

The first trans-continental Networking Academy for  
African and European Digital Innovation Hubs.

## **African Digital Ecosystems Snapshots**

Ghana, Nigeria, Tanzania  
& Uganda

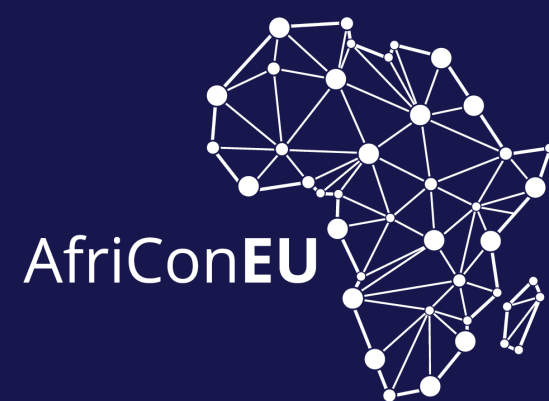
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## GLOSSARY & ABBREVIATIONS

<b>AFRICONEU</b>	The first Trans-continental Networking Academy for African and European DIHs
<b>DIH</b>	Digital Innovation Hub
<b>ESO</b>	Entrepreneurship Support Organisation
<b>EU</b>	European Union
<b>FMCG</b>	Fast Moving Consumer Goods
<b>GDP</b>	Gross Domestic Product
<b>GEM</b>	Global Entrepreneurship Monitor
<b>GIZ</b>	German Agency for International Cooperation
<b>ICT</b>	Information and Communications Technology
<b>SDGs</b>	Sustainable Development Goals
<b>SME</b>	Small and Medium-sized Enterprise
<b>STI</b>	Science, Technology and Innovation
<b>VC</b>	Venture capital

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY</b>	01
Introduction	03
<b>METHODOLOGY</b>	04
Method	05
Framework	07
<b>AFRICAN DIGITAL ECOSYSTEMS: GHANA SNAPSHOT</b>	09
1.1 Markets	11
1.2 Policy	12
1.3 Finance	13
1.4 Infrastructure & Support	13
1.5 Culture	14
1.6 Human Capital	16
<b>AFRICAN DIGITAL ECOSYSTEMS: NIGERIA SNAPSHOT</b>	18
2.1 Markets	20
2.2 Policy	21
2.3 Finance	22
2.4 Infrastructure & Support	23
2.5 Culture	24
2.6 Human Capital	25
<b>AFRICAN DIGITAL ECOSYSTEMS: TANZANIA SNAPSHOT</b>	28
3.1 Markets	30
3.2 Policy	31
3.3 Finance	31
3.4 Infrastructure & Support	32
3.5 Culture	33
3.6 Human Capital	34
<b>AFRICAN DIGITAL ECOSYSTEMS: UGANDA SNAPSHOT</b>	36
4.1 Markets	38
4.2 Policy	39
4.3 Finance	41
4.4 Infrastructure & Support	41
4.5 Culture	43
4.6 Human Capital	44

<b>KEY INSIGHTS</b>	46
4.1 Markets	48
4.2 Policy	48
4.3 Finance	50
4.4 Infrastructure & Support	52
4.5 Culture	53
4.6 Human Capital	54
<b>CONCLUSION</b>	56
<b>REFERENCES</b>	58
<b>LIST OF FIGURES</b>	
Figure 1: Ecosystem Analysis Framework	07
<b>LIST OF TABLES</b>	
Table 1: Overview of African Digital Innovation Ecosystems	02
Table 2: Number of Interviews Conducted by Country	06
Table 3a, 3b: Ghana - Digital Ecosystem Snapshot	10
Table 4a, 4b: Nigeria - Summary of Digital Snapshot	19
Table 5a, 5b: Tanzania - Summary Digital Snapshot	29
Tables 6a, 6b: Uganda - Summary Digital Snapshot	37
Table 7: Summary of common factors across the four countries	47
<b>LIST OF IMAGES</b>	
Image 1: AfriConEU Networking Academy Event - DIH Business Model, Ghana (i)	12
Image 2: AfriConEU Networking Academy Event - DIH Business Model, Ghana (ii)	14
Image 3: AfriConEU Networking Academy Event - The Technology Transfer Process, Nigeria (i)	22
Image 4: AfriConEU Networking Academy Event - The Technology Transfer Process, Nigeria (ii)	23
Image 5: AfriConEU Networking Academy Event - Technology Valorization, Tanzania	30
Image 6: Tanzania Policy Roundtable, Promoting and Enabling Innovation Spaces	31
Image 7: Uganda Policy Roundtable, Towards a common digital market and a connected startup ecosystem (i)	39
Image 8: Uganda Policy Roundtable, Towards a common digital market and a connected startup ecosystem (ii)	40
Image 9: Uganda Policy Roundtable, Towards a common digital market and a connected startup ecosystem (iii)	40



# EXECUTIVE SUMMARY

In this report, we assess the landscape of the Digital Innovation ecosystems in four African countries namely: Ghana, Nigeria, Tanzania and Uganda. Our analysis focuses on six areas: markets, policy, finance, culture, infrastructure and human capital. In the first instance, we provide a brief overview of each country’s digital ecosystem across the six factors. We then go further to highlight key insights emerging across the four countries.

While we elaborated on the differences between each of the four countries, we found the following common factors:

<b>Markets</b>	Driven by mobile adoption, digital markets are growing but affordability and access remain limiting factors. These factors combined with gender and geographical gaps results in women and those in rural areas being excluded from participating in the digital economy.
<b>Policy</b>	Broad level ICT frameworks exist but policy gaps remain with regards to enabling digital adoption and innovation. In some instances, the impacts of positive policy initiatives are diminished by restrictive and punitive government regulations.
<b>Finance</b>	Investment into African tech markets continues to grow. However, driven by a lack of patient, catalytic capital, early-stage startups and certain key sectors remain under-funded
<b>Infrastructure &amp; Support</b>	Addressing infrastructure gaps particularly in rural areas is high on the agenda for both private and public actors. The number of digital innovation hubs is growing but funding constraints limit the support they provide to startups.
<b>Culture</b>	On the whole entrepreneurship is regarded as a positive solution to unemployment and a way to increase financial and economic participation. However cultural and socio-economic barriers prevent many women and youth from pursuing digital entrepreneurship.
<b>Human Capital</b>	There is increasing emphasis on digital skills development. However, education systems are not adapting and meeting the demand for advanced digital skills.

Table 1: Overview of African Digital Innovation Ecosystems

## INTRODUCTION

Over the last few years, digital innovation has increasingly become an important driver for Africa’s social and economic development. Digital technologies are enabling solutions to address the region’s pressing social challenges and creating a growing number of economic opportunities. At the centre of this digital transformation are innovative entrepreneurs supported by an ecosystem of investors, international development and philanthropic partners, policy makers and government actors, corporate partners, ecosystem enablers and Digital Innovation Hubs (DIHs).

This report contains an extract of findings from a 6-month research process that took place between February and July 2021. The study aimed to analyse the digital innovation ecosystems in Ghana, Nigeria, Tanzania and Uganda in order to gain a deeper understanding of challenges and identify opportunities for their strengthening. The research encompassed desk-based research, qualitative interviews with 60 hub leaders, entrepreneurs, investors, ecosystem enablers and policy makers and two quantitative surveys; an ecosystem with overall 266 respondents across Ghana, Nigeria, Uganda and Tanzania and a DIH capacity needs survey which was completed by 32 digital hub leaders in the four countries. The full findings from the research were published in a final report: [State of Play in African DIHs: The case of Ghana, Nigeria, Tanzania and Uganda](#).

The research was carried out as part of the activities to establish AfriConEU – The first trans-continental networking academy for African and European Digital Innovation Hubs (DIHs). The AfriConEU project aims to support the strengthening of Digital Innovation Hubs in Africa by boosting their capacity to foster innovation and growth and empower women and youth through the digital economy.



# METHODOLOGY



# METHOD

## Overview

The data gathering phase of our study lasted six months, starting in February 2021 and ending in July 2021. Data was collected using a range of methods including:

- *Desk-based research*
- *One-to-one virtual interviews*
- *Country-specific virtual roundtables*
- *Surveys – Ecosystem survey and DIH capacity needs survey.*

In this section, each data gathering exercise is introduced and discussed in more detail providing greater insights into our methodology.

## Desk Research

The primary purpose of the desk-based research was to conduct a literature review that would help contextualise this project. The data gathered was obtained from several sources including, government policies, NGO and international NGO reports, newspaper articles, academic journals, and blogs.

## Interviews

Between March and July 2021, 60 virtual semi-structured one-to-one interviews were conducted with hub leaders and managers, entrepreneurs, investors, ecosystem builders and network organisations as summarised in Table 5. To find participants, key ecosystem actors were identified and approached by leveraging relationships with local AfriConEU partners in each country.

Interviewed	Uganda	Ghana	Tanzania	Nigeria	Total
Hubs	8	6	4	8	26
Ecosystem Enablers	4	8	1	4	17
Startups	2	1	3	2	8
Investors	1	2	3	3	9
<b>Total</b>	<b>15</b>	<b>17</b>	<b>11</b>	<b>17</b>	<b>60</b>

Table 2: Number of Interviews Conducted by Country

## Roundtables

Between May and June 2021, four virtual ecosystem roundtables were hosted by ATBN in partnership with local DIH partners of the AfriConEU project including HapaSpace (Ghana), Emerging Communities Africa (Nigeria), Buni Hub (Tanzania) and Outbox (Uganda). The roundtables were attended by a cross-section of actors from across the digital innovation ecosystem including hub leaders and managers, entrepreneurs, development partners, investors and policy makers.

## Surveys

Additional data was collected by administering two surveys:

An ecosystem survey targeted at diverse actors within the four ecosystems which was completed by 266 respondents.

A DIH capacity needs survey that was completed by 32 hub leaders across the four countries.

# FRAMEWORK

To guide and standardise the process the literature was reviewed and aggregated according to a framework. The framework that structures this section is based on Isenberg’s Entrepreneurial Ecosystem Analysis Framework[1]. It contains six focus areas as depicted in Figure 1:

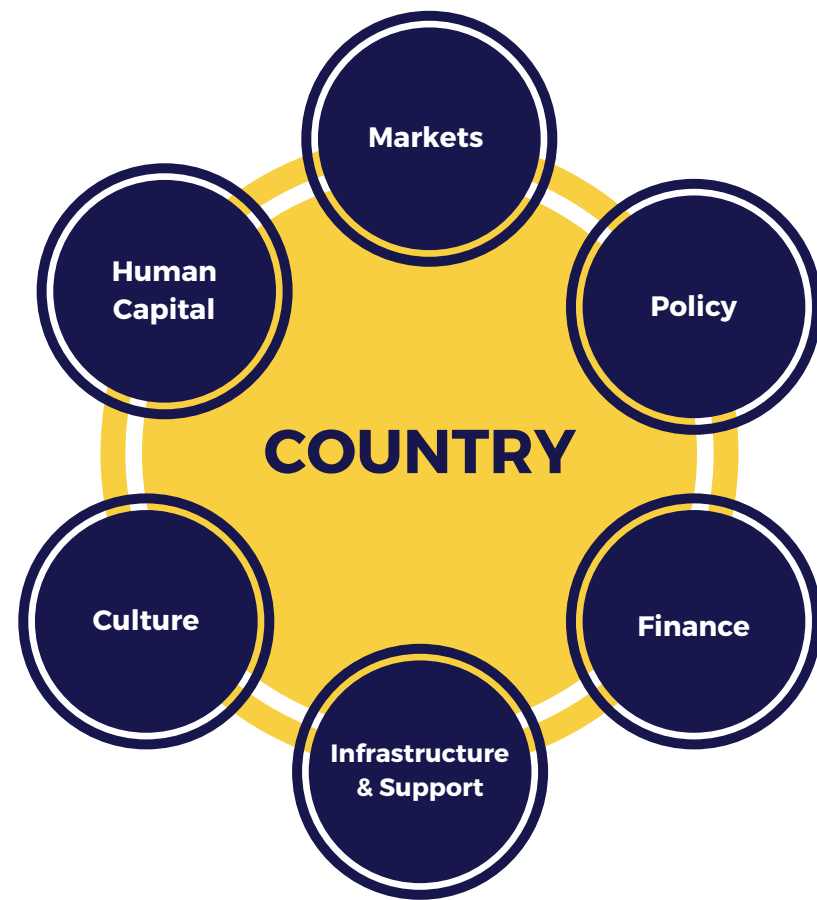


Figure 1: Ecosystem Analysis Framework

## Overview of Ecosystem Factors Framework



### Markets

Provides an overview of a country’s digital markets and their contribution to the general economy as well as some of the factors influencing digital growth including technology adoption, affordability and access, digital literacy and income levels.



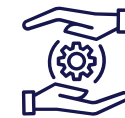
### Policy

Provides an overview of a country’s digital markets and their contribution to the general economy as well as some of the factors influencing digital growth including technology adoption, affordability and access, digital literacy and income levels.



### Finance

Explores the funding landscape for digital innovation and startups including identifying the major sources of financial support and the key investment sectors. This section also considers the challenges faced by startups and entrepreneurs when it comes to securing financial support.



### Infrastructure & Support

Reviews the state of each country’s technology and digital infrastructure including internet connectivity and digital innovation spaces. This section also explores the country’s tech and innovation hubs, highlighting the role they play in supporting the development of the digital ecosystem while also documenting the challenges they face.



### Culture

Examines some of the cultural factors that either enable or impede entrepreneurship as well as digital adoption and innovation in each country. Emphasis is placed on youth and gender, specifically how and to what extent the prevailing attitudes and societal norms affect young people and women’s relationship with entrepreneurship and technology.



### Human Capital

Highlights the level of digital skills and knowledge present in each ecosystem. It also explores any challenges and gaps in the development of knowledge and skills for the digital economy while highlighting the role that education institutions and other ecosystem actors are playing to address these gaps.

[1] Isenberg



# African Digital Ecosystems

## Ghana Snapshot

The 5th largest market for technology investments in Africa, Ghana is an important and growing hub for digital innovation in the region. The ICT sector is a key part of the Ghanaian economy and increasingly a focus area for country's policy makers who recognise its potential for driving innovation and creating employment.

In this section, we provide a snapshot of the digital innovation landscape in Ghana.

Ecosystem Factor Ghana Snapshot Summary	
<b>Markets</b>	<ul style="list-style-type: none"> <li>▪ In 2017, the ICT sector contributed \$1.7 billion (3.6 percent) to the country's GDP.</li> <li>▪ Top 6 ICT sub-sectors: FinTech, EdTech, HealthTech, AgTech/Agrifood, eCommerce and logistics.</li> <li>▪ Mobile market - 16 million unique mobile subscribers; (53% of the population).</li> <li>▪ Internet penetration 45% (2018)</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>▪ A wide range of ministries and agencies committed to tech and/or entrepreneurship</li> <li>▪ National Entrepreneurship and Innovation Plan (NEIP) launched by the government in 2017 to support startups and small businesses.</li> </ul>
<b>Finance</b>	<ul style="list-style-type: none"> <li>▪ Among the top 5 of VC investment destinations in Africa E-health is Ghana's best funded sector.</li> </ul>
<b>Infrastructure &amp; Support</b>	<ul style="list-style-type: none"> <li>▪ \$83 million Eastern Corridor Fibre-Optic Backbone project, launched in 2015</li> <li>▪ 36 hubs across the country, mainly in Accra but increasingly in other regions</li> <li>▪ Ghana Hubs Network is connecting and strengthening hubs.</li> </ul>

Table 3a: Ghana - Digital Ecosystem Snapshot

Ecosystem Factor Ghana Snapshot Summary	
<b>Culture</b>	<ul style="list-style-type: none"> <li>▪ High unemployment driving entrepreneurialism among youth</li> <li>▪ Women remain under-represented in the digital sectors, representing only 15%</li> </ul>
<b>Human Capital</b>	<ul style="list-style-type: none"> <li>▪ Strong regulatory and higher education foundation for technology skills</li> <li>▪ Few Ghanaians have advanced digital skills</li> <li>▪ Coding programmes and bootcamps addressing the digital skills gap</li> </ul>

Table 3b: Ghana - Digital Ecosystem Snapshot

## 1.1 Markets

Ghana's economic growth is driven by a diverse range of sectors. Of particular importance is the role of ICT in growing and shaping Ghana's economy. In 2017 Ghana's ICT sector contributed \$1.7 billion (3.6 per cent) to the country's GDP[2]. Within this sector, there are six sub-sectors that dominate:



The number of people in Ghana subscribed to a mobile network has grown significantly, with GSMA[4] estimating a five-fold increase in the last ten years. With 16 million unique mobile subscribers (53% of the population), the country's mobile penetration rate is above the average of 44% for Sub-Saharan Africa. Along with a high number of mobile subscribers, Ghana also has a significant number of adults who rely on these networks for their mobile money accounts. The adoption of mobile money has created a means to bring underserved populations into the formal financial system and extend critical services like healthcare and education more widely.

[2] World Bank, Ghana Digital Economy Diagnostic  
 [3] World Bank  
 [4] GSMA, The Mobile Economy West Africa 2018

While more and more Ghanaians are getting online (mobile internet increased from 2 per cent in 2005 to 45 per cent in 2018), the high cost of data continues to exclude many from the digital economy with 1GB of data estimated to cost over 2% of the average Ghanaian's monthly income. A study by Alliance for Affordable internet ranked Ghana 23rd out of 73 countries on its Affordability Drivers Index which looks at a number of factors related to internet access.

## 1.2 Policy



Image 1: AfriConEU Networking Academy Event - DIH Business Model, Ghana (i)

Over the years the Government of Ghana, mainly through the Ministry of Communication and Digitalisation has introduced various reforms and policies related to technology, digital innovation, and entrepreneurship. Some of these include the ICT for Accelerated Development Policy (ICT4AD) 2003; the Electronic Transaction Act 2008; the National Technology Agency Act 2008; and the Electronic Communications Act 2008.

The intended purpose of these reforms being to facilitate a more competitive digital market in Ghana. More recently, at the 2019 Ghana Digital Roadmap Conference[5] the government outlined how its Beyond Aid strategy along with an updated ICT4AD policy would enable the nation to become an ICT innovation leader by 2023[6]. The updated ICT4AD policy is intended to signal Ghana's commitment to advancing ICT and in turn making the country an attractive destination for ICT related Foreign Direct Investment[7].

Recognising the importance of technology and innovation hubs, the government of Ghana's National Entrepreneurship and Innovation Plan (NEIP) was launched in June 2017. NEIP's main objective is to provide support for startups and small businesses[8] and was established under the jurisdiction of the Ministry of Business Development, which provided the NEIP with a \$10M seed fund[9]. The agency is expected to leverage this to raise a further \$100 Million to support startups and SMEs in Ghana. Since its inception NEIP has worked through tech hubs to provide support and training to young entrepreneurs across the nation[10].

[5] Annang, 'Ghana Digital Roadmap Conference 2019 Begins Today'  
 [6] World Bank, Ghana Digital Economy Diagnostic  
 [7] Ministry of Communications, 'The Ghana ICT for Accelerated Development (ICT4AD) Policy'  
 [8] NEIP, 'National Entrepreneurship & Innovation Programme'  
 [9] NEIP.  
 [10] GSMA, A Deep Dive into the Ghanaian Start-up Ecosystem

## 1.3 Finance

Ghana is ranked as Africa's fifth most active funding market[11]. In 2020, the total amount of Venture Capital investment in Ghana was \$111M, 101% more than the \$55M raised in 2019. The average size of the deals in 2020 (\$8.54M) was also 55% higher than the average deal size in 2019 (\$5.5M). The number of deals increased as well, by 30%, from 10 in 2019 to 13 in 2020[12]. The key sectors attracting investment include e-health, fintech, e-commerce and logistics. E-health is Ghana's best funded sector with two of the top 5 funded startups, m-pharma and African Health Holdings, in 2019[13].

Despite the impressive growth, funding remains a challenge for most Ghanaian startups. This has been attributed to a lack of knowledge of how to build viable and scalable business models on the part of entrepreneurs as well as a shortage of patient financing that understands the needs of local startups[14].

## 1.4 Infrastructure & Support

### Infrastructure

In recent years, the Ghanaian Government in partnership with development and private sector actors has made significant investments into the country's digital infrastructure. For example, the \$83 million, 800km Eastern Corridor Fibre-Optic Backbone project launched in 2015 through a collaboration between the Ghanaian government, France's Alcatel-Lucent and the Danish International Development Agency[15].

Despite these investments, internet infrastructure and access particularly in the rural areas remains a challenge. To bridge the gap for under-served regions in the country, the government established the Ghana Investment Fund for Electronic Communications (GIFEC) [16]. Funded through contributions from Mobile Network Operators, Internet Service Providers and government, GIFEC is running a number of infrastructure projects including establishing Community Internet Centres within rural communities and setting up solar powered satellite hubs to extend basic internet and telephony services under the Rural Telephony Project[17].

[11] Disrupt Africa, 'African Tech Startups Funding Report 2020'

[12] AfricArena, 'The State of Tech Innovation in Africa', 77

[13] Kuuire, 'VC Investments Top \$90 Million For Ghana's Tech Ecosystem In 2020'

[14] Armah, 'Addressing Ghana's Startup Funding Challenges'

[15] NITA, 'President Inaugurates a \$38 Million Fiber Optic Backbone Project'

[16] GIFEC, 'Ghana Investment Fund for Electronic Communications'

[17] GIFEC

## Digital Innovation Hubs

Ghana has an active digital innovation support ecosystem with 36 hubs according to Ghana Hubs Network. While the majority of the country's hubs are concentrated in the capital city Accra, there has been an uptick in hubs operating in other regions of the country. Some of the most active and established hubs in the country include iSpace, Meltwater Entrepreneurial School of Technology (MEST), Kumasi Hive and HapaSpace.



Image 2: AfriconEU Networking Academy Event - DIH Business Model, Ghana (ii)

Despite the growing number of technology and innovation hubs in Ghana, their success and sustainability has remained an issue. A number of challenges including a lack of collaboration and funding are seen to be limiting the potential of Ghanaian hubs to effectively support innovators[18].

The Ghana Hubs Network (GHN), an umbrella organisation bringing together the business, technology and innovation hubs in the country was established to support collaboration, knowledge sharing and address the challenges of hubs. The network runs a number of capacity building programmes for hub managers, coordinates joint initiatives and provides networking opportunities[19].

## 1.5 Culture

[18] Ball, Adereth, and Bar-Shany, 'Catalysing Local Innovation Ecosystems in Kenya and Ghana'

[19] GHN, 'Ghana Hubs Network'



## Entrepreneurship

Attitudes towards entrepreneurship are generally positive in Ghana. A GEM study found that 37 per cent of Ghanaians between the ages of 18 and 64 were in the process of or had recently started their own business[20]. Entrepreneurial participation is particularly high among the youth. This is in part driven by the high youth unemployment rate which at 12% is higher than the average in Sub-Saharan Africa[21] and has led many young people to turn to entrepreneurship.

## Youth

Ghana's population is primarily young and urban. In 2019, under 25-year-olds accounted for 56.8 percent of the population[22] while the urban proportion has increased from 15 per cent in 1950 to 56 per cent in 2018[23]. Highly entrepreneurial and increasingly technology-savvy, the urban youth population hold a lot of promise for driving innovation and harnessing the country's entrepreneurial opportunities[24]. However, as previously discussed, this potential is limited by a lack of digital and business skills as well as a shortage of early-stage funding to establish their businesses. In 2015, the Youth Employment Agency (YEA) was established by the government to support youth entrepreneurship and skills development.

## Gender

Ghanaian women are some of the most entrepreneurial on the continent. In fact, Ghana is one of only two Sub-Saharan African countries where female entrepreneurs outnumber male[25]. When it comes to the Science, Technology and Innovation (STI) however, women remain highly under-represented, making up only 15% of the sector[26].

This gender gap has been attributed to cultural factors such as the gendered notion that science and technology is a male industry and the adverse effect it has on women's willingness to consider a career in this industry; the burden of family obligations and domestic labour that is unduly placed on women thereby limiting the time they have to pursue careers outside the home; and gender-bias and discrimination which women face within the sector[27].

[20] Herrington and Kelley, 'African Entrepreneurship: Sub-Saharan African Regional Report'

[21] World Bank, 'Addressing Youth Unemployment in Ghana Needs Urgent Action, Calls New World Bank Report'

[22] United Nations, Department of Economic and Social Affairs, Population Division, 'World Population Prospects 2019, Volume II: Demographic Profiles'

[23] United Nations, Department of Economic and Social Affairs, Population Division, 'World Urbanization Prospects: The 2018 Revision'

[24] World Bank, Ghana Digital Economy Diagnostic

[25] GEM, 'Women and Youth Spearheading Business Creation'

[26] Quaye, Yamga, and Tetteh, 'National Framework for Research, Innovation, and Commercialisation in Ghana'

[27] Coalition for Digital Equality, 'Bridging the Digital Gender Divide in Africa: Insights from Ghana and Uganda'

A number of public and private initiatives have been launched in the country to address this issue. For example, the Ms Geek competition was launched by the Ministry of Communication and Digitalisation in 2019 with the goal of developing technology related skills amongst girls and young women. Other notable gender inclusion initiatives include eSkills for Girls by GIZ, Unlocking Women and Technology run by iSpace Foundation and Tech Needs Girls by Soronko Academy among others.

## 1.6 Human Capital

Ghana has a strong foundation for digital skills development. Increasingly a priority for the government, the ICT in Education Policy[28] outlines the government's strategy for integrating ICT into education. Furthermore, the country boasts a number of public and private universities such as the Kwame Nkrumah University of Science and Technology (KNUST), the University of Ghana and Ashesi University which are producing technological talent. A testament to the growing digital talent pool in Ghana was the establishment of an artificial intelligence research centre in Accra by global technology giant Google in 2018[29].

This positive outlook is however tempered by the fact that few Ghanaians possess advanced digital skills which are increasingly becoming a necessity as the nation develops digitally[30] and demand for coders, developers and cybersecurity professionals in both the private and public sectors continues to grow[31].

To address the digital skills gap, a growing number of specialist coding programmes and bootcamps have emerged. Many of the programmes offer short-term, intensive training models of three to six months intending to rapidly train developers, software engineers and other in demand digital skills. Some of the active programmes in the country include Andela, Developers in Vogue which is focused on upskilling women developers and Soronko Academy.

[28] Ministry of Education, 'ICT in Education Policy'

[29] Dean and Cisse, Google AI in Ghana

[30] International Finance Corporation, 'Digital Skills in Sub-Saharan Africa: Spotlight on Ghana'

[31] World Bank, Ghana Digital Economy Diagnostic



# African Digital Ecosystems

*Nigeria Snapshot*

One of the largest markets in the region, Nigeria has consistently ranked as a leading destination for technology investment particularly in the Fintech space. The ICT sector is a key driver of the nation’s economic growth and the country was among the first in the region to establish a national body focused on the promotion of ICTs.

In this section, we provide a snapshot of the digital innovation landscape in Nigeria.

Ecosystem Factor Nigeria Snapshot Summary	
<b>Markets</b>	<ul style="list-style-type: none"> <li>• In 2017, the ICT sector contributed 17.83% to the country’s GDP.</li> <li>• Mobile market – in 2018, there were 172 million mobile subscribers, equal to a penetration rate of 87% of population</li> <li>• Over 112 million Nigerians had access to the internet in 2018, representing 56% of the population</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>• Nigerian government amongst the first in Africa to set up a national body responsible for ICT.</li> <li>• Broad mix of ICT-specific policies and legislations as well as more general policies and laws.</li> <li>• Focused on tech and innovation ecosystem environment digital skills and literacy gaps and improving digital infrastructure.</li> </ul>
<b>Finance</b>	<ul style="list-style-type: none"> <li>• Ranks one of Africa’s leading ecosystems for VC investments</li> <li>• Received Venture Capital investment totalling an estimated \$307M In 2020 (897M in 2019)</li> <li>• FinTech is Nigeria’s best funded sector</li> </ul>

Table 4a: Nigeria - Summary of Digital Snapshot

Ecosystem Factor Ghana Snapshot Summary	
<b>Infrastructure &amp; Support</b>	<ul style="list-style-type: none"> <li>• Nigeria is one of Africa’s most advanced eco-systems with 90 active tech hubs.</li> <li>• Home to over 40 hubs, Lagos is the continents’ top innovation city.</li> <li>• Telecommunication company Globacom expanded its 4G network to cover all 36 Nigerian states</li> <li>• Anticipated that mobile operators in Nigeria will spend \$8.5B to improve network infrastructure and services.</li> </ul>
<b>Culture</b>	<ul style="list-style-type: none"> <li>• One of the highest entrepreneurship rates in the world.</li> <li>• 18–64-year-olds make up 35% of total early entrepreneurial activity.</li> <li>• Women entrepreneurs (36%) are more likely to be involved in business than men (34%).</li> <li>• Women remain underrepresented in the tech sector owning 30% of the nation’s tech firms.</li> </ul>
<b>Human Capital</b>	<ul style="list-style-type: none"> <li>• Large concentration of tech related institutions in urban parts of Nigeria.</li> <li>• Many 18-24 graduates entering the digital job market require 1-4 years of further training.</li> <li>• Nigeria also has several universities that are actively working to improve digital literacy and support skill development.</li> </ul>

Table 4b: Nigeria - Summary of Digital Snapshot

## 2.1 Markets

The Nigerian ICT sector is a key driver of the nation’s economic growth contributing 17.83% to the Nigeria’s national GDP[32]. In Nigeria, there were over 172 million mobile subscribers, accounting to a penetration rate of 87% of the population[33].

[32] Jobberman, 'Digital Sector Skills Gap'  
 [33]Kolawole, 'Nigeria Mobile Report 2019'.



This figure represented a 6.4% growth increase, compared to 162 million subscribers in 2017. Over 112 million Nigerians had access to the internet in 2018, representing 56% of the population.

Until fairly recently the cost of internet data was high which has meant that Nigerian men who are more likely to have higher incomes are more likely to adopt ICTs. This is evident in both Internet use and mobile phone[34] ownership, with men in comparison to women, are 17% more likely to use the internet and 13% more likely to use a mobile phone. According to the Alliance for Affordable Internet[35] Nigeria ranks 19th out of 73 countries on its Affordability Drivers Index.

## 2.2 Policy

The Nigerian government was among one of the first in Africa to set up a national body responsible for ICT. The “National Information Technology Development Agency (NITDA), was established in 2007 to plan, develop, and promote the use of ICT[36]. Since then, the government has gone on to establish a broad mix of ICT-specific policies and legislations as well as more general policies and laws that make reference to ICT, technology and innovation in relation to wider national goals[37]. More recently, through its Ministry of Communications and Digital Economy (FMoCDE)[38] the government has developed three policy documents of interest to this study. These being the 2017 Nigeria ICT Roadmap 2017-2020[39]; the Nigeria ICT Innovation and Entrepreneurship Vision (NIIEV)[40]; and the National Digital Innovation and Entrepreneurship Policy (NDIEP)[41]. Collectively these actions are intended to create an enabling environment for the nation’s tech and innovation ecosystem, to address digital skills and literacy gaps and to improve digital infrastructure. The NDIEP in particular was specifically introduced in response to COVID-19 with the intention of laying out how digital innovation can be utilised to mitigate the impact of the pandemic[42].

Paradoxically however, for a nation that has a wide range of policies and initiatives dedicated to supporting and advancing the tech and digital ecosystem; the government has at times adopted a stance that runs counter to its overall technology and innovation aims. For instance, until 2018 and in accordance with the Central Bank of Nigeria’s policies, mobile network operators were barred from offering mobile money services in Nigeria. As a result, there has been low penetration and uptake of mobile money services in Nigeria[43].

[34] Gillwald, Odufuwa, and Mothobi, ‘The State of ICT in Nigeria 2018’

[35] Alliance for Affordable Internet, ‘Africa Regional Snapshot: Affordability Report 2020’

[36] Viik et al., ‘Guidelines and Roadmap for Full Deployment of E-Governance Systems in Africa’

[37] Lixi et al., ‘Nigeria Digital Economy Diagnostic Report’

[38] FMoCDE, ‘Federal Ministry of Communications and Digital Economy’

[39] FMoC, ‘Nigeria ICT Roadmap 2017-2020’

[40] NITDA, ‘Nigeria ICT and Entrepreneurship Vision’

[41] Borokini, ‘Review Of National Digital Innovation and Entrepreneurship Policy’

[42] Borokini

[43] GSMA, The Mobile Economy West Africa 2018

## 2.3 Finance

Nigeria consistently ranks as one of Africa’s leading ecosystems for VC investments. In 2020, the country received Venture Capital investment totalling an estimated \$307M, a decline of 49% compared to the \$747M raised in 2019[44]. The average size of the deals in 2020 (\$4.32M) was also 78% lower than the average deal size in 2019 (\$19.66M). Interestingly, while overall funding declined, the number of startups raising funding increased by 71%, from 38 in 2019 to 71 in 2020 [45].



Image 3: AfriconEU Networking Academy Event - The Technology Transfer Process, Nigeria (i)

Regarding the distribution of funding, FinTech emerges as the sub-sector that receives the most funding. Between 2019 and 2020 62% of Nigeria’s total funding was in FinTech[46]. Flutterwave a FinTech startup raised \$170 million with an over \$1 billion valuation, making it the third Nigerian start-up to achieve unicorn status[47]. Driving these investments is an active funding ecosystem made up of local and international investors including Y Combinator, Ventures Platform, Microtraction, Acuity Ventures, Ingressive Capital, Kepple Africa Ventures and Sherpa Ventures[48].

A look beneath the high investment figures however reveals the fact that a significant portion went to Nigerian startups that are incorporated and registered outside of Nigeria, primarily in the United States of America[49]. This, together with the country’s low ranking on the Ease of Doing Business index (131st out of 190 countries globally) suggests that the investment climate in the country remains challenging resulting in investors preferring to work with startups domiciled abroad[50].

[44] Disrupt Africa, ‘African Tech Startups Funding Report 2020’

[45] AfricArena, ‘The State of Tech Innovation in Africa’

[46] Partech Africa, ‘2020 Africa Tech Venture Capital Report’

[47] Kene-Okafor, ‘African Payments Company Flutterwave Raises \$170M, Now Valued at over \$1B’

[48] Disrupt Africa, ‘African Tech Startups Funding Report 2020’

[49] AfricArena, ‘The State of Tech Innovation in Africa’

[50] AfricArena

## 2.4 Infrastructure & Support

### Infrastructure

As evidenced in section 1.2.2 above, Nigeria is committed to improving its digital and tech ecosystem. In the context of infrastructure this has meant addressing issues such as quality of service and network congestion[51]. The telecommunication company Globacom (commonly referred to as Glo) expanded its 4G network to cover all 36 Nigerian states[52]. In 2019, another telecommunication company, Airtel, extended its 4G network and now covers an additional 100 towns[53]. Overall, it is anticipated that Airtel in Nigeria will spend \$8.5B to improve network infrastructure and services[54].

### Digital Innovation Hubs



Image 4: AfriconEU Networking Academy Event - The Technology Transfer Process, Nigeria (ii)

**With 90 active tech hubs, Nigeria is one of Africa's most advanced eco-systems and Lagos, home to over 40 hubs, is the continent's top innovation city[55].**

A hub of note is the Lagos based Co-Creation Hub (CcHub)[56] that has emerged as a centre for knowledge production and job creation[57]. Over the course of just under 10 years, CcHub has functioned as a pre-incubation program (2012-13); a full incubator (2013); an accelerator (2014); and Seed Fund – serving as a bridge round for entrepreneurs and innovators that need smaller investments[58]. In 2018 CcHub in partnership with Facebook launched NG Hub and in 2019 it began operating as a design lab.

However, few hubs in the country have been able to achieve the level of success of CcHub. For many technology and innovation hubs in Nigeria, particularly those outside of the capital city, funding and capacity remain a primary concern.

[51] Gillwald, Odufuwa, and Mothobi, 'The State of ICT in Nigeria 2018'

[52] GSMA, The Mobile Economy West Africa 2018

[53] GSMA

[54] GSMA

[55] Giuliani and Ekeledo, 'Building a Conducive Setting for Innovators to Thrive a Qualitative and Quantitative Study of a Hundred Hubs across Africa'

[56] Co-Creation Hub, 'Co-Creation Hub'

[57] Atiase, Kolade, and Liedong, 'The Emergence and Strategy of Tech Hubs in Africa: Implications for Knowledge Production and Value Creation'

[58] Wangari and Crawford, 'Unlocking Pipeline: A Playbook for Entrepreneur Support in Africa'

To connect and support the development of hubs in the country, the Innovation Support Network– Hubs (ISN-HUBS) was formed. The organisation is working to build hubs' capacity, provide access to funding and knowledge sharing opportunities as well as setting standards for best practices in entrepreneur support[59].

## 2.5 Culture

### Entrepreneurship

Nigeria is among the countries with the highest entrepreneurship rates in the world[60]. Nigerians have a positive attitude towards entrepreneurship with 82% considering entrepreneurship to be a good career choice. Around 82% believe that there are good opportunities for entrepreneurship in Nigeria with only 21% being deterred by a fear of failure[61].

### Youth

In 2019, under 25-year-olds accounted for 63 per cent of the population[62] and 21.4 per cent of youth were unemployed and/or not in training or education[63]. The youth population in Nigeria is also an entrepreneurial population with 35% of 18–64-year-olds[64] in Nigeria making up what is described as total early entrepreneurial activity (TEA). This TEA figure is amongst the highest in Sub-Saharan Africa[65]. However, barriers including lack of access to funding and low skills continue to impede many young Nigerians from successfully pursuing entrepreneurship[66].

### Gender

Nigeria is one of only two Sub-Saharan African countries where female entrepreneurs outnumber males, with women (36 per cent) being more likely to be involved in business than men (34 per cent)[67]. However, within the tech sector, women's participation is significantly lower than men with only 30% of tech firms being owned by women[68]. A factor that has affected this is that women in Nigeria are not afforded the same access to finance as men due to a financial system that is biased in its approach to lending and credit[69].

[59] ISN Hubs, 'ISN Hubs'

[60] Herrington and Kelley, 'African Entrepreneurship: Sub-Saharan African Regional Report'

[61] United Nations, Department of Economic and Social Affairs, Population Division, 'World Population Prospects 2019, Volume II: Demographic Profiles'

[62] Lixi et al., 'Nigeria Digital Economy Diagnostic Report'

[63] Herrington and Kelley, 'African Entrepreneurship: Sub-Saharan African Regional Report'

[64] Herrington and Kelley

[65] Ezeani, 'Barriers to Graduate Employment and Entrepreneurship in Nigeria'

[66] Herrington and Kelley, 'African Entrepreneurship: Sub-Saharan African Regional Report'

[67] Ramachandran and Omakwu, 'Nigeria's Tech Sector May Be Booming, but Where Are the Women?'

[68] Ramachandran and Omakwu



A non-financial reason that contributes to this inequality is a culture that prioritises celebrating successful men[70] and research supports the idea that is a correlation between entrepreneurship receiving positive media attention and people perceiving entrepreneurship in a positive light[71].

To address this inequality the Nigerian government has undertaken steps to make the teaching of STEM subjects more gender inclusive. Within the NGO sector organisations like TechHer and projects like the 1000 Girls in Training are working to increase the number of women in tech. Finally in 2019 the Gender and Equal Opportunities Bill was reintroduced to Nigerian National Assembly and while its remit is broader than tech, its passage would contribute to a fairer tech sector for women[72].

## 2.6 Human Capital

Nigeria has a number of longstanding and prestigious educational institutions and as previous sections have demonstrated Nigeria is a key player within the continent's tech and innovation ecosystem. However, 18-24% of graduates enter the digital job market requiring 1-4 years of further training in order to gain the relevant skills required to become employable[73].

To address this gap in digital literacy, the Universal Service Provision Fund (USF) runs programs such the School Knowledge Centres (SKC) and the E-accessibility project. The SKC project has provided 396 public secondary schools with connectivity, computers, and power backup and ICT skills training. The E-accessibility project is focused on improving access for those with disabilities. Nigeria also has several universities such as the Federal University of Technology Akure that are actively working to improve digital literacy and support skill development.

As discussed in previous sections, there is a large concentration of tech related institutions in urban parts of Nigeria. This urban/rural divide also contributes to the digital literacy gap.

[70] Olarewaju, 'Can Equalizing Educational Endowments Between Men and Women Create More Female Self-Employed Value in Nigeria?'

[71] Herrington and Kelley, 'African Entrepreneurship: Sub-Saharan African Regional Report'

[72] Ramachandaran and Omakwu, 'Nigeria's Tech Sector May Be Booming, but Where Are the Women?'

[73] Jobberman, 'Digital Sector Skills Gap'

Steps to address this include the Grand Alliance project aimed at advancing innovation being run by the American University of Nigeria in the north-eastern state of Adamawa. Similarly, In the south-western state of Osun, Obafemi Awolowo University is host to the African Institute for Science Policy and Innovation that aims to establish a campus-based innovation hub[74].

[74] Dalberg Global Development Advisors, 'Catalysing Growth in Nigeria'



# African Digital Ecosystems

*Tanzania Snapshot*

Ecosystem Factor Nigeria Snapshot Summary	
<b>Markets</b>	<ul style="list-style-type: none"> <li>• The ICT sector is one of the fastest growing sectors in Tanzania (grew 11.7% in 2019 despite 6.8% GDP growth)</li> <li>• 25 million unique mobile subscribers as of 2020.</li> <li>• Internet penetration: 55.4% in urban areas, 14% in rural areas</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>• Overall ICT strategy contained in the 2016 National ICT Policy</li> <li>• Innovation and entrepreneurship policies fall under the purview of the Ministry for Works, Transport and Communication, and the Ministry of Education, Science and Technology.</li> <li>• In 2017, Tanzania's National Economic Empowerment Council published the Tanzania Inclusive National Entrepreneurship Strategy.</li> </ul>
<b>Finance</b>	<ul style="list-style-type: none"> <li>• Ranked 11th in Africa for VC funding with \$4.6m raised in 2020.</li> <li>• Agritech is Tanzania's best funded sector.</li> </ul>
<b>Infrastructure &amp; Support</b>	<ul style="list-style-type: none"> <li>• 23 active hubs in 2019 (35% increase from 2018)</li> <li>• The National ICT Broadband Backbone, a fibre optic network, is 95% complete as of 2019.</li> <li>• World Bank's Digital Tanzania Project has committed \$150m to improving Tanzania's technology ecosystem.</li> </ul>
<b>Culture</b>	<ul style="list-style-type: none"> <li>• Youth entrepreneurship programs implemented to reduce youth unemployment.</li> <li>• Under 25s unemployment reduced from 6.8% in 2011 to 3.48 in 2019.</li> <li>• 54.3% of SMEs are owned by women, most aged 25 to 40</li> </ul>

Table 5a: Tanzania - Summary Digital Snapshot

Ecosystem Factor Nigeria Snapshot Summary	
<b>Human Capital</b>	<ul style="list-style-type: none"> <li>• Tanzania Entrepreneurship and Competitiveness Centre (TECC) launched in 2016 to train potential entrepreneurs.</li> <li>• National Entrepreneurship Training Framework (NETF) is addressing skills gap.</li> <li>• College of Engineering and Technology in partnership with the University of Dar es Salaam received funding to establish incubators across Tanzania.</li> </ul>

Table 5b: Tanzania - Summary Digital Snapshot

### 3.1 Markets



Image 5: AfriConEU Networking Academy Event - Technology Valorization, Tanzania

Tanzania's ICT sector is one of the nation's fastest growing sectors; growing by 11.7% in 2019, whereas in the same year GDP growth was 6.8[75].. Contributing to this is Tanzania's growing mobile market. In 2020 Tanzania had 25 million unique mobile subscribers compared to 12 million in 2010[76]. Unique subscriber penetration at the end of 2020 was 41% and unique subscriber mobile internet penetration for the same period was 18% [77]. In terms of access, a significant number (86%) of Tanzanians living in rural areas do not have internet connectivity. By comparison, 44.6%[78] of urban dwelling Tanzanians who are not connected to the internet.

Ranked 41 of 73 countries in terms of internet affordability it is no surprise that high costs, low quality of networks and lack of digital skills have had a significant effect on mobile uptake, especially among women[79]. Furthermore, amongst women who own mobile devices, they are less likely to use them for services such as mobile money. One initiative, Project Tigo, is working to address this and so far, the project has resulted in a 2% increase in the proportion of women who use mobile money[80].

[75] NACTE, 'Mapping Skills Gap and Skills Needs for Technician Graduates In The Selected Economic Sectors for Industrial Growth in Tanzania'.

[76] GSMA, 'Tanzania: Driving Social and Economic Value through Mobile-Sector Tax Reform'

[77] GSMA, 'Digital Transformation in Tanzania'

[78] O'Grady, 'Tanzania Hopes to Accelerate Internet Access'

[79] GSMA, 'Digital Transformation in Tanzania'

[80] GSMA, 'Tanzania: Driving Social and Economic Value through Mobile-Sector Tax Reform'



## 3.2 Policy

Tanzania's ICT innovation and entrepreneurship policies and regulations fall under the purview of two ministries: the Ministry for Works, Transport and Communication and the Ministry of Education, Science and Technology (MoEST)[81]. MoEST oversees a number of divisions including the Tanzanian Commission for Science and Technology (COSTECH)[82] and the ICT Commission[83]. In addition to these government bodies, Tanzania's overall ICT strategy is contained in the 2016 National ICT Policy[84].

To support entrepreneurs, in 2017 Tanzania's National Economic Empowerment Council (NEEC) published the Tanzania Inclusive National Entrepreneurship Strategy (TINS)[85]. The Strategy acknowledges and commits to addressing some of the factors that may adversely affect entrepreneurship including insufficient funding, not enough legislative support and a skills gap.



Image 6: Tanzania Policy Roundtable, Promoting and Enabling Innovation Spaces

## 3.3 Finance

In 2020, Tanzania ranked 11th in Africa in terms of Venture capital funding with \$4.6m raised[86]. Even though it is relatively a small number, it is significant given that in 2019 Tanzania didn't receive any VC investment. The average size of the deals in 2020 was \$1.15M for an overall 4 deals[87]. Agritech was the sector that received the most funding[88] with East African Fruits securing \$3.1m[89].

[81] MoEST, 'Ministry of Education, Science and Technology'  
 [82] COSTECH, 'Tanzania Commission for Science and Technology'  
 [83] ICT Commission, 'Information and Communication Technology Commission'  
 [84] Ministry for Works, Transport & Communication, 'National ICT Policy 2016'  
 [85] NEEC, 'Tanzania Inclusive National Entrepreneurship Strategy'  
 [86] Partech Africa, '2020 Africa Tech Venture Capital Report'  
 [87] AfricArena, 'The State of Tech Innovation in Africa'  
 [88] AfricArena; Disrupt Africa, 'African Tech Startups Funding Report 2020'  
 [89] Jackson, 'Tanzania's East Africa Fruits Closes Series A Funding Worth \$3.1m'

Compared to other tech ecosystems in Africa, Tanzania's ecosystems can best be described as nascent. Most startups and entrepreneurs still have to rely on self-funding or family and friends to get their businesses off the ground[90]. While limited, a growing number of funding opportunities do exist. A number of funders and investors that are active in the ecosystem including AHL Venture Partners, Atraxx Group, Beyond Capital Fund, TBL Mirror Fund, and Lundin Foundation are providing grants, angel investment, debt and equity to startups in the country[91].

However, several factors are still limiting the growth of the Tanzania investment ecosystem including a policy and regulatory framework that is seen to be prohibitive to foreign investment[92].

## 3.4 Infrastructure & Support

### Infrastructure

In 2009 Tanzania launched the National ICT Broadband Backbone (NICTBB), a fibre optic network, and as of 2019 it is 95% complete[93]. The NITCBB has contributed to greater access and lower costs[94] and recently the Tanzanian government has agreed to extend the NITCBB into Mozambique[95].

Mobile operators continue to invest in Tanzania and, in 2019, that investment was approximately \$2.6bn[96]. For instance, Vodacom invested \$66m in 2017, to improve data and voice network capacity. In the same year, Halotel committed to investing \$1.7bn to improve network infrastructure. Additionally, the World Bank through its Digital Tanzania Project has committed \$150m to improve Tanzania's technology ecosystem[97]. Divided into two phases; Phase I (2018-2022) and Phase II (2021-2026) the project will result in increased and improved access to broadband internet services.

### Digital Innovation Hubs

In 2019 there were 23 active hubs in the county[98], signifying an increase of 35% [99] from the previous year. Tanzania's former capital city, Dar es Salaam is referred to as "Silicon Dar" on account of it being home to significant number of hubs and tech startups[100].

[90] Sahara Ventures, 'A Startup in Tanzanian Context, Challenges and Opportunities'

[91] Antoun, 'The Great Debate'

[92] World Bank, 'World Bank in Tanzania'

[93] Viik et al., 'Guidelines and Roadmap for Full Deployment of E-Governance Systems in Africa'

[94] GSMA, 'Digital Transformation in Tanzania'

[95] Malakata, 'Tanzania Extends National Broadband Backbone to Mozambique'

[96] GSMA, 'Digital Transformation in Tanzania'

[97] GSMA, 'Tanzania: Driving Social and Economic Value through Mobile-Sector Tax Reform'

[98] Giuliani and Ekeledo, 'Building a Conducive Setting for Innovators to Thrive a Qualitative and Quantitative Study of a Hundred Hubs across Africa'

[99] Giuliani and Ajadi, '618 Active Tech Hubs: The Backbone of AFRICA'S Tech Ecosystem'

[100] Materu, 'Tanzania's Self-Formed "Silicon Dar" Turning City into Smart Hub'



Recently there has also been a rise in hubs outside of Dar es Salaam[101]. Rlabs Iringa and Mkwawa Community Art Space are based in Iringa, Twende Makerspace is in Arusha and Zanzibar Technology Business Incubator (ZTBI) in Zanzibar to name a few[102].

Challenges to hubs in Tanzania and to the national tech ecosystem more broadly, include sustainability, opportunities for collaboration, funding and, policies and regulations that stifle growth and investment and fail to prioritise innovation[103]. To mitigate this there are stakeholders within the ecosystem e.g., Sahara Ventures, Robotech Labs, and Ennovate Hub who offer primarily non-financial support, including, mentoring, providing shared workspaces and business support[104]. In addition, the Tanzania Startup Association (TSA), an umbrella membership-based organization, is working to strengthen the ecosystem by bringing together the various stakeholders including startups, innovation hubs, venture capital, and private equity funds in Tanzania[105].

## 3.5 Culture

### Entrepreneurship

Supported by government agencies and organisation such as the Tanzania Entrepreneurship and Competitiveness Centre (TECC)[106] entrepreneurship is increasingly becoming popular as an employment option for Tanzanians. However, cultural attitudes in the country tend to hold salaried employment in high regard and for many, entrepreneurship is still perceived as a consequence of not being able to find opportunities elsewhere[107]. However, it has been suggested that these attitudes are rooted in Tanzania's socialist past which contributed to an attitude of dependency on the government rather than cultivating entrepreneurial self-drive[108]. Government initiatives such as Tanzanian National Entrepreneurship Training Framework (NETF) are now aiming to embed entrepreneurship within the country's education system and nurture entrepreneurialism[109].

[101] Mtambalike, 'What You Need to Know about Tanzania Innovation Ecosystem. Why Are We the Fastest?'

[102] Mtambalike

[103] Mtambalike

[104] Antoun, 'The Great Debate'

[105] TSA, 'Tanzania Startup Association'

[106] TECC, 'Tanzania Entrepreneurship and Competitiveness Centre'

[107] Rusinov, 'Entrepreneurial Education and Attitudes in Tanzania'

[108] Kushoka, 'Encouraging Entrepreneurship in Tanzania. Start-Ups and Growth Barriers'

[109] Rusinov, 'Entrepreneurial Education and Attitudes in Tanzania'

### Youth

Tanzania's under 25-year-olds accounted for 63 per cent of the population based on 2019 figures [110]. Youth unemployment rates peaked in 2011, at 6.75%. In response to this the government in partnership with organisations such as the International Labour Organisation (ILO) and the African Development Bank implemented a range of youth entrepreneurship programs. Tanzanian youth engagement with these programs has resulted in a steady decline in youth unemployment as of 2019 the figure stood at approximately 3.48%[111].

### Gender

In Tanzania 54.3% of SMEs are owned by women, with most aged between 25 and 40. However, women still face barriers and exclusion that limit their ability to become entrepreneurs. These include patriarchal norms that dictate women must prioritise domestic and family responsibilities, misogyny and harassment in the workspace, unequal access to skills training and access to finance[112][113]. Initiatives to address this include training provided by Vodacom's Business Women Connect (BWC) in the use of mobile money services (M-Pesa and M-Pawa)[114]

Worthy of note is the number of hubs either founded and led by women or focused on empowering women[115]. Both Safe Space Co and Ndoto Hub, are Dar es Salaam based hubs founded by women in 2017[116]. In April 2021 Ndoto Hub announced two new spaces the Ndoto Innovation College and Ndoto Hub Arusha[117]. These two hubs join SheCodesForChange and Apps and Girls as examples of how women in Tanzania are creating spaces for using technology as a tool for women's empowerment.

## 3.6 Human Capital

Tanzania is emerging as a key player in the African tech ecosystem and part of that is attributable to the nation's human capital[118].

[110] United Nations, Department of Economic and Social Affairs, Population Division, 'World Population Prospects 2019, Volume II: Demographic Profiles'

[111] O'Neill, 'Tanzania - Youth Unemployment Rate 1999-2019'

[112] Kapinga et al., 'Exploring the Contribution of Business and Technology Incubators to Women Entrepreneurs' Business Development in Dar Es Salaam, Tanzania'

[113] Sahara Ventures, 'Digital and Financial Inclusion for Women-Led Business in Tanzania'

[114] GSMA, 'Digital Transformation in Tanzania'

[115] Materu, 'Tanzania's Self-Formed "Silicon Dar" Turning City into Smart Hub'

[116] DigestAfrica, 'These Are the 3 Latest Tech Hubs in Tanzania's Eco-System'

[117] Ndoto Hub, 'We Are Excited to Introduce Ndoto Innovation College and Ndoto Hub Arusha'

[118] Mtambalike, 'What You Need to Know about Tanzania Innovation Ecosystem. Why Are We the Fastest?'

However, there is still a mismatch between available and required skills. During a 5-year period (2014/15 – 2019/20), of 95,771 graduates who entered the job market with the necessary skills for their chosen sector, only 27% were skilled in ICTs[119]. One of the ways the skills gap is being addressed in Tanzania is through a National Entrepreneurship Training Framework (NETF) that is overseen by the NEEC with support from the International Labour Organisation (ILO)[120].

Universities have also teamed up with government agencies and international organisations to address the gap in digital and entrepreneurship skills. For instance, the College of Engineering and Technology in partnership with the University of Dar es Salaam Entrepreneurship Centre (UDEEC), Small Industries Development Organization (SIDO), and the Ministry of Industry and Trade received funding from the Gatsby Charitable Foundation, the Ashden Trust (UK) and the Carnegie Corporation to establish incubators across Tanzania[121]. More recently the Tanzania Entrepreneurship and Competitiveness Centre (TECC) launched in 2016 [122], as a government, private and academic partnership to train potential entrepreneurs[123].

[119] NACTE, 'Mapping Skills Gap and Skills Needs for Technician Graduates In The Selected Economic Sectors for Industrial Growth in Tanzania'

[120] Rusinov, 'Entrepreneurial Education and Attitudes in Tanzania'

[121] COSTECH, 'Rolling Strategic Plan 2016/17- 2021/21'

[122] TECC, 'Tanzania Entrepreneurship and Competitiveness Centre'

[123] TECC

# African Digital Ecosystems

## *Uganda Snapshot*

Ranked 7th in Africa as a destination for venture capital funding, Uganda's digital ecosystem is nascent but growing steadily. The country's digital market is considered one of the most dynamic in the region. With a young and entrepreneurial population and increasingly ICT-focused policies, the nation is poised to become a leading innovation hub in the region.

In this section, we provide a snapshot of the digital innovation landscape in Uganda.

Ecosystem Factor Nigeria Snapshot Summary	
<b>Markets</b>	<ul style="list-style-type: none"> <li>▪ The ICT sector's contribution to Uganda's GDP was 10.5%.</li> <li>▪ 27 million mobile subscriptions and a penetration rate of 69.2%.</li> <li>▪ With 12.6 million internet users, internet penetration stands at 26.2%.</li> </ul>
<b>Policy</b>	<ul style="list-style-type: none"> <li>▪ The Ugandan Ministry of ICT and National Guidance (MoICTNG) – the ministry dedicated to ICT.</li> <li>▪ National ICT Policy established in 2014.</li> <li>▪ In July 2021 the government introduced a 12% tax on mobile data, which in turn increased the costs of mobile internet use for Ugandans.</li> </ul>
<b>Finance</b>	<ul style="list-style-type: none"> <li>▪ Ugandan ranked 7th in Africa as a destination for venture capital funding.</li> <li>▪ In 2020, the total amount of Venture Capital investment in Uganda was \$11.3M.</li> <li>▪ The average size of the deals in 2020 was \$2.83M.</li> <li>▪ FinTech is the dominant sector for startup investment.</li> </ul>

Table 6a: Uganda - Summary Digital Snapshot

Ecosystem Factor Ghana Snapshot Summary	
<b>Infrastructure &amp; Support</b>	<ul style="list-style-type: none"> <li>▪ State-owned National Backbone Infrastructure introduced by the government in 2007.</li> <li>▪ Government (e.g., Rural Communications Development Fund) and private actors (e.g., Connected Society Innovation Fund for Rural Connectivity) are working to extend ICT infrastructure to rural areas</li> <li>▪ 10 active tech hubs in Uganda as of 2019.</li> </ul> <p>Startup Uganda, the umbrella body for ecosystem actors is working to build cohesion and develop the ecosystem.</p>
<b>Culture</b>	<ul style="list-style-type: none"> <li>▪ In 2019, under 25-year-olds accounted for 67.3 per cent of the population.</li> <li>▪ 30% of Uganda's youth population are involved in the early stages of starting a business</li> <li>▪ Four out of ten business owners in Uganda are women. However cultural norms still hinder women's entrepreneurship particularly within the digital sector.</li> </ul>
<b>Human Capital</b>	<ul style="list-style-type: none"> <li>▪ Mismatch between what the market requires and what skills exist within the population.</li> <li>▪ Women have historically been excluded from STEM related education and employment.</li> </ul>

Table 6b: Uganda - Summary Digital Snapshot

## 4.1 Markets

In 2019, the ICT sector's contribution to Uganda's GDP was 10.5%<sup>[124]</sup>. Uganda's digital market is considered one of the most dynamic in Africa on account of the number of operators<sup>[125]</sup>.

[124] Government Citizen Interaction Centre, 'From an Economic Perspective[...]'

[125] Gillwald et al., 'The State of ICT in Uganda'



There are an estimated 27 million mobile subscriptions and a penetration rate of 69.2% of the population[126]. In 2021, internet penetration was 26.2% and Uganda had 12.6 million internet users an increase of 14% between 2020 and 2021[127]. A study by Alliance for Affordable Internet[128] ranked Uganda 31st out of 73 countries on its Affordability Drivers Index.

There are inequalities in relation to access with women and those in rural parts of Uganda being the most affected by this. In 2019, 9% of those who lived in rural areas have internet access compared to 30% of those in living in urban areas[129]. A 2018 Finscope study revealed that 46% of women had access to mobile phones, 12% less than men[130]. This lack of access means that many women cannot fully engage with all the opportunities that tech offers, and they remain excluded from participating in the digital economy[131]. However, it is also worth noting the gender gap in internet use is much lower in Uganda than it is in almost every other African country[132].

## 4.2 Policy

Over the years the Ugandan government has introduced and implemented a number of laws and policies that demonstrate its commitment to growing its ICT sectors[133]. The Ugandan Ministry of ICT and National Guidance (MoICTNG) established in 2006 is the main body responsible for the nation's ICT sector[134]. Outlined in Uganda's Vision 2040 document is the government's commitment to building a Hi-tech ICT city and associated infrastructure[135].



Image 7: Uganda Policy Roundtable, Towards a common digital market and a connected startup ecosystem (i)

[126] World Bank, 'Digital Solutions in a Time of Crisis: Uganda Economic Update: Fifteenth Edition'  
 [127] Kemp, 'Digital in Uganda'  
 [128] Alliance for Affordable Internet, 'Africa Regional Snapshot: Affordability Report 2020'  
 [129] Gillwald et al., 'The State of ICT in Uganda'  
 [130] Agaya, 'FinScope 2018'  
 [131] EU, 'Jobs and Growth Compact for Uganda'  
 [132] World Bank, 'Digital Solutions in a Time of Crisis: Uganda Economic Update: Fifteenth Edition'  
 [133] World Bank, 'Uganda Economic Update, 14th Edition'  
 [134] Gillwald et al., 'The State of ICT in Uganda'  
 [135] Government of Uganda, 'Uganda Vision 2040'



Image 8: Uganda Policy Roundtable, Towards a common digital market and a connected startup ecosystem (ii)

To support Vision 2040, the MoICTNG introduced the Digital Uganda Vision which provides a unified ICT policy for the nation [136]. Supporting this is Uganda's National ICT Policy 2014 Outlines its commitment to universal ICT access and explicitly prioritises gender, people with disabilities and Uganda's youth[137].

While there are efforts by the Ugandan government to institute policies and laws that support the digital economy and the ICT sector there are a number of policy actions that seem to be in contrast with these goals[138]. For instance, in July 2021 the government introduced a 12% tax on mobile data, which in turn increased the costs of mobile internet use for Ugandans[139].

Given that the cost of mobile use was already unaffordable for a significant portion of the population, the recent tax increase will most likely exclude even more people from participating in the digital economy and continue to widen the digital divide. The overall view of the Ugandan government approach to ICT and its commitment to the ICT sector is that while it remains a work in progress in many aspects, the nation is on the right path to growing a vibrant and sustainable digital economy[140].



Image 9: Uganda Policy Roundtable, Towards a common digital market and a connected startup ecosystem (iii)

[138] World Bank, 'Uganda Economic Update, 14th Edition'  
 [139] Ministry of Information and Communications Technology, 'National Information and Communications Technology Policy for Uganda'  
 [140] Nesbitt-Ahmed, Scharwatt, and Daniels, 'Supporting the Growth of the Tech Start-up Ecosystem in Uganda: A Policy Outlook'

## 4.3 Finance

Uganda is ranked 7th in Africa as a destination for venture capital funding[141]. Aside from the decline in 2020, Uganda had seen a year-on-year increase in VC funding raised by startups over the last five years. In 2020, the total amount of Venture Capital investment in Uganda was \$11.3M, 70% less than the \$38M raised in 2019. The average size of the deals in 2020 (\$2.83M) was also 70% lower than the average deal size in 2019 (\$9.5M)[142]. However, the number of deals remained the same (4) across both years.

FinTech is the most dominant sector for startup investment. Fintech firms, for example Ensibuuko and Numida which raised \$1m and \$2.3m respectively in 2021, accounted for the biggest share of funding.

Despite promising growth, startup funding overall and for digital firms in the country remains limited. Part of the reason for this is that many Ugandan startups lack financial support in the early stages to enable them to attain the level of maturity that is attractive to venture capitalists. In addition, many entrepreneurs lack knowledge about the investment process and the necessary legal support to meet funder requirements[143].

## 4.4 Infrastructure & Support

### Infrastructure

In recent years there has been increased investment, both private and public, in Uganda's digital communication networks. In 2007, the Ugandan government introduced a state-owned National Backbone Infrastructure and more recently has made significant investments in "middle" and "last mile" networks[144]. These have all contributed to increased access for many Ugandans. However, digital divides persist, particularly for those in rural areas.

[141] World Bank

[142] AfricArena, 'The State of Tech Innovation in Africa'

[143] The Innovation Village, 'STARTUP FINANCING'

[144] World Bank, 'Digital Solutions in a Time of Crisis: Uganda Economic Update: Fifteenth Edition'

Initiatives such as the Rural Communications Development Fund have been established in order to extend ICT infrastructure to rural areas[145]. Cost also continues to be a limiting factor. For example, despite 12000 kilometres of laid fibre-optic cable, different operators have duplicated routes thereby increasing costs[146]. To address this the Ugandan National Broadband Policy is enforcing infrastructure sharing among operators[147]. Alongside the government, agencies such as GSMA are also investing in Ugandan infrastructure. The Connected Society Innovation Fund for Rural Connectivity in partnership with mobile provider MTN and iSat Africa and was awarded £330,000 by the GSMA[148]. As a result, communities who previously had no access have gained access to mobile internet for the first time[149].

### Digital Innovation Hubs

Ugandan digital entrepreneurship ecosystem is described as nascent but expanding and ranks well in global rankings[150]. Kampala, Uganda's capital city is host to most of Uganda's digital entrepreneurs and many have been successful in the growth of homegrown business; with some expanding beyond Uganda's borders[151]. For example, SafeBoda[152] a Ugandan ride-hailing company that prioritises safety in the motorcycle mass transit industry began offering its services in Kenya in 2017 and in Nigeria in 2020[153].

Uganda's tech and innovation ecosystem is bolstered by a growing number of tech hubs and as of 2019 there were ten active hubs in Uganda[154]. To facilitate their activities, tech hubs in Uganda have formed partnerships and networks with NGOs, government departments and international agencies. There is also a growing number of hubs working together to provide support to digital startups, e.g., Outbox, HiveColab and The Innovation Village. In 2019 the Innovation Village together with investment company Ortus Africa Capital launched the 97Fund in order to provide early capital to startups[155].

[145] Gillwald et al., 'The State of ICT in Uganda'

[146] Gillwald et al

[147] Gillwald et al

[148] Kiboi, 'Up to 50,000 People from Rural Communities Gain Access to Mobile Coverage through Newly Deployed Network Sites in Ghana and Uganda'

[149] Kiboi

[150] World Bank, 'Digital Solutions in a Time of Crisis: Uganda Economic Update: Fifteenth Edition'

[151] Gillwald et al., 'The State of ICT in Uganda'

[152] SafeBoda, 'SafeBoda'

[153] World Bank, 'Digital Solutions in a Time of Crisis: Uganda Economic Update: Fifteenth Edition'

[154] Giuliani and Ekeledo, 'Building a Conducive Setting for Innovators to Thrive a Qualitative and Quantitative Study of a Hundred Hubs across Africa'

[155] CK Japheth, 'One Small Step for Our Entrepreneurs, One Giant Leap for Our Ecosystem. Humbled to See #The97Fund Fall in Place. @The97Fund Is for the Missing Middle Unlocking the Positive Value of Technology in Society. See <https://t.co/9qSr0p2Syl> for More.. <https://t.co/W14v2pu9i1>'



Funding however remains a barrier to entry and a challenge to the sustainability of Uganda's tech and innovation ecosystem. Other limitations include a lack of differentiation between hubs that offer incubation and acceleration services and the ability to achieve sustainability due to an over reliance on donor funding for operational costs. To address these challenges, Startup Uganda, the umbrella body for ecosystem actors including hubs, startups and investors is working to build cohesion and develop the ecosystem[156].

## 4.5 Culture

### Entrepreneurship

Uganda has some of the highest entrepreneurial rates in sub-Saharan Africa. Almost 50% of young Ugandans would like to pursue entrepreneurship and 30% are actually involved in the early stages of starting a business[157]. However due to a number of skills, funding and support gaps, many of these remain informal, micro enterprises and have a high failure rate.

### Youth

Uganda has one of the youngest populations in the world. In 2019, under 25-year-olds accounted for 67.3 per cent of the population[158]. With over a million young people entering the job market each year and not enough formal jobs being created, the country also has one of highest rates of youth unemployment. 13.3% of young Ugandans are out of employment while an estimated 83% are underemployed or in unstable jobs that do not offer a decent standard of living[159]. To address this challenge, the government of Uganda has established a number of youth employment initiatives under the auspices of the National Youth Policy (NYP). However, information in relation to support available is not effectively being accessed by the country's youth. One study found that 89% of young entrepreneurs had not received any support from policies and initiatives put in place by the government[160].

[156] Startup Uganda, 'Startup Uganda'

[157] GEM, 'GEM Uganda: Supporting Africa's Young Entrepreneurs'

[158] United Nations, Department of Economic and Social Affairs, Population Division, 'World Population Prospects 2019, Volume II: Demographic Profiles'

[159] Kempner, 'Youth Unemployment in Uganda Has Been Misdiagnosed'

[160] GEM, 'GEM Uganda: Supporting Africa's Young Entrepreneurs'

### Gender

Uganda ranks high amongst African nations in terms of the high number of women-owned enterprises. Nearly four out of ten business owners in Uganda are women[161]. However, women in Uganda are adversely affected by gender-based inequality which in turn affects their ability to pursue entrepreneurship as a career option and has historically excluded them from STEM related education and employment. When it comes to the digital sector, Ugandan women remain under-represented and face social cultural and institutional barriers to participating in digital entrepreneurship[162].

Organisations such as the Uganda Women Entrepreneurs Association Limited[163] and programs like Her StartUp run by Smart Girls Foundation Uganda[164] are working to create a more enabling and inclusive environment for women entrepreneurs. While initiatives like Women in Technology Uganda (WitU) are working to provide role models, build digital skills and support women to establish businesses in the digital sector[165]. Additionally, institutions such as Makerere University recently passed an Affirmative Action Policy that establishes a 40 percent enrolment quota for female students in STEM[166]. Other Ugandan universities have similar initiatives; Busitema University, Mbarara University of Science and Technology (MUST) (working with Google) and The African Rural University (a women-only university) all have programs aimed at increasing the number of women who enrol in STEM subjects[167].

## 4.6 Human Capital

As noted previously, Uganda has a sizeable young population and requires a large number of jobs to be created. Digital economies have immense potential to do this but there is still a gap in digital skills. Currently there is a mismatch between what the market requires and what skills exists within the population[168]. Initiatives such as Refactory, a skills acceleration programme which aims to produce tech talent that is ready for the job market and FundiBots which provides practical science and ICT skills training in schools are working to bridge the technology skills gap from the ground up.

[161] World Bank, 'Digital Solutions in a Time of Crisis: Uganda Economic Update: Fifteenth Edition'

[162] Ball, 'Examining Gender Barriers for Female Digital Entrepreneurs in Uganda'

[163] UWEAL, 'Uganda Women Entrepreneurs Association Limited'

[164] Smart Girls Foundation Uganda, 'Her Start Up'

[165] WitU, 'Women in Technology Uganda'

[166] World Bank, 'Uganda Economic Update, 14th Edition'

[167] Clesensio, Florence, and Francis, 'Investing in Women as Drivers of Growth'

[168] Mercy Corp, 'Competing in a Digital Age'





# Key Insights

While there are significant differences between each of the four countries there are several common factors that emerged both in the literature review as well as in the interviews and roundtable discussion. In this section, we build on the similarities that emerged from the literature review while introducing additional interview and roundtable insights.

Ecosystem Factor Summary of common factors across the four countries	
<b>Markets</b>	Driven by mobile adoption the digital markets are growing but affordability and access remain limiting factors. These factors combined with gender and geographical factors results in women and those in rural areas being excluded from participating in the digital economy.
<b>Policy</b>	Broad level ICT frameworks exist but policy gaps remain with regards to enabling digital adoption and innovation. In some instances, the impacts of positive policy initiatives are diminished by restrictive and punitive government regulations.
<b>Finance</b>	Investment into African tech markets continues to grow. However, driven by a lack of patient, catalytic capital, early stage startups and certain key sectors remain under-funded
<b>Infrastructure &amp; Support</b>	Addressing infrastructure gaps particularly in rural areas is high on the agenda for both private and public actors. The number of digital innovation hubs is growing but funding constraints limit the support they provide to startups.
<b>Culture</b>	On the whole entrepreneurship is regarded as a positive solution to unemployment and a way to increase financial and economic participation. However cultural and socio-economic barriers prevent many women and youth from pursuing digital entrepreneurship.
<b>Human Capital</b>	There is increasing emphasis on digital skills development. However, education systems are not adapting and meeting the demand for advanced digital skills.

Table 7: Summary of common factors across the four countries

## 5.1 Markets

**Driven by mobile adoption and digital markets are growing but affordability and access remain limiting factors.**

Emerging from the snapshots is the role and importance of mobile markets; in all four countries mobile markets were growing and contributing significantly to each nation's economic growth. This mirrors what is happening across Sub-Saharan Africa where in 2019 mobile services contributed 9% to the regions' GDP[169].

COVID-19 has further accelerated the adoption of digital technologies with more people requiring access to mobile devices and internet data in order to keep up with the new ways of working, learning and socialising virtually.

However, access and affordability remain an issue and the high costs associated with smartphones and internet data is still excluding many from the digital economy[170]. According to Alliance for Affordable Internet, Africa still lags behind the rest of the world when it comes to internet access and affordability[171]. They further note that addressing these gaps will require concerted efforts from governments in the form of enabling policy frameworks as well as investments into infrastructure and digital skills.

## 5.2 Policy

**Broad level ICT frameworks exist but policy gaps remain with regards to enabling digital adoption and innovation.**

As the country snapshots have shown, there is a strong foundation in terms of broad frameworks and government initiatives to support the adoption and use of ICTs in all of our focus countries. Our conversations with stakeholders also highlighted the fact that there is growing momentum around the development of policies to drive digital innovation and entrepreneurship.

For example, in Ghana, Nigeria and Uganda, and there's ongoing dialogue between private sector and policy makers about the development of Startup Acts to address the specific challenges of digital startups[172].

[169] GSMA, 'The Mobile Economy: Sub-Saharan Africa 2020'

[170] GSMA

[171] Alliance for Affordable Internet, 'Africa Regional Snapshot: Affordability Report 2020'

[172] Chijioke, 'A Review of Startup Act Policy In Africa'

While in Tanzania there are plans to establish a dedicated ministry to champion local innovation.

However, our research also revealed that the existing policy environment in these countries is not effectively supporting digital adoption and innovation. For example, speaking on the Ugandan government's recent implementation of a 12% tax on internet data one hub leader noted:

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*Five or six years ago, I would have said that we were on a trajectory whereby policies were enabling more people to get online, for example allowing imports of mobile devices at affordable prices. But now, we have things like a digital tax and so many other taxes, for instance, on transferring money between banks and digital platforms. So, the cost of joining the digital economy has increased.*

While in Tanzania, several actors raised the issue of prohibitive regulations that are discouraging the flow of investment into Tanzanian tech startups. Similar to the sentiments from Uganda, some felt that the Tanzanian Government is prioritising the collection of Tax revenues over fostering a conducive environment for digital innovation. One hub leader decrying the high taxation on investments into the country said:

”

*To receive funds from an external vehicle in Tanzania, the capital gains tax is 30%. So, it is very frustrating for investors to invest when 30% of that money is going to where it is not intended.*

While another noted:

”

*One existing regulation, by the Tanzanian communication regulatory authority essentially mandates that all technology application businesses must get a licence and to do that they are charged a certain percent on the top line revenue. So, it can be quite unappealing not only to entrepreneurs, but also to investors because essentially with a top line tag, the regulator is actually more like a shareholder in the company.*

However, it also became clear that in addition to government action, digital actors and the private sector have a key role to play in creating an enabling policy environment for tech and innovation as a stakeholder in Nigeria explained:

”

*In Nigeria, a lot of our policies are driven and influenced by the private sector. If you look for example at telecoms, no one had any clue how to go about regulating that, but with the combination of the big players, like MTN and Airtel, we're far ahead of a lot of countries as far as telco regulations are concerned. And that's only because the actors put pressure, and we're able to provide some sort of guidance.*

### 5.3 Finance

**Investment into African tech markets continues to grow. However, driven by a lack of patient, catalytic capital, early-stage startups and key sectors remain under-funded.**

Africa tech sector is increasingly attracting investment. In the last five years, investment has increased each year including in 2020 which despite the pandemic saw a 42% increase in investment into Africa tech startups compared to 2019[173]. However, as the country snapshots have highlighted, a number of challenges and gaps persist within the Africa tech funding landscape.

First, funding is concentrated towards sectors that are popular with investors while some sectors that are crucial to serving local needs remain under-funded. For example, in 2020 the fintech, e-commerce, e-health and logistics sectors attracted most of the investments, while other sectors such as agriculture or education - for which there is a growing need in many Africa economies - remain under-funded.

Our conversations with African digital ecosystem actors highlighted this as a challenge noting that many locally relevant, high potential opportunities remain untapped as a result. Some have argued that this is driven by the unrealistically high return expectations of venture capital investors. This in turn is causing them to crowd into deals that they believe can deliver these returns quickly[174]. One Hub leader in Ghana noted:

[173] Disrupt Africa, 'African Tech Startups Funding Report 2020'

[174] Akinyemi and Osamuyi, 'Chasing Outliers: Why Context Matters for Early Stage Investing in Africa'

”

*They [investors] are interested in investing in products that they perceive to have demand and not necessarily what is needed locally*

Secondly, we see that access to finance remains a challenge particularly at the early stage. This has been attributed to a number of factors including the fact that 70% of investors are based outside of the continent[175]. This has contributed to investor biases and investment models that are not well suited to the local context[176]. One startup founder in Tanzania speaking on the issue of biases against local entrepreneurs by foreign investors noted:

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*With regard to funding, there is a common dynamic which plays out. There are a number of startups from across the ecosystem who have raised investment. However, the unwritten rule is that the founder must have either a) white founder who came from Europe/USA b) or an African founder that is educated in the West. For many local founders, it is a challenge to raise seed funding.*

Furthermore, the focus on quick returns and a lack of patient, catalytic capital is contributing to funding constraints for local startups. During our Ghana roundtable, Amma Sefa-Dedeh Lartey, the CEO of Impact Investing Ghana surmised the funding gap within the ecosystem as follows:

”

*We're missing catalytic capital. That is, capital which is not just looking for a return now or in the next 10 years, but says, 'I want to develop the ecosystem.' Because if you come in looking specifically for investments, you're being efficient, you just want to find some good companies, invest in them and move out.*

[175] Cuvellier, 'All Eyes on Africa'

[176] Akinyemi and Osamuyi, 'Chasing Outliers: Why Context Matters for Early Stage Investing in Africa'

”

*We need people who are willing to invest in the ecosystem. They don't because the popular model, which is the venture capital model, is expensive. It is expensive because of the skill sets of the people that are needed for it to work well. And that means that you can only do big deals, you can only invest \$500,000 or \$1million at the minimum. However, the needs of the ecosystem are much smaller than that. And so, we need investors who are willing to experiment and who invest in experiments.*

## 5.4 Infrastructure & Support

**Addressing infrastructure gaps particularly in rural areas is high on the agenda for both private and public actors.**

A recurring theme across all four countries is the existence of infrastructure gaps that are driving a rural/urban divide when it comes to digital and mobile connectivity. This is also the case across Sub-Saharan Africa where 49% of the region's, largely rural population remains unconnected to mobile internet[177].

Reassuringly, it appears that despite the economic uncertainty caused by the pandemic, mobile operators in the region are committed to investing \$52 billion in infrastructure between 2019 and 2025[178]. Additionally, as we expand on in the next section, the pandemic has catalysed greater prioritisation of infrastructure investments by the regions' governments.

**The number of digital innovation hubs is growing but funding constraints limit the support they provide to startups.**

Data across the four ecosystems indicates that there's a proliferation of digital innovation hubs and as of 2019, there were 643 active tech hubs across Africa[179]. However, data also shows that funding remains a major concern for hubs and that this is limiting the level of support that hubs are able to provide to startups.

[177] GSMA, 'The Mobile Economy: Sub-Saharan Africa 2020'

[178] GSMA, 20

[179] Giuliani and Ekeledo, 'Building a Conducive Setting for Innovators to Thrive a Qualitative and Quantitative Study of a Hundred Hubs across Africa'



## 5.5 Culture

**Cultural barriers prevent many women and youth from pursuing digital entrepreneurship.**

When it comes to attitudes towards entrepreneurship, all four countries exhibit high rates of entrepreneurialism and positive perceptions towards entrepreneurship. However, our findings revealed that perceptions towards digital entrepreneurship are less positive driven by a lack of understanding of the sector.

This creates an additional barrier for young people to pursue digital entrepreneurship due to lack of support from their families and social pressure to find job opportunities in traditional sectors. Speaking about his experience one digital entrepreneur in Ghana said:

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*As a typical Ghanaian when you graduate from school, you are expected to get a job and start your life. So, if you choose to become an entrepreneur, especially in the digital space, when most likely your parents do not have a higher education or may have low literacy levels, then it becomes very difficult for them to understand what you are trying to do. Personally, it has been really difficult for me, and it's a battle that I haven't even conquered yet.*

Additionally, as the country overviews have shown, cultural and socio-economic barriers to African women's participation within digital sectors remain a challenge. One study found that women constitute only 29% of entrepreneurs, 30% of ESO founders, and 25% of investors within the African innovation ecosystem[180]. Our own findings corroborate this and in the next section we discuss how the pandemic has widened these gaps and threatened a lot of the progress previously made.

[180] AfriLabs, 'Needs Assessment Report'

## 5.6 Human Capital

As noted in the snapshots, digital skills and digital literacy emerged as a concern, with all four countries experiencing some form of skills shortages. Likewise, our interviews and roundtable discussions reveal that a major challenge that is seen to be holding back the development of African digital ecosystem is the shortage of talent with relevant skills for the fast-evolving digital economy. One hub leader in Ghana explained:

”

*We are doing a lot of training programmes, but there is still a big gap when it comes to getting technical people who can build products. The few who are available are taken up by corporates or global freelancing companies. Existing tech startups cannot compete for this talent. So, getting talent and specifically, affordable talent is a big issue. And I'm not just talking about tech talent, but we need growth hackers, people who understand data, marketing and finance people who understand tech. There is a big challenge around the talent gap which needs to be fixed.*

To explain what is driving this gap, some actors we spoke to pointed to traditional education systems which do not put enough emphasis on practical skills, are too bureaucratic and slow to adapt and are out of touch with industry needs. One leader of a software skills development programme in Uganda said:

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*Our higher education system emphasises more of the academic side of things. We have degrees in software engineering, computer science and information technology which are not really aligned to the context within the industry. I've seen so many students complete these degrees but are then not able to find meaningful employment which is very concerning. This is simply because we are not paying serious attention to how the industry is evolving.*

Similarly, one academic in Ghana noted:

”

*Our traditional universities mostly focus on theory, more than practice. And what we know about tech is that it evolves very quickly. And especially in the COVID world. COVID has shown the challenges and the opportunities in depth. And many of those opportunities are beyond what our traditional universities teach. We're seeing universities take too long to update their curricula and introduce new concepts. So, universities lagging behind industry, especially in tech, and much more so in a COVID world.*

# Conclusion



Our research has shown that over **all the technology markets across the four countries are growing**. This growth is driven mainly by mobile adaptation, however affordability and access remain significant limiting factors. It is also important to note that currently women, and those living in rural areas are being excluded from fully participating in the digital economy. Luckily, addressing infrastructure gaps particularly in rural areas is high on the agenda for both private and public actors.

Moreover, expedited by COVID-19, governments are starting to become more aware of the need to develop the digital economy as a means to employment and economic growth. Board level ICT frameworks exist in all four countries. However, policy gaps remain and in some instances, the impacts of positive policy initiatives are diminished by restrictive and punitive government regulations.

Even though entrepreneurship is regarded as a positive solution to unemployment and a way to increase financial and economic participation, cultural barriers prevent many women and youth from pursuing specifically digital entrepreneurship. In regards to skills, there is increasing emphasis on digital skills development from universities as well as private training organisation. However, overall education systems are not adapting and meeting the demand for advanced digital skills, which is a critical limiting factors to the development of the digital ecosystems.

A positive indicator that points to the development of the digital economy is the raise in investment into the tech markets. Investments continued to grow even during the time of the pandemic. Yet, all four ecosystems could benefit from an increase in patient, catalytic capital, as well as early-stage funding to startups as certain key sectors remain under-funded.

Digital innovation hubs are in the centre of all four innovation ecosystems and their numbers are growing. Still, funding constraints limit the support they are able to provide to startups and the ecosystem as a whole.

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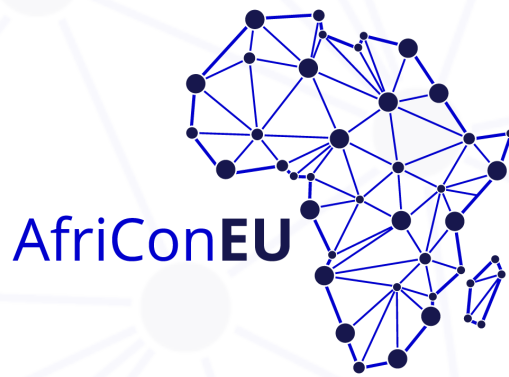
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