet access to obtain the materials, these activities work well in cases where there are few computers in the classroom or intermittent internet access. A forthcoming CUE study looks further at the barriers to expanding CS education with the goal of uncovering models around the world that have succeeded despite various constraints.

One potentially promising way to overcome resource constraints is to teach without a computer.

As the examples of Ghana Code Club, Teencoders, and others show, many already recognize the need for young Africans to learn computer science. However, more needs to be done to ensure that all students have the opportunity to learn these concepts and to develop skills of the future.

5 *Ghana Code Club*, accessed November 22, 2019.
6 "About Us," *Teencoders*, accessed November 22, 2019.
7 *CS Unplugged*, accessed November 22, 2019.

Viewpoint

Prerequisites to getting Africa's urbanization "right"

Somik Lall, Global Lead on Territorial Development Solutions & Lead Economist for Urban Development in Africa, World Bank @SomikCities

The rapid growth of cities in Africa is presenting the continent with a major opportunity to enhance productivity and living standards. In most parts of the world, rapid city growth has triggered economies of scale and specialization along with knowledge spillovers, thereby boosting productivity. International evidence suggests that doubling of a city's size boosts income per capita between 3 percent and 8 percent.[1] In fact, countries that are more developed have more urbanization, and countries that switch from slow economic development to rapid economic development also switch from slow urbanization to rapid urbanization.

In contrast, African countries are not making much of the opportunity of urbanization. Only a handful of countries—such as Ghana, Namibia, Rwanda, and Togo—have been relatively successful in translating urbanization into poverty reduction.[2] Notably, the agglomeration of urban economic activity is lower in Africa than elsewhere, while the potential returns in labor productivity growth are the highest.[3] Unfortunately, neither markets nor the policy environment have coordinated decisions that yield satisfactory outcomes in the living or working environment.

Markets for land are generally dysfunctional, product markets are fragmented, and weak city planning and limited finance hobble urban development. In fact, very few large African cities have substantial own-source revenues, and tax mandates are often related to having regional government status: consider Kampala, where per capita revenue was $59 for the 2014 fiscal year, much higher than $26 for the rest of the country.

But more broadly, urbanization has been driven by a lack of opportunity in the countryside as agricultural activity has declined and, without the accumulated savings to make significant investments in housing, the default option has been to build shacks. Consequently, 60 percent of the region's urban population lives in slums.[4] With Africa's urban population likely to double over the next 25 years, there is an urgent need to make cities livable, productive, and sustainable.

1 Stuart Rosenthal and William Strange, "Evidence on the nature and sources of agglomeration economies," *Handbook of Regional and Urban Economics* 4 (2004): 2119-71.

2 Kirsten Hommann and Somik Lall, *Which Way to Livable and Productive Cities? A Road Map for Sub-Saharan Africa* (Washington, D.C.: World Bank, 2019).

3 Somik Lall, J. Vernon Henderson, and Anthony J. Venables, *Africa's Cities: Opening Doors to the World* (Washington, D.C.: World Bank, 2017); Maria Edisa Soppelsa, Nancy Lozano Gracia, and L. Colin Xu, "The Effects of Pollution and Business Environment on Firm Productivity in Africa," *World Bank Policy Research Working Paper* 8834 (2019).

4 United Nations. 2015a. Millennium Development Goals Indicators. Indicator 7.10. Proportion of Urban Population Living in Slums.

What should be done?

To make cities work for development, African policymakers will need to develop ***urbanization*** plans built on the following four proposals:

Raise agricultural productivity: It is difficult to visualize vibrant cities without a well-functioning rural sector. Research suggests that invention, adaptation, and dissemination of new technologies to existing farms is likely boost overall productivity and support a more vibrant structural transformation.[5] A good starting point would be to strengthen national agriculture research and development and innovation systems.

Adopt a well-functioning land market: African leaders need to focus more on the structural foundation of their cities by strengthening institutions governing the transfer, valuation, and use of land. For example, Kenya has one of the least efficient property registration systems on the continent: Lack of registration affects 24 percent of land-owning households in Nairobi. At the same time, the difficulty of registering property has contributed to a growing informal housing supply in urban areas. The capital value forgone by not developing Kibera (1,000 acres of land near Nairobi city center) amounts to $1 billion, $466 per person in greater Nairobi, or 70 percent of Kenya's GDP per capita in 2014. In Tanzania, only 10 percent of land is registered, and it takes 65 days to transfer property. These inefficiencies reduce incentives for formal land development.

Enhance land use planning: Also, better land use planning will enable cities to put in early and coordinated infrastructure investments that allow for well "formed" urban development. As Africa's cities clarify land rights and strengthen land use planning, they will encourage economic growth. They will also lay the foundations to expand domestic revenue mobilization, as revenues from appreciation in land values can help finance much-needed urban infrastructure.

> International evidence suggests that doubling of a city's size boosts income per capita between 3 percent and 8 percent.

Embrace the benefits new technologies offer: Disruptive technologies that combine data with automation present an incredible opportunity to reshape notions of density and economic geography. Add to the mix the gig economy (based on flexible, temporary, or freelance jobs) and sharing economy (involving short-term, peer-to-peer transactions), and we can have vibrant communities that do not need lumpy "grid" infrastructure. In fact, Africa's cities may be able to leapfrog the current development path and be highly livable, productive, and sustainable. However, this accomplishment will require the basics of land management as well as aggressive investment in human capital.

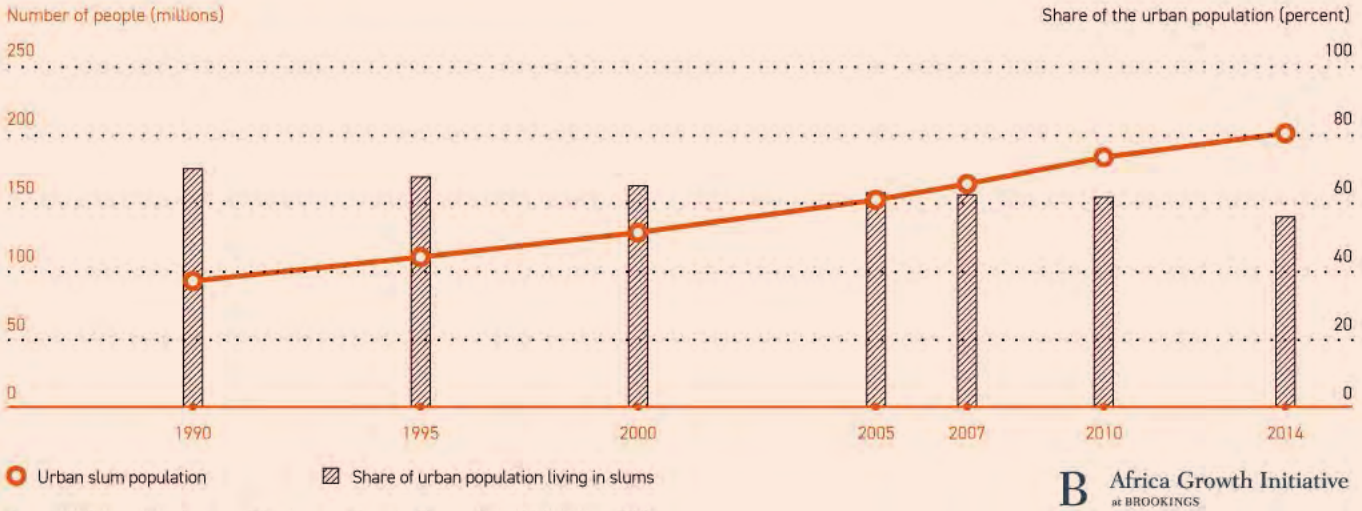
5 Keith Fuglie, Madhur Gautam, Aparajita Goyal, William F. Maloney (2019). Harvesting Prosperity: Technology and Productivity Growth in Agriculture. World Bank Publications.

Figure 3.6

Urban slums double in size but service delivery remains poor

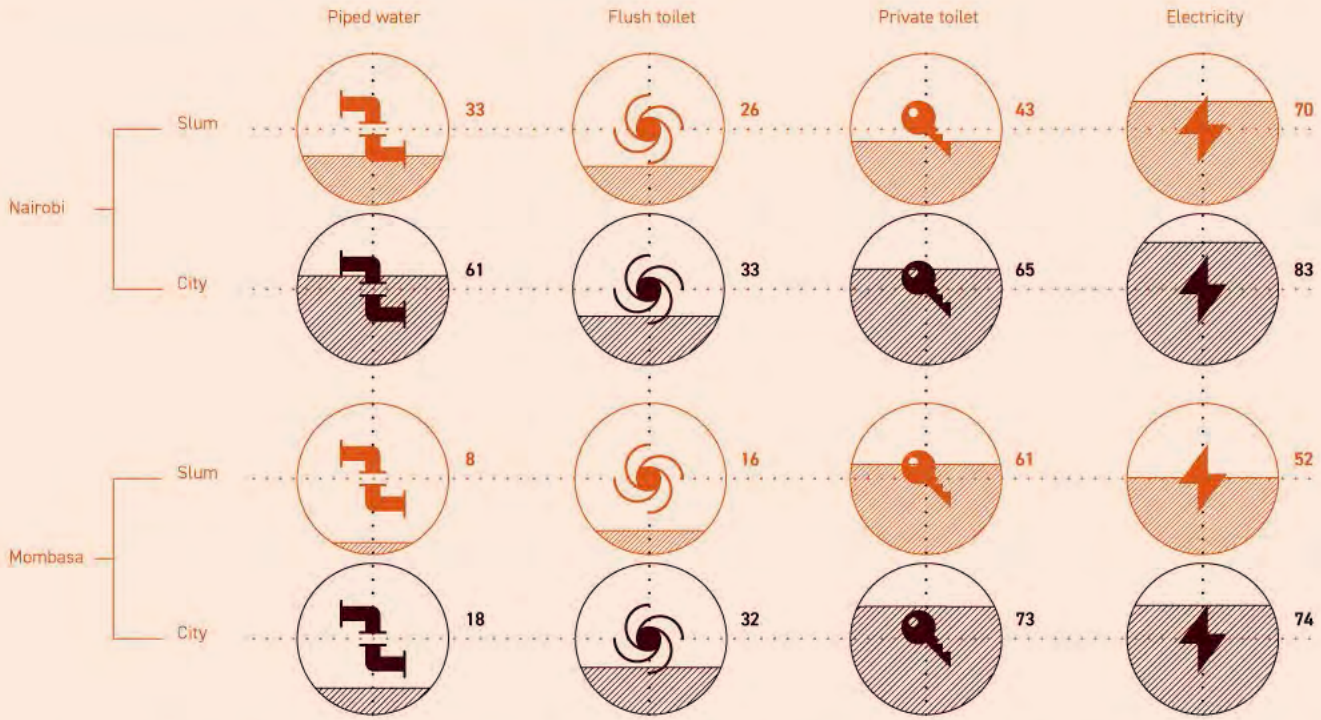
As Africa rapidly urbanizes, the number of people living in urban slums has doubled from 100 million in 1990 to 200 million in 2014 despite the fact that the share of urban population living in these settlements has declined from 70 to 56 percent. The share living in slums has not declined as rapidly as it has in South and East Asia and is 25 percentage points higher than the second worst region, South Asia. Citizens living in urban slums also face worse conditions with lower access to piped water, flush toilets, and electricity.

Number of people vs. share of urban population in slums

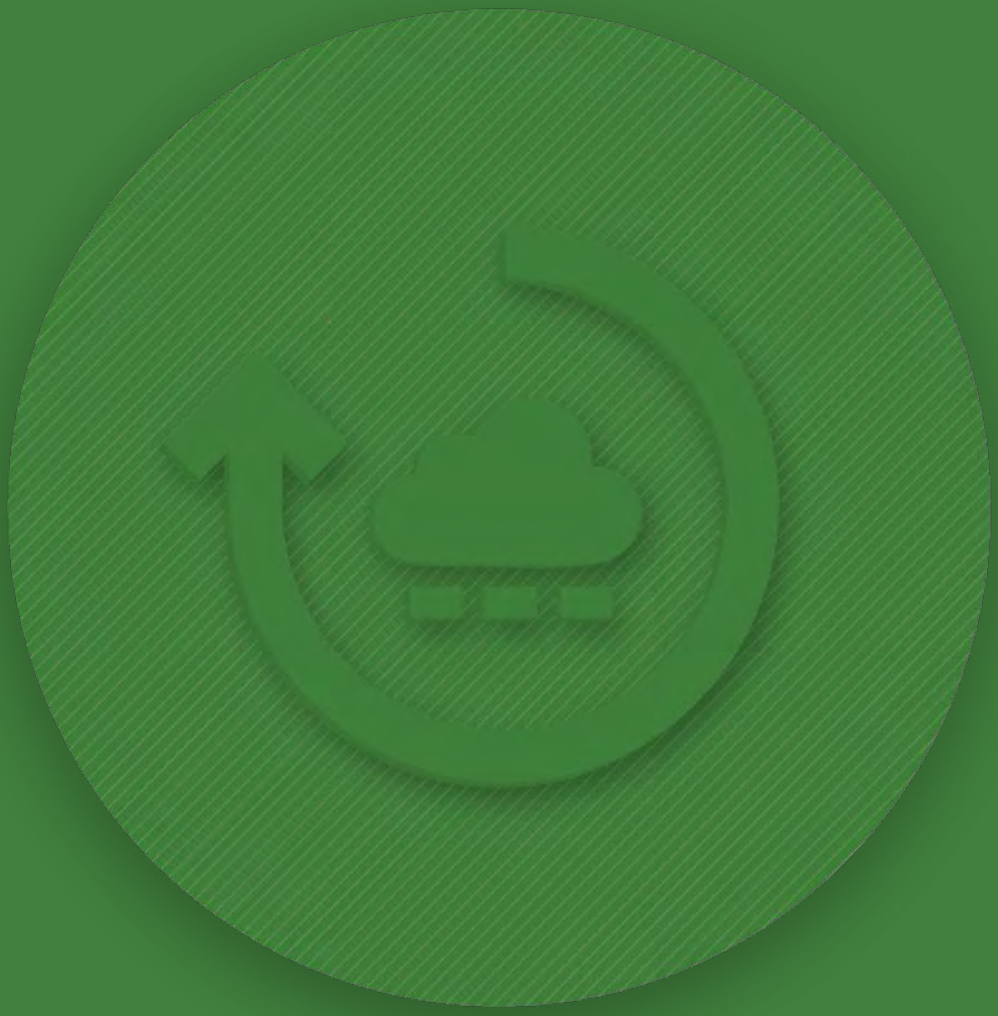


Source: UN-Habitat, Urbanization and Development: Emerging Futures (Nairobi: UN-Habitat, 2016).

Service access is unequal within cities, with slum dwellers having far less



Source: Shohei Nakamura, Bhavya Paliwal, and Nobuo Yoshida, Overview of the Trends of Monetary and NonMonetary Poverty and Urbanization in Sub-Saharan Africa (Washington, D.C.: World Bank, 2018).



COMBATTING CLIMATE CHANGE

An urgent call for comprehensive global and local action

Africa can play a leading role in the fight against climate change

Ngozi Okonjo-Iweala, Chair of the Board, Gavi, the Vaccine Alliance; Nonresident Distinguished Fellow, Africa Growth Initiative, Brookings Institution & Former Minister of Finance, Federal Republic of Nigeria @NOIweala

At the end of this year, world leaders are expected to come forward with updated, more ambitious national climate plans under the Paris Agreement. Though buried deep within the legalese of the Paris Agreement, this point of process is both a critical test and a once-in-a-lifetime opportunity.

Research from the New Climate Economy shows that bold climate action could deliver at least $26 trillion in global economic benefits between now and 2030. It could also generate over 65 million new low-carbon jobs by 2030, a number equivalent to the combined workforces of the United Kingdom and Egypt today; avoid over 700,000 premature deaths from air pollution compared with business-as-usual; and generate an estimated $2.8 trillion in government revenues in 2030 through subsidy reform and carbon pricing alone.[1]

Delivering the benefits of a new climate economy requires ambitious action across key economic systems, creating the conditions for the phase-out of coal and rapid scale-up of renewables in the energy sector; investing in shared, electric, and low-carbon transport in cities; scaling up sustainable food and land use systems, including forest landscape restoration; targeting investment to resilient water infrastructure; and reducing emissions from key industrial value chains, such as plastic.

However, if the world fails to step up climate action, continuing on our current climate trajectory could force 100 million people into extreme poverty by 2030.[2] Africa is the most-exposed region to the adverse effects of climate change despite contributing the least to global warming.

The region is already disproportionately feeling the impacts related to a changing climate. Devastating cyclones affected 3 million people in Mozambique, Malawi, and Zimbabwe in the spring of 2018.[3] GDP exposure in African nations vulnerable to extreme climate patterns is projected to grow from $895 billion in 2018 to about $1.4 trillion in 2023—nearly half of the continent's GDP.[4]

If fairness was the only goal, the impetus to act would lie solely with developed economies. Make no mistake, the big emitters absolutely must step up their domestic climate action, and quickly. But building the new climate economy is also a once-in-a-lifetime opportunity that every African nation should prioritize and claim a stake in.

This opportunity is why, despite historically negligible carbon emissions, despite only accounting for 2 percent of world coal demand, and despite the lack of leadership from some developed countries, many African countries are now making serious efforts to transition

1 Global Commission on the Economy and Climate, *Unlocking the Inclusive Growth Story of the 21st Century: Accelerating Climate Action in Urgent Times* (Washington D.C.: New Climate Economy, 2018).

2 Stephen Hallegatte et al., *Shock Waves: Managing the Impacts of Climate Change on Poverty* (Washington D.C.: World Bank, 2016).

3 Mark Yarnell and Devon Cone, *Devastation and Displacement: Unprecedented Cyclones in Mozambique and Zimbabwe a Sign of What's to Come?* (Washington D.C.: Refugees International, 2019).

4 Abdi Latif Dahir, "Africa's fastest-growing cities are the most vulnerable to climate change globally," *World Economic Forum*, December 21, 2018.

towards low-carbon technologies, low-carbon and resilient infrastructure, and low-carbon tax systems.

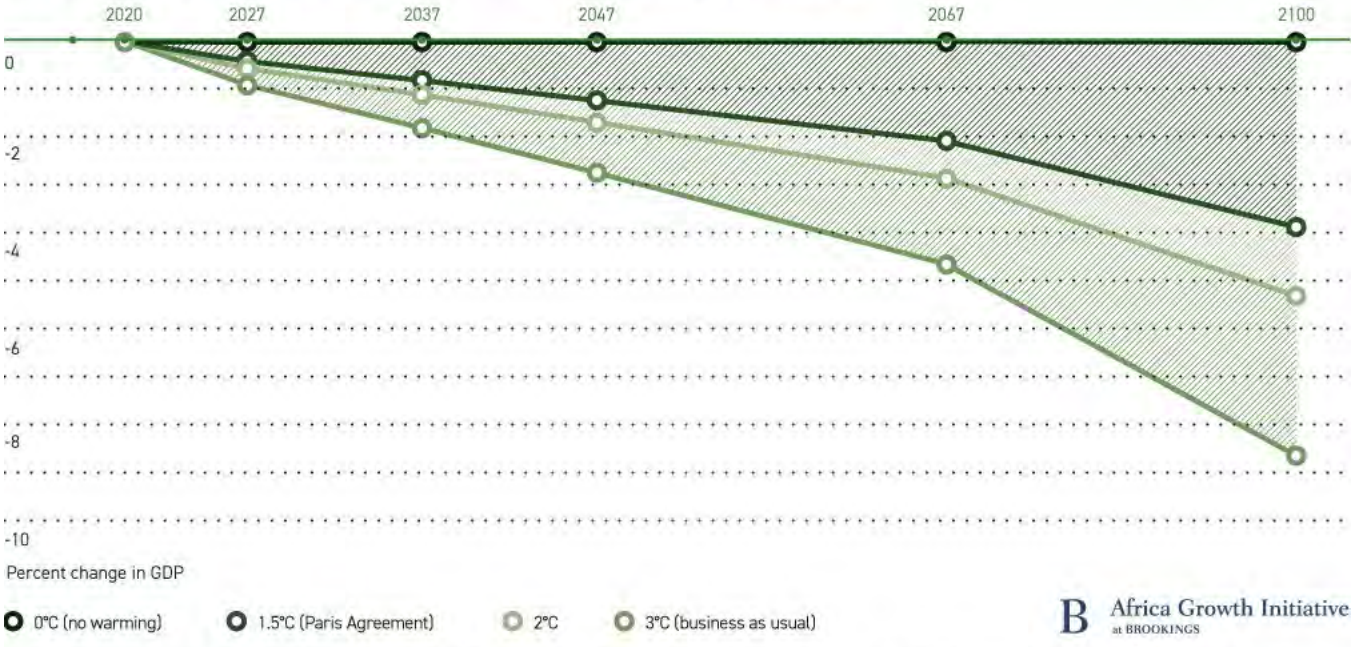
Morocco has built the world's largest concentrated solar facility to help achieve the country's goal of 52 percent renewable energy mix by 2030. The advanced 6,000-acre solar complex, Noor, serves as a clean energy source for around 2 million Moroccans, and provides pivotal job opportunities as the country transitions away from the fossil fuel industry.[5] The solar complex is also offering training programs for women for entrepreneurial and agricultural activities and is recruiting women in decision-making roles to guide project activities.[6]

South Africa's Carbon Tax Act, which places specific levies on greenhouse gases from fuel combustion and industrial processes and emissions, came into effect in June 2019.[7] By 2035, the carbon tax could reduce the country's emissions by 33 percent relative to the baseline.[8] Furthermore, South Africa's recent renewable energy auctions have led to solar and wind prices lower than those of the national utility

Figure 4.1

The impact of climate change on sub-Saharan Africa's GDP

Climate change is predicted to significantly decrease Africa's GDP through mechanisms such as lowered crop yields, reduced agricultural and labor productivity, and damage to human health. Assuming no major changes in the world's social, economic, and technological trends, climate change resulting in a 3°C temperature increase will decrease Africa's GDP by as much as 8.6 percent per year after 2100. If climate change is limited to the 1.5°C agreed to in the Paris Agreement, the decrease in GDP will be significantly less—only 3.8 percent per year after 2100.



Source: Tom Kompas, Van Ha Pham, and Tuong Nhu Che, "The Effects of Climate Change on GDP by Country and the Global Economic Gains From Complying With the Paris Climate Accord," Earth's Future 6, no. 8 (2018): 1153-73.

5 Climate Investment Funds, "Solar plant the size of San Francisco powers Morocco's sunlit ambitions," *Climate Home News*, January 22, 2019.

6 African Development Bank, *Ouarzazate Solar Complex Project – Phase II (NOORo II and NOORo III Power Plants)* (Abidjan: African Development Bank, 2014).

7 Republic of South Africa, *Act No. 15 of 2019: Carbon Tax Act, 2019* (Cape Town: Government of South Africa, 2019).

8 Sifiso M. Ntombela, Heinrich R. Bohlmann, and Mmatlou W. Kalaba, "Greening the South Africa's Economy Could Benefit the Food Sector: Evidence from a Carbon Tax Policy Assessment," *Environmental and Resource Economics* 74, no. 2 (2019): 891-910.

or from new coal plants.[9] Often regarded as the continent's clean energy trailblazer, much of what has been learned through South Africa's renewable energy procurement process can influence similar developments across Africa.

My own country, Nigeria, which struggles with electricity access for a majority of its population, has set a renewable energy target of 30 percent by 2030.[10] This goal underscores the potential for both grid-based and decentralized renewable energy investments to deliver energy access and climate change benefits simultaneously. Notably, off-grid solutions—like M-Kopa and Lumos that deliver electricity to thousands of households on the continent—and mini-grids are important options in both unserved rural areas and underserved urban areas. Natural resource-rich African countries, like Nigeria, should see renewables as a central part of achieving universal energy access while setting themselves on a pathway for low-carbon and resilient development.

The biggest energy companies see this future too and are working to diversify their global portfolios. As of September 2019, the world's major oil companies had made about 70 clean-energy deals, putting them on track to surpass the total for 2018.[11] Shell, for instance, has invested in SolarNow, which sells high-quality solar solutions in Uganda and Kenya. Since its inception in 2011, SolarNow has supplanted 210,000 tons of greenhouse gas emissions.[12] More African countries should insist upon being recipients of this 21st century investment.

While the private sector is driving the shift into renewables, state-owned enterprises (SOE) in the energy sector—in Africa and globally—are lagging behind.[13] African governments need to support reform in the SOE sector by, for example, introducing competitive procurement for electricity supply. This strategy could open African institutions and markets to emerging opportunities in the renewable sector, and even drive down the price of renewables.[14] Efforts such as South Africa's Renewable Energy Independent Power Producer Procurement (REIPPP) program and the World Bank and International Finance Corporation's Scaling Solar program have resulted in solar prices as low as $0.05/kilowatt-hour.

With an abundance of solar, wind, and geothermal resources, African countries already have a comparative advantage in renewables. The falling costs of green technologies provide a propitious moment to be on the delivery end of the new energy revolution. And while it may seem counterintuitive, Africa's most oil- and gas-rich countries should be leading the energy revolution. Beyond the energy sector, food and land use systems—including the agriculture and forestry sectors—are integral to sub-Saharan Africa's economy, accounting for 70 percent of livelihoods

> Whether driven by opportunism or a sense of moral justice, the world's developed and emerging economies must take action at home and help Africa deliver the investments that will bring the goals of the Paris Agreement within reach.

9 "Advancing Africa with Renewable Energy Auctions," *International Renewable Energy Agency*, May 16, 2018.
10 Jan Corfee-Morlot et al., *Achieving Clean Energy Access in Sub-Saharan Africa* (Paris: OECD/Financing Climate Futures, 2019).
11 Timothy Abington and Kelly Gilblom, "Shell Leads Big Oil in the Race to Invest in Clean Energy," *Bloomberg*, September 4, 2019.
12 See https://www.solarnow.eu.
13 Andrew Prag, Dirk Rottgers, and Ivo Scherrer, "State-Owned Enterprises and the Low-Carbon Transition," *OECD Environment Working Papers* 129 (2018).
14 Andrew Herscowitz, "The Unintended Consequences of Falling Solar Prices in Africa," *Medium*, May 23, 2018.

and almost one-quarter of regional GDP. In fact, new business opportunities in sustainable food and land use systems could deliver $320 billion each year by 2030 across sub-Saharan Africa.[15] These opportunities include $120 billion in forest ecosystem services and restoration of degraded land, $100 billion in increased agricultural yields, and $100 billion in supply chain efficiency improvements and enhanced value-adding capacity. Concerted landscape restoration efforts in Ethiopia's Tigray region, for example, are enhancing farmers' resilience, water availability, and livelihoods.[16] Such sustainable food and land use approaches can deliver multiple co-benefits, from reducing rural poverty, to boosting food security and improving population health, to protecting and regenerating natural capital.

Africa's transition to a new climate economy is underway in many places. The question is: Will developed countries create a tail-wind or a head-wind? How they answer this question will determine whether Africa is positioned to fully capitalize on this opportunity. While it may not be polite to say so, African countries need money—both to build a cleaner more prosperous future for themselves and to avoid the worst impacts of climate change created largely by others.

The pending replenishment of the Green Climate Fund (GCF) acts as both a mechanism and a barometer for this challenge. The good news is that in October 2019, 27 countries confirmed their pledge to the GCF's replenishment, bringing the total raised so far to $9.7 billion.[17] The GCF is critical for maintaining momentum behind the Paris Agreement by supporting developing countries to enhance their climate action. But, so far, some major contributors have been silent. We need to hear from them.

African leaders cannot do this alone. And nor should they. Whether driven by opportunism or a sense of moral justice, the world's developed and emerging economies must take action at home and help Africa deliver the investments that will bring the goals of the Paris Agreement within reach.

15 Food and Land Use Coalition, *People, Health and Nature: A Sub-Saharan African Transformation Agenda* (London: Food and Land Use Coalition, 2019).

16 Cathy Watson, "Landscape restoration in Ethiopia brings watershed to life," *Agroforestry World*, June 6, 2017.

17 "Countries step up ambition: Landmark boost to coffers of the world's largest climate fund," *Green Climate Fund,* October 25, 2019.

Viewpoint

Confronting the challenges of climate change on Africa's coastal areas

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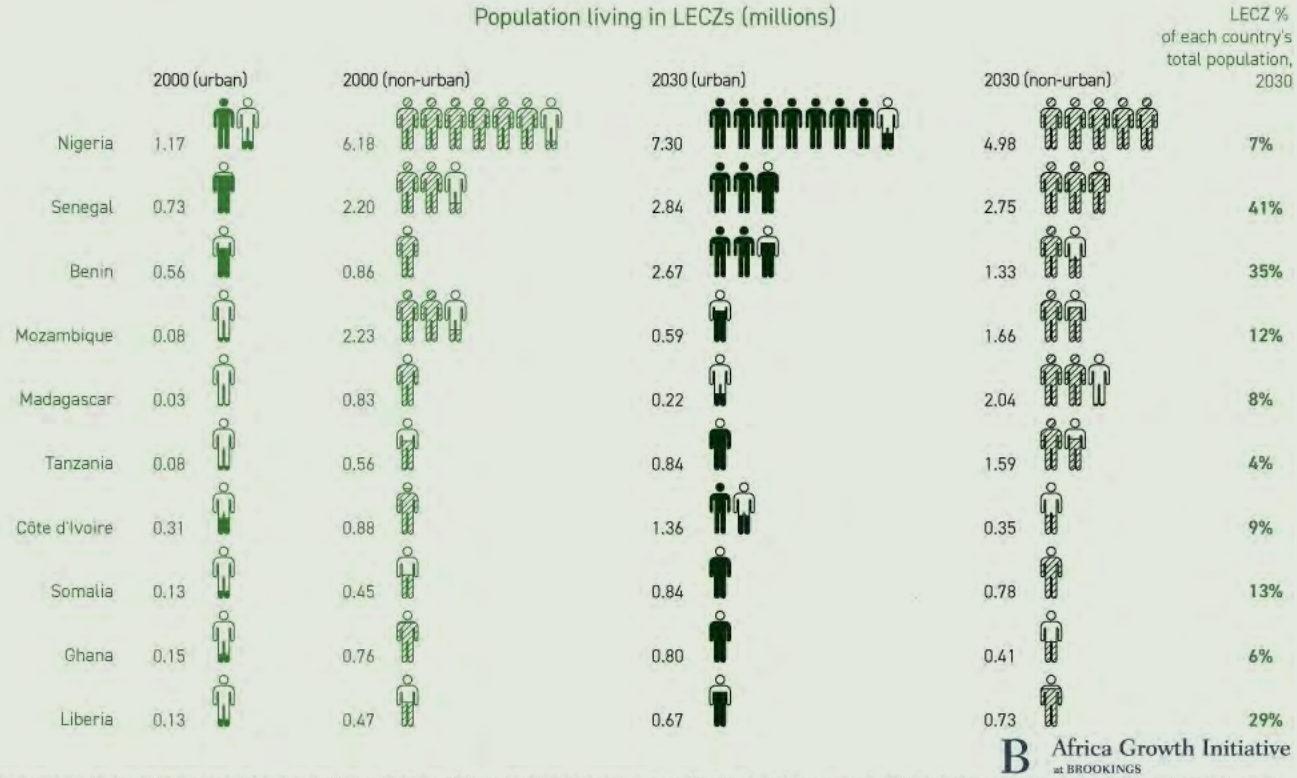
Climate change will undoubtedly present one of the most significant risks to Africa's sustainable development objectives over the next decade, and nowhere is the threat more imminent than on its coastlines. Indeed, recent estimates show that sea levels could rise 100 cm by 2100,[1] further compounding the many hazards threatening the region.

1 Robert J. Nicholls et al., "Sea-level scenarios for evaluating coastal impacts," *WIREs Climate Change* 5, no. 1 (2014): 129-150.

Figure 4.2

Population in low-elevation coastal zones by 2030

The number of Africans living in low-elevation coastal zones (LECZs) is projected to significantly increase by 2030, particularly due to high rates of population growth and urbanization in coastal zones. Coastal population growth is projected to be highest in East and West Africa. This rapid coastal development could exacerbate the already high levels of vulnerability of many coastal African countries.



Note: The projections for the additional population that will live in LECZs in 2030 are based on a scenario where Africa's population reaches 1.6 billion; global economic growth is high; and political, social, and economic governance is exclusive, with limited benefits for the very poor.
Source: Barbara Neumann et al., "Future Coastal Population Growth and Exposure to Sea-Level Rise and Coastal Flooding - A Global Assessment," PLoS ONE 10, no. 3 (2015).

Particularly worrisome is that demographic trends are interacting with climate change in coastal areas, generating a unique set of development challenges. Coastal areas in Africa, like elsewhere in the world, tend to be more densely populated due to the economic opportunities there. For example, in Nigeria's low-elevation coastal zones (LECZs),[2] the population density is 491 inhabitants per km^2, compared with 134 inhabitants per km^2 nationally.[3] By some estimates, Africa's populations in LECZs will rise at an annual rate of 3.3 percent between 2000-2030, which is more than double the world's average. In many cases, individual countries will experience even more extreme changes: For example, in Senegal, the share of the LECZ population is projected to skyrocket to 50 percent by 2060, up from 20 percent in the early 2000s.

As sea levels rise, so too does the likelihood that the success of these burgeoning regions will be washed away as food production will decrease, access to clean water will be curtailed, catastrophic storms will become more prevalent and more harmful, acidification will spread, and the region's already limited ability to mitigate these and related disasters will falter.

2 LECZs are areas located at an elevation level of 10 meters or less above mean sea level.

3 Henrike Brecht et al., "Sea-Level Rise and Storm Surges: High Stakes for a Small Number of Developing Countries," *The Journal of Environment and Development* 21, no. 1 (2012): 120-38.

Extreme weather events will become less predictable and more damaging

By substantially increasing sea surface temperature, climate change brings about more violent cyclone activity and storm surges on coastlines, generating higher wind speeds and heavier precipitation, which make disaster forecasting, preparedness, and management more challenging. Indeed, an increase in the temperature of tropical sea surface by 1°C increases wind speed by 3 to 5 percent.[4]

About 30 million Africans live within the flood hazard zone around the Atlantic and Indian Oceans, out of which 2 million are likely to be flooded ***each year***. Abidjan is a case in point: It is ranked among the world's top 20 cities in term of population exposure to floods, and its asset exposure is similarly high at $42 billion.[5]

Natural defenses to extreme events will erode

Mangroves offer an effective buffer against coastal vulnerability to storm surges by obstructing the flow of water and hence attenuating inundation. Therefore, they can play the same role as infrastructure designed to protect coastal areas from such extreme events as storm surges and cyclones. Notably, mangrove rehabilitation projects can be two to six times cheaper than other protection infrastructure. However, mangroves have varying tolerance to salinity, depending on the species. Flooding, deforestation, and increases in ocean surface temperature that raise the salinity of inland water are increasingly putting mangroves in jeopardy and further weakening the already fragile adaptive capacity of African coastlines. According to some estimates, vulnerable populations exposed to the risk of mangrove destruction are projected to increase by 103 percent and losses in GDP by 233 percent from the baseline scenario.[6]

Increased salinity will cause clean water availability to dry up and infrastructure to falter

Beyond its damaging effects on mangroves, saltwater intrusion into inland coastal areas negatively impacts river salinity, hence available drinking and irrigation water, making both off-season agriculture and freshwater fishing more challenging. Saline water intrusion into inland water also increases the risk of high blood pressure in pregnant women and increases infant mortality.[7] Africa's already weak infrastructure will also suffer, as salinity stemming from sea-level rise impacts roads through land subsidence, progressive blistering, cracking, and pulverization, resulting in higher maintenance costs.

Food production will suffer

In Africa, artisanal fishing is a predominant economic activity. For example, in Ghana, 2.2 million people depend on fishing for their livelihoods, including nearly 125,000 artisanal fishermen.[8] Rises in water temperature and acidification levels damage many fish species' physiology, including their

4 Ibid.

5 Nicholls, "Sea-level scenarios"

6 Brian Blankespoor, Susmita Dasgupta, and Glenn-Marie Lange, "Mangroves as protection from storm surges in a changing climate," *Ambio* 46, no. 4 (2017): 478-91.Susmita Dasgupta et al., "Facing the Hungry Tide: Climate Change, Livelihood Threats, And Household Responses in Coastal Bangladesh," *World Bank Policy Research Working Paper* 7148 (2014).

7 Susmita Dasgupta, Mainul Hug, and David Wheeler, "Drinking Water Salinity and Infant Mortality in Coastal Bangladesh," *World Bank Policy Research Working Paper* 7200 (2015).

8 "Safety and Sustainability for Small-Scale Fishers in West Africa," *World Bank, May 16, 2016.*

size and reproductive capacity, and, therefore, their market value. Relatedly, changes in water temperature cause species to migrate and diminish the number and size of catches. Indeed, local fishermen in West Africa have, in recent years, reported that some types of previously abundant fish are increasingly scarce, even disappearing.[9] For example, the sardinella fish species, which used to be highly abundant in Senegalese sea waters have now disappeared.[10]

Strategies for adaptation and financing

Adaptation is paramount for withstanding the effects of climate change, especially since inaction will be costlier. Estimates show that adaptation costs range from less than 5 percent (in Niger) to 60 percent (in Kenya) of the costs of inaction.[11] Crucial strategies for adaptation include infrastructure construction and maintenance, beach nourishment, and diversification away from activities vulnerable to climate change. If governments undertake some of these strategies, population exposed to flooding could be halved by 2100.[12] Without adaptation, the annual costs related to flooding alone could range between $5 billion and $9 billion.[13]

Figure 4.3

Financing projects for adaptation to and mitigation of climate change

The number of climate change-related projects in Africa has significantly increased since 2006, from only 6 projects approved to a peak of 83 projects approved in 2013. Funding peaked in 2018, when a total of $612.6 million of funding for 53 projects was approved to address climate change on the continent. Since 2006, the greatest increase has been in projects dedicated to adaptation—the process of adjustment to actual or expected climate and its effects.

Source: "Climate Change: OECD DAC External Development Finance Statistics," OECD, 2017.

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9 Ibrahima Ly, Ahmadou Aly Mbaye, and Papa Gora Ndiaye, *Gestion des risques induits par le changement climatique dans la pêche artisanale en Afrique de l'Ouest* (Dakar: GIZ, ENDA, University of Dakar, and REPAO, 2017).

10 Timothee Brochier et al., "Complex small pelagic fish population patterns arising from individual behavioral responses to their environment," Progress in Oceanography 164 (2018): 12-27.

11 Ephraim Nkonya et al., "Economics of Land Degradation: The Costs of Action versus Inaction," *IFPRI Issue Brief* 68 (2011).

12 Paul Watkiss, Thomas E. Downing, and Jillian Dyszynski, *AdaptCost Project: Analysis of the Economic Costs of Climate Change Adaptation in Africa* (Nairobi: United Nations Environment Program, 2010).

13 Jochen Hinkel et al., "Sea-level rise impacts on Africa and the effects of mitigation and adaptation: An application of DIVA," *Regional Environmental Change* 12, no. 1 (2012): 207-224.

A key challenge to the implementation of adaptation strategies in Africa is financing. Costs of adequate adaptation could reach $300 billion for Africa,[14] plus $3 billion per year for maintenance—numbers that sharply contrast with the limited resources currently devoted to adaptation in Africa. While developed countries have pledged to double funding for adaptation projects over the 2014-2020 period, the cumulative funding flowing to developing counties reached only $4.4 billion in 2018, with around 43 percent of this amount going to Africa.[15] Scaling up financing to adaptation is critical to avoid further disrupting already fragile economic and social infrastructure. Notably, financing adaptation must not use the same pipeline and modalities as standard official development assistance. So far, climate funding is highly unpredictable and depends solely on the good will of donor countries. Considering the increasingly robust scientific evidence linking levels of emission to economic losses, health, peace, and security in Africa, the "polluter pays" principle should be used to channel funds for adaptation financing in African countries. This funding should be specifically earmarked to climate change-related projects to ensure that investments are fast-tracked, and that disaster responses are timely and effective.

14 Ibid.
15 Charlene Watson and Liane Schalatek, "Climate Finance Thematic Briefing: Adaptation Finance," *Climate Finance Fundamentals* 3 (2019).

Viewpoint

Policy priorities for achieving food and nutrition security by 2030

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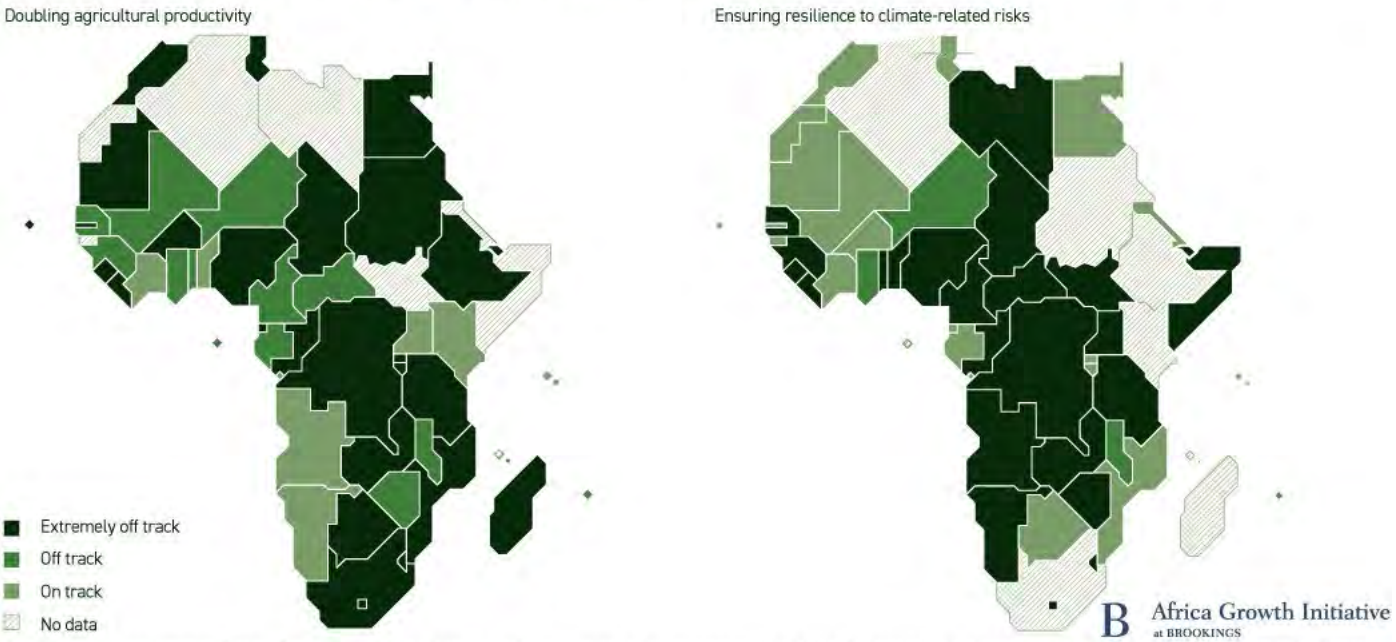
A key priority for Africa over the next decade should be to address a deteriorating food security situation that is compounded by the effects of climate change, declining agricultural productivity, and rapid population and urbanization growth. Encouragingly, this priority is reflected in initiatives shared by Africa and the world. Already, the African Union member states are committed to ending hunger by 2025 under the Comprehensive Africa Agriculture Development Program (CAADP). Similarly, United Nations Sustainable Development Goal 2 calls for ending hunger and all forms of malnutrition by 2030. Despite these and other commitments, though, progress has been modest with only 9 out of 55 African countries currently on track to reduce undernutrition to 5 percent or less by 2025. This insufficient progress underscores the need to redouble efforts. Going forward, policy priorities centered around leveraging science and digital technology, and addressing fragility hold the greatest promise.

Figure 4.4

Improving food and nutrition security depends on increasing agricultural productivity and resiliance

Progress in agriculture and food security in Africa remains modest: Only seven countries are on track to meet the Comprehensive Africa Agriculture Development Program (CAADP) goal of doubling agricultural productivity by 2025, and only 19 are on track to ensure resilience to climate-related risks. Furthermore, only two countries—Côte d'Ivoire and Seychelles—are on track to reach both of these goals.



Source: African Union, Inaugural Biennial Review Report of the African Union Commission on the Implementation of the Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods (Addis Ababa: African Union, 2018).

Leveraging science to adapt agriculture to climate change: Climate change is already affecting agricultural production in Africa, and future projections suggest even worse outcomes. The frequency of droughts has dramatically increased, from an average of once every 12.5 years over 1982-2006 to once every 2.5 years over 2007-2016. These droughts have also become more severe and prolonged, diminishing the productive capacity of the land. Farmers face other climate risks, including lower and erratic rainfall, shorter rainy seasons, and a higher incidence of pests and diseases.[1] By some estimates, Africa could face a near double-digit reduction in crop yields and production volumes over the next decade, as well as rising food prices by similar margins (Figure 4.5).[2] The impacts of these and other indicators are projected to be even larger by 2080.

In places where climate-smart agriculture is practiced today, farmers are seeing increased food security and resilience. In Rwanda, for example, the Land Husbandry, Water Harvesting, and Hillside Irrigation project has helped control erosion, intensify yields on existing land, and provide greater protection from droughts. Under this program, maize yields increased 2.6 times between 2009 and 2018, with even larger increases for beans, wheat, and potatoes.

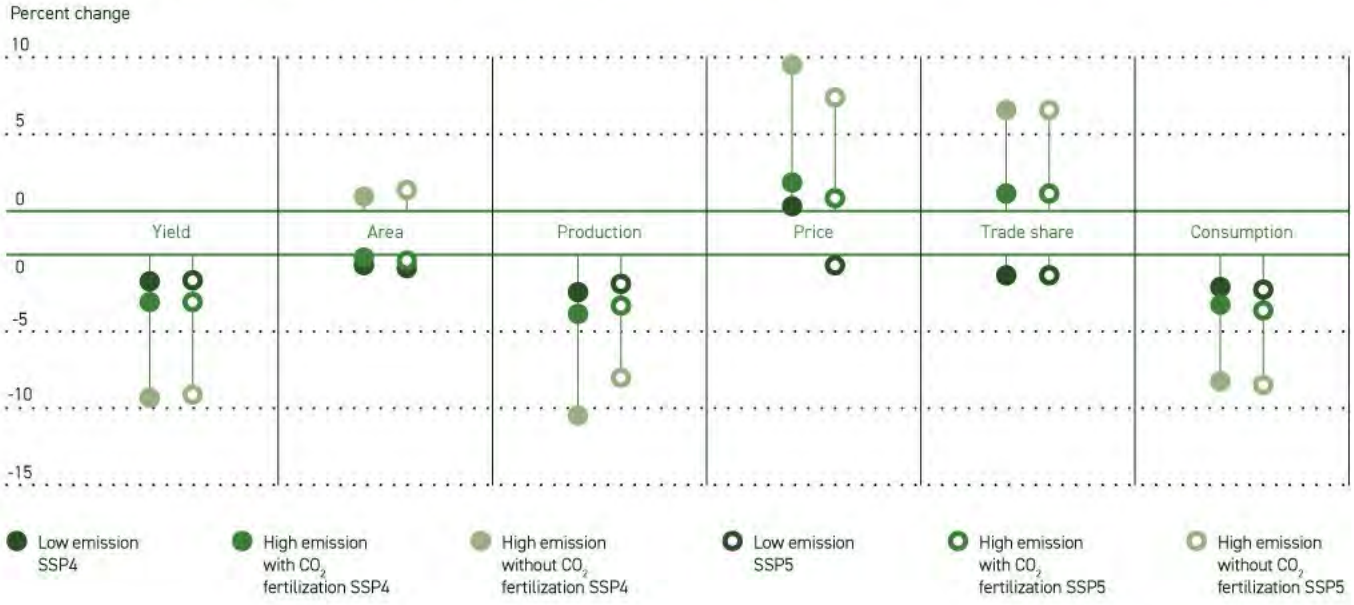
1 Stephane Hallegatte et al., *Shock Waves: Managing the Impacts of Climate Change on Poverty* (Washington, D.C.: World Bank, 2016).

2 Petr Havlik et al., "Climate Change Impacts and Mitigation in the Developing World: An Integrated Assessment of the Agriculture and Forestry Sectors," *World Bank Policy Research Working Paper* 7477 (2015).

Figure 4.5

Estimated effects of climate change on crop production, prices, trade and consumption in Africa, 2030

Crop yields and production volumes in Africa are likely to take a hit as climate change intensifies. The figure shows two alternative plausible future scenarios, known as "Shared Socioeconomic Pathways," or SSPs. Under SSP4, emissions can be kept low through development of new technologies but least advanced countries experience very limited growth, and a significant rise in inequality increases the poorest regions' vulnerability to climate change. SSP4 is also characterized by decreased collaboration between regions of the world. Under SSP5, there is much more investment in human capital as well as a decrease in inequality and vulnerability to climate change. In this case, though, high economic growth is based on conventional technologies with high carbon and resource intensities, which increase the challenge for mitigation. International cooperation is high and characterized by strong trade relations. However, a lack of environmental consideration leads to patterns of consumption putting higher pressure on natural resources, particularly in terms of diets. Estimates by Havlik et al. (2015) find that, by 2030, Africa could face an up to 8 percent reduction in crop yields and production volumes with prices possibly rising by more than double digits. The impacts on these and other indicators are projected to be even larger by 2080.



Source: Havlik et al., "Climate Change"

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In Senegal, the West Africa Agricultural Productivity Program has developed new high-yielding, early-maturing, drought-resistant varieties of crops such as sorghum, millet, groundnuts, and cowpeas. These varieties are being widely disseminated to farmers and have raised yields by an average of 30 percent, even with less and more erratic rainfall. Despite the late onset of rains in 2014, with only half the average total rainfall, yields for farmers of improved sorghum and millet varieties increased.

Science offers enormous potential to provide sustainable solutions for food security, including innovations to improve adaptation to climate change, science-based management of productive resources (land, soil, and water), and the storability and transportability of foods to reduce food waste and loss. Leveraging science effectively requires the translation of scientific solutions into packages that can be disseminated and adopted by farmers at scale, both at the farm and landscape levels. This task calls for effective linkages between international, regional, and national science organizations with farmers and extension systems. The solutions should be co-generated between researchers and farmers so that local resilience challenges can be addressed in a demand-driven and knowledge-intensive manner.

Harnessing digital technologies: Sorely needed extension services, which impart new skills to farmers and enhance labor and land productivity, currently are often inadequate and may not always respond to farmers' changing needs—and so digital technologies can help.[3] Digital tools for monitoring climate risks can identify the onset of climatic shocks before they happen, and facilitate responses for building resilience. Automated irrigation systems, soil sensors, and drones can boost the efficiency of production. Digital tools can enhance food availability and accessibility, as well as improve food utilization and safety through effective monitoring of food hazards. E-commerce platforms can integrate smallholder farmers into value chains and enable them to eliminate the transaction costs of locating demand, determining prices, and improving efficiency in service delivery.

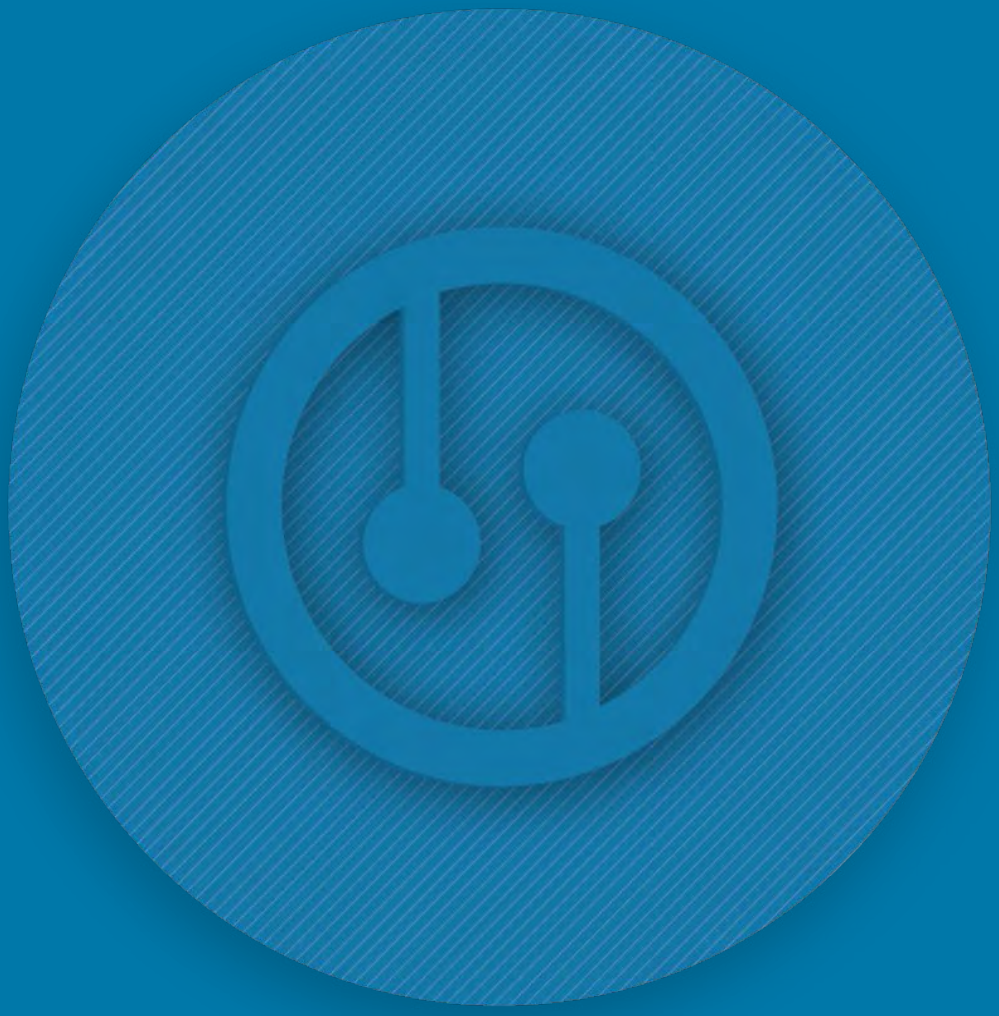
There are several examples from across the globe that highlight the role of technology in transforming the lives of farmers. For example, today, through Hello Tractor, which connects tractor owners with farmers over text message, farmers in Nigeria, Ghana, and Kenya can seamlessly rent machines that they previously had to buy or could not access at all. Over 500,000 farmers have been reached with tractor services. About 60 percent of the farmers report higher productivity and more than 90 percent report overall improvement in quality of life. Platforms such as Digital Green or Plantix can dramatically increase agricultural productivity by making it easier for farmers to acquire new skills for monitoring the quality of their crops. Plantix provides a diagnostic and monitoring tool that allows users to share pictures of sick plants, identify diseases, pests, and nutrient deficiencies, and then send the information back to the community. Such technologies directly help improve productivity along the food value chain.

Preventing fragility and addressing its consequences on food security: The prevalence of undernutrition is about twice as high in conflict-affected areas. The effects of conflicts on food security include disruption of agricultural production activities at the farm level, disruption of post-harvest management functions such as marketing and storage, and the weakening of the ability of poor households to recover from shocks. Conflicts create stress on local and national institutions, leading to weak delivery of agricultural services and public infrastructure and low investments at the farm level and in downstream parts of the food system.

Africa cannot address food insecurity without addressing the agriculture-related drivers of conflict and fragility and their consequences. In this context, there is need to manage competition for natural resources in fragile areas, especially between herders and crop farmers. Fragile and conflict-affected areas can be difficult to reach for outsiders. Therefore, it is important to build capacity in local institutions to enable design and implementation of community-based approaches.

Despite the challenges of climate change and state fragility in parts of Africa, the continent has the potential to not only achieve food and nutrition security, but to leverage the food sector for its overall development.

3 The possibilities are comprehensively reviewed in World Bank, *The Future of Food: Harnessing Digital Technologies to Improve Food System Outcomes* (Washington, D.C.: World Bank, 2019).



CAPTURING THE FOURTH INDUSTRIAL REVOLUTION

A regional and national agenda

The Fourth Industrial Revolution and digitization will transform Africa into a global powerhouse

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The Fourth Industrial Revolution (4IR)—characterized by the fusion of the digital, biological, and physical worlds, as well as the growing utilization of new technologies such as artificial intelligence, cloud computing, robotics, 3D printing, the Internet of Things, and advanced wireless technologies, among others—has ushered in a new era of economic disruption with uncertain socio-economic consequences for Africa.[1] However, Africa has been left behind during the past industrial revolutions. Will this time be different?

So far, it does not appear that Africa has yet claimed the 21st century,[2] as it still lags behind in several indicators essential for a successful digital revolution (see Figure 5.1).[3]

Improvements in Africa's ICT sector have been largely driven by expanding mobile digital financial services: The region had nearly half of global mobile money accounts in 2018 and will see the fastest growth in mobile money through 2025.

But artificial intelligence (AI) and blockchain are also attracting interest in Africa, as they have the potential to successfully address social and economic challenges there. And there are so many other areas in which 4IR technology can be transformational.

Table 5.1

The four waves of industrial revolution

Wave	Period	Transition Period	Energy resource	Main technical achievement	Main developed industries	Transport means
I	1760 - 1900	1860 - 1900	Coal	Steam engine	Texile, steel	Train
II	1900 - 1960	1940 - 1960	Oil, electricity	Internal combustion engine	Metallurgy, auto, machine building	Train, car
III	1960 - 2000	1980 - 2000	Nuclear energy, natural gas	Computers, robots	Auto, chemistry	Car, plane
IV	2000 - present	2000 - 2010	Green energies	Internet of Things, 3D printer, genetic engineering	High tech industries	Electric car, ultra fast train

Source: Petre Prisecaru, "Challenges of the Fourth Industrial Revolution," Knowledge Horizons - Economics 8, no. 1 (2016): 57-62.

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1 Landry Signé. Africa's Role in the Fourth Industrial Revolution: Riding the World's Biggest Wave of Disruptive Innovation. Forthcoming. See the summary online: landrysigne.com.

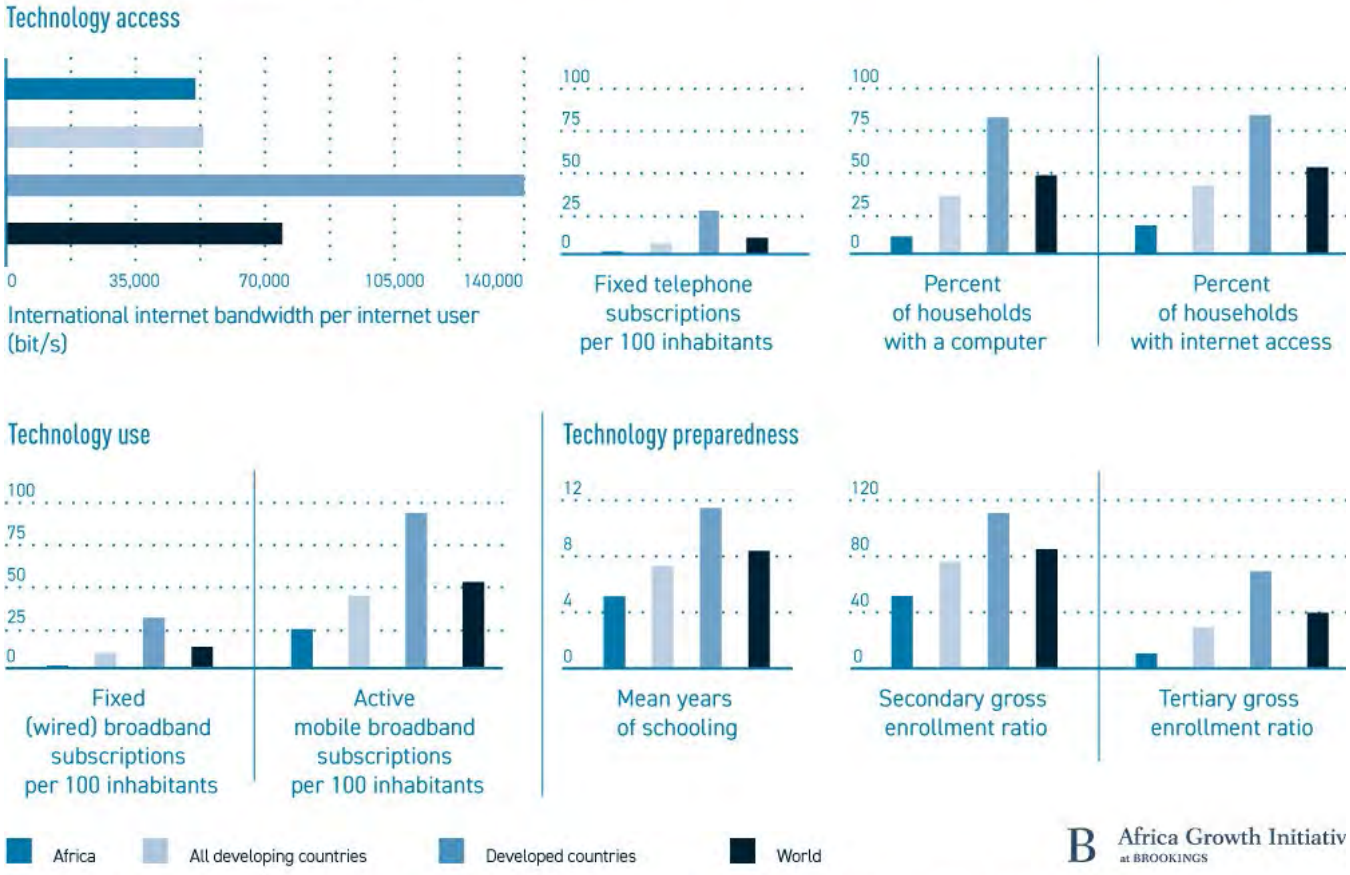
2 World Bank, *Can Africa Claim the 21st Century?* (Washington, D.C.: World Bank, 2000).

3 See the International Telecommunications Union's Information and Communication Technology Development Index (IDI Index) conceptual framework and methodology: https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis2017/methodology.aspx

Figure 5.1

Africa's ICT development indicators

Africa still lags behind both developed and other developing countries in several indicators essential for the Fourth Industrial Revolution, especially in infrastructure, technology access, and education.



Sources: Hebatallah Adam, "The Digital Revolution in Africa: Opportunities and Hurdles," Proceedings of the 10th International Conference on Digital Strategies for Organizational Success (2019) and International Telecommunication Union, Measuring the Information Society Report: Volume 1 (Geneva: International Telecommunication Union, 2018).

The transformative potential of 4IR in Africa is substantial

Encouraging economic growth and structural transformation: In recent years, the ICT sector in Africa has continued to grow, a trend that is likely to continue. Of late, mobile technologies and services have generated 1.7 million direct jobs (both formal and informal), contributed to $144 billion of economic value (8.5 percent of the GDP of sub-Saharan Africa), and contributed $15.6 billion to the public sector through taxation.[4] Digitization has also resolved information asymmetry problems in the financial system and labor market, thus increasing efficiency, certainty, and security in an environment where information flow is critical for economic growth and job creation.

Failure to recognize and capitalize on 4IR opportunities, conversely, will impose considerable risks on African stakeholders: Without attempts to move beyond existing models of innovation, entrepreneurship, and digital growth on the continent, African businesses risk falling further behind,

4 GSM Association, *The Mobile Economy: Sub-Saharan Africa 2019* (London: GSM Association, 2019).

exacerbating the global "digital divide" and lowering their global competitiveness.[5] Going beyond the existing models requires discipline in governance to allow an endogenous innovative environment. At the same time, institutions must protect the market through consumer protection laws and regulations that encourage competition.

Fighting poverty and inequality: The spread of digital technologies can empower the poor with access to information, job opportunities, and services that improve their standard of living. AI, the Internet of Things (IoT), and blockchain can enhance opportunities for data gathering and analysis for more targeted and effective poverty reduction strategies. Already, we have witnessed the transformational power of formal financial services through mobile phones, such as M-Pesa, reaching the underserved, including women, who are important drivers for sustainable poverty eradication. These financial services allow households to save in secure instruments to enlarge their asset base and escape cycles of poverty.

Reinventing labor, skills, and production: By 2030, Africa's potential workforce will be among the world's largest,[6] and so, paired with the needed infrastructure and skills for innovation and technology use, the 4IR represents a massive opportunity for growth. Indeed, the 4IR is dramatically changing global systems of labor and production, requiring that job seekers cultivate the skills and capabilities necessary for adapting rapidly to the needs of African firms and automation more broadly. Already, Africa's working population is becoming better educated and prepared to seize the opportunities provided by the 4IR: For example, the share of workers with at least a secondary education is set to increase from 36 percent in 2010 to 52 percent in 2030.[7]

Increasing financial services and investment: Digitization has impacted economic growth through inclusive finance, enabling the unbanked to enter formality through retail electronic payments platforms and virtual savings and credit supply technological platforms.[8] More broadly, digitization is enabling entrepreneurs and businesses to rethink business models that are more impactful, sustainable, and connected to other sectors of the economy. For example, with fintech, digitization has gone beyond the financial sector to affect the real sector and households, transforming product designs and business models across market segments.[9] Businesses are able to design products and trade online, and individuals are able to operate financial services and payments for shopping and investments. The government is also migrating to online platforms to conveniently provide public services.

Other 4IR technologies are also having impact. For example, in West Africa and Kenya, blockchain has enabled efficient verification of property records and transactions, and expanded access to credit in some previously informal sectors of the economy.[10] Since blockchains are immutable, fraud—and thus the cost of risk—is reduced. There are also immense opportunities for job creation in Africa.[11] Given the informal sector is estimated to constitute 55 percent of sub-Saharan Africa's

5 Rosanna Chan, "Rethinking African growth and service delivery: Technology as a catalyst," in *Foresight Africa: Top priorities for the continent in 2018* (Washington, D.C.: Brookings Institution, 2018), 88-9.

6 Jean Phibert Nsengimana, "How Africa Wins the 4th Industrial Revolution," *Forbes*, October 10, 2018.

7 World Economic Forum, *The Global Human Capital Report 2017* (Geneva: World Economic Forum, 2017).

8 Virtual savings products and short-term credit platforms include M-Shwari, KCB M-Pesa, and Equitel in Kenya; M-Pawa in Tanzania; and Mokash in Uganda and Rwanda, which has been extended to Côte d'Ivoire as MoMoKash.

9 Njuguna Ndung'u, "Next steps for the digital revolution in Africa: Inclusive growth and job creation lessons from Kenya," *Brookings Institution Working Paper* 20 (2018).

10 Samuel Gebre, "Blockchain Opens Up Kenya's $20 Billion Informal Economy," *Bloomberg,* June 13, 2018.

11 Mobile technologies and services generated 8.6 percent of GDP in sub-Saharan Africa and supported almost 3.5 million jobs in 2018. The GSM Association projects that by 2023, mobile's contribution will reach almost $185 billion, 9.1 percent of GDP. See: GSM Association, *The Mobile Economy: Sub-Saharan Africa 2019* (London: GSM Association, 2019).

GDP[12] (with significant heterogeneity across countries), these tools can be transformational. Their consequences can cascade: Increased financial inclusion contributes to greater capital accumulation and investment, hence potential for employment creation.[13]

Modernizing agriculture and agro-industries: Africa has yet to harness the full potential of its agricultural sector, and 4IR technologies provide an opportunity to do so. Farming alone accounts for 60 percent of total employment in sub-Saharan Africa, and the food system is projected to add more jobs than the rest of the economy between 2010 and 2025.[14] Farm labor and income is especially important in sub-Saharan Africa, where on-farm activities represent almost 50 percent of all rural income in countries like Ethiopia, Malawi, Nigeria, and Tanzania.[15] Information on competitive pricing, monitored crop information, disease prevention tips, and disaster mitigation support has the potential to transform the agriculture sector to improve income, production, and demand throughout the continent. Furthermore, as incomes rise across the continent, growing consumer demand for food and beverages will coincide with business-to-business growth in agro-processing.

Ghana-based companies Farmerline and Agrocenta offer farmers mobile and web technology for agricultural advice, weather information, and financial tips. Zenvus, a Nigerian startup, measures and analyzes soil data to help farmers apply the right fertilizer and optimally irrigate farms.[16] The "Sparky Dryer," a dehydration machine invented by a Ugandan engineer, uses biofuel to dehydrate produce and reduce food waste.[17] African entrepreneurs and startups are also using the Internet of Things to help farmers optimize productivity and reduce waste through data-driven "precision farming" techniques.

Improving health care and human capital: African countries face numerous health challenges exacerbated by climate change, limited physical infrastructure, and a lack of qualified professionals. 4IR technology can help mitigate these threats and build sustainable health care systems, especially in fragile states.

Mobile technology has become a platform for improving medical data and service delivery: About 27,000 public health workers in Uganda use a mobile system called mTrac to report medicine stocks. The SMS for Life program, a public-private partnership, reduces medicine shortages in primary health care facilities by using mobile phones to track and manage stocks levels of malaria treatments and other essential drugs.[18] Rwanda became the first country to incorporate drones into its health care system, using autonomous air vehicles to deliver blood transfusions to remote regions. Technology has also improved disaster response: During the West African Ebola outbreak in 2014, WhatsApp became an easy method of dispersing information, checking symptoms, and communicating under quarantine.[19]

Illness detection and pharmaceutical production have most immediately benefited from digitization. AI is being slowly implemented in Ethiopia to help medical professionals correctly diagnose cervical cancer and other

12 United Nations Economic Commission for Africa, *Contribution to the 2015 United Nations Economic and Social Council Integration Segment* (Addis Ababa: United Nations Economic Commission for Africa, 2015).

13 It is estimated that one additional technology job creates five new jobs in the local non-tradable sectors.

14 Simeon Ehui, "Why technology will disrupt and transform Africa's agriculture sector in a good way," in *Foresight Africa: Top Priorities for the Continent in 2018* (Washington, D.C.: Brookings Institution, 2018), 96-8.

15 Food and Agriculture Organization of the United Nations, *The State of Food and Agriculture: Leveraging Food Items for Inclusive Rural Transformation* (Rome: Food and Agriculture Organization of the United Nations, 2017).

16 Ehui, "Why technology"

17 Harriet Kariuki, "Innovation is Key to Curbing Post-Harvest Losses in Africa," *Medium*, August 19, 2018.

18 Access to Medicine Foundation, *Access to Medicine Index 2016* (Amsterdam: Access to Medicine Foundation, 2016).

19 Milicent Atieno, "How technology can improve healthcare in sub-Saharan Africa," *Innov8tiv*, 2017.

abnormalities.[20] IBM Research Africa is also using AI to determine the optimal methods for eradicating malaria in specific locations and using game theory and deep learning data analytics to diagnose pathological diseases and birth asphyxia.[21] (For more on the promise of artificial intelligence in Africa, see the viewpoint on page 69).

Strategies for overcoming key challenges facing Africa during the 4IR

Clearly, the 4IR presents significant opportunities as well as challenges for Africa. The key issue for policymakers is how to position their economies to benefit from the 4IR while managing the challenges that it presents. Below are three strategies that leaders should prioritize.

Fixing the labor-skills mismatch

Since creating jobs for the burgeoning youth population is a priority in most African countries, many governments are reluctant to support technologies that threaten existing jobs. Some of the current technologies tend to replace low-skilled workers—of which Africa has an abundance—with higher-skilled workers, constraining participation in the 4IR to economies with relevant skills.[22] African governments must invest in education and reskilling programs to ensure that technology supplements, instead of replaces, labor.

Enhancing agile governance for secure, effective management of the 4IR and integration into global value chains

As innovation is at the heart of the 4IR, reinforcing state and institutional capacity to drive and support innovation and create an enabling business environment is essential for success.

A major regulatory challenge involves increasing cybersecurity. Most African countries lack a comprehensive legal framework and institutional capacity to address cybercrime. Instead, efforts to prevent cybercrime are appearing at the more local level or are implemented by private sector actors themselves. For example, between 2015 and 2016, there was a 73 percent increase in Information Security Management System-certified companies, from 129 in 2015 to 224 in 2016, with the majority in South Africa, Nigeria, and Morocco.[23] Adopting widely accepted and appropriate norms and regulations, such as these, is a first step to increasing cybersecurity. At the same time, companies should invest in their employees to develop cybersecurity skills and integrate cyber risk protection in their decision making process.

The African Continental Free Trade Agreement offers a unique opportunity to enhance governance around the 4IR. With aligned policies and procedures, the continent can adapt to the rapid changes of the 4IR and leverage it to accelerate participation in global value chains.

More broadly, the 4IR can actually empower service delivery, through, for example, national identification and a new generation of biometrics that can centralize data for a variety of uses and users.

Developing physical and digital infrastructure

Access to advanced technology in Africa is constrained by infrastructure parameters such as lack of electricity and low teledensity,

20 Cary Champlin, David Bell, and Celina Schocken, "AI Medicine Comes to Africa's Rural Clinics," *IEEE Spectrum*, April 27, 2017.
21 Victor Akinwande, "AI in health care: Where does Africa lie?" *Techpoint Africa*, March 26, 2018.
22 Wim Naudé, "Entrepreneurship, Education and the Fourth Industrial Revolution in Africa," *IZA Institute of Labor Economics Discussion Paper* 10855 (2017).
23 International Organization for Standardization, *ISO Survey of Management System Standard Certifications* (Geneva: International Organization for Standardization, 2018).

internet density, and broadband penetration.[24] As a result, mobile phone and internet use remains low (Figure 5.2). (For more on strategies for upgrading Africa's ICT infrastructure, see the viewpoint on page 71). Other technological bottlenecks include a lack of standardized application programming interfaces and common data languages for the increased integration of largely self-sufficient systems as well as exposure to the dangers of cyberattacks. Accelerating the physical connectivity of fiber-optic networks as well as the interoperability of virtual platforms is critical not only for upgrading technology on the continent, but also for reaching and lowering unit costs for the underserved.

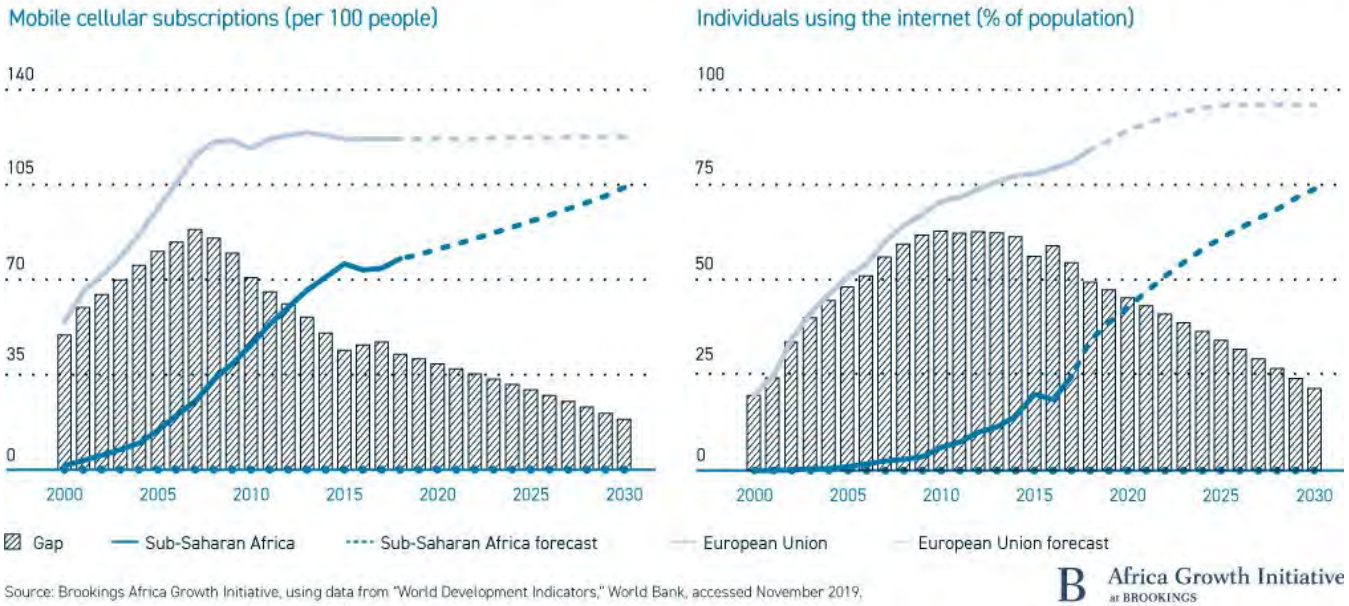
More broadly, adequate infrastructure development will drive and sustain economic transformation in Africa. With lower transport and communication costs, countries with suitable agro-ecological conditions can produce high-value products. Closing the internet connectivity and access gap with advanced economies will enable more African countries to enter service export markets. Small-scale manufacturers in Africa may also become more competitive with access to digital platforms for research, sales, and distribution.

To make the most of the 4IR, African governments and entrepreneurs need to recognize new niches for industry and leverage them to achieve sustainable, inclusive growth, and take decisive steps to close the gaps in digital skills, infrastructure, and research and development.

Figure 5.2

Closing the gap in mobile phone and internet access

In recent years, Africa has begun to close the gap in mobile phone and internet access. In 2018, compared to the European Union, the average gap in mobile phone access was only 44.6 mobile cell phone subscriptions per 100 people, down from a high of 92.8 in 2007. For internet access, the gap is also lessening, although at a slower rate: The access gap in 2017 was 55.4 percentage points, down from a high of 63.8 in 2010. By 2030, given current trends, these gaps are projected to decrease to 19.4 and 21.8 for mobile phone and internet access, respectively.



Source: Brookings Africa Growth Initiative, using data from "World Development Indicators," World Bank, accessed November 2019.

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24 International Telecommunications Union, *Measuring the Information Society Report 2018, Volume 1* (Geneva: International Telecommunications Union, 2018).

Viewpoint

Shooting for the moon: An agenda to bridge Africa's digital divide

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Africa needs a digital transformation for faster economic growth and job creation. The World Bank estimates that reaching the African Union's goal of universal and affordable internet coverage will increase GDP growth in Africa by 2 percentage points per year.[1] Also, the probability of employment—regardless of education level—increases by 6.9 to 13.2 percent when fast internet becomes available, as it facilitates firm entry and boosts productivity and exports.[2] As such, digital technologies offer a unique opportunity for African countries to significantly transform various sectors of their economies. However, this potential cannot be fulfilled unless Africa addresses its sizeable deficits in digital infrastructure.

Africa is seriously lagging on the digital front. For example, internet penetration, quality, and affordability are very low compared to the rest of the world: Internet penetration in 2019 averaged 39.6 percent in Africa compared to 62.7 percent in the rest of the world, though there is immense variation among countries, ranging from 89.8 percent in Kenya to 5.3 percent in Burundi. Furthermore, in 2017, Africa used only 1 percent of the world's total international internet bandwidth. The median mobile broadband download speed in Africa is 2.7 megabits per second (Mbits/s), roughly half the global median of 5.2 Mbits/s, and the monthly cost of a fixed broadband connection is 36.6 percent of gross national income, compared with 14.5 percent globally.

African countries spend about 1.1 percent of GDP on digital investment, while advanced economies spend an average of 3.2 percent. Thus, business-as-usual is not an option, as it will continue to widen the digital divide and drive further marginalization of Africa.

On the bright side, the region has shown a readiness to embrace full digitization: It has seen the highest rate of increase in internet use and connectivity in the world over the last two decades and is home to a young and dynamic population. Over the same time period, the number of internet users in Africa has increased more than 116-fold, from 4.5 million to 523 million, while that in the rest of the world did not even double. Young Africans in particular are capitalizing on new technologies to launch startups and to find solutions to the continent's problems. Successful

1 Cesar Calderon et al., *Africa's Pulse, No. 19, April 2019: An Analysis of Issues Shaping Africa's Economic Future* (Washington, D.C.: World Bank, 2019).

2 Jonas Hjort and Jonas Poulsen, "The Arrival of Fast Internet and Employment in Africa," *American Economic Review* 109, no. 3 (2019): 1032-1079.

technological innovations, ranging from mobile banking services in Kenya to delivery of life-saving medications by drones in Rwanda, are widespread. Those successes need to be scaled up to the continental level.

Unsurprisingly, African youth, aiming to fully integrate into the 21st century economy, are demanding better digital services. In response, the African Union, supported by the World Bank, is pursuing an initiative for digital transformation, accelerating the rate of internet use to catch up and even surpass the rest of the world in a decade or less.

This Digital Moonshot initiative has five key elements. The first element is investing in digital infrastructure to improve access and quality, which includes investing in connectivity (e.g., high-speed internet, internet exchange points), the Internet of Things (e.g., mobile devices, computers) and data repositories (e.g., data centers, clouds). These upgrades will require some public investments, but most investment will need to come from the private sector, hence the need for legal and regulatory reforms to encourage private investment.

With its large numbers of imaginative and creative youth, Africa should become the startup continent.

The second element is investing in a digitally savvy workforce to build robust digital economies and competitive markets. Third is investment in digital platforms that offer products and services through digital channels. Most platforms are developed by the private sector, but some (e.g., digital ID systems) are public sector-led. Fourth is the development of digital financial services to enhance financial inclusion; M-Pesa in Kenya is the best example of such a system. The development of digital financial systems requires reforms of monetary and financial regulations and supervision systems to allow mobile phone operators to provide financial services. The fifth element is to create an ecosystem to encourage digital entrepreneurship and innovation. With its large numbers of imaginative and creative youth, Africa should become the startup continent.

Finally, I must highlight two additional points. First, the goal of digitally transforming Africa is achievable. The total cost of this initiative is estimated at between $80 billion and $100 billion over 10 years, with more than half of the investment coming from the private sector. The challenge is not just to mobilize public resources; rather, the biggest challenge is to put in place policies and institutions that encourage the private sector to invest. Second, the needs of the digital economy should not distract from work to deal with Africa's other needs, especially investment in human capital, energy, and transport.

Viewpoint

The future is intelligent: Harnessing the potential of artificial intelligence in Africa

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Kevin Muvunyi, Research Officer, Next Einstein Forum @kevinmuv

The future is intelligent: By 2030, artificial intelligence (AI) will add $15.7 trillion to the global GDP, with $6.6 trillion projected to be from increased productivity and $9.1 trillion from consumption effects.[1] Furthermore, augmentation, which allows people and AI to work together to enhance performance, "will create $2.9 trillion of business value and 6.2 billion hours of worker productivity globally."[2] In a world that is increasingly characterized by enhanced connectivity and where data is as pervasive as it is valuable, Africa has a unique opportunity to leverage new digital technologies to drive large-scale transformation and competitiveness. Africa cannot and should not be left behind.

In a world that is increasingly characterized by enhanced connectivity and where data is as pervasive as it is valuable, Africa has a unique opportunity to leverage new digital technologies to drive large-scale transformation and competitiveness. Africa cannot and should not be left behind.

There are 10 key enabling technologies that will drive Africa's digital economy,[3] including cybersecurity, cloud computing, big data analytics, blockchain, the Internet of Things, 3D printing, biotechnology, robotics, energy storage, and AI. AI in particular presents countless avenues for both the public and private sectors to optimize solutions to the most crucial problems facing the continent today, especially for struggling industries. For example, in **health care**, AI solutions can help scarce personnel and facilities do more with less by speeding initial processing, triage, diagnosis, and post-care follow up.[4] Furthermore, AI-based pharmacogenomics applications, which focus on the likely response of an individual to therapeutic drugs based on certain genetic markers, can be used to tailor treatments.

1 PwC, *Sizing The Prize: What's The Real Value of AI for Your Business and How Can You Capitalize?* (London: PwC, 2018).
2 Gil Press, "Artificial Intelligence (AI) Stats News: AI Augmentation To Create $2.9 Trillion Of Business Value," *Forbes*, August 12, 2019.
3 Youssef Travaly, Nathalie Munyampenda, and Esther Kunda, *Moving from goodwill to action: A call for a Coordinated Vision for Africa's Digital Economy* (Kigali: Next Einstein Forum, 2019).
4 Access Partnership and University of Pretoria, *Artificial Intelligence for Africa: An Opportunity for Growth, Development, and Democratization* (Pretoria: Access Partnership and University of Pretoria, 2018).

Considering the genetic diversity found on the African continent, it is highly likely that the application of these technologies in Africa will result in considerable advancement in medical treatment on a global level.

In **agriculture**, Abdoulaye Baniré Diallo, co-founder and chief scientific officer of the AI startup My Intelligent Machines, is working with advanced algorithms and machine learning methods to leverage genomic precision in livestock production models.[5] With genomic precision, it is possible to build intelligent breeding programs that minimize the ecological footprint, address changing consumer demands, and contribute to the well-being of people and animals alike through the selection of good genetic characteristics at an early stage of the livestock production process.[6] These are just a few examples that illustrate the transformative potential of AI technology in Africa.

However, a number of structural challenges undermine rapid adoption and implementation of AI on the continent. Inadequate basic and digital infrastructure seriously erodes efforts to activate AI-powered solutions as it reduces crucial connectivity. (For more on strategies to improve Africa's digital infrastructure, see the viewpoint on page 67). A lack of flexible and dynamic regulatory systems also frustrates the growth of a digital ecosystem that favors AI technology, especially as tech leaders want to scale across borders. Furthermore, lack of relevant technical skills, particularly for young people, is a growing threat. This skills gap means that those who would have otherwise been at the forefront of building AI are left out, preventing the continent from harnessing the full potential of transformative technologies and industries.

Similarly, the lack of adequate investments in research and development is an important obstacle. Africa must develop innovative financial instruments and public-private partnerships to fund human capital development, including a focus on industrial research and innovation hubs that bridge the gap between higher education institutions and the private sector to ensure the transition of AI products from lab to market.

At the same time, we must be careful that priority sectors drive the AI strategy in Africa with accompanying products—not the other way around. We believe the health care industry presents by far the most urgent need and promising market opportunity, and, as such, should be put at the top of the list for the continent's decisionmakers. A large portion of the African population is still unable to access proper health care, with a low patient ratio of one physician per 5,000 patients, and there is almost no country with a fully integrated health management platform.[7] AI could intervene directly to improve personalized health care and product development. Importantly, the health management platform precedes the leveraging of AI, so we must equally invest in cybersecurity, Big Data, cloud computing, and blockchain.

What does this mean for Africa?

Artificial intelligence for Africa presents opportunities to put the continent at the forefront of the Fourth Industrial Revolution. Before Africa can lead this transformation, though, there are important steps that must be undertaken. First, the region needs to formulate a comprehensive continental

5 "Speakers at the 2019 Indaba: Keynote Speakers," *Deep Learning Indaba,* 2019.
6 Martien Groenen, "Animal Genomics," *Wageningen University & Research*, accessed November 19, 2019.
7 Kingsley Ighobor, "Diagnosing Africa's medical brain drain," *African Renewal*, December 2016 – March 2017.

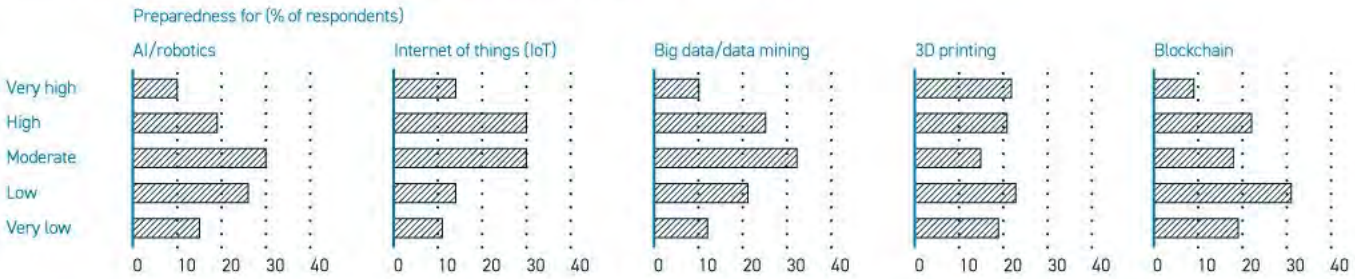
blueprint to guide its AI strategy by involving key Pan-African institutions, academia, and the private and public sectors in its conception.

In addition, these stakeholders must also invest in creating a digital identity platform for all Africans with reliable data banks for AI to be a viable economic option. For this, it is imperative to leverage readily available local talent as a means to promote and democratize AI technology continent-wide. Finally, we must harmonize regulatory policies that encourage ethically built AI systems so as to guarantee a more inclusive economic development for Africa. With these important steps, the next decade for Africa will be intelligent.

Figure 5.3

Firms' preparedness for the Fourth Industrial Revolution

The majority of African firms report moderate to very low levels of business preparedness for five key 4IR technologies. Notably, firms are least prepared for artificial intelligence/robotics and blockchain technologies. Experts say that the low levels of preparedness stem from the inability of firm leadership to develop effective digital strategies, as well as low levels of education and skills of employees.



Source: Kapil Kapoor et al., "Fourth Industrial Revolution, Jobs, and Skills," in Creating Decent Jobs: Strategies, Policies, and Instruments, eds. Celestin Monga, Abebe Shimeles, and Andinet Woldemichael (Abidjan: African Development Bank, 2019), 297-334.

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Viewpoint

A national strategy for harnessing the Fourth Industrial Revolution: The case of South Africa

Cyril Ramaphosa, President of the Republic of South Africa @CyrilRamaphosa

The Fourth Industrial Revolution (4IR) represents the great tectonic shift of our time. It is creating new possibilities for improving people's lives. Disruptive technologies like machine learning, artificial intelligence, and big data are changing the way we live, the way we work and do business, and the way we govern.

As a continent that continues to be impacted by historically low levels of development, Africa can and must take advantage of technological advances to industrialize, pursue inclusive growth, and attract investment. It must also be at the forefront of driving new solutions to our developmental challenges, like access to health care and education.

South Africa is preparing itself to take the great quantum leap into the future, and in doing so to ensure that technological advances benefit all, and not a select few.

By 2030, we aim to be a nation that has fully harnessed the potential of technological innovation to grow our economy and to uplift our people. To this end, we have established a Presidential Commission on the Fourth Industrial Revolution to develop an integrated national response strategy. The commission is composed of representatives of tech startups, academia, cybersecurity specialists, researchers, social scientists, trade unionists, and other representatives from key economic sectors. This commission, which is due to report in early 2020, has various workstreams on issues such as infrastructure and resources, research, technology and innovation, human capital, industrialization, and policy and legislation.

Our focus is threefold. First, we need to respond with agility and purpose. Like the self-learning artificial intelligence we have today that was unthinkable a decade ago, we must be adaptive and responsive to the pace of change.

> We want to be a country where our people are digital citizens, our workforce is skilled and empowered, and our youth enjoy the transformative benefits of employment in a new world of work.

Second, we are determined to take advantage of the opportunities technological change presents to enhance our global competitiveness, with a focus on key sectors with high growth potential such as agriculture, mining, manufacturing, information and communications technologies, and electronics. That is why we have prioritized attracting investment in ICT infrastructure, especially fiber optics. We also are in the process of licensing high-demand broadband spectrum as part of our economic reform package. Next generation super-fast 5G is already being rolled out in parts of South Africa.

South Africa is also developing capabilities to further our scientific and technological understanding. Projects like the MeerKat radio telescope are pushing the envelope of space observations. Our Council for Scientific and Industrial Research is recognized as a continental leader in research into complex contemporary challenges from climate change early warning systems, to water security, to biotech and nuclear research.

Third, we aim to ensure that our citizens are prepared, and, where necessary, to shield them from any adverse consequences of technological change. Just about every industry will be impacted by automation. Reskilling will therefore be critical, as will investing heavily in curriculum innovation to prepare our people for the jobs of the future.

By 2030 we want to be fully integrated into the economy of the future—an economy that uses technological innovation to revolutionize manufacturing and industrial processes and energy provision and distribution. We want to demonstrate how science, technology, and innovation have been used to enhance our food and water security and to build smart human settlements.

We want to be a country where our people are digital citizens, our workforce is skilled and empowered, and our youth enjoy the transformative benefits of employment in a new world of work. Africa is a continent of entrepreneurs, and we want to use the advance of technology to catalyze entrepreneurial activity. Economic growth will be driven by the leaner and more adaptable small- and medium-sized businesses of the future. Industry 4.0 will enable us to "leapfrog" outdated processes and technologies in favor of newer, more sustainable ones. Digital business models such as mobile money have taken root in large continental markets and are expanding.

We want to be a country where our people are digital citizens, our workforce is skilled and empowered, and our youth enjoy the transformative benefits of employment in a new world of work.

Although the resource sector will continue its substantial contribution to GDP, Africa's long-term growth lies in scaled-up investment in disruptive technologies, especially with the rapid growth of the consumer class, more people entering the workforce, improved levels of education, and mass urbanization.

Our ability to harness the 4IR rests on forging collaborative partnerships between government and the private sector, with policymakers and industry experts, and with our fellow nations on the African continent. Our success rests on the political will of governments, on being prepared to take risks, and on striking a balance between innovation and regulation.

South Africa, together with the other nations of the world, shares a desire to be part of this new age of disruption, and, in doing so, ensures that we move beyond mere connectivity towards sustainable growth, tangible job creation, and an inclusive future.

Figure 5.4

Digitization, automation, and jobs in South Africa

Digitization and automation will both displace workers and generate jobs as productivity increases, technology-responsive policy is enacted, and new occupations are created. As a result of these processes, South Africa could gain up to 1.2 million jobs by 2030.

Jobs gained and jobs lost by 2030 as result of automation, millions, mid-point scenario

Source: Nomfanelo Magwentshu et al., *The Future of Work in South Africa: Digitization, Productivity, and Job Creation* (Johannesburg: McKinsey & Company, 2019).

BOLSTERING AFRICA'S ROLE IN THE GLOBAL ECONOMY

The importance of regional integration

A continental strategy for economic diversification through the AfCFTA and intellectual property rights

Vera Songwe, Executive Secretary, U.N. Economic Commission for Africa & Nonresident Senior Fellow, Africa Growth Initiative, Brookings Institution @ECA_Official @songwevera

With all Africa now signed on to the African Continental Free Trade Agreement (AfCFTA) and 29 countries having ratified it (as of January 2020), the region is now implementing a single continental market for goods and services and laying the foundations for the establishment of a continental customs union. Many on the continent look to the AfCFTA as an investment, economic diversification, and job creation blueprint that will shape the future of Africa in the years to come, help meet the SDG targets by 2030, and consolidate progress toward the African Union's Agenda 2063. Indeed, with a combined GDP of over $2.3 trillion and a population of 1.2 billion—of which most are below the age of 30—African countries stand to gain substantially from intra-regional trade.

Progress on the finalization of AfCFTA Phase I negotiations, namely, the establishment of the schedules of concession for trade in goods, rules of origin, and specific commitments for trade in services, is encouraging. However, Africa will need to do more than just increase trade in existing commodities to benefit fully from the AfCFTA, hence the importance of beginning Phase II of negotiations on investment, competition policy, and intellectual property rights.[1] In particular, with an increasingly digitized economy and a store of innovative youth, working on IP registration and protection will be key to harnessing the full potential of the AfCFTA and securing Africa's future.

Still-low intra-regional trade highlights the potential gains from the AfCFTA

Though intra-African trade has been increasing slightly, it remains substantially below optimal levels, and intracontinental trade is still very low compared to the rest of the world. The share of intra-African exports as a percentage of total African exports has increased from about 10 percent in 1995 to around 17 percent in 2017, but it remains low compared to levels in Europe (69 percent), Asia (59 percent), and North America (31 percent).[2]

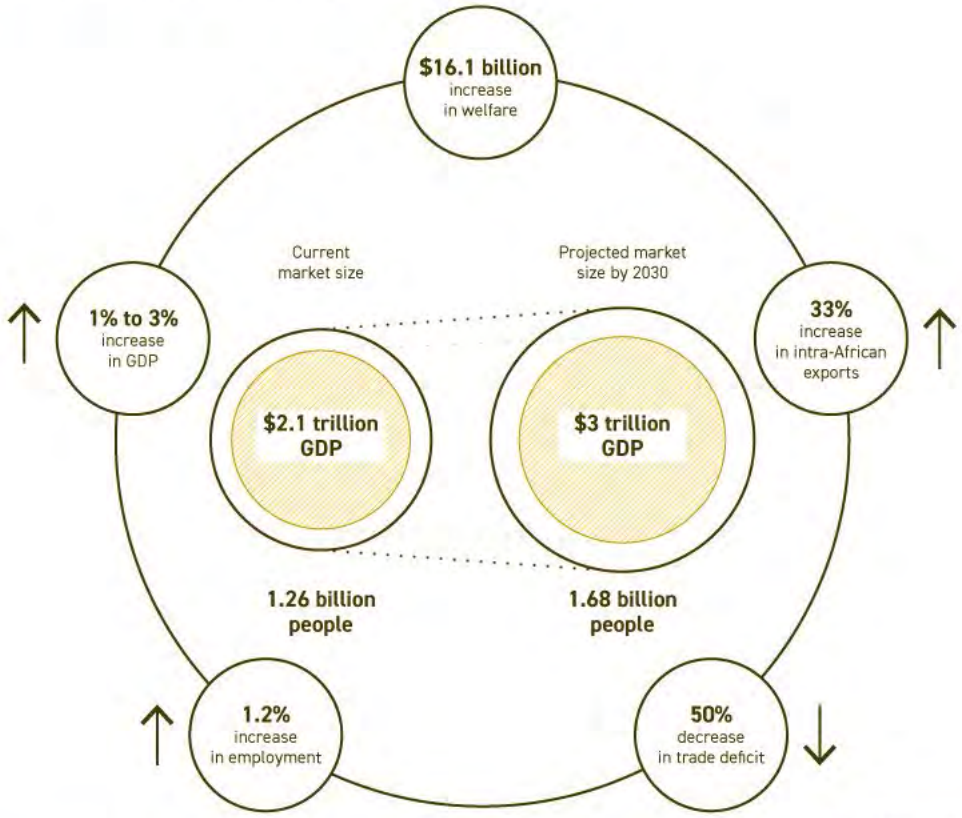
1 See Vera Songwe, "Africa must take a lead role in the data economy," *Financial Times*, October 14, 2019.

2 United Nations Economic Commission for Africa, *Assessing Regional Integration in Africa IX: Next steps for the African Continental Free Trade Area* (Addis Ababa: United Nations Economic Commission for Africa, 2019).

Figure 6.1

Gains from the African Continental Free Trade Area

Implementation of the AfCFTA is expected to boost African welfare, GDP, and intra-African trade. The below figures show the continent's potential gains under a scenario in which there is 100 percent liberalization of tariffs on trade in goods. UNCTAD states that the gains will arise from increased employment, improved use of domestic resources to increase the productivity of the manufacturing and agriculture sectors, and access to cheaper products. These gains will not accrue evenly among all countries, but, on the whole, Africa will benefit from the AfCFTA.



Source: UNCTAD, "The Africa Continental Free Trade Area: The Day After the Kigali Summit," UNCTAD Policy Brief 67 (2018).

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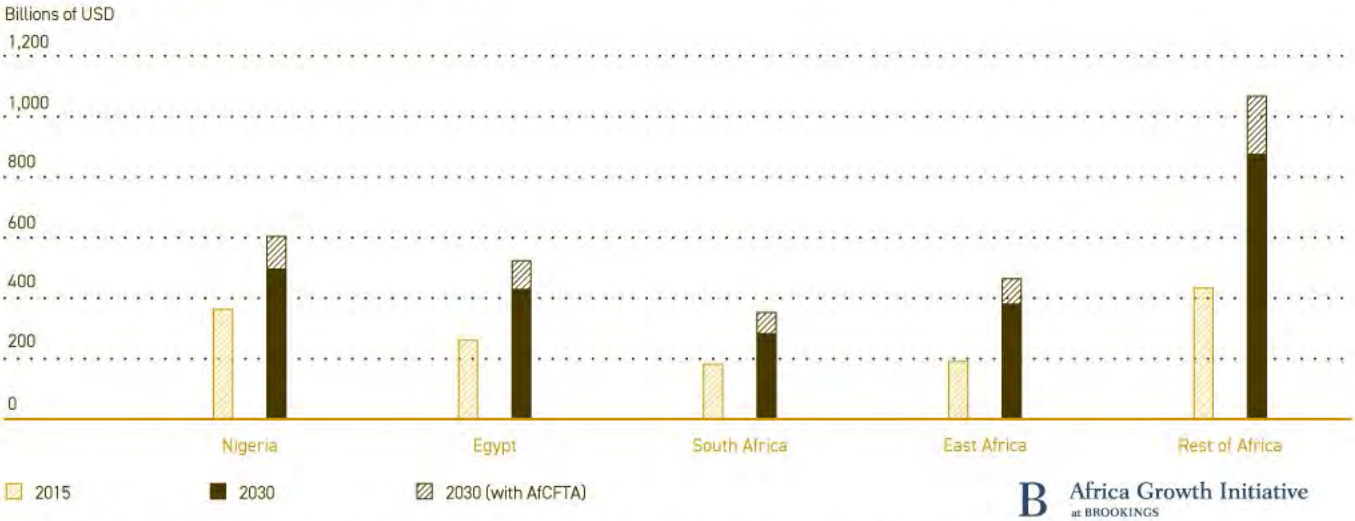
Projected GDP of Africa with and without the AfCFTA



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Source: Brookings Africa Growth Initiative, using data from Jacques Bughin et al., Lions on the Move II: Realizing the Potential of Africa's Economies (Brussels: McKinsey & Company, 2016).

Figure 6.2

Regional integration among selected regional economic communities

Africa's current regional trade agreements only cover a limited number of policy areas, and have had limited impact on regional integration, infrastructure, and the free movement of people. The AfCFTA is far more ambitious, and will cover as many as 20 policy areas, eight more areas than the most comprehensive current regional agreement, the EAC.

	AfCFTA	Common Market for Eastern and Southern Africa (COMESA)	East African Community (EAC)	Economic Community of West African States (ECOWAS)	Southern African Development Community (SADC)
Tariffs on manufacturing goods	✓	✓	✓	✓	✓
Tariffs on agricultural goods	✓	✓	✓	✓	✓
Export taxes	✓	✓	✓		✓
Customs	✓	✓	✓	✓	✓
Competition policy	✓	✓	✓		
State aid	TBN	✓	✓		
Antidumping	✓	✓	✓	✓	✓
Countervailing measures	✓		✓		✓
Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS)	✓				✓
State trading enterprise (STE)	✓				
Technical barrier to trade (TBT)	✓		✓		✓
General Agreement on Trade in Services (GATS)	✓			✓	✓
Sanitary and phytosanitary (SPS)	✓	✓	✓		✓
Movement of capital	✓	✓	✓	✓	
Public procurement	TBN				
Investment	✓				
Intellectual property rights (IPRs)	✓	✓			
Environmental laws	TBN				
Labor market regulation	TBN				
Agreement on Trade-Related Investment Measures (TRIMs)	TBN				

✓ Covered under trade agreement TBN To be negotiated

Source: World Bank, World Development Report 2020: Trading for Development in the Age of Global Value Chains (Washington, D.C.: World Bank, 2019).

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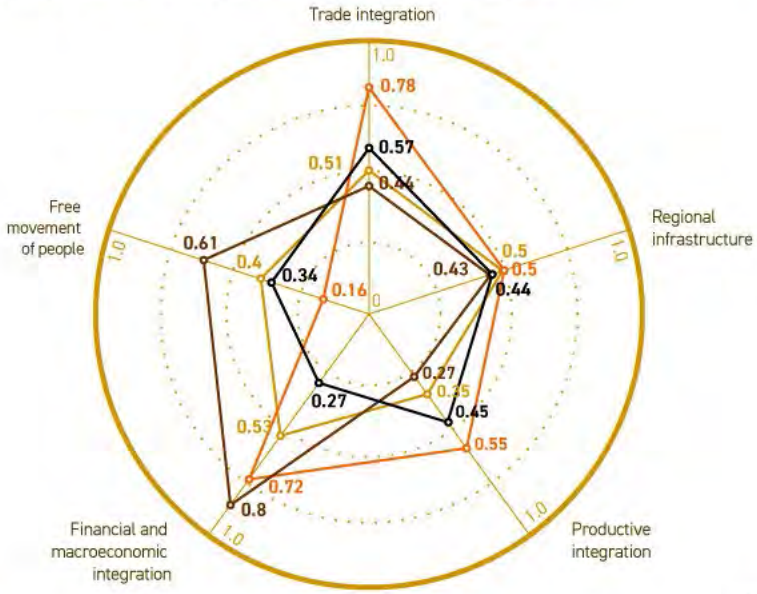
Figure 6.3

Progress on various dimensions of regional integration

The African regional economic communities continue to make progress towards integration, but progress has been uneven across the communities. Notably, the ECOWAS and EAC regions are leading on financial and macroeconomic integration, and the EAC and COMESA have made the most progress on trade integration. Most glaringly, for all regions, is the insufficient progress around regional infrastructure.



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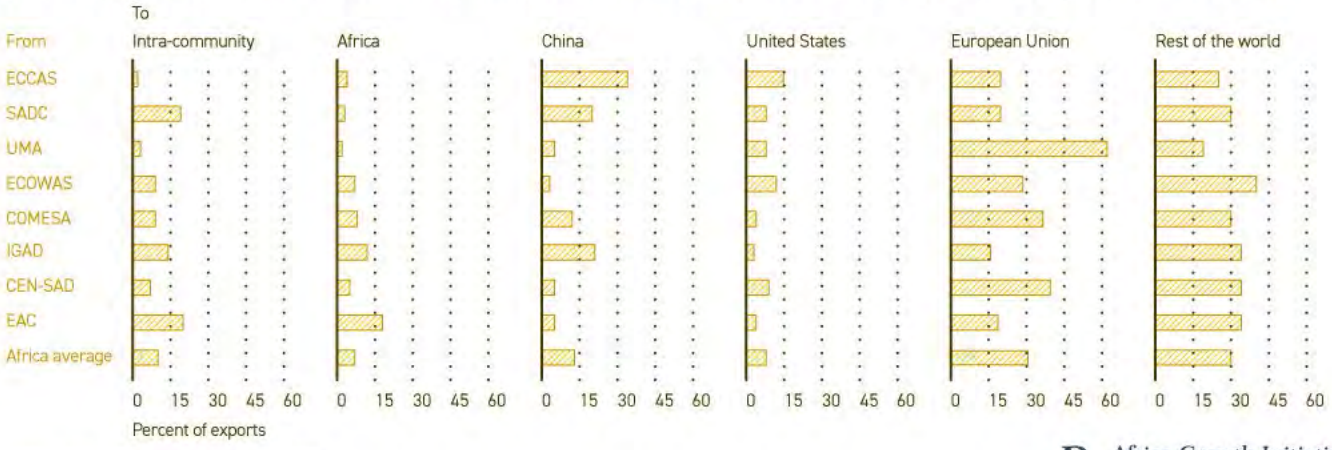
Note: Progress in each dimension of regional integration is scaled from a minimum of 0 to a maximum of 1, where 1 is the best score attainable. Scores in each dimension are calculated by weighting and standardizing selected indicators for each dimension. Productive integration refers to the ability to take part in regional and global value chains in order to unlock productive potential and make sectors more globally competitive and considers items such as shares of intra-regional intermediate goods exports and imports.
Source: "Regional Economic Communities," Africa Regional Integration Index, accessed December 11, 2019.

Figure 6.4

Export trade of the African regional economic communities by partner, 2010–2017 average

The challenge of the AfCFTA will be to increase regional trade beyond the immediate regional economic communities. Though intra-African trade has been increasing slightly, it still remains substantially below optimal levels. With intracontinental exports and imports averaged at 17 and 12 percent, respectively, clearly the region cannot rely solely on its own economy for a demand pull or push. As the figure shows, though, tremendous potential for growth lies within the continent's borders. For example, while both SADC and the EAC export about 20 percent of their goods within their sub-region, only the EAC exports over 15 percent to the rest of Africa. In short, the scope for growth is great when it comes to trade with the rest of the continent. With strong policies for diversifying goods production and also export markets, the AfCFTA could incentivize African countries to shift imports from outside the region to neighboring countries instead.



Source: UNECA, compiled from UNCTAD database.

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Supporting innovation will boost export diversification

For Africa to realize the full potential of the AfCFTA it will have to put in place policies that encourage and protect innovation by both residents and non-residents alike, but with a sharper focus on domestic innovation.

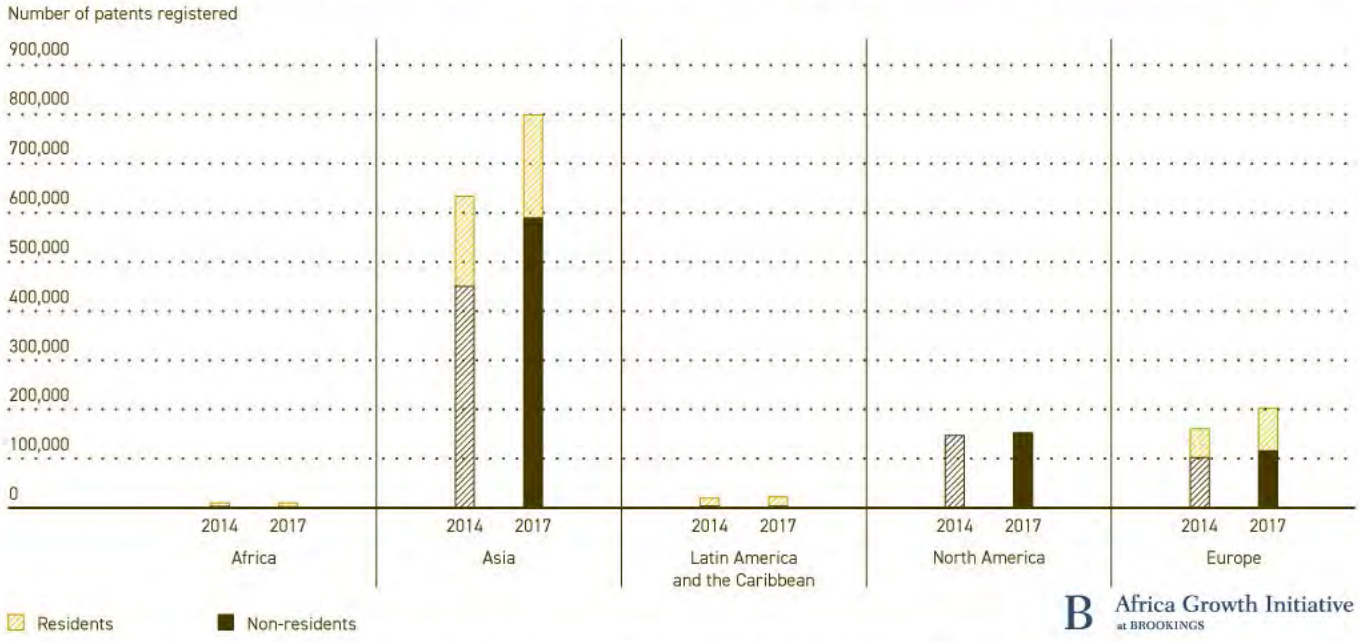
Indeed, an important component of export diversification is innovation—for which Africa is primed due to its young, dynamic, and increasingly educated population. Unfortunately, current policy frameworks on the continent do not adequately protect and encourage innovation.

One indication of innovation is the number of patent registrations filed in countries, and Africa is lagging globally. In 2017, African countries registered 1,330 patents by residents, compared to 1,682 in Latin America and the Caribbean, 592,508 in Asia and 116,359 in Europe (Figure 6.5). Moreover, contrary to the case of Latin America, Asia, and other developing market economies, in Africa, registration by non-residents is higher than by residents and growing faster. The substantial difference between patents registered by residents and patents registered by non-residents could be a result of the high and prohibitive costs of patent registration, as non-residents often are more able to afford patent registration than residents. For example, it is more expensive to register an idea in Côte d'Ivoire, Kenya, or Senegal than it is to register in Canada, the U.K., or Japan, which creates an avoidably and prohibitively high barrier to innovation (Figure 6.6). Notably, countries with more diversified economic bases—such as Tanzania, South Africa, and Botswana—also tend to have lower patent registration costs.

Figure 6.5

Number of registered patents by region

Patents are important tools for encouraging and protecting domestic innovation. As such, an important indicator of innovation is the number of patent registrations filed in a country. Notably, unlike other regions of the world, patent registration by non-residents in Africa is higher than that by residents and is growing faster. Many experts posit that the substantial difference between these numbers could be a result of the high and prohibitive costs of patent registration.

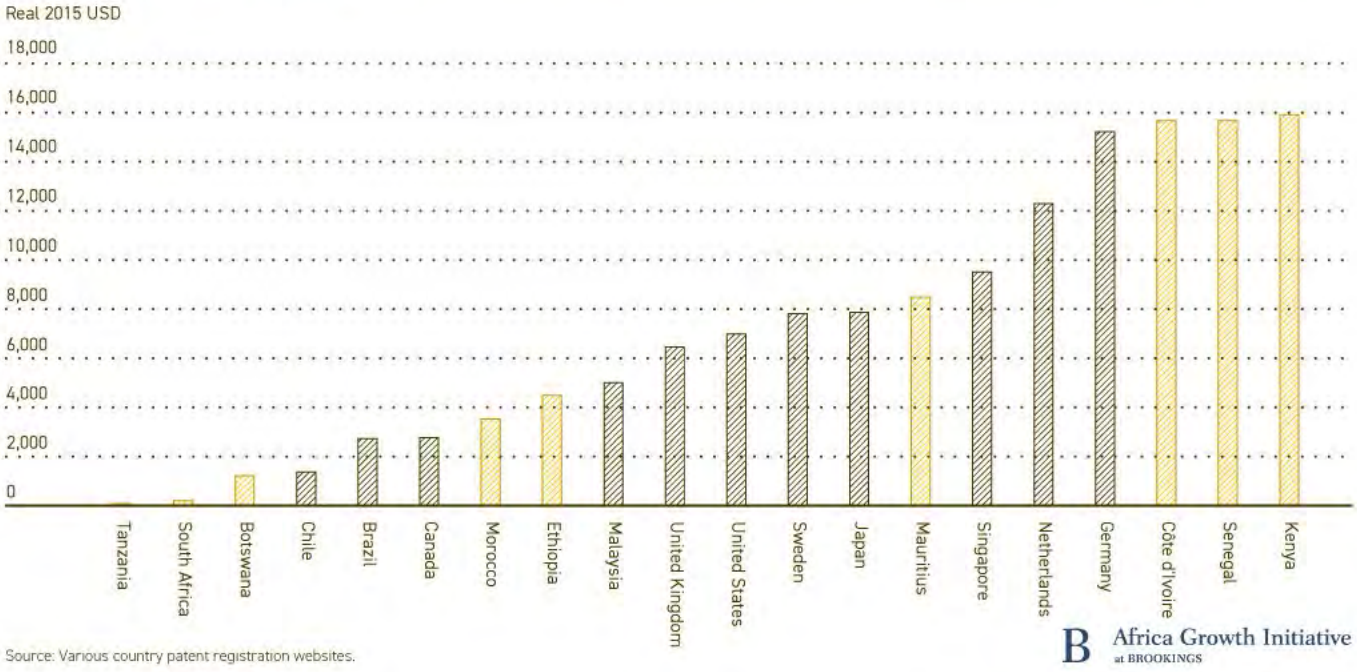


Source: "2018 IP statistics," Africa Regional Intellectual Property Rights, accessed December 6, 2019. African Union, Statute of the Pan African Intellectual Property Organization (Addis Ababa: African Union, 2016).

Figure 6.6

Cost of a patent for a small entity, select countries

Patent registration fees in Africa range from some of the lowest to very high, and too often are much higher than those in developed countries, creating an obstacle for local innovators and entreprenuers.



In GDP per capita terms, registration costs are even more prohibitive for Africa's innovators, who are more often young and without jobs. Kenya's patent registration fees are 13.3 times its GDP per capita, while for Senegal and Ethiopia the ratio is 10.2 and 7.9 respectively. By contrast, the same ratios for the U.S., Germany, and Malaysia are 0.1, 0.3 and 0.4, respectively, a reflection of more affordability in registration of ideas in other regions.

Two key sectors in which IP protection along with the AfCFTA will boost growth

New technology platforms are developing across the continent, from Ride in Ethiopia to health care platform Bylos in Rwanda. In Kenya, for example, nearly 50 percent of all transactions are done through mobile payment.

In 2018, Africa's **services sector** accounted for over 52 percent of Africa's GDP—largely boosted by the booming digital sector. (For more on the potential of technology and digitization in boosting African economies, see Chapter 5). These technologies are empowering new small and medium entrepreneurs, creating jobs, diversifying economies, improving productivity, and facilitating entry into new markets.[3] The AfCFTA can provide the vehicle for going to scale through a pooled African market—but only if these innovations are adequately protected, a move that requires innovation registration to be standardized across markets. Currently, in some cases, new technologies need to be registered in every country of entry, adding another barrier for young entrepreneurs already facing challenges like financing and poor infrastructure. While policymakers invest heavily in cybersecurity, which is important, significant investment is needed in the protection of innovation by ensuring the application of affordable harmonized IP laws across the continent.

3 Martin Wolf, "The fight to halt the theft of ideas is hopeless," *Financial Times*, November 19, 2019.

In addition, an important area of the intellectual property rights discussion is in the health and pharmaceutical sector. The **health and biotechnology market** holds great potential for the continent. Indeed, a recent report by Global Market Insights projects that the size of the biotechnology market will almost double from about $399.4 billion in 2017 to $775 billion by 2024.[4] Currently, Africa accounts for over 25 percent of the pharmaceutical market, but produces only 2 percent of the drugs used there. The continent also imports over $14 billion worth of drugs, many of which are produced using African plant varieties.

The development of a biotechnology supply chain on the continent will not only help to diversify Africa's economies but will also create jobs. A well-exploited African health care and wellness sector, including regional pharmaceutical value chains, could create over 16 million jobs across the continent. The IP rights discussion is central to the success of Africa's health and pharmaceutical sector. While the World Trade Organization (WTO) supports rules requiring countries to provide an effective level of plant variety protection,[5] an IP protocol in the AfCFTA can address gaps in the existing WTO rules by protecting traditional knowledge, cultural expression, and biological resources.

With the collective weight of the continent behind the AfCFTA, African countries may be able to finally get an agreement harmonizing key IP issues that are not at all or not fully covered under other multilateral treaties.

Next steps for Africa and the Continental Free Trade Agreement

The current trade tensions among the United States, China, and others loom large on the global agenda. Moreover, a synchronized slowdown of the world economy, underpinned by Brexit and a weak euro area, would lower world demand. These challenges portend a difficult external environment and underscore the importance of the AfCFTA. To benefit from the AfCFTA, though, including economic diversification, implementation of policies that encourage and protect innovations are fundamental prerequisites.

In addition to protecting innovation, Africa will have to work towards a **continental policy on research and development** that enables African governments to accelerate research and development in universities. Second, as more and more industries locate to the continent, Africa must ensure that the innovations from its new companies are available to or shared with local producers. Third, to support innovation, **education, especially higher education and education for girls**, has never been more crucial for Africa. Growth in areas like the pharmaceutical and biotechnology sectors requires substantial investments in higher education. Education will support efforts to build and strengthen Africa's competitiveness in an increasingly global environment where margins are dropping and competition is increasing. Already, regional institutions like the African Regional Intellectual Property Organization and the Pan-African Intellectual Property Organization provide for regional cooperation in the management of IPs as Phase II negotiations of the AfCFTA begin, but a **continental regulatory body** could help to harmonize regulation and implementation of policies.

We're still getting out of the starting gates, but already Africa is speeding ahead. While implementation of this landmark trade agreement will require time and effort, protecting the spirit of and Africa's aspirations for increased trade and prosperity should be the focus of the policymakers, the private sector, and the international community alike over the next decade and beyond.

4 Sumant Ugalmugale and Rupali Swain, *Biotechnology Market* (Selbyville, DE: Global Market Insights, 2019).

5 See Article 27.3 of the Agreement on Trade Related Aspects of Intellectual Property Rights (TRIPS) – plant and animal inventions are patented if they are new. See also Alan Oxley, *Retarding Development: Compulsory disclosure in IP law of ownership and use of biological or genetic resources* (Melbourne: Australian APEC Study Center, Monash University, 2006).

Viewpoint

Support for governance in Africa will level the playing field for US commercial engagement with the region

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To many nations and international businesses, Africa is increasingly an important investment destination. In August, at the Tokyo International Conference on African Development, Japan's private sector committed to investing $20 billion over three years in Africa.[1] At the first Russia-Africa Summit in Sochi in last October, the Kremlin announced that $12.5 billion worth of deals were reached, although mostly in the form of memorandums of understanding.[2] Even as Europe wrestles with Brexit, the European Union held the fifth Africa business forum in Morocco last November. And, in an effort to spur investment, the U.S. has sought to revamp its commercial engagement in Africa through the creation of the $60 billion U.S. Development Finance Corporation and a more active commercial diplomatic strategy known as Prosper Africa. The list goes on.

While this trend is welcome, American companies have yet to enter African markets at a significant scale due to the perceived risk in investing there. In fact, only 14 African countries are in the top half of the Transparency International's Perceptions of Corruption Index, which ranks 180 countries according to the perceived levels of public sector corruption. Conversely, 29 countries from the continent are ranked among the bottom 50 nations. Given the extra-territorial reach of the U.S. Department of Justice in its efforts to enforce the Foreign Corrupt Practices Act, American companies are likely to be risk-averse entering many emerging markets, especially in Africa.

Indeed, Paul Boynton, chief executive of Old Mutual Alternative Investments, notes that global investors are holding back because of the perceived risks of investing in Africa, which in reality are much higher than the actual risks.[3] Indeed, the recent governance trend line has been positive, if uneven. The Ibrahim Index of African Governance notes that three out of four African citizens now live in a country where governance has improved over the past 10 years.[4] At the same time, more elections are taking place in Africa than ever before, although fewer than one in six leads to a full transfer of power to the opposition.[5] In fact, virtually every country now holds an election on a regular basis. The African Union, which will suspend a government that comes into power

1 Aisha Salaudeen, "Japan takes on China with a planned $20 billion investment in Africa," *CNN*, August 30, 2019.
2 Henry Foy, "Russia turns on the charm at first Africa summit," *Financial Times*, October 24, 2019.
3 Paul Boynton, "Sub-Saharan Africa's struggle to attract impact investment," *Financial Times*, August 28, 2019.
4 Mo Ibrahim Foundation, *Ibrahim Index of African Governance Report* (London: Mo Ibrahim Foundation, 2018).
5 Martin Ronceray and Bruce Byiers, "Elections in Africa—Playing the game or bending the rules?" *ECDPM Discussion Paper* 261 (2019).

through extra-constitutional means, has committed member governments to "regular, free, fair and transparent elections" through the African Charter on Democracy, Elections and Governance.[6]

Since the end of the Cold War and the fall of the Berlin Wall, the demand for accountable governance in Africa and regular elections has become one of the region's defining characteristics. Most recently, for example, in Zimbabwe, an impressive 70 percent of the electorate turned out for the first post-Mugabe elections, though they also tragically resulted in at least six deaths in post-election violence when the military turned on protestors. Given Africa's aspiration for free and fair elections, it is in the interests of the continent's partners to redouble their funding for improved transparency, fair and free elections, and respect for the rule of law, which inevitably will lead to increased foreign direct investment.

The U.S. should be a leader in this effort. Africa receives about $16 billion in aid annually from the U.S., including long-term development assistance, humanitarian programs, political aid and military and security assistance.[7] However, when it comes to support for democracy programs—elections, human rights and gender equality organizations, political parties, and legislatures—the amount spent across Africa's 54 countries in 2017 was a paltry $286 million, only 1.78 percent of total aid, or about $5 million per country.[8] As it concerns investments in anti-corruption programs and institutions in Africa that same year, the U.S. spent only $9 million. This equals just over $165,000 per country, a relatively insignificant amount given the challenges and potential commercial significance of many African markets.

Given Africa's aspiration for free and fair elections, it is in the interests of the continent's partners to redouble their funding for improved transparency, fair and free elections, and respect for the rule of law, which inevitably will lead to increased foreign direct investment.

The U.S. would do well to step up investments in Africa's democratic institutions and processes. A more transparent investment environment in Africa will level the playing field between American companies and many of its competitors, especially those from China. Given the region's youthful population and the spread of social media in urban areas, the demands for democratic accountability and transparency are likely to grow. So will the demand for jobs, which only the private sector can provide at the required scale. Indeed, employment in Africa continues to be a challenge, as 85.8 percent of employment is in the informal sector, and the region needs to create 12 million jobs annually to keep up with population growth.[9]

Helping to strengthen democratic and transparent processes and institutions in Africa will improve the investment environment. Improved governance will decrease the perception of risk in Africa, and the volume of U.S. investment in the region will likely grow. Both Africa and the U.S. will be significant beneficiaries.

6 African Union, *African Charter on Democracy, Elections, and Governance* (Addis Ababa: African Union, 2007).
7 James McBride, "How Does the U.S. Spend Its Foreign Aid?" *Council on Foreign Relations*, October 1, 2018.
8 OECD. 2019. Creditor Reporting System. Accessed on September 23.
9 Celestin Monga, "Jobs: An African Manifesto," in *Creating Decent Jobs: Strategies, Policies, and Instruments*, eds. Celestin Monga, Abebe Shimeles, and Andinet Woldemichael (Abidjan: African Development Bank, 2019), 1-47.

Viewpoint

Unpacking the engagement of nontraditional actors in Africa: China and other emerging players

Yun Sun, Nonresident Fellow, Africa Growth Initiative, Brookings Institution

While China, Europe, and the United States have been intensifying their competition in Africa over the last decade, the next decade is likely to see other players making more prominent moves. Among them, India, Russia, and major actors in the Middle East are already shifting resources and attention to the promising continent.

Chinese financing begins to show downsides

China's comparative advantage has laid in the large financial resources at its government's disposal and its state-backed economic engagement model. Although Beijing has indicated a desire to increase private equity investment in Africa, it is unlikely to abandon its overall priority on infrastructure development financed by Chinese loans. But as the frenzy over the large Belt and Road Initiative infrastructure projects in Africa subsides with the existing projects' loan payments due, African governments have to deal with the sobering financial consequences of projects such as the Addis-Djibouti railway and the Mombasa-Nairobi railway.

The Chinese financing model has been widely criticized by observers, and the debt sustainability problem does not only affect African government borrowers, but also the Chinese banks as creditors. As the Second Belt and Road Forum in April 2019 ushered China into a stage of more stringent and responsible lending mechanisms, the hope is that Chinese financing to Africa will become more disciplined. But this also requires African governments to be more disciplined and cautious in their economic cooperation with China. Instead of indulging in what appears to be easily available funding, African governments will have to recognize and prepare for the consequences of debt to China, both economically and in terms of security and other strategic implications.

India looks to engage through technology

India is also growing its partnership and deepening economic and political relations with Africa. Although the amount of financing may not rival that of China, India's engagement efforts are comprehensive, including bilateral senior visits, increased trade and investment, development assistance, and trilateral cooperation alongside other countries. Indian technology centers in Africa have the potential to advance high-tech development in the region, an area that other partners have generally neglected. In fact, since 2015, six IT centers have been established in the region, including the Center of Excellence in Information Technology in Morocco, a Center for Advanced

Information Technology in Lesotho, and related centers in Madagascar and Zimbabwe. India has also built up vocational training centers in seven nations, including the Gambia and Rwanda.

Russia is reviving its involvement

Although Russia is nowhere near where the Soviets had been in terms of engagement and influence in Africa, Moscow is launching a charm offensive to resurrect old bonds, strengthen its commercial and security presence, and garner support on the world stage. Notably, this relationship is drawing scrutiny, largely from the United States, which is critical of what it calls Russia's "votes for arms" deals.[1] In the meantime, Russia remains a key player in arms sales to Africa, although investment and other economic activities have a long way to go.

Although Russia's commercial engagement is lagging, progress is notable, with its trade with Africa jumping from $1.8 billion in 2010 to $4.8 billion in 2018.[2] Given Russia's strength and Africa's needs in the energy sector, partnerships and investments in traditional oil and gas as well as nuclear power are arising in Côte d'Ivoire, Egypt, Ethiopia, Ghana, Kenya, Nigeria, Rwanda, Zambia, and elsewhere. Furthermore, in October 2019, Russia hosted the first-ever Russia-Africa Summit in Sochi, during which $12.5 billion worth of deals were struck. Russia also announced the forgiveness of $20 billion in debt.

Turkey is igniting engagement

Turkey has been gradually raising its profile in Africa for the past decade. In the past 15 years, its trade with African countries has quadrupled from $5.4 billion to $20.6 billion. Turkey and Africa have established summits and a formal partnership since 2008, and Turkish President Tayyip Erdoğan has made more than 30 trips to Africa since coming to power in 2003.[3] Under his watch, Turkey has expanded its diplomatic presence to more than 40 embassies in Africa, up from 12 in 2009. Similarly, the state-controlled Turkish Airlines now flies to more than 50 African destinations, up from 14 just nine years ago.

Countries in the Middle East look to bolster their regional presence

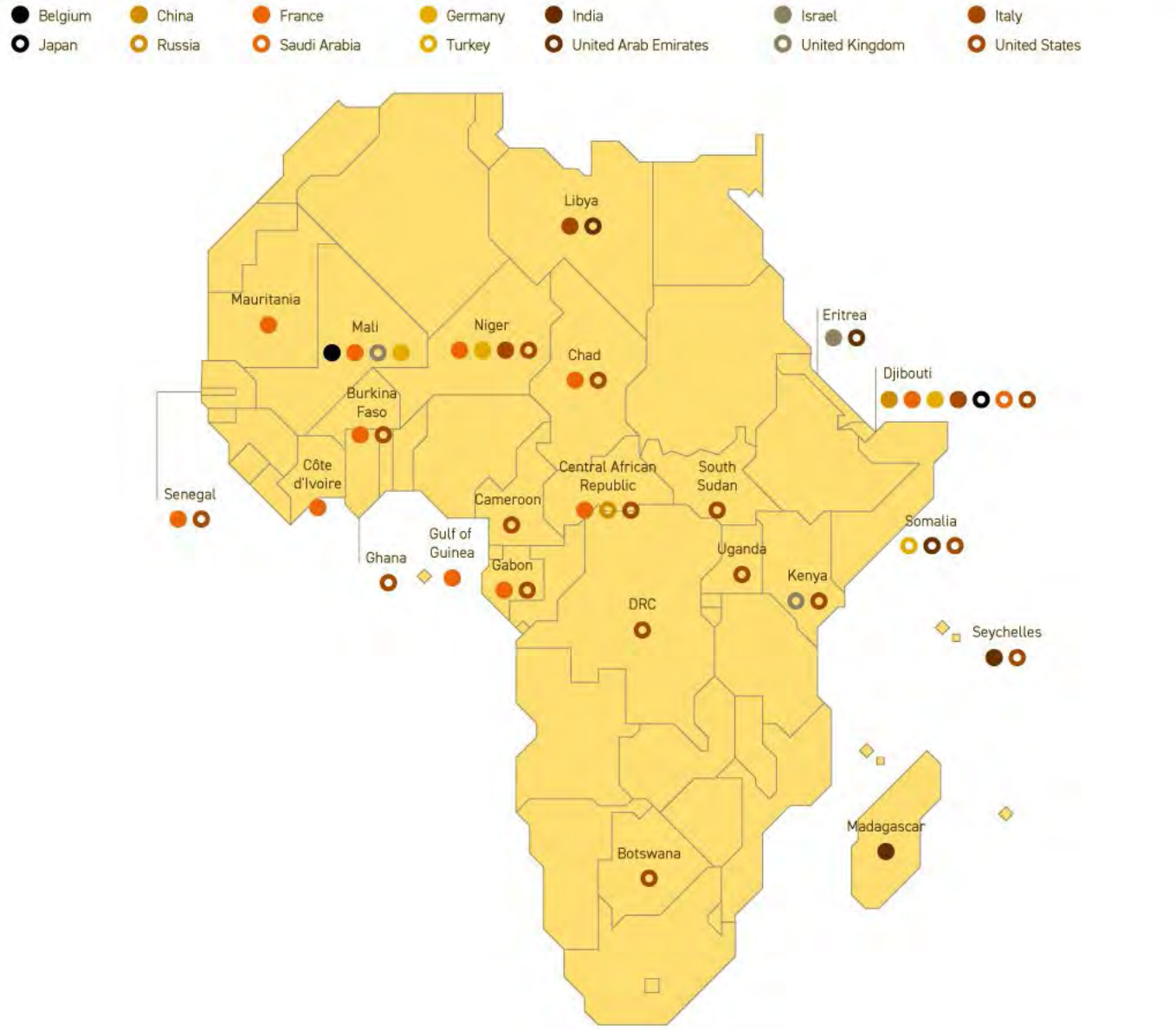
The Middle Eastern countries have demonstrated increasing interest in Africa's economic potential in recent years. As a regional and global trade hub, the **United Arab Emirates** (UAE) is quickly recognizing the tremendous potential Africa's emerging markets and industrialization bring, and has become a leader in African investment within the Gulf Cooperation Council, overtaking Saudi Arabia in 2016. Due to the UAE's geographical proximity to Africa, many large multinational companies have already established their Middle East and Africa headquarters in Dubai. Both Dubai and Abu Dhabi have made considerable investments in African infrastructure, technology, and energy: For example, during President Cyril Ramaphosa's visit to the UAE in July 2018, the country announced a $10 billion investment in infrastructure and enterprise growth within the South African economy over the next few years.

1 "Remarks by National Security Advisor Ambassador John R. Bolton on the Trump Administration's New Africa Strategy," *White House National Security Council*, December 13, 2018.
2 Landry Signé, "Vladimir Putin is resetting Russia's Africa agenda to counter the US and China," *Brookings Institution*, October 22, 2019.
3 Peter Kenyon, "Turkey Is Quietly Building Its Presence in Africa," *NPR*, March 8, 2018.

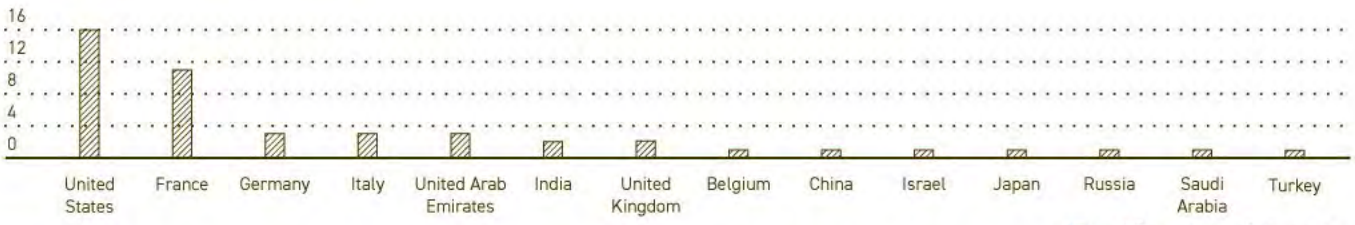
Figure 6.7

Defense partnerships: Military outposts in Africa

As commercial engagement has increased so has security collaboration, with many African countries hosting a number of European and Asian military outposts. Djibouti's location on the Red Sea makes it a particularly strategic security partner. Even so, the United States remains the partner with the most military outposts in the region, followed by France.



Military outposts by foreign country



Source: Andrews Atta-Asamoah, "Proceed with caution: Africa's growing foreign military presence," Institute for Security Studies, August 27, 2019.

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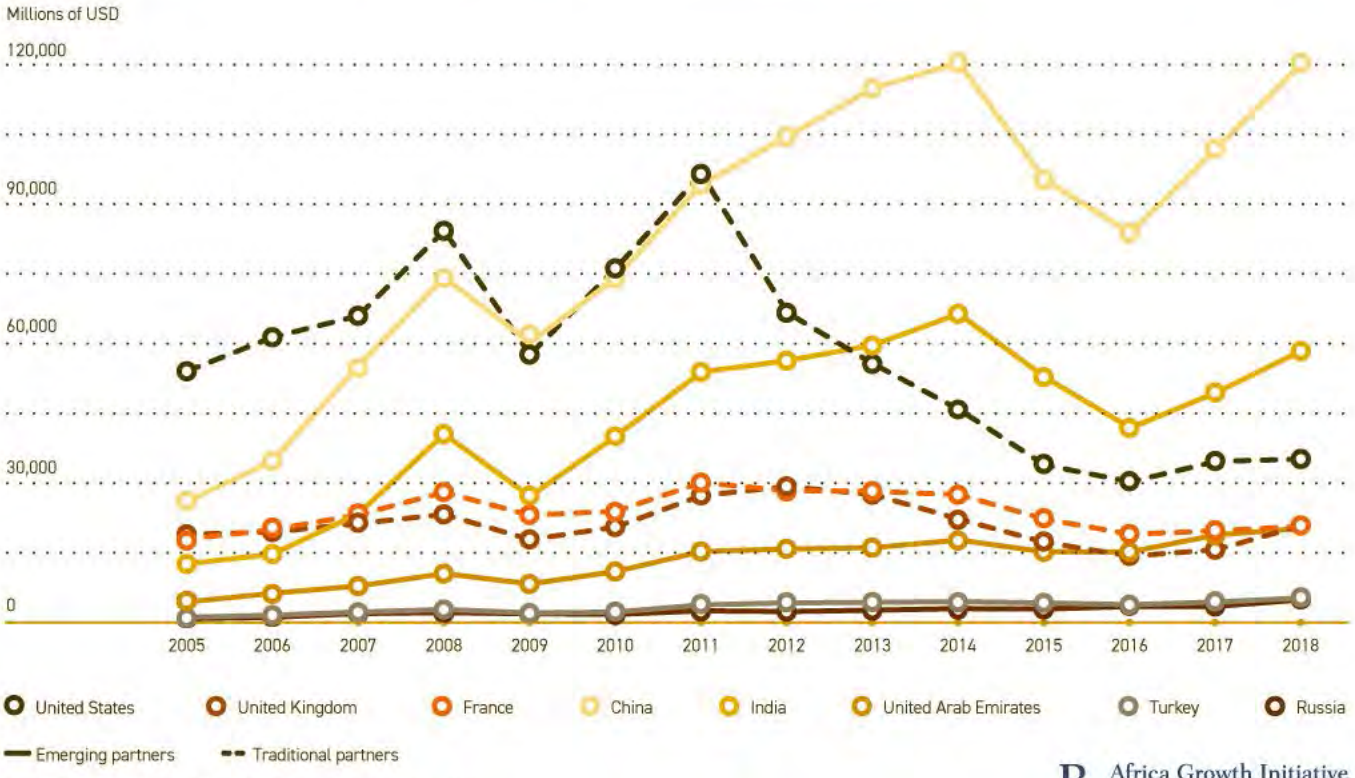
Figure 6.8

Africa's commercial and diplomatic partnerships

Africa's partnerships with the world have rapidly evolved in recent years and are likely to continue doing so over the next decade. Emerging partners such as China, India, the United Arab Emirates, Turkey, and Russia are increasingly trading with the continent, holding summits with African leaders, and establishing a military presence in Africa. In contrast, traditional partners such as the U.S. and countries in the European Union have, in many cases, decreased their involvement with Africa.

Commercial partnerships: Trade with traditional and emerging partners

While China, India, and other new partners increase their commercial relationship with the continent, trade with more traditional partners, especially the U.S., is dipping.



Source: "Direction of Trade Statistics," IMF, accessed November 12, 2019.

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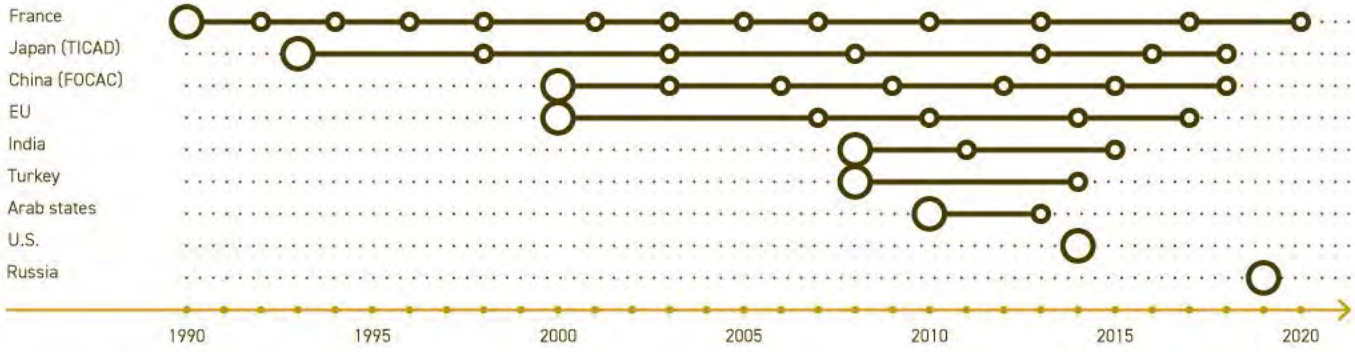
Diplomatic partnerships: Summits with African leaders

The United States is playing catch-up in terms of using a continent-wide leaders' summit to frame its strategy with Africa, as Japan, China, and the European Union have all maintained long-running Africa heads-of-state summits. Russia is the newest country to engage in such a way. Summits offer opportunities not only for high-level diplomatic engagement, but also facilitation of commercial relationships.



Note: Larger dots represent first conference meeting.
Source: Judd Devermont, "The Art of Summitry," Center for Strategic and International Studies, September 30, 2019.

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Partially reflecting the competitive relationship between the UAE and **Saudi Arabia**, during that same trip, Ramaphosa was able to secure a $10 billion investment commitment—focused on reviving South Africa's energy sector—from Saudi Arabia. In its quest for food security, Saudi Arabia has also become the top investor in agriculture in Africa.

Africa might just be the new battleground for the feud between the Gulf states and **Qatar**. Qatar currently has more embassies in Africa than any country other than Turkey. To expand security ties and develop economic relations, including in its quest for food security, the Qatari government has been increasingly active in African peace and security affairs and economic investment. Indeed, Qatar has played the roles of both a mediator and an investor in the Sudan Darfur issue and between Eritrea and Djibouti in their border disputes.

As the world's fastest-growing continent, Africa is attracting attention and resources from all key world and regional players. This trend will continue to grow in the foreseeable future, resulting in a much more diverse and complex picture in terms of the external players' roles and impact on Africa. The diversification of Africa's external partners, which will continue over the next decade, is generally a positive trend, as the involvement of more interested players will reduce the continent's dependence on any single party. Now, African policymakers and leaders must manage the complex competitive relations among these new partners while maximizing the gains for African society and peoples. Capacity building of African states and civil society is now an even more pressing task.

Viewpoint

How to make the global governance system work better for Africa

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The provision of global public goods (GPG)—such as mitigating climate change, fighting tax avoidance, or preserving and extending fair rules-based international trade—is even more important for Africa than for other parts of the world. And yet, Africa could be sidelined from the decision-making process for the foreseeable future in a global governance system dominated by the G-2 (the United States and China) or the G-3 (should the European Union succeed in acting cohesively).

Mitigating climate change. A prime example of a GPG in which Africa has an outsized stake is climate protection given the region's high exposure to climate change. In fact, according to the Intergovernmental Panel on Climate Change, given Africa's geographic position, high

dependence on ecosystem goods and services, and weak adaptation capacity, no continent is more vulnerable to the effects of climate change that come with worsening drought conditions, increased water stress, and sea level rise.1 (For more on the impacts of climate change on Africa, see Chapter 4.)

Protecting corporate tax bases. Given Africa's challenge with domestic resource mobilization, another important example of a GPG for the region is the protection of corporate tax bases—in other words, preventing large corporations from shifting their accounting profits to the countries with the lowest tax rates. This issue is particularly important for Africa, where corporate taxes are a substantial fraction of total government revenue.[2] Some progress has recently been made on this front under the OECD/G-20 Inclusive Framework on Base Erosion and Profit Shifting.[3] The OECD-sponsored work has expanded to the issue of fair taxation of digital platforms, and is now trying to unify various proposals with the aim of reaching international rules focused on an agreed definition of a country's tax base as well as a global floor to national tax rates.[4] The issues involved remain contested: Progress has been made on tax evasion through the automatic exchange of information between countries, but steps to reduce legal tax avoidance are still being discussed. It is good that many African countries are participating in the work of the OECD/G-20 to make sure the region's interests are well represented.

Africa's mostly small nation-states have a great interest in a rules-based multilateralism rather than an international order based on ad hoc "deal-making," where the very large players can exert their weight in each case

Ensuring a fair and stable system for international trade. As many African countries are small, trade-dependent economies where export-led strategies are necessary for economic success,[5] a fair and stable system of rules governing international trade is a third example of a GPG vital for Africa. Sidelining the World Trade Organization would not be in the interest of African countries.

In these as well as other domains of global governance, Africa's mostly small nation-states have a great interest in a rules-based multilateralism rather than an international order based on *ad hoc* "deal-making," where the very large players can exert their weight in each case.

The way forward

In the past, the least developed countries—including most African nations—were able to secure some special consideration in the domains of trade ("equal but differentiated treatment") and climate (special treatment in the Kyoto protocol), owing to their low income levels. This principle should continue to be applied during the coming decade.

1 Isabelle Niang et al., "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*, ed. Vicente R. Barros et al. (Cambridge, U.K. and New York: Cambridge University Press, 2014), 1199-265.

2 "Corporate tax remains a key revenue source, despite falling rates worldwide," *OECD*, January 15, 2019.

3 "International Collaboration to End Tax Avoidance," *OECD/G-20*, 2019.

4 "OECD invites public input on the Secretariat Proposal for a 'Unified Approach' under Pillar One," *OECD*, November 15, 2019.

5 Vera Songwe and Deborah Winkler, *Exports and Export Diversification in Sub-Saharan Africa* (Washington, D.C.: Brookings Institution, 2012).

However, going forward, Africa's losses because of tax avoidance or global warming threaten to dwarf the gains it may receive through the traditional special treatment regime. Full participation in the rule-making process is thus the first global governance-oriented objective that African nations should pursue.

A related specific objective for African countries should be to argue for the introduction of a population variable in the calculation of voting weights where weighted voting applies, such as in the governance of the Bretton Woods institutions.[6]

True, it would be unrealistic and unjustified for population to be the main determinant of voting weights in international institutions. There is no global democracy, nation-states are still the legitimate constituent units of the global system, and voting weights should reflect nations' capacity and willingness to contribute resources to the provision of global public goods. But population should not be excluded altogether. The basis of global governance has always included a partial recognition of the democratic principle of "one person, one vote," as is evident from the beginning of the Charter of the United Nations: "We the People…" This principle should translate into at least a modest role for population in calculating governance weights.

A world in which the rules of the game are essentially made by the superpowers alone, either globally or within their own spheres of influence, is not in Africa's interest. For Africa to be able to lend its support to the kind of multilateralism from which it will benefit, African nations will have to take further steps in uniting their voices toward this common goal.

A world in which the rules of the game are essentially made by the superpowers alone, either globally or within their own spheres of influence, is not in Africa's interest.

6 Currently, voting weights at the IMF only include GDP, openness, variability of current payments and net capital flows, and international reserves. For details, see Brahima Sangafowa Coulibaly and Kemal Dervis, "The governance of the International Monetary Fund at age 75," Brookings Institution, July 1, 2019.

About the Africa Growth Initiative

Who we are

The Africa Growth Initiative (AGI) at Brookings conducts high-quality, independent research, which helps establish long-term strategies for economic growth and strong policies for development in Africa.

Our work & approach

Our interdisciplinary team of experts draws on the core strengths of Brookings—authoritative and nonpartisan research, a depth of practical expertise, and unparalleled convening power—to develop effective solutions that maintain the momentum and broaden the benefits of growth in Africa. AGI distinguishes itself by ensuring that the analysis it produces is:

- Quantitative: AGI uses data analysis and empirical research to inform its findings, providing an "economic lens" that is applicable to all discussions on Africa and can help pull together disparate narratives on security, humanitarian crises, geopolitics, and extractive industries.
- High Quality: AGI delivers research conducted with the most rigorous academic discipline and subjected to thorough peer review.
- Collaborative: AGI partners with experts throughout Brookings and the academic community, as well as with stakeholders around the world to draw on perspectives from business, government, and practitioners in the field.

Our priorities

Pillar I: Sustainable Financing for Economic Development

AGI explores mechanisms for African governments to fill the gaps in their domestic resource mobilization policies and thus create more sustainable development financing overall through two main themes:

- Domestic resource mobilization (looking inward)
- Financial innovation (doing more with less)

Pillar II: Structural Economic Transformation

In order to build resilience against shocks and looming challenges linked to rapid population growth and high unemployment on the continent, AGI is committed to exploring pathways for structural economic transformation in Africa to achieve sustainable and inclusive growth.

- Maintaining the growth momentum (economic diversification and management of risks)
- Broadening the benefits (no one left behind)

Cross-cutting Pillar: Innovative Technologies for Economic Development (leapfrogging)

The potential for technology to leapfrog in African development cannot be overstated. Under this theme, AGI explores where the next technological innovation can be transformational and how they can be leveraged to deliver on development challenges in various areas.

Pillar III: US-Africa Relations (fit for the 21st century?)

AGI's relationships on the continent and strategic placement in Washington D.C. create opportunities for AGI to engage U.S. and multilateral policymakers on recommendations for an updated and mutually beneficial U.S.-Africa relationship.

- US-Africa and China-Africa relations
- Nexus of economic development, security challenges, and humanitarian issues

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