



CATALYSING LOCAL INNOVATION ECOSYSTEMS IN **KENYA AND GHANA:**

THE ROLE OF DEVELOPMENT FINANCE

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EXECUTIVE SUMMARY

➤ THIS REPORT EXAMINES THE ROLE OF DEVELOPMENT FINANCE IN SUPPORTING AFRICAN TECH ECOSYSTEMS. USING A DESIGN-LED APPROACH AND SYSTEMS THINKING TOOLS, WE ANALYSE THE RESULTS OF 35 ONE TO ONE INTERVIEWS, 70 SURVEYS AND 3 ROUNDTABLES WHICH TOOK PLACE IN NAIROBI, ACCRA, AND LONDON.

We identify three central problems with present approaches to development investment in the African tech sector:

- **Insufficient investment and attention is being given to building and developing ecosystems as a whole, with present focus mostly directed towards supporting individual start-ups and entrepreneurs.**
- **Interventions by development organisations who do not work with governments may generate long term dependencies by the local ecosystems on foreign aid.**
- **Current investment methodologies unintentionally create a bias against local entrepreneurs. This reduces the potential of local innovation to contribute to sustainable development.**

As a consequence of these three factors, development finance in Africa is simply not reaching its potential in meeting the needs of African innovation ecosystems.

We conclude with five recommendations for the future role of development finance in supporting the African tech ecosystem:

- **Development finance should increase support for hubs and ecosystem intermediaries.**
- **When hubs are supported, investors should ensure that their resources serve to promote collaboration rather than competition.**
- **Investors should be conscious of the important role that national and regional governments have to play in shaping innovation. Organisations should cooperate with governments, and provide funding for infrastructure, networks and capacity building.**
- **Development funds should maintain an emphasis on supporting local and diverse teams, even when perceived risk and due diligence costs are higher.**
- **Future research into development in the African tech sector should experiment with more dynamic and systems-oriented research designs.**

Finally, we recognise that development patterns differ from country to country and continent to continent. We encourage future research on the best ways to catalyze innovation in developing countries in general, and Sub-Saharan Africa in particular.

INTRODUCTION

➤ AFRICA CONSTITUTES ONE OF THE FASTEST GROWING TECHNOLOGY MARKETS IN THE WORLD. SINCE 2000, MOBILE CONNECTIONS IN SUB-SAHARAN AFRICA HAVE GROWN BY 44%, SIGNIFICANTLY SURPASSING THE 34% GROWTH RATE FOR DEVELOPING REGIONS AS A WHOLE, AND 10% GROWTH RATE FOR DEVELOPED REGIONS¹. INTERNET USAGE GREW BY 3,600% BETWEEN 2000 AND 2012², AND FACEBOOK USAGE GREW BY 42% BETWEEN 2015 AND 2017, REACHING MORE THAN 170 MILLION ON THE CONTINENT³

Beyond presenting an attractive business opportunity, digital innovation has the potential to radically transform the African economy. By increasing the abundance and accessibility of information, generating online platforms for communication, and dramatically reducing transaction and market entry costs, a growing tech sector has the potential to increase productivity, create jobs, and increase environmental sustainability more effectively than traditional forms of foreign aid⁴. This is perhaps best illustrated by the proliferation of mobile phones and mobile banking, which, by reducing transaction costs, have increased the accessibility of credit, medical insurance, and electricity across the continent⁵. According to the GSMA, the mobile phone ecosystem currently contributes over \$100 billion to Sub-Saharan Africa's GDP, and supports more than 3 million jobs⁶.

These developments have given rise to a growing number of young, innovative entrepreneurs across the continent who are leveraging technology to develop homegrown solutions to local challenges and create economic opportunities for themselves and their communities. It is estimated that there are more than 400 active tech hubs across Sub-Saharan Africa which provide support to this emerging pool of entrepreneurs⁷.

There is also a growing realisation within the development sector that technological innovation has the capacity to promote economic and social growth. DFID has recently launched a series of innovation partnerships across the African continent as well as provided funding for GSMA Ecosystem accelerator⁸.

A joint partnership between the World Bank Global ICT department, the African Development Bank Group, and other international investment organisations has launched a series of ICT initiatives with both regional and national focuses¹⁰.

However, at this stage the tech sector in Africa continues to face an uphill battle. With co-funding from Innovate UK, we undertook a focused investigation into the difficulties faced by the African tech sector. By applying a design-driven and systems thinking approach, we identified not a single problem, but rather a series of interrelated gaps resulting in cyclical obstacles to innovation and development.

The structural nature of the problems which our research revealed indicates that an ecosystem approach is needed to build local capacity in the use of digital innovation for sustainable development. Start-up ecosystems are composed of individuals and organisations which facilitate the formation of new start-up ventures. In successful ecosystems, universities, funding organisations, research institutions, support and training organisations, service providers as well as large corporations work to create a network that fosters an environment for start-ups to scale¹¹.

Rather than investing in a number of individual start-ups, this report argues that development finance should seek to strengthen catalysts within ecosystems by investing in upskilling, and enabling collaboration between African tech Hubs, as well as connecting these Hubs to global networks of foreign investors, international development agencies, and public sector actors. The report is based on research conducted by ATBN in 2017-2018.

METHODOLOGY

➤ **OUR STUDY EMPLOYS A DESIGN-DRIVEN APPROACH TO EXAMINE THE ECOSYSTEMS OF KENYA AND GHANA. DESIGN-DRIVEN RESEARCH EMPHASIZES THE RECONFIGURATION AND REITERATION OF RESEARCH QUESTIONS EMERGING FROM THE STORYTELLING OF LOCAL ACTORS.**

When we first communicated with Hub leaders in Kenya, we were asked what sort of programme we were proposing. They were surprised to hear that we had no prefigured plan; one hub leader remarked that *“no one has ever come just to listen.”* To us, this is indicative of a tendency within the development sector to design programs before we hear the problems from local leaders and beneficiaries. Through the design-driven approach, we were able to listen to and understand the needs of different stakeholders on the ground before formulating recommendations.

Our process was composed of three stages: during the discover stage, we conducted 35 one to one interviews and circulated surveys to 70 leaders from different sectors within the Kenyan and Ghanaian tech ecosystems. With responses from these enquiries in mind, we entered the define stage of our investigation, in which we presented our existing thoughts to 120 stakeholders in three roundtables which took place in Nairobi, Accra, and London. The discussions which these roundtables produced allowed us to reconceptualize and redefine both the challenges of local tech ecosystems and our framework for tackling them. Finally, we entered the develop stage of the project, during which we produced a series of policy recommendations and a potential programme of action. We also partnered with Frontier Economics to produce a complementary report titled *“Early Stage Investment in the Sub-Saharan Tech Sector”*.

In addition to design-driven research methods, we used systems thinking tools and archetypes to analyse the structural problems we encountered. Systems thinking is a disciplined approach for examining problems more completely and accurately before acting. It encourages researchers to take the time to question and share findings with beneficiaries before constructing conclusive interventions. The methodology involves identifying cross-temporal patterns of behavior from observable events or data, and exposing the underlying mechanisms that drive those patterns. By understanding the structures that are not serving us well in the present, we are better equipped to generate more satisfying, long-term solutions to complex problems¹².

The system archetype which most clearly resembled the relationships we observed was the fix that backfires, in which the implementation of a quick fix to reduce a problem symptom creates long term unintended consequences that exacerbate the problem, despite seeming to alleviate the symptoms in the short run. Because system-mapping is inherently dynamic, we hope this methodology will promote future discussions and revisions to our map as it currently stands. Organisations can access and comment on our map through Kumu¹³.

¹² Goodman, Michael. “Systems Thinking: What, Why, When, Where, and How?” *The Systems Thinker*. Accessed Online October 2018.

¹³ Bar-Shany, Stav. “Catalysing Local Innovation Ecosystems: The Role of Development Finance.” *Kumu*

KENYA

- 40 Surveyed
- 20 Interviewed
- 40 Roundtable Participants

↘
Largest economy in East and Central Africa

↘
Largest recipient of foreign investment among African countries: Foreign participation in NSE was 54.1 per cent of total equity turnover between January and June of 2014

↘
Highest number of mobile users in Africa. Rising local demand, with 50% of the population expected to live in urban areas by 2050. (Kenyan Embassy website).

Local partner- iHub

- First and largest hub of its kind in Africa
- Founded by Erik Hersman in 2010
- Attracted nearly 17,000 members between 2010 and 2016 (iHub growth statistics)
- Partners include Google, Microsoft, and Facebook, among other major international investors
- Website: ihub.co.ke

Roundtable

Key Speakers:

Yaron Cohen - Co-Founder Viktoria Solutions
Marc de Courcel - Co-founder & COO Optimetriks
Cindy Oraro - Partner - Oraro & Company Advocates
Hilda Moraa- Founder at Pezesha

In Attendance

50% Start-ups, including Savannah Informatics, iProcure, and Optimetriks
30% Hub and Entrepreneur Support Organisations, including Growth Africa and Village Capital
10% Advisory Services
10% International Investors and Venture Capital
1 in 4 participants had existing relationships with the UK tech ecosystem.

KEY QUESTIONS

- What are the biggest challenges to getting international investment into the Africa tech ecosystem?
- How can local & international investors partner to catalyse investment into the Africa tech ecosystem?
- Are international funding programs like the GSMA Ecosystem Accelerator accessible to Kenyan start-ups?
- What are the challenges for Kenyan start-ups to compete on the global stage?
- Do you think development & impact funds create any unique opportunities or challenges for African start-ups compared to commercially-focused funds such as VCs?
- How can Kenyan start-ups be supported to compete globally?
- What expertise and value do Kenyan start-ups & ecosystem players have to offer UK businesses & investors?

“ **Cultivating and sharing more success stories is crucial to driving both local and international investor interest in the African tech ecosystem.** ”

Hilda Moraa, Founder at Pezesha

KEY INSIGHTS

Development finance has a crucial role to play in supporting tech in Kenya

➤ “Development and impact funding is crucial to supporting start-ups at the early stages of development. Kenyan start-ups need support in understanding which funds are available, as well as in measuring and reporting their impact so that they can better access grants. Development funds need to adjust their grant making approach to align with the needs of tech start-ups and avoid overly burdensome reporting”.

- Marc de Courcel co-founder and COO Optimetriks

Greater need for collaboration within the ecosystem

➤ Participants admitted that this discussion was the first time they had all sat around the same table to discuss mutual challenges. They recognized that a shortage of resources led to competition over funding and mistrust which hindered collaboration. We were asked when we could return to facilitate the next discussion. This highlighted the important role that catalytic and network building organisations can play in the future.

➤ Ideas proposed for promoting future collaboration included organising joint pitch events as well as developing a shared start up and knowledge base to map the ecosystem.

➤ iHub, Nailab, Kijiji, Village capital, Metis Fund, and the Entrepreneurs Hub were some of the Hubs and Accelerators represented.

Government and regulation

➤ There was broad agreement that the Kenyan government could do more to realize the value that tech start-ups can bring to the broader economy.

➤ Participants welcomed government support but were apprehensive of the potential for overregulation.

➤ UK government initiatives like the Enterprise and Small Enterprise Investment Schemes can support the growth of the African tech ecosystem by providing successful models for how government interventions can drive technological innovation.

➤ Representatives of Oraro, a law firm providing legal services to international and local companies, stressed the need for international investors who seek to invest in East Africa to understand the local regulatory environment.

Investors as catalysts

➤ The scarcity of early stage, pre-revenue funding for start-ups is a fundamental gap in the African tech ecosystem.

➤ High rates of unemployment, lack of access to credit facilities, and low family incomes prevent many promising entrepreneurs from securing the funding they need to build their business.

➤ Initial seed funding from local investors can help entrepreneurs approach international investors.

➤ Hilda Moora, founder at Pezesha, raised initial seed funding from local investors. She felt this put her in a much stronger position as she approaches international investors for her next round of funding.

➤ Organisations like Viktoria Ventures, headed by Yaron Cohen, are already undertaking important work in creating local angel investors in East Africa.

➤ Investors can catalyze, but they also need catalysts. Local money which understands the needs of entrepreneurs can serve this purpose.

➤ Harnessing investment from African Diaspora communities who want to contribute to the development of their home countries may also help to alleviate this gap.

“ This is the first time we have sat down around the same table to discuss how we can work together. We need more gatherings like this. ”

Hub leader, Kenya

GHANA

- 30 SURVEYED
- 15 INTERVIEWED
- 40 ROUNDTABLE PARTICIPANTS

➤ Home to 24 of 442 active African tech Hubs

➤ Strong universities and emerging wave of local talent

➤ Google's first AI research center to be launched in Accra later this year

➤ Highest mobile internet penetration in West Africa

➤ \$10 million National Entrepreneurship Innovation Plan launched by the Ghanaian government in 2017¹⁴

Local partner- iSPACE

- Founded in 2013 by Fifi Baidoo and Josiah Kwesi Eyison
- Funders include: Hivos, Indigo Trust
- Website: ispacegh.com

Roundtable

Key Speakers:

Josiah Kwesi Eyison - Founder, iSpace
Worlali Senyo - Senior Consultant, Corporate Services, FarmerLine
Paschorina Mortty - Country Manager, Djembe Communications and representative of Innovation Prize for Africa

In Attendance

60% Start-ups
30% Hub and Entrepreneur Support Organisations
10% Local Investors and Advisory Services
Only 1 participant had existing relationships with the UK tech ecosystem.

KEY QUESTIONS

- What are the biggest challenges to getting international investment into the Ghana Tech ecosystem?
- How can local & international investors partner to catalyse investment into the Ghana Tech ecosystem?
- What has been your experience raising investment and connecting with international partners in the UK and other countries outside Ghana?
- What do you think needs to be done to better support Ghanaian start-ups to compete on the global stage?
- Do think development/impact funds create any unique opportunities or challenges for African start-ups compared to commercially-focused funds such as VC's?

▣ **Investors should not copy and paste the Silicon Valley model onto Africa.** ▣

Hub leader, Ghana

KEY INSIGHTS

Driving investment into the ecosystem

- Josiah Eyison, Founder and CEO of iSpace emphasised the need for investors to be more involved in building the ecosystem by working closely with hubs and actually going on the ground to find the small but promising start-ups.
- Investors should not copy and paste the Silicon Valley model onto Africa. An alternative model would focus on start-ups that are solving real problems and have potential to scale.
- Access to investment within the ecosystem is effectively about "who knows who" rather than being merit-based.

Strengthening hubs and promoting collaborations

- Despite competition over limited funds, collaboration between Hubs has increased as Hubs begin to realise their mutual interests. Increased collaboration is necessary in order to advocate mutual interests to local governments, attract funding, and fundraise jointly.
- Participants suggested sector-specific specialisation among Hubs as a means of diffusing competition.
- Kumasi Hive, a hub specialising in incubating hardware start-ups, was highlighted as a good example of this.

Addressing the early stage funding gap

- Lack of early-stage funding from Angel and VC investors generates a dependency on the grant cycle and a necessary relationship between tech and development. This means that entrepreneurs need fundraising and advocacy skills, as well as the language to navigate both the tech and development sectors.
- At present, Hubs lack the resources to train entrepreneurs in these skills.
- Worlali Senyo, Senior Consultant Farmerline shared how grant funding helped them get their business off the ground concluding that sources of patient capital, such as grants, are needed to enable start-ups to build capacity and give them freedom to experiment, fail, and prove their proposition. He however cautioned start-ups to avoid relying on grants in the long run and instead use them to research and develop their sustainable business models.

Knowledge generation and sharing

- There was a broadly recognized need for knowledge sharing in order to build the brand of the ecosystem globally.
- Start-ups and hubs hold untapped knowledge about the emerging African tech ecosystem.
- PR and marketing firm Djembe Communications spoke about how they promote the African innovation brand. Country Manager Paschorina Mortty emphasized that local start-ups should invest in storytelling in order to brand Ghana as a place of innovation.
- Other participants suggested that marketing experts should partner with start-ups to provide affordable packages to enable this. Alternatively, by training local entrepreneurs to market their own stories, we can break the cycle of dependence on marketing companies.

" The grant we received from Indigo trust was critical in enabling us to get our business off the ground. In the early days, we lacked the traction to attract Venture Capital funding. Emerging start-ups depend on patient capital which can enable them to invest in building the capacity of their team and give them the freedom to experiment, fail and prove their proposition. "

Worlali Senyo Senior Consultant, Corporate Services, Farmerline

UK

➤ 40 ROUNDTABLE PARTICIPANTS

↘
World leader in digital tech innovation

↘
More than £50 billion in digital tech turnover

↘
More than 300,000 digital jobs¹⁵

↘
Home to more than 1/3 of Europe's tech unicorns, estimated at more than \$1 billion

Hosted by Addleshaw Goddard

Roundtable

Key Speakers:

Liliana Biglou OBE

Maxime Bayen, Senior Insights Manager - Ecosystem

Accelerator at GSMA

Albert Opoku, Co-Founder of hapaSpace Kumasi, Ghana

In Attendance

20% Hub leaders and entrepreneurs, including hapaSpace and Baobab Circle as well as Mexidus and ICODE

15% university researchers from UCL and LSE

35% private sector investors

30% Development Finance, public sector consultants, and NGO representatives, including DFID, Planet Earth Institute, and Solution Era

KEY QUESTIONS

- What role can development and philanthropic finance play in supporting the tech ecosystem and nurturing high impact innovation?
- What are the key challenges hindering the growth of local tech ecosystems across Africa?
- What innovative financing models can be applied to fund ecosystem development and early-stage entrepreneur support?
- How can African governments be supported to take a leading role in the establishment of their tech ecosystems?

¹⁵ Tech City UK, London, Accessed Online October 2018.

¹⁶ British Council: Ghana, Youth Action: Digital Jobs Africa. Accessed Online October 2018.

KEY INSIGHTS

Pipeline challenge

- "The funding gap for start-ups (in Africa) may be one issue but reliable deal flow is certainly also a challenge from our point of view." Investor UK.

The challenge of due diligence

- Maxime Bayen, Insights Director at the GSMA Ecosystem Accelerator and Mobile for Development, noted that publicly funded investors have difficulty conducting due diligence on potential recipients. Poor infrastructure and the weak precedent for investment makes the process very expensive, constraining the number of entrepreneurs that public sector development finance can reach.
- However, by developing the right skills and competencies local intermediaries can help facilitate this sort of investment in the future.

The potential role of the UK government

- Liliana Biglou, Social Impact Consultant and Former Director at British Council Ghana spoke about the key role that the UK Government can play by investing in skills and social enterprises as well as fostering an environment of innovation. She mentioned Youth Action: Digital Jobs Africa¹⁶, a digital skills programme implemented in Ghana as a successful example of UK intervention into the African tech ecosystem. She however stressed the need for different government departments to synchronize their efforts to support the ecosystem.

The pressures faced by hub leaders

- Hub leaders who are already entrepreneurs in their own right take on multiplied responsibilities in order to support broader ecosystems. iSpace and HapaSpace are entrepreneurially funded ventures, and their leaders are stretched thin by necessity.
- "All investors are looking for post revenue start-ups. Local hubs are helping to build these start-ups but no one is investing in the hubs." - Albert Opoku, Co-Founder of hapaSpace Kumasi, Ghana.

The need for local market insights

- Participants discussed the importance of UK investors understanding the nuances of different African technology markets and tailoring their investment approach. Technology functions differently in different environments, and UK investors are unlikely to be able to understand or capitalize on the substantive nature of their investments without listening to entrepreneurs who experience the market on the ground.

"As our accelerator is funded by public (DFID) money (for the part of our fund focused on supporting African start-ups), there is a need to conduct thorough due diligence on finance, product, people, reputational risk and impact. Considering the size of the continent and the early stage at which we fund these start-ups, this process is expensive and time-consuming. This limits our ability to reach more entrepreneurs and potential start-ups"

Maxime Bayen Insights Director, GSMA Ecosystem Accelerator and Mobile for Development

DISCUSSION

AS PART OF THE DESIGN-DRIVEN APPROACH, WE DIDN'T ENTER THE PROJECT WITH A PRECONFIGURED SOLUTION. THE CHALLENGES WE IDENTIFIED AND STRATEGIES FOR OVERCOMING THEM EVOLVED ORGANICALLY FROM THE DESK RESEARCH WE CONDUCTED, THE STORIES WE HEARD AND THE DATA WE GATHERED.

Nevertheless, as an organisation that has been focused on supporting local African entrepreneurs, we arrived at the project with an approach which was oriented towards supporting start-ups and individual entrepreneurs.

Our approach reflected the attitudes of development finance organisations as a whole. The January 2017 GSMA report, *"Building Synergies: How Mobile Operators and Start-ups can Partner for Impact in Emerging Markets"*, proposed a synergies framework which connects the needs of local entrepreneurs to the resources of mobile operators. Similarly, Village Capital's 2017 publication, *"How Ecosystem Builders Can Help Entrepreneurs Succeed"*, recounts the successful formation of a series of Entrepreneur Support Organisations (ESOs) which find, train, and invest in local innovators¹⁸.

The roundtable in Nairobi gave us the first insight into the more systemic nature of the problems at work. Participants stressed the need for more active government support, as well as the difficulties of collaborating in a highly competitive and resource-scarce environment. The roundtable in Accra reinforced and expanded on these problems. It both showed us what successful collaboration between ecosystem players can look like, and revealed the potential for development finance to strengthen hubs.

Our journey therefore revolved around understanding the relationship between the ecosystem and the individual entrepreneur, and it ultimately involved a fundamental transformation in the sort of questions we were asking. The research began as an investigation into the challenges of entrepreneurs, but ended as an analysis of the hindrances to the ecosystem; initially, we asked what more can be done, and now we ask how the things we are already doing can be done differently.

COMMON THEMES EMERGING FROM OUR DATA

Tech activities in both Kenyan and Ghanaian ecosystems are largely driven by development finance.

- ↘ Optimetriks took part in the DFIF-funded GSMA Accelerator.
- ↘ Both iSpace and Farmerline received funding from the Indigo Trust. For the latter, Worlali Senyo noted that this support enabled them to develop despite the inaccessibility of venture capital.

Lack of funding, specifically but not exclusively in the early stage.

- ↘ Participants at the Kenya roundtable noted the scarcity of early stage, pre-revenue funding for start-ups.
- ↘ Participants at the Ghana roundtable touched upon the relative difficulty of accessing Venture Capital, and the consequent dependence on development finance.

Need for knowledge and skills

- ↘ Entrepreneurs stated that they lack grant writing and impact evaluation skills to attract funding.
- ↘ Hub leaders in Kenya and Ghana stated that their entrepreneurs lack basic skills like pitching for funding.

Weak relationships between entrepreneurs and local government

- ↘ Roundtable participants in both Kenya and Ghana indicated that their governments could do more to nurture local tech ecosystems.

Chronic lack of collaboration between ecosystem players, including development organisations, funders, investors, accelerators, hubs, governments, entrepreneurs, educational institutions

- ↘ Participants in the Kenya roundtable admitted that they had never sat together around the same table, and asked us when we could return to facilitate future discussions.
- ↘ Competition over funding is the main reason why hubs had difficulty collaborating.
- ↘ In Ghana, hub leaders pushed for greater collaboration by encouraging specialisation between them. However, hub leaders mentioned that they needed more collaboration, specifically around advocating for government support.

→ DISCUSSION

The commonalities and differences between our two case studies led us to three realisations. First, the fact that the Kenyan and Ghanaian tech ecosystems faced similar challenges despite great disparities in the development of the local tech sectors suggests that this development is not a good indicator of the substantive strength of the ecosystem. The second realisation came in the form of a question: if, as our research indicates, development finance is already playing a significant role within each of these tech ecosystems, why is it that participants in our study stressed scarce access to financial support, weak relationships with each other and a persistent shortage of human capital? This question is what led us to our most definitive conclusion: that the challenges faced by entrepreneurs are complex and interconnected, and that they are ultimately rooted in the ecosystem as a whole. These three realisations are what drove us to use system-thinking tools¹⁹ to analyse the dynamics at work.

Diagram A presents our system analysis. It portrays how the activities of development organisations and international investors aimed at supporting start-ups generate unintended consequences that hinder the growth of the ecosystem. Loop A conveys the start-up-oriented investment dynamic, whereby development organizations try to promote scalable technological innovation by investing in start-ups. These investments do produce short term benefits; they promote the growth of start-ups and entrepreneurs on the ground²⁰.

However, as Loop B demonstrates, by prioritising start-ups over ecosystems, development organisations effectively withhold funding and resources from intermediaries like hubs, R&D institutions, universities, advocacy organizations and training programs. As a result, intermediaries are forced to compete over scarce resources, thereby preventing the sharing of knowledge and skills. Specifically, hubs face growing pressures to compensate for these structural failures, but under-resourcing prevents them from collaborating and meeting the broader needs of the ecosystem. Hence, the statement by Albert Opoku of hapaSpace Kumasi that “local hubs are investing in start-ups, but no one is investing in these hubs.”

Consequently, we conceive of start-up-oriented investment as a system archetype of a fix that backfires: by investing in the end entrepreneur, development finance is aiming to promote long term growth. However, this very action is itself what generates a series of unintended consequences. Under-resourced intermediaries result in competition over resources, a lack of shared skills and knowledge, and the absence of joint advocacy necessary to garner government support. This short term fix is therefore perpetuating the very problem it seems to resolve through prolonging obstacles to the formation of a sustainable innovation ecosystem capable of generating relevant technological solutions at scale.

The system mapping process also helped us understand two additional structural impediments to ecosystem growth. The first is the relationship between government and agents of local innovation. There is a growing consensus in innovation studies around the conviction that investment by the public sector is the foremost impetus for innovation. Mariana Mazzucato, Director of the Institute for Public Purpose and Innovation at UCL, argues that investments in Research and Development, human capital formation, industrial transformation, and technical innovation involve risks too high for the private sector to absorb. Time and capital intensive investments like these have historically been most successfully undertaken by the public sector. In developing economies, this scale of investment is crucial to enhancing productivity, creating well-paid jobs, and advancing infrastructure. Through mission-oriented innovation, governments can bring different sectors to collaborate in new ways, thereby promoting system-wide transformation²¹.

We acknowledge that development in the African context is likely to take place through mechanisms unique to the history and resources of African economies²². Nevertheless, recent investment by the Rwandan government presents an optimistic case study for how Mazzucato’s framework can be implemented in this environment. Since 2000, the government has adopted a series of “National Information and Communication Technology” plans which are now nearly two decades in the running. The plans involve heavy investment in the construction of ICT infrastructure and the services necessary to operate it²³. As a result of these investments, the Rwandan economy has seen an 8% growth rate between 2001 and 2015²⁴.

¹⁹ Stroh, Peter David. *Systems Thinking for Social Change*. Chelsea Green Publishing, Hartford: 2015.

²⁰ Bayen, Maxime. “Africa: a Look at the 442 Active Tech Hubs of the Continent.” *GSMA Blog*, March 2018. Accessed online October 2018.

²¹ Mazzucato, Mariana. “Mission-Oriented Innovation Policy.” *UCL Institute for Innovation and Public Purpose Working Paper*, 2017. ²² Csikszentmihályi, Christopher, Gemma Rodrigues, et. al. *Social Tech Ecosystems in Sub-Saharan Africa*, 13. MITI, 2018. Accessed Online 20 October 2018. ²³ Tajfiryika, Masimba. “Information technology is Supercharging Rwanda’s Economy.” *Africa Renewal*, April 2011. Accessed Online 20 October 2018.

²⁴ The World Bank. “The World Bank in Rwanda.” Accessed Online 20 October 2018.

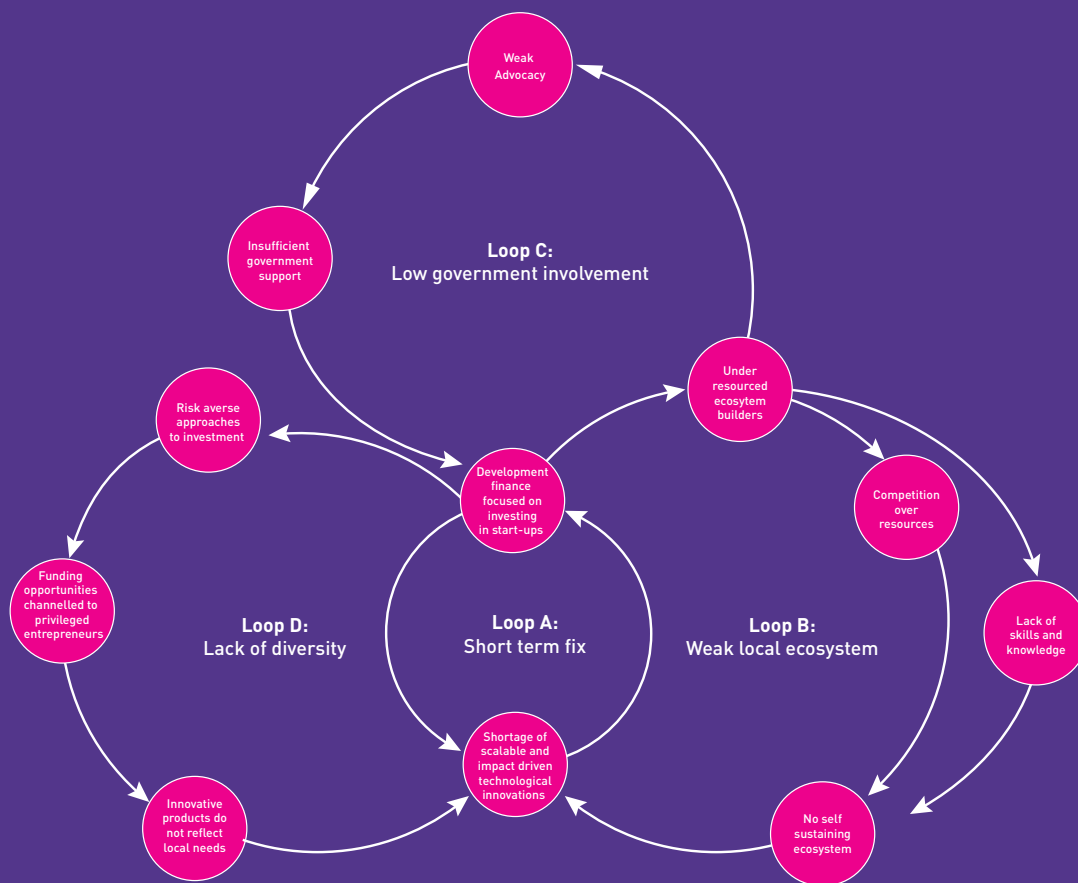


Diagram A: System analysis map - The focus on investment in individual start-ups generates unintended consequences preventing the growth of a sustainable tech ecosystem.

In both Kenya and Ghana, however, our research revealed widespread perceptions that the government is not sufficiently supporting the growth of local tech ecosystems. Moreover, as Loop C of our map suggests, weak relationships between local government and tech sector actors are exaggerated by the inability of intermediaries to wage successful joint advocacy campaigns in order to garner government support. There is therefore a strong need for development organisations to ensure that their strategies do not weaken, but strengthen, national governments, and to prioritise collaboration with the public sector and system intermediaries.

The second additional issue that our system mapping revealed is the cycle of privilege currently operating in entrepreneurial support. Loop D shows how the current strategy comes to generate an unintentional bias towards entrepreneurs from urban, male, internationally educated, or expat backgrounds. This is well demonstrated by Village Capital’s finding that 71% of start-up investment in Africa in the past three years has gone to four businesses, all run by expats. Andela is one example of a

highly successful start-up which works in Africa but is owned and operated in New York City. The recent M-ITI report, “Social Tech Ecosystems in Sub-Saharan Africa” notes M-Pesa as another case in point. While the proliferation of mobile banking successfully illustrates how technology can promote development, the company is owned by Vodafone, and consequently most of the profits generated are not being reinvested in local economies²⁶. These examples raise questions regarding the ability of the African tech sector to achieve long term independence.

As investors from both the development sector and private sector discussed at our London roundtable, there is a high cost of conducting due diligence for local start-ups in an environment which is geographically vast, lacks reliable infrastructure, and has a weak precedent of foreign investment. Existing privileges frequently signal lower risk investments, and consequently privileged entrepreneurs constitute a more appealing investment opportunity. However, as the M-ITI report aptly notes, allocation of funding to largely expat and ivy-league educated recipients cannot

be entirely attributed to the “quality of ideas or chance of success”. Thus, development organisations which invest in the tech sector using public funds should be aware that choosing projects based exclusively on the perceived risk has the unintended consequence of perpetuating biases within the pool of entrepreneurs. By hindering local and diverse investment, they ultimately hinder sustainable local innovation.

If the goal of development finance is, undoubtedly, development, then its investments should directly reflect this end. Redirecting investments towards the formation of collaborative networks, a well funded education system, local hub support, and infrastructure, will ensure that development finance is nurturing local ecosystems and contributing towards sustainable growth. System-oriented investment generates a multiplier effect whereby resources can be combined and distributed in a manner which promotes innovation to resolve local challenges. Investors benefit from local market insights which promote scalability and sustainability in the long run.

²⁶ Social Tech Ecosystems in Sub-Saharan Africa, 13.

RECOMMENDATIONS

WHILE THE DEVELOPMENT SECTOR DEPENDS ON TANGIBLE IMPACT OUTCOMES, STAKEHOLDERS IN THE SECTOR NEED TO COME TO TERMS WITH THE LONG TERM NATURE OF STRUCTURAL CHANGE. WE SHOULD NOT BE FEARFUL OF INVESTING IN PROCESSES RATHER THAN SPECIFIC PROJECTS - ULTIMATELY, FUNDING KNOWLEDGE TRANSFER, EDUCATION, COLLABORATION, AND LOCAL GOVERNMENT RESEARCH INITIATIVES IS MOST LIKELY TO FOSTER A SELF SUSTAINING ENVIRONMENT OF LONG TERM GROWTH.

Because there is a rise in the amount of funding accessible to innovation for development across Africa, it is especially important for international actors to understand the complexity of the challenges and be conscious of the unintended consequences their investments have the potential to generate.

↘ Increase support for hubs and ecosystem intermediaries

Our foremost recommendation is that development finance organisations increase support for Hubs and ecosystem intermediaries, rather focusing primarily on individual start-ups. In doing so, they can promote a multiplier effect, as a single Hub will likely nurture hundreds of start-ups and entrepreneurs. They can also encourage sustainability and scalability by building local capacity and skills which will ultimately help to develop a self sustaining tech ecosystem. Ecosystem oriented investment is also likely to reduce the cost of due diligence faced by publicly funded development organisations.

↘ Foster collaboration and not competition

As investment in Hubs takes place, development finance organisations should ensure that their intervention serves to foster collaboration rather than competition. Encouraging a balanced division of labour and specialisation between Hubs as well supporting them to generate and share knowledge will create sustainable models of cooperation in the long run.

↘ Cooperate with local governments

While it should supplement present government deficiencies, development finance should work with local governments and ecosystem leaders to strengthen their institutions and policies. By investing in local infrastructure, networks, and capacities, development finance can control for the risk of structural dependency within the African tech sector.

↘ Fund local and diverse teams

Additionally, we recommend that development funding maintain an emphasis on supporting local and diverse teams, even when perceived risk and due diligence costs are higher. Local innovation is important because developmental problems are best resolved by the communities who experience them every day. As anthropologist James Ferguson notes, ordinary people are “often better positioned than experts from on high to make decisions that affect their own lives”²⁸. Furthermore, unlike foreign-owned companies which could end up extracting value from local economies, locally-owned companies are more likely to reinvest their profits back into their communities and drive further growth. We would also caution against prioritising the formation of new supporting programs like accelerators, and encourage enquiries into how development organisations can support local activities already taking place.

↘ Experiment with dynamic and systems oriented research designs

Finally, we would encourage future research into development in the African tech sector to experiment with more dynamic and systems oriented research designs. By adopting more humanistic research methods, we ensure that our recommendations reflect the challenges faced by different stakeholders and generate more effective solutions.

RECOMMENDED AREAS FOR FURTHER EXPLORATION

- Alternative funding models that better fit with the realities of developing tech ecosystems. The Silicon Valley model of investment which has become the global blueprint presents challenges in the African tech context where, given the scale of the challenges, the formation of “unicorns” in a few years may not be a realistic expectation. At this moment, the number of exits and success stories to attract many international investors remain lacking. The difficulties African tech start-ups face in accessing international investment are explored in more detail in the complementary report produced by our partner, Frontier Economics.
- Approaches to attracting and developing diverse entrepreneurial talent, and in particular female entrepreneurs into the tech ecosystem. At ATBN some of the work we have done in this area includes creating a female-focused digital entrepreneurship accelerator, Her Future Africa. By targeting young women outside the tech ecosystem and using ‘non-techie’ language to promote the program, our accelerator was able to attract women who previously would never have seen themselves as ‘techies’. We also tried to address the shortage of role models who are key to attracting more female talent by publishing *Founding Women*, a book spotlighting successful African female technology entrepreneurs. We recommend that others take a more system-wide approach to tackling the barriers for female talent to fully contribute and participate in the African technology sector.
- Innovative collaboration models between public, private and development sector as well as between local and international investors to drive technology innovation. Models such as Public Private Partnerships (PPPs) have proven successful in areas such as infrastructure development. There is potential to explore new models such as Collective Impact²⁹ that enable key stakeholders to work together in supporting technology innovation and entrepreneurship.
- Despite adopting Mazzucato’s approach, we recognize the limits of applying a framework derived from the history of developed countries to countries which are currently developing. More research should therefore be conducted on the best ways to catalyze innovation in developing countries.

²⁹ Collaboration for Impact “Collective Impact Framework”. Accessed Online October 2018.

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