SUPPORTING INNOVATIONS IN RURAL TANZANIA

An evidence synthesis highlighting the need for investment in the innovation ecosystem in Tanzania



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Acknowledgments

On behalf of the Ifakara Health Institute and Ifakara Innovation Hub, we would like to give special thanks and acknowledgement to all the program partners, both local and international, who actively and tirelessly participated in the overall strategic assessment of the program.

Our sincere appreciation also goes to the Ifakara Innovation Hub Executive Committee, whose representatives shared their time and insights above and beyond what was expected from them to make sure this process yielded the desired outcome.

We would like to thank Fondation Botnar and the Embassy of Switzerland in Tanzania for providing resources, both technical and financial, to make this program a success.

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Embassy of Switzerland in Tanzania Ubalozi wa Uswisi Tanzania

Last but not least, we would like to thank the capable team from Genesis Analytics who worked tirelessly to capture and synthesise insights from a wide range of stakeholders to inform the findings presented in this report.

Thank you all for taking time to participate in this very important project, and we hope the read is insightful.

A total of seventy sources were reviewed.

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This evidence synthesis was developed by Genesis Analytics as a supporting piece during a strategic review of the "Developing innovation and entrepreneurship ecosystem in Tanzania" program.

he overall goal of this program is to ensure that local Tanzanian innovations contribute to the economic and social well-being of Tanzanian people. The program is a multi-partner initiative, hosted at and leveraging <u>Ifakara Health Institute</u> (IHI)'s knowledge, experience and know-how, to achieve three distinct but mutually reinforcing outcomes:

Establishment of the <u>Ifakara Innovation Hub</u> (*IIH***): The IIH is intended to support innovators, specifically those in Ifakara and the surrounding areas, to develop, test, prototype, and eventually commercialize their ideas, research, and innovations, particularly those in the health sector. IIH will create a space that allows a diverse range of (aspiring) innovators including students, community members, and the private sector, to use the hub to turn their ideas into innovations. Innovations coming out of the hub will directly feed into the second component of this program, described below.**

Support to Product Development Centres (PDC): The second component of this program is to equip partner 'maker spaces'¹ in Tanzania with technical assistance and equipment to become fully functional PDCs. The underlying assumption here is that fully functional PDCs will allow innovators to prototype and scale their innovations, consequently leading to a pipeline of products that are contextually relevant and useful to the people of Tanzania, specifically those in rural areas.

Support to the innovation ecosystem: Developed in tandem with the above two components, the program's third component seeks to cultivate a space that brings together both international and national stakeholders, who are positioned to effectively support the innovation ecosystem from ideation, to testing and prototyping, and eventual commercialization. This cohort of stakeholders will include (i) academic institutions that support research and innovation; (ii) private sector institutions that supports effective and conducive policies and regulations; and (iv) the donor community, which provides financial and technical assistance where needed, and as appropriate. Each of these stakeholders will play a unique role in enhancing capacity and creating an overall conducive environment for a vibrant innovation ecosystem.

Purpose and approach to the evidence synthesis

The objective of this evidence synthesis is to describe:

- 1 Why innovation is considered a key ingredient in the economic development;
- 2 The state of the Tanzanian innovation ecosystem; and
- **3** Evidence for best practice around practical program implementation.

This evidence synthesis was informed by thematic searches across a range of search terms including: 'innovation', 'entrepreneurship', 'innovation ecosystem', and 'maker spaces', and then disaggregated by geography. The synthesis consulted a wide range of material including published journal articles, research papers, organization publications/blogs, and local newspaper materials, among others. The process of identifying these sources focused on the relevance and saturation of thematic areas rather than aiming to be exhaustive. A total of seventy (70) sources were reviewed.

The Value of Innovation

'Innovation' is the development of new ideas and/or processes, particularly using technology, that improves goods and services and/or the efficiency of production.²

nnovation also has the potential to improve the overall well-being of individuals and economies, which is particularly relevant to developing country contexts such as Tanzania.³ Specifically, 'social innovation' goes beyond the general definition of innovation to focus on **"developing and deploying effective solutions to challenging and often systemic social and environmental issues in support of social progress."**⁴

Social innovations⁵ could therefore be new or improved products, processes, or services, that are specifically designed to address pervasive social and environmental challenges, and add value to customers/consumers.⁶

- 2 🛃 How does innovation lead to growth?
- 3 🛃 Innovation for Development
- 4 🛃 Defining Social Innovation
- 5 Due to the nature of this project, this literature adopts the definition of social innovation to highlight the potential to address social challenges which we feel captures the nature and intention of this program.
- 6 🛃 The Innovation Paradox: Developing-Country Capabilities and the Unrealized Promise of Technological Catch-Up



Supporting innovation in developing countries

Innovation is key to the overall economic development of a country because of its inherent ability to drive growth - a study published in the Journal of Innovation and Entrepreneurship found a positive correlation between innovation and economic growth in 19 European countries including Germany, France, Belgium, Czech Republic and Greece, amongst others.⁷ Economists estimate that between 50-80% of economic growth for a given country is driven by innovation and new knowledge.⁸

At the enterprise level, innovation facilitates economic growth by enhancing productivity, either through more efficient production or the development of new products, which means that more innovative enterprises are frequently more competitive, productive, value-creating, and therefore well-positioned for long term survival.⁹ Furthermore, with enhanced productivity and efficiency, enterprises create more employment opportunities, offer higher wages, and thus contribute to increased household consumption, thereby enhancing overall economic growth. At the national level, innovation also drives economic growth because it enhances financial systems; infrastructure development; quality of life, and a country's global competitiveness.

Furthermore, *social* innovation is credited for enhancing the overall well-being of individuals and societies by addressing pressing social and environmental challenges. Additionally, innovations and new/adapted technologies may also be able to provide faster and cheaper means of addressing these challenges, which are more likely to be scaled.¹⁰ The Stanford Social Innovation Review (SSIR) concluded that a less recognized reason for Africa's quick recovery from the 2008 financial crisis (and the continued growth trajectory today) is its increasing investments in science, technology and innovation, which has enhanced the overall well-being of individuals.¹¹



PHOTO CREDIT: Fiona Graham

There is evidence today that successful social innovations continue to yield massive benefits for society. A famous example is Mpesa, a mobile based money transfer application in East Africa.

Mpesa has revolutionized how people access money and how business is conducted across the region. Today, over 42 million people use Mpesa and this has allowed vulnerable populations such as women and youth to safely access money while also enabling people to save safely.

^{7 🛃} Does innovation promote economic growth? Evidence from European countries

^{8 🛃} Social Innovation Creates Prosperous Societies

^{9 🛃} Enterprise innovation in developing countries: An evidence from Ethiopia

^{10 🛃} Major donors launch new fund to support innovation

^{11 🕹} Social Innovation Creates Prosperous Societies

The need for health innovations in East Africa

Research conducted by the Center for the Advancement of Social Entrepreneurship (CASE) at Duke University explored the healthcare innovation sector in East Africa affirmed that the health innovation ecosystem within East Africa is nascent but growing. This research concluded that on the whole, the East African region is a high potential healthcare innovation market with numerous growth opportunities. It further determined that closer collaborations among actors and institutions in East Africa's healthcare innovation ecosystem have and will continue to gain from focusing collectively on better alignment of resources, increased connections and collaborations with each other. A crucial conclusion here is that **partnerships are a key to scaling healthcare innovations**. This conclusion points to the relevance of this program's partnerships-based implementation approach, which seeks to engage several stakeholders in the implementation, growth, and scale of the program and its initiatives.

Further, as the market is on an upward growth trajectory, there is a need to invest in academic and commercial research centres for research and knowledge creation.¹² This will drive towards a pipeline of innovations which can be tested, prototyped, and consequently introduced onto the market. In a similar fashion thus, this conclusion points to the need and timeliness of efforts to equip existing 'maker spaces' – facilities that provide opportunities for hands on learning through encouraging *occupants to make things* – with the hopes of establishing fully functional Product Development Centres (PDCs) to support prototyping and production of products for commercialisation.

International support for innovation towards sustainable development

Donor communities today recognize innovation as a crucial ingredient to achieving ambitious global objectives such as the United Nations (UN) Sustainable Development Goals (SDGs).



SDG 9: Industry, Innovation and Infrastructure directly highlights the need for innovation, but the UN has also recognised that innovation is key to achieving economic growth, social equity, and environmental protection.¹³ The United Nations Conference on Trade and Development (UNCTAD) also highlighted innovation as one of the new pathways to support the implementation of the SDGs.¹⁴

Beyond the UN and the SDGs, several major bilateral donors have demonstrated their commitment to innovation, by independently and collectively investing in the development of innovation ecosystems and innovations to address global development challenges.

In 2014, the Global Innovation Fund was launched by a commitment from the United States Agency for International Development (USAID), the United Kingdom Department of International Development (DFID), the Swedish International Development Cooperation Agency (SIDA), the Australian Department of Foreign Affairs and Trade, and the Omidyar Network.

- 12 🛃 Healthcare Innovation in East Africa Navigating the Ecosystem
- 13 🛃 Innovation Policy and Sustainable Development
- 14 🛃 New innovation approaches to support the implementation of the Sustainable Development Goals



East African Innovation Context

The East African innovation landscape remains underfunded, fragmented, and untapped.

his is due to a lack of investment in research and development (R&D), unsupportive enabling environments, and weak institutions. These are each described in turn below.

Lack of investment in R&D

The World Bank notes that despite the fact that innovation promises high returns, developing countries typically invest far less in R&D in comparison to more developed countries. As such, innovation in a developing country context often consists of *marginal improvements* in process or products, rather than *significant technology adoption* or *new product imitation*, and it very infrequently involves frontier research.¹⁵

15 🛃 'Innovation Paradox' Analyzes Key Factors in Spurring Growth: Managerial Skill, Innovation Capacity are Vital to Raising Productivity A study published in the African Journal of Science, Technology, Innovation and Development, which evaluated inclusive innovation processes in Uganda and Tanzania, states that while innovation efforts exist and have increased in recent years, they remain disproportionately few compared to the existing need for such efforts.¹⁶

Additionally, there is a lack of demand for local knowledge, both within government agencies and other donor entities, which continues to fuel the slow adoption of R&D, highlighting the need to build demand for local knowledge and consequently innovations.¹⁷

To mitigate this, universities and academic institutions have been found to play crucial roles as knowledge providers and as intermediaries necessary for innovation system advancement.¹⁸ As such, there is a need to foster relationships between academic institutions and the innovation ecosystem to enhance the linkages between R&D and industry.

It is important to point out that while local and intensive R&D is an important marker and ingredient of innovation, modernity has provided ways to side-step it. Specifically, while innovation has traditionally been perceived as a linear process that begins with intense R&D on how to solve specific problems, which eventually leads to working models that are later introduced to the market, innovation today takes a more iterative and non-linear approach.¹⁹

Due to the interconnectedness of the world and easily accessible knowledge sharing across geographies and timeframes, some scholars argue that countries or firms do not have to be at the technological frontier to be innovative. This is because, through knowledge sharing and collaborations, promising ideas and technologies can be assimilated and adopted for the purposes of enhancing innovation in other parts of the world. This has important implications for budding innovation ecosystem players like those in Tanzania, which may not have the capacity to conduct basic research in the traditional sense, but can still be seen as part of the innovation ecosystem.

Unsupportive enabling environments

Aside from investments in R&D, the ability of an ecosystem to produce game-changing innovations is linked to the extent to which the enabling environment has sufficiently depth and inclusivity. The enabling environment, as determined by the National Innovation Ecosystem (NIE), includes the policy environment, infrastructure, and socio-economic diversification. A study published by the Institute of Electrical and Electronics Engineers (IEEE), conducted in Uganda, Kenya, and Tanzania, found that East Africa has recently experienced considerable entrepreneurial growth, facilitated by innovation-friendly regulatory environments; the evolution of National Research Education Networks (NReNs); and the rollout of more sophisticated infrastructure.²⁰ However, while components of a NIE are increasingly a common policy priority, the innovation ecosystem in East Africa is still fragmented and unsupported.²¹

^{16 🛃} Inclusive innovation processes - experiences from Uganda and Tanzania

¹⁷ ibid

¹⁸ ibid

^{19 🗄} Competitiveness, Innovation and Productivity: Clearing up the Confusion

^{20 🛃} Baseline analysis of 3 innovation ecosystems in East Africa



Policies and resources such as funding, are key to the success of innovative firms

Weak institutions

Institutional quality is another key factor in the vibrancy of an innovation ecosystem. A study published in the Research Policy Journal found that the strength and quality of regional institutions directly improves the resources and support available to firms. This is because stronger, higher quality institutions yield better human resource capabilities, as well as policies and resources such as funding, that are key to the success of innovative firms.

Thus, better institutional environments increase the value of firm-level resources for innovation, while weak institutions diminish the value of firmlevel resources for innovation.²² The implication of this for countries in East Africa with weaker institutions, such as Tanzania, is that the extent of innovation output is likely to be curtailed.²³

The following section takes a closer look at the Tanzanian innovation ecosystem more specifically.

22 ibid23 ibid

The State of the Tanzanian Innovation Ecosystem

Tanzanian innovation sector overview

According to a World Bank report on technology start-up ecosystems in Dar es Salaam, the innovation ecosystem in Tanzania is still considered 'nascent'. A nascent ecosystem is characterized by (i) a limited number of early-stage startups, (ii) few clusters of communities of entrepreneurs, (iii) founders that lack business experience, (iv) scarce and inexperienced mentors, and (v) few occasions of successful entrepreneurs (as defined by the modern conception of entrepreneurship).²⁴ As depicted in the diagram below, the Tanzanian innovation ecosystem has in reality only been in existence since around 2010.

Essentially, the Tanzanian innovation ecosystem has really only been around for about ten years.

FIGURE 1: Summary of the development of the Tanzanian innovation ecosystem from 2010²⁵

The first wave of innovation spaces; Buni Innovation Hub, Kinu Co-creation, DTBi, Mara Space etc.		More private sector involvement in the ecosystem; start-up acquisitions, start-up funding etc.	
2010 - 2013		2014	4 - Present
	2014 - Establis Maker S Mini Ma and ST		2016 - Present Establishment of Tech Events (Sahara Sparks, Bits and Bytes etc.) Corporate Acceleration and Multi Sectoral Innovation Programmes.

Adapted from: www.saharaventures.com

It is important to point out that while nascent, the entrepreneurial and innovation space in Tanzania is growing rapidly. According to the Global Innovation Index, Tanzania's ranking climbed 26 positions from 123rd worldwide in 2013 to 97th in 2019.²⁶

^{24 🛃} Tech Start-up Ecosystem in Dar es Salaam: Findings and Recommendations.

²⁵ Innovation spaces are physical environments that promote community learning, and making. They can include hubs, labs, hackerspaces, makerspaces, co-working spaces etc. A makerspace is a place where you can make things. It's a space for hands-on learning with light tools for creativity.

^{26 🛃} Innovation Ecosystem







This is due to several investments and commitments made by various stakeholders, as explained below:

Public Sector: Innovation has been supported by the establishment of institutions such as the Dar Es Salaam Institute Of Technology (DIT) and the Tanzania Commission for Science and Technology (COSTECH), which are important key players in the ecosystem.

Private Sector: The private sector has actively pioneered, developed, and supported innovation spaces such as BONGOTech, ROBOTech, and Sahara Ventures.²⁷

Donor Community: International donors have made financial, technical, and capacity building investments to support the budding innovation ecosystem in Tanzania.

There are now several physical spaces in Tanzania supporting entrepreneurs, both in urban and rural locations, including a few that specifically target underfunded groups such as youth and women, described in the box below.

BOX 1: Examples of support for innovation provided by different hubs for traditionally excluded individuals²⁸

The Youth - COSTECH, in collaboration with Buni Hub, started an initiative that establishes and encourages the development of innovation spaces at several universities across the country. Innovation spaces like Ndoto Hub and SafeSpaceco offer support that directly targets women who are venturing into the entrepreneurship space, consequently ensuring that no one is left behind as the innovation ecosystem space grows.

Rural Communities - In a similar way, Twende and AISE! collaborated to bring together entrepreneurs committed to working on innovations that feed into four rural communities in Tanzania.

²⁷ Ł Accelerate early and growth-stage businesses solving Africa's biggest challenges to grow and connect with investment opportunities

^{28 🛃} Mapping of Tanzanian Hubs and Innovation Spaces

The Tanzanian Innovator

According to the World Bank, 85% of founders in Dar es Salaam are male, with an average age slightly below 30. 80% of founders have a university degree, and 15% have some form of graduate degree.

However, while the majority of founders in Dar es Salaam are highly educated, the overall quality of skills in the country remains low,²⁹ detracting from the vibrancy of the innovation ecosystem and highlighting the need for human capital development to support innovation.

In addition to this, the following are key factors potentially holding Tanzanians back from becoming innovators and entrepreneurs:

Un-supportive Social Expectations: Entrepreneurship (or self-employment in general) is considered a 'lesser' option compared to the traditionally salaried jobs that youths pursue. As such, youths may not pursue their desires to be entrepreneurs, should they have them.³⁰

Lack of Social Capital/Networks: A paper examining why graduates in Tanzania do not readily embrace entrepreneurship found that while many students value entrepreneurship as a viable economic opportunity, the majority still find it intimidating as they lack the social capital needed to successfully thrive in an entrepreneurial environment.³¹

Therefore, to build the Tanzanian innovation ecosystem, **intentional efforts and support will be needed to recruit potential innovators who are traditionally left out of innovation spaces** and to support them while they turn their innovative ideas into prototypes and eventually products and services ready to scale on the market.



- 29 This could be linked to the mismatched education system as well as a lack of collaboration between education systems and industry needed skills. The World Bank report recommends increasing business skills among entrepreneurs, expanding practical education in universities and through rapid skills training programs.
- 30 🛃 Capability, social capital and opportunity-driven graduate entrepreneurship in Tanzania
- 31 📩 Capability, social capital and opportunity-driven graduate entrepreneurship in Tanzania

Types of support provided to innovators and in Tanzania

Innovators, and entrepreneurs in Tanzania can already access a wide range of support including capacity building support, as well as co-working and co-living spaces, primarily in Dar es Salaam.

The table below outline the types of support available to innovators in Tanzania:

Type of Support	Definition			
Accelerators	Accelerators are mainly defined by their mandate to provide skills development and access to networks to their cohort of startups, for the purpose of accelerating their growth. There are a number of accelerators in Dar es Salaam that support startups. ³² Accelerators in Tanzania are a mixture of government-funded institutions such as the Small Industries Development Organization (SIDO) and Dar Teknohama Business Incubator (DTBI), and private institutions such as Sahara Ventures. While there is evidence that these accelerators are supporting entrepreneurs to grow, there are gaps that still remain. For example, it was found that only 5% of accelerated startups received additional funding in the years after graduating from the accelerator programs, indicating that the businesses graduating are still not investment-ready or have not proved product-market fit. ³³			
Maker spaces	Maker spaces differ from accelerators, as there is no expectation that users should have an existing innovation and there is more encouragement for ideation. Rather, the space is available for like-minded individuals to come together and develop new ideas and products using available resources. Maker spaces tend to be specialised and so there are fewer of these available in the Tanzanian ecosystem. The most notable maker spaces (DIT, BongoTech, and ROBOTECHLabs) operate out of Dar es Salaam. BONGOTech and ROBOTech, are highlighted as pioneer spaces that have allowed entrepreneurs who are interested in 'making things' to experiment.			
Mentorship	This is a knowledge transfer mechanism for entrepreneurs to acquire business acumen, understand the unspoken rules of start-ups, and gain access to networks generally through formal and informal relationships with experienced business people. From research conducted by the WB in Dar es Salaam, only 35% of founders reported having received mentorship. ³⁴			

33 🛃 Tech Start-up Ecosystem in Dar es Salaam: Findings and Recommendations

34 🛃 Tech Start-up Ecosystem in Dar es Salaam: Findings and Recommendations

³² Although accelerators and incubators are often conflated, there are differences between them. According to the WB, Accelerators support entrepreneurs and startups in the early stages of development and they are often comprised of the following features: (i) a highly competitive and open application process for entrepreneurs, (ii) provision of small amounts of seed investment, (iii) a focus on small teams rather than individual founders, (iv) intensive support for a limited period of time (usually 3-6 months), with active mentorship and networking, and (v) collaborative work among startups through cohort or classes of startups. Incubators are physical spaces that support startups by providing an office space and administrative support services. The most typical services are legal, recruiting, IT, accounting, public relations and pooled buying programs. In addition, incubators may also provide coaching, mentorship, and help with access to funding on an ad hoc basis.

Type of Support	Definition
Investment	Investment options (including high growth venture capital, angel investors, and individuals) are limited for innovators and entrepreneurs in Dar es Salaam. While most entrepreneurs in Dar es Salaam were able to raise small amounts of capital in their first year of existence, only a small fraction raised money in their second year. ³⁵ It takes significantly longer for innovators in Tanzania to access both credit and investment funding ³⁶ compared to other economies. ³⁷ Research conducted by the Sahara Innovation Venture, a key player in the innovation space in Tanzania, points out that sectors such as health tend to receive disproportionately higher funding opportunities compared to other sectors. There is no evidence of international investment pipelines for Tanzanian innovations. Recommendations specify catalysing privately managed seed-funding options to address limited availability of funding for entrepreneurs.
Community	Innovation ecosystems are more likely to mature and succeed if the actors engaged in the ecosystem operate as a community. In a community structure there are knowledge spill overs and access to resources which flow through a network of embedded connections. The tighter and more connected an ecosystem, the more efficient the flow of knowledge and access to resources. Given the low numbers of clusters of entrepreneurs in Dar es Salaam and greater Tanzania, the community remains sparse. Research by the WB indicates that only those who have access to the inner circles, including Buni Innovation Hub and the University of Dar es Salaam, are in favourable positions to access critical inputs to the early-stage entrepreneurship processes such as grants and investments. Those outside such clusters feel that it is harder for them to access similar resources and support. However, being a part of the most influential investment cluster is not a guarantee of success but rather it is considered a short-term factor of success for start-ups.

35 ibid

³⁶ The World Bank found that it takes about 90 days to obtain credit in Dar es Salaam and about 125 days to obtain funding. In comparison, it takes about 15 days and 30 days respectively to obtain credit in the West Bank and Gaza and Beirut respectively and it takes only 33 days to obtain funding in the West Bank and Gaza.

Collaboration between academic institutions, governments, and the private sector

A positive component of the Tanzanian innovation ecosystem is the recognition that collaboration is important for the success of an innovation ecosystem. In recent times, there has been an increase in collaborations between academic institutions and other key players within the Tanzanian ecosystem, as illustrated in the box below.

BOX 2: Collaboration in the Tanzanian innovation ecosystem³⁸

Several universities beyond DIT have established innovation spaces to tap into the research and design coming out of their associated academic institutions. These include: Kiota Hub at Tumaini University, Data Lab at the University of Dar es Salaam (UDSM), and AMCET Hub at the Al Maktoum College of Engineering.

COSTECH, a parastatal, is mandated to foster and encourage collaborations (and efforts) that emphasize research and technology design inherently illuminating the link between academia and industry.

Buni Hub and COSTECH have started an initiative to support the establishment and growth of innovation spaces, specifically those attached to universities. The goal is to create awareness in universities and R&D institutions about innovation spaces, and encourage them to also establish similar institutions.

Initiatives such as Sahara Ventures, one of the oldest accelerators in Tanzania, support postrevenue startups to ensure that they are able to survive.

	☆

However, while the above examples demonstrate progression, Tanzania, like many developing nations, has a few challenges that hamper collaboration. For example, there is no active connection between commercial products and services with scientific research. As such, research will rarely be developed for products that find their way to commercialization. These gaps exist not only in Tanzania, but tend to be common challenges faced by all nascent innovation ecosystems. It should thus be expected that as innovation ecosystems grow, particular support should evolve to fill these gaps.

Donor engagement in the Tanzanian innovation ecosystem

In Tanzania, donors have played a crucial role in enhancing the overall innovation ecosystem. This effort has varied from capacity building efforts, financial support, and support to research initiatives.

Capacity Building: UNICEF Tanzania helped establish Youth for Children (Y4C) Innovation Hub. Y4C Hub is a partnership between University of Dar es Salaam (UDSM) College of ICT (CoICT) and UNICEF Tanzania. It was was established in 2016 to provide the design skills and social context to support students in developing products and solutions with real social value, ultimately to promote child rights. Y4C Hub provides unique value in its emphasis on Human Centred Design (HCD) and Challenge Driven Education (CDE) approaches, where projects are developed for a period of one year and are directly linked to solving real challenges facing society in collaboration with the challenge owners and mentors.

Financial Support: The Human Development Innovation Fund (HDIF) in Tanzania is committed to inspiring and accelerating the experimentation, commercialization, and diffusion of innovations for human development.³⁹ To achieve this ambitious goal, HDIF has partnered with COSTECH to realise the shared goal of fostering innovation and the effective use of technology for human development in Tanzania.⁴⁰ Since 2013, HDIF has worked with several innovators and has invested up to GBP 23.5 million to enable projects that seek to pilot or scale services that will improve the well-being of Tanzanian's.⁴¹ HDIF has supported 43 innovations across 20 regions of Tanzania.⁴²

Ground-Breaking Research: A five-year research project called "Enabling Productivity and Innovation in Low Income Countries" (EPI-LIC)⁴³ funded by DFID and commissioned by the University of Tilburg in the UK⁴⁴ was aimed at filling research gaps on the state of innovation in several countries, including Tanzania.⁴⁵

While the above list is not exhaustive, it highlights notable efforts by the donor community that are currently in place to enhance and support the innovation ecosystem in Tanzania.

- 39 🛃 Inspiring and accelerating the experimentation, commercialisation, and diffusion of innovations for human development in Tanzania.
- 40 🛃 Mapping of Tanzanian Hubs and Innovation Spaces

- 42 🛃 ibid
- 43 Lenabling Innovation and Productivity Growth in Manufacturing Small and Medium Sized Enterprises in Low Income Countries
- 44 🛃 Tanzania: Qualitative Study on Innovation in Manufacturing Small and Medium Sized Enterprises (SMEs): Exploration of Policy and Research Issues
- 45 🛃 Enabling Innovation and Productivity Growth in Manufacturing Small and Medium Sized Enterprises in Low Income Countries



^{41 🛃} Our Innovators



Best Practices

'Maker Space' Support

aker spaces are spaces where people with common interests' network, share knowledge, and work on projects together or simultaneously.

A key advantage of maker spaces in Africa is that they have an ability to bring different groups of people (for example students, entrepreneurs, hobbyists, etc.) together to work on common ideas. The spaces provide opportunities for innovation and growth in sophisticated sectors.⁴⁶

Maker spaces can be community- or commerciallyoperated, and are frequently found in places such as academic institutions or community centres, with the intent of encouraging their users to 'make things', and are thus used for both teaching and learning.⁴⁷ In Tanzania, most innovation spaces are a mixture of accelerators and incubators⁴⁸ and there is a need to encourage more universities and R&D institutions to establish maker spaces for those who have not yet seeded a business idea.⁴⁹

- **46 Maker spaces: Potential growth platforms for domestic electronics**
- 47 🛃 Innovative Learning Spaces in the Making
- 48 Although accelerators and incubators are often conflated, there are differences between them. According to the WB, Accelerators support entrepreneurs and startups in the early stages of development and they are often comprised of the following features: (i) a highly competitive and open application process for entrepreneurs, (ii) provision of small amounts of seed investment, (iii) a focus on small teams rather than individual founders, (iv) intensive support for a limited period of time (usually 3-6 months), with active mentorship and networking, and (v) collaborative work among startups through cohort or classes of startups. Incubators are spaces that support services. The most typical services are legal, recruiting, IT, accounting, public relations and pooled buying programs. In addition, incubators may also provide coaching, mentorship, and help with access to funding on an ad hoc basis
- 49 🛃 Innovation Spaces Republic of Tanzania

Tanzania has particular strengths which provide an excellent prevailing environment for the creation of further maker spaces. These include (i) a history of communal maker environments in Africa, (ii) a culture which supports aspirational entrepreneurship (demonstrated by existing successful case studies in neighbouring countries like Kenya), (iii) evidence that it is easy to attract users, and (iv) the ease with which current hubs (co-working spaces, community centres, etc.) can be leveraged into maker space environments.

However, there are also weaknesses and threats to sustainability of the current conceptualisation of maker spaces in Tanzania. Potential weaknesses include: (i) donor reliance, (ii) western conceptualisation of innovation, (iii) limited regional impact, (iv) high set up costs, and (v) a lack of sophisticated equipment for prototyping.⁵⁰ Additionally, threats to sustainability of the existing maker spaces in Tanzania include unsustainable business models and inability to generate revenue,⁵¹ as well as poor dissemination of best practices and a lack of strong, visionary leadership.

Characteristics of successful maker spaces

Good practice indicates that a maker space should be committed to a culture of innovation and should provide the skills and foundation that users need to succeed in this kind of environment.⁵² There are two primary elements of support which the literature indicates are fundamental ingredients for maker space success:

Equipment: Most maker spaces provide access to light infrastructure and tools such as 3D printers to encourage a 'do it yourself' attitude towards solving local challenges.⁵³

Community: Community and culture are also important attributes of maker spaces. A thriving maker space culture is one where users of the facility share a sense of pride and ownership of the space⁵⁴ and a signature characteristic of maker spaces is the organic formation of communities of innovators.⁵⁵ This encourages networking between makers, and sharing of ideas and resources such as open software/data to allow collaboration. Additionally, communities also create opportunities for peer-to-peer learning, and sometimes provide opportunities for accessing funding.⁵⁶ Community and shared purpose together simulate motivation and courage to innovate.⁵⁷

^{50 🛃} Innovation Spaces - Republic of Tanzania

^{51 🛃} Maker spaces: Potential growth platforms for domestic electronics

^{52 🛃} Meaningful Making: Establishing a Makerspace in Your School or Classroom

^{53 🗄} Communities of "Makers" Tackle Local Problems

⁵⁴ Wilczynski, Vince and Cooke, Malcolm. "Identifying and Sharing Best Practices in International Higher Education Makerspaces Identifying and Sharing Best Practices in International Higher Education Makerspaces" 2018/03/15

^{55 🛃} Communities of "Makers" Tackle Local Problems

^{56 🛃} Maker spaces: Potential growth platforms for domestic electronics

^{57 🛓} Learning from Innovation Hubs: Fluidity, Serendipity, and Community Combined



It is important to note that the support above is intended not only to enhance the creation and invention of things within maker spaces but also to ensure that makers have the social, personal and business support needed to prototype, scale, and eventually commercialize viable products.

The role of maker spaces in policy engagement

In addition to the above, there is an increasing recognition of the importance of policy engagement by maker spaces. Those maker spaces in East Africa that have engaged policymakers have had positive experiences in achieving systemic change, as well as being more likely to have sustainable operations.⁶⁰ However, in Tanzania, there is not sufficient evidence of maker space engagement with policy to date.

Research conducted with several maker spaces in sub-Saharan Africa, including Buni Hub in Tanzania, one of the oldest maker spaces, found that maker spaces often focus on cultivating relationships with direct users and funders, but neglect policy engagement altogether.⁶¹ Very few hubs have what are considered 'strategic engagements', which involve building long-term relationships where hubs ultimately advise policymakers or convene regular moments of advocacy between citizens and policy makers.⁶² The dominant reason for this lack of engagement is due to complex government systems or corrupt policy environments that limit meaningful discussion. This research found that rallying multiple actors to advocate for a common cause has proven an effective way of engaging policymakers regarding innovation.⁶³

Overall, current Tanzanian national regulations and policies are considered misaligned to those needed for developing an innovation ecosystem.⁶⁴ For example, entrepreneurs have reported that taxation and laws governing the filing of taxes are not readily available or user-friendly.⁶⁵

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^{59 🛃} Best Practices for Staffing a Maker Space, Fab Lab, or Innovation Center

^{60 🛃} To support innovative social impact, tech hubs are realizing they need to engage policymakers. But how?

^{61 🛃} Technology innovation hubs and policy engagement

^{62 🛃} Technology innovation hubs and policy engagement

^{63 📩} To support innovative social impact, tech hubs are realizing they need to engage policymakers. But how?

^{64 📩} Tech Start-up Ecosystem in Dar es Salaam: Findings and Recommendations

⁶⁵ WB recommends addressing process constraints such as business registration and access to loans processes.

Managing an Innovation Partnership effectively

There is a definitive commitment from development sector actors to partner with the private sector for effective innovation partnerships.

n 2015 alone there were four global policy commitments to multi-stakeholder partnerships:⁶⁶

The third international conference on financing for development: This recognised the potential for multistakeholder partnerships and promotes them as a key tool for development

2 *The UN Sustainable Development Goals:* Goal 17 is dedicated to partnerships, re-affirming their potential to mobilise and share knowledge, expertise, technology and financial resources.

- **3** *The Business for 2030:* Provides additional tools and partnering organizations to assist companies to achieve the SDGs.
- **4** *The SDGs compass:* Supports companies to align their strategies with the SDGs while measuring and managing their contribution.

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Effective donor coordination can contribute significantly to the success of partnerships and is thus key to maximise developmental impacts.⁶⁷ However, evidence indicates that there is a need for a structured approach to managing multi-stakeholder innovation partnerships.

BOX 3: Ten success factors for making partnerships effective coalitions for action⁶⁸

1 Secure high-level leadership Ensure partnerships are country-led and context-specific 2 Avoid duplication of effort and fragmentation Make governance inclusive and transparent 4 Apply the right type of partnership model for the challenge Agree on principles, targets, implementation 6 plans and enforcement mechanisms Clarify roles and responsibilities Maintain a clear focus on results 8 9 Measure and monitor progress towards goals and targets **10** Mobilise the required financial resources and use them effectively

The first success factor regarding leadership is of particular importance in a maker space environment, as several types of leadership are required to successfully manage and run a maker space. As such, the role of each leader is critical and needs to be defined accurately. In some maker spaces, leaders teach within the maker space (for example on how to use specific machinery) and in other maker spaces, leaders simply manage the spaces and help guide those who come in. Defining the roles and responsibilities of each leader is a key factor in the success of maker spaces.⁶⁹ Besides teaching, other roles and responsibilities include interacting with other stakeholders, identifying the kinds of support makers will need, or completing regular maintenance of machinery.

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The Importance of Articulating Contribution

Finally, programs engaged in multi-stakeholder partnerships need to find the right design for a monitoring and evaluation (M&E) system to support a shared understanding of program implementation and success.

Good practice guidelines for M&E in multi-stakeholder partnerships suggest at least four elements are required for an effective M&E system:⁷⁰

- 1 *Make M&E a core input into decision-making:* A first rule of thumb for M&E is that it is most useful when the information it generates is useful and also used in practice, preferably to advance collective action in the partnership. Secondly, M&E should not overload the time and capacity of those involved.
- 2 Adequately combine accountability and flexibility:⁷¹ Innovation involves decision-making under uncertainty. Such conditions require an iterative program logic that facilitates program adaptation to ensure successful engagement with innovators and entrepreneurs. This in turn can ultimately lead to better reflection and learning, and hence better support to partnerships (provided that donor agencies shift their behaviour from being risk averse to accepting risk of failure).
- **3** *Focus on learning:* Moving the focus from results (and success) to learning will in turn allow partnerships to keep focusing on transformational long-term objectives (vs. reactive short-term objectives), and change/progresses.

Finally, when considering the expected outcomes of an initiative focused on innovation, it is important to consider the realistic timeframe for results to materialise. There is causal evidence that in the long term, innovation is linked with per capita economic growth.⁷² The typical timeframe investigated in the evidence ranged from 10 to 20 years. In the case of complete sector innovation adoption, such as in the energy sector, evidence indicates adaptation and use of innovations can take as much as 20 to 70 years to be fully integrated in an economy.⁷³

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^{73 🗄} How long does innovation and commercialisation in the energy sectors take?



In some instances, this growth is shown to then subsequently have an effect on the level of innovation in an economy – generating a virtuous development cycle.⁷⁴ The evidence of this relationship between innovation and economic growth supports the perspective that while innovation can have immediate short-term benefits, the true effects of innovation will only be realised over time. This implies that any program engaged with developing innovation should be pragmatic and realistic with respect to the timelines within which change is expected to occur.

...while innovation can have immediate short-term benefits, the true effects of innovation will only be realised over time.

74 However, the majority of this evidence covers developed economies rather than developing economies.







