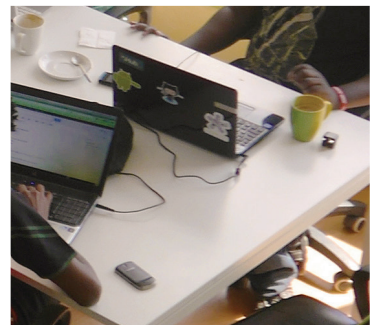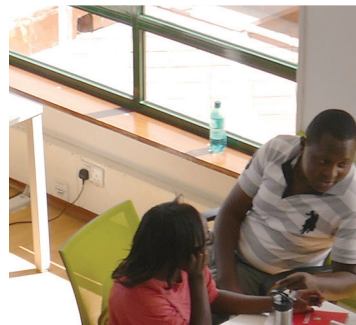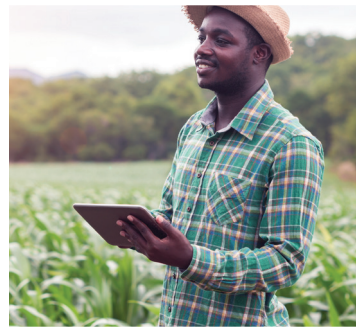# Regional good practices

Accelerating innovation, entrepreneurship and digital transformation in the Africa region

Regional good practices: Accelerating innovation, entrepreneurship and digital transformation in the Africa region

Acknowledgements

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Please consider the environment before printing this report.

Foreword

The COVID-19 pandemic has, more than ever, shown the enormous potential of digitization. It has drawn attention to the gaps that remain and called into question the socio-economic models that influence our lifestyles and habits.

Globalization, changing industrial geography, liberalization and the increasing use of information and communication technologies, despite the low penetration rate in Africa, has put additional pressure on communities by creating a global single market and enhancing competitiveness.

In recent years, Africa has witnessed extraordinary dynamism in its innovation ecosystem. To go further, sustainable development requires an inclusive digital innovation ecosystem accompanied by mechanisms for promoting youth entrepreneurship.

ITU research around global innovation shows that there is a growing digital innovation divide in many countries. ICT-centric innovation ecosystems have a critical role to play in fostering digital transformation that leads to economic inclusion, positive externalities and sustainable growth for communities, cities and countries.

Evaluating and building an environment that enables innovation based on best practices is undoubtedly a way to make local development prosperous, in countries, and therefore, in the region. I am confident that the resources and insights shared in this report will inspire Member States in the region to advance their efforts to create thriving digital innovation ecosystems.

Doreen Bogdan-Martin
Director, ITU Telecommunication Development Bureau

Executive summary

Digital transformation and systems innovation in the Africa region have made great strides in the past years as a result of the work of innovative entrepreneurs, progressive government initiatives on the country and pan-African level, and collaborative ecosystem builders all over the continent.

The intertwined role of entrepreneurship, innovation and technology is fuelling a paradigm that requires new thinking and insights. It is imperative to understand this paradigm at the global and regional level, and to have the capacity to act at the national level. The 2020 ITU Regional Innovation Forum for Africa, which took place as part of the ITU 2020 Global Innovation Forum, concluded that governments need to create locally tailored regulatory frameworks through inclusive processes. Corporate and government actors must collaborate – not compete – in order to not replicate each other. Young entrepreneurs must be put at the forefront of growth on the continent.

ITU research on global innovation shows that there is a growing digital innovation divide in many countries. ICT-centric innovation ecosystems have a critical role to play in fostering digital transformation that leads to economic inclusion, positive externalities and sustainable growth for communities, cities and countries. This ecosystem of entrepreneurs, entrepreneurial support organizations, academics, public and private sector stakeholders and financiers struggles to provide the necessary ingredients to fuel a positive digital transformation in society. Many practices in their ecosystems need renewal.

Indeed, ecosystems in the Africa region also face significant challenges: low levels of internet penetration, brain drain, lack of adequate training and education in ICT-centric innovation, low levels of local investment and insufficient infrastructure, while globally, technological innovation around the world has been accelerating at an unforeseen levels, and so, lagging behind has become a serious threat for local ecosystems. At the same time, the region is "leapfrogging" in many respects and this report has found many good practices that can be used to accelerate digital transformation and serve as a basis for better policies in countries where gaps have been identified. By replicating and amplifying good practices home-grown in the Africa region, countries can strengthen their digital innovation ecosystems, help their digital economies thrive and become global leaders. It is therefore imperative to share regional and global knowledge, expertise and experience.

This report is divided into five sections:

The Introduction gives the reader a hands-on manual to this report. It summarizes the key findings covered in the report and lays out the report objectives. This section also provides information and points to key resources for regional Member States to turn their countries into thriving digital innovation ecosystems. It also gives an overview of the role of innovation in sustainable economic and social development, basic background information about ITU work and mandate on digital innovation and the key challenges to innovation in the Africa region.

Section 2 provides regional context by providing innovation policy monitors for the engines growth and digital transformation enablers. This section sets the stage for a comparative analysis among countries using existing indices and provides insights on the current status of the enabling environment for innovation capacity at the regional level.

Section 3 highlights good practices from the Africa region. This section provides a quick snapshot of practices that represent complex solutions adaptable to other ecosystems, giving the reader an idea of whether or not a given practice is relevant or applicable to their own ecosystem challenges and goals by explaining which building blocks of ICT-centric innovation it pertains to.

Appendix A explains the report methodology. It also defines the language used in the report to help readers understand the research and analysis process. Understanding the research methodology is key to deciphering the relative rankings of countries' innovation capacity. This appendix also explains the key building blocks needed to accelerate transformation: innovation dynamics, innovation capacity and ICT innovation in key sectors.

Appendix B provides two full samples case studies from the practices identified in the report. Each practice demonstrates how a barrier has been successfully addressed and its potential to be turned into a working good practice in any ecosystem. The full case studies are available on request.

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1   Introduction

This report provides an overview of the comparative innovation capacity of the Africa region through ICT-centric Innovation policy monitors and shares insights about good practices strengthening the capacity to integrate ICT innovation in national development agendas.

Overall, although sub-Saharan Africa has benefited from rapidly growing innovation systems, its performance in the three engines of growth must improve for the region to become a real actor on the global stage. Nigeria for example, has an entrepreneurial ecosystem that is performing well, while its technological and innovation ecosystems need further support to turn the country into a thriving digital innovation ecosystem.

To understand these discrepancies, the report introduces two ICT-centric innovation policy monitors: the three engines of growth monitor and the enablers of digital transformation monitor.

The report notes that there are many good practices in the region fuelling the entrepreneurial journey. Each practice presented in the report was analysed based on its impact in a third ICT-centric innovation policy monitor, the ecosystem maturity map monitor. Each stakeholder group, at each of the five stages of the entrepreneurial journey, is assessed by its level of engagement to assess the maturity of the ecosystem. For example, the first stage of the journey for entrepreneurs is entrepreneurial interest, while for the public sector, it is having a vision and strategy. The monitor enables stakeholders to visualize the maturity of the ICT-centric innovation ecosystem and identify which practices to keep, which must be improved and which to replace.

Many of the traditional national innovation agencies responsible for guiding innovation dynamics can benefit from expanding their mandate to include building innovation capacity and integration of ICT innovation into key sectors; otherwise, they will be restricted to relying on other ecosystem stakeholders.

The importance and relevance of isolating good practices to replicate or scale up, as well as knowing which bad practices to replace, in order to create a thriving and mature ICT-centric ecosystem has been made clear throughout this report. However, understanding digital innovation and learning about the importance of good practices is only the first step in the innovation journey.

Vibrant ecosystems that are the envy of other countries require a culture where stakeholders organically leverage existing resources and continuously update their policies and programmes to remain competitive. Building an innovation culture at the country level is a journey[1]. Ecosystems go through stages of development, and in these stages, every stakeholder has a role to play, and actions to take.

To get a holistic assessment of the community or country capacity to innovate with ICTs, further engagement will be necessary, especially to be able to map the country context. This report does not for example offer an analysis of the ecosystem maturity map monitor, nor does it offer country-level details on the ecosystem maturity map.

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[1]   https://www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-TOOLKIT.2-2020-PDF-E.pdf

The ITU Digital Innovation Framework can offer the tools first highlighted in its 2017 report on good practices[2] and updated in the 2020 *Bridging the Digital Innovation Divide: A toolkit for developing sustainable ICT-centric ecosystem projects* [3]. Publications such as this report enable ITU to share its expertise with ecosystem builders. Interested stakeholders can request technical assistance to develop a national profile (see South Africa's for ICT-Centric Innovation Ecosystem Snapshot[4] as an example) or map two of the policy monitors at the country level, either through holistic country review (see Moldova's ICT-centric Innovation Ecosystem[5]), or a Digital Innovation Profile (see Montenegro: ICT Centric Innovation Ecosystem Snapshot[6]). Stakeholders can also engage in capacity-building courses, such as the Ecosystems 101 series, where they receive training and certification on ITU innovation framework.

This report is a starting point for regional stakeholders to understand the dynamics of ICT-centric innovation. The scope of this report has been to give a brief overview, a snapshot of this vast region, with regards to certain elements of its innovation ecosystems: to highlight key practices and gaps for the reader to understand how an innovation ecosystem works, where strengths lie in the region and which weaknesses need to be addressed.

This report attempts to cover a region consisting of 44 countries - aiming for a length accessible and content relevant to any reader meant that data had to be carefully curated and some was moved to the appendices. We tried to counter this by representing as many ecosystems as possible, selecting cases and data from as many countries as possible. Additional qualitative and quantitative research should be conducted to complement the information described here; however, this is out of the scope of this report. For technical assistance from ITU in developing a thriving ICT-centric innovation ecosystem in your country, please contact ITU-RO-Africa@itu.int.

Background

In the digital age, technology use and innovation are ubiquitous. However, countries and regions with limited capabilities struggle and require support to be competitive in the global market. Entrepreneurs who find opportunities worth exploring must undertake a journey to turn these opportunities into businesses, and deliver product and services to the market. A successful journey results in entrepreneurs delivering problem-solving innovations to their communities, and in regional or global markets. This success depends on enabling building blocks such as talent, infrastructure, capital, market, culture, policies, and an overarching national vision and strategy alignment that provides the key ingredients of robust and vibrant digital innovation ecosystems.

In many regions, innovators are still struggling. The ingredients needed to facilitate this journey are often missing. Without the required support, they are unable to compete on a regional scale, let alone globally, contributing to a growing digital divide both within and between countries.

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[2] ITU toolkit on the subject, Bridging the digital innovation divide: A toolkit for strengthening ICT centric ecosystems is available at https://www.itu.int/en/ITU-D/Innovation/Documents/Publications/Policy_Toolkit -Innovation_D012A0000D13301PDFE.pdf

[3] The report is available at https://www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-TOOLKIT.2-2020-PDF-E.pdf

[4] https://www.itu.int/en/ITU-D/Innovation/Documents/Publications/Brochure%E2%80%93DIP%20South %20Africa.pdf

[5] https://www.oecd-ilibrary.org/docserver/pub-810fd87d-en.pdf?expires=1588179691&id=id&accname= ocid54015561&checksum=F57F3808A2FB7FC11B5CC250C9E229F2

[6] https://www.itu.int/dms_pub/itu-d/opb/inno/D-INNO-PROFILE.MONTENEGRO-2020-PDF-E.pdf

To close this gap, it is necessary to provide stakeholders such as policy-makers, private sector executives and entrepreneurs with evidence-based guidance relevant to their regions, enabling them to design innovation policies and programmes for their organizations and countries.

Digital innovation is essential for a country to stay competitive in the global market. The ITU Digital Ecosystems Thematic Priority[7] identifies and amplifies relevant good practices to build countries' capabilities to be thriving members of the emerging global knowledge economy.

Objectives

ITU Members' priorities (detailed below) make it important to provide evidence-based guidance for each region on measuring their innovation capacity and changing its direction.

This report provides these insights as well as good practices which can be modified and replicated by champions in their own communities to help mainstream vibrant digital innovation ecosystems conducive to an accelerated digital transformation of society.

This report offers an overview of the opportunities inherent in accelerating digital transformation in the Africa region. It provides an understanding of the critical enablers and linkages needed to foster ICT-centric innovation and examines good practices that can serve as a basis for strengthening digital innovation ecosystems. It also promotes regional and international cooperation, and partnerships in building ICT-centric innovation ecosystems.

This report builds on the first such regional report, *Accelerating digital transformation good practices for developing, driving and accelerating ICT-centric innovation ecosystems in Europe*[8] which was published in 2018. It focused on good practices from Europe which can be examined, replicated and adapted to fit local contexts to develop thriving digital innovation ecosystems. Based on this previous report and enhancements to the ITU digital innovation framework, this report, *Regional Good Practices: Accelerating innovation, entrepreneurship and digital transformation – Africa region* is part of a series that will focus on good practices from each ITU region. Sharing and implementing good practices is crucial to improving the performance and productivity of entrepreneurship-driven innovation.

This report offers an overview of the opportunities inherent in accelerating digital transformation in the Africa region. It provides an understanding of the critical enablers and linkages needed to foster ICT-centric innovation in the region and examines good practices that can serve as a basis for strengthening digital innovation ecosystems. It also promotes regional and international cooperation, and partnerships in building ICT-centric innovation ecosystems.

Mandate

With innovation increasingly prioritized by policy-makers, and due to the outcomes of the 2017 World Telecommunication Development Conference and the 2018 ITU Plenipotentiary Conference, the Telecommunication Development Bureau (BDT) has embraced innovation as one of the priorities of the ITU Development Sector (ITU-D).

At the ITU 2018 Plenipotentiary Conference (PP-18) in Dubai, ITU membership established the Connect 2030 Agenda for Global Telecommunication/ICT Development; a shared global

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7   http://staging.itu.int/en/ITU-D/Innovation/Pages/default.aspx
8   https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2018/WSIS/Accelerating%20Digital%20Transformation.pdf

vision for the sustainable development of the telecommunication/ICT sector. Through this agenda, technological advances contribute to accelerating the achievement of the SDGs by 2030. Goal 4, in particular, is to "Enable innovation in telecommunications/ICT in support of the digital transformation of society"[9]. Target 4.1 is that by 2023, all countries will have policies and strategies that foster digital innovation.

The BDT main objectives, defined at WTDC, are to strengthen the ITU-D membership capabilities to integrate ICT innovation into their national development agendas, and promote a culture of innovation. This mandate was further developed at WTDC-17, with an additional goal of developing "strategies to promote innovation initiatives, including through public, private and public-private partnerships"[10]. Relevant regional initiatives have been incorporated for each region.

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[9]   https://www.itu.int/en/mediacentre/backgrounders/Pages/connect-2030-agenda.aspx#:~:text=The%20'Connect%202030%20Agenda%20for,Goals%20(SDGs)%20by%202030

[10] https://www.itu.int/en/ITU-D/Conferences/WTDC/WTDC17/Documents/WTDC17_final_report_en.pdf

2   ICT-centric innovation: Africa region

The Africa region covers almost all of the countries on the African continent, and its vastness, cultural and economic diversity could not be suitably represented if handled as one.

The region is large and encompasses 44 countries in total. For this report, it is therefore into four subregions, one managed by the ITU Regional Office and three managed by Area Offices. The ITU Regional Office in Addis Ababa manages activities in the overall region, as well as the following countries: Eritrea, Ethiopia, Kenya, Uganda, Tanzania, and South Sudan.

The ITU Area Office for Central Africa in Yaoundé, Cameroon manages Burundi, Cameroon, Central African Republic, Chad, Republic of the Congo, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Madagascar, Rwanda, and Sao Tome and Principe.

The ITU Area Office for Southern Africa based in Harare, Zimbabwe, manages Angola, Botswana, Eswatini, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Zambia, and Zimbabwe.

The ITU Area Office for West Africa based in Dakar, Senegal, manages Benin, Burkina Faso, Cabo Verde, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Niger, Nigeria, Senegal, Sierra Leone, and Togo.

2.1   Engines of growth

This section aims to map the level of development of the three engines of growth[11] the technology, innovation and entrepreneurship ecosystems in order to better understand the current state of the subregions through a snapshot of the countries' performances. This is a chance to identify gaps and illuminate opportunities to understand, develop and synchronize these drivers of development. Without coordinated and comprehensive intervention, countries are at risk of becoming late adopters of disruptive technologies; which could lead to the further widening of the digital innovation divide.

There are international indices that measure aspects of the three engines of growth: the innovation ecosystem, the entrepreneurial ecosystem and the technology ecosystem. The indices are: the ICT Development Index (IDI), published by ITU[12]; the Global Innovation Index[13] published annually by Cornell and the World Intellectual Property Organization (WIPO); the Global Competitiveness Index[14] published annually by the World Economic Forum (WEF), and the Global Entrepreneurship Index[15] published annually by the Global Entrepreneurship Development Institute.

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[11]   For more information on the Three Engines of Growth, please refer to Chapter 4.2.1 in the methodology section of this report.

[12]   https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis/methodology.aspx

[13]   https://www.globalinnovationindex.org/Home

[14]   http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf

[15]   https://thegedi.org/global-entrepreneurship-and-development-index/

While each of the indices (explained in the Methodology section of this report) is useful for measuring individual engines of growth and aspects of the engines of growth in an ICT-centric innovation ecosystem, they fall short when it comes to measuring the ecosystem. Thus, ITU extrapolated the data from the published indices to begin assessing the digital innovation ecosystem in the Africa region. This information is presented in the Table 1 and analysed further in regional charts.

Table 1: Key engine of growth indicators

Country	ITU ICT Development Index (ITU IDI 2017 ranking)[16]	Global Innovation Index (GII 2019 ranking)[17]	Global Competitiveness Index (WEF GCI 2019 ranking)[18]	Global Entrepreneurship Index (GEDI 2018 ranking)[19]
Angola	160/176	–	136/141	123/137
Benin	161/176	123/129	125/141	128/137
Botswana	105/176	93/129	91/141	52/137
Burkina Faso	162/176	117/129	130/141	129/137
Burundi	172/176	128/129	135/141	135/137
Cameroon	149/176	115/129	123/141	121/137
Cabo Verde	93/176	–	112/141	–
Central African Republic	175/176	–	–	–
Chad	174/176	–	141/141	137/137
Congo (Rep. of the)	–	–	–	–
Côte d'Ivoire	131/176	103/129	118/141	105/137
Dem. Rep. of the Congo	171/176	–	139/141	–
Equatorial Guinea	163/176	–	–	–
Eritrea	176/176	–	–	–
Eswatini	–	–	121/141	86/137
Ethiopia	170/176	111/129	126/141	110/137
Gabon	114/176	–	119/141	79/137
Gambia	144/176	–	124/141	117/137
Ghana	116/176	106/129	111/141	93/137
Guinea	166/176	125/129	122/141	130/137
Guinea-Bissau	173/176	–	–	–
Kenya	138/176	77/129	95/141	109/137
Lesotho	133/176	–	131/141	–

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16   https://www.itu.int/net4/ITU-D/idi/2017/index.html
17   https://www.globalinnovationindex.org/userfiles/file/reportpdf/gii-full-report-2019.pdf
18   http://www3.weforum.org/docs/WEF_TheGlobalCompetitivenessReport2019.pdf
19   https://thegedi.org/global-entrepreneurship-and-development-index/

Table 1: Key engine of growth indicators (continued)

Country	ITU ICT Development Index (ITU IDI 2017 ranking)[16]	Global Innovation Index (GII 2019 ranking)[17]	Global Competitiveness Index (WEF GCI 2019 ranking)[18]	Global Entrepreneurship Index (GEDI 2018 ranking)[19]
Liberia	–	–	–	119/137
Madagascar	169/176	121/129	132/141	125/137
Malawi	167/176	118/129	128/141	133/137
Mali	155/176	112/129	129/141	118/137
Mauritius	72/176	82/129	52/141	–
Mozambique	150/176	119/129	137/141	124/137
Namibia	118/176	101/129	94/141	61/137
Niger	–	127/129	–	–
Nigeria	143/176	114/129	116/141	101/137
Rwanda	153/176	94/129	100/141	91/137
Sao Tome and Principe	132/176	–	–	–
Senegal	142/176	96/129	114/141	103/137
Seychelles	90/176	–	76/141	–
Sierra Leone	–	–	–	132/137
South Africa	92/176	63/129	60/141	57/137
South Sudan	–	–	–	–
Tanzania	165/176	97/129	117/141	115/137
Togo	156/176	126/129	–	–
Uganda	152/176	102/129	115/141	131/137
Zambia	146/176	124/129	120/141	102/137
Zimbabwe	136/176	122/129	127/141	–

Source: Adapted from ITU IDI, Global Innovation Index, Global Competitiveness Index, Global Entrepreneurship Index

It is worth noting that none of the global indices covers all countries in the Africa region.[20] As each index therefore includes a different total number of countries, their rankings are calculated individually to provide a snapshot assessment of the engines as follows:

- **ITU ICT Development Index (IDI)**: Countries that rank between 1 and 44 have a strong performance (green); from 45 to 132 indicate insufficient performance (yellow), and from 133 to 176 indicate poor performance (red).
- **Global Entrepreneurship Index (GEDI)**: Countries that rank between 1 and 34 have a strong performance (green); from 35 to 102 indicate insufficient performance (yellow), and from 103 to 137 indicate poor performance (red).
- **Global Innovation Index (GII)**: Countries that rank between 1 and 32 have a strong performance (green); from 33 to 96 indicate insufficient performance (yellow), and from 97 to 129 indicate poor performance (red).

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[20] Most countries for which no data was available in each of the indices, are located in sub-Saharan Africa. The lack of data is also mentioned as an obstacle to research and thus evidence-based action taken in the AU African Innovation Outlook Report 2019 https://au.int/sites/default/files/documents/38122-doc-aio_3rd _edition_final_eng_repro.pdf (xvii ff.).

- **Global Competitiveness Index (GCI)**: Countries that rank between 1 and 35 have a strong performance (green); from 36 to 105 indicate insufficient performance (yellow), and from 106 to 141 indicate poor performance (red).

Using the available data for all countries in the Africa region (presented in Table 1), performance of the three engines of growth is presented in the Figures 1, 2, 3 and 4 below.

Figure 1: Technology ecosystem performance
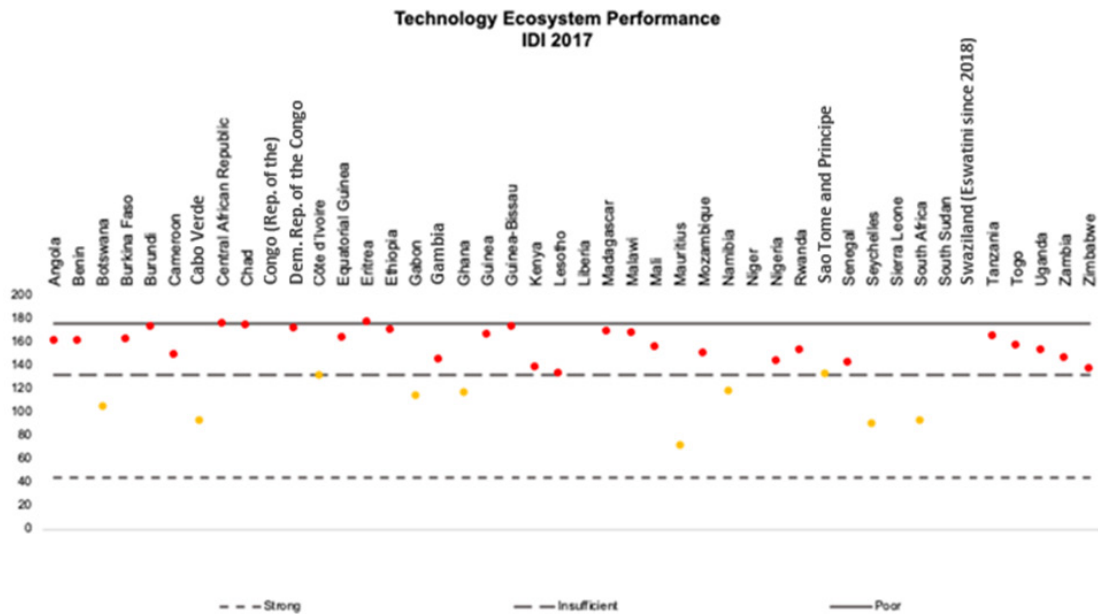
Source: ITU ICT Development Index 2017

As in previous years, the Africa region records by far the lowest average value in the ITU IDI, which — although higher than in the previous year — is not much more than half the global average. Only one country in this region (Mauritius) exceeds the global average value or ranks within the top half of the distribution, while 28 of the Africa region countries fall within the least connected country (LCC) quartile at the bottom of the rankings. This concentration of IDI values towards the bottom of the distribution also means that Africa has a narrower range of values than other regions, including other regions that are primarily comprised of developing countries, reflecting the consistency between levels of economic and ICT development.

The Africa region, however, has shown the highest proportional rate of improvement in the IDI as a whole, and for all three sub-indices, mostly due to growing numbers of mobile-cellular and active mobile broadband subscriptions, on very low starting points for the latter indicator in IDI 2016.

Figure 2: Entrepreneurial ecosystem performance
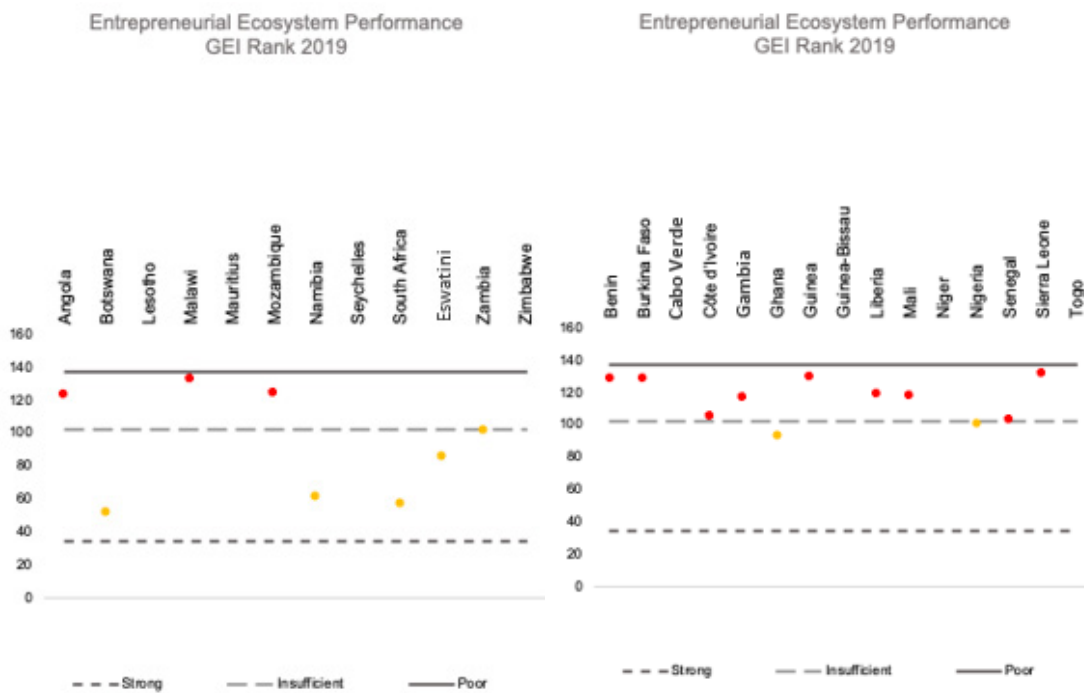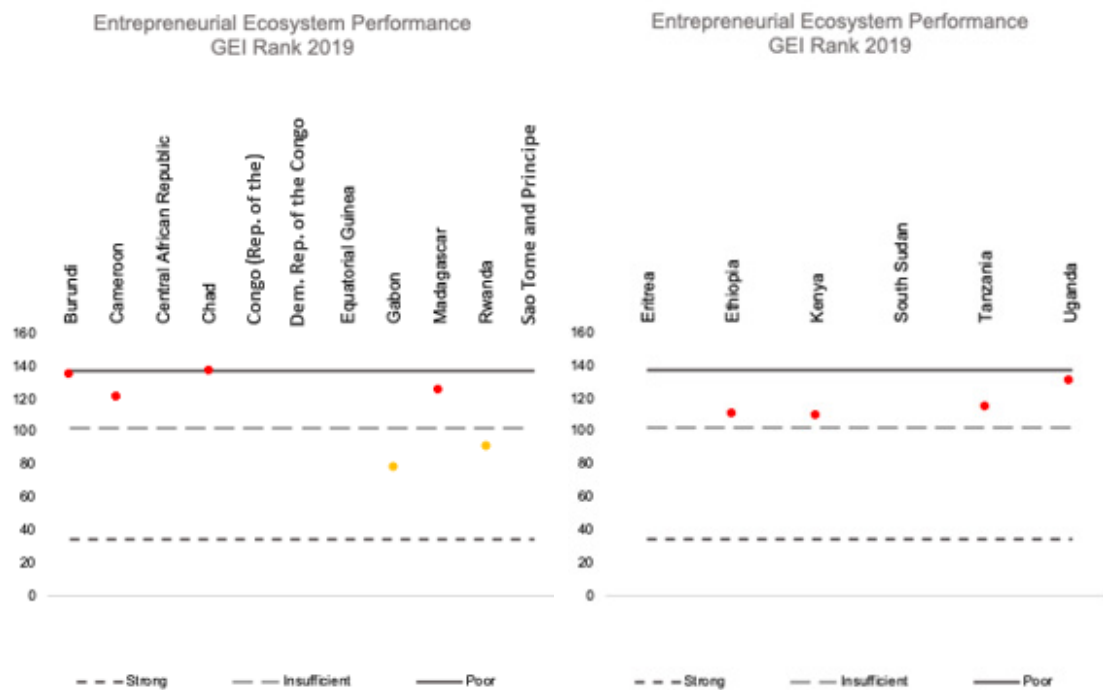
Source: ITU adapted from Global Entrepreneurship Index 2019

Nineteen countries in the region fall into the poorly performing bottom quartile, almost twice as many as countries in the insufficiently performing middle half. In this index, the differences between the subregions become most apparent: The southern Africa subregion is clearly performing much better than the other subregions. The report accordingly states that "sub-Saharan Africa can look to the examples of regional leaders Botswana and South Africa. Both countries demonstrate the possibility for great change and substantial improvement on relatively short time scales"[21].

According to GEI 2019, sub-Saharan Africa as a whole would see the quickest gains by improving start-up skills: improving access to the education and skills that support careers in entrepreneurship. When looking at the individual country score cards in the GEI report, it becomes apparent that this is not due to the individual score, i.e. the entrepreneurial qualities of the people in the ecosystem, but the institutional score, i.e. the quality of the institutions that support entrepreneurship. This is also reflected in the overall great strength in Opportunity Perception with which GEI 2019 credits the region.

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[21]   See https://www.itu.int/en/ITU-D/Statistics/Pages/publications/mis/methodology.aspx, page 14

Figure 3: Innovation ecosystem performance
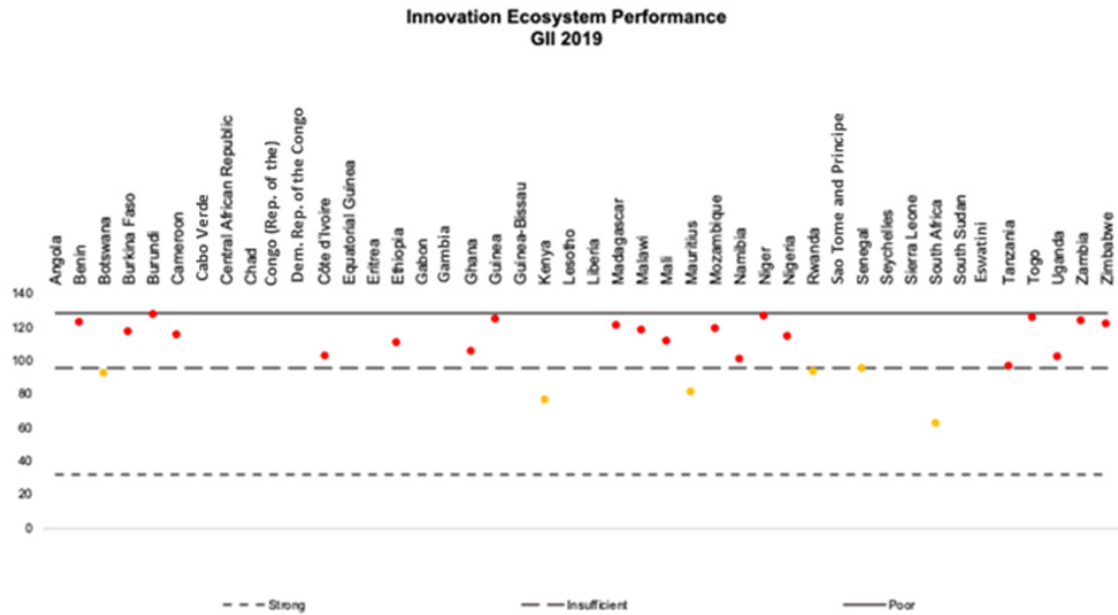
Source: Global Innovation Index, 2019

Although the graph based on the Global Innovation Index 2019 rankings appears mostly in red, with some yellow, meaning that the majority of countries in sub-Saharan Africa fall into the bottom quartile, this bleak interpretation changes when mapping the innovation performance against income levels and competitiveness rankings[22].

Figure 4: Innovation expectation
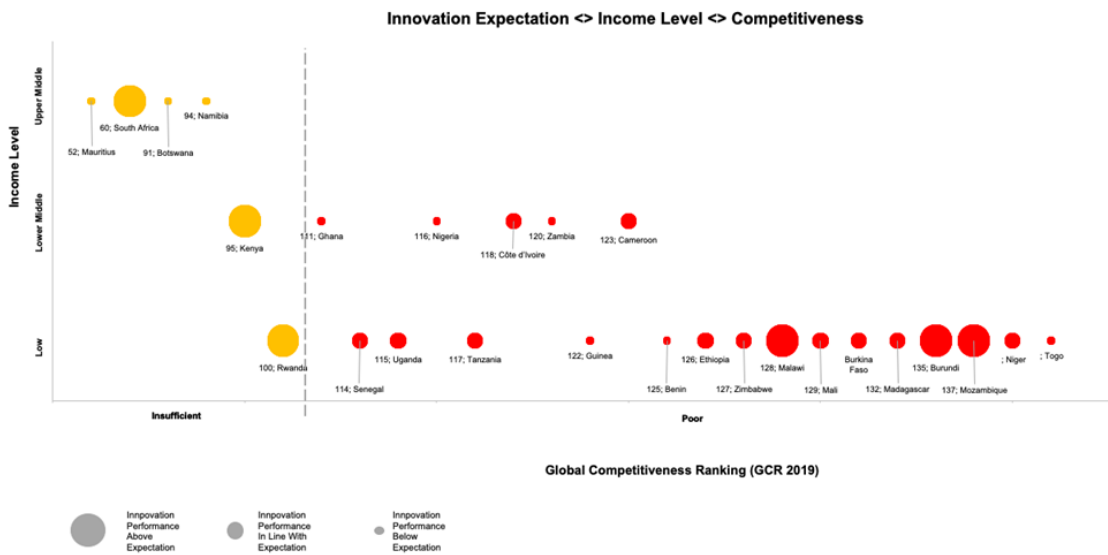
Source: Adapted from Global Competitiveness Index, 2019

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22   See https://www.globalinnovationindex.org/Home. https://www.wipo.int/edocs/pubdocs/en/wipo_pub_gii
       _2019.pdf Table A and Figure F

11

The Global Innovation Index 2019 only examines 129 economies worldwide, explaining that as economies might leave or enter the index, data might be missing or incomplete. The 2019 report states that "as in previous years, the Africa region shines in terms of innovation relative to level of development. Out of the 18 innovation achievers identified in the GII 2019, six (the most from any one region) are from the sub-Saharan Africa."[23] The six countries which are ranked by GII 2019 as above expectations for their level of development – South Africa, Kenya, Rwanda, Malawi, Burundi and Mozambique – fall into all income levels. Of the six countries which stand out for being innovation achievers, only South Africa is an upper-middle income country, while Kenya is a lower-middle income country, and all other four are low-income countries.

Of the six countries that the World Economic Forum 2019 Global Competitiveness Ranking identified as doing best in terms of competitiveness, the top four are also the countries with the highest income levels in the region: Mauritius, South Africa, Botswana, and Namibia. Kenya and Rwanda – both innovation achievers and arguably the countries in the region which have made the most difference in the global innovation landscape in recent years – are lower-middle and low-income countries respectively. Thus, the data support the claim "that when developing economies consistently invest in innovation, they can embark on a journey that leads to prosperity."[24]

However, along with Kenya and Rwanda, Mozambique, Malawi, and Madagascar have been innovation achievers at least three times in the previous eight years, and Burundi entered the GII only in 2019 and immediately was identified as an innovation achiever. The nine economies performing below expectations in the region are spread equally about all three levels of income. Both these facts demonstrate that innovation in isolation does in fact not automatically lead to greater competitiveness or higher income levels but is just one engine of growth.

Good practices can be found in each subregion, but not yet enough to take the ICT-centric innovation ecosystems to their full potential. Most countries in the region have underperforming engines of growth; translating to gaps in performance when it comes to their ICT-centric innovation ecosystems.

Table 2 uses these indices as a proxy for the engines of growth. The entrepreneurial ecosystem is represented by the Global Entrepreneurship Index, the technology ecosystem is represented by the ITU IDI and the innovation ecosystem is represented by the Global Innovation Index.

2.2   ICT-centric innovation performance

Table 2 uses a colour-coding system with the following parameters:

- Green indicates strong performance and presence of good practices. The threshold was set for a country in the top quartile (the top 25 per cent) based on the overall index ranking.
- Yellow indicates insufficient performance but presence of some good practices. The threshold was set as a country within the middle quartiles of the ranking (between 26 and 75 per cent).
- Red indicates poor performance with absence or very little good practices. The threshold was set as a country falling within the bottom quartile (the bottom 25 per cent).

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[23]   See https://www.globalinnovationindex.org/Home, page xviii
[24]   See https://www.globalinnovationindex.org/Home, page 9

Table 2: ICT-centric innovation performance

Country	Income Level (GII 2019) (Note)	Entrepreneurial ecosystem performance (GEDI 2018)	Technology ecosystem performance (ITU IDI 2017)	Innovation ecosystem performance (GII 2019)
Angola	–	Red	Red	–
Benin	Low income	Red	Red	Red
Botswana	Upper-middle income	Yellow	Yellow	Yellow
Burkina Faso	Low	Red	Red	Red
Burundi	Low	Red	Red	Red
Cameroon	Lower-middle income	Red	Red	Red
Cabo Verde	–	–	Yellow	–
Central African Republic	–	–	Red	–
Chad	–	Red	Red	–
Congo (Rep. of the)	–	–	–	–
Côte d'Ivoire	Lower-middle income	Red	Yellow	Red
Dem. Rep. of the Congo	–	–	Red	–
Equatorial Guinea	–	–	Red	–
Eritrea	–	–	Red	–
Eswatini	–	Yellow	–	–
Ethiopia	Low	Red	Red	Red
Gabon	–	Yellow	Yellow	–
Gambia	–	Red	Red	–
Ghana	Lower-middle income	Yellow	Yellow	Red
Guinea	Low	Red	Red	Red
Guinea-Bissau	–	–	Red	–
Kenya	Lower-middle income	Red	Red	Yellow
Lesotho	–	–	Red	–
Liberia	–	Red	–	–
Madagascar	Low income	Red	Red	Red
Malawi	Low income	Red	Red	Red
Mali	Low income	Red	Red	Red
Mauritius	Upper-middle income	–	Yellow	Yellow
Mozambique	Low income	Red	Red	Red
Namibia	Upper-middle income	Yellow	Yellow	Red
Niger	Low income	–	–	Red
Nigeria	Lower-middle income	Yellow	Red	Red
Rwanda	Low income	Yellow	Red	Yellow
Sao Tome and Principe	–	–	Yellow	–
Senegal	Low income	Red	Red	Yellow
Seychelles	–	–	Yellow	–

Table 2: ICT-centric innovation performance (continued)

Country	Income Level (GII 2019) (Note)	Entrepreneurial ecosystem performance (GEDI 2018)	Technology ecosystem performance (ITU IDI 2017)	Innovation ecosystem performance (GII 2019)
Sierra Leone	–	Red	–	–
South Africa	Upper-middle income	Yellow	Yellow	Yellow
South Sudan	–	–	–	–
Tanzania	Low income	Red	Red	Red
Togo	Low income	–	Red	Red
Uganda	Low income	Red	Red	Red
Zambia	Lower-middle income	Yellow	Red	Red
Zimbabwe	Low income	–	Red	Red

Note: Adapted from the 2019 Global Innovation Index. https://www.wipo.int/edocs/pubdocs/en/wipo _pub_gii_2019.pdf

2.3   ICT-centric policy and strategy

Having separate, siloed policies on innovation, entrepreneurship or technology, while a start, is not enough to enable a country's digital innovation ecosystem. To prompt the digital transformation of country economies and ensure their global competitiveness, they require policies that intersect and thus simultaneously impact all three ecosystems. The existence of policies in and of itself does not equal a complete picture of a country's ICT-centric innovation ecosystem. However, it is still necessary to be aware and assess the implementation and comprehensiveness of the existing policies for the three engines of growth, as well as how they complement one another to both understand the degree to which a country has prioritized ICT-centric innovation, and how effectively it can enable the ICT-centric innovation ecosystem.

Without policies that specifically target ICT-centric innovation, it can easily fall through the cracks. For example, an entrepreneurship policy may enable start-ups and SMEs in specific sectors and overlook technology entrepreneurship; while a technology policy may focus solely on state technology development and fail to consider the role of start-ups in driving innovation.

According to the *Benchmarking Report on Small Business and Start-up Acts in Africa* by the Innovation for Policy Foundation (with support from *Agence Française de Développement* (AFD)), "19 African governments have enacted [...] Small Business Acts (SBAs) and Startup Acts, instruments with a transversal scope, aiming to boost the creation and development of SMEs (Small and Medium Enterprises). SBAs and Startup Acts are laws, primarily designed with a national scope. They differ from SME policies and strategies (which are more commonly used) in their binding nature"[25].

As opposed to Small Business Acts, start-up acts do in fact focus on "new firms with high growth potential"[26] and take into consideration that the overwhelming majority of those exist at the intersection of the innovation, entrepreneurship and technology ecosystems. The two existing start-up acts in the Africa region, in Senegal and in Tunisia, describe their target stakeholders

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[25]   https://i4policy.org/resources/benchmarkingstudy
[26]   Ibid.

in differing terms, the common denominators being that start-ups are less than eight years old, and show high growth potential based on an innovative business model.

Providing binding laws provides developing economies with the chance to put themselves on the global map as attractive ecosystems for ICT-centric innovation. The first start-up act was introduced in Italy in 2012, with the Tunisian Startup Act of 2018 being the first on the African continent. In sub-Saharan Africa, only Senegal has adopted its Startup Act of 2019 so far, while the cabinet of Mali has approved of a draft which is yet to be adopted. Start-up acts are currently being developed in Benin, the Democratic Republic of the Congo, Ethiopia, Ghana, and Rwanda. An online consultation process –the first of its kind in the country – on the Startup Bill is underway in Kenya[27]. Start-up acts in the region are almost always co-created by different stakeholders in deliberation and consultation processes.

ICT-centric innovation policies are examined in the second table of the ICT-centric Innovation Policy Monitor. The table below provides an overview of existing laws for small business as well as start-up acts in the four subregions. It demonstrates that while most countries in the West and Southern African subregions have policies for small businesses, Kenya, Gabon and the Democratic Republic of the Congo are the only countries in the East and Central African subregions which provide binding laws.

Desk research of legislation regarding innovation and technology found that while several countries have formulated visions and strategies (see 2.3.1), not all of these have passed binding laws. As with the data for the *Three Engines of Growth* (see chapter 2.1), not all countries in the Africa region provide an overview of their legislation, therefore the following table presents a snapshot of small business and small and medium enterprise (SME) policies in those countries in the four subregions which have formulated visions or strategies regarding ICT-centric innovation ecosystem development goals. Policies that comprehensively enable the ICT-centric innovation ecosystem should thus be strengthened to reflect their complementarity and ensure their holistic development. For a full assessment of country-level policies, Member States should request technical assistance from ITU.

Table 3: Africa Region: ICT-centric innovation ecosystem strategies and policies

Subregion	Country	Policy	Policy Type (engine of growth)		
			Entrepre-neurship	*Technology*	*Innovation*
East Africa	Kenya	National Information, Communications and Technology (ICT) Policy 2019[28]	x	x	x
		Small and Micro Enterprises Act 2012[29]	x		
		Science, Technology and Innovation Act 2013[30]		x	x

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[27] https://startupbill.ke/have-your-say-on-the-bill/
[28] https://www.ict.go.ke/wp-content/uploads/2019/12/NATIONAL-ICT-POLICY-2019.pdf
[29] https://www.msea.go.ke/resources/downloads/82-micro-and-small-enterprises-act-2012#:~:text=AN%20ACT%20of%20Parliament%20to,Authority%2C%20and%20for%20connected%20purposes.
[30] https://www.nacosti.go.ke/images/docs/2018/november/Science-Technology-and-Innovation-Act-No.-28-of-20131.pdf

Table 3: Africa Region: ICT-centric innovation ecosystem strategies and policies (continued)

Subregion	Country	Policy	Policy Type (engine of growth)		
			Entrepre-neurship	Technology	Innovation
	Tanzania	SME Development Policy 2003[31]	x		
	Dem. Rep. of the Congo	SME Act 2009[32]	x		
Central Africa		SME Act 2015	x		
	Gabon	SME Act and SME Charter 2005[33]	x		
West Africa	Benin	Decree on National Charter for SMEs 2005[34]	x		
	Burkina Faso	SME Act and associated Decree on SME Charter 2017[35]	x		
	Côte d'Ivoire	SME Act 2014[36]	x		
	Ghana	National Business and Small Scale Industries Act 1981[37]	x		
		National Science, Technology And Innovation Policy (2017 – 2020)[38]		x	x
	Niger	SME Act 2010[39]	x		
	Nigeria	Trade Marks Act 2004[40]			x
		National Information Technology Development Agency Act 2007[41]		x	x
		Federal Competition and Consumer Protection Act 2018[42]	x	x	
	Senegal	SME Act 2008[43]	x		
		Startup Act 2019[44]	x	x	x

[31] https://www.mit.go.tz/uploads/documents/sw/1455890063-SME-Development-Policy.pdf

[32] https://www.leganet.cd/Doctrine.textes/Decon/Charte.pme.2009.pdf

[33] http://www.droit-afrique.com/upload/doc/gabon/Gabon-Loi-2005-16-promotion-PME-PMI.pdf

[34] https://docplayer.fr/630756-Charte-nationale-des-petites-et-moyennes-entreprises-et-des-petites-et-moyennes-industries-pme-pmi.html

[35] https://cga-bf.bf/wp-content/uploads/2017/01/charte_des_pme_du_burkina_faso.pdf

[36] http://www.commerce.gouv.ci/commerce/userfiles/file/loi-n-2014-140-poltique-ntle-pme.pdf

[37] https://moti.gov.gh/agencies.php

[38] https://mesti.gov.gh/wp-content/uploads/2017/07/Draft-National-STI-Policy-Document-10-July-2017.pdf

[39] https://docplayer.fr/8050957-Republique-du-niger-fraternite-travail-progres.html

[40] https://nlipw.com/research-laws-africa/trademarksact/

[41] https://nitda.gov.ng/wp-content/uploads/2020/11/NITDA-ACT-2007-2019-Edition1.pdf

[42] https://placng.org/i/wp-content/uploads/2019/12/Federal-Competition-and-Consumer-Protection-Act-2018.pdf

[43] http://www.droit-afrique.com/upload/doc/senegal/Senegal-Loi-2008-29-promotion-PME.pdf

[44] https://www.sec.gouv.sn/d%C3%A9cret-n%C2%B0-2019-800-du-17-avril-2019-relatif-aux-attributions-du-ministre-du-commerce-et-des-petites

Table 3: Africa Region: ICT-centric innovation ecosystem strategies and policies (continued)

Subregion	Country	Policy	Policy Type (engine of growth)		
			Entrepre-neurship	*Technology*	*Innovation*
Southern Africa	Botswana	Small Business Act 2004[45]	x		
	Malawi	Communications Act 1998[46]		x	
		Science and Technology Act of 2003[47]		x	x
	Mauritius	Information and Communication Technologies Act 2001[48]		x	
		Small and Medium Enterprises Act 2017[49]	x		
		Mauritius Research and Innovation Council Act 2019[50]			x
	South Africa	Small Business Act 1996[51]	x		
		Companies Act 2008[52]	x		x
		Technology Innovation Act 2008[53]		x	x
		Broad-Based Black Economic Empowerment Amendment Act, 2013[54]	x		
		Electronic Communications Amendment Act, 2014[55]		x	
	Zambia	Small Enterprises Development Act of 1996[56]	x		

45 http://www.ilo.ch/dyn/natlex/docs/ELECTRONIC/84997/94911/F1967252511/BWA84997.pdf
46 https://malawilii.org/mw/legislation/act/1998/41
47 https://www.ncst.mw/wp-content/uploads/2014/03/S_T_ACT.pdf
48 https://www.icta.mu/docs/laws/ict_act.pdf
49 https://enterbusiness.govmu.org/Documents/Archives%20New/The%20Small%20and%20Medium%20Enterprises%20Act%202017.pdf
50 http://www.mric.mu/English/Documents/Mauritius%20Research%20and%20Innovation%20Council%20Act(SLO).pdf
51 https://cisp.cachefly.net/assets/articles/attachments/02978_natsmalbusact102.pdf
52 https://www.gov.za/documents/companies-act
53 https://www.gov.za/documents/technology-innovation-agency-act
54 https://www.bbbeecommission.co.za/broad-based-black-economic-empowerment-act-46-of-2013/#:~:text=To%20establish%20a%20legislative%20framework,provide%20for%20matters%20connected%20therewith.
55 https://www.gov.za/documents/electronic-communications-amendment-act-0
56 http://www.parliament.gov.zm/sites/default/files/documents/acts/Small%20Enterprises%20Development%20Act.pdf

2.4 Enablers of digital transformation

The following section provides an overview of the current state of the seven enablers of digital transformation for the four subregions. The enablers are vision and strategy, infrastructure and programmes, talent and champions, capital and resources, markets and networks, culture and communities, and regulation and policy.

Because each enabler is one part of a whole, and each enabler is crucial for successful innovation activities, the combined efficiency of the enablers can be taken together to give a sense of the overall efficiency of the ecosystem.

2.4.1 Vision and strategy

One of the most prominent examples of a strategic vision to connect, innovate and transform the Africa region is the Smart Africa Alliance, a coalition of 30 African heads of State that drafted an actionable manifesto that aims to accelerate sustainable socioeconomic development on the continent, ushering in a knowledge economy through affordable access to broadband and the usage of ICTs (Smart Africa 2013).

While the country rankings above might demonstrate gaps in innovation capacity, many countries in the Africa region have a strategy or strategies to develop ICT-centric innovation ecosystem performance. Such strategies include the development of digital economies, as well as national, governmental and ICT sector strategic plans.

Central Africa

- **Rwanda ICT Sector Strategic Plan (2018-2024)**[57]: Rwanda has been propelling the growth of ICTs since 2000, which is showing major results in revenue generation through businesses. The ICT Sector Strategic Plan drew inspiration from the Smart Africa Manifesto, and has identified seven pillars (smart cities, fintech, smart agriculture, trade and industry, health, education, government, women and youth empowerment in ICT) and three key enablers (ICT capacity development, smart governance and intelligent infrastructures).
- **Chad Digital Development Strategy (2020-2030)**[58]: the aim is to modernize infrastructures and better integrate the use of digital technologies in all the key socio-economic activities by constructing a National Data Center, laying optical fibre networks throughout the country and modernizing mobile telephony networks. This plan has been validated in July 2020 in a two-day workshop with more than 100 participants.

East Africa

- **Kenya Digital Economy Blueprint**: **Powering Kenya's Transformation**[59]. Digital economy (Internet-based economy) is seen as a driver of innovation and competitiveness, and thus, this strategy aims to identify foundations, define imperatives and identify areas of intervention and seize opportunities to achieve national priorities through ICTs. This shall be supported by five digital economy pillars that include a digital government, digital infrastructure, innovation-driven entrepreneurship, and digital skills and values.

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[57] https://minict.gov.rw/fileadmin/Documents/Mitec2018/Policies___Publication/Strategy/ICT_SECTOR_STRATEGIC_PLAN__2018-2024_.pdf
[58] http://numerique.td
[59] https://www.ict.go.ke/wp-content/uploads/2019/05/Kenya-Digital-Economy-2019.pdf

- **Digital Ethiopia 2025: A Digital Strategy for Ethiopia Inclusive Prosperity**[60] is the first of its kind and a call to action for a coordinated effort between multiple stakeholders to advance Ethiopia's digital economy, which, as the report suggests, is at an early stage of development. In order to achieve this, four pathways are identified: agriculture, global value chains in manufacturing, services sector, and tourism competitiveness.

Southern Africa

- **Digital Society South Africa: National E-Strategy towards a thriving and inclusive digital future (2017-2030)**[61]: the strategy aims to position South Africa as a significant player in the development of ICTs and accelerate the uptake and usage of ICTs in other social and economic sectors through a single cohesive National e-Strategy in combination with national policies to establish an ecosystem as the basis of the digital society. It focuses on initiatives that have a significant, catalytic potential on growth and development with a long-term view to transition the economy to the digital industrial revolution.

- **Digital Malawi Government Strategy** (2019)[62] is a Government of Malawi project supported by the World Bank Group and aims to support the delivery of innovative and efficient e-government solutions and services for the improvement of delivery of public services and maximizing impact of ICTs on the achievement of the Malawi Growth Development Strategy (MGDS).

- **Digital Mauritius 2030**[63]: the Ministry of Technology, Communication and Innovation has developed a multi sector economy based on relevant and timely policy decisions taken over the years and is now laying emphasis on the formulation for an innovative, effective and sustainable public sector and at the same time creating an enabling environment for business facilitation development, including digital government, ICT infrastructure, innovation, talent management and cybersecurity.

West Africa

o **National Digital Economy Policy and Strategy of Nigeria (2020-2030)**[64]: The Federal Ministry of Communications and Digital Economy has developed this strategy to reposition the Nigeria economy and utilize the growth of the digital technology sector over the past few years to serve as a catalyst to rapidly develop the economy. Eight pillars of this development have been identified: developmental regulation, digital literacy and skills, solid infrastructure, service infrastructure, digital services development and promotion, soft infrastructure, digital society and emerging technologies, and indigenous content development and adoption.

o **Both Mali and Côte d'Ivoire have developed plans for the strategic digitalization**: Mali adopted the *Plan Mali Numérique 2020* (Digital Mali Plan 2020)[65] in 2014; Côte d'Ivoire developed plans in 2012 to kick-off the structural digital development of the country[66].

This is not an exhaustive list of the ICT strategies in the Africa region, but a selection that demonstrates government commitment to creating thriving ICT-centric ecosystems on the national level. In most strategies clear short- medium- and long-term goals are established based on detailed status quo and gaps analysis, and they recognize important technological trends relevant to their countries and other national goals. Most of them recognize the importance of the development of the other enablers of digital transformation outlined in this report, including

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[60] https://tapethiopia.com/wp-content/uploads/Ethiopia-Digital-Strategy-2020.pdf
[61] https://www.dtps.gov.za/images/phocagallery/Popular_Topic_Pictures/National-e-strategy.pdf
[62] http://www.pppc.mw/digital-malawi
[63] https://mitci.govmu.org/Documents/Strategies/DM%202030%2017%20December%202018%20at%2012.30hrs.pdf
[64] https://www.ncc.gov.ng/docman-main/industry-statistics/policies-reports/883-national-digital-economy-policy-and-strategy/file
[65] https://communication.gouv.ml/wp-content/uploads/2019/11/DraftMN2020.pdf
[66] http://www.telecom.gouv.ci/accueil/action/5

physical infrastructures, talent, capital or policies. These strategy plans demonstrate that actors from the public sector have visions and strategies, and some plans are recurring or building on previous local strategies, building on the key learnings from those. The role of the private sector, in the form of public private partnerships is often recognized, key ICT companies are asked to contribute to the plans. However, further examination, through stakeholder consultation. Citizen juries or co-creative workshops (such as the validation workshop in Chad) seem rare, even though these will also be needed to be able to assess the level to which all stakeholder groups in the countries have endorsed their country strategy.

2.4.2   Infrastructure and programmes

Hard infrastructure

The development of physical infrastructures is present in most of the countries' development strategies, and an intra-Africa cross-border connectivity project[67] is one of the Country Flagship projects of Smart Africa: Guinea, in collaboration with Tata has connected Mali, Guinea and Senegal; four more are being worked on to be closed by the end of 2020. The second phase consists of ten countries and scheduled to complete by 2021. The remaining Africa region countries, with priority on the Smart Africa members will be in the third and final phase, planned to be completed by 2025. This is an example of private and public sector investment for improved ICT access across countries.

On the country level, Kenya for example has developed a National ICT Infrastructure Masterplan[68], which, by 2029 promises increased coverage of the national e-government infrastructure especially in the rural areas to achieve high quality e-government infrastructure with 99.99 per cent availability, high reliability and security, affordable ICT services for citizens and an additional 3.9 per cent contribution to GDP. This is based on a World Bank estimate, which states that every 10 per cent increase in Internet penetration results in a 1.3 per cent increase in economic growth: investing in Internet infrastructures that support innovation ecosystems and digital economies generates high returns.

However, the ITU IDI report shows that the Africa region still has room for improvement: in 2017, only 16.3 per cent of Africa region households had Internet access, while this percentage was 51.46 per cent around the world. Fixed (wired) broadband Internet usage was understandably low (at 0.4 subscriptions per 100 inhabitants, the global number being 12.39) as building out cable-based infrastructures in countries covering vast areas of land is not feasible and returns on investment are low. It is clear that the population uses mobile Internet: there are 22.9 active mobile-broadband subscriptions per 100 inhabitants, compared to 52.23 subscriptions per 100 inhabitants around the world.

Digital infrastructures also require general infrastructures, such as electricity. The availability and reliability, or lack thereof might boost or hinder access to ICT infrastructure across the region. While ad-hoc solutions exist and grassroots might develop novel solutions (such as mini grids of renewable energy or community networks), and country-level solutions are emerging (see the Smart Africa Country Flagship project "Electricity for 125M families" in Rwanda[69]), the lack of

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[67]   https://smartafrica.org/services/intra-african-cross-border-connectivity/
[68]   http://icta.go.ke/powerassets/uploads/2020/06/The-ICT-Infrastructure-Master-Plan-2019-2029-.pdf
[69]   https://smartafrica.org/services/electricity-for-125m-families/

reliable electricity and ICT infrastructures hinders citizens' participation in and contribution to innovation ecosystems and thus, the growth of GDP.

Soft infrastructure

Based on the ITU ICT Development Index (ITU IDI), the level of education in the region is lower than the global level: while the mean years of schooling was 8.52 worldwide, it was 5.24 in Africa based on the 2017 report. Secondary gross enrolment ratio was at 50.48, while this number was 84.00 worldwide. Differences have also been high in third-stage education: the tertiary gross enrolment ratio was merely 9.49 in Africa, compared to 38.69 worldwide.

In addition to the ITU IDI, the "innovation linkages" pillar from the Global Innovation Index helps us better understand soft infrastructure, as it sheds light on university and industry collaboration, state of cluster development, R&D financed from abroad, joint venture strategic alliances and number of patent families filed by residents in at least two offices. Using this pillar as a proxy for soft infrastructure, we can establish that there are seven countries with a strong performance[70], ten countries record insufficient performance, and nine countries rank between 97–129, which indicates poor performance[71]

Nowadays access to information through the Internet or physical knowledge sharing mechanisms such as innovation and technology conferences, meet-ups and co-working spaces have started supplementing some of the traditional, formal education approaches in the start-up scene. This report includes good practice case studies about technology and innovation hubs (CcHub, IbuHub or Techvillage educate people who contribute to the innovation ecosystem) and training resources (e.g. SEDA South Africa, which offers training business skills, offered by the state), also for disadvantaged groups such as women (e.g. Go Girls ICT).

In order to take the Africa region ICT-centric innovation ecosystems to the next level, stronger linkages need to be created between, as well as incentive investment in, the three engines of growth to ensure the adequate development of hard and soft infrastructure that allows cross pollination and development of innovative solutions that can be taken to market and serve the needs of communities.

2.4.3   Talent and champions

The population in sub-Saharan Africa is young: while the median age in Africa today is just below 20, Nigeria for example (the country with the largest population in Africa) with an average age of 18 years has one of the youngest populations on Earth. At the same time, the lack of employment opportunities drives people to large cities or to other countries. While members of the diaspora often support their families financially, the brain drain caused by a lack of opportunities leads to a lack of talents that would contribute to the innovation ecosystem and without champions, youth don't have any role models whose footsteps they could follow. According to the GEDI report, the lowest average scores are in, amongst others, start-up skills: tertiary education is not as broadly accessible as in other regions, and entrepreneurial skills are less common.

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[70]   these are countries between ranking 1-32, i.e. Kenya 20th, Mozambique 22nd, Rwanda 23rd, Uganda 25th, Mali 27th, Burundi 30th, Tanzania 32nd

[71]   Burkina Faso 105th, Cameroon 102nd, Nigeria 100th, Zambia 111th, Ethiopia 112th, Côte d'Ivoire 113th, Togo 127th, Madagascar 128th, Niger 129th

Countries' competitiveness on a global level can be guaranteed through skills development, and countries in the region have clearly recognized this as a driver and addressed it in many of the national digital strategies. The support of ICT-centric entrepreneurship on a national level (see the Smart Africa Country Flagship Programme Entrepreneurship Youth Innovation and Job Creation by the Republic of Mali) and recognition of talents and champions (e.g. through national innovation competitions) are crucial steps in reversing such adverse societal effects.

According to the GII however, human capital and research performance, which includes education, tertiary education and R&D in sub-Saharan Africa is between insufficient[72] and poor[73]. Thus, existing schools and academic institutions, such as secondary and tertiary schools, as well as R&D and training centres are present, but their efforts to train talent to start businesses and enter the job market are not sufficient.

To address the lack of sufficient talent, training in ICT skills, as well as management, business planning and entrepreneurship should be introduced into all levels of education, ensuring that when talent comes out of secondary school, universities and other training institutes, they are able to cater to the needs of the private sector as well as have the ability to develop their own innovative start-ups, which are then able to grow into SMEs and high-growth firms.

2.4.4   Capital and resources

According to the GII, sub-Saharan Africa continues to have low levels of R&D investments compared to what other world regions spend, and low rankings in the Global Entrepreneurship Index (GEDI – GEI) which indicate that capital for investment in start-ups/small businesses is insufficient in the region. At the same time, GEDI also reports that sub-Saharan Africa shows greatest strength in Opportunity Perception: meaning that the population can identify opportunities to start a business and the institutional environment makes it possible to act on those opportunities, however, the lowest average scores include risk capital: the general risk climate is not as favourable in the region as in other areas, and the capital availability lags behind other regions.

The WEF Global Competitiveness Report (which in its analysis includes the availability of venture capital and human capital) states that the Africa region was overall the least competitive region in 2019, with 25 of the 34 economies assessed scoring below 50. The ranking is led by Mauritius (52nd), South Africa, the second most competitive in the region, improved to the 60th position, while Namibia (94th), Rwanda (100th), Uganda (115th) and Guinea (122nd) all also improved significantly. Among the other large economies in the region, Kenya (95th) and Nigeria (116th) also improved their performances. The remaining countries in the region have low levels of venture capital, as well as very little financing for SMEs, making it difficult for start-ups to grow into SMEs and high-growth firms.

As the Smart Africa Report *Africa's Blueprint for the Development of an ICT Start-Ups and Innovation Ecosystem*[74] also states, without capital, innovators and entrepreneurs will find it nearly impossible to develop their ideas beyond the start-up stage, survive the valley of death, and become SMEs and high-growth firms. Investments from the private sector, both domestic

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[72]   South Africa ranks 65th, Botswana 73rd, Zimbabwe 76th, Mauritius 77th, Benin 92nd, Senegal 93rd
[73]   Ghana ranks 97th, Cameroon 98th, Rwanda 102nd, Burundi 103rd, Kenya 104th, Mozambique 105th, Togo 108th, Madagascar 109th, Burkina Faso 110th, Namibia 112th, Côte d'Ivoire 113th, Uganda 114th, Nigeria 119th, Malawi 122nd, Mali 123rd, Ethiopia 124th, Tanzania 125th, Niger 126th, Guinea 128th, Zambia 129th
[74]   For further information and access to the report, please contact info@smartafrica.org

and foreign, are crucial to enabling ICT-centric innovation flourish. Examples of incentivizing investment in and systematically developing the ecosystem through other resources (such as office spaces or business support) include the Technology Innovation Agency and the Small Enterprise Development Agency in South Africa, as well as the Rwanda ICT Chamber. Before incentivizing innovation ecosystems through tax breaks and customs fees, the Kenya Revenue Authority (KRA) decided to propose a new Income Tax Act which implies a progressive taxation system, the core tax structure for reducing inequality, leading to the realization that a large proportion of Kenya's taxpayers are non-compliant, which, according to the KRA, reduces the effectiveness of the progressive tax regime.

Additional practices that countries in the region can introduce to incentivize investment in their ecosystems include minimizing uncertainty in the economic, social and political environment[75]; tax holidays on investments; real estate tax exemption and introducing free economic zones, which have minimal tax rates for investors. Non-financial resources include other necessary elements, such as office space, mentorship, networking opportunities and legal and business expertise. Start-ups need both financial (which can be public, private, or a mix of the two) and non-financial resources to be able to innovate in an ICT-centric innovation ecosystem.

2.4.5   Market and networks

If markets are not well established or clearly defined, the job of the entrepreneur is difficult: the presence of effective market frameworks (North, 1990 in GEI 2018), are crucial in order for businesses to understand and define where they operate. This means that in terms of innovation ecosystems, the need exists, however, domestic markets are relatively underdeveloped and unsophisticated.

The WEF Global Competitiveness Report ranks product markets, for which the criteria include domestic competition and trade openness. Based on the report, most countries in sub-Saharan Africa do not have a large and/or stabilized enough market for ICT-centric innovations, demonstrating a need for increased markets[76].

When analysing market capabilities of entrepreneurs, the GEI also includes the criterion of internationalization: whether entrepreneurs want to enter global markets and whether the economy is complex enough to produce ideas that are valuable globally, and whether they have the capabilities to produce beyond domestic markets. The component average of internationalization in sub-Saharan Africa is currently only at 15 per cent (GEDI GEI 2018, page 12).

In order to develop innovative solutions, it is required in innovation ecosystems that scientific clusters and networks of R&D contribute to the process, and at the same time, entrepreneurial clusters are often tightly linked to university research. As stated by the Global Innovation Index, currently none of the top 100 science and technology clusters of the world are in sub-Saharan Africa (GII 2019 pp 61-80), only some so-called "noise" can be identified in certain areas of the region (e.g. around Johannesburg, Kampala, as well as alongside the Abidjan-Accra-Lagos

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[75]   http://www.oecd.org/gov/trust-reliability.htm
[76]   Out of 141 countries analyzed, Rwanda ranked 66th, South Africa 69th, Guinea 71st, Gambia 76th, Namibia 83rd, Ghana 85th, Kenya 88th, Senegal 94th, Botswana 95th, Côte d'Ivoire 96th, Nigeria 97th, Lesotho 102nd, Burkina Faso 103rd, Cabo Verde 104th, Eswatini 105th, Tanzania 107th, Uganda 109th, Zambia 111th, Cameroon 112th, Mali 114th, Madagascar 116th, Burundi 117th, Malawi 118th, Mozambique 121st, Democratic Republic of the Congo 127th, Gabon 134th, Ethiopia 135th, Zimbabwe 136th, Chad 141st.

nexus, *ibid*. p 67). At the same time, according to the GSMA Ecosystem Accelerator Report in 2019, there were 618 technology hubs and incubation centres on the African continent, from which 59 are based in South Africa, 55 are based in Nigeria and 30 in Kenya[77].

The C4DLab at the University of Nairobi is aiming to become a global point of reference for ICT research and innovation for sustainable development, however, more such examples are needed in order for networks and clusters to be created, which ensure that innovators have the necessary resources they need to develop their ideas and successfully undertake the entrepreneurial journey. These need to exist at a level high enough to help develop the competitiveness of the innovation ecosystem.

2.4.6   Culture and communities

The WEF Global Competitiveness Report includes four criteria in its assessment of a country's entrepreneurial culture: attitudes towards entrepreneurial risk, willingness to delegate authority, growth of innovative companies and companies embracing disruptive ideas. Entrepreneurial culture in their definition is thus a mix of human attitudes towards entrepreneurship and growth, which is measurable.

Using the Global Entrepreneurship Index, it is possible to develop an overall understanding of entrepreneurial culture in the region. Out of the 44 countries that are in the Africa region, 30 are listed in the report. The top five countries in the region are Botswana (risk acceptance being the strongest area at 76 per cent, but Risk Capital being the weakest area at 14 per cent), South Africa (Product Innovation being the strongest area at 69 per cent and start-up skills the weakest at 7 per cent), Namibia (excelling at Product Innovation at 96 per cent, and weakest area Startup Skills at 8 per cent), Gabon (Networking is the strongest area at 57 per cent and Risk Capital the weakest at 8 per cent) and Eswatini (Risk Capital being the strongest area at 62 per cent and Startup Skills the weakest at 5 per cent).

According to the GEI, the lowest average scores are in the area of risk acceptance, which is problematic because of the personal entrepreneurial traits, fear of failure is one of the most important obstacles to a start-up. Willingness to take risks is low, and aversion to high-risk enterprises can cause a lack of entrepreneurship, which results in weaker innovation ecosystems. Therefore there is significant room for improvement when it comes to entrepreneurial culture and community in the region: whether it comes to people being able to identify opportunities for entrepreneurship or whether the regulatory environment is perceived as supportive of such endeavours.

Much journalistic and anthropological attention has been paid to the relationship between cultural norms and an entrepreneurial mindset, especially the need for critical thinking and embracing of failure. Until quite recently, most of these accounts agreed that entrepreneurs were regarded as taking irresponsibly high risks – especially those whose families had put them through university before they chose their own business over a corporate or government career – and as social failures when failing economically. With the growing popularity of Western, Chinese, and also African entrepreneurial role models, and with the growing number of successful start-ups and exits on the continent, the stereotypes seem to be shifting.

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[77]   https://www.gsma.com/mobilefordevelopment/blog/618-active-tech-hubs-the-backbone-of-africas-tech-ecosystem/

Cultural norms regarding gender in some – though by far not all – countries make sub-Saharan Africa the region with the world's highest rate of women entrepreneurs, and "the only region in the world where more women than men are entrepreneurs", as Diariétou Gaye, World Bank Director of Strategy and Operations for the Africa Region, already noted in 2018.[78] However, most of these businesses are micro businesses with no employees and little opportunity to grow. When it comes to ICT-driven entrepreneurship, women are much less represented than men, with women led or co-founded companies comprising single digit percentages in all studies.

Innovation and knowledge-sharing hubs, co-working spaces and communities can foster entrepreneurial culture and change the cultural perception of entrepreneurship. The South African Small Enterprise Development Agency and the Rwanda ICT Chamber aim to develop the local entrepreneurial culture, and local hubs, such as CcHub, IbuHub or Techvillage develop entrepreneurial communities that can exchange knowledge, experience, resources and create a sense of belonging. It is important that the countries invest in entrepreneurial culture, and this can be done by incentivizing people to become entrepreneurs through favourable policies for start-ups, generous insolvency regulations to provide confidence in risk-taking ventures, subsidies and channels for start-ups to find investors, and a sophisticated market that will allow innovators to sell their products and services.

2.4.7   Policy and regulation

Policies are key to creating a strong foundation for innovation ecosystems, as they help create stable, reliable and predictable environments through regulation that help start-ups fail and recover and grow into SMEs. As the GII 2020 report states, the UN General Assembly attested to the relevance of policies, and also ensuring that the impact of these is measurable: the 2019 resolution of UNGA on STI for Sustainable Development encourages "efforts to increase the availability of data to support the measurement of national innovation systems (…) and empirical research on innovation and development to assist policymakers in designing and implementing innovation strategies" (GII 2020). Data-driven policy making through research is an activity that the C4DLab at the University of Nairobi is championing.

The GII 2020 includes a "government effectiveness index", which is a standardized index that reflects perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government commitment to such policies[79]. The percentile rank (which indicates rank among all countries in the world) of government effectiveness in 2019 in sub-Saharan Africa was 26.35, the lowest compared to the other regions of the world. The regulatory and policy environment needs improvement for entrepreneurship to really flourish. Policies and regulations that protect intellectual property (IP), which make it easy and affordable to start a business and reduce risk in case of business failure, differ greatly from country to country and within countries.

With its focus on Africa, the African Innovation Outlook (AIO 2019)[80] also highlights the vast differences in policy environments between different countries, as well as differences between developed and developing economies in terms of where innovation is happening. The AIO emphasizes that the African Development Bank has been encouraging policy intervention in

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[78]   https://www.worldbank.org/en/news/opinion/2018/11/29/women-entrepreneurs-the-future-of-africa
[79]   http://info.worldbank.org/governance/wgi/#home in GII 2020 report
[80]   https://au.int/sites/default/files/documents/38122-doc-aio_3rd_edition_final_eng_repro.pdf

the main driver of innovation (and thus source of job creation): informal economy. It points out that governments and policy makers in Africa are interested in policy questions such as the extent to which innovation is sustainable, inclusive, green, or promotes (or impedes) equity, and raises the question how such impacts can be measured. Impact planning, measurement and evaluation needs to be supported with data. And while it is important that innovation ecosystems aim for data minimalism (i.e. that only data are collected that will be used and is necessary) and for the secure storage and anonymization of that data, the Africa region needs to develop its data collection practices in order for data-based decision making to become embedded in its policy, regulatory and legislative processes.

Good examples of approaches to creating stable and reliable regulatory and policy frameworks include Smart Africa, the pan-African platform, which in its manifesto states that the participating countries will support ICT and broadband investments "by continuously advancing and harmonizing our policy environments to ensure they are enablers, rather than constraints to universal access"[81]. #i4policy, a gathering of ecosystem leaders, supports the emergence of relevant policy reforms driven by local communities of people affected by public policy, thus they engage in public consultation and recommendation processes to ensure that policies are relevant. Utilizing the #i4policy open source tool, multiple local organizations set up a platform to encourage public participation in the development of the Kenya Startup Bill[82], which will have a major influence on the innovation ecosystem in Kenya.

Improving policies and regulations for an enabling environment will require strengthening IP protection laws, making it easier (and more accessible) to start a business, providing mechanisms that allow people to pursue entrepreneurship without risk of insurmountable damage in the event of business failure and ensuring that competition is possible.

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[81] https://smartafrica.org/about/manifesto/
[82] https://startupbill.ke/have-your-say-on-the-bill/

3 Good practices accelerating digital transformation

This section highlights good practices that fuel digital transformation in the region by providing a brief snapshot of each case study. Every chosen case impacts one or more building blocks of ICT-centric innovation: innovation dynamics, innovation capacity and ICT innovation in key sectors.[83]

3.1 Africa Open Science Hardware (Ghana)[84]

Africa Open Science Hardware is a community of makers, hackers, practitioners and researchers in science and technology inclusive of government officials, private sector players and civil society across Africa. This practice impacts two of the building blocks of innovation:

- **innovation dynamics** by providing an alternative to traditional intellectual property (IP) and closed systems;
- **ICT in key sectors** by creating locally adaptable technologies, in particular for natural sciences and biotech research as well as medical appliances.

3.2 Botswana Innovation Hub (Botswana)[85]

The Botswana Innovation Hub (BIH) is a 'traditional' science and technology park and an innovative and networked organisation that promotes technology, entrepreneurship and commercialisation. This practice impacts two of the building blocks of innovation:

- **innovation dynamics,** by creating new scientific, technological, and indigenous knowledge-based business opportunities, fostering entrepreneurship and technology transfer to develop start-up companies and adding value to existing companies, generating knowledge-based jobs opportunities and by attracting innovative companies and institutions;
- **ICT innovation in key sectors** by working within key sectors such as biotechnology, ICT and ICT enabled services, cleantech, mining technologies and indigenous knowledge.

3.3 CcHub (Nigeria)[86]

Co-Creation Hub (CcHub) is an innovation centre dedicated to accelerating the application of social capital and technology for economic prosperity. It is the first open living lab and pre-incubation space in Lagos that was designed to be a multi-functional, multi-purpose space where work to catalyse creative social tech ventures takes place. The hub is a place for technologists, social entrepreneurs, government, tech companies, impact investors and hackers in and around

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[83] For samples of full case studies, see Appendix B.
[84] http://africaosh.com/
[85] https://www.bih.co.bw
[86] https://cchubnigeria.com

Lagos to co-create new solutions to the many social challenges in Nigeria. This practice impacts all three building blocks of innovation:

- **innovation dynamics** through its research and development unit;
- **innovation capacity** through start-up incubation, research and development unit, as well as content creation, methodology development and teacher training to support STEM (science, technology, engineering, and mathematics) education in schools;
- **ICT innovation in key sectors** with dedicated focus areas for health and for government.

3.4 Dzuka Africa (Malawi)[87]

Dzuka Africa incubates emerging social impact entrepreneurs, focusing on business training, co-working space provision and access to working tools or equipment, and focuses on social entrepreneurship and the creative sector. Through different programmes, Dzuka Africa further empowers youth and women with life and professional skills to enable them to be self-sustainable by building resilient start-ups. This practice impacts two of the building blocks of innovation:

- **innovation dynamics** by providing space for the innovation community of Blantyre and facilitating exchange with other stakeholders of the growing ecosystem;
- **innovation capacity** for entrepreneurs with a strong focus on the arts and creative sector, as well as on women, through training, mentoring and incubating start-ups.

3.5 HubCité/WoeLab (Togo)[88]

HubCité is an alternative and participative urban planning project that questions the classical regulatory and elitist approaches by proposing a model where the townspeople themselves take charge of the destiny of their neighbourhood. This practice impacts two of the building blocks of innovation:

- **innovation dynamics,** by shifting the focus from the global to the hyper-local, neo-vernacular level, and by focusing on replicable, open to all, low-high-tech solutions;
- **innovation capacity,** by providing a laboratory of social and technological innovation and incubation for collaborative start-ups.

3.6 IbuHub[89]/TechVillage[90] (Zimbabwe)

This good practice looks at two hubs in Bulawayo: TechVillage is a collaborative working space for early-stage entrepreneurs and also caters to the needs of coders and hardware makers, collaborating with the National University of Science and Technology (NUST). IbuHub identifies and brings together Africa's young entrepreneurs into a support ecosystem that grows technology and diverse innovation-centric start-up ideas into commercially viable ventures. This practice impacts two of the building blocks of innovation:

- **innovation capacity,** by co-creating a pipeline for tech start-up founders from Zimbabwe's leading university of science and technology to market;
- **ICT innovation in key sectors,** by engaging all relevant stakeholders of the local ecosystem of the commercial hub of Zimbabwe.

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[87]   http://dzukaafrica.org
[88]   http://woelab.tg
[89]   http://ibuhub.com
[90]   https://www.techvillage.org.zw/

3.7   Innovation for Policy (i4Policy) Startup Act Co-creation Process (Senegal)[91]

The process of co-creating the Senegal Startup Act, which was led by the government of Senegal and facilitated by the Innovation for Policy Foundation, illustrates the practice of co-creating policies through deliberation and consultation. The Innovation for Policy Foundation grew out of the #i4Policy movement which brings together innovation communities across 48 African countries shaping inclusive innovation policies with their governments.

This practice impacts one building block of innovation: innovation dynamics, by inviting innovation community leaders to articulate and share their views and recommendations for policies, and by co-creating the policies through an inclusive process of deliberation.

3.8   Junub Open Space (South Sudan)[92]

Junub Open Space[93] is a community innovation hub empowering and supporting entrepreneurs who develop innovative technological solutions for social challenges. Through training, mentoring and incubating start-ups based on the values of open culture, as well as regional and international outreach and networking, Junub Open Space sensitizes and creates awareness on peace building, sustainability, gender equity, youth and women empowerment within South Sudanese communities. The hub is a key actor in the young innovation ecosystem in the capital Juba and the country as a whole. This practice impacts two of the building blocks of innovation:

- **innovation capacity**, by supporting entrepreneurs in a post-conflict situation through training, mentoring and incubating entrepreneurs;
- **innovation dynamics**, by building a network of entrepreneurs, makers, researchers, peace activists, as well as connecting it to the private and public sector interested in identifying new models of economic development.

3.9   Kenya Revenue Authority (Kenya)[94]

The Kenya Revenue Authority (KRA) serves as the governmental agency responsible for the assessment, collection and accounting for all revenues due to the government, in accordance with the laws of Kenya. This practice impacts two of the building blocks of innovation:

- **innovation dynamics**, on the national level through facilitating Kenya's bureaucratic transformation proposing innovative, professional and Customer-Focused Tax Administration services and convening the necessary stakeholders and resources to implement smart intelligence and risk-based compliance strategies;
- **integrating ICT innovation into key sectors** such as the finance sector by leveraging ICTs to strengthen Kenya's administrative capacity, enhance transparency and fairness through organizational change and business process optimization.

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[91]   https://i4policy.org/
[92]   https://junubos.org/
[93]   https://junubos.org/
[94]   https://www.kra.go.ke/en/

3.10 Small Enterprise Development Agency (SEDA), South Africa[95]

SEDA is an agency and centre of excellence of the Department of Small Business Development (DSBD), which provides non-financial support to small enterprises and cooperatives in South Africa. This practice impacts two of the building blocks of innovation:

- **innovation capacity**, through developing, supporting and promoting small enterprises throughout the country;
- **innovation dynamics**, by ensuring their growth and sustainability, thus impacting the innovation and industrial ecosystem.

3.11 Vision 2030 (Kenya)[96]

Vision 2030, launched in 2006 as a presidential decision, is a long-term development blueprint for accelerating Kenya's transformation into an industrialized middle-income nation by the year 2030. This practice impacts two of the building blocks of innovation:

- **innovation dynamics**, by developing a cohesive and equitable society, macroeconomic stability, infrastructure, Science Technology and Innovation (STI) and security/public sector reforms;
- **ICT innovation in key sectors**, by working within key sectors such as infrastructure, public sector reforms, tourism, agriculture, trade, manufacturing or education and training.

3.12 Wennovation Hub (Nigeria)

Wennovation Hub is a Nigerian incubator, accelerator and co-working space founded in 2010 and present in Abuja, Kaduna, Lagos and Ibadan. This practice impacts two of the building blocks of innovation:

- **innovation capacity**, by helping start-ups through activities such as accelerators, consulting and mentorship;
- **ICT innovation in key sectors**, by working with innovative digital start-ups focusing on agriculture, healthcare, education, clean energy and infrastructure.

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[95] http://www.seda.org.za
[96] http://vision2030.go.ke

Appendix A: Methodology

This section describes the project research methodology. The first section explains the research goals and methods of the report as a whole. Each subsequent section explains: the necessary definitions to understand the report; namely the engines of growth, enablers of digital transformation, ecosystem maturity map and good practices; and the data collection and analysis methods used for each section.

A.1   Research goals and methods

The goals of this research were to understand the Africa region ICT-centric innovation ecosystem; understand ICT-centric innovation capacity based on the three engines of growth (technology ecosystem, entrepreneurial ecosystem and innovation ecosystem); provide a comparative ranking of the ICT-centric innovation ecosystems and identify good practices from the Africa region that can be used to build sustainable digital innovation ecosystems with ITU digital innovation framework.

This framework was first introduced in *Bridging the digital innovation divide: A toolkit for strengthening ICT-centric ecosystems*[97]. It enables countries to understand their digital innovation ecosystem challenges, opportunities to create ICT start-ups, nurture talent, and develop specific guidelines and recommendations, initiatives, programmes and projects to help create new jobs and new growth based on best practices.

This report was compiled primarily using desktop research and some survey methods. ITU collected evidence on the overall digital innovation ecosystem in the region using sources including peer-reviewed academic journal articles; books; government websites; reports from government, intergovernmental and non-governmental agencies and the private sector; and national and regional newspapers. In some cases, surveys were sent to collect additional information where possible, for example, on details of a good practice.

A.2   Monitoring ICT-centric ecosystems

A.2.1   The three engines of growth

The three engines of growth are key to a digital transformation journey: the national innovation ecosystem, the entrepreneurial ecosystem and the technology ecosystem.

- **National innovation ecosystem**: The national innovation ecosystem, which includes research institutions, academia and public sector entities such as national innovation agencies and public sector financial institutions, plays an invaluable role in the national innovation journey, particularly in kick-starting innovation.
- **Entrepreneurial ecosystem**: This includes the entrepreneurs, their support systems and the organizations that initially nurture the formation of enterprises through the "valley of death" and subsequently nurture their growth as SMEs. Often, tech start-ups that have the potential to become high-growth firms end up as SMEs because of the lack of a market or

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[97] https://www.itu.int/en/ITU-D/Innovation/Documents/Publications/Policy_Toolkit-Innovation_D012A0000D13301PDFE.pdf

appropriate business models. These support networks enable them to achieve their full potential.

- **Technology ecosystem**: The technology ecosystem includes high-growth technology companies and the ecosystems that support them. These include high-tech companies, their original equipment manufacturers, system integrators, firms in ICT sectors and business-to-business (B2B) technology platforms that support SMEs. These companies and their ecosystems are integrated into local or global value chains. This ecosystem development is critical to a country's ability to leverage technological innovation and to create high-growth industries and jobs.

Figure A.1: The three engines of growth
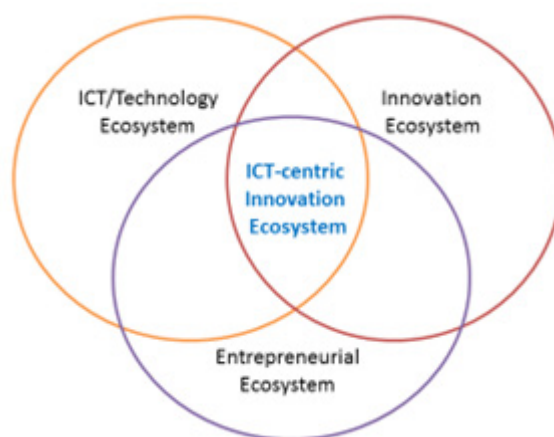
Source: ITU

A country's ICT-centric ecosystem is where the three engines of growth intersect. In an immature ecosystem, the three engines of growth lack synergy: ecosystem stakeholders operate in silos and do not align their initiatives toward a common vision. By contrast, in a mature ecosystem, members of the three engines of growth understand their roles and perform them individually while also working together to create policies and initiatives that enable a thriving digital innovation environment. Understanding and assessing the ecosystem makes it possible to identify the enablers needed to achieve the national vision. Enablers include programmes, policies and initiatives that foster digital transformation.

A.2.2   Data collection and analysis

With this understanding, data were collected by consulting published global indices, which can serve as a proxy for the three engines of growth. The indices are published by reputable academic institutions, international organizations and non-profit organizations[98].

The Global Innovation Index measures and ranks countries' efforts and success in innovation. The IDI measures ICT infrastructure and access, level of ICT use in society and the impact of efficient and effective ICT use. The Global Competitiveness Index is published in WEF Global Competitiveness Report. This index measures 12 pillars that the organization has identified as essential to national competitiveness; namely: institutions; infrastructure; ICT adoption;

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[98]   As mentioned previously, the indices are: (a) the ICT Development Index (IDI), published by ITU; (b) the Global Innovation Index published annually by Cornell and the World Intellectual Property Organization (WIPO); (c) the Global Competitiveness Index published annually by the World Economic Forum (WEF) and the (d) Global Entrepreneurship Index published annually by the Global Entrepreneurship Development Institute.

macroeconomic stability; health; skills; product market, labour market; financial system; market size; business dynamism, and innovation capability. Finally, the Global Entrepreneurship Index measures 14 entrepreneurship-enabling pillars: opportunity perception; start-up skills; risk acceptance; networking; cultural support; entrepreneurship by choice (rather than necessity); technology absorption; human capital; competition; product innovation; process innovation; high growth; internationalization, and risk capital.

ITU analysed and colour coded the information from these major indices to create the ICT-centric innovation performance monitor. The monitor provides a comparative assessment of the ecosystem performance according to the three engines of growth both within and between countries in the region. This way, the monitor can be used to reflect a set threshold for action by decision-makers.

A.3   Monitoring the enablers of digital transformation

A.3.1   The seven enablers of digital transformation

The ITU toolkit, *Bridging the digital innovation divide: A toolkit for strengthening ICT-centric ecosystems*, introduces the ecosystem canvas. It is a tool to help stakeholders understand the environment that innovators and entrepreneurs face when undertaking the journey to bring their ideas to market. The ecosystem canvas has seven pillars, each of which is a crucial component of an ICT-centric innovation ecosystem.

The pillars are:

- **Vision and strategy**: This pillar focuses on how the ecosystem is currently performing, what vision the stakeholders have, how the vision will perform, and what needs to be done to take the ecosystem from its current state to its ideal future state.
- **Infrastructure and programmes**: This pillar includes both hard infrastructure (such as connectivity, roads, electricity and public transportation) and soft infrastructure (such as knowledge-sharing mechanisms such as tech hubs, training resources and research institutions). Programmes can take advantage of this infrastructure to support the ecosystem.
- **Talent and champions**: Talent is the ecosystem human capital, who should possess hard skills such as engineering and programming, as well as soft skills such as management, communications and administration. A champion plays a leadership role in the ecosystem by initiating change, building cornerstone institutions and encouraging the contributions of new actors.
- **Capital and resources**: Start-ups cannot succeed without capital and resources. In the early stages, they need risk capital (such as from angel investors). As they mature, VC and private equity funds help them grow. The majority of this funding should come from private investors. To complement the work of financing start-ups directly, support networks and other ecosystem-building programmes need resources to operate successfully.
- **Markets and networks**: Start-ups need markets to serve. It is important for innovators and entrepreneurs to understand the depth of market needs, in addition to local, regional, and international access. Governments are often a significant purchaser of products and services, and a source of contracts for up-and-coming enterprises. Transparent public procurement processes are useful for start-ups. Networks and clusters are also needed in ecosystems to ensure that innovators have access to the resources and connections they need.
- **Culture and communities**: An innovative, entrepreneurial culture has key values such as risk-taking, an appreciation for failure, and a willingness to iterate and learn. These

values create a blueprint for behaviour across ecosystem stakeholder groups, exhibited by communities of innovators and champions through events and activities.

- **Regulation and policy**: Supportive policies and regulations can provide fertile ground for the efforts of entrepreneurs and innovators, while poorly developed policies can stifle innovation. There are a number of areas of policy and regulation that are critical to the success of the innovation ecosystem, including taxation, trade policy, intellectual property law, financial regulation and business regulation.

Within a country, these pillars provide the necessary ingredients to nurture digital entrepreneurship and innovation, looking at a more granular level when the three engines growth come together.

A.3.2 Data collection and analysis

For this report, desktop research was conducted using this framework to examine what is happening in an ecosystem and identify both challenges and possible solutions. The pillar framework identifies countries' performance in each of the seven pillars, contributing to understanding of their individual performance and their performance relative to the region. A complementary quantitative and qualitative approach can also be used to obtain the information needed for this framework. However, due to the complexity of collecting this data for all countries, this report is limited to desktop research. Any country interested in a comprehensive analysis of its ecosystem should request technical assistance from ITU to develop a profile of its digital innovation ecosystem.

A.4 Monitoring the ecosystem maturity map

Once there is an understanding of global and regional performance indicators, and an understanding of the enablers and indicators of digital transformation, it is crucial to understand the entrepreneurial lifecycle, which helps explain how innovation can move from ideas to creating small and medium businesses, high-growth firms and, ultimately, world-class exports.

A.4.1 The framework

Harvard economist Clay Christiansen, while studying the theory of disruptive innovation by companies, realized that the traditional ways in which companies deliver products and services to serve the market can be ineffective in creating competitive solutions and lasting companies[99]. If a product or service does not answer a need or desire, it is unlikely to sell, no matter how innovative it is.

In the context of the innovation journey, most statistics will show that 90 per cent of small and medium businesses fail because they cannot sustainably deliver the right products and services to market. Yet they are expected to be the engine for job creation and to grow into mature firms. What needs to be done by stakeholders to ensure innovation flourishes?

The entrepreneurial lifecycle shown below describes what must be done to create growth and economic inclusion. Therefore, for an innovation-driven economy to be competitive, it is necessary to nurture innovators on this journey to develop ideas into businesses.

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[99] https://hbr.org/2005/12/marketing-malpractice-the-cause-and-the-cure

Figure A.2: The entrepreneurial lifecycle
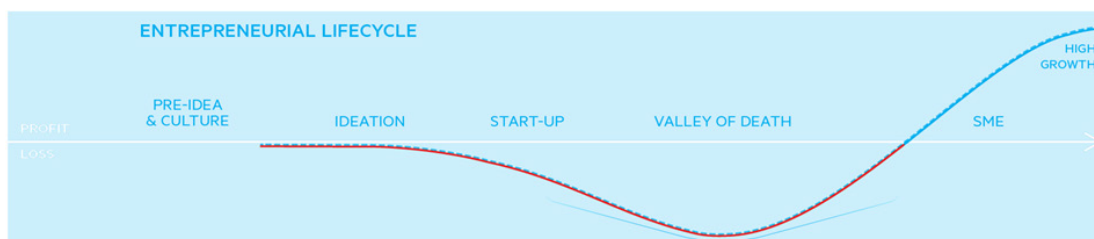
Source: ITU

What is required does not change from country to country, or from community to community. However, the approach to this job, and ways this job is done can change based on the context (such as opportunities) and stakeholder actions. For example, in Silicon Valley, financiers have a strong appetite for high growth and collaboration, which means that they will support innovators much longer through the valley of death until they can figure out a strong global business model that creates high-growth firms[100]. In locations with fewer resources and less collaboration, stakeholder actions may end up creating barely sustainable innovations which never grow. Without access to the right resources and collaboration, innovators will lack appropriate talent to create strong businesses, enabling policies that nurture them or access to value chains from established companies.

The question now remains: Who is doing what in this journey?

ITU has developed an ecosystem maturity map (also known as the stakeholder interface canvas) adapted from the valley of death curve. This tool helps map the roles and actions of stakeholders at each stage of the start-up lifecycle. Once the map is completed, it offers some guidance on how relevant a practice may be to a country or community. Failure to focus ecosystem interventions on the right practice element can waste valuable ICT investment and offer no relief to the competitiveness of an ICT ecosystem.

Figure A.3 represents a colour-coded version of the ecosystem maturity map for country A.

Figure A.3: Colour-coded ecosystem maturity map for country A

Entrepreneurship Phase	Pre-Idea	Ideation	Startup	The "Valley of Death"	SME
Entrepreneurs	Entrepreneurial Interest	Engage with problems	Develop Business Models	Build Collaboration	Expand
Finance	Research Funding	Seed Funding	Angel Investment	Venture Capital	Business Finance & Loans
Entrepreneurial Support	Entrepreneurial Events	Hackathons & Competitions	Co-working & Support	Incubators & Accelerators	Business Association
Private Sector	Success Stories	Research Programs	Lab programs	B2B & Support Services	Skill Training Programs
Academia	Entrepreneur Community	Basic Research	Spin Offs	Soft skill trainings	Human capital
Public Sector	Vision & Strategy	IP & R&D Support	Tax Support	Public Procurement	Trade Policy

Source: ITU

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[100] Blitz-scaling book, Reid Hoffman, founder, LinkedIn

In this country's ICT-centric ecosystem, most stakeholders are not sufficiently performing the necessary roles to enable a thriving ecosystem. While the entrepreneurial support networks are performing quite well, entrepreneurs, academia and the public sector must significantly improve their work in each stage of the entrepreneurial lifecycle. The private sector and the finance sector have some practices that are working, but for the most part, are in significant need of improvement if the country is to develop a competitive ecosystem with world-class firms and high-growth exports.

For more information about this canvas, download the ecosystem maturity map[101].

A.4.2   Data collection and analysis

Due to time constraints, the ICT-centric innovation policy monitor introduced in Section 2 has only been carried out at the country level due to the extensive level of engagement with stakeholders required to determine the maturity level of an ecosystem.

However, for the purpose of this report, it is necessary to understand how each good practice impacts each of the micro-jobs to be done. For detailed, country-level information, Member States are invited to contact ITU to develop a digital innovation profile for their country.

A.5   Monitoring good practices

A.5.1   Why use good practices?

A good practice is a proven practice that yields evidence-based impact and successful results and can be scaled up and replicated. Good practices are needed to help:

• develop flagship projects,
• comparatively assess the strengths and weaknesses of a practice, and
• undertake evidence-based policy or programme development.

Good practices enable actors to effortlessly add value to ecosystem initiatives. However, a good practice should not be replicated "as is", because every ecosystem and every project is different.

ITU has developed a framework for understanding the blueprint of any practice. Practices examined through the good practice canvas, can be replicated in other ecosystem projects, where they can add value and increase their chances of succeeding.

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101   https://www.itu.int/en/ITU-D/Innovation/Documents/Ecosystem%20Maturity%20Tool.pdf

A.5.2   Good practice canvas

Figure A.4: Good practice canvas
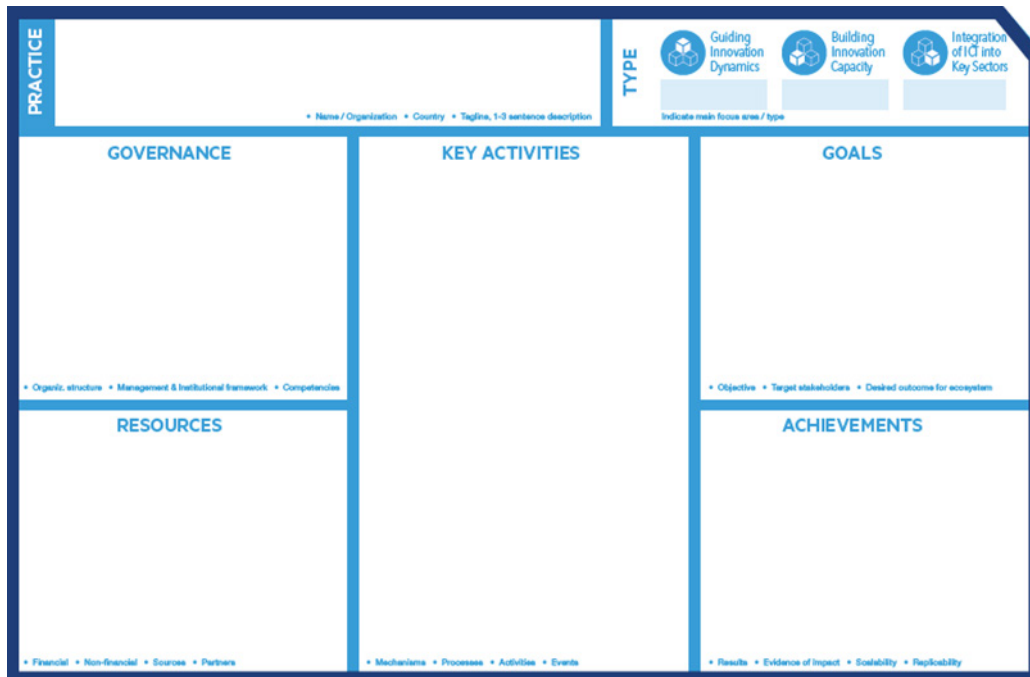
Source: ITU

This tool, composed of seven core pillars, helps the user extract the blueprint of working practices (including key function breakdowns of these practices, along with their corresponding key performance indicators and success stories). The result is a promising blueprint that will enable stakeholders to choose the specific building blocks of a good practice that they would like to adopt, replicate and share. The seven pillars of the good practice canvas are:

- **Practice**: a short description of a practice, the country or city where it is used, a tagline for a practice (if any) and an elevator pitch, or one- to three-sentence description.
- **Type**: this refers to the building blocks building blocks of ICT-centric innovation: (a) guiding innovation dynamics, (b) building innovation capacity (c) and integrating ICT innovation in key sectors.
- **Goals**: this refers to the practice specific objectives, target stakeholders and the desired outcome for the ecosystem.
- **Key activities**: this pillar refers to events, related initiatives, processes and other activities to offer insights into the operating processes of your practices.
- **Governance**: This pillar asks for relevant information about organizational structure (such as flat or hierarchical), management (leadership structure and long-term driver or vision) and institutional frameworks (such as NGO, government agency, etc.), and the competencies (skills and functional roles) required to carry out the practice.
- **Resources**: This refers to critical elements such as financial and non-financial resources such as human capital, equipment and processes. Additionally, an understanding of key partnership for the practice is also helpful as many non-financial resources are derived from partnerships. Furthermore, knowing the funding sources for a specific practice is useful when replicating it, as it can help identify suitable stakeholder groups that can provide the required resource.

- **Achievements**: This is where the practice is evaluated based on the following criteria:

  o   replicability, or how easily it can be copied to a different context;

  o   scalability, or the practice scope in achieving its goals; and

  o   evidence of impact on the ecosystem, or the practice effectiveness in achieving its goals and results, which refers to outcomes based on key performance indicators (KPIs) set by the practice.

A.5.3   Types of good practices

As mentioned throughout this report, good practices are organized around three key types which denote how they impact the overall ecosystem: guiding innovation dynamics, building innovation capacity, and integrating ICT innovation into key sectors. To have a competitive ecosystem, it is necessary to have a combination of all these practices.

A.5.3.1 Guiding innovation dynamics

- Is innovation on the map? How supportive of innovation is the general environment?

This first category, guiding innovation dynamics, refers to practices that enable digital innovation to exist. They support the general innovation environment.

Innovators need a suitable business environment, enabling policies and key programmes to develop appropriate technology solutions. Often, there are many policies and incentives in the general environment that promote entrepreneurship or sectors, but only for non-digital innovators. Thus, existing practices may need to be updated while new policies are developed to close the gaps.

A dynamic innovation environment requires regulatory and organizational settings which are coherent and which guide, facilitate and promote innovation culture, mindset, projects and programmes. Countries need a clear roadmap, vision and strategy, and key initiatives; created through "enabling policies, regulations, and rules balancing the old analogue and the new digital economy"[102].

Each stakeholder in the ecosystem must be able to benefit from their country's environment and work together rather than in silos. Entrepreneurs, for example, must have the means and knowledge to create appropriate solutions for their communities.

Good practices that guide innovation dynamics balance stakeholder collaboration and market forces in a way that will drive innovation, public-private partnerships and access to international markets. For example, policies such as reducing the cost of investment, and fiscal and financial policies can attract international start-ups, while start-up visas can attract talent. Start-up policies for growth could include tax incentives and funding incentives.

Often, practices have a regulatory basis to guide innovation dynamics, but they may not be effective, inclusive or operational. The practices may be missing mechanisms for execution, competing instead of creating synergies through collaboration. Traditional innovation agencies are an example of these type practices because they mostly operate in the innovation ecosystem

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[102]   https://www.itu.int/en/ITU-D/Regional-Presence/Europe/Documents/Events/2018/WSIS/Accelerating%20Digital%20Transformation.pdf

– one of the engines of growth. Newer organizations are needed to tackle the challenges of coordination, trust and cooperation that currently confront lagging ecosystems. These agencies need to work across the three engines of growth to nurture cross-stakeholder collaboration in countries.

A.5.3.2 Building innovation capacity

•   Are innovators equipped with the right tools, skills, know-how and resources to succeed?

The second type of good practices is **building innovation capacity**. This type of practice enables a sufficiently well-developed infrastructure and talent pool with access to resources in the ecosystem to solve challenges in their community. They equip innovators with the right tools, skills, spaces and resources to succeed.

There is a need to provide adequate, skills and knowledge as well programmes that encourage success. In globalized digital economies, access to skills and know-how has been democratized with the many online courses aimed at unlimited participation and open access via the Internet (MOOCs) from reputable organization, for example. Yet many communities struggle to access knowledge and resources. Lack of access to decent skills development initiatives and content, as well as the absence of spaces and programmes that enable innovators inhibit the innovation capacity of entrepreneurs, especially in developing countries.

Innovation hubs, tech parks, lab programmes and other similar arrangements involving multiple stakeholders have sprung up around the world during past few years to address the growing needs of ecosystems. Whether formal or informal, innovation infrastructures – which are essential for building an ecosystem innovation capacity– are usually clustered around higher-learning institutions. When domestic capacity is insufficient, access to regional or global networks and resources becomes necessary.

Lastly, innovators need a continuum of funds to bootstrap and develop their ideas. Without these resources, much of the ecosystem struggles. Collaborative models with academic institutions, and among entrepreneurial support institutions and private sector companies are essential in developing such capacity to ensure that talent is well equipped.

A.5.3.3 Integrating ICT innovation into key sectors

•   Is ICT innovation integrated across key sectors?

The third and final category is good practices that help integrate ICT innovation into key sectors so that start-ups and SMEs can realize their full potential and scale up beyond their niche, enabling transformation across other industries.

Ecosystems must focus on national development priorities and make linkages to other ecosystems. Without this focus and linkages, innovators will struggle with entry and scale-up to unlock opportunities. One place where they can find quick alignment is in the public sector. This is particularly important for start-ups, who can take advantage of government demand. This helps innovators with product testing, validation, establishing credibility and growing, while also helping the government digitalize its services.

Innovative entrepreneurial ICT ventures realize their full potential when they can tap into other industries beyond ICT. This is where the potential for digital transformation is greatest. Here, collaboration with the private sector plays a vital role. By partnering with start-ups, corporations benefit from new ideas, circumvent corporate red tape to test new innovations, rapidly create prototypes and benefit from the flexibility of entrepreneurial culture. At the same time, start-ups benefit from this partnership by accessing resources and infrastructure.

Another example is a cluster development initiative in which the ICT sector can drive innovation in non-ICT sectors. Cluster focus in a sector can help SMEs and large businesses digitally transform their value chains by enhancing their ability to create and deliver value in the marketplace. Here, the linkages between ecosystems and global networks of collaboration are important.

A.5.4   Data collection and analysis

Good practices were identified through pre-existing knowledge, desk research and networks. Data on each practice were collected through desk research, interviews with the practice owners and/or surveys; and analysed according to the pillars of the canvas. Using the Good Practice Canvas, the pillars of each practice are presented in the full case studies.

Appendix B: Full case study samples

This section provides two full case studies from the good practices identified earlier in the report. The case studies highlight the pillars of the good practice canvas[91] by providing:

- an overview of the practice, including its goals and target stakeholders;
- the type of case study;
- its governance structure;
- its partners and resources;
- its achievements.

It also provides an infobox with a summary on the practice impact on the entrepreneurial lifecycle, which is derived from the stages outlined in the ecosystem maturity map.

To access all case studies in their entirety, please contact the ITU Digital Ecosystems Thematic priority at ITU-RO-Africa@itu.int.

B.1   Africa Open Science Hardware (Ghana)

Africa Open Science Hardware (Africa OSH)[103] is a community of makers, hackers, practitioners and researchers in science and technology inclusive of government officials, private sector players and civil society across Africa. Together, they harness the power of open science to foster the development of cutting-edge research and create locally adaptable technologies. The particular focus of the network is on natural sciences and biotech research as well as the development of medical appliances.

Type

This practice impacts two of the building blocks of innovation: innovation dynamics and ICT innovation in key sectors.

Goal(s)

The main goal of Africa OSH is to create a conversation and set of actions on open science hardware, among African actors, and between them and the international community, in order to adopt open science hardware principles and practices appropriate to local contexts. Africa OSH contextualizes the Global Open Science Hardware Roadmap which lays out recommendations to make open hardware ubiquitous in science by 2025 through activities that enable anyone to gain knowledge and find information about OSH and/or the community and actions aimed at creating the necessary enabling conditions for the present and future of the OSH community.

Target stakeholders

The main stakeholders of Africa OSH are the 48 network members, mainly researchers, makers, hackers and innovators at the intersection of natural sciences and technology.

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[103]   http://africaosh.com/

Governance

Africa OSH is a loose network organizing the annual Africa OSH Summit as well as connecting its members throughout the year. There is no formal institution steering the network activities, however, it is associated with Kumasi Hive in Ghana.

Partners and resources

Africa OSH relies on the resources of its partners to support the further development of open hardware development in science in the Africa region. The key partners driving this vision are Science and Technology Innovation Centre and Laboratories (STICLab) (Tanzania), Association for the Promotion of Open Science in Haiti and Africa (APSOHA) (Cameroon), Kumasi Hive (Ghana), The Exploratory (Ghana), Global Lab Network (Ghana), and Gathering for Open Science Hardware (GOSH), an international initiative.

Key activities

Africa OSH activities include collaborative fabrication of open source hardware, such as the sayansiScope, a 3D Printed Low Cost Microscope, which has been developed in Tanzania based on the Openflexure design (University of Bath, WaterScope).

Africa OSH also works to democratize the use and adoption of DIY Bio and community biotechnology to drive biology research necessary for harnessing the power of Africa's biotechnology industry in education and research, e.g. through a partnership with the Open Bioeconomy Lab on understanding the molecular biology reagent accessibility issues in Africa, exploring business models around the local bio-manufacturing of these enzymes as an alternative for creating an open, sustainable and equitable bio-economy in Africa.

The organization also participates in publishing and scholarly communication in international peer-reviewed journals as well as through open access publishing; explores and supports possibilities for entrepreneurship based on open innovation; and conducts research on Intellectual Property and Open Licensing, as well as the Ethics of Openness.

Achievements

- Two editions of the Africa OSH Summit, 2018 in Kumasi, Ghana, and 2019 in Dar es Salaam, Tanzania. Each summit attracted participants from all over Africa and the world.
- Africa OSH has been represented at various conferences, such as the 2018 International Conference of the UNESCO Chair in Technologies for Development, or the 2018 re:publica digital conference in Accra.
- Opening of The African Institute of Open Science and Hardware with its main campus in Yaoundé, Cameroon.

Impact on the entrepreneurial lifecycle

Africa OSH has instilled good practices in the research and development related phases of the Entrepreneurial Lifecycle through its collaborative pan-African approach of harnessing the power of open source to foster the development of cutting-edge scientific research in the Africa region.

B.2   Botswana Innovation Hub Technopark (Botswana)

The Botswana Innovation Hub (BIH)[104] is a "traditional" science and technology park and an innovative and networked organisation that promotes technology, entrepreneurship and commercialisation. Its focal sectors include biotechnology, ICT and ICT enabled services, cleantech, mining technologies and indigenous knowledge.

Type

This practice impacts two of the building blocks of innovation: innovation dynamics and ICT innovation in key sectors.

Goal(s)

BIH aims to contribute to economic development and competitiveness, create new scientific, technological, and indigenous knowledge-based business opportunities, foster entrepreneurship and technology transfer to develop start-up companies and add value to existing companies, generate knowledge-based jobs opportunities and attract innovative companies and institutions.

Target stakeholders

BIH main stakeholders are entrepreneurs and the private sector.

Governance

BIH is under the Ministry of Tertiary Education Research Science and Technology, with a Board of Directors from diverse disciplines to perform fiduciary duties for the company. Its two subsidiaries are Botswana Innovation Hub Properties (BIHP), which has a mandate to develop and manage the science and technology park, and Botswana Innovation Hub Investments (BIHI), a special purpose vehicle to attract commercially viable and technology related investments. The Botswana Innovation Fund (BIF) is governed by a committee, which consists of independent members of the public from private sector and the business community with support from the BIH Secretariat, which has established a Fund Administration Office and acts as the secretariat for the fund.

Partners and resources

In 2008, the government committed budgets to commence project components such as the master-planning, design and construction of infrastructure, on a 57ha piece of land allocated for the project. This included the design and construction of 25 000m2 of offices, laboratories, conference and meeting facilities, sports and recreational facilities.

BIH signed an MoU Botswana Institute for Technology Research and Innovation (BITRI) which identified areas of collaboration on matters of research, technology transfer and commercialization amongst others. Other partners include Nubian Seed, Organozyme Technologies, SEEKit, Six Dots Studios, Vantage Properties, Aminaami, Bayon Holdings, Kalahari Honey, Leverage Point and Intelligent Transport Management System, Nimbus Engineering.

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[104]   https://www.bih.co.bw

Key activities

What differentiates BIH from other traditional STPs in the region has been the availability of incentives to residents, including 15 per cent corporate tax, flexibility in importing specialized labour, competitive telecommunications package, eligibility to training levies, and to the Innovation Fund (seed and early innovation funding), as well as favourable business and investment environment.

The company focuses its activities and output on the following strategic areas: develop and manage the Science and Technology Park, attract innovative companies and institutions, foster commercialization of innovations and technology transfer and contribute towards competitiveness and national priorities.

It supports start-ups and existing local companies as well as attracts international companies and institutions to develop and grow competitive technology driven and knowledge-based businesses. Services are focused on technology entrepreneurship development include incubation, business acceleration and innovation building capacity. It also promotes innovation through provision of seed/early-stage funding; and provides office space, commercial and light industrial plots.

Achievements

Since 2013, three new programmes were developed, the Technology Transfer Office, First Steps Venture Centre (FSVC) and the Cleantech Centre.

BIH constructed of the central icon building intended to foster innovation and create new office and laboratory and conferencing spaces and leased out of land to innovative science and technology entities. The central building was ready for full use in 2016. Many companies have shown interest in developing further on the land in partnership and lease agreements to develop a new satellite communications facility. BIH was accepted as full members of the International Association of Science Parks (IASP) and areas of innovation which is meant to drive growth, internationalization, global networking, and access to a broad knowledge base with a formidable multiplier of resources and opportunities.

Impact on the entrepreneurial lifecycle

BIH has instilled good practices in areas such as entrepreneurial interest, engage with challenges, develop business models, build collaboration, entrepreneurial events, entrepreneurial community, incubators and accelerators, seed funding and angel investment, and expansion of SMEs of the entrepreneurial lifecycle.

B.3   CcHub (Nigeria)

Co-Creation Hub (CcHUB)[105] is an innovation centre dedicated to accelerating the application of social capital and technology for economic prosperity. It is the first open living lab and pre-incubation space in Lagos which was designed to be a multi-functional, multi-purpose space where work to catalyse creative social tech ventures takes place. The hub is a place for technologists, social entrepreneurs, government, tech companies, impact investors and other stakeholders in and around Lagos to co-create new solutions to the many social challenges in Nigeria.

Type

This practice impacts all three building blocks of innovation: innovation dynamics, innovation capacity and ICT innovation in key sectors.

Goal(s)

The main goal of CcHUB is the application of social capital and technology for economic prosperity. It reaches this through setting several sub-goals, namely to:

- Serve as a knowledge platform where organizations can connect and build new skills and competencies to solve local challenges, from start-up pre-incubation to enterprise innovation capacity building.
- Support in particular the public health and governance sectors in leveraging technologies for social impact.
- Improve STEM education in Nigeria through the usage of technology to create, build capacity and deliver STEM education to all classrooms.

Target stakeholders

CcHUB individual innovators, entrepreneurial support networks, the private sector and the public sector.

Governance

CcHUB has a hierarchical top-down approach organizational structure with various practice and project leads as well as several administrative staff reporting to the CEO. CcHUB has launched and acquired different initiatives in Nigeria, Rwanda and Kenya under its umbrella and collaborates with various organizations all over the Africa region in delivering its projects and programmes. The founder of CcHub is also its CEO. He is supported by a team that takes care of finances, human resources, administration, and digital security.

Partners and resources

CcHub works with a broad range of partners, including the Bill & Melinda Gates Foundation, Google for Startups, Omidyar Network, Amazon Web Services, Microsoft, Facebook, The Tony Elumelu Foundation and Raspberry Pi Foundation.

Key activities

CcHUB activities include a start-up support from pre-incubation through incubation to acceleration through its Incubation Unit, the re:learn Practice, which improves STEM education

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[105] https://cchubnigeria.com

by leveraging technology to create engaging content and introducing innovative teaching methods to STEM teachers, and the Public Health Practice, which leverages technology to bridge some of the gaps and challenges with providing optimal services and improve health outcomes.

Additional activities include the Design Lab is the research and development unit, based in Kigali, Rwanda, which collaborates with global stakeholders to explore the application of technology to solve systemic challenges in Africa; and the GovLab programme contributes to good governance by accelerating the application of innovative technology to bridge the gap between the government and its citizens.

Achievements

CcHub was started in Lagos, Nigeria 10 years ago with the vision to use technology to solve local challenges. Some of its achievements to date include:

- A network of 650 start-ups across the continent. 7 300 direct jobs and over 35 000 indirect jobs have been created by portfolio companies through their value chain, USD 1 000 000+ were invested in direct start-ups by CcHUB and over USD 61 million in external funding were attracted by the start-ups in their portfolio.
- CcHUB Launched NG_HUB in May 2018, a deep-tech focused innovation lab building solution with advanced technologies such as artificial intelligence, data science, Internet of Things and virtual reality.
- CcHUB launched CcHUB Growth Capital in 2015, Nigeria's first social innovation fund to invest in next-generation infrastructure for change in Nigeria and beyond. It had a targeted fund size of over 1 billion Naira.
- CcHUB Education Practice (re:learn) delivered world-class STEM education to thousands of students by providing support for the smart application of technology in schools across Nigeria.
- The i-HQ project helped build an 'innovation city' in Yaba district / Lagos – a hotspot for creative ventures where all key stakeholders (academics, industry and government) find adequate infrastructure, resources and enabling environment to strive while collaborating.
- In 2019, CcHub acquired the iHub in Nairobi, Kenya.
- In an interview marking the 10-year anniversary, the founder of CcHUB stressed that he considers the validation and support from local and national governments for innovation ecosystems as the biggest achievement of CcHUB, which in turn was able to shape the development of the vibrant innovation ecosystem in Nigeria and increasingly in the Africa region.

Impact on the entrepreneurial lifecycle

CcHub has instilled good practices in all phases of the entrepreneurial lifecycle. It impacts innovative entrepreneurs with finance, entrepreneurial support and private sector development from pre-idea to SME phase.

B.4   Dzuka Africa (Malawi)

Dzuka Africa[106] incubates emerging social impact entrepreneurs, focusing on business training, co-working space provision and access to working tools or equipment, and focuses on social entrepreneurship and the creative sector. Through different programmes, Dzuka Africa further empowers youth and women with life and professional skills to enable them to be self-sustainable by building resilient start-ups.

Type

This practice impacts two of the building blocks of innovation: innovation capacity and innovation dynamics.

Goal(s)

The overarching goal of Dzuka Africa is to support social impact innovators on their entrepreneurial journey.

Target stakeholders: Dzuka Africa main stakeholders are entrepreneurs.

Governance

Dzuka Africa was founded by a consortium of business representatives with a vision to support youth and women while building a thriving innovation ecosystem in Blantyre. Most of the co-founders now make up the advisory board of Dzuka Africa. The management team consists of a CEO supported by hub managers and administrative staff.

Partners and resources

Dzuka Africa partners with local universities and key stakeholders of the ecosystem in Blantyre, Malawi's commercial hub, as well as partners throughout the country to establish a pipeline from school through university to high growth businesses, and to connect the creative, technology and entrepreneurial sectors. Its key partners include: the Malawi University of Science and Technology, Polytech Blantyre Design Studio, mHub Lilongwe, Social Enterprise Academy, Commonwealth Business Women, British Council and Nesta.

Key activities

Dzuka Africa has several activities, including:

- The **StartMeUp Program**, which is an incubation for emerging entrepreneurs, focusing on business training, Co-working space provision and access to working tools or equipment.
- **Me2ICount Program**: Due to limited access to funds leading to high dropout rates, only 5 per cent of Malawian high school graduates earn a tertiary education degree. Me2ICount focuses on imparting social entrepreneurship learning to scholars teaching them how to create billable solutions for identified community challenges.
- **InvestInMe Township Entrepreneurship program**: This initiative to develop township-based entrepreneurs provides support to underprivileged youth who struggle to access resources and skills needed to launch and grow their businesses. The programme provides training and development, as well as access to markets.

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[106] http://dzukaafrica.org

- **PitchNight**: Strengthen the entrepreneurship community by bringing together all stakeholders together in a fun way on a monthly basis. Its objectives are to highlight up-and-coming entrepreneurs, connect entrepreneurs to financing and support, inspire youth.

Additional, Dzuka Africa offer memberships and hot desks in two co-working spaces in Blantyre in Limbe, facilitates networking events to create market exposure, collaborates with local, national, regional and international partners to support social innovation and entrepreneurship in Blantyre, and equips children aged 6 to 12 with 21st century skills through Lil Wiz Club Codelab and Picazzo Arts and Craft classes.

Achievements

- Establishment of Start-up Hubs in Blantyre and Limbe.
- Establishment of Amayi Home of Creatives in Chilomoni, a township of Blantyre.
- Establishment of BlantyreEvents Hub - Covid 19 Support Program for Events Planners and Hospitality Industry focusing on Lodges.
- Out of 201 mentees in its different programs, 190 have created social innovation start-ups. Dzuka Africa to date has 43 active members in its three hubs.

Impact on the entrepreneurial lifecycle

Dzuka Africa has instilled good practices for social impact entrepreneurs - predominantly women and youth - in all entrepreneurship phases through entrepreneurial support: events, co-working and support, incubation, and access to business associations.

B.5   HubCité Network and WoeLab (Togo)

WoeLab[107] is the first free laboratory of social and technological innovation of Togo, set up in 2012 within the framework of Lomé HubCité Africaine and developed by the platform L'Africaine d'Architecture. It is an alternative and participative urban planning project that questions the classical regulatory and elitist approaches by proposing a model where the townspeople themselves take charge of the destiny of their neighbourhood through collaborative approaches.

Type

This practice impacts two of the building blocks of innovation: innovation dynamics and innovation capacity.

Goal(s)

To help members develop smart city solutions from the bottom up and rethink the African city through vernacular and local innovation, a praxis that creates start-ups and companies focused on engineering and architectural solutions; as well as "making everyone equal in the face of the digital revolution" through integrated architecture, primitive computationalities, technological democracy and sustainable cities.

Target stakeholders

HubCité and WoeLab main stakeholders are academia, entrepreneurs and experts.

Governance

The lab itself is managed by a team around the founder. The team involves the community in its immediate neighbourhood through sustainably planned and implemented strategies of hyper-local vernacular community engagement.

Partners and resources

Both WoeLab sites have 600 square meters of space each that are used as living quarters for people to visit. Partners include research centres and design schools, universities and researchers.

Key activities

HubCité and WoeLab activities include:

- **WoeLab**: first free laboratory of social and technological innovation of Togo, focused on technological democracy and diverting the use of discarded electronic material by creating sustainable technology.
- **WoeLab Prime**: an incubator for start-ups and a way to identify the great potential of young children by incorporating hackathons, coding classes, etc.
- **SiliconVilla**: incubation programme helping entrepreneurs replace the architect, urban planner or decision maker in the production of the city in topics such as waste management, mobility and resources.
- **Network of hubs**: network of proximity hubs, easily replicable, open to all, promoting the spirit of sharing and incubating technology that can easily permeate the most modest layers of the population.

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[107]   http://woelab.tg

Additionally, they raised over 4,600 dollars to develop the Woebots1 W.Afate, the first artisanal 3D printer, and with that, more than 20 other 3D printers were made from discarded e-waste; and hosted the first Global Urban Datafest in Lomé.

Achievements

- WoeLab is the first free laboratory of social and technological innovation of Togo.
- More than 11 collaborative start-ups created and incubated at WoeLab.
- Won the African Innovation Summit Award 2014.
- Won the Global Fab Award in 2014.
- Ashoka Foundation (Fellow since 2017).
- African Leadership Award (2018).

Impact on the entrepreneurial lifecycle

WoeLab and the HubCité networks are instilling good practices at the pre-idea and ideation phases, including entrepreneurial interest, entrepreneurial events, engaging with challenges, hackathons and competitions, as well as later on, with co-working and support and Incubators and accelerators of the entrepreneurial lifecycle.

B.6 IbuHub and TechVillage (Zimbabwe)

This case looks at two hubs in Bulawayo: TechVillage[108] is a collaborative working space for early-stage entrepreneurs and also caters to the needs of coders and hardware makers, collaborating with the National University of Science and Technology (NUST). IbuHub[109] identifies and brings together Africa's young entrepreneurs into a support ecosystem that grows technology and diverse innovation-centric start-up ideas into commercially viable ventures.

Type

This practice impacts two of the building blocks of innovation: building innovation capacity by co-creating a pipeline for tech start-up founders from Zimbabwe's leading university of science and technology to market and Integrating ICT innovation into key sectors by engaging all relevant stakeholders of the local ecosystem of Bulawayo, the technological and industrial production hub of Zimbabwe.

Goal(s)

The shared goal of both hubs is a connected Africa leveraging on technology built by Africans owned by African start-ups.

Target stakeholders

IbuHub and TechVillage main stakeholders are technologists and entrepreneurs.

Governance

There is no formal collaboration agreement between the hubs, yet they offer complementary instead of competing support to innovators. Individually, both hubs rely on hierarchical organizational structures in which a top-down approach is practiced.

Partners and resources

IbuHub works with internationally recognised partners who collaborate to offer support and resources to nurture the growth needs of their participants. TechVillage partners with NUST to create a talent pipeline and offer support for graduates who want to start their own businesses, as well as international networks. Key partners of the practice include: Neolab Technologies, Africa Leadership Academy, National Gallery of Zimbabwe, United Nations Development Program (UNDP), UNESCO, American Corner Bulawayo, African Makerspace Network, AfriLabs, British Council, African Tech and Creative Group (ATCG) and Google for Startups Accelerator.

Key activities

IbuHub and Techvillages activities include the following:

- Both build capacities of innovators and entrepreneurs and connect start-ups to funders, markets and support networks.
- Both offer co-working space and utilities needed for entrepreneurs to grow and scale their business on a membership basis. IbuHub in addition offers back-office services such as legal support, tax returns and filling, annual returns and account functions to its members.

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[108] https://www.techvillage.org.zw/
[109] http://ibuhub.com

- Both facilitate networking and learning events for their communities and the public. In addition, TechVillage in addition hosts meetups for programmers, e.g. the Python user group.
- TechVillage holds space for technologists both working with software and hardware. The latter in particular is quite unique and much appreciated by the university students and graduates who can put their theoretical knowledge into practice by designing and prototyping hardware solutions to local challenges. TechVillage supports STEM mentorship programs for schoolchildren offered by some of its members.
- The **TechFest** is an annual disruptive multi-day and multi-venue event run by the TechVillage which identifies and celebrates the daring young innovators that are rebuilding industries and cities, whilst educating the public on the role that technology can play in their everyday lives. It is an action packed five days of exhibitions, hackathons, street pitches, workshops and breakaway sessions, as well as satellite events held across the city of Bulawayo.

Achievements

- IbuHub has organized the Young Entrepreneurial Women (YEW) Hackathon partnering with the African Leadership Academy Anzisha Prize Program.
- TechVillage has incubated 36 start-ups, 8 Social Ventures, and 204 individual entrepreneurs.

Impact on the entrepreneurial lifecycle

IbuHub and TechVillage have instilled good practices in entrepreneurial interest, entrepreneurial events, success stories, engaging with challenges, hackathons and competitions, developing business models, co-working and support, expansion, skills training programmes and human capital.

B.7   Innovation for Policy (Senegal)

The Senegalese Startup Act was adopted in 2019. This policy was developed through a deliberative and consultative co-creation process. The law was championed by the *Délégation de l'entrepreneuriat rapide* (DER), a ministry under the Senegalese Presidency focused on rapidly mobilizing entrepreneurship, and the World Bank with facilitation and process design from the Innovation for Policy (i4Policy) Foundation. The i4Policy Process is an iterative policy making framework that emerged from the #i4Policy movement of innovation community leaders working to shape inclusive innovation policies with their governments across 48 countries in Africa. Innovation community leaders were invited to articulate and share their views and recommendations for policies, and by co-creating the policies through an inclusive and deliberative process.

Type

This practice impacted **innovation dynamics.**

Goal(s)

The co-creation process of the Senegal Startup Act focused on co-creating public policies and favourable environments for innovation and entrepreneurship in Senegal, holding space for all relevant actors (government, private sector and civil society) to express their views and to consider the views of others, utilizing open source technology to support policy consultation and co-creation at scale, and building capacity for public policy co-creation.

Target stakeholders

Target stakeholders of the co-creation process of the Senegal Startup Act are the citizens of Senegal - and especially youth, start-up founders, investors, entrepreneurship support organizations, and community leaders - and the Government. The DER championed the process, which was led by the Ministry of ICT and the Ministry of Finance. The Innovation for Policy Foundation facilitated the process.

Governance

#i4Policy is a movement bringing together innovation community leaders all over the African continent to co-create national and regional policies. While the activities of the movement are guided by a task force of 21 individuals from 20 countries, the Innovation for Policy Foundation has been founded in Mauritius as a legal entity to enable more regionally interconnected local activities. #i4Policy engages innovation community leaders on the African continent and invites all African citizens to co-create the African Innovation Policy Manifesto. When #i4Policy engages in common interest formation and public policy co-creation in a specific country, it works at the invitation of government and local communities.

Partners and resources

A wide range of stakeholders and partners was involved in the co-creation of the Senegal Startup Act:

Délégation de l'entrepreneuriat rapide, Ministry of ICT, DGIE (Tax authority), Ministry of Finance, Impact Hub Dakar, Jokkolabs Dakar, Baobab Entrepreneurship, World Bank, Italian Agency for

Development Cooperation, as well as the community of entrepreneurs, founders, youth and their supporters.

Key activities

The Innovation for Policy Foundation focuses on three activities:

- Supporting governments and communities to collaboratively engage in policy reform processes, and to draft Startup Acts, Small Business Acts and innovation policies and visions.
- Policy-making R&D:

  - Developing new and innovative methodologies for public consultation and co-creation, such as the policy hackathon, during which citizens role play as policy makers to prioritise needs and develop concrete policy proposals.
  - Development of new open source software tools, such as chat bots, document consultation engines and deliberative public forums.
  - Popularizing co-creation processes, by leveraging collective intelligence to solve social challenges.

Achievements

- Ongoing co-creation of the Africa Innovation Policy Manifesto which recommends policies that will accelerate digital transformation amongst more than 220 hubs in 48 countries.
- Deploying open source technology tools have been used by the Presidency of DRC, the Ministry of ICT of Mali, the Nigeria Information Technology Development Agency, and by communities to co-create inputs on, among others, the Senegalese Startup Act, the draft Kenya Startup Bill and the draft Rwanda Startup Act.
- Engaging with policy makers and communities in more than a dozen countries to support the co-creation of Startup Acts, Small Business Acts and innovation policies and visions.
- Development of a comprehensive Benchmarking Study on Small Business Acts and Startup Acts in Africa, which is growing into an open source toolkit for policy-makers together with many partners.

Impact on the entrepreneurial lifecycle

i4Policy work addresses systems-level change, supporting the co-creation of legal, regulatory and financial environments where local and global entrepreneurs can thrive. Therefore, it does not impact any one phase of the Entrepreneurial Lifecycle in isolation but impacts the whole ecosystem.

B.8   Junub Open Space (South Sudan)

Junub Open Space[110] is a community innovation hub empowering and supporting entrepreneurs who develop innovative technological solutions for social challenges. Through training, mentoring and incubating start-ups based on the values of open culture, as well as regional and international outreach and networking, Junub Open Space sensitizes and creates awareness on peace building, sustainability, gender equity, youth and women empowerment within South Sudanese communities. The hub is a key actor in the young innovation ecosystem in the capital Juba and the country as a whole.

Type

This practice impacts two of the building blocks of innovation: innovation capacity and innovation dynamics.

Goal(s)

Junub Open Space aims to support the creation of a resilient and peaceful South Sudan through fostering youth and women empowerment based on an open innovation culture.

Target stakeholders

Junub Open Space main stakeholders are young and women entrepreneurs.

Governance

The hub is managed by the founder and a core team of administrative and managerial staff. The team also runs the activities around training, mentoring and incubating start-ups. In the activities aiming at guiding innovation dynamics, Junub Open Space relies on its community and involves them as volunteers and freelancers, e.g. in its Blue Messenger Bikes projects on digital and media literacy.

Resources and partners

Junub Open Space regularly implements projects with partners from the international donor community in South Sudan, such as UNESCO, UNICEF, UNDP and Internews.

Junub Open Space is a member of regional and international networks such as ASKnet, AfriLabs and Global Innovation Gathering (GIG), through which it co-creates and implements collaborative short-term projects with partners such as #defyhatenow, GoGirls ICT, Voice Post, Tactical Tech, and TechQuest STEM Academy.

Key activities

- Training, business support coaching and mentoring for youth and female entrepreneurs, e.g. through the Female Entrepreneurship Support Programme (FESP) in collaboration with TechQuest STEM Academy in Nigeria.
- Capacity building workshops in media production, cryptocurrency and open source software and hardware, e.g. through hosting a Java User Group, utilizing the ASKotec Open Hardware kit, or providing the Juba node of #EatBCH_SS which allows for direct international donations utilizing the blockchain-based currency Bitcoin Cash.

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110   https://junubos.org/

- Digital and media literacy trainings for peacebuilding, e.g. with online fact checking platform 211Check, or international hate speech mitigation programme #defyhatenow.
- Activities utilizing technology to mitigate disinformation and hate speech, e.g. Salaam Community Radio production; the facilitation of a Glassroom Experience event with Tactical Tech; or the implementation of the Blue Messenger Bikes programme, through which 50 bikes provide the population of Juba with fact-checked information on the COVID-19 pandemic.

Achievements

- Winner of the 2020 AfriLabs Capacity Building Award.
- Representation of South Sudan at the 2019 United Nations Youth Climate Summit.
- Contribution to the #defyhatenow field guide which formed the basis of the project ongoing work in Cameroon, Ethiopia, Kenya, South Sudan, and Uganda.

Impact on the entrepreneurial lifecycle

Junub Open Space instils good practices in entrepreneurial interest, entrepreneurial events, success stories, engaging with challenges, co-working and support, and building collaboration.

B.9   Kenya Revenue Authority (Kenya)

The Kenya Revenue Authority (KRA)[111] serves as the country's governmental agency responsible for the assessment, collection and accounting for all revenues, due to the government, in accordance with the laws of Kenya. Convening the necessary stakeholders and resources, KRA aims to improve revenue mobilization by broadening the tax base, to combat tax evasion and implement smart intelligence and risk-based compliance strategies. Also, Kenya Revenue Authority intends to leverage on ICTs thus to strengthen Kenya's administrative capacity; enhance transparency and fairness through organizational change and business process optimization.

Type

This practice impacts two of the building blocks of innovation: innovation dynamics and ICT innovation in key sectors.

Goal(s)

Its main objective is to facilitate Kenya's bureaucratic transformation proposing innovative, professional and Customer-Focused Tax Administration services; key enabler is the establishment of trust which will foster Compliance with Tax and Customs Legislation.

Target stakeholders

KRA works with all Kenyan stakeholders, especially the private sector and financiers.

Governance

The governance and management structure is organized as per the recommended international best practice for Semi-Autonomous Revenue Authorities (SARAs).

- Organization Structure: As a step to establish an ICT-automated organization, KRA relies on a task-based structure in which the organization is divided into nine major departments each headed by a commissioner.
- Management: Its leadership is driven by an independent Board of Directors, consisting of both public and private sector experts responsible for policy decisions to be implemented by KRA management. Whereas the Commissioner General is the Chief Executive Officer of KRA undertakes the overall strategic and policy leadership to KRA operations, assisted by Revenue and Support Commissioners and other departmental heads.
- Institutional Framework: KRA established by an Act of Parliament, Chapter 469 of the laws of Kenya, which became effective on 1 July 1995.
- Competencies: Its core competencies derive from the facilitation of domestic taxes, taxpayers' rights and obligations support, import-export, local and foreign investment.

Resources and partners

KRA receives financial and non-financial support from the National Treasury, donor agencies, and strategic partners.

Some of its key strategic partnerships partners are the National Bank of Kenya (NBK), the Commercial Bank of Africa (CBA), I&M Bank Oracle, Cloud, and SAP.

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[111]   https://www.kra.go.ke/en/

Key activities

In collaboration with its key partners, KRA has undergone a rigorous process of re-engineering the collections process to improve their tax collection capabilities; this process included consultations within the industry, multiple bank reviews and the development of new frameworks.

Achievements

- With its tax systems automation, KRA increased the number of tax agent banks and made it possible for banks to collect taxes on their behalf. Banks, such as Barclays Bank of Kenya Citi Bank N.A, became a KRA tax collection agent, after integrating their systems with KRA tax validation interfaces, payment gateway for domestic taxes and common cash receipting system for customs taxes.
- KRA strategy on blending ICTs with the customer-focused tax service led to implementation of a CRM tool that was nominated for the Oracle 'CX' Global Excellence Awards 2018.
- Achieved 3.94 million active taxpayers rising from 1.6 million in 2014/15, only 60 000 short of the 4 million targeted during the Plan period.
- Achieved registration, filing and payment rates at 60 per cent, 55.5 per cent, and 79.9 per cent, respectively promoting adoption of the digital platform.
- Reduced cost of collection to one per cent through application of austerity measures and automation. However, the level rose from 1.22 per cent in 2016/17 to 1.44 per cent in 2017/18 due to additional funding received for revenue enhancement initiatives.
- Became Lead Border Agency at all the 29 terrestrial land borders. KRA has since taken over the leading role in the 29 land borders including the 7 One Stop Border Posts.
- Attained higher Customer Satisfaction rate: rising from 65 per cent in 2014/15 to 71.9 per cent in 2016/17, e.g. through increased presence of staff in the Huduma Centres.
- Achieved lower Average Cargo Clearance Time time from 105 hours to 59 hours, a reduction of 46 hours.
- KRA automated its tax systems which include integration through the payment gateway (PG) and common cash receipting system (CCRS) interface with multiple commercial bank partners. Taxpayers can now remit and file taxes through iTax and make import/export declarations or payments through the Simba system (for Customs taxes).
- KRA has embraced a Whole-of-Government (WOG) approach through spreading iTax support services in 35 'Huduma' Centres across the country which has greatly facilitated convenient tax registration and filing.
- KRA has implemented virtual Communities on Practice (COPs) to share knowledge and locate Subject Matter Experts (SMEs) within the Authority.

Impact on the entrepreneurial lifecycle

KRA has instilled good practices in expansion SMEs of the Entrepreneurial Lifecycle.

B.10 Small Enterprise Development Agency (South Africa)

The Small Enterprise Development Agency (Seda)[112] in South Africa is an agency of the Department of Small Business Development (DSBD), which provides non-financial support to small enterprises and cooperatives. It aims to become the centre of excellence for small enterprise development in South Africa, impacting, subsequently, the country's innovation and industrial ecosystem.

Type

This practice impacts two of the building blocks of innovation: innovation capacity and innovation dynamics.

Goal(s)

Through its non-financial services, Seda aims to develop, support and promote small enterprises throughout the country, ensuring their growth and sustainability.

Target stakeholders

SEDA works with all stakeholders, and especially the private and public sectors.

Governance

SEDA operates in a hierarchal, top-down fashion. Its management consists of a board of directors that oversees the activities of the agency. It is also headed by a CEO who reports to the board, while its executive management team is made up by a Chief Executive Officer, Chief Strategy and Information Officer, Chief Financial Officer, and three executive managers.

Seda was initiated through the National Small Business Amendment Act (Act 29 of 2004) and is mandated to implement government small business strategy; design and implement a standard and common national delivery network for small enterprise development; and integrate government-funded small enterprise support agencies across all tiers of government.

Resources

In collaboration with the Small Enterprise Finance Agency (Sefa), Seda aims to facilitate the access to finance for small enterprises and cooperatives, assisting them, specifically, in their preparation for the "Sefa Loan" application.

Key activities

SEDA carries out several activities, including providing advisory services for business and marketing plan development to impact the country's entrepreneurial and economic growth. Additionally, it offers training courses covering financial management, customer care, report writing and business writing skills. It also assists entrepreneurs in identifying areas of improvement for their businesses through a strategic process: Seda conducts an in-depth diagnosis on small enterprises and cooperatives that approach the Agency through its branch network. First, it identifies key factors that may prevent or facilitate business expansion and sustainability such as quality of products, compliance with national or international standards, access to markets, and marketing of the service /product. Then, having acquired the necessary information, Seda

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[112] http://www.seda.org.za

intervenes through its programs and activities in order to boost the development of small enterprises or cooperatives.

Additional activities include business and marketing plan assistance, courses, seminars and workshops, mentorship programmes and assistance links to financial providers:

- Pitch and Perfect model: pitching masterclasses and competitions.
- TVET College: transforming graduates from job seekers to job creators through a 6-month entrepreneurship training and idea development program, as well as an intensive 12-month incubation program.
- Seda Ambassadors Community and mentorship programme network.
- Seda also publishes online brochures, publications and annual reports.

Achievements

Seda noted significant successes during the 2018/19 financial year. It exceeded targets on 93 per cent of its planned performance measures. This performance evens up with Seda client journey model which advocates for long-term, multiple interventions as opposed to one-off interventions. Some of the most notable achievements during this financial year were:

- 42 848 clients reached through provincial promotional and marketing actions;
- 10 732 diagnostic assessments conducted on client businesses;
- 9 110 enterprises trained in business management;
- 901 cooperatives adopted and assessed;
- 2 860 clients supported through incubation;
- 465 clients supported through innovation;
- 6 957 new jobs created by supported clients;
- 19 064 jobs sustained by supported clients;
- ZAR 1.75 billion turnover increased on supported clients.

Impact on the entrepreneurial lifecycle

Seda has instilled good practices entrepreneurial interest, entrepreneurial events, entrepreneurial community, incubators and accelerators, and expansion of SMEs.

B.11 Vision 2030 (Kenya)

Vision 2030[113] launched in 2006 as a presidential decision, is a long-term development blueprint for accelerating Kenya's transformation into an industrialised middle-income nation by the year 2030. The inclusive contribution of its stakeholders helped Vision 2030 specialise in the country's social, political, economic and macro pillars. Hence, through the development of its medium-term plans, Vision 2030 became competent in developing: a cohesive and equitable society, macroeconomic stability, infrastructure, Science Technology and Innovation (STI) and security/public sector reforms.

Type

This practice impacts two of the building blocks of innovation: innovation dynamics and ICT innovation in key sectors.

Goal(s)

Its ultimate goal is to render Kenya as a globally competitive and prosperous country with a high quality of life by 2030. The stakeholders' participation will be crucial for this program; enabling it to impact the country's socioeconomic and innovation ecosystem. Through execution of its strategies and activities, Vision 2030 creates a cohesive society providing a high quality of life to all Kenyans in a clean and secure environment.

Target stakeholders

Vision 2030 calls for the inclusive participation of all of the stakeholders, in particular the private and public sector, highlighting the important role of international and local experts, ordinary Kenyans and stakeholders from all parts of the country.

Governance

Vision 2030 has a hierarchical organizational structure. Its management consists of a Delivery Board of government officials and private sector representatives, and a Delivery Secretariat (VDS) led by a General Director. The Delivery Board guides the Delivery Secretariat through its policy-making and advisory role, while the latter, by closely collaborating with line ministries, is responsible for the Vision 2030 five-year medium-term plans.

Vision 2030 was launched in 2006 as a presidential decision, instructing the Vision 2030 National Vision Steering Committee to produce a detailed medium-term plan beneficial for the country's socioeconomic and technological development. This was achieved through a consultative approach implemented via workshops with stakeholders from the public service, the public sector, the media and NGOs.

Resources and partners

Vision 2030 has established public-private partnerships. It has also collaborated with financial institutions, private developers, cooperatives and manufacturers of building materials.

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[113] http://vision2030.go.ke

Key activities

The economic, social and political pillars of Kenya Vision 2030 are anchored on the foundations of macroeconomic stability; infrastructural development; science, technology and innovation; land reforms; human resources development; security and public sector reform. Its Third Medium Term Plan (MTP III) 2018-2022 is driven by the Big Four Agenda: food security, affordable housing, manufacturing, and affordable healthcare for all. Activities are focused on:

- Supporting value addition and raising the manufacturing sector share to 15 per cent of GDP by 2022. This will accelerate economic growth, create jobs and reduce poverty.
- Focusing on initiatives that guarantee food security and nutrition to all Kenyans by 2022 through expansion of food production.
- Providing Universal Health Coverage and thereby guaranteeing quality and affordable healthcare to all Kenyans.
- Providing at least 500 000 affordable new houses to Kenyans by 2022 to improve their living conditions.

Achievements

- In a decade since its inception, Vision 2030 has contributed widely to at least 26 of the country's key priority sectors, from agriculture, education and tourism, to trade, gender, and youth vulnerable groups.
- For the science, technology and innovation sector, Vision 2030 has established a national innovation agency and multiple county technology and innovations advisory and prospecting centres that coordinate innovations and technology transfer and adoption at the county level.
- It introduced Centres for Excellence developing a critical mass of human resource necessary for the ICT industry.
- It contributed to the implementation of new incubation infrastructure; the establishment of the IBM Research Lab, and a national scheme for Science and Arts.
- The above have also led to job creation, which is a key component of the overall socio-economic strategy to tackle poverty and income inequality.

Impact on the entrepreneurial lifecycle

Vision 2030 has instilled good practices in entrepreneurial interest, engaging with challenges, developing business models, building collaboration, entrepreneurial events, entrepreneurial community, incubators and accelerators, and expansion of SMEs.

B.12 Wennovation Hub (Nigeria)

Wennovation Hub is an incubator, accelerator and co-working space founded in 2010 with offices in Abuja, Kaduna, Lagos and Ibadan, Nigeria[114]. It works with tech start-ups in agriculture, healthcare, education, clean energy and infrastructure. It also offers training to bridge the skills gap in Nigeria's digital innovation ecosystem; and provides research and consulting services for the private sector, non-governmental organizations and start-ups.

Goals

The Wennovation mission is to "inspire and empower African entrepreneurs to solve immediate socioeconomic challenges by leveraging technology, resources and network collaboratively"[115]. Its vision is to achieve sustainable development through innovation by empowering youth.

Type

This practice impacts two of the building blocks of innovation: building innovation capacity and Integrating ICT innovation into key sectors.

Target stakeholders

Wennovation Hub works primarily with innovative entrepreneurs. It also partners with the private sector, the public sector, academia, financiers and entrepreneurial support networks[116].

Governance

Wennovation Hub staff includes four co-founders who also act as executive director, programmes director, international business director and lead strategist. Additional staff members include two community managers, a programme manager and a national programmes officer.

Partners and resources

Funders include the Dutch Ministry of Foreign Affairs[117] and the AfriLabs Capacity Building Programme (through the French Development Agency)[118].

Wennovation Hub works and has worked with several partners; including Covenant University and the University of Ibadan; entrepreneurial support organizations iDEA Hub Lagos, KAD ICT Hub, AfriLabs and The Next Economy; private company Informa and NGO Centre for Agricultural and Rural Cooperation. Portfolio start-ups, who have gone through a Wennovation accelerator programme, include Ausu, Rural Farmers Hub and Crop2Cash.

Activities and events

Wennovation Hub undertakes several activities to foster entrepreneurship-driven digital innovation in the Nigerian ecosystem. It hosts incubators and accelerators, such as the Build Your Business incubation programme. In collaboration with The Next Economy, a youth career development organization active in Nigeria (as well as Mali and Somalia), Wennovation Hub

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[114] https://wennovationhub.org/about.html
[115] https://wennovationhub.org/images/Wennovation%20Hub%20Brochure%20(Web).pdf
[116] https://wennovationhub.org/images/Wennovation%20Hub%20Brochure%20(Web).pdf
[117] https://medium.com/@wennovation/call-for-entries-into-the-next-economy-wennovation-incubation
-program-2018-abuja-c57e097cec73
[118] https://techcabal.com/2020/10/22/afrilabs-gives-over-e250000-in-grants-to-20-innovation-hubs-across
-africa-launches-insights-report/

hosted the Abuja cohort of the start-up incubator, open to those with an MVP and a team of at least two. Two cohorts (spring-summer and summer-fall) participated in activities including a kick-off boot camp, during which participants went through product evaluation and business planning. The top start-ups were then invited to participate in the three-month incubation programme, which included business validation, strategies to take their ideas to market and mentorship[119].

Achievements

As of 2020, Wennovation Hub achievements included[120]:

- training over 9 000 young people,
- incubation or acceleration of over 300 start-up teams,
- creating over 1 000 jobs through the start-ups,
- having start-ups that have raised over USD 2.5 million, and
- launching the Afropreneur Fund II Acceleration Program and the Tertiary Innovation Programme and Research Commercialization (TERTNOVATE) in higher-learning institutions[121].

Impact on the entrepreneurial lifecycle

Wennovation Hub has instilled good practices in entrepreneurial interest, engaging with challenges, developing business models, building collaboration, expansion, seed funding, angel investment, venture capital, entrepreneurial events, hackathons and competitions, co-working and support, incubators and accelerators, success stories, entrepreneurial community, soft-skill training and human capital.

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[119] https://medium.com/@wennovation/call-for-entries-into-the-next-economy-wennovation-incubation -program-2018-abuja-c57e097cec73
[120] https://wennovationhub.org/images/Wennovation%20Hub%20-%20Portfolio%20(Web).pdf
[121] https://wennovationhub.org/images/Wennovation%20Hub%20Brochure%20(Web).pdf

Office of the Director
International Telecommunication Union (ITU)
Telecommunication Development Bureau (BDT)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdirector@itu.int
Tel.: +41 22 730 5035/5435
Fax: +41 22 730 5484

Office of Deputy Director and Regional Presence
Field Operations Coordination Department (DDR)
Place des Nations
CH-1211 Geneva 20
Switzerland

Email: bdtdeputydir@itu.int
Tel.: +41 22 730 5131
Fax: +41 22 730 5484

Digital Networks and Society (DNS)

Email: bdt-dns@itu.int
Tel.: +41 22 730 5421
Fax: +41 22 730 5484

Digital Knowledge Hub Department (DKH)

Email: bdt-dkh@itu.int
Tel.: +41 22 730 5900
Fax: +41 22 730 5484

Partnerships for Digital Development Department (PDD)

Email: bdt-pdd@itu.int
Tel.: +41 22 730 5447
Fax: +41 22 730 5484

Africa

Ethiopia
International Telecommunication Union (ITU) Regional Office
Gambia Road
Leghar Ethio Telecom Bldg. 3rd floor
P.O. Box 60 005
Addis Ababa
Ethiopia

Email: itu-ro-africa@itu.int
Tel.: +251 11 551 4977
Tel.: +251 11 551 4855
Tel.: +251 11 551 8328
Fax: +251 11 551 7299

Cameroon
Union internationale des télécommunications (UIT)
Bureau de zone
Immeuble CAMPOST, 3e étage
Boulevard du 20 mai
Boîte postale 11017
Yaoundé
Cameroon

Email: itu-yaounde@itu.int
Tel.: + 237 22 22 9292
Tel.: + 237 22 22 9291
Fax: + 237 22 22 9297

Senegal
Union internationale des télécommunications (UIT)
Bureau de zone
8, Route des Almadies
Immeuble Rokhaya, 3e étage
Boîte postale 29471
Dakar - Yoff
Senegal

Email: itu-dakar@itu.int
Tel.: +221 33 859 7010
Tel.: +221 33 859 7021
Fax: +221 33 868 6386

Zimbabwe
International Telecommunication Union (ITU) Area Office
TelOne Centre for Learning
Corner Samora Machel and
Hampton Road
P.O. Box BE 792
Belvedere Harare
Zimbabwe

Email: itu-harare@itu.int
Tel.: +263 4 77 5939
Tel.: +263 4 77 5941
Fax: +263 4 77 1257

Americas

Brazil
União Internacional de Telecomunicações (UIT)
Escritório Regional
SAUS Quadra 6 Ed. Luis Eduardo Magalhães,
Bloco "E", 10º andar, Ala Sul (Anatel)
CEP 70070-940 Brasilia - DF
Brazil

Email: itubrasilia@itu.int
Tel.: +55 61 2312 2730-1
Tel.: +55 61 2312 2733-5
Fax: +55 61 2312 2738

Barbados
International Telecommunication Union (ITU) Area Office
United Nations House
Marine Gardens
Hastings, Christ Church
P.O. Box 1047
Bridgetown
Barbados

Email: itubridgetown@itu.int
Tel.: +1 246 431 0343
Fax: +1 246 437 7403

Chile
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Merced 753, Piso 4
Santiago de Chile
Chile

Email: itusantiago@itu.int
Tel.: +56 2 632 6134/6147
Fax: +56 2 632 6154

Honduras
Unión Internacional de Telecomunicaciones (UIT)
Oficina de Representación de Área
Colonia Altos de Miramontes
Calle principal, Edificio No. 1583
Frente a Santos y Cía
Apartado Postal 976
Tegucigalpa
Honduras

Email: itutegucigalpa@itu.int
Tel.: +504 2235 5470
Fax: +504 2235 5471

Arab States

Egypt
International Telecommunication Union (ITU) Regional Office
Smart Village, Building B 147,
3rd floor
Km 28 Cairo
Alexandria Desert Road
Giza Governorate
Cairo
Egypt

Email: itu-ro-arabstates@itu.int
Tel.: +202 3537 1777
Fax: +202 3537 1888

Asia-Pacific

Thailand
International Telecommunication Union (ITU) Regional Office
4th floor NBTC Region 1 Building
101 Chaengwattana Road
Laksi,
Bangkok 10210,
Thailand

Mailing address:
P.O. Box 178, Laksi Post Office
Laksi, Bangkok 10210, Thailand

Email: itu-ro-asiapacific@itu.int
Tel.: +66 2 574 9326 – 8
+66 2 575 0055

Indonesia
International Telecommunication Union (ITU) Area Office
Sapta Pesona Building
13th floor
Jl. Merdan Merdeka Barat No. 17
Jakarta 10110
Indonesia

Email: itu-ro-asiapacific@itu.int
Tel.: +62 21 381 3572
Tel.: +62 21 380 2322/2324
Fax: +62 21 389 5521

CIS

Russian Federation
International Telecommunication Union (ITU) Regional Office
4, Building 1
Sergiy Radonezhsky Str.
Moscow 105120
Russian Federation

Email: itumoscow@itu.int
Tel.: +7 495 926 6070

Europe

Switzerland
International Telecommunication Union (ITU) Office for Europe
Place des Nations
CH-1211 Geneva 20
Switzerland
Email: eurregion@itu.int
Tel.: +41 22 730 5467
Fax: +41 22 730 5484