

A background image showing a woman in a yellow top writing on a whiteboard with a grey marker. A man with glasses is visible in the background, looking at the whiteboard. The whiteboard has several yellow sticky notes attached to it. A circular inset highlights the woman's hand and the marker as she writes.

Innovation ecosystems in sub-Saharan Africa

How to enable flourishing innovation?
Insights from Cape Town, Nairobi and Lagos

Focus note | August 2020



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Executive summary

innovation ecosystem (noun)

ɪnə'veɪʃ(ə)n 'i:kəʊsɪstəm

A web of interconnected factors that turns a particular location into an engine room for coming up with new solutions and successfully taking those solutions to market. Characterised by an entrepreneurial mindset and a dynamic flow of ideas, capital and labour.

Source: Authors' own

What makes an innovation ecosystem thrive? We explored this question in three African tech innovation ecosystems, at varying stages of maturity: Cape Town, Nairobi and Lagos. We used a systems mapping approach (see, for example, Acumen Academy, 2019) to collaboratively identify the key enablers and inhibitors in each location, and the leverage points for change. This report summarises the findings, common themes and contextual challenges across the three ecosystems.

At the base of any thriving ecosystem is an enabling environment, consisting of a supportive government and sufficient infrastructure. The key building blocks of an innovation ecosystem are talent, capital and technology that are sufficiently mobile. However, an ecosystem begins to grow only when these building blocks are connected by dynamic networking assets, which create a multiplier effect.

Moreover, there are intangible cultural factors that enable an ecosystem to truly flourish and become an engine room for innovative ideas and contextually relevant solutions.

These are:

- Challenges that need to be addressed
- A strong entrepreneurial spirit
- A space where diverse people, ideas and experiences can collide, combining into new forms of innovation

Ecosystem building blocks differ somewhat in each city, according to its unique context, but a few common themes emerged.

- **Sufficient digital infrastructure** is an important market prerequisite, but its absence should not be seen as a barrier to innovation. In fact, a less-than-perfect enabling environment can give rise to more sustainable, contextually-relevant and high-quality innovation.
- **Supportive government policies** are critical, and their importance is most clearly demonstrated where they are absent. A lack of e-leadership skills (Carboni et al., 2020b) at government level hampers not only innovative start-ups but also government's own ability to understand and apply technological innovations internally.



- **Growing talent** is critical for innovation. The demand for skilled talent in the market will continue to rise, at least for the near future. Successful tech innovations require not only high-end technical skills but also entrepreneurial skills. Innovation ecosystems require a wide variety of education and skills training providers linked to the needs of industry, for both hard and soft skills. This role can be played by universities, training centres and ecosystem facilitators such as hubs, as well as through mentoring.
- **Access to finance** continues to be a major challenge faced by African tech innovation ecosystems, more specifically the lack of seed- and early-stage funding. Unnecessary friction is created by entrepreneurs' lack of understanding and experience of different financing options and their limitations. On the side of the investors, there is an apparent lack of understanding of how to approach and apply seed funding effectively. For their part, traditional financial institutions still regard tech companies as too high-risk.
- **Ecosystem facilitators**, as the providers of networking assets, are central to thriving ecosystems. However, the services they provide and the role they play need to evolve alongside the ecosystem. In initial stages, more facilitators may be better, but over time such increasing numbers may give rise to coordination challenges and duplication of efforts. To remain relevant and useful, ecosystem facilitators must continue to meet the needs of their constituents: the ecosystems' start-ups. An important and perhaps underexplored role for ecosystem facilitators is that of convening ecosystem stakeholders, including government and investors, around key issues.

This synthesis report is for stakeholders who are interested in designing approaches, policies and programmes to support local innovation ecosystems.

For more information, see our series of articles about each of the innovation ecosystems that we investigated:



Cape Town tech ecosystem: The promise of inclusive innovation in a divided city



Shapeshifting into maturity: Hubs in the Nairobi innovation ecosystem



**“If you can make it here, you’ll make it anywhere”:
Innovating in Lagos**

Abbreviations

BSO	business support organisation
DFI	development finance institution
FSP	financial service provider
HNWI	high net-worth individual
ICT	information and communications technology
ID	identification
MNO	mobile network operator
MSME	micro-, small and medium-sized enterprise
SME	small and medium-sized enterprise
USD	United States dollar
VC	venture capital(ist)

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Introduction

1.1. Project objective

The process of innovation is a crucial mechanism for increased productivity, economic growth, and, if applied well, enhanced livelihoods (Bester et al., 2020). More and more, economic development policies are focused on encouraging innovation and entrepreneurship (Henderson & Weiler, 2010) – in fact, it may even be said that “ecosystem policy is the new industrial policy” (Startup Genome, 2020). This reflects a move away from models of economic development based on industrialisation, and towards a theory of growth that assumes increasing rates of return for capital within a knowledge economy (Morley, 2015).

There are various models that describe the components – or building blocks – of an innovation ecosystem. Having these building blocks in place is insufficient, however. As will become clear in the subsequent sections, each innovation ecosystem reflects its own unique context. This context, in turn, informs the dynamic relationships between the ecosystem building blocks, which affects the nature of the innovation that is developed.

With this project, we aimed to uncover those dynamic forces for successful innovation in three key African innovation ecosystems: Cape Town, Nairobi and Lagos. Focusing on the three top ecosystems in sub-Saharan Africa as identified in various rankings (see, for example, Startupblink, 2020), we took a deep-dive approach to uncover what goes beyond the tangible ecosystem building blocks to make an ecosystem thrive.

This synthesis report is for stakeholders who are interested in designing approaches, policies and programmes to support local innovation ecosystems.

1.2. Project approach

To make sense of the complex, dynamic, interconnected and sometimes intangible nature of these innovation ecosystems, we approached this project using a Systems Practice methodology. Using this collaborative approach allowed us to work together with ecosystem stakeholders, who know their own context best, and allowed us to engage with complexity without being overwhelmed by it. See Box 1 for a description of this methodology.

Our methodology consisted of desktop review, internal working sessions, informant interviews and ecosystem focus groups. During the working sessions, we identified the most important themes at play in each ecosystem, subjected these to cause-and-effect analysis and identified their interdependencies. The results were an interactive ecosystem map per city (see Carboni et al., 2020a) and an accompanying narrative. These findings were socialised and iterated upon with the ecosystem stakeholders. In plenary and break-out discussions, ecosystem stakeholders filled gaps in the map and identified levers for change. A voting process was used to identify the most prevalent themes and leverage points. Section 3 provides an overview of these findings for each city.

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At Cenfri, we see innovation ecosystems as fulfilling a core role in enabling a digital Africa in which all individuals can flourish.

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The Cape Town focus group session went ahead as planned in February, but the COVID-19-related travel restrictions compelled us to adapt our approach for Lagos and Nairobi to a virtual environment. This included one or two virtual focus group discussions, supplemented with key informant interviews. In Lagos, this included close collaboration with our partner, the Lagos Business School.

Box 1: About Systems Practice

Systems Practice is both a specific methodology and a more general approach to grappling with adaptive problems in complex environments with the aim of making enduring social change at scale.

The methodology of Systems Practice is at its core a participatory sense-making exercise. The aim of the process is to explore and map out all the relevant factors, or forces, that influence a system and its functioning, their causes and effects, and how they then influence one another. A key tool to guide the process is a Systems Map, which shows how all identified and analysed forces hang together. It is important that the Systems Practice process incorporates diverse teams, with internal and external stakeholders of varied backgrounds, to ensure that multiple narratives are explored, and identified forces are unpacked from different angles. Ultimately, the Systems Map and the accompanying Systems Narrative are used to uncover key leverage points. These leverage points are identified for the impact they can have on the functioning of a system and can be taken on by various system stakeholders to affect change.

Systems Mapping is not a diagnostic (its aim is sense-making, not complete analysis), and it is not Network Mapping (it maps out forces of influence, not stakeholders and their actions and relationships).

We base our Systems Practice approach on that outlined by the Omidyar Group (The Omidyar Group, 2017).



2 Innovation ecosystems: A conceptual framework

This section provides an overview of the key concepts that are used in this report. We discuss the most important definitions surrounding innovation ecosystems, and we present a framework for the building blocks of and prerequisites for a flourishing innovation ecosystem.

2.1. Innovation and its role in the economy

Innovation is critical for economic development. Innovation of various kinds is required to achieve greater productivity, economic growth and enhanced livelihoods (Block et al., 2017; Broughel & Thierer, 2019; Henderson & Weiler, 2010).

Innovation entails trying out and successfully applying new things. It is defined as “finding new and better ways of doing things and introducing new ideas or new types of products and services into the marketplace” (Broughel & Thierer, 2019) and “the development and commercialisation of unproven technologies and untested processes and products” (Tuomi & de Castro Neto, 2013). From both of these definitions, it is clear that innovation is more than just having a good idea – it encompasses the successful creation of a product or tool that makes the idea practical (a tangible invention) and then testing the invention in the real world, iterating and taking it to market (Denning, 2018; Weber, 2012) (see Figure 2).

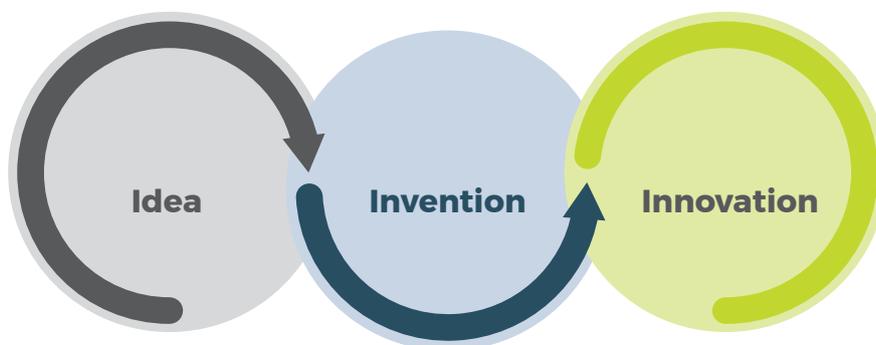


Figure 1: Innovation is an idea that has been developed into an invention and commercialised in the market

Source: Authors' own

Different types of innovation. There are ample granular typologies of innovation (see for example Rowley et al., 2011), but the most important ones apply to the product, process or business model for innovation (Zaidi, 2018), and the extent to which the innovation affects the market (Kylliäinen, 2019) (see Figure 3 on the next page). All of these types were considered in this project.

Individuals with an entrepreneurial attitude are crucial for moving ideas and inventions towards successful innovations. Entrepreneurs are the critical connection linking inventors and the successful use of their inventions in the economy (Baumol, 2008). Success or failure



of an invention depends critically on implementation, and thus it is generally entrepreneurs that have a greater role in growing innovation in an economy (Henderson & Weiler, 2010). An entrepreneurial attitude is instrumental in moving innovations into the market (Hayes, 2020; Kuratko, 2020; Kuratko et al., 2020). Entrepreneurs anticipate needs, spot opportunities and take the risks necessary to bring products or services to the market (Hayes, 2020).

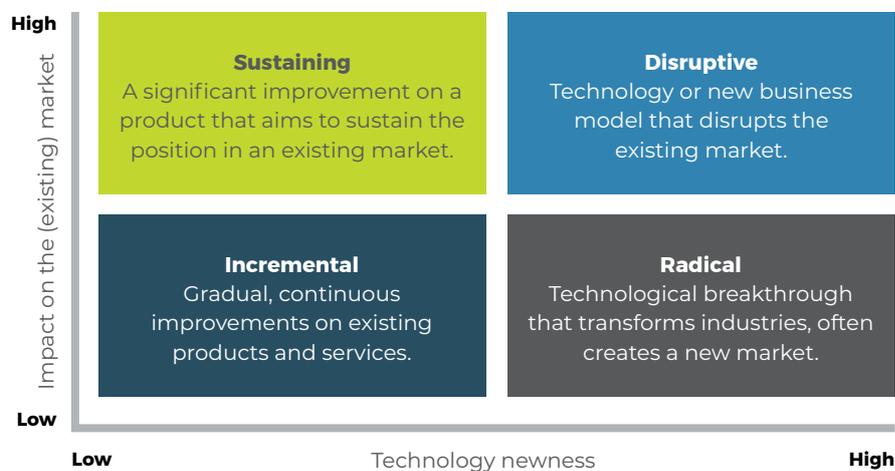


Figure 2: Different types of innovation according to the newness and the impact of the technology

Source: Adapted from Kylliäinen, 2019

2.2. The building blocks of innovation ecosystems

innovation ecosystem (noun)

ɪnə'veɪʃ(ə)n 'i:kəʊsɪstəm

A web of interconnected factors that turns a particular location into an engine room for coming up with new solutions and successfully taking those solutions to market. Characterised by an entrepreneurial mindset and a dynamic flow of ideas, capital and labour.

Source: Authors' own

An enabling environment is the foundation of an innovation ecosystem.

This includes appropriate and supportive government policies, or the absence of regulatory barriers to innovation. Examples include regulation around intellectual property, visas for foreign talent and rules around receiving international investment. It also includes regulation on the ease of doing business, the presence of the appropriate infrastructure and a population's digital readiness.

The key building blocks of an innovation ecosystem are capital, talent and technology.

An ecosystem needs people who have the right combination of skills – which include both hard technical skills and soft entrepreneurial skills – and the right mindset. To be able to generate innovative solutions, these individuals need access to technology. And sufficient capital is required in the ecosystem to allow these individuals to develop and commercialise their ideas.



An ecosystem is greater than the sum of its parts. Even the presence of each building block individually provides no guarantee of individual innovators' success. This is where ecosystem facilitators add value, by bringing the building blocks and players together in a way that best supports their success within a particular context.

The social dimension - or networking assets - are what create the "ecosystem" effect. Networking assets are the component that links the various ecosystem building blocks together, and thus generate a multiplier effect. Networking assets are "the relationship between the ecosystem's actors that cultivate and accelerate innovation through the exchange of information and ideas, and increased collaboration. They include workshops, conferences, networking events and hackathons" (Mulas et al., 2015). In short, networking assets are both tangible, such as the physical spaces required for these engagements, and intangible, such as the relationships and social engagements developed there.

The outcome of a flourishing innovation ecosystem is successful, contextually relevant, sustainable and inclusive innovation. There are certain intangible, cultural factors that can increase the likelihood of such quality innovation emerging (see Figure 5). Firstly, good innovation needs to address a real problem. The presence of ample needs and challenges in the market increases the scope for innovation (George et al., 2012). Secondly, an entrepreneurial mindset is critical, consisting of the ability to see opportunities, and the capacity and willingness to take risks to take advantage of these opportunities (Farley, 2013). This mindset and ability make the difference between an idea, an invention and a commercialised innovation (see Figure 2 on Page 6). Thirdly, the presence of diversity and, more importantly, engagement and exchange of ideas between people of a diverse background with different life experiences are key. Such interaction can generate new emergent ideas and perspectives, creating opportunities and innovation (Kaplan, 2012). The more such overlapping and diverse thinking an individual experiences from their interactions, the greater their potential for creativity and innovation (Satell, 2013). For an ecosystem to flourish, it is important that it is not only home to a diverse range of players, but specifically that those players engage with one another. It is only through this 'collision' with others who are different that you get the benefits of a broadened perspective, challenging of preconceived notions, and uncovering of innovations outside of your usual circle. You also need interactions to be able to commercialise your solution (e.g. with investors and other market actors).

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The more such overlapping and diverse thinking an individual experiences from their interactions, the greater their potential for creativity and innovation.

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Figure 3: Intangible, cultural factors that increase the likelihood of quality innovation

Source: Authors' own

A framework for innovation ecosystems. The prerequisites and building blocks of an enabling environment – the sufficiently free movement of ideas, talent, capital and technology – are fundamental. However, these components are necessary but not sufficient conditions for successful innovations that are contextually relevant, commercially successful and sustainable. Networking assets are what makes a system into an ecosystem, allowing for interaction between different actors, dynamic growth and feedback loops responding to changes in the market. This connects the building blocks in meaningful ways, allowing for the interaction of diverse ideas through collision. The intangible, cultural aspects of real market challenges, the diversity of interactions and an entrepreneurial spirit increase the likelihood of would-be innovators coming up with the best possible solutions. Figure 6 illustrates our framework for innovation ecosystems.

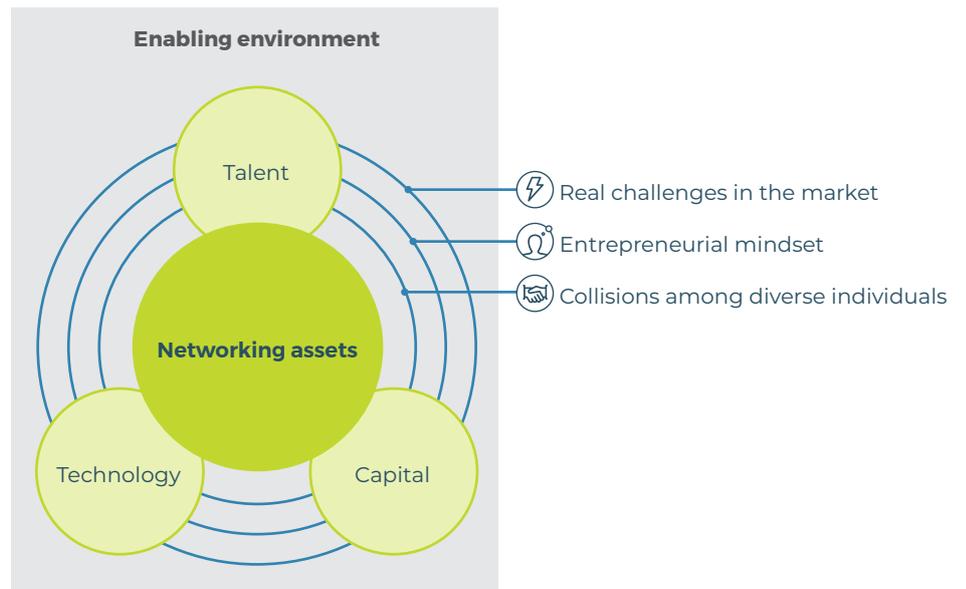


Figure 4: Innovation ecosystem framework

Source: Authors' own



3

Insights from three African tech innovation ecosystems

3.1. Introduction

Each innovation ecosystem is unique and reflects its context, despite sharing the common building blocks as outlined above. In each of the three ecosystems we investigated, a contextual narrative surfaced:

- Cape Town: The promise of inclusive innovation in a divided city
- Nairobi: Shapeshifting into maturity
- Lagos: “If you can make it there, you’ll make it anywhere.”

This section discusses the building blocks of each city’s ecosystem, places it in the context of the overarching narrative and describes the key levers for change. A lever is a specific factor in the ecosystem that, if acted upon, could have a significant positive impact on the flourishing of the ecosystem as a whole. We identified these in close collaboration with local ecosystem stakeholders, through a process of co-ideation, synthesis and voting.

3.2. Cape Town: The promise of inclusive innovation in a divided city

A key theme of the Cape Town ecosystem is high-quality building blocks in a divided ecosystem. Cape Town ranks as the top innovation ecosystem on the continent (Startupblink, 2020), boasting high-quality universities, hubs, investors and start-ups. Of the three ecosystems we investigated, its innovation ecosystem building blocks are the strongest. However, the city is divided economically and spatially, and it suffers from structural and historical inequalities, making access to these building blocks unequal. If addressed, the diversity and challenges that arise from this divided nature might give rise to even stronger innovation, making good on the promise of the ecosystem’s strong basis of building blocks.

3.2.1. Ecosystem building blocks

3.2.1.1. Enabling environment

While Cape Town has relatively good infrastructure, access is unequal. Poor public transport and the cost of data are a challenge for many young entrepreneurs. Other challenges, such as frequent loadshedding¹, add to the cost of running a business.

Government policy directly and indirectly shapes the innovation ecosystem. For example, visa restrictions, labour regulations, intellectual property and repatriation of capital policies have particular implications for the tech sector, as it limits the mobility of labour, capital and ideas. Strict policies tend to hinder entrepreneurship, making it less attractive.

3.2.1.2. Talent

The city has ample capacity to grow its own talent. However, due to the legacy of Apartheid, opportunities to access quality and higher education are not equal. The greater Cape Town area hosts three of

¹ Also known as “rolling black-outs”, which are scheduled regular power interruptions in South Africa.



Africa's top 20 universities² (Times Higher Education, 2019), and a number of training academies in the area are focused on ICT and tech-related courses. Unfortunately, such certificates are less readily accepted by prospective employers than traditional university degrees.

Nevertheless, a pertinent skills gap remains. A 2018 survey of tech founders in the greater Cape Town region found that access to talent is a bigger obstacle than access to financing or markets (Endeavor Insight, 2018).

The city is popular with highly qualified individuals from the rest of the country and abroad, despite some structural deterrents and barriers.

Cape Town is attractive due to its lifestyle and relative affordability, and the network effects of hubs and investors in a small ecosystem make professional networks more accessible (albeit not equally). However, visa and labour regulations, political instability and service delivery challenges can disincentivise international talent or entrepreneurs from settling in the city. For local talent, relative (un-)affordability, (relatively lower) salary levels and lack of social cohesion in the city may act as a deterrent over other cities, such as Johannesburg (BusinessTech, 2019)

3.2.1.3. Capital

Despite the large number of funders in Cape Town, there is a gap in early-stage investment. There is a relatively high concentration of high net-worth individuals (HNWIs), several venture capitalists (VCs), and the traditional financial services sector has a strong base in Cape Town. But gaps remain in seed- and early-stage funding. Most of the funders that are active are relatively risk-averse, seeking start-ups that have reached growth stage. And the business angels in the city, who are seeking early-stage investments, operate in a fragmented manner with limited use of strategic networks. This is a challenge for entrepreneurs (who struggle to obtain the funding) and investors (who don't have the certainty that there are other funders to contribute to business once their funding ends).

Relationships and networks are critical, as the personal connection can be as important as the quality of the venture or idea. Cape Town's socio-economically divided nature limits access to the required networks. This is compounded by unequal access to the space and education that would allow such connections to form organically over time.

3.2.1.4. Technology

Diverse stakeholders such as universities (and their research arms) and corporates play an important role in creating new solutions. Universities have the resources to spend time on new ideas and inventions, but researchers aren't necessarily effective at or incentivised towards taking them to market. An example of an initiative that aims to address this is the University Technology Fund (Creamer Media's Engineering News, 2020). Corporates have the resources and incentive to go to market, but tend to focus on solving a problem in the business rather than the market, and their processes can be limiting for innovators and entrepreneurs.

3.2.1.5. Networking assets

Cape Town hosts many innovation hubs or business support organisations (BSOs) that provide key support to start-ups, but access is unequal. These hubs provide innovation-friendly environments and support "their" entrepreneurs to develop ideas and take them to market. Coordination remains a challenge. There is concern around the level of duplication in this space and around spatial and social divisions. Most physical hubs and events are in the central business district, which is less accessible to the majority of Capetonians.³ While the city boasts

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- 2 The University of Cape Town (1st), the University of Stellenbosch (3rd) and the University of the Western Cape (11th).
 - 3 Some hubs are beginning to address this, such as the GSB Solution Space with locations at the Waterfront (an upmarket area in the city centre, popular with tourists) and in Philippi (a township about 30 minutes' drive from the city centre), as well as the Cape Innovation and Technology Initiative's Bandwidth Barn, with locations in Woodstock (a traditionally working-class – yet recently gentrifying – suburb just outside of the city centre) and Khayelitsha (a township about 40 minutes' drive from the city centre).



many innovation-related events, these aren't always conducive to valuable learning or for expanding networks. For example, pitching events may be a struggle for those from less privileged backgrounds, who experienced low-quality schooling and the kind of systemic bias that undermines the confidence and self-belief required, or for individuals for whom English is not their home language.

There are gaps in the skills training on offer. A number of gaps were highlighted, including training on how to scale a start-up, plus more specialised training on pitching, understanding different types of capital and funding, and negotiating fair deals for both sides.



3.2.2. Levers for change

The following levers for change were identified for their potential to unlock more flourishing innovation in Cape Town:

- **With many of the core building blocks for an innovation ecosystem in place, Cape Town would benefit from greater effort at connecting and networking.** Suggested examples include:
 1. **Applying an inclusive mindset and approach to planning events,** including consideration of time, location, transport, and which actors are included.
 2. **Enhanced coordination between ecosystem facilitators** through open-access events calendars to avoid duplication.
 3. **Value-adding events,** including low-pressure (no pitching) events, convenings on identified challenges, failure and learning events, and idea validation sessions.
 4. **Building mentoring connections for young entrepreneurs** to build confidence, and navigating financing options and strategic decisions. Ecosystem facilitators and investors can catalyse these relationships, but mentor buy-in is key.
- **More training in digital skills is a must.** This starts with the basics and includes high-quality (paid) internships with measurable outcomes, and training in tech-based solutions.
- **Market research and deep participatory design processes to lay bare the market challenges that more privileged innovators may be unaware of.** This helps to deepen the understanding of a problem and to draw on diverse perspectives. These processes deliberately bring in diverse perspectives and ways of knowing.

3.3. Nairobi: Shapeshifting into maturity

Since the launch of M-Pesa over 10 years ago, Nairobi's global image as an innovative tech city, or the Silicon Savannah, has solidified and matured.

It started in the fintech space and rapidly expanded into other tech sectors, with an overarching focus on "social tech" (Haikin, 2018). The city's "Jua Kali" ("getting things done") or "hustle culture" attitude (Daniels, 2010) when applied to tech sector, makes for good ideas that are robustly and cleverly taken to market. A large number of investors and ecosystem facilitators have set up shop in the city, proliferating alongside its start-ups (Divakaran et al., 2018). A decade into its journey, the ecosystem has matured, which has brought with it learnings and challenges. On the one hand, today's founders, investors and ecosystem facilitators are savvier, with a better understanding of what it takes to launch and scale a business. On the other hand, the proliferation



of ecosystem players has increased the levels of competition, which contributes to a sense of distrust in the market. Likewise, these increasing numbers of matured players have new needs, which the ecosystem needs to answer to, ranging from different requirements of physical infrastructure (such as co-working spaces) to the types of training provided.

3.3.1. Ecosystem building blocks

3.3.1.1. Enabling environment

The Kenyan Government's early enabling approach to tech regulation made it possible for innovators to try new things. Where regulation lagged technology (e.g. in the case of M-Pesa), innovations were not assumed to be prohibited and would often be allowed and monitored with a view to developing regulation. Additionally, the Government also regularly convened stakeholders to discuss industry trends, contributing to cohesion in the ecosystem. Recently there has been a shift. The Government has become more risk-averse; its defensive regulatory stance strengthened by bad press around digital credit's role in over-indebtedness and a rise in online gambling. There has been a sense that the promises of the early days are not coming to fruition.

Nairobi has good infrastructure for tech development, albeit with challenges. Seventy-five percent (75%) of the population has access to electricity. There is high mobile network coverage so that today over 90% of Kenyans have an active mobile subscription and 83% have mobile internet subscriptions. However, smartphone subscription is lower at 30%. The city's traffic is also a significant challenge (World Bank, n.d.).

3.3.1.2. Talent

Kenya has a sizeable number of well-educated, tech-savvy young people. A gap exists between what is offered by institutions and required by industry. Some level of digital skills training (with varying levels of quality) is taught at high school and tertiary education level (Carboni et al., 2020b; van den Berg & Johnston, 2019). However, stakeholders complain that formal curricula are too theoretical, outdated and/or not aligned with industry needs. Many graduates also leave university without the necessary soft skills, and require on-the-job training. Currently, it is an employer's market for junior positions, but due the experience and additional skills required, more senior positions are harder to fill.

In addition to on-the-job training, innovative firms have in recent years recognised the importance of investing in additional training. Ecosystem facilitators and investors see greater interest in both technical and personal development training, as well as mentorship programmes. Many young people who enter the digital/ICT sector supplement their university knowledge with short courses from third-party skills training providers, online courses, or after-hours extra classes at universities, which are increasingly being recognised.

3.3.1.3. Capital

Nairobi's funding landscape has gaps in seed- and early-stage funding, partially due to unrealistic expectations from investors. Local investors currently show greater preference for more traditional and certain asset classes, such as property, and they require up-skilling to be introduced to the realities of investing in innovative tech.

Much of the funding available is international, and foreign founders find it easier to relate to potential investors in their networks. Foreign investors generally aren't based in Nairobi, so would not necessarily be part of local networks. This has led to the perception that foreign entrepreneurs receive most of the start-up funding (Mpala, 2018). However, there is a growing realisation among investors that local founders are important for a successful venture, so these perceptions are starting to shift. Also, one finds many instances where start-ups have both a local and an international co-founder. Some local investors are working deliberately on solutions to somewhat de-bias the investment process.

3.3.1.4. Networking assets

Today, Nairobi is home to a host of innovation hubs, co-working spaces, incubators and accelerators. However, many of these business support organisations (BSOs) are struggling with financial viability – feeling the pressure to commercialise – but have not yet identified the right business model. Many are reverting to co-working spaces, which decreases their ability to be engine rooms for new solutions. The rise in the number of BSOs has also led to a rise in competition for business and networks. Throwing open the entry gates for start-ups too widely risks diluting the quality of companies or start-ups that BSOs can attract. Further, hubs' business support networks often depend on hub leads' or companies' personal connections, which are closely guarded, leading to exclusive networks or silos.

Across the ecosystem, the roles of “champions” from the policy, academic or business support space are notable. In their organisations and series of roles, they are credited with championing certain skill sets and strategic priorities and bringing the right people to the table to action on these. Umbrella organisations also have a potentially impactful role in convening the space (see, for example, Malaki, 2019).

Established corporates play a unique role in the ecosystem and can provide investment in terms of ideas or products. However, there is distrust in their relationship with start-ups. Early-stage companies fear (informed by experience) that bigger companies will poach their ideas.





3.3.2. Levers for change

The following levers for change were identified for their potential to unlock more flourishing innovation in Nairobi:

- **Nairobi has a large informal sector that provides opportunities for entrepreneurs.** The sector provides a number of spaces for which entrepreneurs can create solutions, answering to real market needs, and innovating in a space that has traditionally been neglected by large corporates. There is also an opportunity to build stronger relationships between start-ups and big corporates.
- **Ecosystem facilitators must evolve to meet emerging needs of start-ups.** As the ecosystem matures and competition increases, hubs need to adjust their offering to meet the demands of more established and sophisticated start-ups. For example, co-working spaces may no longer suit their needs, whereas focusing rather on specific types of training could add value. Also, more mature start-ups reflect that they simply have less time for “ecosystem engagements” and events. Maturity-based progressions are positive, but mature start-ups moving out of the hub ecosystems presents fewer opportunities for ecosystem engagement and collisions throughout (Hunter, 2020).
- **Focus on the quality of relationships and networks.** Ecosystem convening should overcome current feelings of distrust and disconnect. It should allow ecosystem champions to advance the right conversations with as broad a reach as possible. Ecosystem coordination bodies or umbrella organisations may be able to assist here.
- **Improve linkages between industry and education for skills transfer and validation.** For example, in 2019, Strathmore University’s iLab trained employees of an MNO in cybersecurity and other high-end digital skills (iLabAfrica, 2020). Business schools or labs affiliated with universities are particularly well placed for this kind of partnership. Other examples include tax incentives for industry to invest in such training; and platforms to allow for tech talent to build, validate and vet their skills.
- **Address the mismatches in funding.** This can be done in several ways, such as external de-risking (particularly for debt) or an investment platform that increases transparency and decreases funding information asymmetries. Another approach is to include local representation of foreign funders in Nairobi.
- **Investor education and showcasing success stories can also be a strong lever and help to address the funding mismatch.** It could encourage HNWIs to become angel investors, as could the documentation of case studies work on successful local tech investors.

3.4. Lagos: “If you can make it here, you’ll make it anywhere”

When it comes to tech innovation in Africa, many consider Nigeria the place to be. It has a large, youthful population who are willing to try new things. However, it is not an easy market to capture. Because of infrastructure and other market challenges (ITU, 2017; Lixi et al., 2019; World Economic Forum, 2018), innovations in Lagos must be resilient or they will fail. Start-ups are squeezed from both ends; a large low-income population puts downward pressure on prices, still expecting a quality product, while infrastructural and environmental challenges up the cost of doing business. Additionally, innovators and tech businesses often operate in the face of regulatory headwinds.



3.4.1. Ecosystem building blocks

3.4.1.1. Enabling environment

There is a government-market divide: Policies and regulations don't always match the needs of digital industries (though there have been recent examples of improvements). This is compounded by limited government understanding of the tech sector and/or their appetite to make use of innovative products themselves, as reflected on by ecosystem stakeholders. In addition, the Government is notoriously bureaucratic and fragmented. This challenge is exacerbated by complex and sometimes unclear regulations and an implementation gap where regulations are not strictly enforced. This has contributed to an overall lack of trust between government and industry, and in society more broadly.

Digital infrastructure gaps hamper the ecosystem's ability to develop new solutions, and decrease the market's digital readiness. The price-sensitive market can still not afford access to devices or the internet, which is compounded by a lack of reliable electricity and internet coverage.

3.4.1.2. Talent

The Lagos tech ecosystem is faced with a talent gap. Companies lament that there is not enough tech talent to go around, and talented individuals may take up multiple jobs as a result. However, this wasn't the most front-of-mind challenge for ecosystem players, as other challenges weigh heavier (see below).

3.4.1.3. Capital

Lagos is considered an attractive market to invest in. The size and entrepreneurial nature of the Lagosian market, coupled with some high-profile deals, have led to the perception that Lagos is *the* market to be in. Investors who enter the market have high expectations of returns.

There is a large presence of foreign investors in Lagos, which creates challenges for innovators. Notably, funding deals are predominantly concluded in USD, which increases the cost of capital and puts pressure on business models and returns. There are also some friction points due to investors not fully understanding the idiosyncrasies of operating in the Nigerian market, and local founders not fully appreciating the challenges that investors face, which leads to higher expectations of deal sizes.

(Stories of) negative experiences with local investors mean that local founders are willing to accept the challenges that come with foreign investors. A number of start-ups have reported bad experiences with local VCs requesting unreasonable stakes and term sheets. These local investors are accustomed to lower-risk shares and need to shift their mindsets from buying shares to investing in ventures. They also need to adjust their expectations of risks and returns accordingly. Investor education may help here.

3.4.1.4. Networking assets

The start-up network in Lagos is relatively small and welcoming once you are in. There is a sense that "everyone knows everyone", but the one challenge is getting in. Being part of a good (oftentimes foreign) incubator or accelerator programme is considered vital, both for networks and future funders, as it provides a strong signal of potential.



3.4.2. Levers for change

- **Lagos has a number of untapped opportunities for developing more impactful innovations.** For example, there has been little focus on tech solutions for business, particularly small businesses. There are also significant opportunities in transport, logistics and infrastructure, though some of this is beyond innovation start-ups to solve. Institutional clients (both in government and larger corporates) present an opportunity, and policies could incentivise the use of local products. Market research could help to highlight the untapped opportunities to boost innovation and contribute to informed decision-making.
- **There are a number of ways Lagos can increase partnerships across stakeholder groups.** An example would be regular and formalised dialogue mechanisms (more than one-on-one, closed or ad hoc meetings) for SMEs and government. This allows industry and government to work together to co-create regulation through stakeholder consultations. Another strategy is the creation of a community platform to encourage tech-regulator engagements and co-creation of policies and regulations.
- **Investor education can serve to address both investors' expectations and their understanding of ventures, while case studies of successful tech investments can furthermore help prove the sector as a viable asset class.** This can increase the availability of local funding and the negotiation of more responsible deals, which can address the sense of distrust of local VCs and investors. More funding in local currency (as opposed to USD or other foreign currency) will decrease pressure on the business model. Funding also tends to attract more funding, becoming a virtuous cycle. Investee education, targeted at entrepreneurs, is also necessary to align expectations. Further research can map the start-up and financing landscape in Nigeria, which could help to address misalignment in expectations between start-ups and investors.
- **The ecosystem would benefit from co-creation of financial products and tools, thereby expanding the available funding options for entrepreneurs.** Ecosystem stakeholders noted in particular that the limitations placed on institutional investors and the activities of development finance institutions (DFIs) caused funding gaps and that innovative de-risking solutions would be important to incentivise local investors towards tech innovation. A final challenge is the present thresholds for financing by traditional financial service providers (FSPs), which exclude early-stage start-ups and SMEs. Co-creating new financial products that take these concerns into account can bring together different types of financiers to fill the experienced funding gap for tech innovation in Lagos. Such co-creation should include all those involved in funding tech innovation: financiers, DFIs, intermediaries, tech companies and the regulator.

4

What makes innovation ecosystems in sub-Saharan Africa thrive?

This section highlights and summarises our learnings across the three investigated ecosystems.

We discuss the insights per ecosystem building block (as per Figure 6 on Page 9), as well as common levers for change. These insights are drawn from our research on the innovation ecosystems in Cape Town, Lagos and Nairobi specifically, but can be helpful in engaging in other similar ecosystems on the continent.

4.1. Enabling environment

The importance of a supportive and innovation-smart government, with sufficient e-leadership skills, is most clearly illustrated in its absence.

Innovators in markets like Cape Town and Nairobi may be forgiven for taking for granted the support that (local) government provides to tech innovation – either through campaigns to support and attract investment, programmes to encourage innovation, or through a licensing process that is tolerant of innovation and iterative processes. In markets like Lagos, where government actions are insufficiently supportive of innovation or enforce cumbersome bureaucratic processes, this causes friction. To a large extent, the lack of so-called e-leadership skills among government officials limits innovation.

Sufficient digital infrastructure and digital readiness are seen as prerequisites for innovation in an ecosystem, but an absence might just lead to more radical and sustainable innovation.

There is no doubt that more reliable electricity, greater internet coverage, access and usage of digital devices and sufficient digital rails in an economy (payment infrastructures, digital ID systems, etc.) make digital innovation easier. But those who are interested in supporting or establishing innovation ecosystems should not be discouraged by the relative absence of these prerequisites. Challenging environments encourage innovators to think outside the box and solve local problems to allow their innovation to operate successfully, resulting in more robust products. This type of innovation in the face of challenges is a key strength of all three innovation ecosystems we investigated and will likely be a strength in other African innovation ecosystems as well.

4.2. Talent

No matter how big your supply of local talent, a growing ecosystem will always require more. Entrepreneurs are the most critical talent needed for innovations to succeed.

Successful tech innovations require more than technical skills.

Stakeholders in all three cities reflected on the fact that they perceive a gap in soft skills and/or business skills. In the words of a Capetonian VC: “It is not a viable strategy to collect a team of inexperienced first-time entrepreneurs, build a pitch deck, and hope for the best. Start-ups need to focus on building a business, and some formal business experience on the team is very helpful (Timm, 2019).”

“

Challenging environments compel innovators to think outside the box and solve local problems, resulting in more robust products.

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We did not find any significant benefits to attracting versus growing talent to the ecosystem. Talent from elsewhere can fill the supply gaps experienced by local industry and can bring with them important links to international ideas, networks and funding. However, government policies and regulations can make this a complex and expensive undertaking. Moreover, local talent brings a deeper and contextually relevant understanding of the market and generally proves a more sustainable supply of talent than shorter-term expats.

4.3. Capital

Innovation on the continent is hampered by a lack of seed- and early-stage funding. Despite a rising number of (local) VCs, as highlighted in all three cities, start-ups that have yet to reach growth stage struggle to access the financial tools needed to get there. Figure 7 shows the different possible sources of funding for start-ups at different stages of maturity, and highlights those that are found lacking in African innovation ecosystems.

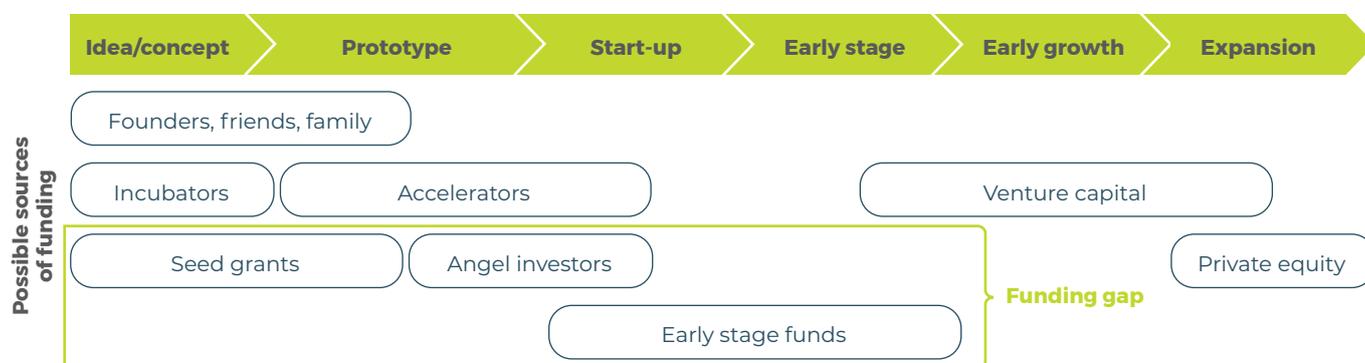


Figure 5: A lack of early-stage financing options in African innovation ecosystems

Source: Adapted from World Bank, 2020

There are gaps in the understanding and experience of both investors and investees. In all three cities, we observed how an “arbitrary understanding” of funding rounds (Jackson, 2019), different financial instruments and the structuring of sustainable deals hampered effective fundraising. This applies to both start-ups (with a tendency to aim for inappropriate funding mechanisms for their stage of maturity, and with unrealistic expectations of the terms and values available) and investors (with insufficient experience of what it takes to invest in early-stage ventures, and with risk-return expectations that may be mismatched for tech innovations).

Networks and relationship building are key for successful fundraising. A refrain that was heard in all three cities was “Investors invest in people”. Financiers base their investment decision as much on the extent to which they believe in a core team as on the extent to which they believe in a business proposition. After all, it is the team that makes or breaks the success of a business when it comes to implementation.

4.4. Technology

Increasing access and use of digital tools by consumers increases the potential market for tech innovations. However, innovators in an African context need to keep in mind the challenges of access to technology and network coverage. For example, smartphone penetration remains low, and there is not yet continuous coverage of mobile data, nor do all

consumers have sufficient disposable income to purchase it. Innovating round these challenges can potentially result in innovative, context-relevant solutions.

Exposure to and reliance on global technology may hamper local innovations. Whereas it is considered positive and important that markets have access to global technology, to inform and spark local ideas, this may also backfire to an extent. Global technology is increasingly accessible to local consumers, which significantly increases the competition for local tech innovations.

4.5. Networking assets

Networking assets are critical for flourishing innovation ecosystems.

The three ecosystems we investigated – Cape Town, Nairobi and Lagos – rank top in sub-Saharan Africa in terms of networking assets specifically for tech innovation (Startup Genome, 2020; Startupblink, 2020).

As described in Section 2, networking assets are key to the functioning of the ecosystem as a whole, as they bring together and act as a multiplier for the other building blocks (an enabling environment, talent, capital and technology). Especially initially, the more networking assets there are, the better.

An increasing presence of networking assets gives rise to increasing coordination challenges. Whereas Lagos, as an ecosystem at an earlier stage of maturity, has fewer of these complaints, from our engagements in Cape Town and Nairobi it became clear that a larger number of such networking assets – or ecosystem facilitators – require increasing coordination and alignment. Failing to do so can make it difficult for start-ups – their target market – to identify the appropriate services for them. It can lead to exclusion of certain segments of entrepreneurs and can lead to a fragmented ecosystem, which defeats the purpose of these assets' multiplier effect. Umbrella organisations (e.g. an industry body) could hold space for such coordination, but need to position themselves carefully – even neutrally – to achieve ecosystem legitimacy.

Networking assets need to remain relevant to the ecosystem.

These ecosystem facilitators provide more than just meeting spaces, thereby facilitating networks and relationships. They also provide training, physical productive assets, and can direct the attention of the ecosystem to market opportunities. These activities need to be designed and carried out in a way that is relevant to the ecosystem, answering to the needs of start-ups at various stages of maturity as well as other market actors. For example, start-ups and investors alike mention a need for more soft entrepreneurial skills, which ecosystem facilitators can provide; and the business model of these networking assets needs to align with the needs and available capital of the start-ups they aim to serve.

4.6. Where do good ideas come from?

Cape Town, Nairobi and Lagos are known as top innovation ecosystems because the ideas that come from them are particularly good – despite certain prerequisites not being present. Our ecosystem investigations highlighted that precisely those factors that can make a market more difficult to deal with – gaps in infrastructure, diversity and social segregation, and limited availability of consumer digital technology – may end up generating the most radical and sustainable innovations.

These challenges in the market should not be seen as deterrents for innovation, but launch-pads of opportunity.

“

Especially initially, the more networking assets there are, the better.

”

5 Considerations for ecosystems stakeholders

Setting up and supporting innovation ecosystems requires a deep dive into the nature of, and dynamics between, the building blocks of that specific ecosystem. Frameworks and cross-country themes are helpful as a first step, but as we have identified in the previous sections, the way these individual factors and themes play out looks very different depending on each city's context. That being said, the following actions have been identified as key levers for impact across all three ecosystems we investigated. Due to the interlinkages between the various themes and factors, focusing on these actions has the potential to significantly impact on the flourishing of any ecosystem.

“

A break-down in relationships and engagement across the ecosystem means the various stakeholders are insufficiently aware of one another's needs, challenges and opportunities.

”

- **The social dimension of an ecosystem is critical: focus strongly on establishing and facilitating the right networks and relationships within the ecosystem.** Consisting of the relationships and collisions that are facilitated by various networking assets, this social dimension is what links all components of the ecosystem together and what brings it to life. A break-down in relationships and engagement across the ecosystem means the various stakeholders are insufficiently aware of one another's needs, challenges and opportunities. This means that government policies are not aligned with industry realities, that trainers don't focus on the right skills needed by industry, that ecosystem facilitators' models don't align with start-ups' needs and abilities to pay, and that start-ups' expectations of investment deals are not aligned with those of investors.
- **Invest in additional training, including both technical (hard) and entrepreneurial (soft) skills.** The more talent is supplied in the market, the more talent will be required, for the foreseeable future at least. Moreover, successful tech innovations require more than just technical skills. Innovation ecosystems require a wide variety of trainers that are linked to the needs of industry, focusing on both technical (hard) skills and entrepreneurial (soft) skills. Such trainers can range from universities and alternative educators to ecosystem facilitators and mentors or active investors. Mentorship has shown to be valuable at different stages of start-up maturity and individuals' career growth. There is also space to better match supply- and demand of talent.
- **Remove the friction in the funding process by increasing information and communication between funders and entrepreneurs.** African tech innovation ecosystems are hampered by a lack of seed-stage and early-stage funding. Addressing this requires more investors willing to take risks and different types of instruments. A lot of friction is created by a lack of experience and understanding of different types of investment options and stages – on the side of both investors and investees. Communication of success stories and a focus on investment education (both for investors and investees) can help here.



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Appendix: Ecosystem stakeholders engaged

Representatives of the following organisations were engaged in the Systems Mapping exercise that was the core of this project:

Cape Town	
Botlhale AI	Tech start-up
Flash Mobile Vending	Tech start-up
Goodwell Investments	Venture capital
GSB Solution Space	Ecosystem facilitation
JUMO	Tech start-up
LIPCO	Legal
Oribi Village	Ecosystem facilitation
Prim-U	Tech start-up
Quona Capital	Venture capital
Qwili Africa	Tech start-up
Rock Paper Scissors Innovation	Innovation consulting
University Technology Fund	Venture capital
VISARLabs	Tech start-up
Wesgro	Local government Ecosystem facilitation
WeAreMonsters	Venture builders

Lagos	
Access Bank	Financial service provider
Africa Fintech Foundry	Venture capital Ecosystem facilitation
Branch Nigeria	Tech start-up
FarmCrowdy	Tech start-up
Fate Foundation	Ecosystem facilitation
FINT Technology Africa	Tech start-up
Google Nigeria	Tech start-up
Growth Capital	Venture capital
iX Consults	Consulting
KPMG Nigeria	Consulting
Lagos Business School	University
Lagos Innovates	Government Ecosystem facilitation
Nigerian Communications Commission (NCC)	Government
Trium Networks Limited	Ecosystem facilitation

Nairobi	
4G Capital	Venture capital
BFA Global	Consulting
Busara Center for Behavioural Economics	Consulting
FSD Kenya	Ecosystem facilitation
GrowthAfrica	Venture capital
IBM Research	Tech firm Ecosystem facilitation
iLab Africa	Ecosystem facilitation
Metta	Ecosystem facilitation
Nairobi Garage	Ecosystem facilitation
Safaricom	Mobile network operator
Sendy	Tech start-up
Strathmore Business School	University
UK-Kenya Tech Hub	Ecosystem facilitation
University of Nairobi	University



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About Cenfri

Cenfri is a global think tank and non-profit enterprise that bridges the gap between insights and impact in the financial sector. Cenfri's people are driven by a vision of a world where all people live their financial lives optimally to enhance welfare and grow the economy. Its core focus is on generating insights that can inform policymakers, market players and donors seeking to unlock development outcomes through inclusive financial services and the financial sector more broadly.

About insight2impact

insight2impact is a resource centre that aims to catalyse the provision and use of data by private and public-sector actors to improve financial inclusion through evidence-based, data-driven policies and client-centric product design. insight2impact is funded by the Bill & Melinda Gates Foundation in partnership with The MasterCard Foundation.