

In partnership



Pathfinding: The future of work in Sub-Saharan Africa

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INTRODUCTION

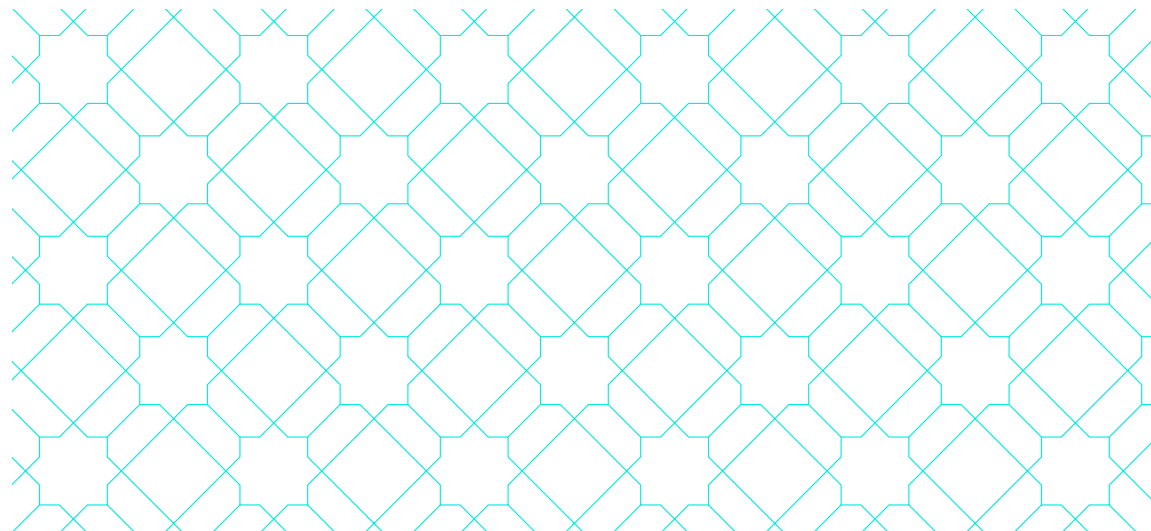
Context matters to the future of work. Technology will likely have very different impacts on workers depending on the country in which they live. Across Europe, for example, the potential number of jobs at risk of automation varies significantly. While in Sub-Saharan Africa, there is a broad consensus that technology could be a force for good by ushering in a structural transformation in the economy that would benefit workers by improving productivity and living standards.

Introduction

The RSA Future of Work programme aims to secure good work for all. Together with the Autodesk Foundation, we embarked on a period of research to explore future work challenges in two distinct global regions and understand what good work innovations are emerging to address them. From digital skills boot camps, to FinTech start-ups providing workers in the gig economy with access to portable benefits – many entrepreneurs and grassroots innovators are demonstrating novel approaches to supporting workers, defining new markets and configuring actors and resources in new ways. Alongside this report we have also published an online directory to help raise awareness of these organisations and provide a practical tool to support policy making and social investment.

In section I we explore how technology and other forces are impacting workers across Sub-Saharan Africa, reviewing historical trends as well as the emerging evidence on how the future of work is playing out in the Covid-19 pandemic context. We identify five key trends that are shaping labour markets in the region:

- 1.** Most workers in Africa are employed in agriculture or informal services.
- 2.** Demographic change has led to a 'youth bulge'.
- 3.** Some (but not all) countries are at risk of experiencing 'premature' deindustrialisation.
- 4.** Technology is enabling some countries to leapfrog traditional economic development pathways.
- 5.** Covid-19 is accelerating the pace of technological change in some sectors, but the region is also much less resilient to economic shocks than more economically developed countries.



In section 2 we explore three good work challenges that need to be addressed if all workers are to benefit from technological change. The challenges centre around skills and employment pathways, social protection coverage, and infrastructure needs. We make the following broad recommendations and provide several case studies of innovative solutions being developed to support workers in the region:

- 1. Create new skills and employment pathways:** digital skills training provision is needed for most countries in Sub-Saharan Africa to catch up with more advanced countries but more generally the education system needs to place a greater emphasis on job pathways that can bring young people into employment.
- 2. Explore new forms of social protection:** gig economy or platform work can provide informal workers with a degree of formalisation but it does not offer sufficient social protection, and platforms may need to do more to support workers if they are to remain viable long term.
- 3. Improve access to infrastructure:** a digital divide is cut across geographical and gendered lines and for countries to harness the benefits of technological innovation policy makers must improve access to both digital and physical infrastructure.

Box 1: Methodology

- We conducted a literature review to understand key trends impacting the region and the emerging evidence on the impacts of Covid-19. We also provide secondary analysis of available data from the World Bank on historical changes in the industrial composition of the region.
- We conducted an innovation mapping exercise to identify over 40 innovations that span a range of themes. Our case studies were identified through extensive desk research and recommendations from ecosystem players, including social innovators and investors.
- Both these activities were complemented by extensive qualitative research with expert stakeholders across African countries, including Kenya, Ghana, Mauritius, South Africa, Uganda. We conducted more than 30 interviews to understand challenges and opportunities around upskilling, government policy interventions and the impact of Covid-19.

5

**TRENDS SHAPING
THE FUTURE OF
WORK IN SUB-
SAHARAN AFRICA**

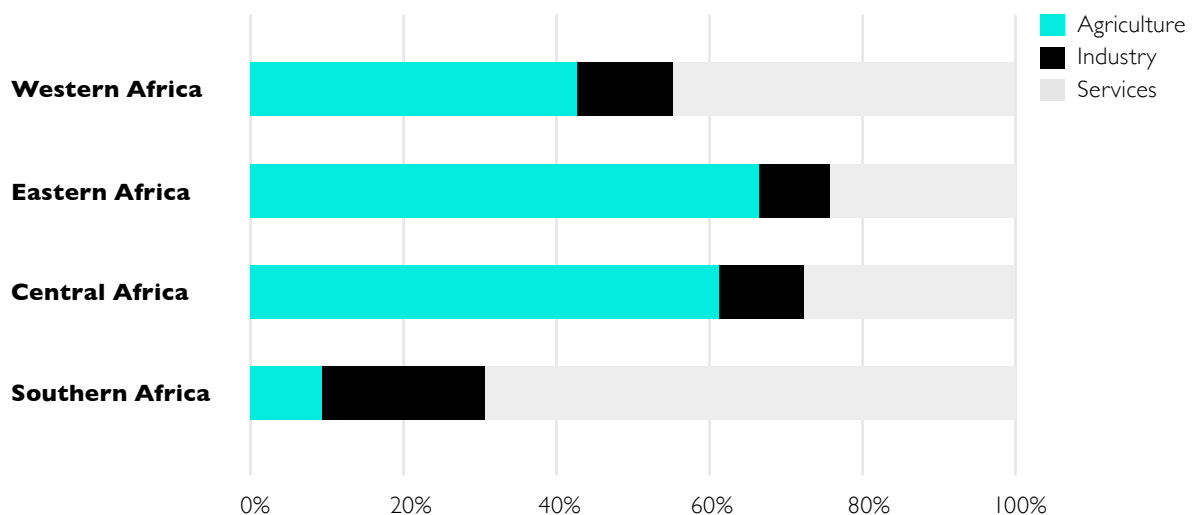
1 Most jobs in Sub-Saharan Africa are in agriculture or informal services

Across Sub-Saharan Africa, around 50 percent of all workers are employed in agriculture, 36 percent in services and the remainder in industries such as mining and manufacturing.¹ In Southern Africa, surrounding the Kalahari Desert, fewer than 10 percent of workers are employed in agriculture while more than two-thirds are employed in services.² While in some countries in Central and Eastern Africa such as Chad, Guinea-Bissau and Somalia more than 70 percent of workers are employed in agriculture.

In some more developed West African countries such as Ghana and Senegal, services are now dominant, with employment in agriculture closer to 30 percent.³

Few countries outside of Southern Africa had more than 20 percent of the workforce employed in industries such as mining and manufacturing in 2020, the exceptions being Burkina Faso (34 percent), the Republic of the Congo (22 percent) and Ghana (22 percent).⁴ In East Africa, manufacturing is dominated by food and beverages, largely the basic processing of agricultural outputs. In some countries, textiles, leather goods and wood-based products also figure prominently. Ethiopia, Kenya and Tanzania have small industries producing vehicles, electronic equipment, and machinery. While in Angola and Nigeria, manufacturing activities have also focused on developing equipment and other industrial inputs that could support the mining and resource extraction sector.⁵

Figure 1: Employment by broad industry group across Sub-Saharan Africa (RSA analysis of World Development Indicators)



1 ILO (2020) Report on employment in Africa (Re-Africa) – tackling the youth employment challenge. [pdf] Geneva: ILO. Available at: www.ilo.org/wcmsp5/groups/public/---africa/---ro-abidjan/documents/publication/wcms_753300.pdf

2 RSA analysis of World Bank Development Indicators.

3 RSA analysis of World Bank Development Indicators.

4 RSA analysis of World Bank Development Indicators. Ghana and Burkina Faso also saw the strongest growth in since 2000.

5 Signé, L. (2018) The potential of manufacturing and industrialization in Africa. [pdf] Available at: www.brookings.edu/wp-content/uploads/2018/09/Manufacturing-and-Industrialization-in-Africa-Signe-20180921.pdf

The vast majority of work in Sub-Saharan Africa is informal, with micro-business owners operating and trading under the radar of government. This has declined over time but remains as high as 80 percent in most countries outside of Southern Africa.⁶ The IMF has suggested that most cities in Sub-Saharan Africa are “consumption cities” rather than “production cities” implying employment is mostly in non-tradeable, proximity services.⁷ A study of informal work in Nigeria highlights that sub-sectors in urban areas typically include street traders, food vendors hairdressers, transport drivers, carpenters and other craft workers.⁸

Some perspectives in the literature highlight the dynamism of the informal sector, which has proven resilient in creating opportunities, including in economic downturns. However, the problem is that these opportunities are often low in productivity and unable to deliver a decent standard of living.⁹ Similarly, in agriculture most farming is smallholder and subsistence orientated, meaning large parts of the rural population live in poverty.¹⁰ The absence of employment protections and a social safety net further contributes to widespread economic insecurity in the region.

Box 2: The impact of automation

There is a lack of evidence on the impact that automation will have on labour markets in Sub-Saharan Africa. Some studies have been conducted on the impact of automation on emerging markets. For example, the World Bank found that automation risk is negatively correlated with GDP per capita, meaning poorer countries are at greater risk – while Sub-Saharan Africa is the most impoverished global region.¹¹ But these studies only include a handful of countries in Sub-Saharan Africa. The World Bank found that Ethiopia was most at risk of the 41 countries that were included in their analysis. South Africa and Nigeria both fell in the middle of the pack.¹² These countries, along with Kenya, are the most digitally advanced. While they are important innovation hubs, they are not representative of the wider region.¹³ Sub-Saharan Africa is also both larger and more heterogenous than Europe (in terms of sectoral composition), which should provide further caution against making generalisations based on limited data.

- 6 RSA analysis of World Bank Development Indicators
- 7 Abdychev, A. et al (2018) The Future of Work in Sub-Saharan Africa. [online] IMF. Available at: www.imf.org/en/Publications/Departmental-Papers-Policy-Papers/Issues/2018/12/14/The-Future-of-Work-in-Sub-Saharan-Africa-46333
- 8 Etim, E. and Daramola, O. (2020) The Informal Sector and Economic Growth of South Africa and Nigeria: A Comparative Systematic Review. *Journal of Open Innovation: Technology, Market, and Complexity*. [e-journal] 6(4). Available at: www.mdpi.com/2199-8531/6/4/134
- 9 Ng'weno, A. and Porteous, D. (2018) Let's Be Real: The Informal Sector and the Gig Economy are the Future, and the Present, of Work in Africa. [pdf] Center for Global Development. Available at: www.cgdev.org/sites/default/files/lets-be-real-informal-sector-and-gig-economy-are-future-and-present-work-africa_0.pdf
- 10 ILO (2020) World Employment and Social Outlook: Trends 2020 [pdf] Geneva: ILO. Available at: www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_734455.pdf
- 11 World Bank (2016) World Development Report 2016: Digital Dividends [online] Washington DC: World Bank. Available at: www.worldbank.org/en/publication/wdr2016
- 12 Ibid.
- 13 Choi, J., Dutz, M. and Usman, Z. (2020) The Future of Work in Africa: Harnessing the Potential of Digital Technologies for All. [e-book] DC: World Bank. Available at: openknowledge.worldbank.org/handle/10986/32124

2 Demographic change is leading to a 'youth bulge'

Changing demographics are key to understanding future of work trends in different global contexts, and Sub-Saharan Africa is very different to other global regions in this respect. In most rich economies, low birth rates and increases in life expectancy have led to population aging, which is expected to have negative effects on economic output. However, automation in this context may be considered more of an opportunity than a threat by enabling countries to maintain sustainable levels of productivity.

Across countries in Sub-Saharan Africa, instead, rapidly expanding population growth is forecast to lead to a 'youth bulge'. Indeed, the IMF predicts that the working age population will experience a net increase of 20 million per year over the next twenty years.¹⁴ Young people aged 15 to 24 are expected to number 283 million in 2030, triple the number in 1990. By 2050, Africa is predicted to be the only region with a growing working age population.¹⁵ The trends are, however, heterogeneous across countries: while Mauritius, for example, has a fertility rate of less than two, Niger has a fertility rate of over seven, which is the highest in the world.¹⁶

This 'youth bulge' will translate into a huge number of jobseekers. Hence one of the biggest labour market concerns in Sub-Saharan Africa is how to create enough jobs to absorb these new entrants in a sustainable way.

Most studies conclude that job creation has not been able to meet the demands of changing demographics to date. Research from the IMF suggests that in recent years, the economy has been able to keep up, by creating on average 9m new jobs each year but that these are mostly low-quality jobs in the informal sector.¹⁷

To the extent automation does take place in Sub-Saharan Africa, it could exacerbate this challenge. In relation to young people, the International Labour Organization (ILO) highlights that technological change has the potential to either mitigate or exacerbate employment challenges.¹⁸

On the one hand, young people are more willing to seize opportunities that come with technological advancements. On the other, Dauth et al highlight that the adoption of robots reduces the rate of hiring of young jobseekers in the manufacturing sector, as firms do not need to create new vacancies when "natural turnovers occur".¹⁹

However, technological change more generally might increase the opportunity for youth to enter the labour force through job creation. The Global System for Mobile Communications Association (GSMA) highlights that the mobile industry in the region directly employed 1.2 million youth in 2018, and predicts that the number will grow to 1.5 million by 2025, creating 300,000 new jobs.²⁰

14 Abdychev, A. et al (2018) The Future of Work in Sub-Saharan Africa. Op cit.

15 Lam, D., Leibbrandt, M. and Allen, J. (2019) The Demography of the Labor Force in Sub-Saharan Africa: Challenges and Opportunities [pdf] Growth and Labour Markets in Low Income Countries Programme. Available at: g2im-lic.iza.org/wp-content/uploads/2019/11/glmlic_sp010.pdf

16 Abdychev, A. et al (2018) The Future of Work in Sub-Saharan Africa. Op cit.

17 Ibid.

18 ILO (2020) Global Employment Trends for Youth 2020. Technology and the future of jobs [pdf] Geneva: ILO. Available at: www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_737648.pdf

19 Dauth, W. et al (2017) German robots: The impact of industrial robots on workers [pdf] IAB-Discussion Paper. Available at: doku.iab.de/discussionpapers/2017/dp3017.pdf

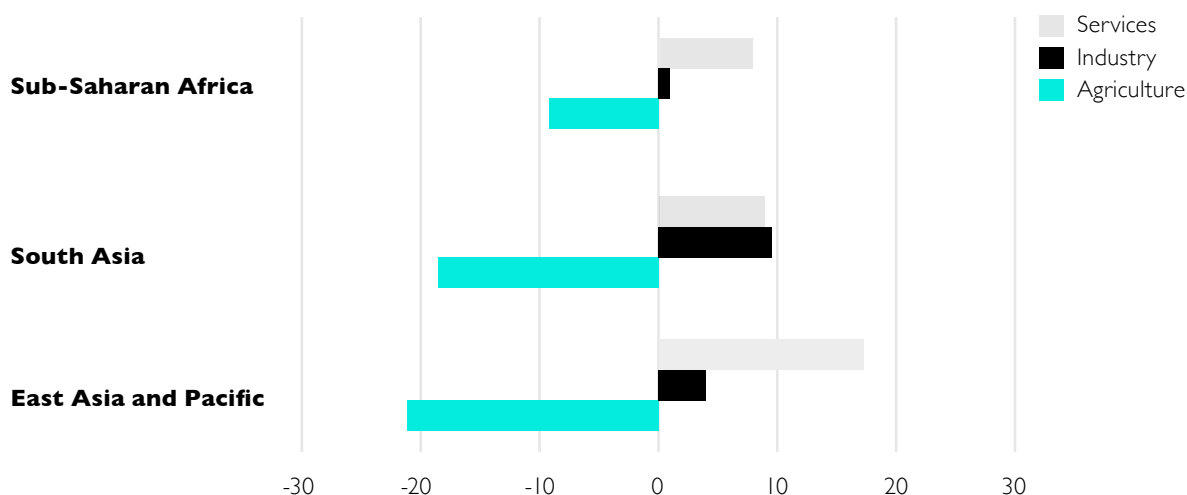
20 GSMA (2020) Powering Youth Employment through the Mobile Industry in Sub-Saharan Africa by 2025 [pdf] Available at: www.gsma.com/mobilefordevelopment/resources/powering-youth-employment-through-the-mobile-industry-in-sub-saharan-africa-by-2025/

3 Some (but not all) parts of the region are experiencing 'premature' deindustrialisation

Historically, as economies have developed, the industry mix of employment shifted from low-productivity activities in agriculture to higher productivity activities in manufacturing and then services. Employment in agriculture is generally in decline in Sub-Saharan Africa but is shrinking at a much slower pace than other regions such as East Asia and Pacific, and South Asia. Since 2000, the employment in agriculture in these regions fell by 21 and 18 percentage points respectively, compared to just 10 percentage points in Sub-Saharan Africa.²¹

Economist Dani Rodrik has warned of 'premature' deindustrialisation, which occurs when manufacturing shrinks at levels of GDP per capita that are a fraction of those at which advanced economies started to deindustrialise.²² Premature deindustrialisation can also refer to the shrinking of manufacturing at a relatively low share of total employment.²³ Proponents of industry-led growth point out that sectors like manufacturing were able to absorb large sections of the workforce in other regions. While our analysis suggests deindustrialisation has not been happening at the regional level in recent years, World Bank data does indicate that this is still happening across a handful of countries. In Kenya and Zimbabwe, for example, employment in industry fell from around 11 percent in 2000 to just 7 percent in 2020.²⁴

Figure 2: Changes in employment share by broad industry since 2000, selected World Bank Regions (RSA analysis of World Bank Development Indicators)



21 RSA analysis of World Bank Data.

22 Rodrik, D. (2016) Premature deindustrialization. *Journal of Economic Growth*. [e-journal] 21(1). Available at: drodrik.scholar.harvard.edu/files/dani-rodrik/files/premature_deindustrialization.pdf

23 Ortiz-Ospina, E. and Lippolis, N. (2017) Are emerging economies deindustrializing too quickly? *Our World in Data* [online] 30 October. Available at: ourworldindata.org/growth-and-structural-transformation-are-emerging-economies-industrializing-too-quickly

24 RSA analysis of World Bank Development Indicators.

Commentators have suggested that new technologies could further hinder prospects for industrialisation. The share of industrial robots in Sub-Saharan Africa is negligible compared to other countries, meaning this almost certainly will not be due to automation.²⁵ Rather the problem might be that there are more robots elsewhere, which has allowed firms to reshore manufacturing in richer countries. While research by the World Bank suggests that this is not yet an issue, to the extent that this trend does play out, in the future it could hinder industrialisation by reducing the cost advantage that low wages give to many countries.²⁶

Irene Yuan Sun offers a different perspective in her book 'The Next Factory of the World: How Chinese Investment is Reshaping Africa' which argues that Chinese entrepreneurs are contributing to the development of parts of the continent at a vastly faster pace than US and Western aid programmes.²⁷ Yuan Sun suggests that as China's working age population has shrunk, and labour has become more expensive, manufacturers have moved their factories to other Asian countries first, and now, to Africa.

Indeed, a recent UNU-WIDER study by Kruse et al suggests that a sort of 'industrial renaissance' has taken place since from 2010, with Nigeria, Ghana and Rwanda witnessing an increase in manufacturing employment.²⁸ However, the productivity, job growth and wage benefits that manufacturing could bring are hampered by the large number of small firms, and the low number of bigger firms which are, moreover, mostly foreign-owned with more supply chain linkages with manufacturing abroad.²⁹ Kruse et al find that manufacturing as a share of real added value actually decreased, meaning that productivity growth in manufacturing was lower than in the economy as a whole.

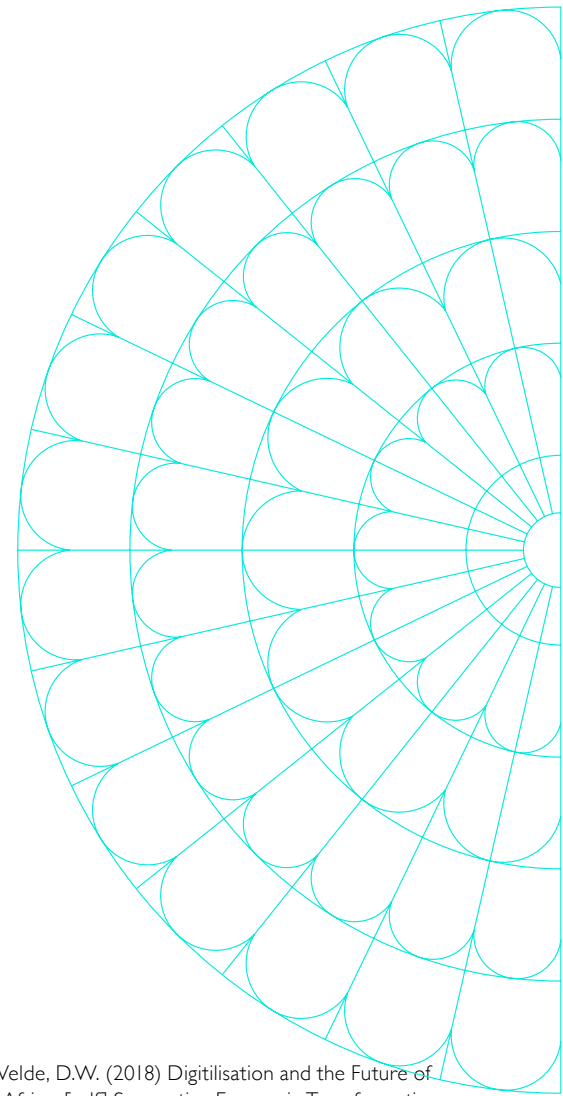
The United Nations Economic Commission for Africa has identified a lack of effective industrial policies by governments as a cause of deindustrialisation. Furthermore, the ILO points out that during the period of structural adjustment programs (SAPs) defined by the IMF, industrial policies were abandoned in favour of structural reform, which required privatisation and liberalisation. More recently, however, several countries have put in place industrial policy plans to accelerate their growth in these sectors, such as South Africa and Ghana.³¹

There is also hope that the African Continental Free Trade Agreement (AfCFTA), which is meant to increase intra-regional trade, will offer a boost to industrialisation and manufacturing.³² However, analysts highlight that this will happen only with a focus on connectivity and infrastructure, and that measures need to be put in place to protect SMEs, commodity producers in rural areas, and less developed countries that might suffer in the process, as well as to ensure working condition standards.³³ Further, commentators such as Michael Odijie argues that industrialisation should come first, with products being exported outside of Africa rather than regionally, along colonial lines, because of the specifics of products rather than trade agreements.³⁴ While it is cheaper for Côte d'Ivoire to export products to the Netherlands than to some African countries, this is because the main export product is cocoa beans, and the Netherlands and France are the main destinations for the product, leading Côte d'Ivoire to shape its trade strategy accordingly.

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However, the ILO highlights the view of many critics who maintain that fixating on manufacturing-led growth strategies can blind policy makers and analysts to alternative growth strategies that might achieve the same results.³⁵ In this context, researchers at the ILO cite cross-country data that shows the effects of services growth can be stronger than manufacturing on aggregate economic growth.

Indeed, tension exists between the traditional model of economic development—manufacturing-led industrialisation that stimulates formal job creation—and an alternative, emerging model anchored on technology as a shortcut to a service-based economy, with opportunities in digital work and entrepreneurship driven by jobseekers. The key, as one expert stakeholder pointed out in an interview with RSA researchers, is to create a viable narrative about the future of work that might not rely on manufacturing and industrialisation. Instead of focusing solely on attracting manufacturing jobs, which is a “very old industrial era”, there should be a plan to pivot to other sectors, including sectors like the green and care economies.



- 25 Banga, K. and te Velde, D.W. (2018) Digitilisation and the Future of Manufacturing in Africa. [pdf] Supporting Economic Transformation. Available at: set.odi.org/wp-content/uploads/2018/03/SET_Digitalisation-and-future-of-African-manufacturing_Final.pdf
- 26 Choi, J., Dutz, M. and Usman, Z. (2020). Op cit.
- 27 Yuan Sun, I. (2018) The Next Factory of the World: How Chinese Investment is Reshaping Africa. Harvard Business Review Press.
- 28 Kruse, H. et al (2021) A manufacturing renaissance? Industrialization trends in the developing world. [pdf] UNU-WIDER Working Paper. 2021/28. Available at: www.wider.unu.edu/publication/manufacturing-renaissance-industrialization-trends-developing-world
- 29 Ibid.
- 30 ILO (2011) Efficient Growth, Employment and Decent Work in Africa: Time for a New Vision. [pdf] Geneva: ILO. Available at: www.ilo.org/wcmsp5/groups/public/---ed_norm/---relconf/documents/meetingdocument/wcms_164482.pdf
- 31 Cloete, K. (2018) Government releases its tenth Industrial Policy Action Plan. Polity. [online] 15 May. Available at: www.polity.org.za/article/government-releases-its-tenth-industrial-policy-action-plan-2018-05-15
- 32 Yeboua, K. and Wait, R. (2020) Free trade deal could boost African manufacturing. [online] Available at: issafrica.org/iss-today/free-trade-deal-could-boost-african-manufacturing
- 33 Oqubay, A. (2019) Why industrialisation is vital for the African Continental Free Trade Agreement to succeed. [online] ODI. Available at: odi.org/en/insights/why-industrialisation-is-vital-for-the-african-continental-free-trade-agreement-to-succeed/; Akeyewale, R. (2018) Who are the winners and losers in Africa's Continental Free Trade area? [online] World Economic Forum. Available at: www.weforum.org/agenda/2018/10/africa-continental-free-trade-afcta-sme-business/
- 34 Odjie, M. (2019) Africa needs to industrialize before focusing on free trade. [online] Quartz Africa. Available at: qz.com/africa/1757394/africa-needs-to-industrialize-before-continental-free-trade-area/
- 35 ILO (2011) Efficient Growth, Employment and Decent Work in Africa: Time for a New Vision. Op cit.

Technology could enable countries to leapfrog traditional economic development pathways

There is a broad consensus that technology could be a force for good by ushering in a structural transformation that would benefit workers. As Njuguna Ndung'u, former governor at the Central Bank of Kenya puts it: "digitisation will provide an important avenue for African economies to leapfrog not only financial development but also development across other sectors of the economy".³⁶ The African Development Bank highlights that focusing on the digitisation of agriculture and informal services is the strategy with the highest potential, noting also that this transformation will likely be led by big data rather than more advanced technologies such as AI and robotics.³⁷

Leapfrogging, refers to the concept of "bypassing intermediate stages of technology through which countries have historically passed during the development process".³⁸ Emerging economies can do this as they are not locked into old technologies, and thus do not need to invest in and upgrade legacy infrastructure. Countries in the region are able to take advantage of these opportunities to a varying extent. Bashkar Chakravorti created the African Leapfrog Index which ranked six countries in terms of ability to harness digital technologies to boost their economies. Kenya and South Africa are in the top places, while Rwanda and Ethiopia are lower.³⁹

A key example of leapfrogging is that of

the mobile revolution. It represents an example of leapfrogging as it allowed countries to avoid the investments required to build fixed-line networks. However, the mobile revolution also led to further innovation, exemplified by the explosion of mobile payment systems and digital banking apps. M-pesa, a money transfer service launched by mobile network operator Safaricom, which had 17 million registered users in Kenya alone in 2010, and by 2017 counted 30 million users across 10 countries.⁴⁰ It was initiated with the support of Vodafone, Safaricom's parent company, but its head offices have now been moved to Nairobi.⁴¹ After the introduction of M-pesa, mobile financial services (MFS) have advanced and diversified: according to recent research by McKinsey, M-Pesa now accounts for less than a quarter of MFS users.⁴² Data from the GSMA further shows that East Africa currently has a significantly higher amount of mobile money active accounts. Although usage in other regions such as Southern and Central Africa is growing at a faster rate.⁴³

Mobile banking has been deemed to have provided significant gains in terms of financial inclusion which allows emerging economies to go through an alternative path, "superior" to the "credit-card based systems that still dominate in most developed nations".⁴⁴

M-payments are also allowing the

- 36 Ndung'u, N. (2018) New frontiers in Africa's digital potential. In Coulibaly, B. (ed.) 2018. Foresight Africa. [pdf] www.brookings.edu/wp-content/uploads/2018/01/foresight-2018_chapter-5_web_final.pdf
- 37 African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, Inter-American Development Bank (2018) The Future of Work: Regional Perspectives. [pdf] Available at: www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/The-Future-of-Work-regional_perspectives.pdf
- 38 UNCTAD (2018) Leapfrogging: Look before you leap. [pdf] New York and Geneva: UNCTAD. Available at: unctad.org/system/files/official-document/presspb2018d8_en.pdf
- 39 Mastercard Center for Inclusive Growth, 2019. Getting Lions to Leapfrog: Understanding the role of technology in promoting inclusive growth in Africa. [press release] 6 September. Available at: www.mastercardcenter.org/press-releases/african-leapfrog-index

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expansion of e-commerce, a field in which countries in Sub-Saharan Africa can harness opportunities to circumvent investment in, for example, a lack of physical retail. However, while in digitally developed countries such as Kenya and South Africa the share of people shopping online exceeds 8 percent, in less well-connected countries it is often below 5 percent.⁴⁵

The gig economy – the growing trend of using online platforms to find small jobs, sometimes completely immediately after request (or ‘on-demand’) – has been a subject of much controversy in Europe. To some it promises the freedom to work when they want and flexibility to fit work around caring or study commitments. To others it is viewed as a way of transferring risk onto workers – a return to 19th century piece work.⁴⁶ But in Sub-Saharan Africa commentators often emphasise how platforms are creating employment opportunities. Uber has reportedly created thousands of jobs in Nigeria, Kenya and Ghana, while Airbnb is estimated to have created over 20,000 jobs across South Africa.⁴⁷ New platforms are also expanding opportunities for traditional informal workers, with platforms such as Lynk opening new markets to artisans in Kenya.⁴⁸

Crucially these platforms can offer workers a degree of formalisation, by improving access to financial and digital services. Shifting from cash to digital payments, for instance, creates a transactional and employment history that could help when applying for credit in the future.⁴⁹ The World Bank suggests that despite the short-term nature of some of these jobs, they can be vital in helping workers “to save and later use those savings to start their own firms – mostly formal firms”.⁵⁰

Others have called on these platforms to do more to ensure good work for all those who use them. For example, in 2017 Uber drivers in Nigeria protested against the introduction of a 40 percent fare reduction, claiming this was being unfairly passed onto drivers.⁵¹ While the Fairwork Foundation found that platforms have not done enough to support workers in South Africa during the Covid-19 crisis, given the level of control they exercise over the welfare and condition of their workers.⁵² Challenges to good work on gig platforms also include the lack of social protection, which is explored later in the paper:

- 40 Monks, K. (2017) M-Pesa: Kenya’s mobile money success story turns 10. CNN World [online] 24 February. Available at: edition.cnn.com/2017/02/21/africa/mpesa-10th-anniversary
- 41 Kitimo, A. (2020) Nairobi made M-Pesa brand’s Africa home. The EastAfrican [online] 11 April. Available at: www.theeastafrican.co.ke/tea/business/nairobi-made-m-pesa-brand-s-africa-home-1439948
- 42 Chironga, M., De Grandis, H. and Zouaoui, Y. (2017) Mobile financial services in Africa: Winning the battle for the customer. [pdf] McKinsey&Company. Available at: www.mckinsey.com/~/media/McKinsey/Industries/Financial%20Services/Our%20Insights/Mobile%20financial%20services%20in%20Africa%20Winning%20the%20battle%20for%20the%20customer/Mobile-financial-services-in-Africa-Winning-the-battle-for-the-customer.pdf
- 43 GSMA (2020) State of the Industry Report on Mobile Money 2019. [pdf] Available at: www.gsma.com/sotir/wp-content/uploads/2020/03/GSMA-State-of-the-Industry-Report-on-Mobile-Money-2019-Full-Report.pdf
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- 45 Kazeem, Y. (2020) African e-commerce is getting a much needed boost from coronavirus lockdowns. Quartz Africa. [online] 19 May. Available at: qz.com/africa/1855227/africas-e-commerce-boosted-by-coronavirus-lockdowns/
- 46 Wallace-Stephens, F. (2018) Good work in the gig economy – showcasing the future work awards. RSA [blog] 30 November. Available at: www.thersa.org/blog/2018/11/good-work-in-the-gig-economy--showcasing-the-future-work-awards
- 47 Choi, J., Dutz, M. and Usman, Z. (2020) Op cit.
- 48 RSA (2019). Lynk [online]. Available at: www.thersa.org/projects/archive/economy/future-work-awards/winners/lynk
- 49 Wallace-Stephens, F. (2018) Good work across the globe – introducing the future work awards. Op cit.
- 50 Choi, J., Dutz, M. and Usman, Z. (2020) Op cit.
- 51 Ongweso, E. (2020) Nigerian Ride-Hail Drivers Are Striking Over Regulations That Leave Them in the Cold. [online] Available at: www.vice.com/en/article/v7g8g8/nigerian-ride-hail-drivers-are-striking-over-regulations-that-leave-them-in-the-cold
- 52 Fairwork (2020) Gig Workers are Among the Most Vulnerable Groups in South Africa’s COVID-19 Crisis. [online] Available at: fair.work/en/fw/blog/gig-workers-are-among-the-most-vulnerable-groups-in-south-africas-covid-19-crisis/

Box 3: Impact sourcing

Behind many tech innovations, and especially artificial intelligence systems, lies repetitive human labour that consists of low level tasks such as data entry, labelling, and coding, which the AI Now Institute calls the 'hidden labour' of the AI pipeline. While for some companies these tasks provide an opportunity to outsource to locations where wages are low in a race to the bottom, some businesses are attempting to 'rewrite the narrative', by introducing impact sourcing. Impact sourcing refers to when platforms outsource jobs, typically micro jobs, to otherwise excluded people, potentially providing access to employment and opportunities for skills development and career progression.

While there are concerns around whether impact sourcing can represent good work, a stakeholder highlighted that the spectrum of opportunity can be seen as a ladder. In this sense, young people or otherwise excluded people, can fill the demand for work that requires lower qualifications like manual labour, data entry, data coding, transcription and so on, to break into the job market while potentially building skills and then moving into higher skilled, higher paid roles in the longer term. Further, work might be paid in US dollars, which means that in some instances they might earn more than salaried workers.

Sama (formerly Samasource) is a company that offers high quality labelling and tagging of training data for AI systems. It provides formal employment to its workers in Kenya and Uganda, with access to benefits that are the same between workers in San Francisco and Kampala. With less turnover, the company can provide higher skills training, with the aim of moving workers 'up the value chain' internally, but also improving career opportunities outside the company. According to Sama's CEO, Wendy Gonzales, "roughly 82 percent go into higher paying jobs or university education and of those that go to jobs, well over 50 percent stay in the ICT space".⁵⁵

Box 4: Leapfrogging in agriculture

Technology has the potential to aid Sub-Saharan countries to develop a higher productivity model of agriculture that can contribute to wider economic growth. During the course of our innovation mapping, we have found several innovations with the aim of supporting a transition away from a subsistence-oriented model of agriculture.

Online platforms such as Farmerline are helping farmers become successful entrepreneurs by providing information and training (on weather conditions, market prices and quality inputs). Their supply chain management platform, Mergdata, also supports farmers with digitising their transactions and accessing credits, and supply chain owners in managing and mapping farms, performing audits and tracing food sources.

Releaf, in Nigeria, is a logistics platform that uses sourcing software that allows them to source directly from smallholder farmers at scale. It provides interest-free financing for farmers to access equipment to help with automation of manual tasks. Releaf, which started in the sustainable palm oil business, provides users access to payment through their network of mobile banking, meaning farmers can start building digital transaction histories and participate in the formal economy.

The Internet of things (IoT) is also being used to help farmers optimise yields and reduce waste through data-driven 'precision agriculture'. Zensus is one Nigerian start-up that has developed sensors to analyse soil data to help farmers apply the right fertiliser and optimally irrigate farms. While companies like M-shamba, Tulaa and Agri-wallet provide farmers with access to markets, alongside loans and finance, and insurance products to safeguard against weather shocks.

55 Ibid.

5 The impact of Covid-19

Research by the IMF, World Bank and African Development Bank concludes that in Sub-Saharan Africa, oil-exporting economies such as Nigeria and Angola have been hit particularly hard by the pandemic, along with less diversified economies and those reliant on tourism.⁵⁶ While the economic crisis in Sub-Saharan Africa initially appeared less severe than Europe, it might also take countries longer to recover, particularly in light of a potentially extended crisis caused by richer countries' 'vaccine nationalism'. The IMF, indeed, predicted that real GDP will not return to pre-crisis levels until 2023 or 2024 for several of the region's largest economies, including Angola, Nigeria and South Africa.⁵⁷

The IMF also suggest that while policy makers in Sub-Saharan Africa responded quickly to the crisis, their efforts were constrained by limited fiscal space.⁵⁸ For example, the ILO has identified a worrying "stimulus gap" between wealthy economies and lower- and middle-income countries. The stimulus gap refers to the ratio of stimulus to working hours lost, which is much higher in wealthy economies.⁵⁹ The Overseas Development Institute (ODI) highlights that as of August 2020, the economic stimulus of the G20 countries had reached 27 percent of GDP, compared to 3 percent in 23 countries in Sub-Saharan Africa.⁶⁰

One crucial aspect is that workers in informal employment have been hit particularly hard, and have been affected to a greater extent than in past crises. Informal workers have also been hit particularly hard in Sub-Saharan Africa.

According to one of our expert interview participants, "the disruption caused by public health restrictions meant that the informal sector, which usually works as a buffer in other types of economic shocks, couldn't do so in the pandemic".

There are some signs that the pandemic may have accelerated a transition in some specific sectors for example, digital commerce and online work. E-commerce giant Jumia reportedly received a boost due to the pandemic, after a period of turbulence in 2019, which saw it scale back its operations from several markets, including Rwanda, Tanzania and Cameroon where it had not turned a profit for several years.⁶¹ Jumia saw a spike in demand for groceries and essential goods, which grew four-fold in the first quarter of 2020 compared to the previous year.⁶² Fashion marketplace Afrikrea also saw orders from customers on the continent triple over the first two months of the pandemic.⁶³

56 Zeufack, A. et al (2020) Africa's Pulse, No. 22 Op cit.; African Development Bank (2020) African Economic Outlook 2020: Supplement. [pdf] Abidjan: African Development Bank Group. Available at: www.afdb.org/sites/default/files/documents/publications/afdb20-04_aeo_supplement_full_report_for_web_0705.pdf; IMF (2020) Regional Economic Outlook for Sub-Saharan Africa: A Difficult Road to Recovery. [online] Washington, DC: IMF. Available at: www.imf.org/en/Publications/REO/SSA/Issues/2020/10/22/regional-economic-outlook-sub-saharan-africa

57 IMF (2020) Regional Economic Outlook for Sub-Saharan Africa: A Difficult Road to Recovery. Op cit.

58 IMF (2020) Regional Economic Outlook for Sub-Saharan Africa, June 2020 Update [online] IMF. Available at: www.imf.org/en/Publications/REO/SSA/Issues/2020/06/29/sreo0629

59 ILO (2020) COVID-19 leads to massive labour income losses worldwide. [online] 23 September. Available at: www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_755875/lang--en/index.htm

60 Raga, S. and Housseini, B. (2020) The evolving fiscal and liquidity stimulus packages in response to COVID-19 in Sub-Saharan Africa. [pdf] Supporting Economic Transformation. Available at: set.odi.org/wp-content/uploads/2020/10/The-evolving-fiscal-and-liquidity-stimulus-packages-in-response-to-COVID-19-in-Sub-Saharan-Africa.pdf

61 Kazeem, Y. (2020) It's been a tumultuous, loss-making year since the billion-dollar IPO of Jumia, "Africa's Amazon". Quartz Africa [online] 14 April. Available at: qz.com/africa/1834923/jumia-africas-amazons-huge-losses-since-a-billion-dollar-ipo/

62 Kazeem, Y. (2020) African e-commerce is getting a much needed boost from coronavirus lockdowns. Quartz Africa [online] 19 May. Available at: qz.com/africa/1855227/africas-e-commerce-boosted-by-coronavirus-lockdowns/

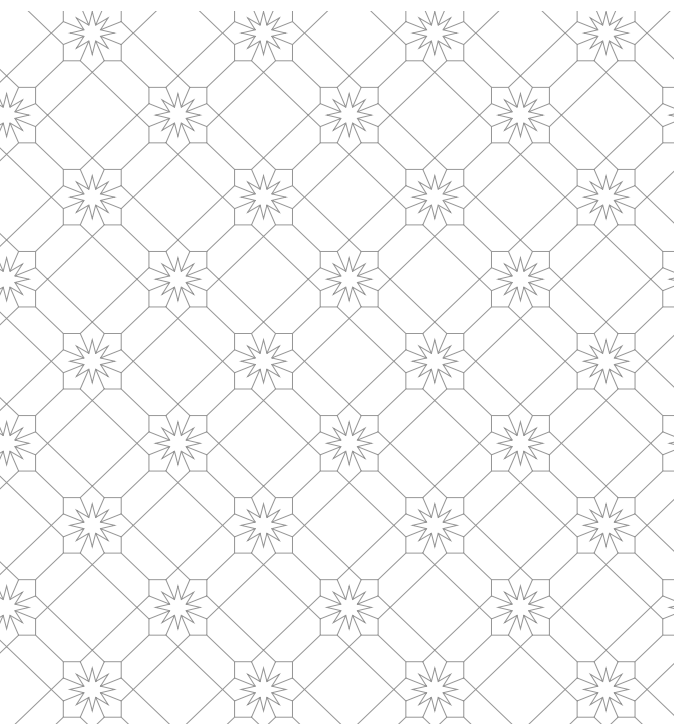
63 Ibid.

Box 5: Digital public services during the pandemic

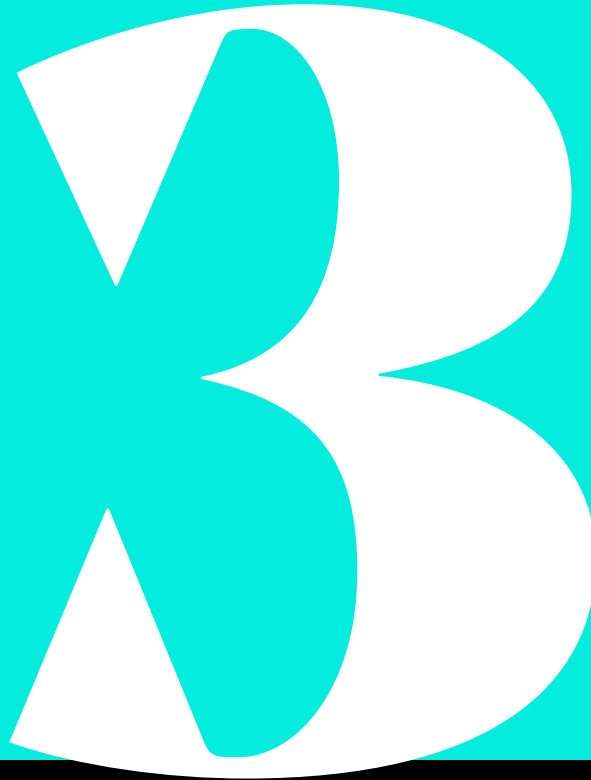
The Covid-19 pandemic has provided a boost to digital innovations in public services. Telemedicine tools are particularly welcome due to the shortage of doctors in most Sub-Saharan African countries, where the doctor-to-patient ratio is over 1 to 4,000.⁶⁴ In Nigeria, Mobihealth International, a fully integrated telemedicine start-up has launched free Covid-19 screening and consultations.⁶⁵ Meanwhile a Rwandan hospital has introduced an AI-powered chatbot called Babyl for triage. Wellvis, an app for self-diagnosis and contact of medical emergency services, is now used in 15 African countries.⁶⁶

EdTech is also helping overcome disruption in learning environments. In Tanzania, Shule Direct, an online learning platform, is reportedly serving 2 r students and made access to all its content free during the pandemic.⁶⁷ Eneza Education is offering education content for primary and secondary schools via SMS.⁶⁸

One technology that is being used to help bridge the digital divide in these contexts is Unstructured Supplementary Service Data (USSD), a low-cost technology which can be accessed by people without smartphones or internet connections. The government of Sierra Leone has used USSD to provide tools for self-assessment of Covid-19 symptoms during the pandemic.⁶⁹



- 64 World Bank Data (2017) Physicians (per 1,000 people) – Sub-Saharan Africa. [online] Available at: data.worldbank.org/indicator/SH.MED.PHYS.ZS?locations=ZG
- 65 World Bank (2020) Harnessing digital technology to fight the pandemic. [online] Available at: www.worldbank.org/en/news/feature/2020/09/19/harnessing-digital-technology-to-fight-the-pandemic
- 66 European Investment Bank (2020) Africa's digital solutions to tackle COVID-19. [pdf] EIB. Available at: www.eib.org/attachments/country/africa_s_digital_solutions_to_tackle_covid_19_en.pdf
- 67 Ibid.
- 68 Barak, P. (2020) Eneza Education launches Shupavu sms learning in Rwanda in partnership with the Mastercard Foundation. [online] Available at: enezaeducation.com/eneza-education-launches-shupavu-sms-learning-in-rwanda-in-partnership-with-the-mastercard-foundation/
- 69 Hinrichsen, S. (2020) Low Tech, High Impact: USSD in the time of COVID-19. [online] Available at: www.gsma.com/mobilefordevelopment/uncategorized/low-tech-high-impact-ussd-in-the-time-of-covid-19/



GOOD WORK CHALLENGES

The future of work landscape is diverse and, therefore, development pathways may look different depending on whether countries have existing strengths in manufacturing or look to leapfrog into different pathways.

During our research we identified three key challenges that countries in the region should address to ensure that all workers access good work in an age of technological change. In this section we explore these challenges in more detail and provide case studies of how innovative solutions are being developed to support workers. These challenges centre around skills and employment pathways, social protection and infrastructure.

Skills and employment pathways

A key strategy to ensure the benefits of technological transformation are inclusive is a focus on skill provision and digital skills in particular. The International Finance Corporation suggests that while 230m digital jobs could be created in Africa by 2030, filling them would also require more than 650m training opportunities to be created.⁷⁰ Further, traditional jobs are becoming more ICT intensive, increasing the need for these types of skills. For example, research by the World Economic Forum shows that the average ICT intensity of jobs in South Africa increased by 26 percent over the last decade.⁷¹

A recent study by the World Bank uses LinkedIn data to paint a more detailed picture of digital skills penetration across Sub-Saharan Africa. According to the research, countries with the most diversified digital skills also tend to have higher overall penetration.

While some skills such as digital literacy and web and mobile application development are more equally distributed across the region, most countries lag behind the region's tech hubs when it comes to advanced skills relating to artificial intelligence, scientific computing and human-computer interaction.⁷² Furthermore, Kenya, Nigeria and South Africa have more diversified digital skills than other countries.⁷³

An expert stakeholder we interviewed suggested that these more digitally advanced countries were also following different digital pathways, "Nigeria, for example, is focused on coding and business skills training, while South Africa prioritises digital skills, automation" and Industry 4.0, which refers to technological innovations in manufacturing such as automation and the Internet of Things.

The provision of digital skills is also unequal across gendered lines. Research by UNICEF found that fewer girls than boys possess ICT skills, with girls disadvantaged both at school and at home.⁷⁴ According to the Global System for Mobile Communications Association, literacy and digital skills are the primary barriers to mobile internet use among women in Sub-Saharan Africa who are aware of the internet.⁷⁵ In the course of our innovation mapping we found several digital skills training innovations that generally focus on helping individuals gain valuable skills, or on enabling employers to upskill their workforces.

69 International Finance Corporation (2019) Digital Skills in Sub-Saharan Africa: Spotlight on Ghana. [online] DC: IFC. Available at: www.ifc.org/wps/wcm/connect/ed6362b3-aa34-42ac-ae9f-c739904951b1/Digital+Skills_Final_WEB_5-7-19.pdf?MOD=AJPERES

71 World Economic Forum (2017) The Future of Jobs and Skills in Africa: Preparing the Region for the Fourth Industrial Revolution. [pdf] Geneva: World Economic Forum. Available at: www3.weforum.org/docs/WEF_EGW_FOJ_Africa.pdf

72 Choi, J., Dutz, M. and Zainab, U. (2020) Op cit.

73 Ibid.

74 Amaro, D. et al (2020) COVID-19 and education: The digital gender divide among adolescents in sub-Saharan Africa. [online] Available at: blogs.unicef.org/evidence-for-action/covid-19-and-education-the-digital-gender-divide-among-adolescents-in-sub-saharan-africa/

75 GSMA (2020) The mobile Gender Gap Report 2020. [pdf] Available at: www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf

Case study: Digital skills training programmes

ALX Africa is a South African leadership accelerator that combines skills development, including in software engineering, data analysis, financial modelling and project management, and development of an entrepreneurial mindset. Users can also take advantage of their own Pathfinder, a career agent that can help them to build the right network opportunities. ALX combines these features into a low-cost modular programme that can rapidly accelerate the careers of young professionals.

In Kenya, the Ajira Digital Programme is unique because it takes a multi-pronged approach to joblessness by tackling skills, infrastructure and access to jobs. Ajira is a government initiative driven by the Kenyan Ministry of ICT, Innovations and Youth Affairs to empower over one million young people to access digital job opportunities.⁷⁵ One of the pillars of the Digital Programme focuses on training people in digital skills such as data entry, transcription, digital marketing, e-commerce and software development, providing certification for the learning. Users can also have access to computers and the internet via Ajira Centers or Kazi Connect Centers located throughout the country. Ajira then connects users to job platforms, working with the private sector to match supply and demand, including for blue collar workers.

However, a common theme that emerged from our interviews with experts and other stakeholders was that for skills provision to have wider economic and societal benefits, it must be coupled with an attention to job placements and industry requirements. This is particularly important in a context where there are mismatches between job opportunities and the skills of people seeking employment, and where educational institutions often fail to confer real world job skills, which include digital, soft, technical, and business skills, to their students. Indeed, skills mismatches are felt by employers in many countries in Sub-Saharan Africa. Research by the World Economic Forum finds that over 41 percent of all firms in Tanzania and 30 percent in Kenya refer to inadequately skilled workforces as a major barrier to innovation.⁷⁶

Another contributing factor is societal expectations for student behaviour. According to one stakeholder we interviewed, educational institutions “are not anticipating workers to be creative,

to be problem solvers, or have the 21st century skills that are important, but rather to be deferential and quiet”. Additionally, there is emphasis on earning a university degree whether or not the degree confers the skills and competencies required to secure employment. During an interview, an innovator we spoke to highlighted the disconnect, stating that “going to school doesn't translate into jobs. The education system is broken; it's not addressing the skills that players are looking for”.

Many stakeholders we interviewed advocated for quicker job pathways such as pursuing skills through Technical and Vocational Education and Training (TVETs) to address the urgency of this challenge. For example, a stakeholder highlighted the need for education to be flexible, cyclical, and rooted in industry needs, citing the idea of open loop learning, “where you come in, gain skills, knowledge and experience, [and] go out and apply it”. Innovations such as Harambee are also trying to create these shorter, more skills-based pathways to work.

⁷⁶ World Economic Forum (2017) The Future of Jobs and Skills in Africa. Op cit.

Case study: Harambee

Harambee is a youth employment accelerator based in South Africa, a country with high youth unemployment rate. Its aim is to aggregate learning and employment opportunities, aided by its tailored matching tools. Harambee works with the private sector, civil society and government to create inclusive opportunities across both the formal and informal economies.

Harambee has connected unemployed youths with 100,000 jobs and work experiences, partnering with 500 African businesses. It improved public employment services and accelerated placement rates by five times. Harambee also works on the basis of a network-based infrastructure where people can move between employed and not employed, learning and mentoring. According to Kate Boydell, a strategic advisor who works with their communications team, what is unique about Harambees is that the goal is to keep people in the network, “not process them and get them out of the network. This way the system is continually learning, we see the pathways that people actually use, not just the ones we think they should or would use”.

2 Social protection

The lack of formal job creation has meant that work on gig economy platforms is seen as an alternative that can provide a ‘formalising’ aspect to work. However, the tailoring of social protection schemes to formal employees means that these workers lack access to benefits such as sick pay and unemployment insurance. As an innovator highlighted during an interview, “I’m not certain that as a continent we have a knit together narrative of how these gigs work for young people and really, what’s on the labour protections side”. Research by the OECD shows that, in East Africa, only in Kenya does social insurance coverage exceed 10 percent of the working age population.⁷⁷

Amolo Ng’weno and David Porteous of the Center for Global Development suggest that governments could recognise gig work as a legitimate source of livelihood, and require platforms to allow workers to register for government benefits and private services.⁷⁸ Indeed, during the course of our innovation mapping we have identified some initiatives that are trying to approach the complex system of social protection for gig workers, one of which is Perks.

77 OECD (2017). Social Protection in East Africa: Harnessing the Future. [pdf] Paris: OECD. Available at: www.oecd.org/dev/inclusivesocietiesanddevelopment/Social_protection_in_East_Africa.pdf

78 Ng’weno, A. and Porteous, D. (2018) Let’s Be Real: The Informal Sector and the Gig Economy are the Future, and the Present, of Work in Africa. Op cit.

Case study: Perks

Some innovations are trying to approach the complex system of social protection for gig workers and informal workers. Perks, for example, is a benefits aggregator tailored to the needs of freelancers, self-employed, and on demand service providers set up by Qhala, supported by the Frontier Technologies Livestreaming Programme and the UK-Kenya Tech Hub. Their user research is focusing on the different needs and priorities at different stages of gig workers' entrepreneurial life. Perks is also asking what types of social security benefits are a priority for different user groups. Initial findings show that gig workers often see themselves as micro business owners. Accordingly, Josiah Mugambi of Qhala highlighted that, "what they find valuable is anything that aids the business or grows the business. For example, a software developer working on Upwork needs a new laptop to improve productivity".

Other benefits of interest include those that can support worker compensation, other productivity tools, and access to finance. Health insurance and retirement benefits are, on the other hand, less of a priority as the network of family and friends functions as a social safety net.

However, some organisations have also called on gig platforms to do more. The Fairwork Foundation outlines a series of measures to improve platform work in South Africa, including reduced commissions, healthcare assistance, sick pay and better engagement with workers and their representatives.⁷⁹

Others have pointed out that there may be structural issues which could impact the viability of certain platforms in the region, leaving workers exposed to increased vulnerability. Ghanaian social innovator Bright Simons notes that some innovations might face challenges on the African continent because of a lack of co-innovation. Innovations need "coupling" opportunities for risk sharing, enhancing distribution and sustaining quality.⁸⁰

Many of these opportunities were not initially available to local platforms as they have been elsewhere for players like Uber, who partnered with Paypal for low-cost fast payments, and with General Motors and Toyota for its fleet management. Uber also developed several partnerships to expand its driver perks programme. Another challenge that local gig economy platforms in Africa face is that they often don't have significant levels of venture capital investment. Many do not manage to scale across different countries and markets: this was the case of SafeBoda, which employed drivers in Uganda but failed its attempt to move to Kenya.⁸¹

That said, advances are being made, in terms of logistics and finance, that can provide support to innovators. One example is Flutterwave, which is enabling digital payments across 20 African countries. Having started in Nigeria, it is being used by a great number of small merchants and platforms. Flutterwave also introduced its own e-commerce marketplace in 2020.⁸² In our innovation mapping exercise we also identified platforms such as Lynk which aims to support the development of such entrepreneurship infrastructure, providing employment for people in various sectors.

79 The Fairwork Project (2020) Code of good practice for the regulation of platform work in South Africa. [pdf] Available at: fairwork/wp-content/uploads/sites/131/2020/11/South-Africa_Code-of-Good-Practice_Full.pdf

80 Simons, B. (2019) Why "Leapfrogging" in Frontier Markets Isn't Working. Center for Global Development. [online] 21 March. Available at: www.cgdev.org/publication/why-leapfrogging-frontier-markets-isnt-working

81 Kolawole, O. (2020) Why Safeboda is leaving Kenya to focus on Uganda and Nigeria. Techpoint Africa. [online] 17 November. Available at: techpoint.africa/2020/11/17/why-safeboda-leaves-kenya/

82 Dunn, N. (2021) Flutterwave is now worth more than some African banks – how should incumbents respond? [online] Available at: www.linkedin.com/pulse/flutterwave-now-worth-more-than-some-african-banks-how-nicole-dunn

3 Infrastructure

The disparity in access and usage of internet and mobile connections is at present excluding large numbers of the population of countries in Sub-Saharan Africa from reaping the benefits of leapfrogging opportunities. For many, internet access remains out of reach. In 2019, only 34 percent of the population had access to fixed broadband, with 45 percent living more than 25km from a fibre node.⁸⁵ A key benefit that is specific to broadband connections rather than mobile ones shows up in terms of skills. Indeed, research by the World Bank showed that demand for high-skilled workers has increased more in areas where there is access to undersea high-speed internet cables.⁸⁶

Limited access, however, is not specific to broadband, but rather plagues mobile connectivity as well. While mobile coverage is relatively higher (3G coverage grew from 26 percent in 2010 to 77 percent in 2020), actual access, measured by the number of 3G connections per resident, was only around 40 percent in 2020.⁸⁷ Many mobile networks have failed to link to the higher bandwidth fibre optic cables, thus failing to leverage the benefits of broadband infrastructure, including the potential reduction in cost of usage.

Case study: Lynk

Lynk is a Kenyan online platform for matching the supply and demand of services by professionals, artisans and other service providers. The platform offers a space to build on the entrepreneurial potential of Kenya's large informal sector, which employs over 80 percent of the country's workforce. Lynk aims to provide both access to jobs and "entrepreneurship infrastructure" including training, loans, customer service, and a digital-career identity to enable blue collar workers to thrive in this space.⁸³

As of 2019, Lynk had facilitated over 20,000 jobs for more than 1,100 users on the platform, 44 percent being female, and over 60 percent young. However, while Lynk was successful in developing unique ways of supporting its users, it appears to have temporarily halted its operations during the Covid-19 pandemic.⁸⁴

83 RSA (2019) Lynk [online]. Op cit.

84 As of July 2021, the last online update from Lynk was in December 2020.

85 Smart Africa (2020) Smart Broadband 2025. [online] Available at: smartafrica.org/knowledge/customer-segmentation/

86 Choi, J., Dutz, M. and Usman, Z. (2020). Op cit.

87 Zeufack, A. et al (2020) Africa's Pulse, No. 22 [pdf] DC: World Bank. Available at: openknowledge.worldbank.org/bitstream/handle/10986/34587/9781464816482.pdf

More generally, internet access also varies considerably across countries. According to the World Bank, more than half the population uses the internet in South Africa.⁸⁸ In West Africa, rates are around 30 percent, while in Central Africa they are as low as 10 percent. Issues with disparity are particularly heightened in the context of urban versus rural dwellers, with the region having the largest gap globally between the two in terms of, for example, smartphone usage. Rural mobile internet use stands at 16 percent, compared to 40 percent in urban areas.⁸⁹ More generally, urban tech hubs such as Cape Town in South Africa, Lagos in Nigeria, Nairobi in Kenya, Accra in Ghana and Abidjan in Côte d'Ivoire are much better placed to harness the opportunities of technology than others.⁹⁰

The digital divide also falls along gendered lines, as women are less likely to have access to infrastructure and skills. A Pew survey of six African countries found that internet usage is higher among young people but concentrated among males and higher income, higher education users.⁹¹ Mobile internet is no exception: in 2019 there was a 37 percent gender gap in mobile internet use in the region.⁹²

Case study: Offline skills provision

In the course of our innovation mapping we observed several innovations that specifically aimed to reach people who have limited access to connectivity. Some of these opportunities offer skills provision.

Mtabe is an e-learning platform for students who don't have access to internet or smartphones. Mtabe provides learning by asking users five questions every day and allowing them to in turn ask the same number of questions every day, all through SMS.

Arifu, a Kenyan firm which provides a digital content and interactive learning platform that is personalised and free for its learners. Arifu's chatbot is designed to work both for smartphones and feature phones, with users being able to access learnings through SMS, WhatsApp and Facebook Messenger.

- 88 Mahler, D., Montes, J. and Newhouse, D. (2019) Internet Access in Sub-Saharan Africa. [pdf] World Bank Group. Available at: documents1.worldbank.org/curated/en/518261552658319590/pdf/Internet-Access-in-Sub-Saharan-Africa.pdf
- 89 Bahia, K. and Delaporte, A. (2019) The State of Mobile Internet Connectivity 2020. [pdf] London: GSMA. Available at: www.gsma.com/r/wp-content/uploads/2020/09/GSMA-State-of-Mobile-Internet-Connectivity-Report-2020.pdf
- 90 Choi, J., Dutz, M. and Usman, Z. (2020) Op cit.
- 91 Silver, L. and Johnson, C. (2018) Internet Connectivity Seen as Having Positive Impact on Life in Sub-Saharan Africa. [online] Pew Research Center. Available at: www.pewresearch.org/global/2018/10/09/internet-use-is-growing-across-much-of-sub-saharan-africa-but-most-are-still-offline/
- 92 GSMA (2020) The mobile Gender Gap Report 2020. Op cit.

As illustrated earlier in this paper, the mobile revolution is a key example of leapfrogging. However, theorists like Calestous Juma highlight that this instance of leapfrogging hasn't provided a stimulus for industrial development and has had relatively little impact on African innovation policy.⁹³ Juma suggests that the mobile revolution has not enabled countries in Sub-Saharan Africa to become producers of technologies, but rather remain consumers.

Further, Juma highlights the need for physical infrastructure in the case of agriculture. Despite the clear benefits that individual innovations mentioned above can bring to its user, inadequate rural infrastructure dampens opportunities for growth. Roads are a prime example, with only 32 percent of rural people in Kenya living within two kilometres of an all-season road, 31 percent in Angola, 26 percent in Malawi, and 24 percent in Tanzania.⁹⁴ This type of barrier means that farmers are limited to growing crops close to home, which limits their ability to use surpluses for local trade, confining them to subsistence agriculture.

Box 6: The invisible mile

Policy will play a key role in supporting inclusive economic growth and technological advancement. Indeed, policy can to some extent be seen to be its own type of infrastructure. Akin to issues relating to the 'last mile' problem of infrastructure, which refers to the final pieces of infrastructure that can deliver a service to its users, policy represents a sort of 'invisible mile'.

Various stakeholders highlighted this role, stating that creating an enabling environment is key. One example is that of Kenya's robust ICT policy landscape, which includes a national ICT policy, a start-up bill, a blueprint for the digital economy and data protection. The policy also prioritises infrastructure investments such as the Silicon Savannah and the new fibre optic cable, DAREI, a submarine cable intended to boost access to data in the region and reduce its costs, and position Kenya as a data connectivity hub in East Africa.⁹⁵

Indeed, investment will play a critical part in supporting the benefits of technological infrastructure. Recent findings from the African Development Bank show that while investment increased considerably as of 2018, there still remained a total financing gap of between \$52bn and \$92bn a year.⁹⁶ However, investment in infrastructure accounts for over half of the recent improvement in economic growth in Africa, with the potential to achieve even more.⁹⁷

93 Juma, C. (2017) Leapfrogging Progress: The Mismatched Promise of Africa's Mobile Revolution. The Breakthrough Institute. [online] 29 June. Available at: www.thebreakthrough.org/index.php/journal/issue-7/leapfrogging-progress

94 Juma, C. (2015) Calestous Juma: Infrastructure for innovation. New African. [online] 26 June. Available at: www.newafricanmagazine.com/11031

95 Mwitwa, M. (2020) New fibre optic to enhance internet speed. The Star. [online] 9 March. Available at: www.the-star.co.ke/business/kenya/2020-03-09-new-fibre-optic-to-enhance-internet-speed/

96 African Development Bank (2019) Africa's infrastructure financing reaches an all-time high in 2018, surpassing \$100 billion – ICA. [online] Available at: www.afdb.org/en/news-and-events/press-releases/africas-infrastructure-financing-reaches-all-time-high-2018-surpassing-100-billion-ica-32728

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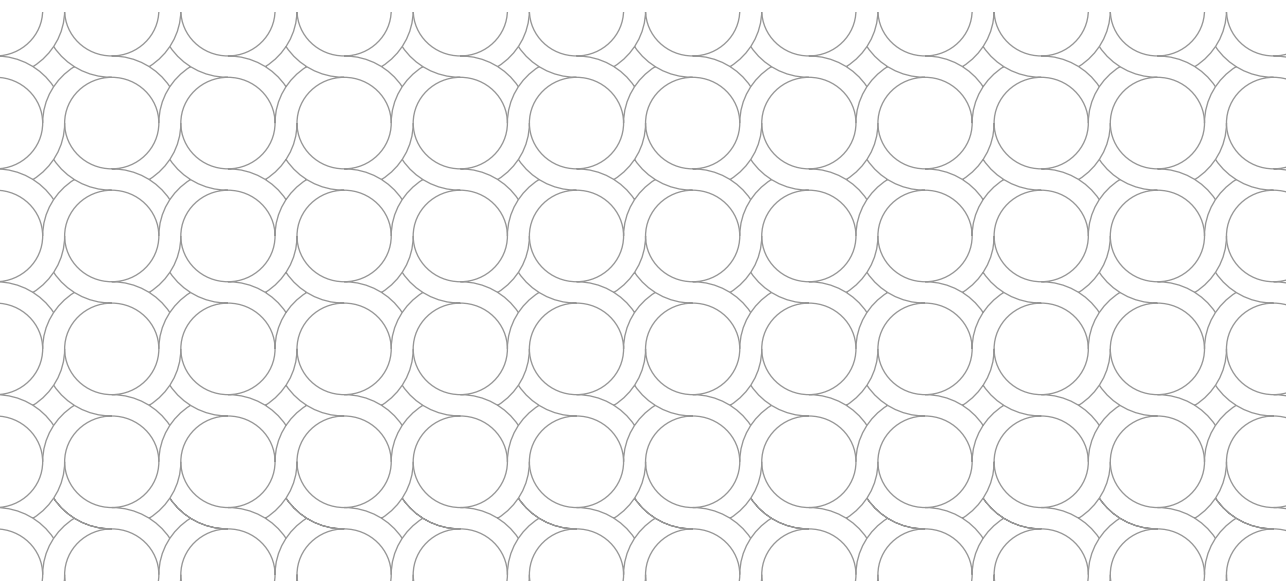
CONCLUSION

Conclusion

In Sub-Saharan Africa, technological transformation will be shaped by the local context of different countries, including the high prevalence of agriculture and informal work. It remains uncertain whether most countries will follow the traditional pathway of manufacturing and industrialisation. Instead, technology could help countries to leapfrog this pathway and turn to higher productivity services and agribusiness. While the Covid-19 pandemic appears to be accelerating technological change in some sectors, it has had some deeply concerning economic impacts on the region.

This paper complements an emerging body of research from the RSA Future of Work programme that aims to explore the contribution that bottom-up grassroots innovators can make towards addressing good work challenges. However, for these innovators to have a lasting impact on people's working lives, they will need to be complemented by other measures, including government policy and physical infrastructure. In summary, we make the following broad recommendations:

- 1. Create new skills and employment pathways:** digital skills training provision is needed for most countries in Sub-Saharan Africa to catch up with more advanced countries but more generally education systems needs to place a greater emphasis on job pathways that can bring young people into employment.
- 2. Explore new forms of social protection:** gig economy or platform work can provide informal workers with a degree of formalisation but it does not offer sufficient social protection, and platforms may need to do more to support workers if they are to remain viable long term.
- 3. Improve access to infrastructure:** a digital divide is cut across geographical and gendered lines and for countries to harness the benefits of technological innovation policy makers must improve access to both digital and physical infrastructure.



Appendix: innovation mapping tables

Digital skills training

Innovation	Countries	Description	Website
Ajira	Kenya	Ajira Digital is a government initiative driven by the Ministry of ICT, Innovations and Youth Affairs to empower over one million young people to access digital job opportunities.	ajiradigital.go.ke
ALX Africa	South Africa	ALX is a leadership accelerator that combines skills development, network-based opportunities, and mindset training into a low-cost, modular program that can rapidly accelerate the careers of young professionals.	www.alxafrica.com
Anchorsoft Academy	Nigeria	Anchorsoft provides technical and job placement for tech jobs in programming, data science, etc.	www.anchorsoftng.com
Ingressive for Good	Nigeria	Ingressive for Good offers scholarships to final year university students, digital skills training, and talent placement.	ingressive.org
MyJobPass	Tanzania	MyJobPass is a workforce accelerator that powers quality and affordable skills-based training solutions by designing and delivering digital learning experiences for organisations and their workforce.	myjobpass.com
Rekindle Learning	South Africa	Rekindle Learning provides micro-learning and employee enablement solutions.	www.rekindlelearning.com
Semicolon	Nigeria	Semicolon addresses skills shortages by delivering hands-on, intensive training, creating community for tech innovators, and executing projects for companies.	semicolon.africa
Slatecube	Nigeria, South Africa	Slatecube leverages AI to solve learning, unemployment, and talent development challenges in Africa.	www.slatecube.com
Utiva	Nigeria	Utiva delivers an encrypted hardware with more than 70 structured tech skills learning programs, accessible with or without internet connection, to African youth.	utiva.io
Village2Nation	Kenya	Village2Nation provides accessible, life-long learning to high school students to sell on Etsy, do online marketing etc.	www.village2nation.academy
Zaio	South Africa	Zaio de-risks hiring with a work-ready graduate training program that addresses core competency gaps via 6-8 week accredited bootcamps and customised, gamified, coding learning journeys.	www.zaio.io

Other skills training

Innovation	Countries	Description	Website
Arifu	Kenya	Arifu provides a digital content and interactive learning platform that is personalised and free for its learners. Arifu's chatbot is designed to work both for smartphones and feature phones, with users being able to access learnings through SMS, WhatsApp and Facebook Messenger.	www.arifu.com
Mtabe	Tanzania	Mtabe is an e-learning platform for students who don't have access to internet or smartphones. Mtabe provides learning by asking users five questions every day and allowing them to in turn ask the same number of questions every day, all through SMS.	www.mtabeapp.com
Traindemy	Nigeria	Traindemy offers on-demand skills taught by the best vocational schools in Africa.	www.traindemy.com
Mosabi	Sierra Leone	Mosabi provides mobile financial education that helps emerging market citizens improve behaviors and decisions on their businesses and money.	www.mosabi.co

Job pathways and talent matching

Innovation	Countries	Description	Website
FLIP Africa	Uganda	FLIP Africa is a freelance marketplace where small and growing businesses can hire experienced, rated, short-term talent.	www.flipafrica.app
Harambee Employment Accelerator	South Africa	Harambee is a youth employment accelerator working with private sector, civil society and government to create inclusive opportunities across the formal and informal economies.	www.harambee.co.za
Qiesto	Nigeria/Ireland	Qiesto connects young Africans with opportunities to showcase their competence as a pathway to jobs, education, or entrepreneurship.	www.qiesto.com
Shortlist	Kenya/India	Shortlist empowers jobseekers in Africa and India to apply for jobs online by demonstrating their skills and abilities in real time, regardless of background.	www.shortlist.net
TalentQL	Nigeria/Ireland	TalentQL hires, develops, and manages remote talent for companies globally.	www.talentql.com
Zlto	South Africa	Zlto is a blockchain powered platform that enables young job seekers to earn digital currency called Zlto by engaging in positive behavior.	www.zlto.co

Social protection

Innovation	Countries	Description	Website
ImaliPay	Kenya, Nigeria	ImaliPay offers financial services, such as savings and loans to gig workers.	www.imalipay.com
Perks	Kenya, Nigeria	Perks is a benefits aggregator designed to meet the needs of freelancers, independent contractors, the self-employed, and on-demand service providers.	www.perks.gg
SmartWage	South Africa	SmartWage enables employers to pay their employees' wages as they have earned them.	www.smartwage.co.za

Impact sourcing and fairer gig platforms

Innovation	Countries	Description	Website
CloudFactory	Kenya	CloudFactory provides human-powered data processing for AI and automation.	www.cloudfactory.co.ke
Juakali	Kenya	Juakali facilitates livelihood opportunities by connecting clients with skilled workers from the informal sector.	www.juakali.co.ke
Lynk	Kenya	Lynk is an online platform for matching the supply and demand of services by professionals, artisans and other service providers. It aims to provide both the access to jobs and 'entrepreneurship infrastructure' including training, loans, customer service.	www.lynk.co.ke
Sama	Kenya, Uganda	Sama offers high quality labelling and tagging of training data for AI systems. It provides formal employment to its workers, with training and access to benefits that are the same between workers in San Francisco and Kampala.	www.sama.com
SweepSouth	South Africa	SweepSouth connects domestic workers with people in search of domestic cleaning services.	www.sweepsouth.com

Other skills training

Innovation	Countries	Description	Website
Agri-wallet	Kenya	Agri-wallet is a blockchain-enabled solution that provides affordable trade and input finance to farmers, buyers, and input providers earmarked for income generating agricultural activities.	www.agri-wallet.com
Agrocenta	Ghana	Agrocenta is a platform for facilitating trade between smallholder farmers and consumers or buyers.	www.agrocenta.com/apps
Apollo Agriculture	Kenya, Nairobi	Apollo Agriculture is a technology company that helps small-scale farmers maximise their profits by providing financing, farm inputs, advice, insurance, and market access.	www.apolloagriculture.com
Khula!	South Africa	Khula! connects producers to customers who are looking for locally grown fresh produce.	www.khula.co.za
Kionect	Kenya	Kionect is a supply chain platform that links micro-retailers, wholesalers, and fast moving consumer goods (FMCG).	www.mastercard.us/en-us/vision/corp-responsibility/social-sustainability/the-mastercard-labs-for-financial-inclusion.html
Mastercard Farmer Network	Kenya, Uganda, Tanzania	The Mastercard Farmer Network connects small-scale farmers with potential buyers, integrates their businesses with payment systems, and enables them to build a digital transaction record that can be used to access formal credit from banks and other financial institutions.	www.mastercard.us/en-us/vision/corp-responsibility/social-sustainability/the-mastercard-labs-for-financial-inclusion.html
M-Shamba	Kenya	M-Shamba provides digital literacy, links farmers to markets, and helps them turn lifestyle farming into 'business' farming.	www.m-shamba.net
Mergdata by Farmerline	Ghana	Mergdata is a supply chain management platform that uses technology to support farmers and help supply chain owners manage farms.	www.mergdata.com
Releaf	Nigeria	Releaf invents and operates proprietary food processing hardware to reduce post-harvest loss in the sustainable oil palm sector.	www.releaf.africa
Zenvus	Nigeria	Zenvus is a precision farming technology company that uses computational algorithms and electronics to transform farms.	www.zenvus.com

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