



# WHITE PAPER ENTREPRENEURSHIP AND FREE TRADE

**Volume II** – Towards a New Narrative of Building Resilience



AFRICAN DEVELOPMENT BANK GROUP  
GROUPE DE LA BANQUE AFRICAINE  
DE DEVELOPPEMENT

## **Fragility is the risk**

The compartmentalization of countries into fragile and non-fragile states obscures realities within countries. Fragile states include households and businesses that are not desperate or highly vulnerable, while non-fragile states include households and businesses that are. Therefore, tackling fragility and building resilience is a challenge that affects all African states to varying degrees.

## **Resilience is the opportunity**

Conventional measures to prevent and mitigate fragility tend to focus on international institutions, non-governmental organizations and national governments. However, without a considerable role for the private sector and greater regional infrastructure and economic integration, resilience has been hard to come by. A new narrative of building resilience is needed to focus attention on the role of entrepreneurs and regional value and supply chains to build resilient communities and resilient sectors across all African states.

## **The (development) investor mindset**

Any successful investment strategy requires continuous management in balancing risk and return. In development finance, return is ultimately defined by the lasting and positive change in the lives of people, whereas risk mostly comes down to not achieving objectives or failing to do so efficiently. For private investment strategies, including venture capital and private equity return is the driving motivation. Traditional development finance institutions tend to be more focused on the risks, particularly when it comes to working with the domestic private sector. In the short term, these differences require innovative ways of collaboration that leverage each other's strengths, while also fostering a change in mindset over the long term.

## **Making the whole greater than the sum of its parts**

Despite significant progress in recent decades, the international development finance architecture is still fragmented in its approach to supporting the growth of the domestic private sector in emerging markets. However, thanks to our growing understanding of the role of entrepreneurship in Africa today and the opportunities arising from moving development cooperation efforts into the cloud over the coming years, this could be about to change.





This White Paper Series on Entrepreneurship and Free Trade is being commissioned under the auspices of Dr. Khaled Sherif, Vice-President at the African Development Bank Group, responsible for Regional Development, Integration and Business Delivery. The task manager of the reports is Frederik Teufel, Advisor to the Vice-President, and the authors are Dr. Michael Borish and Mohamed Ramzi Roshdi, senior consultants employed by the AfDB. Ms. Aileen Marshall, senior consultant, has edited this version of the report and Justin Kabasele and Arsene-Stephane Konan have provided graphic design. It should be recalled that the contents of the White Paper reflect input from individuals who are employed at the AfDB and do not necessarily represent the views of the AfDB or any of its shareholders.

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# 1. Purpose and scope of Volume II

This Volume II is a sequel to the report “Entrepreneurship and Free Trade: Africa’s Catalysts for a New Era of Economic Prosperity” (“Entrepreneurship in Africa”, or “Volume I”, for short). That report profiled the state of African entrepreneurship in relation to trends elsewhere in the world, showcased developments, and suggested future directions for entrepreneurship on the continent.

Volume I was a foundation piece that addressed (1) physical, financial and human capital requirements for successful entrepreneurship; (2) legal and institutional structures for successful development of startups and other ventures, including a more favorable business environment; (3) frontier industries that offer considerable opportunities for entrepreneurship in Africa; (4) the importance of the African Continental Free Trade Area (AfCFTA) as a spur to greater intra-African trade and investment that would also provide further opportunities for entrepreneurs; (5) the need for regional value chains for value-added industrialization, scale and productivity; and (6) the particular importance of infrastructure investment, digitalization, and combatting climate change as key drivers for broad-based, sustainable economic development. The report highlighted the need for partnerships among development finance institutions (DFIs) and others—including the private sector, foundations and non-governmental organizations (NGOs), as well as governments—to help mobilize the needed resources to achieve objectives. It also profiled some of the more specific initiatives underway across the continent to create structures that encourage successful startups, namely incubators, accelerators, and the role of seed, venture and other startup financing to bring innovative businesses to market.

With the AfCFTA ushering in a new era of free trade on January 1, 2021, Volume I focused on implications and opportunities that accompany this expected paradigm shift. While continuing to be broad in coverage, this Volume II report addresses some issues in greater detail, with particular reference to the African Development Bank (AfDB or “the Bank”). These include (1) what is and is not included in the definition and concept of “entrepreneurship” for AfDB purposes, extending to concepts of the nebulous yet important “informal” sector of Africa; (2) how the Bank can systematically support infrastructure, networks, creativity, innovation and ecosystems

that characterize successful entrepreneurship, including more on the potential role of incubators, accelerators and venture financing; and (3) how the Bank can make direct financial and technical contributions to initiatives already underway in support of African entrepreneurship, specifically youth entrepreneurship financing (Youth Entrepreneurship Investment Banks, or YEIB), the recently established Alliance for Entrepreneurship (or AfE), and the recently proposed Africa Fragility Initiative. The report suggests that the last should be recast as the Africa Resilience Initiative (ARI) with a focus on harnessing entrepreneurship in support of contingency planning and emergency preparedness in fragile communities.

The focus on entrepreneurship is not a panacea for the African informal sector. The report acknowledges that the size of the informal sector in African economies is partly due to legal and institutional factors that often encourage businesses to (1) hide cash; (2) keep transactions private and undisclosed; and (3) generally avoid paying taxes to offset the informal taxes (e.g., payoffs) needed simply to move products or access basic services. However, the non-transparency that protects the informal sector also prevents these businesses from scaling up. Non-registration of business operations and assets along with non-disclosure of payments made to creditors (formal, like utilities and telecom companies, and informal, like off-the-books business dealings and transactions) means that most businesses are unable to build up a credit history or to present sufficient tangible assets to serve as collateral. Therefore, informality works against scale, and keeps most businesses small and dependent on working capital.

The report focuses particularly on innovative startups and small businesses that can potentially turn ideas and concepts into tangible operations. These are likely to involve highly trained and skilled individuals and/or those with many years of specialized experience that can fine-tune products and processes to help solve problems. They often represent the growing portfolio of companies that have successfully been able to attract external capital across the continent. Forming effective management teams represents a challenge for these kinds of companies globally, since successful ventures typically require a range of expertise and talent, rather than just a



single owner-operator. To access financing and successfully commercialize their innovations, African entrepreneurs need to overcome the cultural difficulties of shared decision-making authority and working in teams. This report identifies African firms that have done so successfully.

An additional challenge across Africa is access to data and information to power innovation and entrepreneurship. Volume II operates on the premise that ongoing investment in physical infrastructure (e.g., electricity and power, transport, information and communications technologies (ICT)) will be necessary but not sufficient. Additional to this investment, support will be required for social infrastructure (e.g., education at differing levels), regional value chains, and to link research and development (R&D) and other information dissemination platforms with startups or existing businesses. Micro-level business support will also be needed from accounting firms and specialized vendors precisely because the startups and businesses are very small and face challenges in forming effective management teams.

Building on the first volume, this report takes a closer look at the role of incubators, accelerators, and broader legal, institutional and financial

requirements to harness more “formalized” entrepreneurship on the continent. Combined with a description of initiatives underway and recommendations on how the Bank can play a constructive and pivotal role, it aims to provide a high-level road map on interventions the Bank can support from a policy and operational perspective so that African entrepreneurship grows and plays a constructive and influential role in the achievement of other economic and social goals on the continent. Attention is placed on important sectors and activities that offer prospects for economic growth and wealth creation while also aligning with requirements for the “green economy” to account for necessary climate change action. In addition, Volume II addresses future requirements for the continent to adapt to the post-COVID 19 environment with an eye on boosting resilience and emergency preparedness on the health and food security front.

The overall objective of the report, then, is to identify existing gaps, identify how existing initiatives can support entrepreneurship, learn lessons from successful undertakings, and make recommendations for the Bank, its clients and partners (and DFIs more broadly) so that African entrepreneurs can enjoy the success needed for broader economic development on the continent.



## 2. “Entrepreneurship” defined

### 2.1 Concepts and contributing factors

#### What is entrepreneurship?

A scan of sources for definitions of entrepreneurship and entrepreneurs is broad, but generally comes down to individuals and firms that show comparatively high levels of innovation and risk-taking compared to the norm. As noted in *Entrepreneurship in Africa*, entrepreneurship is often inherently disruptive, as it involves risk-taking based on a vision that seeks to redefine the status quo. This is most widely known as “creative destruction”, although dozens of other theories have been included in the economic literature since the early-to-mid-1900s<sup>1</sup>.

While business entrepreneurship typically focuses on these characteristics as a means of achieving earnings and/or market share for future growth and market capitalization, not all entrepreneurs are in business. Entrepreneurship can also be personal or group initiatives above and beyond average levels of effort, creativity and imagination that lead to a desired outcome irrespective of monetary implications. People working for community organizations or NGOs are often entrepreneurial without being motivated by profits or other financial incentives. More recently in corporate board rooms, increasing efforts by activist shareholders to focus on environmental, social and governance reforms have become important in reshaping large-scale firm strategies in the market. Such activism, focused more on social outcomes than personal financial gain, may also be considered entrepreneurial from a policy or governance perspective.

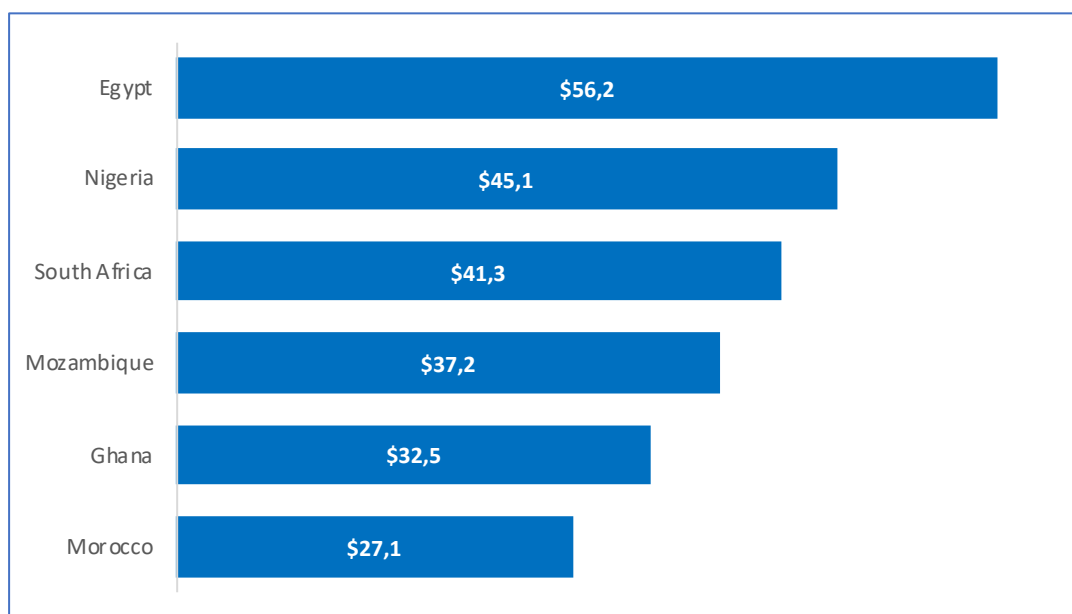
#### Contributing factors to entrepreneurship

Entrepreneurship in Africa highlighted that the study of entrepreneurship is multi-faceted and

influenced by economic resource availability and constraints, political and governance systems, and related socio-economic factors touching on education and culture. All regions and populations have differing degrees of entrepreneurship, and this is true in Africa as elsewhere. For instance, Egypt, Kenya, Nigeria and South Africa account for about a third of the incubators and accelerators and 80 percent of investment on the continent. Although this is not the only measure of entrepreneurship, there are reasons to explain why some countries push ahead faster with startups, ecosystem development, and commercialization. In the cases of these four countries, their economies and populations are larger than most African countries<sup>2</sup>. However, other populous countries like Ethiopia, the Democratic Republic of Congo and Tanzania have not attracted comparable levels of investment activity for startups, suggesting more is required than population levels<sup>3</sup>. Likewise, island states with higher per capita incomes like Mauritius and Seychelles have not developed critical mass in innovative activities despite having higher levels of wealth and legal and institutional environments for business that are typically more highly rated than their peers in Africa<sup>4</sup>. Therefore, scale and critical mass anchored in markets with an industrial base and a minimum threshold of people with relatively high incomes appear to be important drivers in the process.

An additional consideration is levels of foreign direct investment (FDI) and development of financial systems. The four countries that show the greatest investment in startups generally have higher FDI and are among the few countries able to access the limited portfolio investment that is made in Africa. In fact, Egypt, Nigeria and South Africa ranked as the top three countries on the continent in terms of attracting FDI over the past decade. They also tend to dominate the African portfolio investment market.

**Figure 1: Top African Economies by FDI Receipts (billions of \$ from 2011-2020)**



**Source: UNCTAD, Nairalytics**

FDI is considered important for entrepreneurship because of the long-term capital commitment made, and the potential opportunities startups can access. Therefore, how to create a positive business environment that is conducive to FDI, so that supply and value chain links can be established for future growth, is an important consideration for entrepreneurial development in Africa.

An additional consideration is the level of financial sector development. Most African countries show limited financial sector development when measured by degrees of financial intermediation and investment in the economy. According to UNECA, banking sector assets in Africa represent less than 60 percent of GDP<sup>5</sup>. Other indicators from the World Bank show that domestic credit is about 65 percent of GDP in Africa, some of which is skewed by the higher average in North Africa. This compares with 74 percent in Latin America and the Middle East, more than 100 percent in all of Europe<sup>6</sup>, and more than 200 percent in North America<sup>7</sup> and the Asia-Pacific region<sup>8</sup>. The ratio of credit-to-GDP below 30 percent in Africa is less than one quarter the rate of East Asia and Pacific countries. Therefore, in Africa, total bank financing is insufficient and poorly suited to the long-term investment and capital needs of the private sector—with approximately 60 percent of lending activities short-term in nature (less than one year)<sup>9</sup>.

Likewise, the insurance sector plays a small role in African economies. According to Swiss Re, insurance premiums for Africa and the Middle East are about \$111 billion (2019), less than 2 percent of global market share, the lowest in the world. South Africa is the largest African market, with very limited insurance penetration elsewhere despite recent growth in Egypt, Ghana, Morocco and Nigeria for life insurance and Kenya for medical (non-life) insurance<sup>10</sup>.

These weaknesses in core financial intermediation and insurance coverage reflect a fundamental and comparative lack of financial sector breadth and depth, which is likewise reflected in investment-related figures. Boston Consulting Group (BCG) has noted that the Middle East and Africa combined for a total of \$1.4 trillion in assets under management (AuM) in 2020—equal to approximately 1.6 percent of the \$89 trillion global assets under management<sup>11</sup>. World Development Indicators show that African countries account for \$1.25 trillion in equity market capitalization, or just over 1 percent of the global market capitalization estimated by the World Federation of Exchanges. There is also a high degree of concentration, as South Africa alone accounts for approximately 84 percent of the African figure (at \$1.05 trillion), of which Naspers accounts for a sizeable share<sup>12</sup>.



These indicators for Africa compared with other regions show the limited penetration of formal financial markets, which reflects a weaker environment that constrains market development for risk-based financing for new ventures. Financial market development predicated on a conducive business and investment climate helps create the structures for additional venture financing and risk-taking where regulated institutions are unwilling or unable to invest.

This may help explain Kenya’s emergence as a hub for innovative startups. Although Kenya is not among Africa’s top ten economies in terms of attracting FDI, it retains a ‘first mover advantage’

within the digital financial economy. BCG dubbed Kenya as the “birthplace of the mobile wallet”— dating back to 2007, when a grant from the UK’s Department for International Development (DfID) spurred the birth of Kenya’s M-Pesa, the world’s first large-scale mobile peer-to-peer payment network<sup>13</sup>. The concept was inspired by executives at Vodacom-affiliated network operator Safaricom, who recognized that customers had been using prepaid airtime as currency. M-Pesa provided entrepreneurs with the core prerequisite for facilitating digital commerce, a payments channel, and has helped Kenya reach the second-highest mobile payment rate in the world. Kenya’s mobile payments amount to 87 percent of GDP, trailing only China<sup>14</sup>.



## 2.2 Entrepreneurship: zero sum or positive?

While entrepreneurship is considered positive and necessary for future growth and development, it is recognized that not everyone is a winner when disruption occurs. Entrepreneurship has important spillover effects within economies and societies, both positive and negative, causing tensions that are often challenging to remedy. The current (2021) k-shaped recovery from COVID-19 in many countries around the world partly reflects this, with outsized wealth increases and compensation packages for those capitalizing on changing patterns, while others unable to re-skill or mobilize capital are marginalized, laid off, or rendered obsolete in the economy due to automation or other newly adopted technologies.

In Africa, many households that reached “middle class” status prior to the COVID-19 pandemic were pushed back into poverty because of lockdowns, closures, and diminished trade and activity. Likewise, households without transport, electricity and/or internet access often missed out on some of the social goods to help cope with the pandemic, while others capitalized on opportunities or were at least able to continue with critical work, e-commerce, education and other functions.

Recognizing there are winners and losers with rising digitalization and automation, investment in the educational system is one of the critical pillars of support to optimize the benefits of entrepreneurship, and is considered a prerequisite for adaptation to 21st century norms. Investment in education is a broad concept, and not restricted to schools of higher learning. Rather, it includes ongoing investment in human capital formation at all levels, including on-the-job training, apprenticeships, continuing education and re-skilling. Incubators and accelerators represent an increasingly important source of education for entrepreneurs.

Sustained investment on a continuing basis helps with adaptation to disrupted norms, promotes resilience, generates benefits from technological leapfrogging, and ultimately helps to create net gains for society. However, the research recognizes that automation and technological advancements will not benefit everyone equally. Therefore, safety nets need to account for these realities which are particularly important in Africa given demographic trends and the need to create jobs and incomes for youth.

## 2.3 Entrepreneurship in this report

### Startups and small-scale firms

For purposes of this report, entrepreneurship focuses primarily on startups and small businesses. For startups, the purpose of bringing a concept to market is first to demonstrate the viability of a concept (from concept to development to testing), and then to generate revenues through a community of users to demonstrate market potential and to work out problems before scaling up. Along the way, a mix of debt and equity financing may be needed, as well as considerable “sweat equity” in which time and effort are put into all of the up-front work before most financing occurs. In most cases, startups fail to make it past the point of sweat equity because they are unable to convince others that the product or concept is worth the investment risk. Not only are these ventures risky, but they do not have tangible fixed (or other) assets that can be collateralized for secured transactions, particularly if they are still testing and do not have revenues. Because the assets are intangible, banks and other creditors generally stay away from financing such companies.

For existing businesses that are small, higher profits or improving margins based on efficiencies resulting from innovation may be the essence of entrepreneurship. This is different from startups, as the existing businesses may have tangible fixed assets they can pledge for bank loans, and a track record of revenue generation and cash flows that provide creditors and potential investors with at least some confidence of timely repayment. Therefore, a small business may demonstrate entrepreneurship by converting its operational focus from an activity with saturated levels of competition and low margins to a “frontier” or less competitive niche activity in which the market is nascent yet showing potential for growth. This may lead to first-mover activity or simply entry into a market that can add entrants at reasonably high margins. In this kind of scenario, entrepreneurship might be more on the process reengineering of a firm and a reorientation of activities, rather than the startup example that is untested or initially unproven.

Other firms that are larger also show entrepreneurship through organizational refinements and efficiencies, innovative labor and compensation policies, new marketing strategies, and divestitures on the one hand and

mergers and acquisitions on the other. However, these profiles are very different from the fledgling startups or small businesses described above.

### **Large firms, supply chains, and regional value chains**

While this report focuses on startups and smaller businesses, large-scale firms are important as potential sources of demand for startup and small-scale business linkages. They will be of critical importance in actively fostering an environment for entrepreneurship given the role they play in driving many global supply chains and the future importance of regional value chains. These are firms, like governments, that have major procurement requirements that can be advertised and sourced based on quality and volume specifications. The capacity of smaller or startup operations to meet these needs will be a potentially important source of demand for innovative entrepreneurs. The rise of highly successful corporate venture capital firms (CVCs) is also worth noting. The likes of Google Ventures, Salesforce Ventures and Intel Capital have been some of the most active CVCs over the past decade. CB Insights estimates CVC-backed transactions to have reached over 3,300 deals in 2020, with over \$73 billion in investments<sup>15</sup>.

Therefore, while this report looks at supply factors affecting entrepreneurs (e.g., physical, financial and human capital), demand-side factors are also significant. These are the kinds of volume and product specifications and quality thresholds that will need to be met by smaller vendors to obtain contracts from large-scale firms.

The report also recognizes that some of Africa's largest firms are state-owned, and often a drain on fiscal resources and/or contributors to public sector contingent liabilities that weigh on the ability of governments to provide public goods with accountability and/or efficiency. One approach to be considered moving forward is the restructuring and commercialization of state-owned enterprises for better management, accountability and financial results, irrespective of whether they will remain state-owned or if they will be partly or fully divested through private sales or stock exchange listings<sup>16</sup>. This consideration would be particularly relevant for Morocco, South Africa, Egypt and Côte d'Ivoire, all with more than 50 state-owned enterprises, as well as for countries like Tunisia, Mauritius, Algeria, Nigeria and Angola where the number of unlisted state enterprises is high and often dominant in resource-based sectors.

Entrepreneurs can play a role in accelerating the commercialization and improvement of management practices at these companies, as well as potentially serving as buyers for divested (e.g., non-core) units.

## **2.4 Approach taken in Volume II**

With these considerations in mind, Volume II takes the view that entrepreneurship follows multiple tracks simultaneously and dynamically, as differing business and social entities define objectives and needs and seek to meet them. A startup outside of Nairobi may have a waste management concept that needs testing, but no way to access needed financing. However, a large-scale firm in Accra may need exactly what the startup in Nairobi is considering, as a means of promoting plastic recycling and waste management for co-generation in housing neighborhoods that seek off-grid energy sources for household needs. How do the two meet and carry on with their mutual interests?

The above illustrative example points to the need for information platforms to broadly advertise supply and demand so that cyberspace can bring entrepreneurs together. A startup business in an isolated area may be working on an app that could be used in major metropolitan areas. Yet, without connectivity, there is no way to begin a discussion, let alone develop a concept and make a transaction. The multiple tracks of entrepreneurship need platforms to essentially create cyber markets.

It is likely that for the foreseeable future, most Africans will continue to work in tangible goods and services, and less in the more pioneering and innovative frontier industries that capture global headlines. Blockchain, fintech, the internet of things, linked sensors, space travel, drone technology, virtual reality, augmented reality, biotech, biologics, and other knowledge-driven industries will be relevant—and potentially transformational—for African development. But of greater relevance to the immediate daily lives of Africans will be ways in which entrepreneurship can improve quality of life, solve problems, create jobs and incomes, and provide time- and labor-saving services. In many instances, this may occur at the intersection of tangible, industrial “blue collar” sectors and the digital revolution, as with smart tractor sharing in the farming industry or online junk removal services in urban centers. For this reason, Volume II focuses largely on core activities and initiatives that can be broad in their economic and social impact, and highlights potential practical



solutions that are more feasible to achieve and replicate in sectors of importance to Africa. The sectors are selected due to their importance in

achieving green economy objectives as well as in terms of jobs and incomes.

### Box 1: The Agri-Sharing Economy

It is estimated that there are only 13 tractors per hectare of arable land in Africa, compared to the global average of 200. Through Internet of Things (IoT)-driven software, companies like Hello Tractor turn regular tractors into “smart tractors”. Tractors are connected the cloud and farmers can see their location as well as information on the make/model and performance, and book them through a calendar.

The unique model attracted investment from John Deere in Nigeria, to bring 10,000 new tractors to the market over the next five years. John Deere estimates this initiative will bring 9 million hectares of land into production, and generate 37 million metric tons of additional food and 2+ million direct and indirect jobs.

In Kenya, Hello Tractor is working with WFP, John Deere and TechnoServe to create a network of 250 high performing tractor contractors.

Other companies, like Japan’s Kubota, are also developing autonomous, all-electric tractors with AI-enabled features that maximize crop yields.

Likening them to car-sharing apps, Forbes dubbed the tractor sharing business “Uber for the Farm”: with the vehicle being the tractor and the customer being the farmer.

**Source : WFP Innovation Accelerator/Hello Tractor**

At the same time, Volume II recognizes that the frontier industries are likely to have a major effect in the future as large-scale enterprises, financial institutions and governments adopt these innovations. For example, over time banks and other financial institutions will adopt blockchain for transactions, and have already begun to utilize fintech innovations for payments and transfers, as have telecommunications companies. In fact, mobile payments first took off in the early 2000s in Africa thanks to Kenya’s M-Pesa, predating the likes of Square and Venmo, before growing into a global market of \$1.5 trillion<sup>17</sup>. Governments and private companies are likely to encourage the use of drone technologies to accelerate shipments

of goods and to monitor developments (e.g., deforestation, crop development through harvest, water levels in rivers and dams, delivery of pharmaceutical products to remote areas). These developments and corresponding investment in biodiversity, including species preservation, may be essential for Africa’s quest for a robust pharmaceutical manufacturing base by 2040. All of these measures will be important in harnessing the potential of frontier industries to generate economic and social benefits for Africa. Therefore, while the report focuses on more common functions related to current work and livelihoods, it also notes the more ambitious innovations that disrupt how enterprises and households conduct business.

# 3. “Formalizing” the informal economy: the legal and institutional environment

## 3.1 The institutional framework and informality

As most of the African economy is considered to be “informal”, namely subsistence-oriented activities and unregistered for legal and tax purposes, any discussion of harnessing entrepreneurship for future economic growth needs to account for the role played by the informal sector. According to the World Bank, Africa’s informal sector accounts for four out of five urban jobs, serving as the primary source of employment and helping to address challenges as varied as transport and food security<sup>18</sup>. The urban informal sector is particularly prevalent for youth (responsible for the employment of 96 percent of those aged 15-24) and women (92 percent), making it a key dimension to combating poverty.

In effect, almost everyone in the informal sector is an entrepreneur as they are working for themselves and constantly thinking of ways to increase sales and incomes, similar to the established business focus on revenues, profits and cash flow. Their daily activities involve (1) product and marketing strategies (e.g., what goods and services to produce and sell, how and where to sell them); (2) efforts to cut costs for efficiency; and (3) efforts to access finance. The last item may come from rotating savings plans in markets with other vendors, as well as help from family and friends. All of these are characteristic of entrepreneurs.

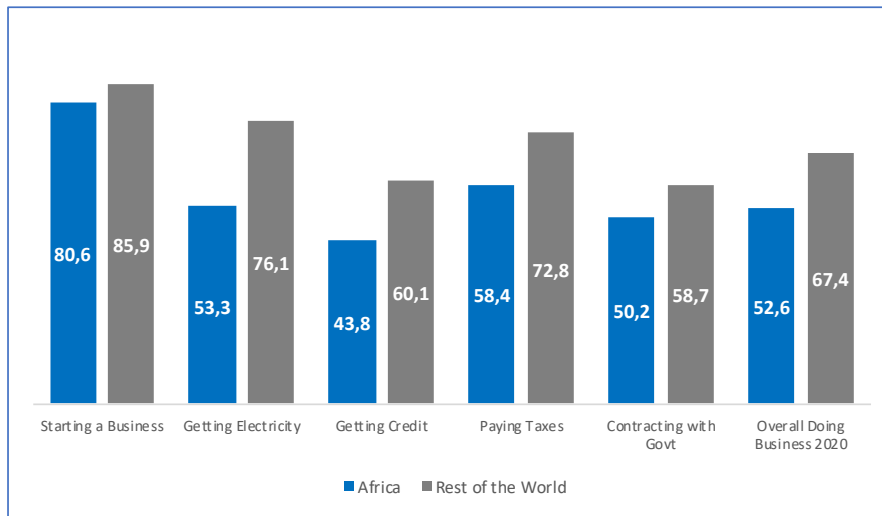
People engaged in subsistence agriculture also show entrepreneurial characteristics. Their daily activities involve how to optimize production based on weather conditions, time of the day (e.g., to account for heat, dampness) and/or distance from production location (e.g., plot, forest), as well as how to generate more output or reduce costs associated with output. Subsistence farmers who spend money on inputs, irrigation and new tools and equipment are betting that these investments will increase yields and productivity and result in greater incomes. Those who invest in structures and protective materials (e.g., plastic lining, barrels) to store output are betting that storage through the harvest season

will lead to higher prices and better returns when supplies are scarcer. All of these activities are characteristic of entrepreneurship, particularly when the net savings are put back to grow or scale up the business.

However, the above examples are not the focus of this report. While some of the entrepreneurs who engage in subsistence farming and low value-added construction, food and beverage processing, artisanal wood working, trade and other services might eventually develop innovative solutions for problems that would attract investor interest, the majority do not. This is little different from high-income economies where most restaurants, bars, gyms, hair salons and related low value-added services generally do not attract financing unless they are scalable businesses that can be produced or franchised in volume.

One of the challenges facing Africa is closing the institutional gaps that exist in the economic landscape so that more individuals who otherwise would wind up in the traditional informal sector will ultimately be able to access opportunities for higher value-added activities. This relates specifically to weaknesses in the legal, regulatory and institutional frameworks and the business environment that stifle entrepreneurship and constrain financing and investment. The premise is that improvements in the general business environment will create a virtuous circle in which incentives to avoid formal registration, licensing, regulation and tax will diminish in relation to the benefits derived from being more transparent. This requires the public sector to minimize time, process and financial cost hurdles so that formalization is no longer a burden for businesses and individuals. It also requires the public sector to properly manage tax revenues so that the broad mass of society believes that paying taxes leads to tangible benefits. Part of the problem has traditionally been that the informal sector has had to make payments for services, but these payments have not flowed to the central government treasury. Thus, they have not helped develop a viable fiscal base for sustained public sector provision of goods and services needed by people and the small business community.

**Figure 2: Africa vs the Rest of the World: Select Doing Business 2020 Scores**



**Source: World Bank. 2020. Doing Business 2020. Washington, DC**

### 3.2 The importance of incentives

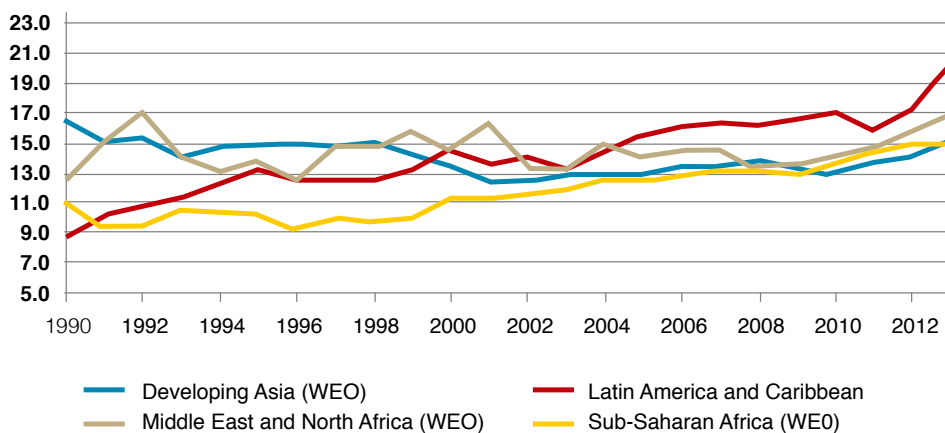
#### Reversing negative incentives

Estimating the size of the informal economy in Africa is a guess at best due to data weaknesses and even definitions. Nonetheless, even casual observation leads to recognition that most employment is informal, and that a considerable amount of GDP is unrecorded due to the informal nature of activities. The ILO estimates that seven out of eight jobs in Africa are informal<sup>19</sup>, with as much as 86 percent of GDP on the continent linked to the informal economy<sup>20</sup>. However, irrespective of what the percentage is on any given day, what matters more is what it reflects. The high level of informality signals a lack of

public trust and confidence in institutions or prevailing incentives, as well as a high level of poverty that simply makes formalities like business registration, fee payment, tax payments and other requirements untenable.

The absence of critical mass in the formal sector creates numerous problems beyond the lack of confidence in institutions. As noted, informality translates into a weak fiscal base for the African public sector. According to the IMF, Africa could potentially collect more in tax revenues (its “tax gap”) than the entirety of its foreign aid receipts. As measured by tax revenue to GDP, Sub-Saharan Africa (SSA) recently dipped below developing Asia for the first time in over two decades. Both SSA and Middle East and North Africa (MENA) lag other emerging regions like Latin America and the Caribbean by a considerable margin.

**Figure 3: Comparative Tax Revenue/GDP**



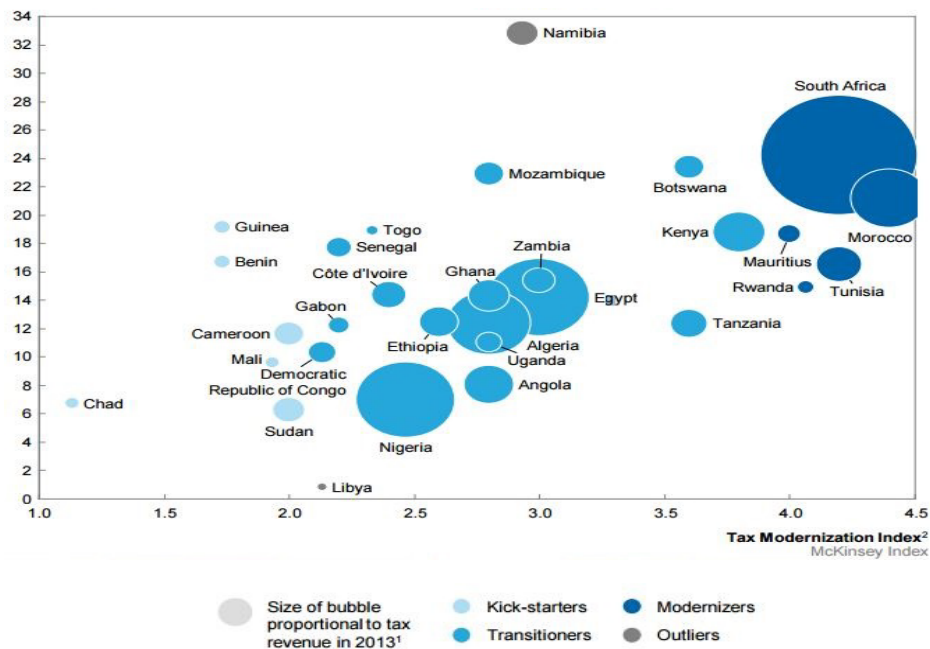
**Source : World Economic Forum**



A McKinsey study completed less than a decade ago identified only five African countries as “modernizers” in terms of their tax systems, with considerable room for improvement in the rest of the continent. One of these countries was Rwanda, profiled by the World Economic Forum for its success in increasing its tax revenues by over 50 percent between 2001 and 2013

through a combination of “legislation, stronger administration and more effective taxpayer registration and compliance”. This growth enabled it to considerably improve public investments in sectors such as healthcare, with government spending on health more than doubling as a percent of GDP between 2008 and 2013, and per capita health spending rising from \$32 to \$70<sup>21</sup>.

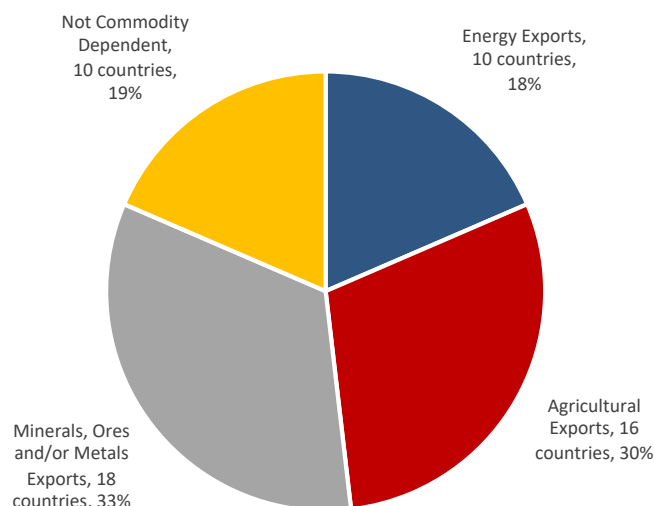
**Figure 4: Relative tax revenue size ( Tax/GDP ratio % of GDP 2013 )**



The weak fiscal base makes it more difficult for governments to provide needed public goods, while making such governments dependent primarily on export revenues and borrowings to meet public expenditure requirements. According to the UN, 44 out of the 54 countries in Africa are considered “commodity dependent”. Exports are

also highly concentrated in a substantial number of countries, with only one or two commodities accounting for more than 75 percent of export earnings. This subjects them to high levels of risk when demand and/or prices decline or if production is disrupted in those specific commodity markets

**Figure 5: Commodity-Dependence in African Countries (Percentage, type of commodity and number of countries)**

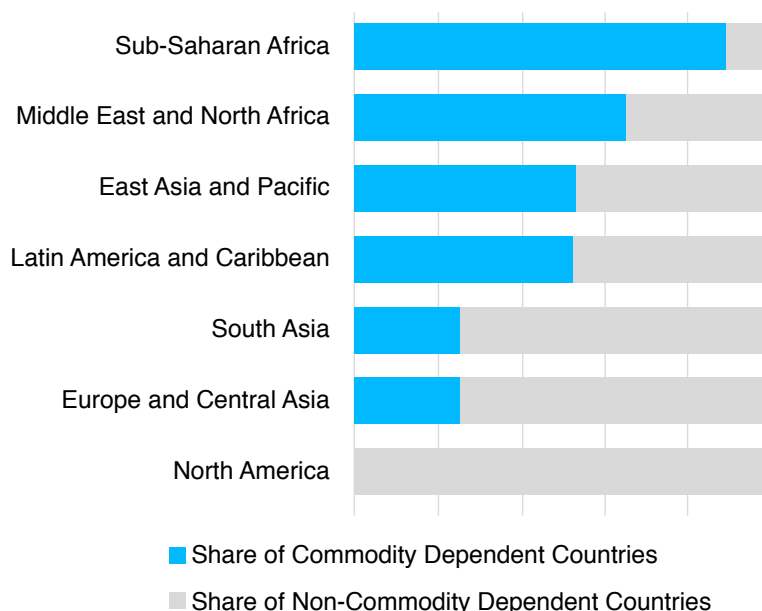


In recent decades, the opportunity cost of outflow of commodities and resources without value-added has exacerbated deep poverty. Africa has the highest levels of commodity dependence as a share of total exports. In Sub-Saharan Africa, exports of raw materials account for \$93.5 billion annually (44 percent of total exports, and 5.5 percent of GDP). This phenomenon, reflecting a legacy of centuries-old trade, has positioned Africa as a supplier of resources to other markets where intermediate processing, finishing and associated services (e.g., distribution, financing) are carried out. This has benefited the receiving markets, but stifled Africa’s movement towards economic diversification able to leverage manufacturing

and services as agents of rising value-added, wealth creation and income growth.

Therefore, while incomes in the aggregate have grown in recent decades in Africa (at least until COVID-19), the opportunity cost of relying on primary sector exports has exacerbated income disparities, while also foregoing opportunities to boost value-added capacity with investments. These dependencies have been highlighted with clarity during the COVID-19 shock, and serve as a signal of Africa’s need to develop more continental (“domestic”) capacity to meet economic and social needs without relying on external markets for emergency financing and support.

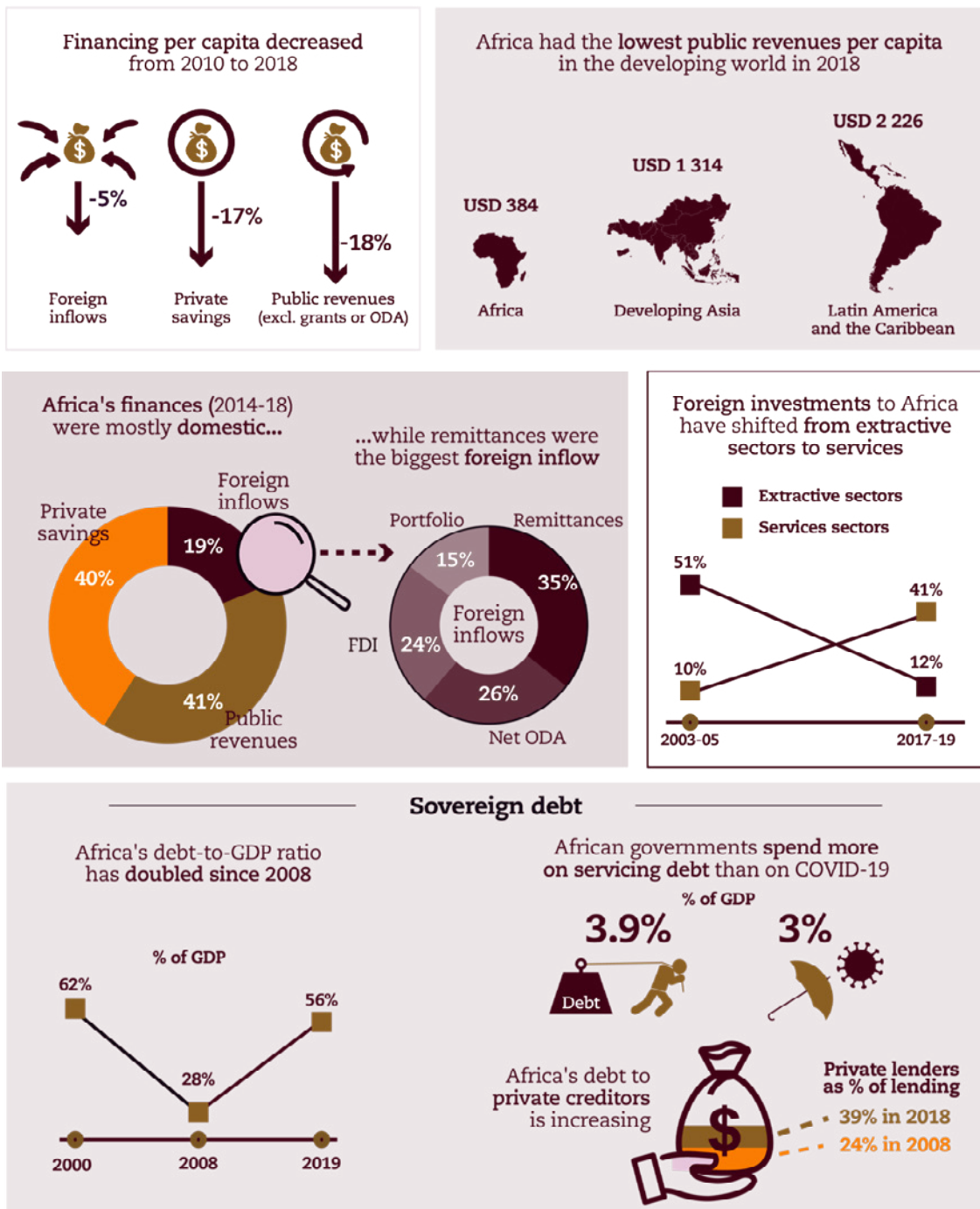
**Figure 6: Distribution of Commodity-Dependent and Non-Commodity-Dependent Countries by Geographic Region, 2013–2017**



A second distortion is highlighted by recent dependency and risk concentration trends. Countries that are highly dependent on primary resources (e.g., oil and gas, minerals/ores) are at significant risk of market fall-out when commodity prices decline. In addition, the high level of concentration subjects them to major economic, political and social risk when these downturns occur. Therefore, while scale and specialization are important where countries and regions enjoy a comparative

advantage, they also need to diversify economic opportunities to mitigate the risk of shocks in major sectors or industries. As they broaden those structural economic opportunities, they will have more scope for value-added, which will be beneficial for job creation. To the extent that their productivity or competitiveness may lag international standards, this will present opportunities for entrepreneurs to provide solutions that increase industry, sector and firm-level productivity and competitiveness.

**Figure 6: financing development in Africa**



Source : OECD (<https://www.oecd-ilibrary.org/sites/377cc779-en/index.html?itemId=/content/component/377cc779-en>)



This dependency is inter-connected and cascades at the macroeconomic level, making it far more serious than just a setback in a particular area of commodity focus. Africa's general dependence on export revenues is underlined in most countries by dependence on a limited number of commodities and/or low volume of output, together with very limited value-added from processing and transformation. Such dependence carries market risk, with declines in revenue generation when prices are low. These patterns then exacerbate the other pillar of public financing (i.e., borrowings or debt financing), as reduced export revenues undermine sovereign creditworthiness, making sovereign governments more dependent on borrowings. As downward trends often lead to ratings downgrades, borrowing costs then go up at the worst time. The weak domestic market for borrowings also means that exchange rate risk further deepens the risk of debt traps and persistent paralysis of government financing. All of this combines to weaken delivery of public goods and services, further undermining confidence that makes the informal sector unwilling to formalize. In the example noted above regarding Rwanda's tax system overhaul in the early 2000s, it was able to reduce external funding by 15 percent in a little over a decade as a result of its reforms and corresponding increases in revenue. More countries in Africa can replicate these efforts while also working to boost value-added.

### 3.3 Transforming the business environment for entrepreneurship

Governments need a stronger fiscal base to provide public goods and services to instill confidence. Yet, until confidence is instilled, most households and businesses will not feel their formal payments will be properly administered and utilized. Instead, they will feel this represents additional confiscation of scarce earnings on top of the informal payments they routinely need to make to obtain services (e.g., driver's licenses, getting goods out of customs, obtaining permits for construction or electricity hook-ups).

This raises the question of what can be done to transform the incentive structure in African countries so that households and small businesses are willing to register businesses and pay taxes in exchange for public goods and services that can be reliably provided by the public sector. Several initiatives around the world supported by the UN, EU and OECD have tested

e-government for ease and speed in processing and keeping costs down. The United Nations 2018 Electronic Government Development Index underscored how much room for growth there is in the African e-government sector. The highest-ranked African nation was Mauritius, which came in at 66th—considerably behind leading nations such as Estonia, which offers 99 percent of government services online and claims to save “800 years of working time per year as a result of this digital transformation”<sup>22</sup>.

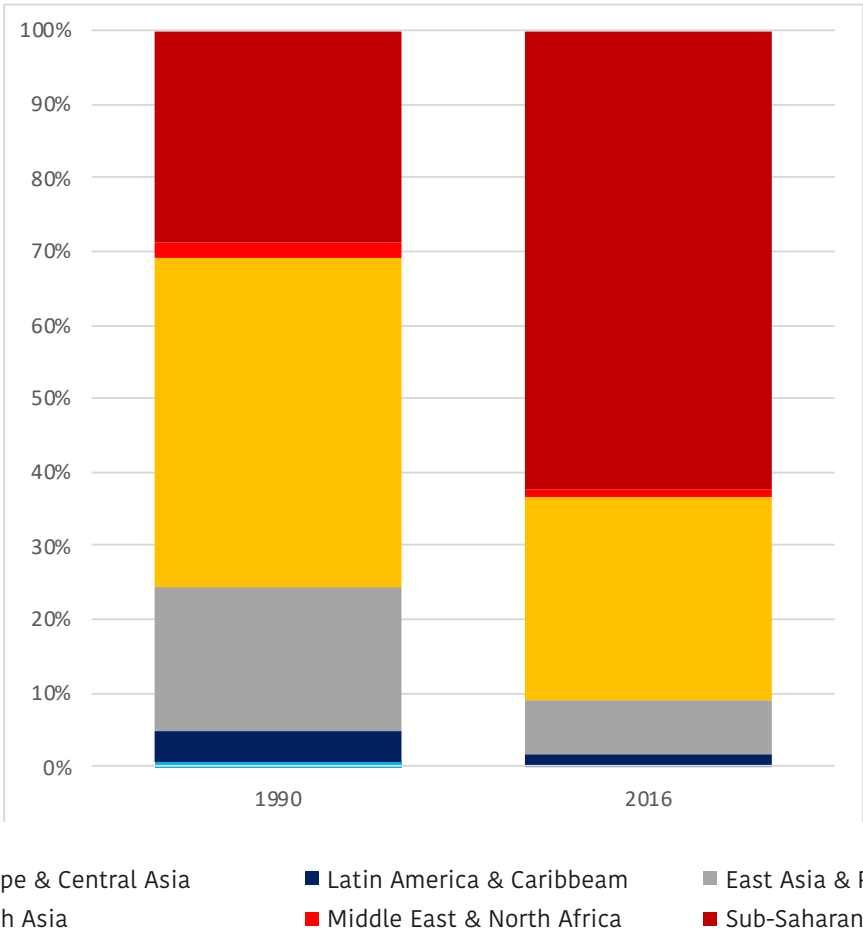
Yet, there are considerable success stories that Africa can build on. That same survey ranked Cape Town as the number two city globally for e-government services (with Moscow coming in first)—while South Africa has introduced biometric services to facilitate broader deployment of e-government services. Rwanda's Irembo Digital Platform was launched in 2015, and has already been used by over 20 percent of Rwandans. Meanwhile, the Digital Impact Alliance assessed the progress of 10 African countries towards digital government over the past decade as “trending upwards at a seemingly faster rate than many of the higher ranked countries in the world”<sup>23</sup>. The next phase of growth could include governance reforms to ensure that public services are rendered effectively and speedily without bribes or other payments. Examples are e-procurement services, employment services, taxation and social services. Where fees or other payments are required, such as for construction and licensing permits and business registration, posting rates openly and explicitly and eliminating discretion will at least let people and businesses know that there is equal treatment.

However, even more important is the signal that major physical and social infrastructure improvements are being delivered so that households and businesses feel the tangible benefit of such improvements. Access to electricity is one of the most important services that can be provided, and progress is being made on this front. However, as global access to electricity has steadily grown over the past three decades, the only continent which has seen a rise in the number of citizens without access to electricity has been Africa. In 1990, nearly three out of every ten people on the planet did not have access to electricity: over 1.5 billion people in total. Less than a third of them were on the African continent. By 2016, 940 million were left without access to electricity, with approximately 600 million of them in Africa. Most households in Sub-Saharan Africa still lack access to electricity, with rates generally among the lowest in the world<sup>24</sup>.

Moreover, some of the projects that will help with electrification are complex, large-scale, costly, will take years to complete (e.g., Grand Inga), and/or are politically sensitive and may lead to other problems for African regions if not resolved diplomatically (e.g.,

Grand Renaissance Dam). Notwithstanding these challenges and risks, for African entrepreneurship to take off, access to electricity will be needed for small businesses to operate, communicate and transact more efficiently than they do today.

**Figure 7: Percent of the world’s population without electricity (by Region)**

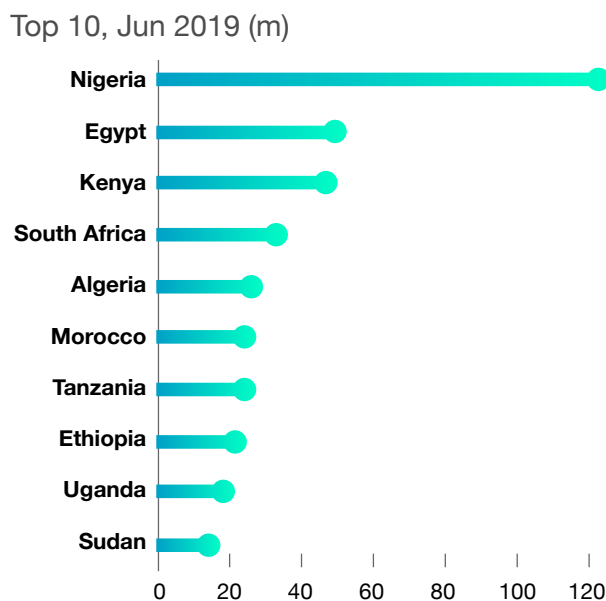


**Source :** Calculated by Our World in Data based on estimates the share of the population with electricity access (%) published by the World Bank and total population estimates from the UN World Population Prospects (UNWPP).

Linkages of small businesses (and startups) with larger businesses, eco-industrial parks, special economic zones and other nearby small businesses and households will also be needed for goods and services to be produced and delivered. Africa needs to have greater connectivity to improve internet access. As of April 2021, 60 percent of the world’s population is now online—whereas only 37

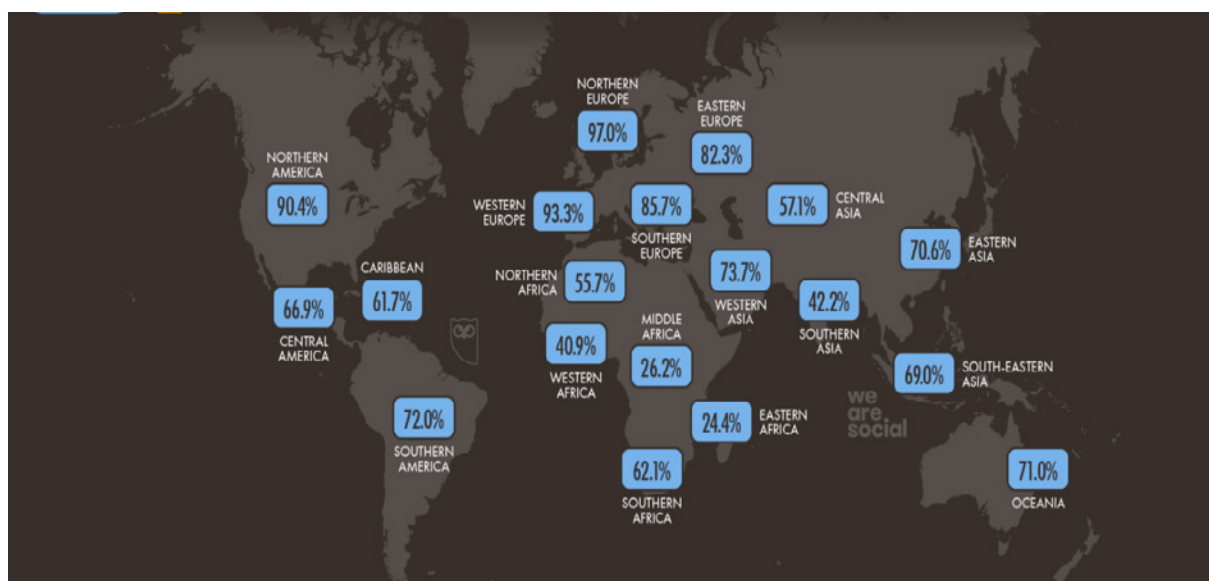
percent of Africans currently have internet access. This equates with over 850 million people lacking connectivity, compared to a little over 500 million who are connected. There are also considerable variances across the continent, with only one out of four people having connectivity in East and Central Africa, compared to 56 percent in the North and over 62 percent in Southern Africa<sup>25</sup>.

**Figure 8: Countries in Africa with most internet users**



Source : Statistica

**Figure 9: 2021 Internet Adoption Around the world**  
 Internet adoption in each region, shown as a percentage of total population  
 Internet user numbers no longer include data sourced from social media platforms,  
 so values are not comparable with previous reports



**Sources:** Kepios (APR 2021) Based on extrapolations of data published by: the itu; local government bodies; gwi; gsma intelligence eurostat; apjii; cnnic; the U.N

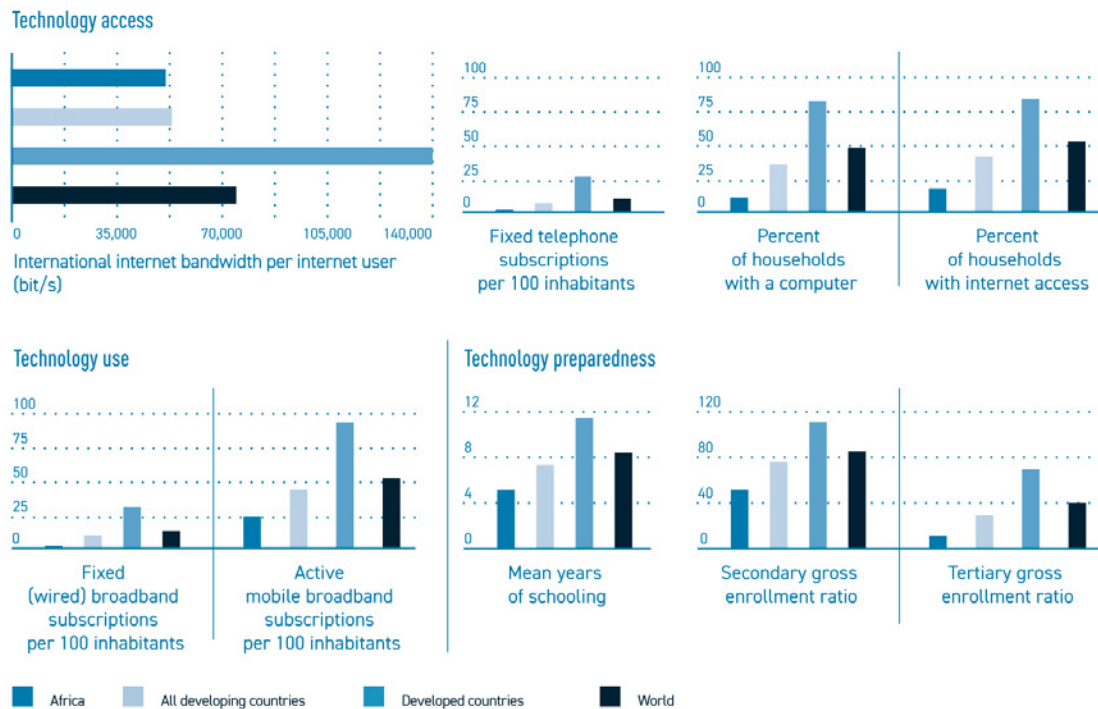
Mobilephonesandconsequentenfranchisement of so many people in the informal sector is an example of how new and easy-to-use technologies can create numerous advantages and conveniences for the disenfranchised. However, ICT investment in Africa is lagging

other parts of the world, and the widely anticipated boost from digitalization will require greater investment and access for data transfers, e-commerce, logistics and planning, 3-D printing and other functions for African entrepreneurship to blossom.



## Africa's ICT development indicators

Africa still lags behind developed and other developing countries in several 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 )

Transport infrastructure represents another area where improvements are underway, but much more is needed. Although 80 percent of African goods are transported via the continent’s road network, only 43 percent of its rural population have access to an all-season road. The African Development Bank notes that a significant share of Africa’s roads remain unpaved, leading to severe traffic congestion (despite fewer vehicles on its roads than any other region), slower movement of goods and people, and considerable road safety issues. Numerous highway, rail, airport, and maritime port projects are underway to improve transport connections, thanks to major initiatives such as the Programme for Infrastructure Development in Africa (PIDA), the Trans-Africa Highway (Cairo–Dakar with a total length of 56,683 kilometers), and the Abidjan–Ouagadougou–Bamako Transport corridor. As an example of the progress that can be made in a relatively short period, Ethiopia reduced the average distance to an all-weather road by nearly half (to 12 kilometers) between 1997 and 2012<sup>26</sup>.

Road networks are good examples as well of where business environment improvements can go a long way towards instilling confidence in public institutions. In many cases, truckers, bus drivers and ordinary motorists are stopped on roads and forced to make payments, slowing them down and draining them of cash. Likewise, at border stations, crossing into other countries can often be time-consuming, tedious and costly. Eradicating illegal payments on road networks, at border stations, and at ports and other entry points is necessary to prevent people and businesses being abused by unfair practices.

An expanded multi-modal network will be needed for the continent to move goods, services and people faster, and to meet the logistical requirements for future contingency planning and emergency response. According to the ESA BMO Network, the waiting time for a container or truck to cross a border post in Africa can range from three minutes to over 67 hours—at an estimated cost of \$185 for each day of delay<sup>27</sup>.

**Table 1: Percent of the World’s Population without electricity (by region)**

| Region                        | Document to export (Number) | Time to export (days) | Cost to export (USD per container) | Documents to import (number) | Time to import (days) | Cost to import (USD per container) |
|-------------------------------|-----------------------------|-----------------------|------------------------------------|------------------------------|-----------------------|------------------------------------|
| SADC                          | 7.3                         | 31.2                  | 1,856.3                            | 8.4                          | 38.0                  | 2,273.3                            |
| COMESA                        | 7.2                         | 32.4                  | 1,915.3                            | 8.2                          | 38.3                  | 2,457.5                            |
| ECOWAS                        | 7.6                         | 27.6                  | 1,528.1                            | 8.1                          | 31.6                  | 1,890.9                            |
| CEMAC                         | 9.0                         | 35.2                  | 2,808.8                            | 10.8                         | 44.0                  | 3,721.4                            |
| Middle East & North Africa    | 6.4                         | 20.4                  | 1,048.9                            | 7.5                          | 24.2                  | 1,229.3                            |
| East Asia & Pacific           | 6.4                         | 22.7                  | 889.8                              | 6.9                          | 24.1                  | 934.7                              |
| South Asia                    | 8.5                         | 32.3                  | 1,511.6                            | 9.0                          | 32.5                  | 1,744.5                            |
| Latin America                 | 7.1                         | 19.0                  | 1,310.6                            | 7.5                          | 22.0                  | 1,441.1                            |
| Eastern Europe & Central Asia | 6.4                         | 26.7                  | 1,651.7                            | 7.6                          | 28.1                  | 2,457.5                            |
| EU                            | 4.5                         | 11.5                  | 1,025.3                            | 5.3                          | 12.1                  | 1,086.5                            |
| OECD                          | 4.4                         | 10.9                  | 1,058.7                            | 4.9                          | 11.4                  | 1,106.3                            |

**Source:** African Development Bank

The Chirundu border post, located on the border between Zambia and Zimbabwe, serves as a telling example of improvements that can be made with benefits to government revenues and for the flow of commerce. It is a key entry point for commercial goods within Southern Africa, as well as a corridor for trade between Eastern and Southern Africa. Handling an average of 268 trucks per day led to heavy congestion, with trucks requiring two to three days to cross—having to navigate nearly duplicate procedures on both sides of the border. An African Development Bank case study reviewed the creation of a “one stop” or joint border post, and estimated that it reduced the average crossing time to two hours. An additional option of a “fast-track preclearance process” takes an average of 15 minutes. Meanwhile, the Government of Zambia is estimated to have increased its revenues by 30 percent thanks to processing time improvements leading to a higher flow of goods across the border<sup>28</sup>. These kinds of improvements will be needed in the future if regional value chains are to succeed. They also show how everyone benefits—traders and consumers with the faster movement and delivery of goods, and governments with improved tax and customs duty collections.

These examples provide a snapshot of confidence-building actions that can be taken

by governments to gain public confidence. As such improvements take hold, governments will be in a stronger position to make their case to the public for increased tax collection. If they can get to this point, the next challenge will be to demonstrate sustained ability to provide needed services in health, education, water and sanitation, housing and other social infrastructure while ensuring public safety.

Until then, the challenge remains that legal and institutional environment weaknesses make it difficult for clusters and ecosystems to form and function, stifling entrepreneurship. By extension, this makes creation of a viable tax base more challenging. Policy reforms and improvements in the business environment that lend themselves to entrepreneurial dynamism and innovation are needed across the board. These include (1) public sector governance and operations; (2) physical and social infrastructure investment and operations/maintenance; (3) initiatives specifically targeting innovative startups and small businesses; (4) business linkages to boost supply and value chains; and (5) development of credit information bureaus and property registries to stimulate lending to creditworthy households and businesses. Other initiatives are discussed below.

### **Opportunities from improved incentives**

To the extent that it improves the incentive framework and “enfranchises” people and innovators, support for entrepreneurship could bring more of the informal economy into the formal economy. In particular, skilled people able to create significant value in the economy are expected to be major beneficiaries, in the process creating jobs, transactions and contracts for other African companies and individuals. Examples of activities include those that (1) enable e-commerce; (2) introduce easy-to-use digital payment systems for companies; (3) design easy-to-integrate specialized apps to make small businesses more efficient; (4) design websites that provide effective access to e-government services, jobs and procurement opportunities; (5) provide solutions to local problems such as waste management and recycling; (6) offer cleantech solutions for energy needs as well as improvements in production processes to reduce greenhouse gases; and (7) enable advertising and contracting as well as verification for references.

Other major opportunities are likely to emerge as progress with blockchain evolves. In this regard, banks may be leaders in helping to expand ecosystems that will create opportunities for startups. This has occurred globally and can be expected in Africa. Therefore, while banks may not be primary lenders to startups during the venture development phase, they may still be valuable sources of cash flow for nascent firms as customers purchasing services. Automated tools to reduce transactions costs in the business and legal sectors are common in other markets and are expected to be used in Africa also. Examples include using blockchain for government archiving and record-keeping, or for household and commercial property transactions.

Opportunities will change incentives to formalize. Services companies that may have previously thrived in the informal economy through “under-the-table” arrangements but kept them small due to the need to evade taxes may find there is a net benefit to becoming more transparent. However, for this to occur, costs of formalization will need to come down.





# 4. Enfranchising the disenfranchised

## 4.1 Focus on entrepreneurship

Entrepreneurship in Africa highlighted the importance of incubators and accelerators as part of the ecosystem of support for entrepreneurs. However, this is just one small part of a larger complex of factors that promote, support and sustain entrepreneurship. As noted above, entrepreneurship is a mix of many factors and can even be considered a culture reflecting incentives that are also subject to physical, financial and human resource limitations. The mix of variables is important, and when many or most are stifled, entrepreneurship is likewise stifled.

In Africa, entrepreneurship is on display in abundance. However, most of it is low in value-added and frequently focused on subsistence and survival, and the variables or factors that enable higher value-added are often missing. To correct for this and provide focus to policy reforms by the Bank and its partners, several initiatives could be pursued to enfranchise the disenfranchised. These include (1) designation of special zones to build clusters and critical mass; (2) establishing more incubators and accelerators linked to these zones as well as separately by working with large-scale firms; (3) expanding all of these initiatives to remote and rural areas to broadly disperse opportunities and leverage overlooked comparative advantages;

(4) coordinate all of the above with business associations through active engagement and support; and (5) ensure support for education and skills development is linked to tangible initiatives described above.

Specific to the Bank and its undertakings, these could serve as targets of Youth Entrepreneurship Investment Banks (YEIB) financing, and potentially be linked to Bank support for the Alliance for Entrepreneurship (AfE). The Bank's role could involve financing and technical support to establish concepts and pilots (with partners or on its own) that could be replicated more broadly across the continent with support from other partners (e.g., DFIs, NGOs, private sector investors, governments, foundations). In some cases, such as incentives to create opportunities in remote areas that entail ambitious structural and governance reforms (e.g., fiscal decentralization, credit bureaus, property registries), the Bank would need to work with others over the long term. Likewise, support for education, training and skills development would require collaboration with and support from partners due to the breadth of activities. However, in other cases, direct financing for startups and support for intra-African trade align well with both YEIB and AfE, as well as with existing initiatives like Compact with Africa that can be leveraged to build on other commitments.

### Box 2

| Alliance for Entrepreneurship in Africa  | Youth Entrepreneurship Investment Banks   |
|--|---|
| <p>The Alliance for Entrepreneurship (AfE) in Africa will bring together multilateral development banks, bilateral donors, African national development banks and financial institutions, banking and non-banking financial institutions, and other public- and private-sector organizations to support financing, training and technical assistance to small and medium-sized businesses and startups in Africa. Financing mechanisms will include leveraging targeted funding pools, guarantee mechanisms for equity investment support vehicles, and financing from European development finance institutions, the African Development Bank Group and the World Bank Group. The IFC will operate the Secretariat and has committed \$2 billion in financing, half for investment and half for trade facilitation.</p> | <p>The Youth Entrepreneurship Investment Banks (YEIB) model seeks to address market failures and fragmentation in the provision of financing and non-financing services for youth entrepreneurs in Africa. It seeks to create national anchor institutions and models that will coordinate the delivery of these services in a systemic, scalable and sustainable manner. YEIBs will invest in and support youth entrepreneurship financial and non-financial ecosystem services, through multi-stakeholder partnerships to enable young people to start, improve and grow businesses, while creating jobs. Two key distinct youth entrepreneur segments that the YEIBs will seek to target are: (1) high growth and scalable youth businesses (tech or tech-enabled, and sponsored by youth who have university or technical education); and (2) annuity-type businesses with reasonable growth prospects (production or service-oriented businesses, and sponsored by youth who have primarily vocational TVET training).</p> |

## 4.2 Facilitating and supporting entrepreneurship

### **Designation of Special Economic Zones, Free Trade Zones, Export Processing Zones, Eco-Industrial Parks and other economic clusters**

This initiative would leverage the use of zones as a vehicle to build critical mass and supply chains, and as a springboard for trade and value-added. Zones and clusters where goods are processed would serve as (1) locations for critical mass to support production, processing and distribution in support of growing industrialization and value-added, while creating demand and consumption of locally produced materials and adding jobs and incomes; and (2) important outposts for trade in regional goods. These zones and clusters, established in corridors and along transport pathways to facilitate logistical coordination, would play an important role in increasing intra-African trade from the current 17 percent<sup>29</sup> to a much higher share in the coming years. This has been highlighted in the agro-industrial segment of the economy that holds out so much promise for Africa, and applies to other activities as well.

For zones where services are provided and developed, it would be harder to designate production sites as “zones” as they only need internet connections. However, Silicon Valley is an example of how clusters and proximity play an important role in innovation, product development, and venture capital. Zones and clusters could promote ecosystem development in innovative services that would also be potentially helpful to producers of goods. Services providers that meet supply chain requirements of firms driving production and processing in these zones could be certified. To the extent that zones and clusters help to create more critical mass, such development should increase the contribution of innovative services to economic and business development more broadly, including regional value chains.

A final note on zones and clusters is that they would be expected to include a mix of goods and services producers that could mingle and interact to better understand each other’s needs and capacities. When sufficient critical mass and dynamism exist it is not uncommon for financial institutions to also locate. This could include investors (e.g., private equity, venture, seed capital) as well as banks and other mainstream financial institutions.

### **Education, training and skills development strategy**

Young people, including entrepreneurs, will need education to gain required skills. The rationale for broad-based support for education and training is to develop an active outreach program to better link suppliers of expertise with the population of young entrepreneurs and small businesses that are the source of demand. This would enhance existing initiatives, and potentially be coordinated with university, college and school/training institute networks to boost overall capacity on the continent.

Such education, training and skills development will need to occur at different levels to match interests and talents. Boosting support for a broad range of education and training that is designed to include practical and applied work can serve as a feeder system for incubators and accelerators as well as supply talent to companies across the continent. The American University in Cairo’s business school provides an excellent example. It brought together the MENA region’s first university-based angel investor network (AUC Angels), alongside a startup accelerator program, a fintech accelerator program, and an eight-week startup “launchpad”—all under the university’s Venture Lab program.

To provide support, universities can be linked to companies in economic zones, as well as to clusters that exist outside zones. If there is sufficient scale, they could be matched with individual companies and production sites. For instance, laboratory research for an agricultural input company may justify the connection even if at a single production site. Small businesses and young startup entrepreneurs could benefit from linkage with business/commerce programs, economics faculties, engineering faculties and others that meet their specific needs. Specialized training institutes can focus on outreach and support for young entrepreneurs to ensure they have both technical skills and the basics for running a business, while vocational education can provide the apprenticeships and skills needed to produce goods and services.

As some training can be conducted online, support for these initiatives should be designed to reach remote communities, and not be restricted to physical attendance. However, such outreach will have its limitations and in some cases online learning will be less feasible and practical. However, remote learning should be considered an additional option to broaden opportunity and exposure to all who wish to pursue specified education and training courses for skills development.

## **Establishment of incubators and accelerators**

The rationale for creation of additional incubators and accelerators is to use investment money committed to and from the private sector to support development of economic zones and promote synergies between these zones and the broader education, training and skills development strategy described above. The incubators and accelerators, together with education, training and skills, would serve as the institutional support mechanisms to advance entrepreneurship.

The objective would be to provide entrepreneurs with available human, physical and potentially financial resources needed for design, experimentation, testing, and possible commercialization of products and concepts. These would be encouraged in economic zones but not restricted to them. They could be supported anywhere there is backing from companies outside zones or from municipalities, business associations, schools or other entities. However, they would represent a good fit for zones and serve as a systematic way to leverage support for education, training and skills development. In effect, the incubators and accelerators would be outreach vehicles that bring companies (in and outside zones) and education, training and skills development institutions together to support young entrepreneurs. Encouraging CVCs to serve as anchors within these zones can also help catalyze specific sectors.

## **Fiscal decentralization to create opportunities for young people and women in remote areas**

To ensure an equitable distribution of support and opportunities with a focus on domestic and local economies, the above concepts need to be conceived and implemented on a decentralized basis. Broader access to improved infrastructure and electricity is essential, and entrepreneurial endeavors can help to bridge these infrastructure gaps in the short term. While urban and densely populated areas and major transport routes are expected to be policy and resource allocation priorities, the future success of broad-based development will partly depend on creating opportunities in other areas. Cities are already overwhelmed and do not have the capacity and infrastructure to handle the load, creating a strong case for decentralization. Many of Africa's future growth areas will be linked to agriculture and food security and improved management of resources for better environmental outcomes. These lend themselves to a decentralized approach.

Not all young and female entrepreneurs will be able to work in designated zones. Therefore, the above concepts need to be "mainstreamed" through the educational, training and skills development system to outlying areas (smaller towns, rural areas), where local zones and clusters could expand opportunities. However, in most African countries, planning is largely centralized and local authorities have even less of a tax base than is available to central authorities. Therefore, local level medium- and long-term planning requires sufficient financial resources to meet economic needs aligned with environmental commitments. Local entrepreneurship structures can help local governments meet their planning objectives, but a nearly non-existent tax base is a major limitation. Future initiatives will need to be ambitious and should include (1) fiscal reform; (2) land tenure reform; and (3) accessible and up-to-date immovable and moveable property registration systems.

Gradual movement to fiscal decentralization will be required for local municipal and property taxes to provide sufficient resources for budgeting and planning. This would be a long-term endeavor, and would require continued investment in (1) property valuation and collection systems; (2) VAT or other local sales tax collection systems; (3) expenditure tracking and verification systems to ensure transparent use of revenues aligned with approved budgeted priorities; and (4) third-party audit and reporting systems to ensure governance and management meet accountability standards. These efforts would also have to be synchronized with central authorities, adding to time, cost and complexity but necessary for national budgeting, planning and fiscal management purposes.

Private land ownership and corresponding immovable property registries can be utilized to provide entrepreneurs with property and plant to pledge as collateral for loans. While there is a risk of maldistribution and concentrated land ownership that undermines competition, efforts should be made to ensure that the rights to land use are broadly distributed even if ownership in some areas is more concentrated. This can be achieved through leaseholds. The objective is that the land itself becomes an asset that can be leveraged for credit access, rather than the hidden capital that keeps so many subsistence farmers and microenterprises in the informal sector. Such property can then also be subject to taxation to help local governments develop a tax base to meet local expenditure needs.



Immoveable property registries would need to be complemented by moveable property registries. These registries could enable entrepreneurs to pledge machinery and equipment (including transport equipment) as collateral for loans that they might not otherwise be able to access. This would help with working capital financing and potentially longer-term firm financing to help the business scale up. Such loans may come from larger companies, commercial finance firms, leasing companies or other non-bank distributors rather than banks themselves.

The above initiatives relate more to local administration and existing small businesses, and less to entrepreneurs working on innovative ideas and concepts but lacking tangible assets that can be collateralized. Nonetheless, they would help to spur economic activity and momentum in local markets, which could create opportunities for startups. By extension, these reforms would be expected to increase opportunities for youth and women.

#### **Coordination with business associations and large-scale firms**

All of the previously described initiatives focused on zones and clusters, incubators and accelerators, human capital and local initiatives would be strengthened by coordination with business associations and large-scale firms. Entrepreneurship initiatives could be coordinated with existing businesses to identify potential needs and sources of demand for new products that young entrepreneurs can meet. Platforms to exchange information and buy/sell opportunities should be targeted to encourage this kind of market-making.

Large-scale firms in particular can serve as drivers of supply and value chains, with comparatively large contracts that offer opportunities for startups to develop their concepts and products, and for small businesses to create sales. Large-scale firms can also be of considerable importance in maintaining ISO or other quality controls through the specifications they include in their contracts. This kind of discipline can help entrepreneurs and small businesses to improve competitiveness with imported goods and services.

Identification of opportunities to pilot these concepts with business associations and comparatively large private sector firms should be sought as early as possible. Differing locations or pilots would display considerable variability based on levels of institutional capacity, technical skill, electricity access, resource

availability, etc. However, in all cases, maximum effort should be put on attracting demand for goods and services so that entrepreneurial initiatives deemed of interest can be supported. These can range from fintech and cleantech solutions at the high end to waste management, and school and household maintenance needs at more local levels.

### **4.3 Challenges to disrupting the status quo**

#### **Resistance to change and counter-arguments**

In addition to normal challenges associated with financing and operational implementation, the proposed initiatives to enfranchise the disenfranchised may run into resistance from those who benefit from the status quo. For instance, cleantech innovators who could potentially cut into the margins of utilities/power companies that have heavy debt loads and cost structures might see their possibilities constrained as larger established operators seek to protect their positions<sup>31</sup>.

This is a general risk when resistance comes from politically influential groups, and is an even greater risk when governments have major sunk costs in loss-making utilities and other enterprises providing public goods.

However, the needs of Africa are so great that there should be ample room to promote entrepreneurship, innovation and startups so that problems across the board are solved. In many cases, larger established firms could integrate solutions from startups into their operations as a means of reducing costs, enhancing operational efficiency, and generating revenue to supplement output. Off-grid and other cleantech related solutions could be utilized in more remote areas or as a grid-supplement in urban areas. Likewise, if the grid is mainly serving the industrial sector as opposed to households, the supplemental power could be used to fill those gaps. Larger established firms with the network and data on households could essentially work with smaller suppliers, with the latter scaling up via contracts while the former supplements revenues through fees or royalties. Another example might be found in the banking sector, where fintech threatens to take away market share from deposit-taking institutions. However, many if not most households in Africa remain outside the banking system. According to the World Bank, 43 percent of Sub-Saharan African adults and less than half of adults in the MENA region had a bank account in 2017.

Although this represented a considerable improvement compared to prior surveys (SSA stood at 23 percent in 2011 and 34 percent in 2014), it continues to lag the global average of 69 percent by a considerable margin<sup>32</sup>.

Therefore, Africa needs to open up the market to disruption so that benefits can accrue to businesses and consumers, helping to create income and job opportunities for African talent. As noted, the expectation is that initial opportunities will abound in (1) e-commerce; (2) digital payment systems for companies; (3) specialized apps to make small businesses more efficient; (4) web sites that provide effective access to e-government services, jobs and procurement opportunities; (5) solutions to local problems such as waste management and recycling; (6) cleantech solutions for energy needs as well as improvements in production processes to reduce greenhouse gases; and (7) advertising and contracting as well as verification for references.

In some markets, there may also be innovation in tourism, a major job creator and source of foreign exchange for at least ten African countries. These countries account for 60 percent of the region's international arrivals and generate 80 percent of its total travel and tourism exports, with six of them relying on tourism for at least one fifth of their total exports<sup>33</sup>.

A second level of risk exists in Africa for those who operate in the informal sector. The most vulnerable are those who lack education or high-value skills, and are dependent on unscheduled or daily contract work, commercial trade, or other activities for basic incomes. As innovation takes hold and Africa gradually becomes more industrialized and automated, many of the kinds of services that are provided by the informal sector may disappear or diminish. This is not altogether different from the assembly line jobs that were common sources of employment in North America and Europe until the 1980s-1990s, and have since largely disappeared due to outsourcing to other regions and automation at home. Many of these jobs did not require high levels of education or skills development and people who have not re-

skilled to keep up with current economic needs have experienced job losses and/or income declines. The same threat exists for many in the African informal sector unless they are able to obtain skills that will make them employable.

### **Opportunities from entrepreneurial disruption**

In the end, entrepreneurship and innovation should generally be welcomed because the needs and challenges for Africa are so great, and because there is room for vested interests to also leverage opportunities from disruption. Encouraging innovation and entrepreneurship will help fill gaps not met by existing enterprises and frameworks, while also making these existing businesses more competitive, efficient and commercially viable. The outreach provided to large-scale firms to play a role in supporting supply and value chains represents an opportunity for all parties to benefit. Startups and small businesses would be able to leverage contracts to scale up, while large-scale firms can cut costs, improve efficiencies, and potentially divest non-core units to generate proceeds for capital expenditure or debt repayment.

All of these movements and shifts will energize the market, helping to build confidence for the future. As this occurs and entrepreneurs, small businesses and households associate some of the progress with public sector initiatives, a willingness to "formalize" is more likely. In addition to boosting the economy and improving services, a key objective is to shift the incentive structure from the status quo to one in which the disenfranchised have clear opportunities to benefit through jobs, sales and incomes.

However, the movement towards increasing innovation and automation will require additional measures and policies that broaden opportunities and reduce vulnerabilities. A commitment to fairness and equitable distribution of incomes and social benefits will be needed to prevent exacerbation of income disparities and social tensions. This has been a major challenge in the northern hemisphere, and will require policies that seek to balance out costs and benefits without stifling innovation and growth.

### Box 3: Accelerators in africa

On September 3rd 1995, a 28-year-old software engineer named Pierre Omidyar spent the weekend building a website that would allow individuals to list items for auction online. The site, which he originally called “Auction Web”, hosted its first transaction when Omidyar sold a broken laser pointer, which fetched him \$14.83. When the listing ended, a surprised Omidyar contacted the buyer to make sure he was aware that the laser pointer was broken—only to discover that the buyer collected broken laser pointers.

He decided to allow sellers to list items on his website for free, in exchange for a small commission on their completed sales. Without the peer-to-peer payment systems that his project has since inspired, Omidyar began receiving cash and checks in the mail from sellers that were listing on his site. Some of his users were paying him in nickels and dimes that were taped to cardboard.

A quarter century later, the company, which has since changed its name to eBay, can be credited with inspiring the over \$4 trillion global ecommerce revolution, and in many ways, the \$5.4 trillion global digital payments market too. eBay acquired, and later spun-off, Peter Thiel and Elon Musk’s PayPal—which took off as a peer-to-peer payments provider that was catering to online buyers and sellers on eBay.

In the early days of its operations, eBay’s honor system for transaction fees to Omidyar and tax payments to government was practical. But, as the website grew to eclipse \$10 billion in annual sales by 2002 and \$25 billion by 2006, it began serving as the withholding agent by incorporating tax payments into all of its transactions. This provided governments with complete, rapid and accurate tax collection and settlement on behalf of users who could otherwise have been operating within the informal economy.

The 2017 IMF Working Paper Taxation and the Peer-to-Peer Economy, considers this matter and opines that it is possible that this “new way of doing business is formalizing activities in certain sectors, bringing them within reach of the regulatory and tax authorities.” In addition to e-commerce websites like eBay and Amazon, similar mechanisms have been adopted with platforms serving as withholding agents and/or data recorders across several other peer-to-peer sectors, including hospitality (e.g., Airbnb), ridesharing (e.g., Uber), professional services (e.g., Fiverr) and financial services (e.g., LendingClub). Numerous platforms are cooperating with tax authorities, while a number of countries “have considered extending the powers of the tax authority to acquire data from platforms, or to require them to automatically report those P2P sellers who have earned income above any tax-free thresholds. For example, the United Kingdom has recently enacted legislation extending the powers of the tax authority to acquire data from digital platforms.”

The same IMF Working Paper describes efforts by governments to harmonize between peer-to-peer applications and their more traditional counterparts. Occupancy and tourism taxes, which were previously only charged to the likes of hotels, have been applied to home rentals. Australia and Canada have eliminated the imbalances that had previously existed between taxi drivers and ridesharing drivers. Today, both local and international peer-to-peer platforms are in widespread use across numerous countries in Africa, including the likes of Kenya, South Africa, Egypt and Nigeria. With the appropriate collaboration between government and the private sector, this business model can bring revenues typically not captured within the formal economy within the purview of tax authorities, while helping to address governance shortcomings and information asymmetry.

Africa’s elusive unicorn club currently has four members: ecommerce giant Jumia, as well as three leading digital payments companies (Interswitch, Fawry and Flutterwave). In the same way that eBay evolved into having a considerable role in withholding taxes for governments, while PayPal and Square serve as data recording giants (now even within the cryptocurrency space), Africa’s unicorns can serve as a key gateway to bring merchants and their transactions into the formal economy. In the future, this can also extend to a wide range of other sectors, powered by the ingenuity of African entrepreneurs who are already solving problems through technology for industries that range from medical services (e.g., Zezeeta), trucking/logistics (e.g., Trella) and agriculture (e.g., Farmcrowdy).

**Source:** Time (<https://time.com/4013672/ebay-founded-story/>) and The History of eBay (<http://www.bellaonline.com/articles/art50656.asp>)

# 5. Tackling fragility and building resilience

According to the African Development Bank, there are 20 “transition states” in Africa, a comparable number to the World Bank’s 21 African “fragile and conflict-affected states” (FCS). Globally, the World Bank classifies 39 countries as FCS across three primary categories: high-intensity conflict, medium-intensity conflict, and high institutional and social fragility. Together, Africa’s transition states account for over 340 million people, and \$208 billion in annual GDP (28 percent of Africa’s population and 8 percent of its GDP). Annual per capita incomes average \$555 across transition state countries.

These countries also face the greatest challenges in addressing macroeconomic imbalances, as they have weak fiscal bases (less than 5 percent of GDP) and exports that amount to less than a third of GDP. With very low levels of value-added in their economic sectors, this leaves them highly dependent on concessional borrowings to meet public expenditure needs. Predictably under such a scenario, levels of social support are low. This results in consistently low Human Development Indicators (HDI). In fact, 13 out of the bottom 15 countries in the 2020 HDI rankings were transition states in Africa, and all 19 countries that were ranked were in the bottom 40<sup>39</sup>.

While the discussion often compartmentalizes countries into fragile and non-fragile states, the distinction obscures realities within countries. Fragile states include households and businesses that are not desperate or highly vulnerable, while non-fragile states include households and businesses that are. Therefore, tackling fragility and building resilience is a challenge that affects all African states to varying degrees.

In this regard, private sector development—and entrepreneurship—can be a valuable tool to combat fragility and build resilience. This can be achieved by broadly supporting entrepreneurship with a focus on solutions to local problems related to fragility, as these are found across the board in agriculture and irrigation, the environment (e.g., forestry, grazing land), social infrastructure (e.g., health, education, housing, water and sanitation), and broader challenges of peace and security.

According to the World Economic Forum, conventional measures to prevent and mitigate

fragility tend to focus on international institutions, non-governmental organizations and national governments. Without a considerable role for the private sector, resilience has been hard to come by. Thus, greater engagement with the private sector and a focus on public-private partnerships is a prerequisite<sup>40</sup>. Meanwhile, enterprises in fragile states are typically small, and often informal and household-based. In fragile states, they are the “99 percent”<sup>41</sup>. A World Bank development impact review of private sector operations in fragile and conflict-affected states covering projects in 23 countries found that “private investments supporting SME development or larger infrastructure projects, in partnership with local business people/stakeholders, had the highest rating for effectiveness”<sup>42</sup>. This strengthens the case for greater private sector involvement. Entrepreneurs can help with logistical supports and ideas to generate product-procurement relationships for local supply chains, in the process helping to create jobs and support the case for financing.

An example is found in Liberia, where public-private dialogue had a considerable post-conflict impact via the Liberia Better Business Forum. It is estimated that reforms yielded approximately \$5 million in private-sector savings, created over 20,000 jobs, increased business registrations by 20 percent and attracted \$13 million in private sector investment<sup>43</sup>.

Therefore, it is recommended that the Bank and its partners support an “African Resilience Initiative” (ARI) with a focus on fragile communities and fragile sectors across all African states. These efforts could harness entrepreneurship to focus on contingency planning and implementation of emergency preparedness measures for future shocks. This would be informed by lessons learned from COVID-19 and the degree of vulnerability experienced by Africa with the financial shock, breakdown of global supply chains, inability to access critically needed supplies and personal protective equipment (PPE), and constraints on pharmaceutical production. Along with a focus on food security and potable water supplies, entrepreneurs could be utilized to devise solutions that would have long-lasting effect and improvement in the economic and social well-being of Africa.



## 5.1 Emergency preparedness

Emergency preparedness is an area of focus that is well known in fragile states, precisely due to their fragility. By definition, preparedness for future emergencies constitutes resilience. Full preparedness helps to meet the test, while inadequate preparation and preparedness culminate in insufficient resilience relative to the threat imposed by the emergency.

The Bank has drafted outlines of how support for regional integration currently targeting infrastructure development, trade and investment, and financial market integration can be enhanced by sharpening the focus on contingency planning and emergency preparedness, particularly in food security, access to potable water, and strengthened health care protection. The need to ensure adequate supplies are in place when emergencies occur provides many opportunities for entrepreneurs focused on multi-modal transport linkages, logistical support and coordination in warehousing and distribution, and information systems, data analysis and telecommunications to assist with these preparations. This includes assistance in (1) planning and design; (2) temperature control in transport and warehousing (essential for food preservation and health care supplies and medicines); (3) inventory management and reporting systems; (4) demographic counts and data management; and (5) related supports that come with the build-out of supply networks. As these networks would involve movement from centralized to decentralized locations, there is potential scope for planning to devolve from central to local authorities and for entrepreneurs to contribute to efficiency in emergency preparations.

The ARI could potentially work together with UN and other agencies to identify prospective needs and to plan for emergencies. Food and water security could be significantly improved by logistical support, including better warehousing, inventory management systems, and communications frameworks for coordination during emergencies. Coordinated responses to the recent locust infestation in East and Southern Africa were made all the more challenging due to bottlenecks resulting from COVID-19 lockdowns. COVID-19, Ebola, and other health epidemics have underscored the need to prepare for future pandemics. Recent efforts to manufacture PPE and other equipment indicate that mapping out production and distribution needs, including raw materials, semi-finished goods, and required machinery, equipment and skills would help to boost resilience to future shocks.

Procurement, storage and distribution of needed medicines is also an area of clear importance. While Africa will require up to two decades to develop needed facilities and capacity to more actively meet many of its own pharmaceutical needs, interim steps need to be managed in anticipation of future outbreaks. The ARI can assist by working with WHO and the African Centres for Disease Control to improve coordination and communications to ensure logistical support is in place for efficient and rapid delivery of needed items. This applies to specific equipment, including refrigeration and reliable temperature control systems, as well as medicines or pharmaceuticals. The COVAX experience, which induced unprecedented commitments and pledges from the world's most advanced economies—and which has since suffered from considerable delays as many of these economies prioritized vaccinations for their own citizens, including those not in the highest risk categories—underscores the importance of an effective and sustainable ARI.

All of the above are areas where the continent as a whole needs help and improvement. One approach would be to work with all states on all of these initiatives, but with particular focus on building institutional capacity and mobilizing investment into physical infrastructure to enable better planning and preparedness in Sahel, Horn of Africa, Lake Chad, Great Lakes, and Mano River Union countries. These efforts would need to take environmental and sustainability concerns into account. They could be integrated into regional development plans coordinated with the respective Regional Economic Communities, with DFIs at the table to assist with planning and budgeting and to ensure appropriate governance and procurement practices are in place and followed. The ARI could likewise leverage relationships with NGOs, foundations, private investors and other development partners to implement plans once budgets are set.

## 5.2 Supporting entrepreneurship to boost resilience

Support for entrepreneurship can play an important role in ARI efforts to boost resilience. In addition to contingency planning and emergency preparedness, ARI support could be focused more broadly on developing physical (e.g., electricity from renewable energy sources, ICT) and social (e.g., education, skills training)

infrastructure to help establish digital platforms that could be utilized by people in fragile states and communities to buy and sell goods and services needed for jobs, incomes, and general quality of life. Building on this, the introduction of incubators and accelerators could link knowledge with initiatives and finance to create innovative businesses, providing support so they can be tested and potentially gain traction in the market. Emphasizing entrepreneurship with incentives for resilience-enhancing solutions would provide an added dimension. Rather than restricting the focus to “fragile states”, the emphasis would be on enhancing resilience more broadly to mitigate the adverse effects of shocks on “fragile communities” and “fragile sectors”, irrespective of nation. Moreover, as solutions will often be applicable across countries and communities, such an approach would be expected to assist with regional integration, enhancing economic resilience along the way.

A second initiative would be to work closely with governments to improve the business environment for production and distribution of goods and services. It would aim to reduce stops and informal taxes (bribes for passage) along the way when transporting goods, and to work with border officials to make the customs processes more efficient for the passage of goods and people. These two activities alone would help provide opportunities for export trade, and to more fully integrate fragile states into regional economies. Bank coordination with partners like UNCTAD could help energize current tax and customs processing initiatives. This could include training and assistance on applying proper codes to specific merchandise when recorded at border stops to help determine whether taxes apply, and if so, at what rate. An additional area of assistance could be in the determination of sanitary and phytosanitary status of products entering, as these often constitute non-tariff barriers to free trade.

A third area would be working with Regional Economic Communities and their member states to develop policies for the determination of preferences for domestic (regionally produced) goods in support of contingency planning and emergency preparedness. This would help stimulate production and processing, as well as make storage and distribution more feasible. More importantly, it would elevate the role African producers play in addressing these requirements, rather than depending on international assistance based on surplus food stocks produced in other markets. In this regard, the entrepreneurship initiative would help to

support and reinforce emergency preparedness, and in the process boost resilience and reduce the vulnerability of fragile communities and states. It will also have the economic benefit of increasing demand for African production and processing, as stored food products would require processing to extend shelf life.

A fourth initiative would be to bring together producers, distributors and investors to develop regional value chains (RVCs). In this regard, the ARI would align well with the recently established Alliance for Entrepreneurship (AfE) which has identified regional value chains as a top priority. The IFC has recently announced \$2 billion in support of this initiative, of which \$1 billion is for investment into entrepreneurial ventures and another \$1 billion is dedicated to trade facilitation. The Bank can boost this initiative by providing assistance to entrepreneurs able to demonstrate commercial viability of startups and link with regional supply and value chains. The agriculture sector is a logical starting point, and fragile states and communities are often part of the potential mix in some commodity-based RVCs, although progress has been held back by encumbrances in regional trade and the unwillingness of African businesses to work together. Leadership in this domain would potentially encourage a pivot to more regionally integrated economies based on comparative advantages, with the additional benefits of generating incomes, reducing current account deficits, and increasing scale in the industrial sector.

A fifth initiative would be to link the above with specialized financing initiatives to encourage adaptation to climate change and better environmental practices as they relate to food production, water conservation and forestry management. It is possible that local entrepreneurs would be able to identify local solutions to problems brought on by climate change, and exacerbated socially and economically by the resulting instability. Examples might include increased recycling of biodegradable products for household energy needs, and biodiversity protection that could be useful in future development of biomedical products. Support to structure incentives for funding of such initiatives could help to solve problems of the physical environment in fragile states and also generate jobs and incomes. Such solutions may also find application in other markets, thereby helping to create more dynamic regional economies.

All of the above would help to boost resilience by linking fragile states to neighboring or regional

economies to increase economic opportunities that can potentially reduce fragility of the most vulnerable communities. Initiatives undertaken in the Sahel may help to provide closer linkages to light manufacturing facilities in coastal states of West Africa. Likewise, a fragile state like Somalia may, at least in some parts of the country, benefit from linkages with entrepreneurial initiatives currently underway in the greater Nairobi region. The Mano River region could build on new-found stability along the West African coast to create partnerships and opportunities involving businesses and governments (including municipalities) from Côte d'Ivoire, Liberia, and Sierra Leone focused on the production and distribution of some PPE, and/or agricultural inputs and livestock.

### 5.3 A Pan-African resilience fund

To achieve what has been mapped out above, an additional initiative to consider would be a Pan-African resilience fund focused on contingency planning, emergency preparedness, and entrepreneurial support to create and institutionalize solutions to reduce fragility and vulnerability. The Fund would invest in resilience startups, ideas and entrepreneurs. Initially, this could be a vehicle that co-invests with incubators, accelerators and venture capital funds that are already in place across the continent. The Fund would specifically focus on resilience ideas. Eventually, it could evolve into its own accelerator to fund startups. A link to/with the AfE might be a way to harvest entrepreneurial ventures across the continent by consolidating financial resources and scaling up technical and advisory support.

The Fund would be a resilience-themed technology accelerator to provide early-stage investments for innovative startups targeting environmental, economic and social dimensions of vulnerability. Startups would apply online, and short-listed firms would attend “virtual bootcamps”. Those identified as good candidates for resilience-related success would be selected for a multi-month accelerator program modeled on the program established by the likes of Flat6Labs, 500 Startups and Egypt Ventures. Startups would receive seed capital and additional training and advisory services (through a tested curriculum that focuses on building a successful venture), with weekly coaching and training and monthly or regularly scheduled one-on-one mentorship.

Areas of focus would be open, but could include (1) methods to create and improve storage facilities for emergency stocks of food, water and medicines, including logistical supports to make coordination more efficient during periods of emergency; (2) recycling of plastic and other waste into usable products and shelter; (3) new technologies and apps to help households, governments and businesses with cost savings and efficiencies; (4) cleantech and other innovations to reduce the impact of climate change and to encourage movement to a green economy; (5) opportunities for better stewardship of the blue economy; and (6) broad applications to enhance community development and welfare. Other initiatives could be defined as the ARI takes hold. Local initiatives would be specific and customized for the locality, but with potential for replication elsewhere. This would both allow for scale and wider application of concepts to enhance the social welfare of vulnerable communities and more broadly improve prospects for emergency preparedness.

# 6. Harnessing entrepreneurship to make the “leap”

## 6.1 Youth and gender: two key drivers of Africa’s future growth

Support for entrepreneurship should be open-ended and non-discriminatory, as it is the degree and distribution of sustainable economic value and social development that matters. At the end of the day, these objectives focus on the elevation of the human condition for the greatest number of people possible in as sustainable a manner as possible.

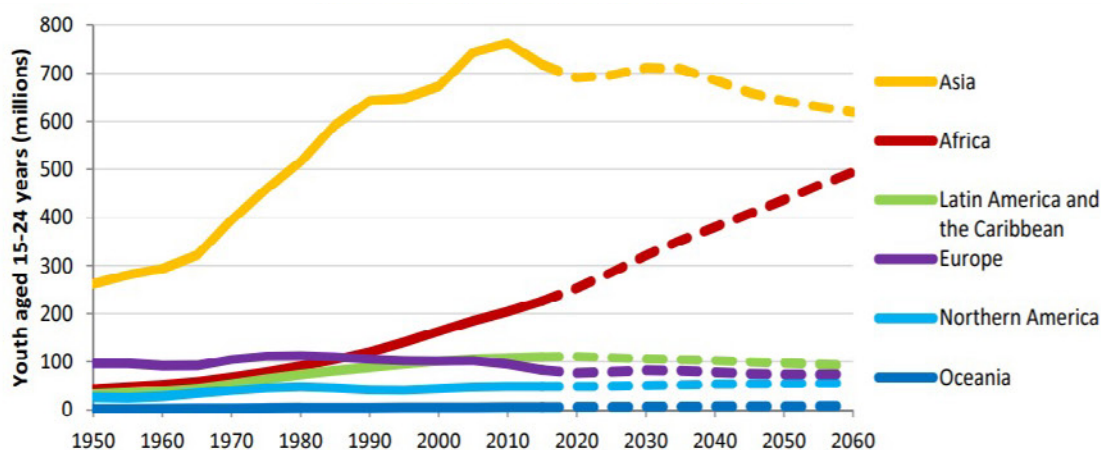
However, as much of the projected growth and development of the 21st century is expected to be transformed by the role of new technologies and the governance and management structures that oversee them, the “digital divide” and its generational implications warrant specific attention. Unlike previous generations, youth are growing up with technology often at the center of their existence. Without debating positive and negative effects, the role of technology is influential and will continue to grow with time.

Mobile telephony and rising internet access are the most fundamental examples, and have been adopted across generations. However, technology will have a disproportionate influence on the human capital formation of young people

as they continue their educations at different levels. This is not only for more academically-oriented (e.g., university track) training, but for the trades as well. For instance, as vehicles become increasingly automated, auto, truck and bus repair and maintenance will need to cover sensors, artificial intelligence, and computer design. Likewise, increasing use of metrology for utilities may become important over time to monitor cost and usage intensity of electricity transmission and distribution. In other words, irrespective of the type of education and skill set, technology will have an increasing role to play in the delivery of content (e.g., remote learning, data, services) as well as the specific application of content for job functions in the work force.

Therefore, support for entrepreneurship should recognize that many, if not most, of the innovations and solutions that will elevate African productivity and contribute to improved social conditions will be driven by youth. Support for entrepreneurship is also necessary to create opportunities and jobs for this burgeoning population, given the current demographics in Africa where 60 percent of the total population is below the age of 25, 77 percent of the population is below the age of 35<sup>45</sup>, and people aged 15-24 are expected to exceed 300 million by 2030<sup>46</sup>. Failure to do so will transform the “demographic dividend” into a “demographic curse”.

Figure 10: Youth Aged 15-24 Years, By Region, 1950-2060



Source: United Nations (2003) World Population Prospects: The 2012 Revision



These developments will also have important gender implications. Women make up about half of Africa's population but only account for one third of the continent's GDP, while nearly 90 percent of working women are employed in the informal sector. Assuming half of the estimated demographic growth is female, the

role played by women will be critical. Support for entrepreneurship will require removal of obstacles and constraints on women in the market so that they can compete on an equal footing. This will both create opportunities and improve the distribution of incomes.

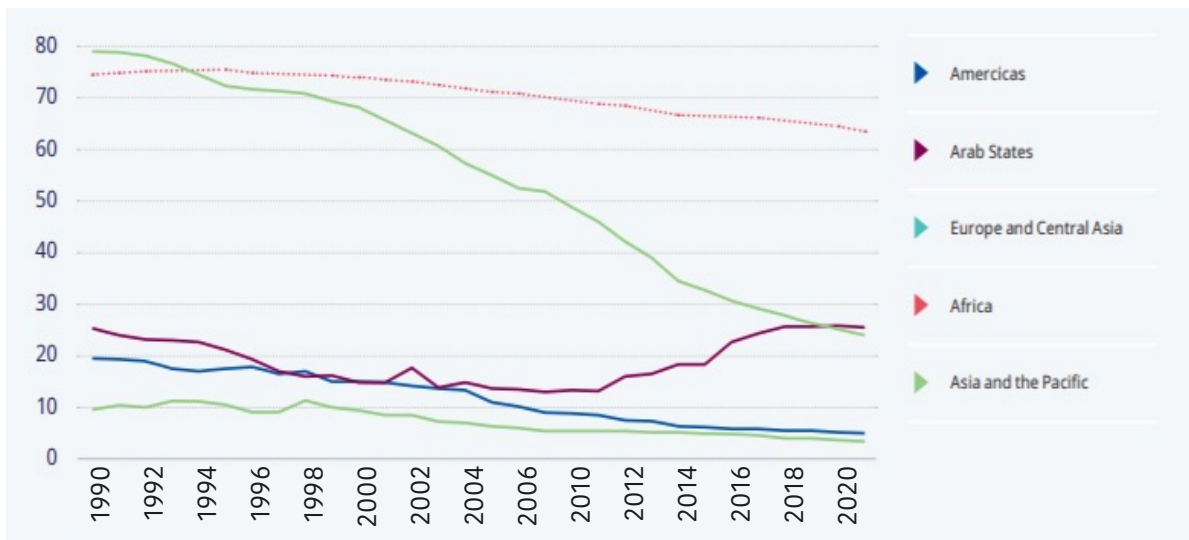


## 6.2 Indispensability of human capital development for wealth creation

### Youth

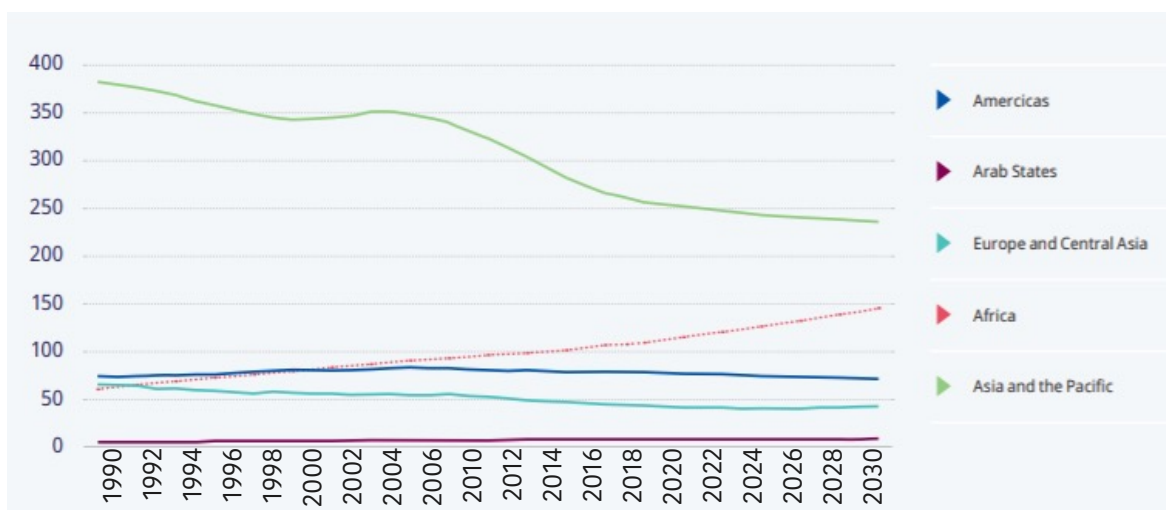
Although nearly one out of four North African youth are unemployed, youth unemployment rates are relatively low in Sub-Saharan Africa. This is because youth cannot afford not to work—but the vast majority are underemployed and/or are confronted with poor working conditions<sup>48</sup>.

**Figure 11: Working Poverty Among Young People by Region—1990–2020 (Percent)**



In fact, Africa is the only continent where the youth labour force is expanding quickly and on an upward trend.

**Figure 12: Youth Labour Force by Region, 1990–2030 (Millions)**



According to the African Development Bank, of Africa's over 400 million youth, approximately one third are "unemployed and discouraged", one third are "vulnerably employed"<sup>49</sup>, and less than one in six are in "wage employment". Overall, more than nine out of 10 African youth are employed in the informal sector, while over a quarter of a billion African youth will lack an economic stake in the system by 2025. On average, 10 to 12 million youth enter the labor market each year, yet the continent only generates 3.1 million jobs.

How could Africa's GDP accelerate with greater—and better—youth employment? According to the IFC, the digital economy has the potential to contribute \$180 billion to Africa's GDP by 2025, and nearly a quarter of a trillion dollars by 2050<sup>50</sup>. Given the demographic data, the continent's youth hold the key to unlocking that potential.

To capture these gains, sustained commitment to education, training and skills development is required to upgrade skills and create jobs. Better training and skills will usher in enhanced productivity and competitiveness. However, as much of the focus will be on the use and application of digital technologies and data transformation, innovation portends rising automation that, by definition, will replace labor with capital. The result could well be labor obsolescence in many activities where people have often found jobs in the informal sector. Therefore, automation may have considerable benefits at the macro level, but may also close down opportunities for those who lack the skills and training needed to prosper in the digital economy. This has occurred in OECD countries, with a combination of automation and offshoring leading to considerable job displacement in industrial sectors. While Africa lacks the industrial base of OECD countries, the threat is comparable for those who have traditionally operated in the informal sector. To reduce this risk and create opportunities for the broadest number of people to benefit from innovation, sustained support for education, training and skills development is necessary.

As noted, failure on this front could transform the projected "demographic dividend" into a "demographic curse".

## Women

How much would Africa's GDP accelerate with greater gender parity? According to the IFC, Africa could add over \$300 billion (10 percent of GDP) through 2025 if its countries make advances in women's equality matching the leading country on the continent. Several countries would see a dramatic boost. In the scenario where women could attain equal opportunities in the workforce, Africa could potentially add \$1 trillion—over one third of its collective GDP—through 2025<sup>51</sup>.

There is little doubt that African output would benefit significantly by creating incentives for greater female participation in the digital economy<sup>52</sup>. This is likely to be seen in a broad range of activities, including light manufacturing and e-commerce distribution, as well as a multitude of services that can be leveraged and scaled up through the use of digital technologies. However, as of today, these scenarios seem a distant possibility. Given the current rate of progress, Africa could take more than 140 years to achieve gender parity<sup>53</sup>.

More generally, the importance of skills development and human capital formation is central to Africa's prospects for economic growth. This applies to entrepreneurship, but also transcends these activities and is central to good governance, effective and reliable public administration, capacity to undertake structural reforms that enable fiscal decentralization, institutional capacity at local levels, and delivery of effective health, education and social services. These human capital components, combined with financing and investment in physical infrastructure and industrial capacity should drive the economic "leap". Entrepreneurship can serve as the innovative engine that powers this leap, building on the other foundations that enable ideas to gain traction in the market. However, for this to happen, active support for incubators, accelerators, and innovation in the economy is needed.



# 7. New frontiers for Africa: the green economy and digitalization

## 7.1 Mining and the green economy: entrepreneurship opportunities

Today's hydrocarbon-dependent economies will experience considerable shocks due to the global energy transition to renewables and the need for decarbonization at a time when energy use and intensity is expected to increase. This will create major opportunities in the mining sector because of Africa's enormous reserves of strategic minerals that can serve as feedstock for battery manufacturing technologies and renewable energy generation. Changes in agriculture in the quest for food security, better forestry management, inland and ocean water resource management, and the shift to clean energy and power in Africa's efforts to industrialize will all also be important.

Broad applications of technological innovation in the mining sector are required to increase productivity, ensure better safety, reduce hazard and waste, and limit environmental damage and negative spillovers. This includes methods of ultimately formalizing the artisanal and small-scale mining (ASM) sector, which accounts for about 20 percent of total mining output in Africa and constitutes an area where safety and hazard risk and abuse of labor (including child labor) is high, and returns for miners are low due to their weak levels of negotiating power when they sell product<sup>54</sup>.

In more industrialized mining activities, new technologies are already being put to use. For instance, companies are using drones and artificial intelligence created by startups to help with the construction of mines as well as ongoing inspections for operations, safety and hazard<sup>55</sup>. However, this requires cloud computing, provision of needed equipment, technical capacity to manage and service drones, and capacity to capture, process and analyze data for effective commercial decision making. Such capacity can be developed and applied more broadly across the continent in mining and other activities, but depends on the availability of ICT infrastructure for applicability and speed.

With infrastructure in place, entrepreneurial ecosystems can devise solutions for the mining sector.

From the production side, a recent study on potential minerals value chains in Africa<sup>56</sup> noted that the shift to mineral energy materials is based on finding options that help Africa and the planet reduce fossil fuel emissions. One solution lies in the production of lithium-ion batteries (LIBs) that can be used in electric vehicles (e.g., cars, trucks, buses) and consumer electronics, as well as serving as storage for renewable energy generated through solar, wind and other renewable energy systems. LIBs use several minerals including lithium and cobalt (Li-Co), manganese, nickel, aluminum, graphite, rare earths, iron, copper and phosphate.

Significant lithium resources are known to exist in many African countries, mainly in Central and Southern Africa and particularly the Democratic Republic of Congo (DRC). Zimbabwe is exploiting the largest known lithium reserves in Africa from its Bikita mine, currently at 10.8 million MT with a lithium content of 150,000 MT (1.4 percent). Exploration is underway in several regions, particularly West Africa, which is emerging as the new lithium frontier. A significant lithium resource has also been discovered in DRC. Currently estimated at 400 million metric tonnes, this is the largest non-brine lithium resource globally.

Countries producing cobalt in Africa include DRC, Madagascar, South Africa and Morocco. All countries produce cobalt as a by-product, except Morocco, the only country with a mine that is producing cobalt as its primary commodity. DRC has the largest mineral reserve of 3.6 million MT, equivalent to 51 percent of known global cobalt reserves, and produced 100,000 tons in 2019, equivalent to 70 percent of global production. An estimated 15 percent of DRC's annual production comes from local artisanal and small-scale informal sector miners (ASM), who typically work in unsafe conditions, take considerable risk, and are under-paid for their output due to poverty and weak bargaining position<sup>57</sup>.



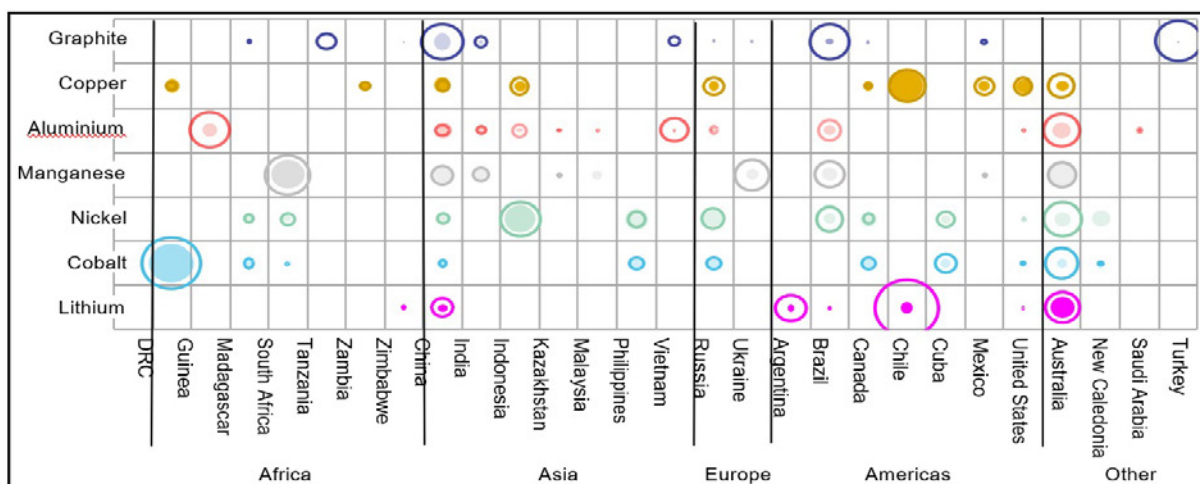
More broadly across the spectrum of minerals and ores, increased demand for African primary products should energize a number of exporting nations that possess resources needed for the global shift to the green economy.

Countries in Africa that will benefit are mainly found in the Central and Southern regions (e.g., Angola, Botswana, DRC, Namibia, South Africa, Zambia, Zimbabwe) with aluminum, chrome, cobalt, copper, iron, lead, lithium,

manganese, nickel, platinum, tin, uranium and zinc. West Africa also possesses significant minerals, including gold, bauxite, iron ore and diamonds, as well as lithium which will serve as a key mineral in the energy transition. Morocco not only produces cobalt, but has long been a leading producer of phosphates, which positions it well for increased use of fertilizer in the African agricultural sector. The figure below compares green minerals in Africa to other regions.

**Figure 13: Africa's Significant Green Minerals are an Advantage**

**Cobalt (52.4%), Bauxite for Aluminium production (24.7%); Graphite (21.2%), Manganese (80%)**



**Source: USGS 2019, Bloomberg NEF.**

**Note: The solid spheres represent 2019 production, the outer circle represents the total reserves. Size of spheres and circles denote proportionality of the resource between countries.**

Future prospects based on exploration and potential development include (1) lithium and cobalt projects in DRC, Madagascar, Mozambique, Namibia, South Africa, West Africa (Mali, Ghana, Côte d'Ivoire) and Zimbabwe; (2) bauxite (for aluminum) in Guinea; and (3) rare earths throughout Central, Eastern and Southern Africa, including Burundi, Uganda, Namibia and South Africa. However, possessing mineral resources will not be enough to capture value-added and foreign exchange benefits. Africa's mineral wealth has been long known, and in some cases symbolizes the problems it faces—lack of value-added, unsafe working conditions in the ASM sector, corruption and capital flight, and environmental degradation. Diversifying away from fossil fuels and capitalizing on minerals needed for environmentally sustainable industry and consumer goods (e.g.,

electric vehicles, sensors, electronic goods) will help reorient African manufacturing and supply chain relationships with better prospects for industrial value-addition than in earlier decades.

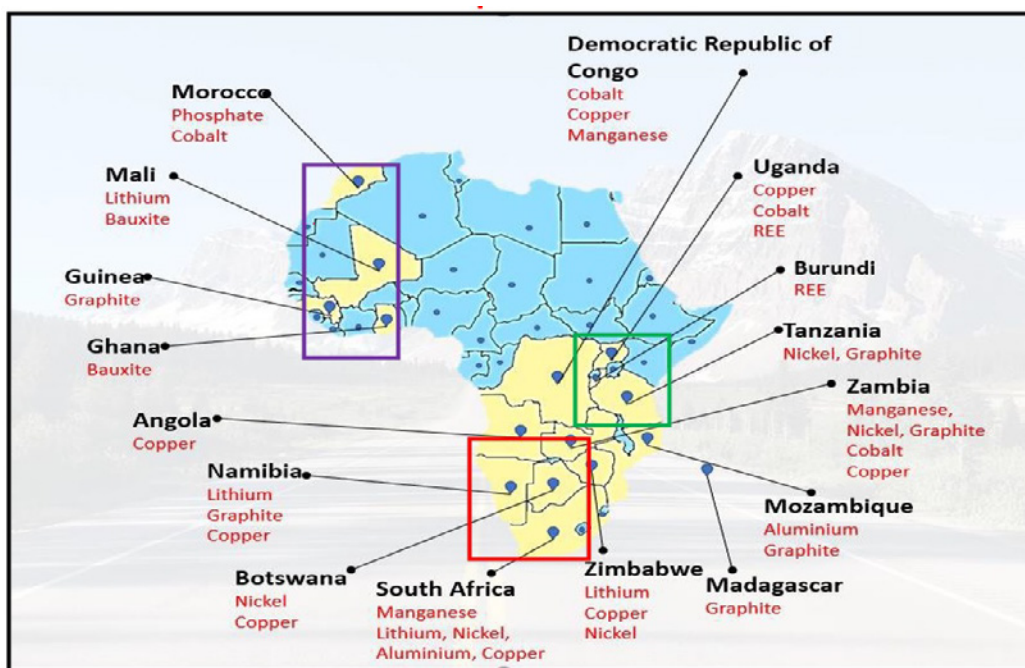
Existing automotive plants serve as a foundation on which to expand through retrofitting for the production of electric vehicles with some production located closer to primary resources and/or additional assembly to meet consumer demand and as a concession for producer access to primary materials. Assembly operations can currently be found in Ghana, Kenya, Nigeria, Rwanda, South Africa and Uganda. However, greater value-addition in electric vehicle and other consumer products, renewable energy systems and additional products and systems will require strategic alignment including

creating demand for battery products. As noted in the study on lithium and cobalt, little to no value addition is currently taking place. Zimbabwe only mines and exports raw lithium ore from its Bikita mine and the DRC extracts and exports raw ore or concentrate of cobalt in some of its operations. This means Africa is still locked in the primary stage of the value chain, which approximates only 10-15 percent of the full value generated from developing end-to-end commodity supply chains. This narrative needs to change through development and implementation of a bold strategy based on industrialization.

Bridging the gap in technical skills, research, testing, applications, and industrial molding will be needed to help close some of the gaps. Specific to battery and electric vehicle value chains, progress towards greater African value-addition will first require advances in precursor production and thereafter venture into cell production and battery pack assembling when the demand is

created. For electric vehicles, manufacturing of two and three wheelers and E-Buses are low hanging fruits. Support for entrepreneurship in these and other areas will potentially play a role in helping Africa to advance its capabilities. In this regard, close links with foreign investors will be necessary to tap into their extensive R&D for knowledge, as well as training, technical support and financing. This will be needed for the creation of regional value chains in relevant mining operations, refining and cathode manufacturing, and battery manufacturing. Based on the battery minerals endowments, three broad zones can be delineated for the development of electric vehicle value chains. They are (1) Western Africa, including Ghana, Mali, Guinea, Morocco (2) Southern Africa, including South Africa, Zimbabwe, Namibia, Botswana; and (3) Eastern Africa, including the DRC, Uganda, Burundi Tanzania. While this zoning is broad and illustrative, a feasibility study will validate the competitive advantages of each country/zone to justify the business case<sup>59</sup>.

**Figure 14: Future EV Battery Economic Zones**



The following table presents examples of how entrepreneurship support can contribute to policy recommendations for regional value chain development. Proposed initiatives draw on the previous sections on economic zones, support for skills development through various

educational initiatives, and outreach from incubators and accelerators to specific job sites for industrial application and testing. These open up practical opportunities for entrepreneurs to capture prospects in the value chain.

Entrepreneur-driven innovations will have a multiplier effect. Movement towards electric battery-powered machinery and equipment in agriculture will help reduce greenhouse gas emissions in the agriculture sector, currently responsible for 20 percent of global emissions. As agriculture is slated for growth in Africa, new approaches and methods must also address the challenge of emissions while increasing agricultural output and value. One study notes that zero emissions from farm equipment is

the single greatest contribution the sector can make to reducing its carbon footprint<sup>60</sup>. Therefore, innovations in the farm equipment sector (e.g., tractors, combines harvesters, threshers, dryers) will contribute to a better environment as well as enhance prospects for food security. This is just one example of how positive developments in one sector will have a multiplier effect on other sectors, enhancing economic productivity and output as well as contributing to a cleaner environment.

**Table 2: Mining Value Chain Development Ideas For African Entrepreneurs**

| Selected Policy Recommendations  | Entrepreneurship Support Initiatives   |
|--|--|
| <b>Conduct pre-feasibility studies on establishing Africa's battery manufacturing value chain</b>          | Identify joint initiatives required for lithium-ion battery manufacturing aligned with product development (electric vehicles, consumer electronics, etc.).  |
|  | Map out requirements for raw materials; refineries; precursors and battery assembling and associated capacities for innovation, capital-raising, manufacturing, energy, and governance.  |
| <b>Improve knowledge of lithium cobalt resources in Africa</b>   | Identify how new applications and digital technologies can assist with national and regional geological mapping of all potential mineralization to delineate potential quantities of critical mineral deposits.  |
|  | Identify activities, investments and deposits where smaller mining operations and SMEs can become part of the value chain.   |
|  | Establish industrial applied research initiatives on regional basis by collaborating with universities to transfer know-how from the private sector to local businesses, and establishing centres of excellence on strategic minerals.   |
| <b>Provide adequate incentives to existing lithium cobalt companies to develop integrated value chains</b> | Promote local industry players as forerunners for potential bigger investments <sup>61</sup> .   |
| <b>Consistency with rest of graphic</b>  | Support training for development of local content plans, strengthen capacity of institutions to train graduates to meet industry requirements, and support vocational training and apprenticeships for skills development.   |
|  | Link human capital formation initiatives to mining activities for job placement, and innovation-testing from products and concepts designed by entrepreneurs in incubators, accelerators, and eco-industrial zones.  |
|  | Encourage indigenous entrepreneurs to make investments along the value chain by providing specialized services such as supply chain or technical support or through consultancy, and/or through direct investment as value chain developers or downstream consumer product manufacturers.                            |
| <b>Strengthen efforts to formalize artisanal and small-scale mining (ASM) operations</b>                   | Ensure compliance with international labour laws.  |
|  | Formally integrate artisanal and small-scale miners into industrial supply chains, so that companies have greater control over their working practices and miners can make a living safely.  |
|  | Provide incentives for local investors to participate in the upstream end of the value chain by processing ores into concentrates <sup>62</sup> , motivate large-scale companies to develop the full value chain of lithium cobalt up to products such as Li-carbonates, cobalt compounds, cells, or the LIB itself. |

**Source:** African Development Bank – Natural Resources Center: **Litium Value Chain Analysis for Mineral Based Industrialization (forthcoming).**

## 7.2 Agriculture, forestry and biodiversity: scope for entrepreneurship and technology

As with mining, ability to capture economic benefits and opportunities in agriculture, forestry and fisheries will require more than a shift in agricultural and water resource management practices. Africa today imports \$50 billion in foodstuffs that could be produced domestically and supplied regionally, partly reflecting the reallocation of the continent's resources from agriculture to fossil fuels in the 1970s-1980s<sup>63</sup>. Restoring production capabilities in agriculture, boosting scale, improving quality, and leveraging regional value chains will help reorient the structure of Africa's economy to reduce distortions and capture value-added.

Climate change is reducing agricultural productivity, already low in Africa, while fish stocks and forestry resources are under threat due to excessive fishing and deforestation. In some cases, agricultural policies and the quest for volume lead to diminished resources, such as illegal harvesting of cocoa trees in theoretically protected zones<sup>64</sup>. Likewise, industrial fishing is putting fish stocks at risk. Policies and effective enforcement will be needed to protect and manage resources so that they are sustainable for future use.

Measures that can be taken are broad. Food producers who want to trade regionally often face what is perceived as a heavy bureaucratic burden to obtain export approvals and meet phytosanitary standards, which impact the capacity of producers and distributors to meet volume requirements. Particularly in the case of perishables, considerable volume is lost due to delays. There is also a need for better market information to match producers with consumers to enable efficient distribution. As urbanization proceeds, urban populations will need greater quantities of food, requiring more targeted distribution from producers to wholesalers to retailers. All of this commercialization likewise requires financing and payments to

achieve volume and supply markets. Support for entrepreneurship can help with all of these needs.

### Agriculture and food security

With growing urban populations and middle classes spending more money on meat, dairy, fresh and processed foods and beverages, there will be a major market in Africa for domestic produce<sup>65</sup>. This, together with the need to achieve nutritional balance and food security as well as better contingency planning for future emergencies, makes agriculture an area of opportunity. However, with most farming carried out by subsistence farmers, a move to sustainable agribusiness is needed for long-term security and income growth. This will require improved policies, better institutions (public and private), and effective value chains. While commitment to increased intra-African trade will add to demand and create incentives for enhanced productivity and efficiency, improvements are required along the entire value chain spectrum, from input suppliers and public information providers, farm site to farm gate, transporters and wholesale/retail distribution networks to household consumers.

Africa is already benefiting from new technologies in agriculture<sup>66</sup>. These include field drones, harvesting robots, and the use of "big data"-driven farm insights to enhance productivity and livelihoods in the face of food insecurity and climate change. Applications are also being developed for early warning systems, such as outbreaks of wheat rust in East Africa<sup>67</sup>. Artificial intelligence (related to big data) is also being introduced in some cases, and may have broader applications over time as more research is carried out on agricultural inputs and their relation to output levels and quality (see Entrepreneurship in Africa). Additional innovation is found with logistics to contribute to transport efficiency in the delivery of food items, and systems that allow farmers to apply for credit and crop insurance. There is also continued progress in applications of biotechnology that help to create varieties of horticultural products that are resistant to pests and drought<sup>68</sup>.



## Box 4

| Lori Systems  | Kobo 360   |
|---|--|
| <p>Founded in 2016 and based in Nairobi, Kenya, Lori has built an e-logistics platform that is revolutionizing the cargo-transport value chain in frontier markets—from the ground up. The relative cost of moving goods in Africa is one of the highest in the world, with up to 75 percent of a product’s cost going to logistics (compared to 6 percent in the US). Lori’s logistical support provided to transporters and cargo owners helps to drive down the cost of goods.</p> <p><b>For Transporters:</b></p> <ul style="list-style-type: none"> <li>• <b>INCREASED MARKETING AND SALES:</b> Increased visibility of brand</li> <li>• <b>OPTIMIZED TRUCK UTILIZATION:</b> Quicker turnaround through proactive systems/data capture leading to more money</li> <li>• <b>AUTOMATIC AND ACCURATE INVOICING:</b> Through Lori proprietary system and software</li> <li>• <b>ACCESS TO CAPITAL:</b> Fuel financing</li> </ul> <p><b>For Cargo Owners:</b></p> <ul style="list-style-type: none"> <li>• <b>RELIABILITY:</b> High quality transporters through proprietary verification and on boarding</li> <li>• <b>TRACKING:</b> Consistent updates provide peace-of-mind</li> <li>• <b>AUTOMATIC INVOICING:</b> Through Lori proprietary system and software</li> <li>• <b>DATA:</b> Packaged to provide management insights and enhanced control</li> <li>• <b>COST SAVINGS:</b> Both direct and indirect</li> </ul> | <p>Based in Lagos, Nigeria, Kobo 360 is a technology company that aggregates end-to-end haulage operations to help cargo owners, truck owners, drivers, and cargo recipients achieve an efficient supply chain framework.</p> <p>With only a click of a button on seamless mobile and web applications, cargo owners can simply request any truck of their choice and have their goods picked up and delivered to the required location through an all-in-one logistics ecosystem.</p> <p>Kobo uses big data and technology to reduce logistics frictions while empowering rural farmers to earn more by reducing farm wastages and helping manufacturers of all sizes to find new markets. Kobo enables unprecedented efficiency and cost reduction in the supply chain, providing 360-visibility while delivering products of all sizes safely, on time and in full.</p> |
| <p><a href="https://www.lorisystems.com/">https://www.lorisystems.com/</a></p>  | <p><a href="https://www.kobo360.com/NG/en/">https://www.kobo360.com/NG/en/</a></p>   |

While most of Africa’s farmers are subsistence, those able to invest in and maintain mechanized equipment can enhance production scale, speed and efficiency of land cultivation. Meanwhile, fundamental improvements that can be channeled through extension services on mobile phones to poor farmers include recommended inputs (e.g., seeds, fertilizer applications, herbicides, weedicides), soil quality and preservation of

nutrients, recommended watering and related irrigation practices involving more unified teams of specialists (e.g., engineers, agronomists, technicians)<sup>69</sup>, harvesting techniques, and methods of post-harvest treatment to eradicate post-harvest losses<sup>70</sup>. Food processing represents an effective method for storage and helps to reduce post-harvest loss risk, subject to temperature control and health requirements.

Remote sensing and connected devices help agricultural, horticultural and aqua-cultural farmers measure productivity, seed and soil quality, and disease risk. They also enable farmers to optimize output, reduce waste, and anticipate negative issues. These technologies can also be applied to livestock management, for both meat and dairy.

Support for entrepreneurship could expand technology for agricultural use. This includes specific apps that can be applied in local growing regions with specific data content to (1) enhance productivity through better organization, timing, application and mix of inputs; (2) meet phytosanitary requirements; (3) assess export requirements and enable documentation for approvals; (4) identify markets for output; and

(5) design guarantee schemes and payment/settlement systems for transactions.

As one example, the African Development Bank has established an agricultural partnership program that better and more affordably distributes fertilizer to farmers to increase productivity (see below). Entrepreneurs could help enhance efficiency and broaden distribution with various digital applications (received by farmers and traders on mobile phones) that help with wholesale, retail and farmgate distribution, as well as technical information for farmers. Likewise, information on payment schemes for purchases would help increase interest and effective demand, as would simple calculators involving input costs, output, and resulting earnings based on differing output price scenarios.

### **Box 5: The African Fertilizer and Agribusiness Partnership (AFAP)**

The African Fertilizer and Agribusiness Partnership (AFAP) is an independent non-profit organization founded in 2012 by a partnership of African development organizations. It was built on the work of the Comprehensive African Agriculture Development Program (CAADP), a framework for achieving ambitious agriculture development goals set in place by African nations and leaders.

AFAP has since evolved into a social enterprise and service provider to the public and private sectors on sustainable development projects and policies focused on market-driven business solutions in the agriculture inputs and agribusiness value chain. AFAP combines technical expertise with entrepreneurial innovation.

AFAP adds value to the agriculture inputs and agribusiness value chain by building capacity and linking African Hub-Agrodealers and smallholder farmers to global inputs and output market companies, promoting the use of high quality and affordable balanced crop nutrition products, partnering with technology and equipment providers, and facilitating trade finance for fixed assets and inventory via the Agribusiness Partnership Contract (APC) mechanism.

AFAP's public-private partnership strategy is ultimately designed to build the capacity of African agriculture inputs and agribusiness SMEs, and increase agricultural productivity. The execution of that strategy with partners results in increased food security, income, job creation, and agriculture contribution to national GDPs.

Since 2012, AFAP has implemented projects/programs and advised public, private sector clients, NGOs, and donors in Ghana, Tanzania, Mozambique, Malawi, South Africa, Côte d'Ivoire, Nigeria, Senegal, Rwanda, Kenya, Ethiopia, Democratic Republic of Congo, and Uganda. AFAP is committed to furthering social inclusion and gender equality throughout all its interventions with strategic partners across Africa.

<https://www.afap-partnership.org/about-us-2/>

Additional opportunities will be found in business management assistance for cooperatives and other business entities that group smallholder farmers into organizations to (1) purchase needed inputs with some buying power; (2) customize irrigation requirements for design, installation and maintenance; (3) arrange for commercial drying to reduce the risk of high moisture content spoiling output; (4) create storage facilities to protect against post-harvest loss and to mitigate the risk of selling during peak harvest when prices are low; (5) access financing and crop insurance; (6) negotiate commercial contracts based on levels of output that are at scale; and (7) handle administrative, management and reporting requirements to members and shareholders. Such business management opportunities could be structured as equity investment, supplemented by debt financing, with value creation generated by management fees for turnkey systems combined with equity value appreciation as the enterprise grows. This could be vertically integrated with wholesale trading and supermarket operations, or horizontally integrated as suppliers to multiple distributors based on product specialization and market specifications.

### **Forestry resources and biodiversity**

Improved forestry management for biodiversity preservation is another area of future sustainable development and value for Africa, as deforestation is a key issue at the core of climate change and rising temperatures. As Africa moves forward with economic reform aligned with environmental objectives, efforts to protect forestry resources will be an important pillar for the future.

Deforestation has been driven by a combination of factors. At the high end, the harvesting of exotic hardwoods used for expensive furniture making abroad has often been imprudent in terms of forestry stewardship, while also foregoing opportunities to establish manufacturing capacity in Africa prior to export. On the low end, in many cases, wood of any sort has been a source of cheap energy for households. Deforestation has also been exacerbated by industrial and artisanal agricultural practices and increasing requirements for land. With 50 percent of the workforce active in mainly subsistence agriculture, this agriculture-induced deforestation has had a major adverse effect on African tree cover. It has also triggered political tensions and conflicts between livestock farmers and herders seeking out new terrain and plant-based farmers protesting against

encroachments on traditional lands. The end result has been depletion of forestry resources, reducing the planet's ability to absorb carbon emissions and putting biodiversity at risk. A more systematic approach is needed to protect forestry resources important for absorbing carbon emissions and biodiversity, particularly as it relates to commitments to boost biotech, pharma and vaccine production in Africa by 2040.

R&D oriented to biodiversity and related tropical research will be essential for future emergency preparedness to reduce the risk of COVID-19-like effects from recurring. With this priority having been recently announced<sup>71</sup>, improved agricultural policies and practices will be needed to protect forestry resources and for forestry management to be enforced with a focus on sustainability. Even more importantly, Africa will require considerable investment and partnerships to develop needed R&D capacity, together with a sound policy framework, adequate regulations, and ongoing commitment to education, training and facilities.

Solutions to loss of forestry resources and biodiversity will need to be devised at all levels. At the macro level, initiating "debt for nature" swaps, as countries like Costa Rica have done to protect biodiversity and to stimulate tourism, could help stabilize Africa's debt position. Debt swaps in exchange for forestry and land preservation could include royalties to reduce fiscal fragility. At the micro level, entrepreneurs can build on existing ventures and initiatives to create multiple tourism strategies to create jobs and generate foreign exchange, including through development of eco-tourism zones or clusters linked to entrepreneurial initiatives in eco-industrial zones to incubate and accelerate applications.

Additional support for better forestry management to achieve green economy objectives can be based on industrialization and value-added to replace the exportation of raw wood. The Bank has recommended that ministries in charge of industrial development in each country analyze the furniture and wood products markets to understand their current state of development, market size and trends, market segments by products, market forecast, main constraints, and the interventions necessary to accelerate growth. The goal of such analyses would be to provide a comprehensive value chain analysis of each segment of the wood processing industry that would provide policy options to line ministries and recommendations on critical interventions

to stimulate the industry's development. This would put in place a framework for domestic and regional supply chains to capitalize on a growing sector of the economy<sup>72</sup>.

Opportunities for entrepreneurs are likely to be at the micro level as companies invest to expand capacity, improve quality, and strengthen operations for better performance. Investment at the micro level can focus on improvements in processing and finishing to meet quality standards regarding dimension, aspect and moisture content. New technologies, information systems, and trained personnel can improve procurement, inventory management linked to processing, packaging, scheduling of delivery times (including exports), and general cash conversion cycle requirements that include regular scheduling of maintenance and replacement of parts, machinery and equipment.

Opportunities for African producers will increase with time as incomes and populations rise. Growth in urbanization also means there should be growing domestic demand for household wooden furniture products as well as wood products for construction needs. Therefore, a broad range of applications for production and processing improvement, quality control, inventory management, logistics and cash management will be needed to enhance competitiveness and meet demand (intra-African and abroad). In this regard, entrepreneurs in eco-industrial zones would likely be an excellent place to establish clusters. At the same time, links to vocational schools will help with job placement and quality of output, while technicians will be needed for inventory, equipment and logistics management and support.

### **Water management and food stocks**

A major issue only now beginning to gain attention internationally is the widespread depletion of fish stock resources resulting from overfishing in ocean waters and broad contamination of water resources as a result of dumping and other negligent practices. The offshore challenge relates to potential violations of sovereign territorial rights, wholesale disregard for fish stocks and needed balance for sustainability. Counteracting threats, challenges and risks is a multilateral endeavor, and African countries will need help from partners due to the technological, security and military implications that can arise. Contamination of water resources is typically a

more domestic or potentially cross-border issue related to pollution of rivers, streams and other inland water sources due to chemical toxins and dumping of electronic, plastic and other waste. The contamination of water resources can affect livestock supplies as well as fish stocks, and trigger search for new pasturage and water sites, potentially exacerbating deforestation. To protect the food security of Africa's growing population, including in urban areas, there is a need to preserve and increase livestock and fish supplies, as well as horticultural products.

In areas of livestock management, digital applications and biotechnologies could improve the health of ruminant livestock and thus help reduce the number of methane-producing animals like cows, goats and sheep required to meet Africa's protein needs. Artificial intelligence may be able to enhance detection of disease, which would reduce mortality rates, improve health of herds, and increase quality of meat ultimately sold to market. Meanwhile, improved vaccines for dairy cows and use of robotics to adjust feed and manage milking cycles are likely to increase African capacity to produce dairy products for domestic markets. Genetic technologies could also help by enabling the breeding of animals that produce less methane, although this is complex and would require considerable testing in the African environment to ensure such practices do not interfere with human and animal health.

With regard to fish stocks, entrepreneurial innovation in data and advanced analytics could enable naval and fisheries authorities to better monitor and manage offshore water bodies (and lake regions) to limit overfishing and counter territorial encroachment by foreign flag carriers. New technologies will help to estimate fish stock populations and trends and determine and enforce quotas when necessary to protect stocks for renewal. Fishing vessels themselves can be equipped with air and undersea drones to provide a comprehensive view of fishing conditions. Future trends will likely add advanced sensors and monitors on vessels to collect data on the gear used, species caught or discarded, and volume of hauls. This will also help naval and marine enforcement authorities monitor illegal fishing. Maintaining the quantity and quality of fish stocks will provide opportunities for entrepreneurs in Africa with expertise in hardware, software and analytics to develop applications and integrate them into government monitoring stations and on vessels.



### 7.3 Waste management: movement to the circular economy

One of the more serious environmental issues in Africa and the world is the landfill buildup of non-biodegradable waste, particularly plastic waste. However, there is also considerable biodegradable waste. In general, major innovation is required to prevent waste, and then to process and re-use what is biodegradable or piling up in unsanitary dumps. This particularly applies in rural areas specific to practices in the farm economy, which engages about half the African labor force. Non-biodegradable plastics and other products represent a far more serious problem in terms of waste management and recycling, and landfill and hazardous, non-biodegradable waste are most problematic in urban areas. However, new technologies can be harnessed to convert some of these products into building materials or other components for reuse. In this regard, incubators and accelerators in urban zones represent excellent sites to test concepts that can potentially be scaled up to solve real problems.

To identify solutions, one approach would be for local and municipal governments to advertise for needed vendors to solve problems like waste. Investment in solutions that recycle and create alternative products can lead to business growth, much as wood pellets from sawmill operations have been used in some cases for fuel. Some solutions will not necessarily be overly complex, and may just need some good young engineers and the ability to turn common sense ideas into widely adopted practice.

In some cases, solutions can be found in a change in practices that prevents waste in the first place. In agriculture, this can be through farm practices to reuse waste, mainly to regenerate soil. Other techniques include optimization of harvest time, such as in horticulture. These practices could enhance productivity as well as reduce waste. In relation to animal health, improved manure management can provide organic fertilizer to enhance soil nutrients and greater agricultural output, resulting in reduced use of chemical fertilizers. Likewise, waste water can sometimes be treated and used as fertilizer. These concepts carry over to food processors as well, as artificial intelligence and sensors can help food processors sort better and slash waste, while other smart technologies can identify inedible by-products for reprocessing.

Food waste by consumers in many markets around the world is high. Recycling at least allows for the processing of this waste for reuse. However, before food reaches consumers, supermarkets and distributors can sell food before expiration dates by using AI-enabled tracking. In some cases, dynamic pricing can be applied to discount the price of the goods to serve as a catalyst for their sale and use.

Likewise, in institutional and restaurant settings, new tools are now being used to capture, track, and categorize data on food waste so that food can be consumed rather than wasted. For instance, in many Western markets it is not unusual for restaurants to package unused food that is collected and distributed to local food banks and housing shelters. AI can also be programmed to forecast sales and predict inventory requirements. All of this reflects optimization to reduce waste. While Africa may not waste as much as other markets, urbanization and growing consumerism are likely to trigger an increase in waste over time. Identifying and mitigating the risk early on will help limit the damage.

### 7.4 Digitalization and fintech: meeting challenges and expanding gains

#### The digital economy

Discussion of the digital economy involves a broad range of rapidly developing, highly impactful, and heavily data-driven fields that rely on the mix of speed, capacity and range to perform functions not previously achieved, or at rates and volumes not previously attainable. More common references are to machine learning and AI, robotics and automation, linked sensors and the “internet of things” (IoT), drones, quantum computing, big data and analytics, and related activities. These are all generally in their nascent or embryonic stages in Africa, although some sectors have already demonstrated capacity for their use. For instance, in the mining sector, the use of drones and artificial intelligence is helping with safety, efficiency and commercial decision-making. The boom in mobile payments, e-commerce and remote work are examples of how new technologies have been implemented in recent years in Africa. This will continue to be the case, with considerable gains resulting from these applications, including in health, education and social services.

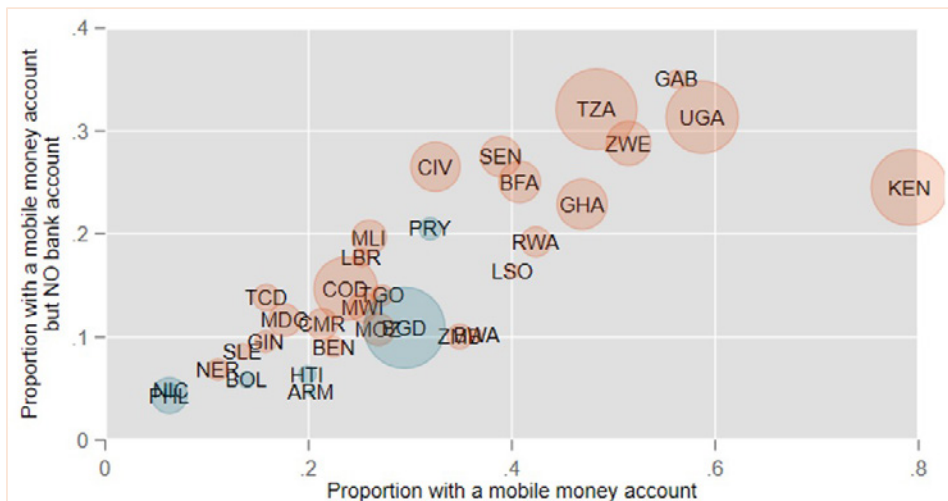
While governance and regulation appear to be the next frontier for AI and broader digitalization development, there are many challenges. These include (1) encouraging broader uptake, as adoption is currently limited to digitized industries and firms at the digital frontier, mostly in the northern hemisphere and very rarely in Africa; (2) deploying AI and other digital capabilities within government, as governments tend to be the largest buyers within states and can spur commercialization of technologies, while at the same time improving their own service offerings; (3) addressing employment and income-distribution concerns, as automation, robotics, and other AI technologies may upend some workplaces, occupations and tasks, including in the African state-owned enterprise sector; (4) ensuring the availability of data, including opening up public sector data to

spur private sector innovation, such as for health, education and social services as well as environmental, biodiversity and forestry protection and protection of underwater resources and offshore territorial monitoring; and (5) resolving the multitude of ethical, legal and regulatory challenges that are problematic around the world and have only begun to be addressed in Africa.

### Fintech

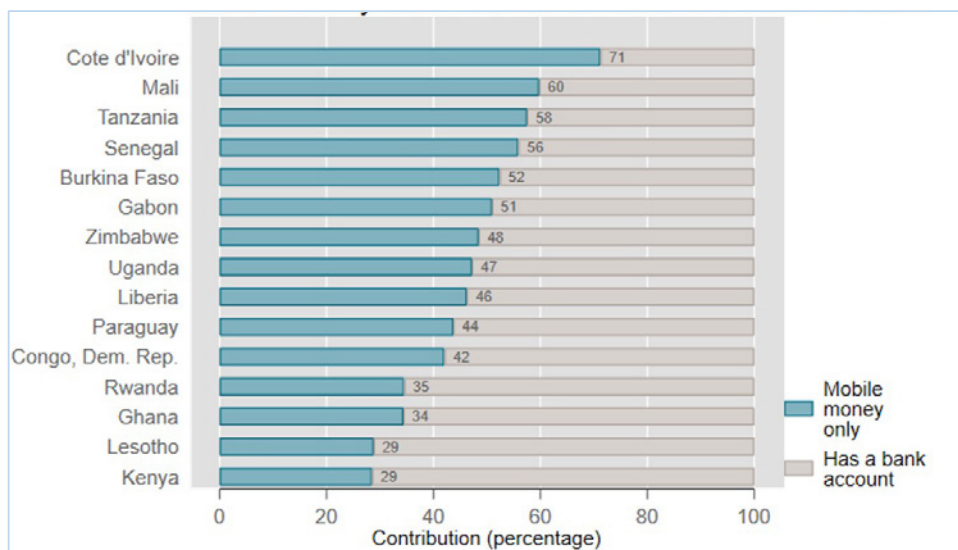
As the success of mobile payments has shown, fintech has great potential to meet some of the continent's financing needs, including for households and small businesses typically operating in the informal sector and outside the banking sector.

**Figure 15: Mobile Money Adoption among People 20-29 Years Old<sup>73</sup>**



**Note:** Circle size represents the absolute number of with a mobile money account but no bank account. Sub-Saharan African countries in

**Figure 16: Mobile Money's Contribution to Financial Inclusion for People in their Twenties<sup>74</sup>**



This can be achieved without undermining banks or banking stability, given that banks mainly lend to large-scale firms and purchase government securities to maintain stable capital and liquidity ratios. Future efforts by banks to play a more prominent role in the small business and household sector could involve support through ecosystems and startups to develop apps and other services to accommodate targeted clients. This would presumably be linked to niche segments like credit cards and housing finance, with potential for expansion over time as Africa's consumer market and middle class grows.

In more advanced financial markets, fintech is being applied to the operations, credit and market risk, and liquidity management of companies engaged in a wide range of financial intermediation, including credit cards, Real Estate Investment Trusts (REITs), real estate brokering, factoring, venture capital, credit information bureaus, bill paying services, loan brokers, banks, real estate crowdfunding, stock exchanges, insurance companies, discount brokers, mutual funds, hedge funds, and bond dealers. Fintech is also important in the provision of support activities (e.g., financial advisors, credit counselors, news services like Bloomberg and Thomson-Reuters, benefits administrators, account information aggregators), and payment systems (e.g., PayPal, Western Union, other money transfer businesses). Banks themselves are often major players in and supporters of fintech ecosystems, as well as buyers of fintech products and services.

In Africa, entrepreneurs may be among those that can design the kinds of data aggregation and management systems needed for countries and localities to accelerate development of credit information bureaus, property registries, and related tools that help with credit risk analysis for lending. This might include simulations and artificial intelligence, which would add another layer of complexity but would represent the kind of innovation that entrepreneurs tend to exhibit. These and other innovations will ultimately be important for African businesses in their efforts to access term financing, both debt and equity.

More broadly, entrepreneurs will find considerable opportunities in blockchain, digital payments, and lending and investment instruments. Leasing and factoring will be a source of demand for data-

intensive analytics for credit risk (leasing) and working capital intensity and turnover (factoring). For instance, companies that have the power of and inclination for ongoing monitoring and real-time analysis, which is more of a retailer's strength (e.g., inventory management) rather than a banking strength, are likely to benefit from the ability to monitor data analysis of trends. This could provide a boost in the provision of working capital lines of credit and receivables-based factoring that allows small businesses faster access to cash without having to undergo laborious steps and documentary processes to access loans from banks.

Insurance applications will continue to increase based on the need for data, statistics, and risk profiling to inform policies, risk-taking thresholds, and the management of claims and payments. In insurance, claims processing will be faster and operationally cheaper, and controls in the system will be expected to reduce fraud. Outstanding issues to be addressed include automated claims processing, and establishing agreements in legal, regulatory and consumer protection frameworks. As these frameworks evolve, entrepreneurs in fintech will find major opportunities to help insurance companies automate. This will be particularly important for auto insurance as the population grows, roads expand, and access to auto finance increases. It will also help with numerous other insurance lines, of which property insurance is of great importance to the business sector when it owns facilities.

In capital markets, tokenized bond instrument issues (and their subsequent secondary market trading) and smart contracts will allow for faster information flows and data-driven decision-making without the use of brokers, dealers or other intermediaries. In this regard, blockchain will be an important contributor to reduced transactions costs in bond markets as they develop. Fintech entrepreneurs will have opportunities to work with exchanges and issuers (including governments) to reduce issuance and transactions costs for investors, helping to add liquidity to the market. Given the low level of local currency bond market development in Africa and efforts to increase local currency shares of overall financing needs, these kinds of technological innovations will be helpful in pushing progress in African financial markets.

# 8. Entrepreneurship in Africa's new economy

## 8.1 Promoting inclusive development

Ambitions to ensure broad-based benefits for youth, women, and the general population will require major investments in physical and social infrastructure for the power generation, transport, logistical and communications capacity needed to ensure movement of goods, people and data. Likewise, an enhanced business environment to driven by regional value chains and linked together by financial market integration, will be needed.

Beyond these requirements, support for entrepreneurship to identify opportunities, conceptualize solutions, and gain market traction in critical areas of need will necessitate incubators, accelerators, centers of excellence, and other institutional supports to serve as catalysts for innovation. This will be enhanced with formal linkages to various educational and training centers to capitalize on more targeted and focused skills development that feeds directly into market needs. As capacity to develop innovations and mentoring from market players expand, it is expected that increased financing will also be available.

Priorities mapped out in earlier sections include an emphasis on more efficient infrastructure and logistics, successful development of a conducive business environment for increased intra-African trade and RVCs, and ongoing financial market development and integration to enfranchise the disenfranchised. All of these initiatives should be inspired by efforts to break the legacy of fiscal fragility, debt dependency, and low value-added across all sectors of economic activity.

Specific targeting of entrepreneurship initiatives should focus on reducing African vulnerability, as evidenced during COVID-19, and boosting resilience. This does not mean protectionism or a rupture with international partners in trade and investment. Rather, it focuses on capitalizing on Africa's resources and potential to achieve a minimum threshold of productive critical mass to generate higher incomes, sustain better distribution of wealth created, and support higher levels of economic and institutional

functionality across the public and private sectors. This means more efficient government services, less corruption, and a service-oriented approach to incentivize the public to meet tax payment requirements. In effect, this becomes an effective social contract between taxpayers and their governments, with the latter becoming a trusted agent of the former as manifested by efficient delivery of public goods.

Linking the above strategy to contingency planning and emergency preparedness for the future provides an added strategic incentive to reduce harm caused by unforeseen shocks. Connecting entrepreneurship initiatives to sustainable policies associated with food security, biodiversity protection, waste management and related outcomes aligned with the green economy will further enable Africa to achieve strategic development synergies—preparation for future emergencies in addition to long-term improvements in the environment on which considerable economic development depends<sup>75</sup>.

As much of the future depends on knowledge-based applications and initiatives, education in the broadest sense is of critical importance to inclusive development. Across the globe, education and skill levels have been defining differentiators as automation continues to permeate the economy. A focus on education and training is therefore required to capture the benefits of digitalization and automation and prepare youth and women for future needs. With such education and training linked to economic organizations (e.g., companies, incubators and accelerators, eco-industrial zones), Africa can mobilize its human resources in a strategic way that helps to create opportunities that enhance productivity and incomes. However, this will require significant investment and time.

As one example, Africa has announced plans to produce 60 percent of its needed vaccines by 2040, compared with only 1 percent in 2020. This will require considerable investment in biotechnology from pharmaceutical and other firms. Africa will need robust partnerships with international agencies to optimize R&D,



as well as major investment in refrigerated or temperature-controlled supply stations, transport infrastructure, and stable electricity and power supplies. A scan of R&D rankings for African universities engaged in health management and sciences shows only 18 institutions on the continent, globally ranked from 308 to 476. These institutions are located in eight countries, of which only four are in Sub-Saharan Africa<sup>76</sup>.

Major coordination and investment will be required to develop this sector. Such gaps in other sectors exist as well. However, the magnitude of the challenge calls for an effort to support inclusive growth, as Africa’s best minds combined with incentives and support will be required to solve these problems.

## 8.2 Examples of initiatives and support

Several initiatives have been devised to address these gaps. They include high-level pledges of finance and institutional commitments (e.g., the May 18, 2021 Summit on Financing African Economies), as well as more specific, relevant initiatives focused on entrepreneurship already described (e.g., Alliance for Entrepreneurship, Youth Entrepreneurship Investment Banks, the proposed African Resilience Initiative). Building on the existing Compact with Africa, a network of partners and initiatives has been established to move forward with support for entrepreneurship and resilience enhancement in Africa.

**Table 3: Select AfDB-Supported Initiatives Supporting African Entrepreneurship**

|   | Main Focus  | Institutional Partners   |
|---|---|--|
| <b>Alliance for Entrepreneurship (AfE)</b>                          | Multilateral effort to provide equity capital for startups and small businesses, and to ensure trade financing is available to stimulate intra-African trade and investment   | IFC, AfDB, others TBD  |
| <b>Youth Entrepreneurs Investment Banks (YEIBs)</b>                 | Led by AfDB to provide equity financing to young African entrepreneurs  | AfDB, others TBD   |
| <b>African Resilience Initiative (ARI)</b>                          | Proposed by AfDB to address fragility needs by involving entrepreneurs and private sector in boosting food security, water management, health care needs, and general emergency preparedness  | TBD  |
| <b>Compact with Africa (CwA)</b>                                    | Initiative to support investment and business environment policy reforms with targeted investments to achieve policy objectives—currently active in 12 African countries  | AfDB, G20 bilateral and multilateral organizations   |
| <b>Affirmative Finance Action for Women in Africa (AFAWA)</b>       | Pan-African initiative to bridge the \$42 billion financing gap facing women in Africa through finance, technical assistance and enabling environment reforms   | AfDB, Attijariwafa Bank, African Guarantee Fund, ECOBANK   |
| <b>Boost Africa</b>   | A joint initiative between the AfDB and the European Investment Bank (EIB) and one of the flagship initiatives of the AfDB’s Jobs for Youth in Africa strategy, aims to harness the continent’s potential, and create opportunities on the ground by empowering young African entrepreneurs | AfDB, EIB  |
| <b>African Guarantee Fund (AGF)</b>                                 | Market-friendly guarantee scheme aims to ease access to finance for small African SMEs  | AfDB in partnership with the governments of Denmark and Spain  |
| <b>Youth Entrepreneurship and Innovation Multi-Donor Trust Fund</b> | Promotes the creation of sustainable jobs for young Africans by equipping youth and women-led startups as well as micro, small and medium enterprises with the skills, financial support and enabling environments to run bankable businesses   | AfDB, others TBD   |
| <b>Seed Capital Assistance Facility (SCAF)</b>                      | Offering investment fund managers two types of cost-sharing support for those willing to include a seed investment window within their overall investment strategy  | AfDB, Global Environment Facility, United Nations Environment Programme, the United Nations Foundation, Frankfurt School of Finance and Management |

## 9. Key lessons for the Bank, its clients and the development community

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Successful support for African entrepreneurship depends on a broad range of factors discussed in this document, with physical infrastructure investment (e.g., power generation and transmission, transport, ICT), social infrastructure (e.g., health, education), business environment for trade and investment, financial market access, and provision of government services being among the most important. At the same time, the state of development will also influence the potential impact entrepreneurship can have on achieving broader economic and social development objectives.

Given the challenges Africa continues to face with many if not most of the identified factors, much of its entrepreneurial talent has operated in the informal sector, resulting in relatively low value-added and limited enterprise scale as well as lower levels of efficiency, productivity

and benefits at the enterprise level. Distortions and weaknesses, particularly in the legal and institutional frameworks, have led to a business environment that fails to meet the continent's economic and social needs. Therefore, improving the business environment will go a long way to help create jobs and opportunities for Africa's entrepreneurs and small businesses.

The Bank and partners can contribute to successful African development with more active and explicit support for entrepreneurs, and by linking entrepreneurship opportunities with solutions for the larger environmental, economic and social challenges. The following chart gives suggestions for the Bank, as well as to clients (sovereign and non-sovereign borrowers) and partners (e.g., DFIs, NGOs, foundations), in terms of approaches that could help to coherently support entrepreneurship in Africa.



**Table 4: Lessons for Future Entrepreneurship Support in Africa**

|   |  |
|---|--|
| <b>Regional public goods</b>                                      | Insufficient availability and efficiency of delivery in public goods adversely affects development progress. Greater investment in regional public goods would improve outcomes for private sector development and entrepreneurship.   |
|   | Domestic private sectors will benefit from investments in energy, transport infrastructure, ICT networks, and improved health, education, water and waste management. The AfCFTA offers significant opportunities to broaden and deepen regional integration and, by extension, intra-African trade and investment. These will be essential for the future success of regional value chains.   |
|   | Governments and the private sector will benefit from advances in financial market harmonization and market linkages, resulting in diversification of government financing sources in local currencies, greater bank lending, broader levels of insurance coverage, and more liquid capital markets. Pension funds will be able to diversify asset classes, while credit information bureaus and property registries could provide data for investors and lenders to manage and price credit and market risk. This is helpful for creditors (e.g., banks and other creditors) and borrowers, by providing information needed to secure assets for collateralized loans, and to allow valuation of tangible fixed assets for additional financing to scale up businesses.  |
| <b>Broaden the scope of Compact with Africa</b>                   | Compact with Africa is focused on domestic markets, thereby foregoing potential opportunities to boost productivity, efficiency, scale and value that a regional approach affords. Broadening the scope of Compact with Africa to encourage greater direct investment nourished by an improved business and investment climate would leverage resource flows and increase impact.  |
|   | Better functioning institutions with incentives that balance investor needs with consumer protection and creditor rights will increase incentives for long-term capital investment in needed infrastructure to capitalize the green economy. PPPs and other long-term investor frameworks will boost investment in needed physical infrastructure on a regional basis (e.g., cross-border power transmission, ICT, and transport networks) that can serve as the backbone for regional value chain planning. This investment can also serve as a key driver of supply chain development in countries and regions, serving as a source of demand for innovation and entrepreneurship.   |
|   | Focus on the 10 AfDB-supported commodity-based value chains would be a starting point, with financing of needed infrastructure and private sector support structures put in place to link with other initiatives (AfE, YEIB, ARI). This could induce expansion of the geographic coverage of Compact with Africa countries as well as providing a demonstration effect for other needs on the continent.   |
| <b>Boost entrepreneurship by supporting AfE, YEIB and the ARI</b> | Supporting nascent initiatives like AfE and YEIB, refining concepts to boost resilience (e.g., transforming the African Fragility Initiative into the Africa Resilience Initiative), and linking these supports and resource flows in a coherent manner will help address shortfalls in financing, technical assistance, transactions and deal-making, and the broader business environment for trade and investment.  |
|   | The AfE provides a favorable opportunity to team with the international community to boost support for entrepreneurs and related trade. Initiatives described in relation to incubators, accelerators and financing should be supported with linkage to other initiatives that connect entrepreneurs and ecosystems with capacity to innovate, develop, test, and ultimately commercialize products and processes.   |
|   | The YEIB provides a channel for specific funding to entrepreneurs linked to venture capital, seed capital, angel financing, private equity, and related risk capital. Such a channel also provides an opportunity to support the needed infrastructure and knowledge- and skills-based connectivity required for success and financing. This includes broad support for education, vocational training, skills development, and general investment in human capital formation so that entrepreneurs have access to the talent needed to scale up for success. This also includes ongoing support for eco-industrial zones across the continent, links to R&D capacity, incubators and accelerators, and closer linkages with business associations to “do deals”.  |
|   | The proposed ARI serves as a means of linking support for entrepreneurship to a range of fragility issues across the continent, serving as a laboratory to identify and create solutions needed to reduce fragility across countries, regions and communities. The ARI also serves as a means of connecting resilience to emergency preparedness for future shocks, building on needed infrastructure investment, logistical support and coordinated regional planning to ensure food security and increased health care capacity in all areas and product categories. Existing partnerships focused on early warning systems can be expanded to tackle contingency planning and emergency preparedness requirements. This would link strategic planning related to physical infrastructure, logistics and regional coordination frameworks. |



# 10. General requirements for successful entrepreneurship outcomes in Africa

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The topic of entrepreneurship is broad. Therefore, methods of support for development are multi-dimensional, while outcomes are affected by a multitude of factors. For the Bank's support for entrepreneurship to be effective, the table below summarizes key recommendations as pillars of the approach. As with other endeavors, a broad range of partnerships is essential for effective design, implementation and outcomes.

The main recommendation for the Bank, Bank partners and Bank clients is that support for entrepreneurship be provided comprehensively, systematically and coherently so that financing, technical assistance and other support is properly targeted, effectively implemented, and carried out in complementary fashion to optimize resource allocation rather than being redundant in some areas and insufficient in others.





## General Requirements for Successful Entrepreneurship Outcomes in Africa

| Prerequisites for Success                          |   | Links to Favorable Entrepreneurship Outcomes   |
|--|---|--|
| <b>High-level policy objectives and approaches</b> |   |  |
| <b>Green economy</b>                               | Transformation to “clean” energy and reversal of practices harmful to the environment will reduce fragility, boost resilience, and create conditions for sustainable growth | Entrepreneurs will benefit from opportunities to (1) promote cleantech and clean power generation, transmission and distribution; (2) adapt mining practices and orientation to safer production and greater value-added battery manufacturing for use in electric vehicles and electronic goods; (3) improve agricultural practices to capitalize on value-added and achieve/maintain food security; (4) protect forestry and fishing resources; and (5) introduce waste management practices to generate health and economic benefits, particularly as the urban population grows.   |
| <b>Inclusive, sustainable growth</b>               | Investments in entrepreneurship enable opportunities for those currently disenfranchised, reducing disparities in income and opportunities                                  | Youth and women will benefit from entrepreneurship support through (1) job creation; (2) household convenience (e.g., e-commerce); (3) educational advancement and skills development; and (4) higher incomes. Additional policy reforms to improve the business environment will also provide incentives for “formalization”, which may then enable other services (e.g., credit access based on payment performance calculated from data available from credit information bureaus).   |
| <b>Total factor productivity</b>                   |   |  |
| <b>Human capital</b>                               | Human capital investment is offensive and defensive in the digital age  | The digital age presents prospects for automation of many manual tasks, with likely benefits of efficiency and, potentially, reduced cost. However, this puts many manual jobs at risk, particularly in low-value services or basic physical labor. Therefore, job creation will be a high priority across the continent, particularly given projections of demographic growth. Support for education, training and general elevation of skill levels in all activities presents an opportunity for productive utilization of the labor force. As people more fully develop skills, entrepreneurs will seek out needed talent to advance their ventures. Likewise, skills development will encourage new entrepreneurs to develop products and processes that solve problems and have market potential. Failure to address these issues will consign most youth and women to positions of extreme disadvantage in the future economy, reducing prospects for opportunity and eradication of poverty. |

|                                 |  |  |
|---------------------------------|--|--|
| <b>Physical capital</b>         | Industrialization and increased focus on value-added are overdue and necessary to achieve scale and reduce vulnerability   | Entrepreneurs will benefit from opportunities focused on boosting value-added in all sectors of the economy. This focus is needed for the continent to achieve a critical mass of supply and demand to (1) reduce dependence on commodity exports for foreign exchange; (2) limit vulnerability to external shocks, sovereign downgrades, and interest rate and exchange rate fluctuations that perpetuate debt trap scenarios; and (3) increase domestic market capacity to finance and sustain operations; while also (4) curtailing current account imbalances resulting from unnecessary imports of food, energy and other goods Africa produces and can process into intermediate and finished products. Opportunities for entrepreneurs will be to introduce solutions that ensure African processing of raw materials into intermediate and finished goods is (1) conducted at internationally competitive rates; (2) compliant with international quality standards; and (3) not reliant on subsidies or unreasonable levels of protection that distort prices and put consumers and taxpayers at a severe disadvantage. |
| <b>Financial capital</b>        | Financial capital is a driver of entrepreneurship, but often hard to access  | Establishment of more formal ecosystems for entrepreneurs will help build the clusters of operators and innovators needed for entrepreneurship to succeed. The presence of seed/venture capital near incubators and accelerators will help boost potential successes, and serve as a sub-market that private equity funds could monitor for potential investment.  |
| <b>Physical infrastructure</b>  |  |  |
| <b>Power and electricity</b>    | Production, transmission and distribution of clean power and electricity will drive modern production as well as heavily influence consumption patterns and provide considerable relief for households | Power will be necessary for sustained testing and operations, as well as for required services inputs (e.g., internet access, data transfer) and goods processing. To the extent that incubators, accelerators and ecosystem clusters operate in zones, ample power supplies will be indispensable. These critical inputs will energize capacity and contribute to scale, making innovative ideas more feasible by reducing per unit costs.  |
| <b>Transport infrastructure</b> | All modes of transport infrastructure will be indispensable for the movement of goods and people, including critical shipments of essential goods  | Logistical efficiency will require adherence to delivery schedules, given the interdependence of units of production. Therefore, all transport infrastructure will be essential for enterprise efficiency. This applies to home-based e-commerce for any goods sold to meet large-scale enterprise and eco-industrial zone requirements. Multi-modal transport will also be essential for critical mass and emergency planning and coordination.   |

|   |  |   |
|---|--|---|
| <b>ICT</b>  | Modern information systems and telecommunications are central to the digital economy, including logistical support for delivery of public goods as well as market activities | Internet access, mobile payment and transfer systems, and capacity to communicate for commercial and information purposes is a starting point for entrepreneurial ventures, along with innovative ideas. Capacity to use artificial intelligence, adapt linked sensors, apply 3-D printing, use drones and related “backbone” activities of the digital economy are not possible without adequate ICT. This also applies to quantum computing, satellite systems to assist with monitoring and surveillance (e.g., encroachments on offshore waters, poaching and destruction in forestry reserves), and other more complex functions that power much of the digital capacity used in innovation. |
|   | ICT capacity is indispensable for the transfer of data that will power analytics   | Data and data analytics are the “raw materials” processed into finished products in the digital economy. Without adequate ICT and computing power, Africa will not be able to compete with other regions of the world. While automation (e.g., machine learning, artificial intelligence) will play an increasingly important role, investment in human capital will be needed to ensure ICT is managed for the purposes intended.  |
| <b>Role of public-private partnerships (PPPs)</b> | Use of PPPs will help transfer risk to the private sector and allow for more stable budgeting and financial planning by governments  | Entrepreneurs will have opportunities to fill niche functions and roles in PPP contracts, which typically involve dozens of business entities with specific and legally bound commitments. Pricing of risk is identified up front and quantified so that long-term capital costs are known. Rating agencies rate bonds to provide market incentives for performance. Given the complexity of these long-term capital projects, entrepreneurs will find many opportunities to enhance risk management, returns, and implementation of contracts for the benefit of the public and markets.   |
| <b>Social infrastructure</b>                      |  |   |
| <b>Health</b>                                     | Commitment to improvements in health, sanitation and nutrition will generate favorable outcomes  | Public and private financing of health care will create enormous opportunities for entrepreneurs to devise solutions to meet health care and system needs. This ranges from basic solutions in health care system management to R&D capacity, laboratory and testing facilities, water treatment, waste management, and improved farming practices to biotechnology, biologics, development of vaccine capacity, and broader pharmaceutical industry development in Africa.   |
| <b>Education</b>                                  | Expansion of educational capacity, improvement in higher learning, and better connectedness with future economy needs will help prepare youth for the future                 | Entrepreneurs and ecosystems will need links to universities, colleges, research stations, and technical/polytechnical institutions to eliminate skills gaps. All levels of education and training will be needed for a sufficiently skilled labor force to work in eco-industrial zones, and to provide the broad range of skills and talents needed for logistics and coordination.   |

| <b>Business environment</b>    |  |   |
|--------------------------------|--|---|
| <b>Institutional framework</b> | Effective and responsible enforcement of laws, regulations and institutions that protect public safety and promote delivery of public goods and competitive market practices are needed to optimize public confidence and create a virtuous circle whereby the disenfranchised are more willing and able to formalize their activities | Enhanced public and investor confidence in the institutional framework will create a buoyant and transparent market that will encourage entrepreneurship to flourish. A broadened tax base and deeper domestic currency financial markets will boost economic resilience and create a more conducive environment for risk-taking. Efficient delivery of e-government that is reasonably charged, service-oriented, effectively targeted, professional, and perceived as helpful to the broader public will serve as a basis for boosting trust and confidence. Effective communication of how policies and regulations contribute to public safety and prevention of hazard will induce compliance. |
| <b>Trade</b>                   | The AfCFTA and movement to an African common market provide templates for future growth and wealth for those active in regional and continental trade  | Entrepreneurs will benefit from the exponential growth of opportunities that will result from greater regional and continental trade as well as from broader economic growth and reduction in trade barriers. Where barriers exist, entrepreneurs will have an opportunity to devise further solutions. However, there will also be “losers” as competition and scale drown out those unable to effectively compete.  |
| <b>Investment</b>              | The AfCFTA and movement to an African common market provide templates for future investment opportunities  | Entrepreneurs will benefit from cross-border and foreign (non-African) direct investment resulting from upstream and downstream opportunities. Greater push to industrialize and capture value-added will help entrepreneurs find opportunities for their products, processes and solutions. The presence of seed/venture capital, angel financing, private equity funds and related risk capital will benefit entrepreneurs, with resulting successful innovation expected to attract bank borrowing and IPOs to generate wealth for successful entrepreneurs, some of which will be recycled into new innovations.  |
| <b>Regional value chains</b>   | Regional integration is essential for scale and to serve as a basis for supply chain expansion, as well as for emergency preparedness  | Entrepreneurs will benefit from RVCs as large-scale firms that often drive the value chain process seek out suppliers (vendors) of both goods and services. Entrepreneurs can fit into such networks with the provision and/or delivery of needed goods/supplies, apps for more efficient logistics and data analytics, programming of needed hardware and software for cross-border coordination, and a range of miscellaneous services needed to effectively implement RVC operations in an efficient manner that meets operational and financial targets.  |
|                                |  | Entrepreneurs will find opportunities in various RVCs to assist with needed food, water, and health-related supplies for contingency planning. This may also involve data-oriented services that support logistical needs (e.g., real-time inventory management, early warning of shortages, scenario analysis).  |



| <b>Financial market integration</b> |   |  |
|-------------------------------------|---|--|
| <b>Lending</b>                      | Lending will increase as non-bank lenders increase their presence in the market, and as supporting infrastructure like credit information bureaus and property registries matures | Entrepreneurs will benefit from bank loans after they have developed the viability of their concepts and, in some cases, begun to generate revenues and achieve commercial success. However, before that point, lending to finance working capital operations is more likely to come from other businesses (e.g., larger firms interested in buying goods or services). The benefit of linking incubators and accelerators to eco-industrial zones or other clusters of production is that applications can be tested and, if they work, more broadly operationalized. This will increase prospects for accessing credit. Formal registration will also allow credit information bureaus to record payment performance, influencing approvals, amounts, rates and tenors of loan contracts, and severity of loan covenants.            |
| <b>Investment</b>                   | Investment will increase as successful ventures materialize   | Entrepreneurs require investment for growth, which typically occurs in stages as they reach milestones. Support for incubators and accelerators will educate entrepreneurs on requirements, which may also encourage growth of market-based support services for startups that typically operate on a shoestring budget and are run by a small number of people with specific technical skills rather than management teams with a full array of skills needed for commercial and operational success. Large clusters of entrepreneurs are likely to also require the services of lawyers, accountants, engineers, technical specialists, etc. to serve as a bridge to investors. While investors are typically demanding due to the high risk of failure, most entrepreneurs need investors to have a chance of success.              |
| <b>Public finance</b>               | Long-term prospects for fiscal decentralization will “democratize” opportunities by creating closer engagement between local authorities and local entrepreneurs                  | Entrepreneurs will not initially benefit from improvements in public finance as it will take time for governments to put in place the conditions to develop higher fiscal revenue-to-GDP levels that ensure adequate flows for public goods and services. However, they will see the benefits of government reforms that lead to more efficient delivery of public services and boost confidence, and as these investments are partly targeted towards facilities and procurement that also support entrepreneurship. On a long-term basis, as fiscal policy becomes more decentralized and local governments are able to provide greater support and issue more contracts, entrepreneurs will benefit from these opportunities (e.g., local waste management solutions, forestry protection, data services for local health clinics). |

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# Endnotes

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1. Joseph Schumpeter suggested that entrepreneurs—not just companies—were responsible for the creation of new things in the search for profit. Frank Knight focused on entrepreneurs as the bearers of uncertainty and believed they were responsible for risk premiums in financial markets. Israel Kirzner thought of entrepreneurship as a process that led to the discovery.” See <https://www.investopedia.com/terms/e/entrepreneur.asp>
2. Nigeria (206 million), Egypt (102 million), South Africa (59 million) and Kenya (54 million) are the first, third, sixth and seventh most populous countries in Africa. See <https://www.statista.com/statistics/1121246/population-in-africa-by-country/>
3. Ethiopia has about 114 million people and the Democratic Republic Congo has a population of nearly 90 million. Tanzania’s population is 60 million. See <https://www.statista.com/statistics/1121246/population-in-africa-by-country/>
4. Mauritius ranks as the highest African country in the World Bank’s 2020 Ease of Doing Business rankings (#13 globally), while Seychelles is ranked as the ninth highest African country (<https://www.doingbusiness.org/en/rankings>)
5. The retail and corporate banking sector accounts for greater than 90 percent of financial sector assets in Africa.
6. 155 percent in high-income Europe and 58 percent in emerging market Europe.
7. 244 percent for the US and Canada combined.
8. 277 percent for high-income Asia-Pacific and 194 percent for emerging market Asia-Pacific.
9. Innovation Finance for Private Sector Development in Africa. Economic Report on Africa 2020. United Nations Economic Commission for Africa. See [https://www.uneca.org/sites/default/files/fullpublicationfiles/ERA\\_2020\\_mobile\\_20201213.pdf](https://www.uneca.org/sites/default/files/fullpublicationfiles/ERA_2020_mobile_20201213.pdf)
10. See <https://www.swissre.com/dam/jcr:864e8938-3d3c-48cc-a3d7-8682962971e7/sigma-4-2020-extra-complete.pdf>
11. See [https://image-src.bcg.com/Images/BCG-Global-Asset-Management-2020-May-2020-r\\_tcm9-247209.pdf](https://image-src.bcg.com/Images/BCG-Global-Asset-Management-2020-May-2020-r_tcm9-247209.pdf)
12. The continent’s largest listed company, South African technology giant Naspers, made an investment of \$32 million in 2001 in China’s Tencent Holdings. That investment is worth over \$200 billion today, approximately equal to the combined value of all African stock exchanges outside of South Africa. Interestingly, Naspers’ own market capitalization (currently approximately \$100 billion) has long traded at a considerable discount to the market value of its Tencent Holdings stake as it grapples with an oversized weighting in the Johannesburg Stock Exchange (JSE), which until recently stood as high as 23 percent. In 2019, Naspers also listed its subsidiary Prosus on the Euronext Stock Exchange in a \$100 billion IPO, transitioning a considerable part of its equity stake in Tencent off the continent, and has since announced plans to shift a larger share of its Naspers business to Prosus to reduce the size of its equity holdings on the JSE—underscoring capacity constraints of a single successful investment—albeit arguably the most successful venture capital investment of our generation—in even the continent’s largest equity market.
13. See <https://www.bcg.com/publications/2020/five-strategies-for-mobile-payment-banking-in-africa>
14. Ibid

15. See [https://www.cbinsights.com/research/report/corporate-venture-capital-trends-2020/?utm\\_source=CB+Insights+Newsletter&utm\\_campaign=c2e55b0015-newsletter\\_general\\_Tues\\_20210316&utm\\_medium=email&utm\\_term=0\\_9dc0513989-c2e55b0015-90659821](https://www.cbinsights.com/research/report/corporate-venture-capital-trends-2020/?utm_source=CB+Insights+Newsletter&utm_campaign=c2e55b0015-newsletter_general_Tues_20210316&utm_medium=email&utm_term=0_9dc0513989-c2e55b0015-90659821)
16. See soe listings —is there a business case for africa?, World Bank, 2021.
17. See <https://www.prnewswire.com/news-releases/global-mobile-payment-market-size-projected-to-reach-12-06-trillion-by-2027--301298753.html#:~:text=A%20report%20from%20Allied%20Market,30.1%25%20from%202020%20to%202027.>
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22. See <https://www.nec.com/en/global/insights/article/2020022516/index.html>
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24. Sub-Saharan African has an access to electricity rate of 43 percent, about half the global average. (See <https://www.brookings.edu/blog/africa-in-focus/2019/03/29/figure-of-the-week-electricity-access-in-africa/>) The rate for the continent is higher (e.g., 54 percent) when including North Africa, where electricity access is generally high.
25. See <https://datareportal.com/reports/6-in-10-people-around-the-world-now-use-the-internet>
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29. UNCTAD. See <https://unctad.org/press-material/facts-figures-0#:~:text=Intra%2DAfrican%20exports%20were%2016.6,America%20and%207.0%25%20in%20Oceania.>
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43. See <https://blogs.worldbank.org/psd/fostering-private-sector-development-fragile-states-piece-cake>
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51. Ibid.
52. Another source found that if every country could narrow its gender gap at the same historical rate as the fastest-improving nation in its regional peer group, the world could add \$12 trillion to annual GDP by 2025, about 11 percent of projected global GDP in 2025. See <https://www.mckinsey.com/featured-insights/employment-and-growth/how-advancing-womens-equality-can-add-12-trillion-to-global-growth>
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54. See Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF). (2017). Global Trends in Artisanal and Small-Scale Mining (ASM): A review of key numbers and issues. Winnipeg: IISD.
55. See <https://www.agenceecofin.com/mines/2106-89339-notam-la-start-up-sud-africaine-qui-utilise-des-drones-et-l-ia-pour-rendre-les-projets-miniers-plus-efficaces>

56. See Jerry Ahadjie and Fred Kabanda, “Potential of Africa’s Battery Minerals to contribute towards the Energy Transition”, African Natural Resources Centre, African Development Bank Group, 2021.
57. See Commodity Code of Conduct for Improved Income Distribution, African Development Bank, December 2020.
58. See Jerry Ahadjie and Fred Kabanda, “Potential of Africa’s Battery Minerals to contribute towards the Energy Transition”, African Natural Resources Centre, African Development Bank Group, 2021.
59. See Jerry Ahadjie and Fred Kabanda, “Potential of Africa’s Battery Minerals to contribute towards the Energy Transition”, African Natural Resources Centre, African Development Bank Group, 2021.
60. See “Agriculture takes center stage in the drive to reduce emissions”, McKinsey Quarterly, June 2020.
61. A good example is emerging in Uganda where Ionic Rare Earth and other mining companies are developing REE resources for mining, processing, and the export of concentrates to foreign industries. Meanwhile KiiraMotors is also based in Uganda, manufacturing electric Vehicles (EV) using imported components of LIB and other critical metal products. There are also iron ore deposits in southwestern Uganda and a historical lithium mine in north-western Uganda. The Kilembe copper mine in western Uganda, has been mothballed for years, but contains large quantities of copper, cobalt and niobium, all of which are critical metals to the electric vehicle and which could meet more than 90% of Kiira’s critical metal supply without the need for imports. The need to develop a complete value chain is obvious in this scenario. Governments must facilitate the establishment of integrated industry structures to produce components by granting appropriate incentives
62. The Li-Co value chain can have a wide range of investment and capex requirements from as low as US\$10 million.
63. See Afrique: Les petits exploitants agricoles doivent tirer parti de la ZLECAf, <https://fr.allafrica.com/stories/202106160427.html>
64. Citing data from an NGO, one source notes that satellite imagery revealed destruction of 14,000 hectares of forest in southwest Côte d’Ivoire between November 2017 and September 2018. This kind of deforestation is putting at risk flora and fauna, and reducing the general level of tree cover in the country, despite its dependence on agricultural exports for foreign exchange. See <https://www.afrik21.africa/afrique-concilier-agriculture-et-biodiversite-cest-possible/>
65. One source identifies the potential market at \$645 billion through 2025. See <https://fr.allafrica.com/stories/202106160427.html>
66. See <https://impactalpha.com/african-agtech-is-boosting-yields-protecting-resources-and-raising-incomes/>,
67. See <https://reliefweb.int/report/world/bill-gates-highlights-role-data-and-technology-end-hunger-fao-conference>
68. See <https://allianceforscience.cornell.edu/blog/2021/06/east-africas-banana-farmers-welcome-new-varieties-that-resist-disease-and-drought/>
69. See <https://intpolicydigest.org/how-to-improve-micro-irrigation-in-africa/>
70. The FAO estimates post-harvest losses up to 40 percent of total, with increasing risk resulting from rising temperatures and globalization of trade. See « 40 % de la production agricole mondiale est perdue en raison des espèces nuisibles (FAO) », Ecofin, 4 juin 2021.
71. See <https://www.nature.com/articles/d41586-021-01048-1>
72. A link in the chain between government policy for the industry and market activity at



the firm level would be articulation of a downstream processing policy that ensures higher conversion rates and the development of quality products. Therefore, as part of the analysis for the macro framework for wood processing, policy options should consider (1) the total number of mills and overall processing capacity in relation to national annual allowable cut; (2) processing of secondary and tertiary products; (3) processing of smaller materials such as branches from mature trees; (4) utilisation of sawdust and other sawmill residues; (5) total ban on round log exports; and (6) exporting lumber by mixed species according to colour, density and end use so as to remove pressure on individual or single species. See African Natural Resources Centre (ANRC). 2021. Wood processing and trade of wood products in Africa. African Development Bank. Abidjan, Côte d'Ivoire.

73. Center for Global Development. See <https://www.cgdev.org/blog/where-mobile-money-making-biggest-difference-financial-inclusion-young-people>
74. Center for Global Development. See <https://www.cgdev.org/blog/where-mobile-money-making-biggest-difference-financial-inclusion-young-people>
75. One estimate suggests biomolecules, biosystems, bio-machines, and biocomputing could collectively produce up to 60 percent of the physical inputs for the global economy, highlighting the importance of long-term environmental management for future growth. See “What’s ahead for biotech: Another wave or low tide?”, McKinsey Global Institute, April 2021.
76. Tunisia (5), Morocco (3), Egypt (2) and Algeria (1) account for 11 of 18 facilities that are ranked. The balance is in South Africa (3), Kenya (2), Nigeria (1) and Tanzania (1). See <https://www.scimagoir.com/rankings.php?country=Africa&ranking=Research&sector=Health>





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