

Chapter 4

Digital transformation for youth employment and Agenda 2063 in Central Africa

This chapter analyses the actual and potential contribution of the digital economy to accelerating job creation in Central Africa (Burundi, Cameroon, Central African Republic, Chad, Republic of the Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon and São Tomé and Príncipe). Despite the boom in the use of digital services in 2020 due to the coronavirus (COVID-19), Central Africa is struggling to increase the Internet penetration rate among the population in general, and public and private companies in particular and thereby create more jobs. The chapter opens with the opportunities digitalisation brings for reducing unemployment, while pointing out the constraints related to the limited communications infrastructure. It then highlights the untapped potential of digital development, and identifies areas in which this could facilitate a rapid expansion of youth entrepreneurship, notably through the creation of start-ups. The conclusion formalises the priorities for improving the contribution of digitalisation to job creation.

EXECUTIVE BRIEF

The economies of Central Africa are making slow progress in creating digital jobs, due to significant structural constraints: less than 48 in 100 people have access to electricity, while the mobile phone subscription rate (66.9%) remains ten points below the African average. Only 9 out of every 100 people use a computer in Central Africa. One-third (34.2%) of the region is covered by 4G. The high cost of subscriptions explains the low Internet penetration rate, which is 26% compared to an average of 35% for Africa, and the few jobs created by digital technology.

With an agricultural sector that employs 70.3% of the working population and generates only low incomes, the structure of the region's economies, especially those that export minerals, is not conducive to digital development. Yet the potential is real: with a young population having increasingly access to education and stable national regulatory frameworks, it is possible to create dynamic start-ups.

To address these issues, four policy areas should be explored: (i) developing communications infrastructure to facilitate access; (ii) strengthening education systems to equip the workforce with the adequate skills; (iii) leveraging digital technologies to promote entrepreneurship and foster the digital transformation of regional value chains and (iv) implementing decisions taken at the continental, regional and national levels that encourage economic diversification. These decisions include the introduction of a specific tax system for the digital economy, the pooling of infrastructure potential between countries and an increase in public-private partnerships (PPPs).

Central Africa

Youth employment

Unemployment and informal employment remain predominant

Total working population

81% in informal sector

% of young workers who are unemployed or informal

45%

The number of youth with post-secondary education has doubled

9% (2000) → 18% (2020)

But 25% of them are unemployed

Communications infrastructure

Mobile phone subscription rates are increasing, but are now below Africa's average

Year	Central Africa	Africa
2010	46%	44%
2018	67%	77%

Only 5%

of intermediary cities in the region are connected to fibre-optic broadband (the lowest rate in Africa)

Mobile communications cost on average 22% of monthly income

22%

Digital economy

Mobile money transactions increased 9-fold since 2010...

USD 200 Million (2010) → USD 1.8 billion (2019)

...but, the potential of digital entrepreneurship remains largely untapped

Only 9 start-ups raised over USD 100 000 during 2011-20

Youth under the age of 30 represent 65% of the population...

...but only 33% of them have access to the Internet

What's next for policy makers?

- Co-ordinate investment in digital infrastructure regionally in order to expand coverage and affordability
- Encourage digital entrepreneurship by improving the regulatory framework
- Encourage the digital transformation of regional value chains
- Leverage public-private partnership to facilitate the school-to-digital-work transition

Central Africa regional profile

Table 4.1. Selected indicators on digital transformation in Central Africa

			Central Africa (5 years ago)	Central Africa (latest year)	Source	Latest year
<i>Digital sector</i>	Communications infrastructure	Percentage of the population with a cell phone	4.6	23.2	ITU	2018
		Percentage of the population with 4G coverage	19.2	55.4	GSMA	2020
		International Internet bandwidth per Internet user (kilobits/second)	4 536.6	10 902	ITU	2017
	Telecommunication sector	Total capital expenditure (as a percentage of total revenue)	18.4	18.3	GSMA	2018-20
		Earnings before interest, taxes, depreciation and amortisation (as a percentage of total revenue)	28.9	n.a.	GSMA	2018-20
	Total employed headcount within the telecom companies (head account full-time equivalent).	9 716	10 607	GSMA	2016-17	
<i>Digital economy</i>	Start-up development	Number of active start-ups that raised at least USD 100 000	1	9	Crunchbase	2011-20
	Digital services	E-Commerce sales (in USD million)	81.2	108.4	UNCTAD	2014-18
		Export of professional and IT services delivered electronically (in USD million)	841.9	645.4	UNCTAD	2014-18
<i>Digitalised economy</i>	Internet use among people	Percentage of the population that use mobile phones regularly	55.4	63.1	Gallup	2018
		Percentage of women with Internet access	16.6	23.9	Gallup	2018
		Percentage of the poorest 40% with Internet access	14.0	15.9	Gallup	2018
		Percentage of rural inhabitants with Internet access	11.4	16.8	Gallup	2018
	Digital-enabled businesses	Percentage of firms having their own website	22.5	22.6	World Bank	2018*
		Percentage of firms using e-mail to interact with clients/suppliers	47.3	46.9	World Bank	2018*
		Percentage of goods vulnerable to automation that are exported to OECD countries	n.a.	9.0	World Bank	2020
	Access to finance	Percentage of the population with a mobile money account	4.0	23.0	Demirgüç-Kunt et al.	2017

Note: * Data for 2018 or the latest available. Chapter 1 provides the definitions of a digital and a digitalised economy. n.a. – not available, ITU – Information Technology Union, GSMA – Global system for Mobile communication Association, UNCTAD – United Nations Conference on Trade and Development.

Sources: Authors' calculations based on data from Crunchbase (2020), *Crunchbase Pro* (database); Demirgüç-Kunt et al. (2018), *The Global Findex Database 2017* (database); Gallup (2018), *Gallup World Poll* (database accessed on 1 February 2020); GSMA (2020), *GSMA Intelligence* (dataset); ITU (2020), *World Telecommunication/ICT Indicators Database* (database); UNCTAD (2020), *UNCTADSTAT* (database); World Bank (2020a), *World Bank Enterprise Surveys* (database); World Bank (2020b), *World Development Report 2020*.

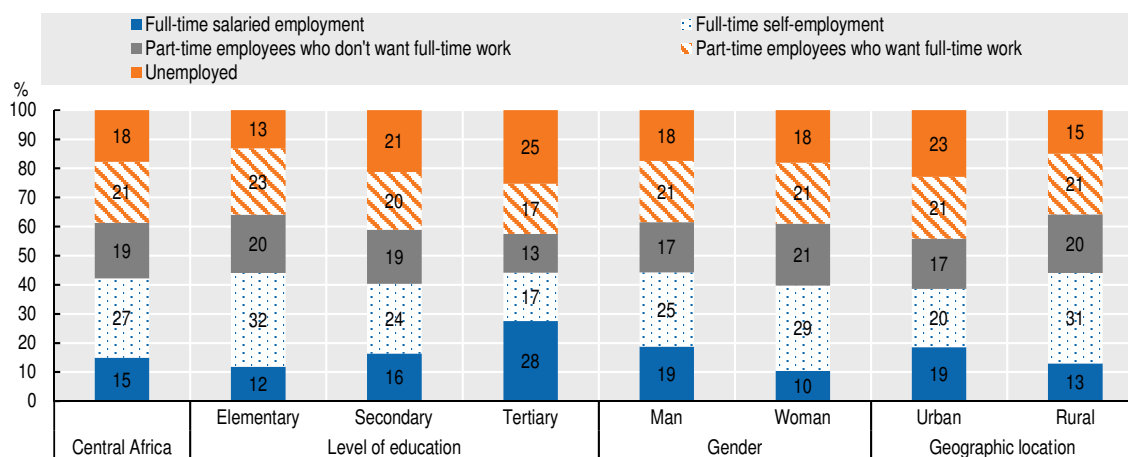
Digitalisation offers opportunities to create jobs, but access to communications infrastructure remains disparate across Central Africa

The digital economy and job creation are central to the African Union's Agenda 2063

Underemployment remains high in Central Africa, as does precarious employment. As much as 81% of the working population is precariously employed in the informal sector (ILO, 2020), and more than two-thirds earn their livelihood from agriculture. The African Union's Agenda 2063 aims to reduce vulnerable employment in Africa from 73.89% to 41% between 2020 and 2063. Despite the low unemployment rate in the subregion (7.1% in 2019), underemployment exceeds 70%, reaching 80% in Gabon and São Tomé and Príncipe (ILO, 2020).

More than 60% of the population in Central Africa is aged 15-34 years. By 2030, around 3 million young people will reach working age each year. However, this potential is under-exploited as young people are without work and do not fully contribute to wealth creation. Indeed, unemployment and informal employment remain predominant, affecting 45% of young workers in Central Africa. The informal sector is an outlet (32%) for those with only a basic education, or no education at all. In comparison, higher education graduates are more likely to be unemployed (25%), a sign of a mismatch between their skills and the needs of the labour market (Figure 4.1).

Figure 4.1. Youth employment in Central Africa by socio-economic group, 2010-18 average



Notes: The data include seven Central African countries: Cameroon, Burundi, Central African Republic, Chad, Congo, Democratic Republic of the Congo (DR Congo), Gabon. Elementary: have completed primary education or less (up to eight years of basic education). Secondary: have completed part of secondary education up to three years of higher education (9 to 15 years of education). Tertiary: have completed four years of study beyond high school and/or have obtained a university degree after four years of study.

Source: Gallup (2018), Gallup World Poll (database), www.gallup.com/analytics/232838/world-poll.aspx.
StatLink <https://doi.org/10.1787/888934203700>

The digital economy represents a tremendous opportunity for the structural transformation of Central Africa. For this reason, it was chosen as the second goal of Agenda 2063, which states that digitalisation should lead to “well-educated citizens and a skills revolution underpinned by science, technology and innovation”. This goal is part of the African Union's aspiration to create a “prosperous Africa, based on inclusive growth and sustainable development” (African Union, 2015). In Cameroon, the number of direct

jobs created in information and communications technology (ICT) is reported to represent 3-5% of the labour force, while each ICT job generates 4.9% of jobs in other sectors (Wamba and Ndjie, 2019). However, these jobs are less sustainable when supported by start-ups with little or no structure.

Access to digital tools in Central Africa is the lowest on the continent

Although it still lags behind other regions of the continent, there has been a leap forward in Central Africa's adoption of mobile phones. By 2018, 66.83% of the population had taken out a mobile phone subscription (ten percentage points lower than the African average), compared to 45.76% in 2010 (World Bank, 2020c). In comparison, fixed line subscriptions accounted for fewer than 3% of new subscriptions over the same period. Despite this, the region is trailing behind in terms of access to digital tools. For example, computer use remains reserved for 9.81% of the population in Central Africa, compared to the continental average of 10.1% (Table 4.2).

Table 4.2. Mobile phone subscription and computer use in Central Africa (per 100 inhabitants)

	Mobile phone subscriptions (per 100 inhabitants)		Computer use (%)	
	2010	2018	2010	2018
Burundi	19.34	56.53	8.89	10.91
Cameroon	42.46	73.19	3.94	13.81
Central African Republic	22.32	27.41	0.53	0.96
Chad	24.05	45.12	0.2	0.23
Congo	87.01	95.34	0.78	11.17
DR Congo	18.31	43.38	0.03	0.04
Equatorial Guinea	42.31	45.16	4.37	15.9
Gabon	99.13	138.28	10.72	35.51
São Tomé and Príncipe	56.95	77.05	6.11	9.8
Central Africa	45.76	66.83	3.95	9.81
Africa	44.3	76.7	5.8	10.1

Source: Authors' calculations based on the International Telecommunication Union (ITU, 2020), www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx.

Weak purchasing power, combined with a lack of competition between operators, helps explain why the region is lagging behind. The cost of mobile phone communication remains a major obstacle to digital expansion in the subregion. With an average monthly per capita income of USD 195.76, and average communication costs of 21.9% of this income, it is difficult to achieve the figure of almost 80% mobile phone subscriptions seen in other African subregions (Table 4.3). Moreover, the mobile phone market is oligopolistic, and limited competition is a barrier to reducing costs. On average, each country has only three operators for a population of 150 million inhabitants in the region. Airtel (India), Orange (France) and MTN (South Africa) are established in several countries in the region.

Table 4.3. Incomes and mobile phone subscription costs in Central Africa

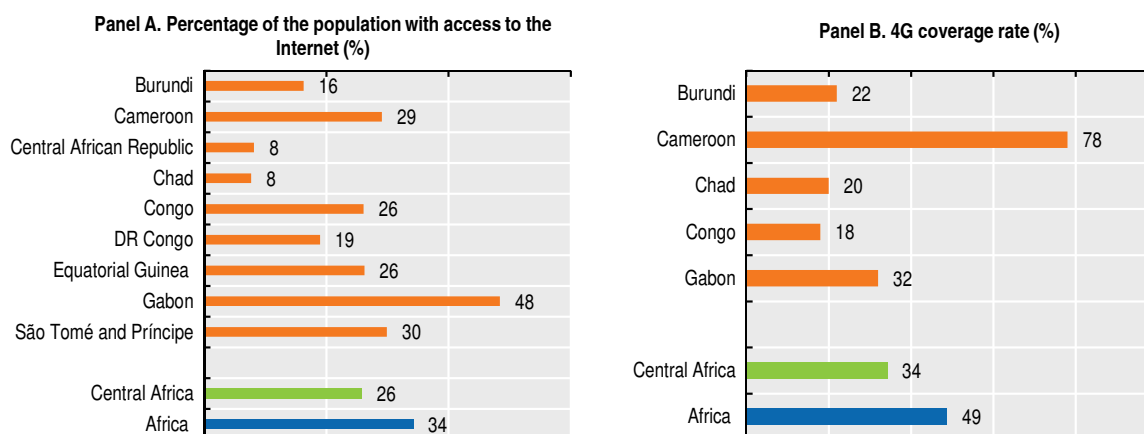
	Average annual income in USD	Mobile phone subscription costs as a percentage of GNI*
Burundi	280	30.03
Cameroon	1 400	12.02
Central African Republic	489.6	38.48
Chad	720	36.02
Congo	1 710	
DR Congo	430	25.2
Equatorial Guinea	7 180	
Gabon	7 210	3.07
São Tomé and Príncipe	1 720	8.45
Central Africa	2 348.84	21.90

Notes: *Gross national income.

Source: Authors' calculations based on World Bank (2020c), *World Development Indicators* (database) and ECA (2019), "Digital Transformations and Economic Diversification in Central Africa: Issues, Challenges and Opportunities".

Beyond access to telecommunications and digital tools, the region suffers from poor Internet and 4G access. In 2018, only 25.8% of the population had access to the Internet, compared to 34.2% in Africa (Figure 4.2). Similarly, low 4G coverage, compared to the African average, suggests poor service quality when it is accessible. Despite the implementation of policies to increase 4G coverage, only 34.2% of the population in Central Africa was covered by a 4G network, compared to 48.77% across the continent as a whole. Only Cameroon had a coverage rate of 78%, thanks to its network of relay antennas.

Figure 4.2. Internet penetration rate and 4G coverage in Central Africa, 2018

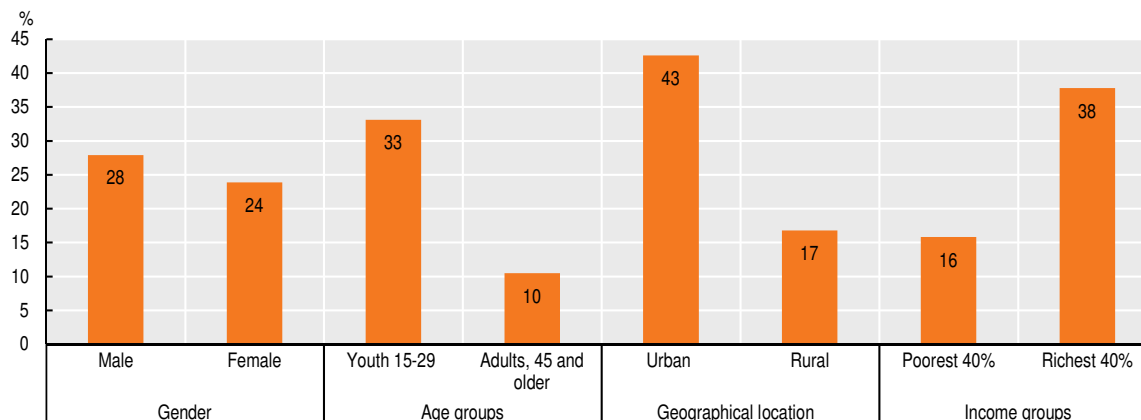


Source: Authors' calculations based on Gallup (2018), *Gallup World Poll* (database), www.gallup.com/analytics/232838/world-poll.aspx and GSMA (2020), *GSMA Intelligence* (database) www.gsmainelligence.com/.
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The varying rates of Internet penetration are also characterised by socio-economic, gender and geographical inequalities. Although low, compared to other subregions, Internet access for young people is a key issue in Central Africa. While they represent more than 65% of the population (ECA, 2019), only 33% of 15-30-year-olds have access to the Internet (Figure 4.3). Similarly, there are significant inequalities in terms of access between urban and rural areas due to the lack of terrestrial fibre optic networks linking the major conurbations to peripheral cities. For example, only 5%

of intermediate cities are within 10 km of the basic network, compared to 36% of large cities (see Chapter 2, Figure 2.1). Increased Internet access for young people, especially outside large conurbations, would help to facilitate their integration into both the informal and formal labour markets.

Figure 4.3. Internet access by socio-economic group in Central Africa, 2018



Source: Authors' calculations based on Gallup (2018), Gallup World Poll (database), www.gallup.com/analytics/232838/world-poll.aspx.

StatLink  <https://doi.org/10.1787/888934203738>

There are two main explanations for the varying rates of Internet coverage and the poor quality of services in Central Africa:

- **The lack of infrastructure and limited fibre optic networks.** Landlocked countries such as Chad, the Central African Republic, Burundi and the Democratic Republic of the Congo are poorly served by fibre optic and do not have direct access to submarine cables. Increasing the Internet penetration rate requires financial investment, with a view to joint projects and network expansion policies.
- **The high costs of mobile data and digital tools (smartphones and computers).** In 2018, the cost of one GB of mobile data amounted to 6.35% of the monthly per capita income in Cameroon, three times higher than the international standard, set by the United Nations at a maximum of 2% of monthly per capita income (Table 4.4). In Equatorial Guinea, a one-gigabyte connection cost an average of USD 34.80, compared to USD 2.80 and USD 4.10 in Rwanda and Ghana respectively (A4AI, 2018). Compared to the rest of the continent, the highest tariffs are found mainly in the Economic and Monetary Community of Central Africa (CEMAC). A survey of Internet use in Cameroon and the Democratic Republic of the Congo also revealed that the cost of digital services was a barrier to Internet use for more than 20% of the population surveyed (GSMA, 2016a).

The high cost of mobile data is due to several factors including: the existence of numerous taxes on Internet communications, which not only prevent the expansion of mobile telephone and Internet service use but also, and more importantly, prevent their inclusion in businesses; and the limited competition in the telecommunication sector, where the number of operators is very small, about three per country (ECA, 2019).

Table 4.4. Price of 1 GB in USD and as a percentage of 2018 average monthly income in Central Africa

Country	Price per GB in USD	Price of 1 GB as a percentage of monthly GNI per capita
Burundi	3.22	13.31
Cameroon	3.48	3.07
Central African Republic	9.20	28.30
Chad	12.18	23.20
Congo	8.87	7.83
DR Congo	12.57	33.52
Equatorial Guinea	34.80	-
Gabon	6.96	1.26

Source: Authors' calculations based on A4AI (2018), *Mobile Broadband Data Costs*, a4ai.org/extra/mobile_broadband_pricing_usd-2018Q4.

Despite its potential, the development of the digital economy remains limited and uneven in Central Africa

The adoption of national strategies and regulations for the digital ecosystem is an encouraging sign and could be accelerated in the current context

The COVID-19 crisis has prompted accelerated use of new technologies in many Central African countries. Full or partial lockdowns have increased the use of new technologies in the region, particularly through telecommuting (videoconferencing), and have encouraged the rapid adoption of new regulations. For example, in April 2020, the Bank of Central African States (BEAC) introduced regulations to promote the interoperability of mobile money accounts across the region to encourage contactless payments (Financial Afrik, 2020). Moreover, since March 2020, schools have been using distance learning and online courses via social network platforms or applications (Facebook, Zoom, TeamLink, WhatsApp and Google Learning). The Economic Community of Central African States (ECCAS) and the United Nations Educational, Scientific and Cultural Organization (UNESCO) also reaffirmed their commitment to providing immediate support to member states, for example by making USD 196 000 available to facilitate educational continuity in Gabon, in particular through innovative teaching/distance learning arrangements using all relevant media (online, offline, television, radio, printed materials – UNESCO, 2020). In Cameroon, which has more than 73% formal employment, the service sector would have experienced the largest slump in activity if telecommuting had not been so dynamic (Andrianarison and Nguem, 2020).

More and more countries are adopting national strategies to support the development of their digital ecosystems. Most countries are below the global average in terms of digital service provision (*e-governance, e-learning, mobile money, etc.*). As a result, the lack of content adapted to the local context is a major barrier to increased Internet use. Indeed, it is cited as the main barrier by 43% in Cameroon and 45% in the Democratic Republic of the Congo, followed closely by the cost of data and lack of digital skills (GSMA, 2016a). However, governments are increasingly recognising the importance of developing a digital ecosystem offering local content to encourage the emergence of a digital economy. It is therefore essential to create an enabling policy environment, with the adoption of digital agendas or strategies.

Several examples exist throughout the region:

- In **Gabon**, the government wants to transform the country into a “regional digital hub”. It has invested in infrastructure, including the construction of a submarine fibre optic cable landing station and a terrestrial network of more than 1 100 km through a PPP (Box 4.1). The number of Internet subscribers has increased sevenfold since 2010.
- In the **Democratic Republic of the Congo**, the National Digital Plan 2025 aims to reduce youth unemployment by 25% and create more decent jobs in start-ups (DRC, 2019).
- In **Cameroon**, in the wake of “major achievements”, the Digital Cameroon 2020 strategic plan should contribute to achieving growth and full employment targets over the next five years, through more intensive use of ICT in production tools. The goal is to increase the number of direct digital jobs created from 1 000 in 2016 to 50 000 in 2020 (Ministry of Posts and Telecommunications, 2016).
- In the **Congo**, with its three pillars of e-citizenship, e-government and e-business, the government also plans to increase employment in e-commerce (Republic of the Congo, 2019).

Box 4.1. Gabon’s Internet connectivity success

In 2018, Gabon was the sixth most connected country on the African continent (World Bank, 2018). This performance can be explained by the institutional framework for the digital sector supported by the Agence nationale des infrastructures numériques et des fréquences [National Agency for Digital Infrastructure and Frequencies] (Aninf), established in 2011. It enabled the acquisition of 1 100 km of terrestrial fibre optic cable from Libreville, the submarine cable landing station, thanks to an investment of USD 58 million made with the contribution of the World Bank. The liberalisation of the telecommunications sector has also attracted foreign direct investment (FDI). Group Vivendi Africa (GVA) has been the leading Internet service provider in Gabon since 2017. Thanks to an investment of XAF 15 billion and the commissioning of the Central African Backbone (CAB) submarine cable, Internet access costs have been cut by a factor of ten and the Internet penetration rate has increased by 28% to 48.4% (Digitalbusiness.africa, 2018).

Source: Authors’ compilation based on a literature review.

Improving the institutional framework for the digital sector requires the creation of telecommunications regulatory agencies. These national, public agencies are involved in preventing digital security incidents and protecting consumers, providing users with better services and signing agreements. Their main mission is to enforce telecommunications and ICT laws and regulations, to ensure that access to networks open to the public is provided under objective, transparent and non-discriminatory conditions, and to guarantee healthy and fair competition in the sector. Enforcement helps to create an environment that inspires public confidence and makes the sector more dynamic. In addition, consultation meetings between consumers and Internet service providers have sometimes resulted in lower tariffs. At the regional level, the regulatory agencies (Table 4.5) have contributed to the digital revolution in their respective countries.

Table 4.5. Regulatory agencies in Central African countries

Country	Body	Year established	Key policies
Burundi	Agence de régulation et de contrôle des télécommunications [Telecommunications Regulatory and Control Agency] (ARCT)	2010	Guaranteeing consumer protection
Cameroon	Agence de régulation des télécommunications [Telecommunications Regulatory Agency] (ART)	2010	Defining the conditions and obligations for interconnection and infrastructure sharing
Central African Republic	Autorité de régulation des télécommunications et de la poste [Telecommunications and Postal Regulatory Authority] (ARTP)	2012	Accelerating interconnection between populations
Chad	Autorité de régulation des communications électroniques et des postes [Postal and Electronic Communications Regulatory Authority] (ARCEP)	2014	Accelerating network interconnection between populations
Congo	Agence de régulation des postes et des communications électroniques [Postal and Electronic Communications Regulatory Agency] (ARPCE)	2009	Setting tariffs related to communications
DR Congo	Autorité de régulation de la poste et des télécommunications du Congo [Postal and Telecommunications Regulatory Authority of the Congo] (ARPTC)	2002	Expanding network provision
Equatorial Guinea	Autorité de régulation des postes et télécommunications [Postal and Telecommunications Regulatory Authority] (ARPT)	2009	Stepping up the construction of infrastructure
Gabon	Autorité de régulation des communications électroniques et des postes [Postal and Electronic Communications Regulatory Authority] (ARCEP)	2012	Improving quality of service
São Tomé and Príncipe	Autorité générale de régulation [General Regulatory Authority] (AGER)	2005	Guaranteeing consumer rights

Source: Authors' compilation based on ITU (2020), ITU Statistics (database), www.itu.int/en/ITU-D/Statistics/Pages/default.aspx and national administrations.

Improving the regulatory framework has thus contributed to the emergence of dynamic digital entrepreneurship in the region. In Cameroon, for example, video game start-up Kiro'o Games, founded in 2015, was able to open its capital to private investors to finance its expansion. The company is seeking to raise USD 1 million and has already registered subscriptions for USD 380 000, including USD 110 000 from 89 investors, most of whom are Cameroonians living abroad. Other examples exist throughout the region (Table 4.6; Box 4.2). However, the potential for job creation remains limited for the time being, due to the small size of these structures. AppsTech for example, a business application solutions provider founded in 1999 and operating in more than 40 countries with revenues estimated at between USD 1 million and 10 million, only has about 100 employees.

Table 4.6. Examples and estimated sizes of digital start-ups in Central Africa, 2020

Company	Sector	Year founded	Country	Revenue (in USD million)	Number of employees	Total funds (in USD million)
<i>Diool</i>	E-commerce	2015	Cameroon	n/a	11-50	2.1
<i>Gaboncoin</i>	Advertising platform	2012	Gabon	1-10	2-10	n/a
<i>Helios Towers</i>	Telecommunications	2012	DR Congo	n/a	35	105
<i>Empleoguinea</i>	Online recruitment	2010	Equatorial Guinea	1-10	1-10	n/a

Note: Information on the number of employees is taken from LinkedIn profiles (accessed 25 June 2020), n/a = not available.

Source: Authors' compilation based on Crunchbase (2020), Crunchbase Pro (database), www.crunchbase.com.

Box 4.2. Start-ups are spreading, particularly in the health sector, despite a difficult environment

The creation of start-ups is evidence of the strong creative potential among young people in Cameroon, where the African innovation research site Briter Bridges lists 96 such start-ups.

At the age of 25, Arthur Zang became famous with his now renowned Cardio Pad. This medical tablet allows cardiologists, of whom there are far too few, to perform electrocardiograms and monitor patients remotely. Having caught the attention of Cameroon's President in 2011, he received a grant of EUR 35 000 from the head of state to develop a prototype, which he released in 2013 (ID4D, 2017). A year later, he launched his company, Himore Medical Equipment, which created 14 jobs thanks to loans of around EUR 50 000 from local banks, without taking any risks. Apart from access to finance, the obstacles encountered by Arthur Zang relate to low investment in research and development, and to manufacturing process capabilities. In the absence of a local medical device industry, he had to find foreign partners in China and Korea to manufacture the components, which were then assembled in Yaoundé.

Another computer engineer, Alain Nteff, also seeking to solve a public health problem, co-founded the social enterprise Gifted Mom in Cameroon in 2014. The company's goal is to reduce maternal mortality by offering pregnant women and young mothers follow-up medical care through a mobile application. The follow-up care is provided by doctors employed by Gifted Mom. In 2015, Gifted Mom found investors by taking part in a business acceleration programme in South Africa. Seeking out promising entrepreneurs, South African platform ALN Ventures bought a USD 20 000 stake in the company. This came in addition to the prizes it has won, such as the Digital Africa competition, providing initial funding of USD 220 000.

Source: Authors' compilation based on a literature review.

The creation of community technology hubs is an important addition to the national strategies and supports the development of digital start-ups. These hubs offer a range of services to the local ecosystem, acting as incubators and accelerators for local start-ups, facilitating networking between digital entrepreneurs and providing co-working spaces (Table 4.7). They also promote discussion between policy makers and the digital start-up community through forums such as Kinshasa Digital Week in the Democratic Republic of the Congo. However, the development of these technology hubs remains relatively limited in the region, with the exception of Cameroon, which stands out with its 18 hubs (Box 4.3).

Table 4.7. Examples of technology hubs in Central Africa

Name	Date created	Location	Key information
<i>ActivSpaces</i>	2010	Buea and Douala, Cameroon	A group of 87 start-ups generating USD 250 000 in revenue and organising more than 2 000 events. One of the first co-working spaces to offer free and open access.
<i>Ja Gabon</i>	2013	Libreville, Gabon	Has trained nearly 4 000 young people in financial education and entrepreneurship to improve their employability.
<i>Bantu Hub</i>	2015	Brazzaville, Congo	Launched a mentorship programme in 2015, including accelerated entrepreneurship training and technical, marketing and other support for young digital entrepreneurs.
<i>Centrafrique Tech Hub</i>	2017	Bangui, Central African Republic	Digital and physical learning space.
<i>Ingenious City</i>	2018	Kinshasa, DR Congo	Has launched 55 start-ups, including 21 in the technology field.

Source: Authors' compilation based on a literature review.

Box 4.3. Digital clusters concentrated in Cameroon

According to the AfriLabs 2019 report, Cameroon has 18 of Africa's 644 tech hubs, compared to 11 in the DRC and 90 in neighbouring Nigeria – the country with the most tech hubs, ahead of South Africa and Kenya. The Cameroonian clusters include *ActivSpaces* in Douala and Buea, *O'Botama*, *IT Kola* and *ZixtechHUB*. Some operate as incubators offering co-working spaces, others as business accelerators.

The country's main hub, called **Silicon Mountain** in Buea in the southwest region, gave rise to the *Zoomed* application, developed by Bruno Zuo to remotely track vehicles by SMS, and the *Njorku.com* search engine, developed by Churchill Mambe Nanje to help the unemployed find jobs.

Another hub, the **Cameroon Silicon River**, was launched by the authorities in Yaoundé in 2019 to encourage innovation in the administrative capital. Last but not least, *Minajobs.net* is a frequently consulted platform. It provides information on recruitment in all sectors, with an average of 1 467 companies recruiting out of just over 9 000, according to information provided by the National Employment Fund.

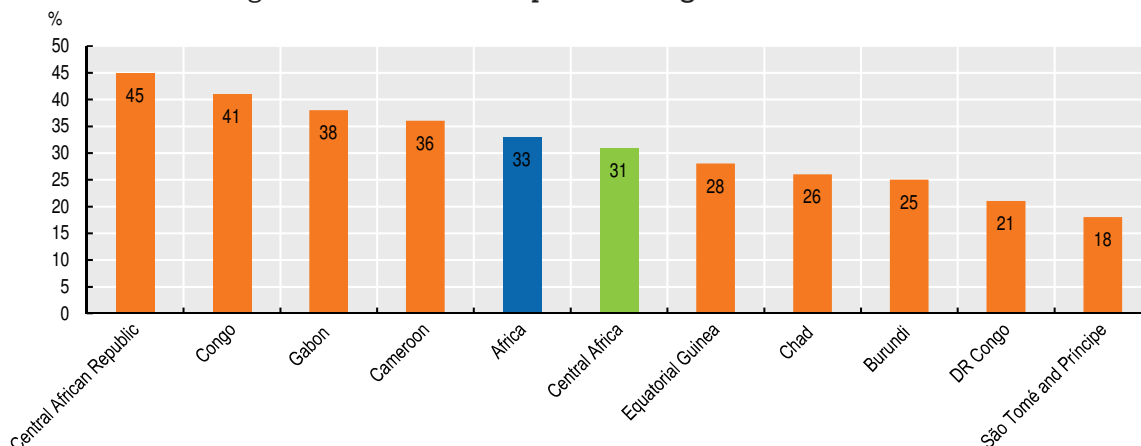
However, these hubs rely on a fragile digital environment. In 2017, instability caused by the separatist conflict in the country had already led the authorities to shut down the Internet in the two English-speaking regions for three months, forcing the Silicon Mountain stakeholders to move their offices near Douala. Equally, the cost of accessing communications infrastructure remains a major obstacle to the development of these hubs despite Cameroon's ambition to multiply ICT jobs by 50 by 2020.

Source: Authors' compilation based on a literature review.

Weak regulatory infrastructure and human capital hamper the emergence of digital enterprises, limiting direct job creation

Digital transformation will not create enough direct jobs. According to data from World Bank's Enterprise Surveys, only 31% of the companies surveyed have a website through which they can conduct their business (Figure 4.4), although the digital entrepreneurship ecosystem is varied. This rate is lower than Africa as a whole (33%) and is very uneven across the countries.

Figure 4.4. Share of companies using their own website



Note: Data for 2018 or the latest available.

Source: Authors' calculations based on World Bank (2020a), World Bank Enterprise Surveys (database), www.enterprisesurveys.org/en/survey-datasets.

StatLink  <https://doi.org/10.1787/888934203757>

There are two non-exhaustive explanations as to why so few firms have their own websites. First, the private sector is dominated by informality, limiting access to the financing needed to invest in purchasing computer equipment or new technology. Second, the high cost of digital-related services and the high rate of digital security incidents prevent small entrepreneurs from considering the Internet as an important sales channel. In addition, the number of Internet exchange points between the different access providers is low (ECA, 2019). The low adoption of new technology by local businesses explains the limited development of e-commerce and online service platforms in the region.

Table 4.8. Trade in goods (via e-commerce) and digital-related services in Central Africa, 2010-17 (USD million)

	Online sales or e-commerce		Digital-related services	
	2010-13	2014-17	2010-13	2014-17
Burundi	7	8	11	16
Cameroon	99	113	598	547
Congo	35	7	270	165
DR Congo	51	8	145	29
Gabon	3	1	212	164
São Tomé and Príncipe	1	1	3	10
Central Africa	196	138	1 240	930

Source: Authors' calculations based on UNCTAD (2020), UNCTADSTAT (database), <https://unctadstat.unctad.org/wds/TableViewer/tableView.aspx?ReportId=158359>.

Despite the pushes by Cameroon and Gabon, the development of trade in digital services and online sales in Central Africa remains weak and is facing a slowdown (Table 4.8). This phenomenon of potential “premature de-digitalisation”, borrowing Dani Rodrik’s description of premature de-industrialisation, could be explained by the region’s instability, the strong fluctuations in connections, lack of confidence and the immaturity of the regional digital market. In addition, policies to simplify online services are slow to take shape and achieve their objectives.

The COVID-19 health situation could rekindle interest in the development of e-commerce in the region. Indeed, despite the lack of reliable statistics, e-commerce is in high demand through online orders of items with flexible delivery. According to the Economic Commission for Africa, e-commerce is reviving the sales of African companies during the COVID-19 crisis. The opening of the Electronic World Trade Platform (eWTP), by the Alibaba Business Group, to a larger number of countries on the continent, for example, could allow a greater participation of African SMEs to global trade during the COVID-19 crisis.

Better access to communications infrastructure could encourage the development of businesses using digital tools. For example, the construction of a data centre, planned in the Republic of the Congo in the coastal town of Pointe-Noire and representing an investment of USD 30 million, has the potential to create many direct and indirect jobs in the region. In the medium and long term, this new data centre will increase the country’s digital information management and storage capacities, with potential externalities for neighbouring countries (Alley, 2020). Furthermore, improved high-speed Internet coverage is in turn increasing the productivity of firms and allowing them to expand their export prospects to more distant markets. Thus, trade in digital services and e-commerce should be more dynamic, creating new opportunities for businesses located in better connected areas. Similarly, the average survival rate of firms in Central Africa could increase if the regional regulatory framework facilitates the adoption of digital and financial tools.

Strengthening digital security should help boost consumer confidence and the adoption of new technologies. According to a 2018 report by McAfee, cybercrime costs 0.8% of global gross domestic product (GDP) in 2019, or USD 2 100 billion; sub-Saharan Africa loses USD 3 billion annually. In Central Africa, losses are estimated at approximately USD 400 million, mainly due to activities such as e-mail account spoliation, embezzlement of money transfers and mobile phone payment fraud. This is in addition to piracy, financial attacks and threats on mobile phones, and SIM box fraud. According to the Agence nationale des technologies de l'information et de la communication [National Agency for Information and Communication Technologies] (ANTIC) of Cameroon, there are multiple types of digital security incidents, including the installation of spy programs, hacker programs, information theft, website destruction, credit card fraud, identity theft, commercial fraud, breaches of trust and various scams. ANTIC has also indicated that in recent years Cameroon has lost nearly USD 6.9 million due to scamming¹ and about USD 6.4 million due to skimming.²

Table 4.9. Digital security rankings of Central African countries

Country	Score	World ranking (out of 175)	Regional ranking (out of 42 countries in sub-Saharan Africa)
Cameroon	0.432	91	13
Gabon	0.318	100	15
Congo	0.167	130	25
Chad	0.098	147	30
Burundi	0.087	151	33
São Tomé and Príncipe	0.064	158	36
Central African Republic	0.036	167	39
Equatorial Guinea	0.031	168	40
DR Congo	0.008	174	42

Note: The level of each country's cybercrime prevention development or commitment is assessed according to five pillars: (i) legal measures, (ii) technical measures, (iii) organisational measures, (iv) capacity building, and (v) co-operation, and then aggregated into an overall score. For more details on the calculation of this index, please refer to the ITU website.

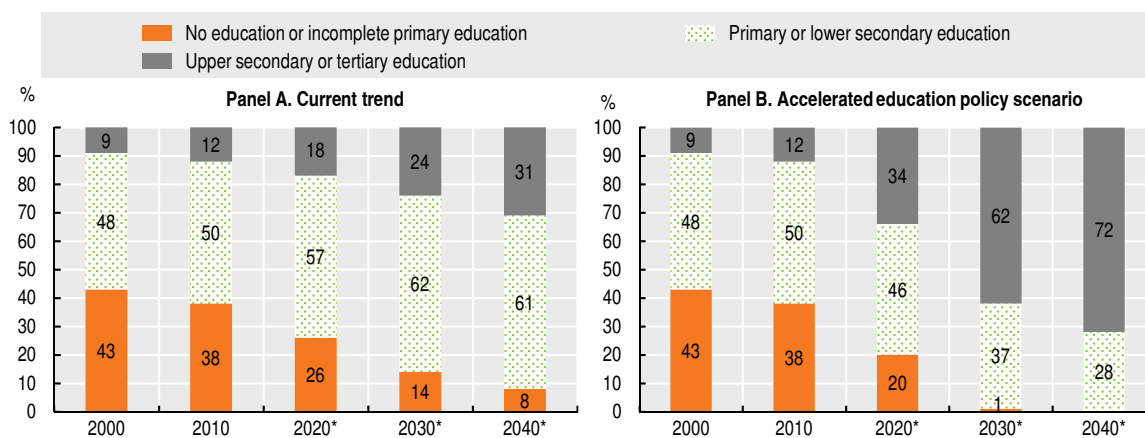
Source: Authors' calculations based on ITU (2018), *Global Cybersecurity Index (GCI) 2018*, www.itu.int/dms_pub/itu-d/osp/str/D-STR-GCI.01-2018-PDF-E.pdf.

Persistent digital security incidents are hindering the development of digital start-ups, weakening the potential for job creation. Increasingly, start-ups in Central Africa are a way out of unemployment for young people. Unfortunately, their websites are regularly attacked by competitors. The loss of markets and customers as a result of misuse of information is forcing start-ups to limit recruitment.

Taking advantage of digitalisation will also require a workforce with the necessary technological and technical skills


Despite slow progress, more and more young people have access to education. In recent years, the number of young people having completed secondary or tertiary education has risen from 9% in 2000 to 18% today (see Figure 4.5, Panel A). Following similar trends, this proportion could reach 31% by 2040. If the region could make progress in education at a similar pace to Korea, the proportion of young people having completed upper secondary or tertiary education could reach 72% (Figure 4.5, Panel B). Education is a key determinant of informal employment in Central Africa. Among young workers with only basic education or no education, 32% are self-employed, a proportion that falls to 16% for those with higher education.

Figure 4.5. Projections for youth educational attainment in Central Africa, 2000-40



Note: * are for projections. Due to data availability, the figures reported are for the population aged 15-29.

Source: Authors' calculations based on Wittgenstein Centre for Demography and Global Human Capital (2018), Wittgenstein Centre Data Explorer Version 2.0 (Beta) (database), www.wittgensteincentre.org/dataexplorer.

StatLink  <https://doi.org/10.1787/888934203776>

The mismatch between skills and the digitalised labour market in the region explains why it is lagging so far behind in terms of job creation. Despite a gradual improvement in educational attainment, the skills mismatch among young people means that they are unable to take full advantage of the use of new technologies or to move out of vulnerable and temporary employment situations. Of the organisations surveyed, 51.5% of companies in the Congo believe that lack of skills is a major obstacle to value creation, compared with 42.7% in Gabon, 26.7% in the Democratic Republic of the Congo, 24.3% in the Central African Republic, 20.4% in Cameroon, 10.3% in Chad, and 8.8% in Burundi (World Bank, 2020a). In 2016, 32.4% of young people surveyed in the Congo were in temporary employment and 8.2% wanted to use their skills to get better pay. For 85% of young people, their lack of specific skills (technological and technical knowledge) was hindering their transition into the labour market (ILO, 2016).

PPP policies and policies to improve scientific education are being pursued to develop basic, digital and entrepreneurial skills

The development of young people's digital managerial skills is based on PPPs. In Gabon, for example, the government, in partnership with UNESCO and Airtel, launched the *Train my Generation: Gabon 5 000* initiative in 2015, aiming to train at least 5 000 young people aged 17 to 35 years old in ICT through (i) an introduction to computers; (ii) tutoring through distance learning (e-learning); (iii) support for entrepreneurship and mobile applications development; and (iv) a scholarship in rare digital economy professions. To date, 1 538 students have benefited from training through ten centres established across the country (ITU-UNESCO, 2017). In Cameroon, the professionalisation of teaching within the framework of the Bachelor, Master, and Doctorate system has led university leaders to sign agreements with the private sector to offer students technical learning frameworks. Vocational streams currently account for 40% of the education system. At the regional level, the *Support Cluster for Professionalisation of Higher Education in Central Africa* facilitates in-company training for students (PAPESAC, 2011; World Bank, 2017).

Strengthening education in science, technology, engineering and mathematics (STEM) and ICT will be crucial, especially for young women. The region's countries currently rank at the bottom of the scale in terms of ICT-related human capital and basic ICT skills, mainly due to the low quality and quantity of human capital (38.33%) in the

higher education sector and, in particular, in STEM-related programmes, i.e. science, technology, engineering and mathematics (IFC/L.E.K., 2019). Barakabitze et al. (2019) show that this weakness is also due to a delay in communications infrastructure in schools. In Cameroon, for example, only 31% of secondary schools have a computer laboratory. One of the concerns of many Central African countries is poor STEM education for women. Women are 25% less likely than men to be able to use ICT for basic purposes, such as using simple arithmetic formulas in software (UNESCO, 2019). However, initiatives exist in the region to address this problem and would benefit from being expanded. In 2019, UN Women launched the *Tujenge STEM* programme in the Democratic Republic of the Congo, with the aim of training young women aged 18 to 34 in STEM entrepreneurship. The initiative operates within the *Ingenious City* technology hub to facilitate networking and incubation of start-ups (Table 4.7). In Cameroon, the Institut africain d'informatique [African Institute of Informatics] launched the *Mijef 2035* initiative in 2015, the successor to the *Operation 100 000 Women / Horizon 2012*, launched in 2002, which had trained 103 350 women and more than 60 000 young people in ICT.

Digitalisation could improve the productivity of workers in existing sectors and promote entrepreneurship, fostering indirect job creation

Digitalisation represents a genuine opportunity to create indirect jobs in the region. However, many of these jobs will remain informal, at least at the business start-up stage. In this category, unstructured start-ups will have to comply to receive efficient and sustainable support.

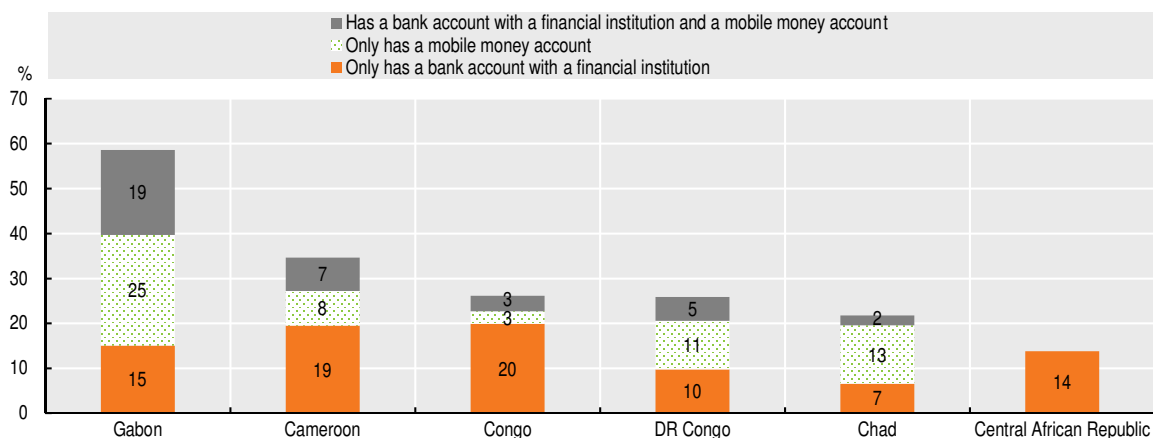
Fintech, which is rapidly gaining ground in Central Africa, could facilitate access to financing for young entrepreneurs. In Central Africa, 30.1% of the population had access to banking services in 2017, the lowest rate on the continent (World Bank, 2017b). Although only recently introduced, mobile money has undergone considerable development in recent years. In 2019, transaction volumes reached USD 1.8 billion, compared to only USD 200 million in 2010 (Table 4.10). Mobile money could contribute to the financial inclusion of previously excluded populations. In fact, in some countries such as Chad and the Democratic Republic of the Congo, a large proportion of the population has only a mobile money account (Figure 4.6). In addition, fintech companies could help to create jobs by offering innovative financing solutions adapted to young entrepreneurs. In Cameroon, for example, equity crowdfunding platform Guanxi Investment offers companies the opportunity to raise funds directly from the general public through the sale of shares. Nonetheless, low levels of income and financial education, multiple computer system malfunctions, and a lack of electrical and digital infrastructure are limiting the emergence of fintech businesses in the region.

Table 4.10. Development of mobile money in Central Africa

	Year	Number of registered accounts (millions)	Number of active accounts (millions)	Transaction volume (USD billion)	Transaction value (USD billion)
Central Africa	2010	13	8	0.2	11.3
	2019	48	20	1.8	30.5
Sub-Saharan Africa	2010	125	78	10.3	196.9
	2019	469	181	33.8	456.3

Source: Authors' calculations based on GSMA (2019), *Mobile money metrics* (database), www.gsma.com/mobilemoney/metrics/#global?y=2019?v=overview?g=global.

Figure 4.6. Percentage of the population with a bank account, by account type (over 15 years old), 2017



Source: Demirgüç-Kunt et al. (2018), *Global Findex 2017* (database), <https://globalfindex.worldbank.org/>.
StatLink  <https://doi.org/10.1787/888934203795>

Improving financial inclusion in the region via mobile money and new financial technology requires the support of complementary policies

Capacity building, combined with user-friendly platforms, could improve customers' understanding and awareness of digital financial services. Currently, less than 40% of adults are financially literate in most Central African countries (GFLEC, 2015). Similarly, lack of digital skills is a significant barrier to the use of the mobile Internet, especially for women. In the Democratic Republic of the Congo, 75% of women reported needing help to use the mobile Internet and 17% of them are afraid of making a mistake and losing money (GSMA, 2015). The design of adapted products could be a significant factor in facilitating their adoption.

The extension of digital identity systems could make it possible to include more people in the digital transformation. In Central Africa, only 62% of adults have a document proving their identity, yet most commercial banks require government-issued identification to open an account. The introduction of a digital identity system could therefore improve access to financial services, as well as to mobile phones and public services. In Cameroon and Gabon, for example, nearly 50% of ID card holders use their identification for SIM cards or a mobile phone service (World Bank, 2019).

Leveraging new technology could improve farming techniques and bring producers and consumers closer together. As we have seen, the agricultural sector accounts for more than 70% of employment and contributes 30% of the region's GDP. Unfortunately, these jobs are precarious, vulnerable and seasonal. Moreover, climate change in the region is not conducive to the development of agriculture. Digitalisation (blockchain, smartphones and connected objects) could help improve agricultural techniques to increase farming productivity and resilience in the face of these climatic risks (rising temperatures, reduced precipitation, natural disasters or invasion of caterpillars and other insects that destroy crops). Applications such as eFarm/Jangolo in Cameroon (e-marketplaces linking farmers directly to buyers) or BanQu in the Democratic Republic of the Congo (a blockchain-based farmer identification tool) are helping to bring agricultural products closer to consumers and improve their traceability (CTA, 2019). In 2004, the CEMAC countries adopted a common agricultural strategy for member countries that aims not only to increase production volumes, but also to diversify output through a more rational system (CEMAC, 2004).

Developing digitalised regional value chains with a comparative advantage to accelerate the region's productive transformation. Central Africa is highly dependent on raw materials, with an export concentration rate of 0.81 in 2018 (UNCTAD, 2019, 2020). It lags far behind in terms of industrialisation, and regional trade is no more than 3%, with all countries exporting almost the same products. However, digitalisation can offer a response to the region's structural challenges, particularly in the fields of mining, hydrocarbons, wood, and cash crops (cotton, cocoa, coffee and bananas among others).

- In Gabon, for example, the use of satellite images by the Agence gabonaise d'études et d'observations spatiale [Gabonese Agency for Space Studies and Observations] (AGEOS) is contributing to the sustainable development of the **timber industry** by ensuring rational exploitation of the forest, wildlife and resources (ECA, 2019).
- In the Democratic Republic of the Congo, the **cobalt industry** could also benefit from digitalisation. Forty percent of the cobalt produced globally is used in batteries for smartphones and electric cars, and the Democratic Republic of the Congo produces around 60% of the world's cobalt and is believed to have 50% of its cobalt reserves. This sector includes major companies, but also features a multitude of artisanal producers, employing around 200 000 people. The use of digital tools could optimise the management of the various ore extraction sites, ensure the traceability of production, control quantities and improve safety at the various sites. Lastly, industrialisation, producing semi-finished or even finished products, could create more added value (ECA, 2019). In 2018, the Better Cobalt project, based on blockchain technologies, was launched to improve the traceability of production. The cobalt produced at these sites will thus be validated in accordance with the ethical sourcing standards defined by the OECD, while focusing specifically on issues related to child labour and human rights violations in the sector (RCS Global, 2018).

Promoting regional co-ordination on infrastructure and regulations could accelerate digital development in Central Africa

Developing communications infrastructure will contribute to ensuring access across Central African countries

Co-ordinating infrastructure projects at the regional level, with the support of private partners, would improve access to new technology. In this regard, the Programme for Infrastructure Development in Africa (PIDA), led by the African Development Bank (AfDB), the AU Commission and the New Partnership for Africa's Development (NEPAD), would benefit from being strengthened and accelerated. According to PIDA data, there are currently five infrastructure projects aimed at extending terrestrial fibre optic networks and connecting countries in the region to submarine cables. Nine projects aim to improve regional Internet exchange points. Among the most important of these are the Central African Backbone (CAB4), the Plan d'action consensuel de déploiement des infrastructures de communications électroniques de l'Afrique centrale [Consensus Action Plan for the Deployment of Electronic Communications Infrastructure in Central Africa] (PACDICE-AC), and the Border Frequency Coordination Agreement (ECA, 2019; Fukui et al., 2019).

Pooling resources from the public and private sectors to achieve significant savings. Alper and Miktus (2019) estimate that the region will need to invest USD 2.9 billion to achieve full 4G coverage by 2025. However, between 2014 and 2018, only 7% of regional and national government infrastructure financing budgets were allocated to ICT development, i.e. USD 162 million (ICA, 2018). Taking an integrated approach to the development of infrastructure projects by, for example, laying fibre optic cable prior to constructing physical infrastructure such as roads or pylons, could save up to

70-90% of the cost of installing broadband Internet, which remains expensive for states. Moreover, strengthening PPPs could accelerate these projects. The private sector has been the main investor in communications infrastructure. Over the 2015-19 period, the telecommunications service sector in Central Africa has invested an average of USD 750 million per year in communications infrastructure projects.

Harmonising the regulatory framework applicable to digital resources and strengthening shared strategies. This aspect should be broader and more multisectoral, moving beyond a narrow focus on digital security, according to the thirty-fifth session of the Intergovernmental Committee of Senior Officials and Experts (ICE) for Central Africa. The main priorities would be to adopt texts at the national level that are aligned with digital development policies at the subregional level. States should also expand their communications infrastructure and strengthen their regulatory framework. At this level, the legal and regulatory framework is laid down by ECCAS in model laws in an effort to harmonise digital policies and ensure consistency (Tsafak Djoumessi, 2018). Eight model laws on digital issues are currently in force in the region, however, they can be difficult to implement as they often overlap with laws adopted at the national level. Establishing working and implementation evaluation groups would help to reduce misunderstandings related to the implementation of the texts. Moreover, the institutions responsible for digital activities should consult every year to monitor the level of progress in each nation. Inter-country consultation committees could help to better harmonise legal frameworks at the ECCAS and CEMAC levels.

Implementing, monitoring and evaluating decisions taken at the continental, regional and national levels

Implementing policies to speed up progress towards the Agenda 2063 vision for digitalisation. It is important to design digital development programmes that comprehensively integrate training, use and protection, drawing on best practices. The patchy recognition of the electronic certificates issued by each country's public administrations undermines the security of data flows at the regional level. To ensure the smooth flow of data over the Internet and prevent national or subregional traffic from moving through countries outside the region, a programme for the deployment of Internet exchange points at the national and regional level is being rolled out under the aegis of the AU. In March 2019, the telecommunications ministers, meeting in Brazzaville, adopted a road map and an institutional framework for the regional digital development strategy (Table 4.11).

Table 4.11. Selected subregional digital development strategies in Central Africa

Domain	Strategies
Infrastructure and costs	Accelerating optical fibre laying and reducing the cost of accessing broadband and therefore Internet and telecommunications services.
Education and skills	Reforming the education and research sector; building human capacity within the regional economic communities in the field of the digital economy.
Public-private dialogue	Establishing public-private consultation frameworks.
Regulation	Adopting subregional legal reforms validated by the regional economic communities.
Funding	Creating a subregional digital solidarity fund to finance the start-ups that will be the employers of tomorrow.

Source: Authors' compilation based on ECA (2019), "Digital Transformations and Economic Diversification in Central Africa: Issues, Challenges and Opportunities".

To make the regional action plan a success, the focus must be on infrastructure, subscription costs and combatting digital security threats. Among other things, it will be necessary to:

- **Establish co-ordination agreements between the region’s governments to improve access to and use of new technologies and reduce the costs borne by consumers and businesses.** These agreements would include a review of the various conditions and possibilities for sharing channels reserved for mobile operators and service providers. Between Cameroon and Chad, for example, a radio frequency sharing agreement has ensured equitable access to the spectrum and avoided interference in areas near the border (ITU, n.d). Similarly, in 2020, Gabon and Congo worked together to implement a free roaming agreement ensuring free calls between the two countries.
- **Relax and harmonise digital taxes at the regional level for start-ups using the Internet as their main resource.** Across all countries in the region, 80% of SMEs see taxation as the most significant constraint affecting their operations (World Bank, 2018). The varied and high taxes not only prevent the expansion of the use of mobile phone and Internet services, but also, and above all, they prevent companies from integrating them into their operations. A coherent national and community tax policy would enhance the capacity for job creation. In Chad, for example, statutory fees per subscriber amount to almost 20% of the annual income of the poorest consumers. Reducing the fees applied to incoming international calls, for example, could generate an additional 270 000 connections, including 40 000 via mobile Internet access. Moreover, resources newly available to operators could be reinvested and potentially generate more than 700 direct jobs in the sector (GSMA, 2016b).
- **Encouraging the transfer of knowledge in the digital sector through the creation of cross-border hubs and institutions.** More university institutes that specialise in education for digital professions will need to be established. The Cameroon-Congo Interstate University, which provides training in the fields of digital engineering, agriculture and ICT, was inaugurated in 2019 and has already welcomed more than 300 students from the two countries. Similarly, the creation of a cross-border technology hub/incubator with regional scope, as proposed by ECCAS, could encourage people to train in ICT-related professions and support innovative projects.
- **Strengthen the implementation, monitoring and evaluation of digital strategies, with an emphasis on youth employment components.** Countries in the region will need to adopt strategic digital plans specifically on youth employment, like the Digital Cameroon 2020 plan or the section devoted to this sector in the Emerging Gabon plan. Other countries have adopted similar plans. However, given the transnational nature of the digitalisation of economies, these national strategies should be part of a regional approach.

Notes

1. Scamming refers to all types of scam, especially those carried out on the Internet. Scams mainly consist of getting a person (the victim) to make a transfer from his or her bank account (criminal cybercrime). <https://cybercriminalite-penal.fr/scamming/>.
2. Skimming is a fraudulent activity that involves hacking bank cards, particularly from cash machines (ATMs). The cards are duplicated and used abroad, to the detriment of their owners and their bank accounts. www.panoptinet.com/cybersecurite-pratique/cest-quoi-le-skimming.html.

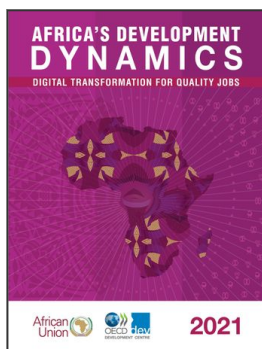
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