Ghana Innovation Ecosystem Insights, Challenges & Opportunities

A Summary Report in association with the UNDESA-R4D Demand-Led Innovator Support Program

March 2022

A Note for the Reader:

This report was prepared as a contribution to the broader UNDESA-R4D Demand-Led Innovator Support Program, which ran from July to December 2021. It is not a comprehensive analysis of the entire ecosystem, but rather designed to provide an accessible, high-level introduction to some of the key challenges and opportunities that are currently influencing its evolution based on desk research and selected stakeholder consultation. As such, it is intended to be used as a tool for catalysing further connections and potential ecosystem-strengthening collaborations among local and international actors, as well as a conversation-starter to help build the wider evidence base around innovation ecosystem strengthening more broadly.

Overview of this Report

Strong innovation ecosystems create the enabling environment for innovations to be developed and scaled, and for actors to solve critical challenges. This report builds upon existing literature and consultations with a range of stakeholders to highlight some key themes and considerations for ecosystem strengthening in Ghana in 2022 and beyond.

To prepare the report, we employed a mixed-method approach including a desk review of the literature and existing policy documents, stakeholder interviews, and a review of ongoing initiatives and organizations actively strengthening the Ghana innovation ecosystem.

At the core of this analysis is a framework for understanding and assessing innovation ecosystems developed by the International Development Innovation Alliance (IDIA) and published in the November 2021 report *Strengthening Innovation Ecosystems*. This framework comprises nine goals or assets within an ecosystem that research suggests enable innovation and social entrepreneurship to flourish. As such, they are a useful reference point for both assessing the strength of an ecosystem and aligning the various ecosystem-strengthening efforts of different actors.

The report is broadly structured into four sections as follows:

- ❖ **Section 1 – Background:** An introduction to the UNDESA-R4D Program and the IDIA Innovation Ecosystems framework utilized to map the findings.
- ❖ **Section 2 – Context:** A brief overview of the socio-economic landscape of Ghana, the current Governmental priorities that have a bearing on the innovation ecosystem, and examples of some of the ongoing initiatives/ programs for ecosystem strengthening in Ghana.
- ❖ **Section 3 – Ecosystem Goal Insights:** High-level reflections on how well Ghana's ecosystem is performing against each of the nine IDIA framework goals.
- ❖ **Section 4 - Conclusion:** Final reflections for ecosystem supporters to consider.

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1.0 Background

1.1 Overview of the UNDESA-R4D Demand-Led Innovator Support Program

In July 2021, the United Nations Department for Economic and Social Affairs (UNDESA) and Results for Development (R4D) began a short-term collaboration to explore the innovation ecosystem in Ghana. This engagement was based on the following challenges frequently identified in previous analyses of Ghana's innovation ecosystem:

- **There is a large and growing supply of innovations in Ghana with the potential to be catalytic in improving development outcomes**. However, there are multiple barriers in play at both the level of individual innovators and the broader ecosystem that prevent the effective matching of this supply with the demand side (actors who have the ability, resources and need to support the efficient and effective scale-up of these solutions).
- **There is an opportunity to explore a more demand-led approach to scaling innovations in Ghana that is responsive to both innovator and ecosystem needs.** Historically, most support for innovation (domestic and international) has focused on building the supply side and direct capacity-building support to entrepreneurs. The UNDESA-R4D Demand-Led Innovator Support Program reflects an effort to develop an integrated approach that better balances and matches the needs of innovators (supply) with those of the ecosystem (demand). This resulted in a unique experiment combining two parallel work streams as shown in Figure 1 below.

Figure 1 Program overview
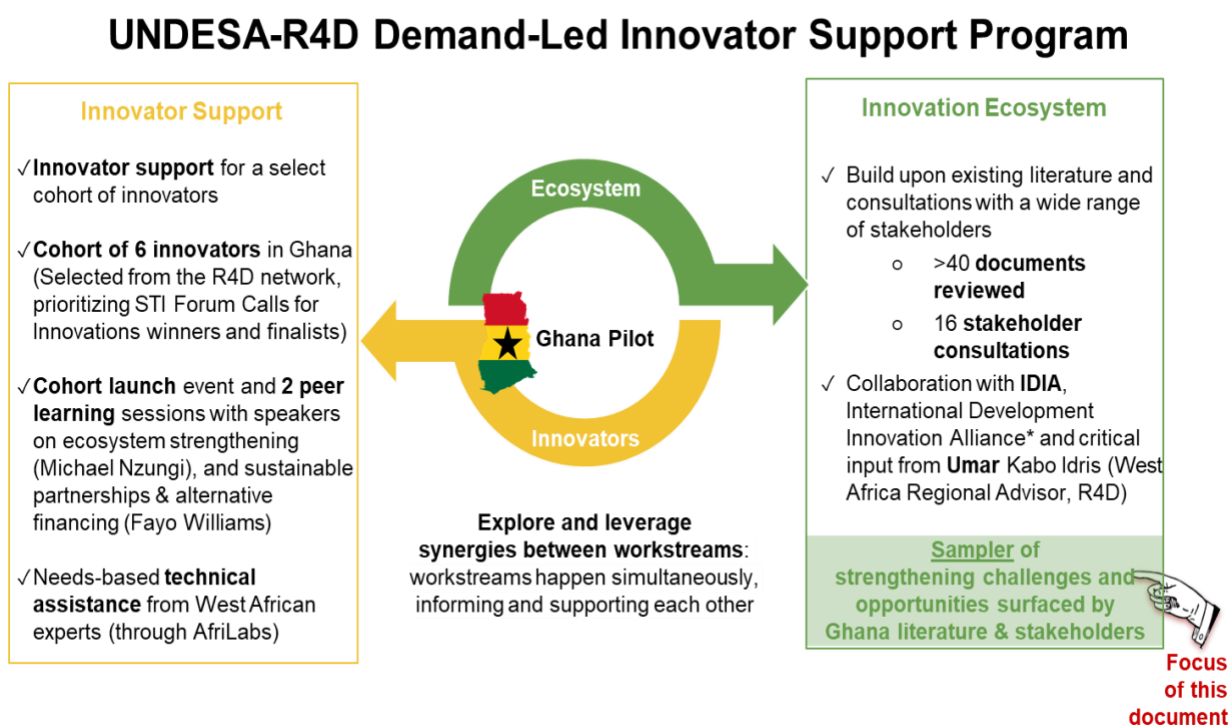
* IDIA collaboration included inputs from the IDIA Ecosystems Working Group and their report on Innovation Ecosystems.

1.2 Understanding Innovation Ecosystems

Within the context of global development, we define **innovation**[1] **as a new solution with the transformative ability to accelerate impact**. Innovation can be fuelled by science, research, and technology, can entail improved ways of working with new and diverse partners, or can involve new social and business models or policy, creative financing mechanisms, as well as path-breaking improvements in delivering essential services and products. Innovation thrives best when facilitated by a strong ecosystem of favourable enabling conditions.

Digital innovations and entrepreneurship in general have overlapping connections with the innovation ecosystem, with great potential to transform the economy and contribute to accelerating progress toward the SDGs. At this intersection is the use of technology, with tremendous potential to modernize and transform the economy, create solutions to address critical needs of society, ease citizen access to information, stimulate collaboration, networking and investment, and generally support a vibrant innovation ecosystem. Youth (individuals aged 18-35 years) make up a significant proportion of population demographics (particularly across Africa) and are also highly active in the start-up space, representing a huge (if currently under-utilized) resource for socio-economic advancement.

An **innovation ecosystem** is defined as **the combination of actors, assets and relationships that together provide a supportive enabling environment for innovation and social entrepreneurship to flourish.** In practice, the definitions that actors use tend to fall along a continuum depending on which actors, assets or relationships they emphasize:[2]

- At one end of the continuum the focus is on ***entrepreneurial support***, where the innovator is placed at the centre of the model and the primary focus of strengthening efforts is filling in gaps and resources for entrepreneurship. Accordingly, the strength of the ecosystem is determined by how well the innovator's needs are met.
- In the middle of the continuum are models that place emphasis on the ***innovation process***, broadening the range of actors involved and strengthening the overall capacity of an ecosystem to translate ideas into solutions and reinforce connections among actors to facilitate scaling.
- Finally, at the other end of the continuum are ***mission-driven approaches***, in which the emphasis is on creating a shared sense of purpose and identity among a variety of ecosystem actors and mobilizing them to address a shared mission or development challenge. This may include sector specific ecosystem approaches, as when governments, private sector actors and others agree to collaboratively support innovation designed to improve educational outcomes for girls.

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[1] A call for innovation in international development (International Development Innovation Alliance)
[2] See IDIA Insight Guide: Innovation Ecosystem Strengthening (pp. 10-13) for further detail.

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It is important to note that entrepreneurial, innovation-oriented and mission-driven approaches are all valuable in creating high-performing and productive innovation ecosystems. In many ways, while they may enjoy different levels of attention under the development spotlight, they do not reflect 'either / or' decisions, where one approach can be argued as inherently more important than another. In fact, it could be argued that the most impactful and sustainable ecosystem interventions will likely accommodate elements of — or an interaction between — all three, engaging a wide variety of actors around a common mission while using this to stimulate new forms of partnership and investment that will continue to strengthen the wider enabling environment.

A Goal-based approach to Ecosystem Strengthening

Because of their complexity, innovation ecosystems typically offer many different entry points for strengthening. Most interventions seek to address specific problems or weaknesses where that ecosystem is deemed to have gaps or is poorly performing. These 'deficit-based' approaches, while valid, encourage the perception that one-off targeted interventions can somehow 'fix' an ecosystem, and often ignore the dynamic interplay of different factors that will continually act to strengthen or weaken interdependent parts over time. For this reason, the language of ecosystem strengthening is arguably more appropriate in recognising that there are very likely some assets that may already exist on which to build, and that it is a continual (rather than isolated) activity.

Following extensive research and consultation with both international and country-level actors, IDIA identified nine Ecosystem Goals that represent the main focus of initiatives across the continuum of entrepreneurial > innovation > mission-driven interventions.

1. Building informed **human capital**
2. Ensuring **accessibility of finance** for innovation processes
3. Establishing supportive **research, markets, energy, transport, and communications infrastructure**
4. Creating enabling **policies and regulations**
5. Nurturing a **culture** supportive of innovation and entrepreneurship
6. Supporting **networking assets** that enable productive relationships between different actors
7. Ensuring **equitable and inclusive ecosystem governance and participation**
8. Creating smoother **pathways to scale** for specific innovations
9. Mobilizing a **collective ecosystem approach** to address a particular development challenge

Together, these nine goals offer a helpful and comprehensive framework within which the vast majority of ecosystem strengthening activities can be categorized (see Figure 2 below).

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Figure 2 Innovation Ecosystem Goals

*Source: IDIA (2021) '*Strengthening Innovation Ecosystems*'*

The framework in the *IDIA Insight Guide: Strengthening Innovation Ecosystems* paper unpacks the typical challenges that may hinder the achievement of a particular goal within an ecosystem, and the strengthening strategies that different interventions have employed to try and mitigate or resolve those challenges. These challenges and strategies are in no way comprehensive and greater evidence is needed to further understand what works and what does not in strengthening innovation ecosystems.

The remainder of this report applies the IDIA framework as a lens through which to begin exploring Ghana's innovation ecosystem, and provides a common language through which different types of actors can share and learn from each other about the process of ecosystem strengthening.

2.0 Context

This section provides an overview of the context and outlines the Government of Ghana's priorities regarding its social development policies and progress towards meeting the Sustainable Development Goals (SDGs) by 2030.

2.1 Ghana's Socio-Economic Context

Ghana is a stable West African democracy with a population of ~31 million (2020) people and a GDP per capita of USD 2328 making it one of Africa's leading economies. Ghana's rapid growth was halted by the COVID-19 pandemic, the March 2020 lockdown, and a sharp decline in commodity exports. According to the World Bank, Ghana's economy had grown at an average of 7 percent in 2017-19 before experiencing a sharp contraction in the second and third quarters of 2020. The economy is projected to recover gradually over the medium term to average 5.1 percent yearly in 2021-23, thanks to commodity price growth and strong domestic demand. After declining by 1.7 percent in 2020, real per capita GDP is projected to return to its pre-COVID-19 level in 2021.

The Government of Ghana (GoG) has prioritized sustained economic growth, accelerated poverty reduction, and enhanced shared prosperity on the path to recovery from the impacts of the Covid-19 pandemic on businesses and livelihoods**.** The *Coordinated Programme of Economic and Social Development Policies (2017-2024): An Agenda for Jobs: Creating Prosperity and Equal Opportunity for All* (CPESDP) offered a new approach to doing things to drive the agenda for change, growth, job creation and prosperity for all. The programme entails achieving the following:

    i. Creating opportunities for all Ghanaians to develop themselves;
    ii. Safeguarding the natural environment and ensuring a resilient built environment;
    iii. Maintaining a stable, united and safe country; and
    iv. Building a prosperous nation.

The goal of the Agenda is to remove the bottlenecks stifling the growth of the private sector, and create one of the best environments for private sector growth and development in Africa.

At the centre of this vision is an intentional strategy to develop the human capital for an optimistic and prosperous nation by creatively applying resources to create economic opportunities for all Ghanaians. For example*,* in 2017, the Government of Ghana introduced the Free Senior High School (FSHS) policy as an audacious move to absorb the cost of secondary and technical vocational education training (TVET) making it free to all citizens in line with achieving SDG 4.1. In the spirit of leaving no one behind, this policy has gone a long way to reversing the trend which previously excluded most students from the opportunity to progress to secondary level education.

The removal of cost barriers through this policy has been accompanied by an expansion of education infrastructure, efforts to improve quality and equity in delivery of education, and initiatives to develop the employability skills of young Ghanaians to increase their competitiveness in the world of work.

''Education and skills training are the most important source of empowerment and providing opportunities to the youth to help drive Ghana's development, and in the process create jobs. As a nation we are determined to bring education to the doorstep of our children because it is worth it. We dare to do this because we ardently believe that the Ghanaian child deserves it''. — Free Senior High School Secretariat.

All of this has helped in creating a stronger pipeline of entrepreneurial talent for the innovation ecosystem, yet despite the successes of the policy, it has not been without implementation challenges. There are concerns over compromised quality and disruption given the staggered model introduced which rations time spent in schools to reduce congestion and address infrastructure challenges in schools. Equally, there have been questions around whether the education being provided adequately addresses the 21st century job market by equipping students with the knowledge, skills and tools to enhance creativity and innovation, problem solving, including entrepreneurship at all levels of education and training.

Alongside education and training in Ghana, the government also has prioritized transformation of Ghana's economy. The Government developed a catalytic intervention, the Ghana CARES 'Obaatanpa' to support the recovery and revitalisation of micro, small and medium scale enterprises (MSMEs), setting the country on a path to transform the economy and enabling a "build forward better" agenda. Phase one of this initiative (July-December 2020) was a response to stabilizing the shocks of Covid-19 and supported citizens with social services to provide some relief during the peak of the pandemic. In the second phase (2021-2023), the government plans to fuel productive sectors of the economy and pursue import substitution strategies to drive economic growth.

While Ghana's economic outlook has remained positive, it does face several risks and challenges for sustained growth and stability, in particular with regard to meeting its Sustainable Development Goals (SDGs) by 2030. Ghana has taken proactive measures to solidify its commitments to achieving the Sustainable Development Goals (SDGs), including financing the SDGs as a long-standing priority. The Country Financing Roadmap for the SDGs: Ghana Insight Report that was published in June 2021 by the World Economic Forum defines the national development priorities and resource allocation plan. However, Ghana's low domestic revenue mobilization and debt sustainability challenges are a significant factor driving Ghana's need to identify other sources of financing for its sustainable development agenda.

2.2 Government priorities targeting the Innovation Ecosystem

Ghana is pursuing a range of policies and government-coordinated initiatives that place Science, Technology and Innovation (STI) at the centre of the country's socio-economic development. This is in line with the 2030 Agenda, adopted at the United Nations Sustainable Development Summit in September 2015, positioned Science, Technology and Innovation as key means to implement the SDGs[3]. Harnessing STI, which has cross-cutting applications in agriculture, education, health,

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[3] Progress Report of the Global Pilot Programme on STI for SDGs Roadmaps; European Union and United Nations Inter-Agency Task Team, 2021

industry, energy, water and sanitation and other sectors of the Ghanaian economy, could accelerate achievement of SDGs.

- Ghana developed an STI roadmap and action plans to help realize the SDGs. The SDGs prioritized for Ghana under the Ghana STI for SDGs roadmap are SDG1 (no poverty), SDG2 (zero hunger), SDG3 (good health and well-being), SDG4 (quality education), SDG6 (clean water and sanitation), SDG8 (decent work and economic growth) and SDG9 (industry, innovation and infrastructure). The Progress Report of the Global Pilot Programme on STI for SDGs roadmaps makes the case for more efforts to be dedicated to improving STI capability in Ghana and other pilot countries. This includes strengthening Ghana's research and development capabilities, academia and industry collaboration, and pursuing the transformation of research output and innovation into business ventures that create jobs and grow Ghana's economy. Important to strengthening the innovation ecosystem is SDG 5 (gender equality), which focuses on ensuring inclusive and equitable participation of women in STEM fields and innovation processes, be they in the formal or informal economy.

- The Ministry of Environment, Science, Technology and Innovation (MESTI) exists to promote sustainable environmental management and the adoption and application of science and technological innovations through the formulation of policies, monitoring and evaluation of the implementation of sector plans, programs, and projects for national development. The Ghana Innovation & Research Commercialization (GIRC) Centre under MESTI is a strategic agency that brings together government, public research institutions, academia, innovation hubs and the private sector. The objective of the GIRC Centre is to drive and grow research and innovation and support the transformation of research output and innovations into industrial products and services.

- The *Coordinated Programme of Economic and Social Development Policies (2017-2024): An Agenda for Jobs: Creating Prosperity and Equal Opportunity for All* (CPESDP) has placed entrenching Information and Communications Technology (ICT) and digital innovation at the center of the national development agenda, and also as part of a strategy to position the country as a regional ICT hub. The National Entrepreneurship and Innovation Programme (NEIP) is a government initiative formed in 2017 under the Ministry for Business Development (MoBD) to create a business-friendly, innovative and entrepreneurial environment for businesses, especially youth-led businesses. The Covid-19 pandemic has also presented an opportunity for the economic transformation of Ghana through innovation and digitalization.

- There are various concerted efforts ongoing to catalyse digital innovation in Ghana. The goal of these efforts is to mobilize diverse digital innovation ecosystem stakeholders towards more collaborative and inclusive ecosystem development. These include the Ghana Digital Innovation Week (GDIW) held in November 2021, born from the trilateral cooperation between Ghana, Germany and Israel on innovation for development. GDIW is a week-long convening to bring together all ecosystem voices, define a common vision for Ghana's digital innovation ecosystem and guide earlier conversations towards concrete action.

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- The [Ministry of Communication and Digitalisation (MoCD)](#) is a critical unit mandated to initiate and develop national policies aimed at achieving cost effective information and communications infrastructure and services to enhance Ghana's economic competitiveness. Its role in improving the information, communication and technology (ICT) infrastructure, bridging the digital divide places it as a visible actor in championing the government's digitalization agenda and therefore a critical stakeholder in the innovation ecosystem. In line with its mandate of facilitating the development of communication infrastructure and expanding access to technological innovations by citizens, MoCD champions special initiatives that encourage young women to pursue interest and careers in Science, Technology, Engineering and Mathematics (STEM). [Miss Geek Ghana Competition](#) encourages young women to apply tech innovation in addressing every problem in their communities.   Other interventions include the [Girls in ICT](#) initiative connecting girls to brighter opportunities through digital skills.

  > *"We all know there is a gender digital divide and digital skills shortage globally and if indeed we want women to also take the place as partners in the development of our country, they must engage with the digital economy that is unfolding globally."*
  > *- Ursula Owusu, Minister of Communications and Digitalization*

- Key agencies under MoCD with bearing on the innovation ecosystem include the [Advance Information Technology Institute- Kofi Annan Centre of Excellence (AITI-KACE)](#). AITI-KACE aims to promote human and institutional capacity building; research and innovation; consultancy and advisory services in ICT and e-governance solutions in Ghana and Africa. In response to addressing the infrastructure needs of start-ups, [Accra Digital Centre (ADC)](#) is a tech park that offers incubation, business support, digital skills development, acceleration and research services to propel technological innovations and accelerated growth.

- In addition to digitization, inclusive participation in Ghana's innovation ecosystem is an important goal. The [*Coordinated Programme of Economic and Social Development Policies (2017-2024): An Agenda for Jobs*](#) includes the vision to promote diversity, equity and inclusion, which is also a critical aspect in considering strengthening of an innovation ecosystem. The power of inclusive innovation is that it doesn't just invite under-represented voices and perspectives into the innovation ecosystem; it places them at the center of it. While certainly there have been gains in Ghana mainstreaming equity and inclusion into systemic practices, goals and processes, a lot still needs to be done to approach ecosystem strengthening through an equity and inclusion lens.

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2.3 Examples of Ecosystem Actors & Initiatives

A range of actors play a role in scaling innovations within an innovation ecosystem, including innovators, hubs, ecosystem support organizations, government agencies, academic and research institutions, civil society institutions as well as a range of financial institutions, investors, and development agencies and philanthropic donors.

Ghana's innovation ecosystem is active, growing and collaborative. Most ecosystem interventions are focused on strengthening entrepreneurial support and helping different actors to realize different roles along the innovation process (the left and middle sections of the continuum discussed in Section 1.2 above). This has helped increase connectivity across ecosystem actors, but not necessarily coordination. For example, at a meeting of the IDIA Ecosystem Strengthening Working Group in July 2021, representatives from Ashesi University, Ghana Hubs Network (GHN), Impact Investing Ghana and NEIP presented the visual below (Fig 3) as an illustration of some of the relationships between actors involved in the financing side of Ghana's innovation ecosystem.

Figure 3: An illustration of Ecosystem Relationships in Ghana

Source: IDIA Ecosystem Strengthening Working Group July 2021 Meeting presented by Impact Investing Ghana and NEIP representatives.
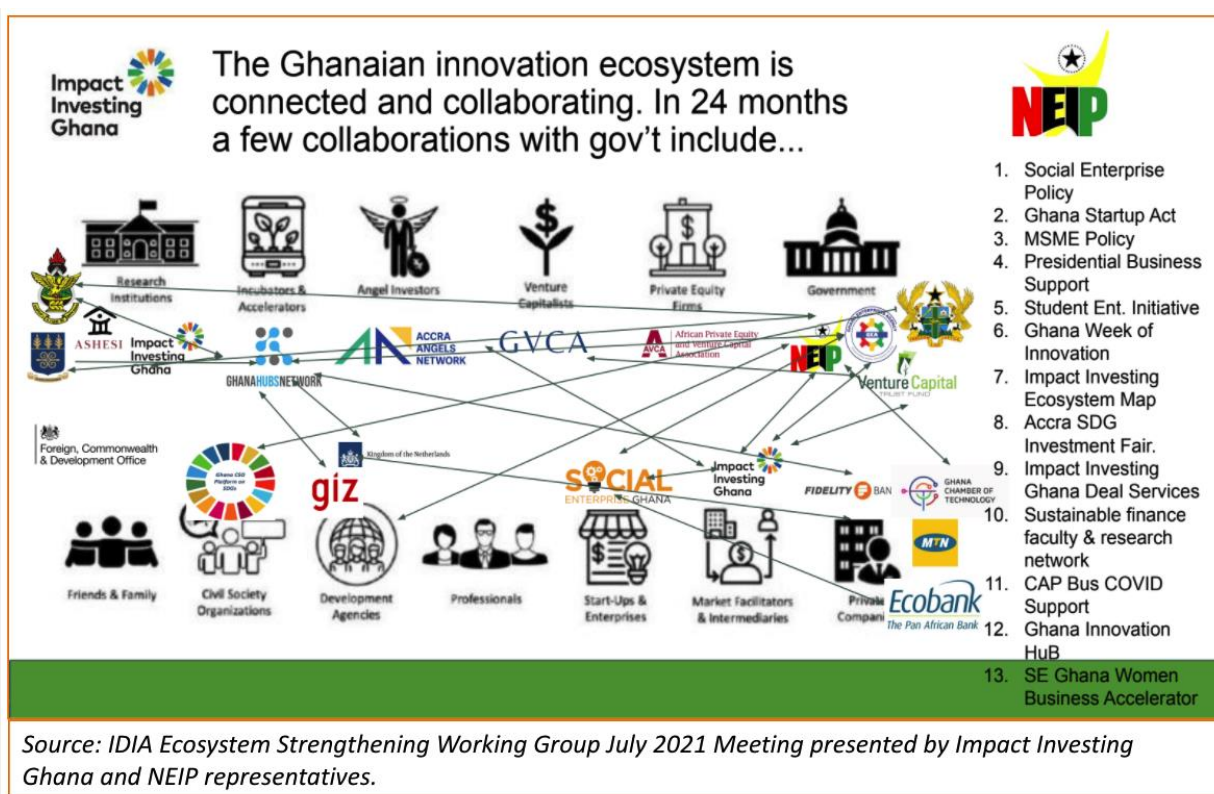
Outlined below are some of the local actors and internationally funded initiatives that are currently working with the specific intention of strengthening Ghana's innovation ecosystem. Note this list is in no way comprehensive, but instead provides some illustrative examples.

Local actors specifically seeking to strengthen the innovation ecosystem in Ghana

Ashesi University (Ashesi)

Ashesi has earned global recognition distinguishing itself as an institution educating innovative and entrepreneurial leaders through an immersive learning experience. Known for its learning by doing approaches, Ashesi rolls out several initiatives to unleash the entrepreneurial drive and creativity in students and communities. Among such initiatives is the Ashesi D:Lab which combines design thinking and lean research methodologies for problem solving, research, collaboration and business innovation. The Ashesi Venture Incubator (AVI) offers an experiential learning opportunity to recent graduates to develop their skills and entrepreneurial ventures with economic and social impact. Bridging academia and industry, Ashesi brings its experience in supporting student entrepreneurship initiatives to develop tools and frameworks needed to Facilitate Innovation Ecosystem Strengthening among actors in mobilizing, designing and facilitating local innovation ecosystems, recognizing that ecosystem strengthening is more of a process than an event.

British Council in Ghana

Since 1944, British Council has built connections between students, educators, policymakers, academics, creatives and entrepreneurs in Ghana, the UK and globally. The British Council supports young people with the development of skills, platforms and education to access better opportunities that shape their future careers. It offers a range of vibrant programs on art, creative economy, youth employment and skills development . Through its work, the British Council contributes to the development of human capital but also creates an enabling environment for innovations to grow by interacting with local ecosystem actors and facilitating global connections.

Ghana Climate Innovation Centre (GCIC)

Ghana Climate Innovation Centre (GCIC) incubates and accelerates green, profitable and sustainable businesses with a mission to 'develop and support an exceptional set of transformational ventures and entrepreneurs who are pioneering adaptive and mitigating solutions for climate change issues in Ghana.' At the core of the centre's work lies a deep commitment to gender equality, social responsibility and proactive approaches to climate mitigation and adaptation to build an economic powerhouse and a sustainable society in Ghana. GCIC shares in Ashesi's philosophy of raising entrepreneurial leaders with critical thinking skills. It leverages the special focus on innovation and climate change to shape policy advocacy in the ecosystem.

Ghana Hubs Network (GHN)

Ghana Hubs Network is the umbrella association of 50+ tech, business and innovation hubs across Ghana to facilitate partnerships, create synergies, foster collaboration with members and partners, and influence policy action in support of the innovation and entrepreneurship ecosystem. Innovation hubs offer co-working spaces, digital tools and services, training, networking opportunities, business incubation and acceleration, serving as nodal points of connecting and community building for innovators and ecosystem actors. As the coordinating body, GHN promotes collaboration of hubs in Ghana but also facilitates PanAfrican and global exchanges for peer learning. GHN advocates for the right policies for an enabling environment, help grow traction for sustainable operations and to lead the development of a cohesive and strengthened tech and business ecosystem in Ghana, driven by the values of integrity, inclusiveness, quality, and collaboration.

Impact Investing Ghana (IIGh)

Impact Investing Ghana (IIGh) brings together actors from across sectors committed to developing impact investing, to develop a clear and dynamic understanding of the Ghana ecosystem, to work to remove obstacles to develop the impact investing ecosystem/market in Ghana, and to develop opportunities for impact investment in and from Ghana. IIGh research to date has identified eight development challenges in the ecosystem which include capacity building, quality control and financial sustainability support for Enterprise Support Organizations (ESOs) such as incubators and hubs as well as setting up innovative finance vehicles to unlock local funding. This includes collaborative workshops, creation of action groups to drive forward some of the actions identified by research as well as support from the research team to provide any additional insights needed for action and advocacy. This project will provide a clear pathway to benefits identified by research by developing a collaborative platform which includes government, ESOs, researchers and others to develop and execute capacity building, quality control and financial sustainability. By strengthening key ecosystem players like ESOs and driving collaboration between ecosystem players through mechanisms that will continue after the project ends, the ecosystem will be strengthened long term.

Social Enterprise Ghana (SE Ghana)

Social Enterprise Ghana is the network for high impact social entrepreneurs in Ghana working together with partners to strengthen Ghana's social enterprise ecosystem. The goal of SE Ghana is to organize and develop a strong ecosystem for the social enterprise sector by increasing funding, driving policy, intensifying learning and innovation and ensuring that there is adequate research and data on the sector. SE Ghana is a part of the larger African Social Entrepreneurship Network (ASEN) which seeks to improve the social entrepreneurship ecosystem across the continent. SE Ghana, like other networks around the world, brings together social entrepreneurs to support one another, lead development in the social entrepreneurship space, and advocate for their interests.

International initiatives seeking to strengthen the innovation ecosystem in Ghana

Several global donors are actively funding ecosystem strengthening initiatives in Ghana, including the UK Foreign, Commonwealth and Development Office (FCDO), the Dutch Ministry of Foreign Affairs (Dutch MoFA) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) among others. Examples of the initiatives they are supporting (and the different ecosystem goals they are targeting) are provided below.

Ghana Digital Innovation Week (GDIW)

The first Ghana Digital Innovation Week (GDIW) was held in November 2021, a product of the trilateral cooperation agreement between Ghana, Germany and Israel on innovation for development. GDIW is a week-long convening to bring together all ecosystem voices, define a common vision for Ghana's digital innovation ecosystem and guide earlier conversations towards concrete action.

Some quotes from 2021 GDIW participants on international efforts to strengthen Ghana's innovation ecosystem are shared below:

- *"By duplicating programs and actions in a fragmented manner, development agencies fuel the chaos in the ecosystem and stirs up unnecessary competition."*
- *"Funding is often done from an emotive approach, where development agencies choose to fund innovations to feel good rather than based on the real value the project achieves. A question the development agencies need to ask themselves: Are we funding valuable projects or are we funding projects that are just pushing for development projects for the sake of them?"*
- *"We have a question about how donors learn about priorities. First is shifting the mindset so that it becomes demand driven and understanding what the priorities are as defined by locals. But then the challenge is who are you talking to? Are you getting the full picture? We've seen the sort of difference between the Accra based actors who seem to get a lot more voice than the regional counterpoints. Is there a different way that donors should be thinking about understanding demand? Is there a better channel or approach than the typical kind of consultation that happens at present?"*

MakeIT in Africa

GIZ's 'Make IT in Africa' program promotes tech entrepreneurship and supports the growth of an enabling environment for entrepreneurs in the digital sector by facilitating better access to finance, markets and skills. Make-IT since 2017 adopts a regional approach and has implemented programs in Ghana, Nigeria, Kenya, Rwanda and Tunisia more broadly in promoting digital innovations in Africa for sustainable and inclusive development. The Deep Dive Africa Tour for European investors seeking to explore early stage startup investments in Ghana and Nigeria exemplifies Make-IT's work in facilitating access to finance, market and skills.

Through a tiered approach, GIZ works with partners and structures implementation at three levels; *Macro*, *Meso,* and *Micro* to provide holistic ecosystem support and address specific nuances at various levels of ecosystem strengthening. relation to evidence and data (intertwined with governance models) and inclusive ecosystems. The support can be targeted at different levels, as shown below:

- Micro-level: Targets entrepreneurs/ innovators directly through innovation challenges, hackathons, mentoring, awareness raising, networking, learnings exchanges, accelerator programs, among other interventions.
- Meso-level: Cooperating with and strengthening intermediaries like innovation hubs, hub associations, chambers of commerce, associations, NGOs, social businesses, civil society organizations, networks, or entrepreneurship support organizations (ESOs).
- Macro-level: Collaborate with stakeholders on the broader operating environment through policy advisory, technical support and advisory, national entrepreneurship promotion strategy, innovation strategies, government programs and implementation plans.

To make an ecosystem more inclusive, there are additional layers and actors to consider, which may include identifying and programming with marginalized populations within the ecosystem, involving a range of ongoing approaches rather than a specific program.

Initiatives for a Circular Economy

Funded by the Dutch Ministry of Foreign Affairs, the mission of I4CE (Initiatives for Circular Economies) is to promote an economy that runs completely on reusable raw materials, moving away from agriculture/resource extraction as a main source of income toward higher value-added activities such as manufacturing and higher-tech, service-led economies. I4CE founded the Ghana Climate Innovation Centre. I4CE began in 2015 and is ongoing.

National Entrepreneurship & Innovation Program (NEIP)

Set up in 2017 under the erstwhile Ministry of Business Development, NEIP is a government agency that promotes entrepreneurship and innovation to grow start-ups and small businesses. Through business support services, incubation and acceleration, skills training, pitch competitions, funding and access to market support NEIP offers a range of services although with a sector agnostic approach but evolved in prioritizing green businesses. Over the years, NEIP has positioned itself as a key partner driving youth entrepreneurship and currently operates under the Office of the President. In line with its focus of championing youth entrepreneurship, NEIP serves as one of the two agencies to implement the recently proposed YouStart Initiative in the 2022 budget in the next three (3) years together with the Ghana Enterprises Agency.

Research and Information Systems in Africa (RISA) Fund

FCDO's Research & Innovation Systems Africa initiative is a GBP £30m multi-year program implemented by a consortium of five partners: Chemonics, Brink, IMC Worldwide, Results for Development (R4D) and SOAS University of London. It seeks to strengthen research and innovation ecosystems by developing a portfolio of projects addressing IDIA's ecosystem strengthening goals in various African countries, including Ghana. The program has three objectives:

1. To support research organizations to have the capabilities necessary to produce relevant, high-quality research and to create an enabling environment for research organisations.
2. To strengthen the enablers for the scaling of new and emerging technologies with the high potential for poverty reduction and inclusive growth; and
3. To identify and support linkages between research and innovation systems that will improve their integration and coordination.

During the inception stage (through March 2022), RISA will invest in ~10 ecosystem strengthening projects including ~4 in Ghana.

UNDP Accelerator Labs, Ghana

UNDP Accelerator Labs, Ghana (Acc Lab) serves as an innovation and learning hub within UNDP in mapping, testing and experimenting solutions that tackle sustainable development challenges. Driven by building inclusive communities and promoting gender equality, the Lab collaborates with partners, experts and innovators to explore youth and women-led solutions developed locally to accelerate the pace of development. Acc Lab has a keen interest in behavioural approach working with the informal sector, rural communities, and other marginalized groups to create or take advantage of economic and social opportunities.

3.0 Ecosystem Goal Insights

This section looks at each of the nine ecosystem goals discussed in Section 2 and draws on insights from the literature and local stakeholder consultation in Ghana to highlight challenges that are potentially hindering the achievement of that goal in Ghana as well as possible solutions / interventions as voiced by those within the ecosystem.

GOAL 1: Building Informed Human Capital

The process of growing the knowledge, capacities, skills, relationships and expertise that enables people to innovate and support innovation process

Some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include: limitations in technical skills and/or knowledge (or knowledge sharing) among innovation actors, a lack of diversity in the innovator talent pool, and a fragmented policy environment without a clear understanding of human capital needs.

Goal-related challenges in Ghana:

(a) An Industry-Academia Mismatch

It appears that there is a mismatch in the skills that academic institutions in Ghana are teaching and those required by the broader industry, which is exacerbating a high level of youth unemployment in Ghana due to successive cohorts of graduates failing to find appropriate work. One entrepreneur we interviewed working in education shared their thoughts on the various challenges this was causing in terms of building the sizeable pipeline of talent currently in demand by industry players:

> *"It is challenging to find a workforce, because skills need to be cultivated e.g., if they have just gotten out of university. On the other side, there are a lot of talented people who are much more expensive because they are in demand."*
> – Social Entrepreneur

The Coordinated Programme of Economic and Social Development Policies (2017-2024) has prioritized job creation as a way to create prosperity and equal opportunity for all. Building informed human capital, with a key focus on creativity, competency and capabilities is a key enabler towards this goal. High unemployment numbers have called for training to be focused on where labour is needed the most. However, demand for labour continues to be greater than the current supply. There are limited/hard to access resources for individuals to receive proper training/education to meet the demand which impacts the innovation ecosystem. Entrepreneurs and innovation hubs struggle to identify which programs will best result in access to industry, and there are also disconnects between the actors/programs that can provide this for them, including universities, hubs, and other Entrepreneur Support Organizations (ESOs). Innovators have also cited 'training fatigue' especially where such training is tied to investment or financial support.

(b) Poor Program Coordination

The World Bank Report on Youth Employment Programs in Ghana reports that while Ghana has launched a number of initiatives in response to unemployment, the lack of coordination among stakeholders in the sector has led to duplication. Regular exchanges are important for promoting synergies and reducing duplication of programs, and for sharing knowledge. Most existing government-led youth employment programs also lack adequate systems for monitoring and evaluation and for impact measurement. Few programs include clear indicators that measure performance, and most do not carry out tracer studies to assess their effectiveness and what happens to beneficiaries once they have exited the programs. Without such systems and data, policy makers and other stakeholders find it difficult to make informed decisions on whether to fund, iterate or scale up human capital programs.

(c) Limited Specialization of Skills

Despite these challenges, a new generation of tech entrepreneurs has emerged in Ghana, largely as a result of educational institutions offering entrepreneurial and technology-focused courses such as the University of Ghana, KNUST and Ashesi. However, support for additional capacity building across more technical sub-categories is less available, and there remains an increasing need for more specialized skills in the ecosystem to build a stronger pool of future tech leaders, particularly given that most specialized talent is currently 'snatched up' by international big tech companies.

Goal Strengthening Opportunities

(a) Building stronger connectivity between Industry and Academia

> *"There are many opportunities to train more people in the areas of health and education, especially training of more health workers. For example, COVID-19 has fast tracked digitization especially in healthcare which adds demand for digital skills. However, if you look at Ghana's education system there has to be a lot of reforms…Human resources have to be connected to the existing development priorities.*
>
> *Also, we see a lot of gaps, for example, in technical and vocational education skills. We see a lot of gaps in terms of the entrepreneurial skills that we need as a country. All these are opportunities to build human capital in a targeted manner."*
>
> *– Government actor, Research & Policy Expert, Ghana*

As noted in the quote above, a critical opportunity for Ghana is to build human capital in a targeted manner to align the talent pipeline with industry needs. Some private sector actors are stepping in to try and do this to meet their own institutional needs such as Google, which is talent building and recruiting in Ghana as part of their $1billion investment in Africa's digital transformation. Innovation hubs, entrepreneurial universities, and other ecosystem support organizations are also trying to fill the skills gap for potential entrepreneurs through networking, mentorship and training, and the activities of these organizations could be further supported to ensure more systematic provision of internships and applied learning opportunities for early career individuals to build their skills and knowledge. Decentralizing the current high concentration of innovation hubs in the two most populated urban cities in Ghana (Accra and Kumasi) and providing more technology-enabled platforms for learning and training, would also increase the support available for innovators.

(b) Enhancing national talent pipeline coordination and oversight

A stronger, national and government-led approach would be beneficial, if not only to improve the coordination and comparative assessment of these training and capacity building programs. Initiatives funded by international donors are also valuable in helping to strengthen alignment and connectivity across these human capital pipelines. For example, under the FCDO-funded Research & Innovation Systems Africa program (RISA), Impact Investing Ghana is building the capacity of ESOs by helping them foster stronger research-industry connections that they can then use to unlock pathways to finance and industry demand for entrepreneurs under their care. Amplifying favourable government policies, programmes and interventions such as the National Entrepreneurship and Innovation Programme, Business Development Programme, and Business to Business (B2B) matching will also all help to build young talent locally.

GOAL 2: Access to Finance

Strong ecosystems need a range of financial institutions to provide financial products and services to support research and entrepreneurship

Access to finance contributes to productive and sustainable entrepreneurship when innovators can secure diverse financial products and services from different financial institutions. These institutions include (but are not limited to): accelerators/incubators, angel investor networks, private foundations, impact investors, venture capital firms, private equity firms, crowdfunding platforms, public/semi-public funders and banks.

Some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include: slow growth in the diversity of financing mechanisms, limited amounts of appropriate financing to match innovation and scaling needs; investment return uncertainty and risk aversion among financers; and bias/discrimination in the allocation of funding.

Goal-related challenges in Ghana:

(a) Limited and Restricted Funding for Entrepreneurship

In Ghana, funding for entrepreneurship has been steadily growing but has yet to match Ghana's potential. The Entrepreneurs' Guide to Investment in Ghana finds that most start-ups and small and medium scale enterprises (SMEs) struggle to find the right financing options for their unique business needs and face challenges meeting the due diligence requirements for financial instruments if they do find them. According to the ANDE Financial Constraints in Ghana Report, SMEs and start-ups find it especially challenging to access credit. Entrepreneurial SME's focused on growing their businesses typically require a mix of debt, equity and grants, yet debt remains the dominant instrument in the overall financial ecosystem. There is also a limited pipeline of investment-ready companies which constricts venture capital and private equity. Actors such as Impact Investing Ghana also highlighted numerous regulatory challenges, a lack of innovative

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financing vehicles and low participation of institutional investors like pension funds as all further exacerbating these challenges. As a result, the practice of impact investing is still somewhat nascent due to an overall lack of investment-ready companies and a lack of impact metric tracking. A study conducted by Social Enterprise Ghana concluded that there was "little to no policy direction" supporting the growth of impact investing.

> *"Many start-ups are interested in getting commercial loans and finance but are unable to access these due to heavy due diligence requirements and conditionalities.*
>
> *SMEs end up focusing all their attention on meeting the conditions of their financing rather than on what their innovations actually need to develop and scale. Those that do get support are also typically organizations that are led by expats and those with foreign relationships and connections.*
>
> *There is therefore a need for new financing instruments and partnerships, and donors can play a role in providing more flexible mechanisms better tuned to the needs of local innovators."*
>
> – Business Incubation & Acceleration Expert

Goal Strengthening Opportunities in Ghana:

The following interventions were identified through both the desk research and consultation as being impactful in improving access to finance for entrepreneurs in Ghana:

- Innovative financing / alternative funding models to mobilize resources that are stable and predictable
- Simplifying regulations and bolstering alternative financing platforms e.g., digital lending.
- Building a pipeline of viable, investor-ready start-ups by supporting innovators directly (e.g., through training, mentoring, etc.), and engaging Development Finance Institutions (DFIs) to de-risk investments by backing up loans or adopting balanced portfolio approaches (a healthy mix of debt and equity).
- Creating sustainable financing pathways for local innovation ecosystem enablers (e.g. incubators, accelerators, hubs) that support innovators to get invest-ready and access capital (the Afrilabs Report on Building a Conducive Setting for Innovators to Thrive survey finds only 40% of the surveyed hubs offer funding to start-ups.)
- Funding for research and development is needed to help Ghana develop a more sustainable and resilient Science, Technology and Innovation system that can effectively connect and coordinate actor support and interaction within the innovation ecosystem. A report on Assessing the needs of the research system in Ghana recommends increasing research funding through the development of an alternative research incentive mechanism. For example, the government might explore the potential for public-private partnerships to raise funds for research projects in line with national priorities, and through which incentives could be built in for the researcher, or seed funding could be provided to attract international research grants.

GOAL 3: Supportive Markets And Infrastructure

Establishing supportive research, energy, transport and communications infrastructure, as well as access to markets that shape success or failure of innovation

This goal seeks to ensure alignment of research with national priorities and needs, strengthening access to markets to scale up innovations, and the maturity of infrastructure (telecommunication, transport, energy and power) to support the functioning of these domestic markets. Some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include: inadequate and unreliable telecommunications infrastructure (e.g. internet access); structural barriers to market entry and innovation uptake; and disconnects among R&D institutions and innovation actors; and poor diffusion, adoption and commercialization of research.

Goal-related challenges in Ghana:

(a) Weak Linkages between Research Outputs and Industry Needs

The National Framework for Research, Innovation and Commercialisation report identified and mapped existing research and innovation actors in Ghana, in the process concluding that a key weakness was little interaction between the 'triple helix' players of industry, research and government, leading to poor alignment and translation of research within markets. Higher education institutions in particular face a number of challenges, including:

- Weak linkages to the private sector and challenges to securing funding for research and development activities. This has been a major problem hindering the successful transformation of research output and technology in academia to products and services.
- An under-developed research system. According to a report by the UK Department for International Development, Ghana has half the number of researchers per million people than the average for Sub-Saharan Africa.

> *"In terms of research, we need to look at the technical aspects, so we need to get our universities or research institutions, as well as the private sector to drill down what it takes to develop a product and take it to the market. We may also need an interdisciplinary approach. Markets in Africa are not the problem. What is missing is the infrastructure.".*
>
> –International Development Expert

(b) Infrastructure-related challenges

Ghana struggles with inadequate physical, digital, and institutional infrastructure. There is limited access to internet broadband and electricity in rural areas, and despite the growth in mobile penetration, there is still an under-utilization of available digital tools that could help entrepreneurs access financial and other services to meet their needs. These are all factors that underpin the ability of an innovation ecosystem to function in a dynamic and efficient way.

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Goal strengthening opportunities in Ghana:

(a) Deepening collaboration between industry and **academia.**

To encourage more successful transformation of research output and technology from academia into industry products and services, the two sectors need greater visibility of each other and opportunities for closer and more systematic planning and engagement**.** A key step towards this goal happened in 2018, when the Ministry of Environment, Science, Technology & Innovation (MESTI) established the Ghana Innovation and Research Commercialisation Centre (GIRC-Centre), an institution specifically designed to facilitate the translation of research findings and other innovations into products and service for commercialisation. Continued support for GIRC-Centre, and its broader role in promoting partnership between government, public research institutions, industries, academia and the private sector, will help ensure enhanced productivity in this space.

(b) Enhancing the quality and reach of key infrastructure

The innovation ecosystem would benefit from a wide range of infrastructure upgrades, many of which are discussed in the Afrilabs Report on Building a Conducive Setting for Innovators to Thrive. These include:
- The development of public good digital infrastructure and institutional infrastructure to help remove market barriers for those currently excluded.
- Enabling innovation hubs to develop digital platforms to reach more entrepreneurs;
- Enhancing collaboration among tech hubs to create thriving innovation clusters across the country akin to the model of the Ghana Tech and Business Hubs Network (TBHNG) discussed in this GSMA article.
- Hub specialization - offering more specialised forms of technical support to innovators (as opposed to the more generic forms of assistance currently on offer);
- Promoting PPPs to unlock private sector capital to boost infrastructure - a key recommendation from UNESCO and the Council for Scientific and Industrial and Research (CSIR) in their STI4SDGs Roadmap for Ghana 2021

GOAL 4: Policies and Regulations

Governments need to recognise and incentivise research & innovation activity within their policy frameworks

The policy and regulatory environments play a powerful role in determining how well innovation processes and actors operate. Some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include: a lack of clarity about the role that the government should play to encourage innovation; unsuitable policies and regulations, including for research; government processes (particularly around procurement) that are incompatible with innovation / innovators; and an overall lack of policy coherence.

Goal-related challenges in Ghana:

(a) Policy fragmentation and implementation

Some of the key challenges facing the innovation ecosystem in Ghana have emerged from a lack of policy coherence, coordination and timely implementation. Most ecosystem actors consulted for this work strongly supported the importance of government playing a bigger role in the innovation ecosystem, noting a number of priority issues that needed government attention (and which also echoed the challenges identified in The STI4SDGs Roadmap for Ghana 2021. These include:

- Weak linkages between policy formulation and national development planning
- Inadequate budget and resource allocation to STI
- Ineffective coordination of the STI system
- Weak linkages between various agencies and organizations in STI
- Weak linkages between industry and the R&D system
- Over reliance on the use of foreign expertise, furthering a neglect of the use and continued development of local expertise

At the policy level, the Ministry of Environment, Science, Technology and Innovation (MESTI) is responsible for National STI policies while the Ministry of Education (MOE) is responsible for the National STI education policies. Together, one of their goals is to contribute to the ambitions set out in the National Framework for Research, Innovation and Commercialisation which include mobilizing funds for innovation and supporting overall coordination and support for different ecosystem actors. However, there appear to be a range of challenges impeding the fulfilment of this agenda, including:

- Difficulty accessing and translating evidence (research) into policy
- Weak coordination of R&D and innovation activities
- Limited use of technology to collect or disseminate information
- Insufficient 'in-house' technical expertise around innovation processes.

> *"What we have found is that we have the policies, and we may have the regulatory frameworks, but having them implemented is the issue"*
>
> –Research and Policy Expert
>
> *"'Government has been very slow to implement policies and regulations."*
>
> –Innovator and Business Leader

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Goal-strengthening opportunities in Ghana:

(a) Innovation-enabling policies incentivising entrepreneurship

Encouragingly, the Government has also taken several very positive steps in actively devising progressive initiatives and policies for the ecosystem. Among those currently under consideration by parliament are the Ghana Start-up Bill and the Ghana Social Enterprise Policy, which when implemented will together provide a legal framework promoting social enterprises as a means to improve livelihoods (particularly among youth), with specific incentives that will encourage the creation and development of start-ups in Ghana to drive economic development. However, the road to these policies has not been without difficulty, and even when passed these frameworks will likely face common challenges experienced across many policies of this kind relating to effective monitoring and implementation.

GOAL 5: Innovation Culture

Nurturing a culture supportive of innovation and research, sometimes requiring changing mindsets of actors.

An innovation mindset is both a starting place and an underlying foundation for the entire innovation process. Contributions from a wide range of actors over a long time period are typically required to help nurture a positive culture of research feeding into innovation processes and where innovation can flourish. Some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include: a culture in which innovation is not valued or respected; an overly narrow understanding of innovation focused primarily on new technologies; a fragmented ecosystem in which actors are siloed geographically or by sector; and a preference for 'quick win outcomes' at the expense of designing/fulfilling longer-term visions.

Goal-related challenges in Ghana:

Some of the current challenges around innovation culture in Ghana include:
- A tendency for innovation programming to often be driven by international funders in accordance with their own agendas (which can leave little room for localisation and adaptation).
- A narrow focus on technological innovation, expressed (for example) in the tendency of hubs to focus on tech-related programs and capacity development that neglects other forms of policy, process or more frugal (non-tech) innovation in the informal sector.
- A fragmented ecosystem where actors operate largely in siloes without a clear sense of themselves as part of a broader, integrated ecosystem.
- A lack of sustained, long-term initiatives designed to bring ecosystem actors together to coordinate their activities, learn from and collaborate with each other.

> *"To promote innovation culture and improve the demand for innovation, there is a need to focus on concrete application of programs and instruments that will make a difference in the ecosystem rather than the continuous development of strategies"*
>
> –International Development Expert

Goal-strengthening opportunities in Ghana:

Much of the current discussion around Ghana's innovation culture is very positive in nature, reflecting a widespread optimism about the future expansion of innovation within the country. For example, the article 'The Great Debate: Why Ghana is the country for your Tech Startup' notes that:

> "*In West Africa, Ghana is a great launchpad for start-ups for several reasons; compared to its neighbours, Nigeria, and Côte d'Ivoire, it has a faster-growing GDP. There is a vibrant start-up ecosystem of stakeholders offering mentorship, and networking for start-ups… and years of economic and political stability mean Ghana is both a preferred destination for foreign direct investment and for start-ups to launch and scale".*

Targeted approaches to improve the connectivity of actors within the ecosystem, through digital or in-person networking platforms where they can meet and learn from each other, are key to continuing to strengthen this shared sense of optimism and 'can do' attitude to entrepreneurship in Ghana. Initiatives to also engage those in more rural areas outside the main cities will also help to create a more inclusive and truly 'national' sense of community among entrepreneurs.

GOAL 6: Networking Assets

Supporting coordinated networking assets that enable productive collaboration between different actors, these come in many different shapes and sizes

Networks are crucial for innovators to stay abreast of developments; search for funding/supporters; expand their market reach; tap into a larger base of ideas and services; find complementary expertise; access specific skills and competencies; and get new products or services to market before their competitors. For those who help build innovation talent (e.g. universities), who seek investment opportunities (e.g. angel investors) and / or those who are searching for solutions to seemingly intractable development challenges (e.g. governments), networking assets are equally important. These networking assets may come in many different shapes and sizes, and operate with many different purposes / goals, with access to finance being one of the most common. However, some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include: low awareness/recognition of operating as an ecosystem; confusion over intellectual property rights undermining trust across actors; and networking interventions managed by international actors that while driving some short-term gains are often unsustainable or inclusive only of those with privileged connections.

Goal-related challenges in Ghana:

- As noted above, the overriding challenge undermining networking within the Ghana ecosystem is the broader lack of collaboration and coordination between different actors.
- This is exacerbated by the fact that the networking initiatives/platforms that do exist are often funded / implemented by international actors who do not have a deep enough understanding of ecosystem dynamics or local politics that influence successful networking among actors - and who expect complete altruism rather than competition when trying to catalyse ecosystem connections.
- The impact of the COVID pandemic has been to further undermine networking in a country where physical meetings continue to be key in building relationships.

Goal-strengthening opportunities in Ghana:

- Initiatives to foster more mutual awareness and cohesion across ecosystem actors will be valuable, helping participants view themselves through a systems-level lens so they can identify and leverage their points of dependency and overlap. In the interests of sustainability and credibility, these efforts **m**ust be driven wherever possible by local Ghanaian stakeholders.
- Research by Endeavor on Fostering Productive Entrepreneurship Communities concludes that strengthening mentoring relationships, especially between those who have successfully reached a level of scale with their innovation and those who are just starting out.

> *"Relationship building is key to ecosystem strengthening. It is critical to have someone in a country who can build those relationships, and who can understand the nuances of the national innovation system."*   –International Development Expert

GOAL 7: Equitable and Inclusive Participation

Working to address the inadequacies and inequalities entrenched in our global systems, ensuring equitable and inclusive governance and participation infrastructure

Innovation ecosystems flourish when they are inclusive of diverse actors with different backgrounds, areas of expertise and ways of thinking. However, some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include: disadvantaged groups remaining underrepresented in the innovation talent pool and/or facing discriminatory barriers to their participation; ecosystem strengthening efforts that either do not address - or worse, exacerbate - existing inequalities in a society; and a lack of gender equality and social inclusion in the design of innovations themselves.

Goal-related challenges in Ghana:

Some of the factors that appear to be undermining equity and inclusion within Ghana's innovation ecosystem include:

- **Gender biases** - low self confidence among women innovators due to gender stereotypes that limit personal confidence and entrepreneurial drive, or that implicitly dictate limitations to the roles and responsibilities of women in the innovation space. Cultural pressure to fulfil traditionally gender-normative roles can also play a part. This has resulted in a situation where, according to the National Framework for Research, Innovation and Commercialisation, women make up only 15% of those in leadership positions within research institutions, down to 13% in commercial companies.
- **Rural/urban divides** - a concentration of innovation within the urban areas, especially Accra and Kumasi; economically and politically to connect with stakeholders with less diffusion to other parts of the country.
- **Disparate levels of education** - most innovation challenges, competitions and programs crowd out youth without tertiary level education by virtue of their participation structure and requirements.
- **Disability** - the design of innovation programs and the physical structure of spaces where they are delivered often limit the participation and inclusion of people with special needs.

> *"We need to acknowledge cultural barriers that may limit women participation in Ghana especially in terms of gender inclusive coverage. Although things are gradually changing due to the global trend and influence; we are better off now than in the last 10 - 20 years. For example, it used to be difficult to find women engineers. But today we have women engineers, computer programmers and they are comfortable in the field and accepted by all".*
>
> –Member of the Diplomatic Mission

Goal-strengthening opportunities in Ghana:

There are now increasing efforts to improve the participation of women in the innovation ecosystem through specific programmes that deliberately seek to encourage more female participants. For instance, the Ghana Tech Lab advertised its strong encouragement of women to enrol during its recruitment of trainees for its artificial intelligence training programme, while the Ministry of Communication has launched a programme called 'Ms. Geek', which seeks to attract more young women into the fields of Science, Technology, Engineering, and Mathematics (STEM). An all-women technology lab was also launched in 2016 to help women start technology driven businesses.

Those consulted for this work stressed that development agencies can play a powerful role in strengthening equity and inclusion, for example by:

- Training women hub leaders and women entrepreneurs (which is difficult in a patriarchal society, often requiring outside intervention);
- Identifying and empowering equity allies who can design and deliver training on inclusion issues to innovation hubs and other organizations supporting entrepreneurship;
- Surfacing and working to rebalance examples of inequitable power distribution across particular groups within the ecosystem where this is damaging access to essential resources such as funding.

GOAL 8: Pathways to Scale

Creating smoother pathways for research diffusion and scale up for innovation, mobilizing and coordinating the contributions of different actors to ensure scaling journey

An effective innovation ecosystem is the enabling environment for taking proven solutions to impact at scale. In fact, just as it takes a community to raise a child, it often takes an ecosystem to scale an innovation, and to help accelerate the pathways to scale for a particular innovation (or set of innovations) it may be beneficial to mobilize and coordinate the contributions of different ecosystem actors in a targeted and carefully choreographed way. However, some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA include:

- **A strong emphasis on the 'supply' of innovation with limited emphasis on 'demand'.** While the supply of innovations addressing development challenges is abundant, often a missing ingredient is understanding demand from the public sector, civil society, or other key partners at the early stages, along with their specific requirements for viable scale such as price points.
- **Complex processes and funding are not designed for scaling of new innovations.** Due to their complexity and requirements, donor and government procurement procedures and partnerships often place undue burden on innovations that have limited resources (or frugal innovations) and tend to favour larger organizations. Innovations also have more difficulty accessing larger pots of funding that are designed with the flexibility and longer time horizons needed as innovations scales.

Goal-related challenges in Ghana:

As with most innovation ecosystems in Africa, Ghana struggles with the challenge of a surplus of innovations that rarely mature beyond initial pilots. Some of this is due to poorly planned business models and/or partnership approaches, where too much attention is focused on the innovative product or service itself at the expense of the scaling process. Some fail due to difficulties in securing the human capital and talent required to scale up without losing quality. In fact, most of the challenges explored under the previous seven Goals all contribute in some way to hindering smooth pathways to scale for new solutions, and do not bear repeating here.

Goal-strengthening opportunities in Ghana:

The following initiatives all have potential in contributing to supporting smoother pathways to scale for innovators with solutions in Ghana:

- Helping innovators further hone their design-thinking approaches to develop more user-centred and demand-driven products and services with sustainable business models;

- Promoting public sector scaling pathways where new products and services can be adopted and diffused across government systems. This pathway is traditionally neglected or actively avoided by many innovators who fear the challenges of working with government or who are simply more commercially minded. The R4D report on Enhancing Public Sector Demand for and Scaling of Health Innovation presents research into the factors influencing uptake and scaling of innovation through public health systems, which is becoming an increasingly important area of interest for actors seeking to build resilient and adaptive health systems.

- Encouraging international funders to work more closely with other donors from their own community to better coordinate referral, graduation and hand-off mechanisms for the different innovations they support. This will provide a more seamless value chain for entrepreneurs moving through the various stages of the scaling pathway.

GOAL 9: A Collective Approach

Mobilising a collective ecosystem approach to address a particular development challenge enabling greater potential to make progress toward that shared mission

Connecting and mobilising actors within a particular ecosystem provides opportunities to raise awareness of specific issues and gaps; share ideas and encourage participation and relationship-building among various actors; and stimulate the creation and uptake of innovation for a specific purpose or to address a complex problem. However, a collective approach typically requires mapping the actors involved in an ecosystem, gaining an understanding of the relationships and resource flows among them, and then galvanizing them around a specific purpose - all of which can take a lot of time and effort even before they start working together. Some of the typical challenges to achieving this goal across countries/ecosystems identified by IDIA therefore include a lack of visibility, coordination or alignment among actors; difficulties in ensuring diversity and inclusion within the collective group: and the challenge of centring different actors around a single issue.

Goal-related challenges in Ghana:

Challenges associated with the previous Goals discussed in this report can all contribute to making a collective approach very difficult. In Ghana, one of the biggest barriers appears to be a lack of focus, prioritization and/or understanding of the big picture problems that a collective approach might be mobilized around. The fragmentation and lack of visibility across ecosystem actors noted earlier also contribute to challenges in simply identifying who is in the ecosystem and what role they might play as part of a collective approach.

Goal-strengthening opportunities in Ghana:

- The SDGs prioritized by the STI4SDGs Roadmap provide a potential focal point to support the design and implementation of collective approaches, particularly when considering the particular prominence the Government has given to digital innovation.

- There are opportunities to grow Ghana's circular economy and build upon Ghana's informal sector. For a circular or green economy, there needs to be a well-coordinated plan that is inclusive of all parties. Dutch Mofa, for example, supports Initiatives for Circular Economies (I4CE), which seek to promote economies that runs completely on reusable raw materials, moving away from agriculture/resource extraction as a main source of income toward higher value-added activities such as manufacturing and higher-tech, service-led economies. I4CE founded the Ghana Climate Innovation Centre and sees promise in Ghana for growing a circular economy.

- There is a significant need for local advocacy. Development agencies can play a role in allocating more resources to support the articulation and mobilization of ecosystem actors around locally defined priorities. This will generate interest, create demand and unlock resources.

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4.0 Conclusion

On charting a recovery path from the pandemic, Ghana seeks to strengthen its economic resilience, rebuild market confidence, and revitalize the economy in the coming years. At the heart of this recovery strategy is a sustainable debt path, a renewed emphasis on resource mobilization, digital skills development and entrepreneurship promotion to tackle the persistent unemployment hindering the future of its youth.

This report has shared some high-level insights sourced from desk research and stakeholder consultation around the role of the Ghanaian innovation ecosystem in supporting that vision. Undeniably, Ghana remains an attractive and competitive destination for business in Africa with significant untapped potential. For example in the venture financing scene, Ghana's ecosystem was recently included in Africa's Top 5 VC Markets in 2020 report, which noted a range of positive prospects and commercially attractive ventures that will no doubt increase funding flows. Similarly, the growing interest and presence of international tech companies in Ghana in recent times is bringing greater attention and interest to enhancing the innovation ecosystem. This includes the opening in Ghana of Google's first AI Research Centre in Africa and Twitter's decision to use Ghana as a base to expand operations in the African markets. Lastly, as the host of the Africa Continental Free Trade Area (AfCFTA) Secretariat, Ghana is strategically positioned to consolidate gains from regional and continent-wide collaboration in accelerating digital transformation for development.

All these signs paint a very promising future for the growing innovation ecosystem in Ghana. However, they make addressing current weaknesses and inefficiencies even more important to ensure Ghanaian ecosystem actors can respond and make the most of these opportunities for long-term benefit. Ghana's economic and political stability are excellent foundations on which to support the continued maturing of the ecosystem, and the government's increasing embrace of innovation-enabling policies and commitments to digitalization will be powerful assets in driving greater entrepreneurship. This was evident in the recent (inaugural) Ghana Digital Innovation Week (GDIW) in November 2021, a notable example of galvanizing collective stakeholder interest and investment (both domestic and international) in Ghana's innovation ecosystem. As the champion of the government's digitalization agenda, the Vice President in a report inaugurating the GDIW encouraged an open, inclusive and collaborative approach in unleashing the true potential that innovation holds:

"For far too long, things have been happening in a 'silo-like' environment in the digital innovation space. It is important that all key stakeholders are brought together, in a common space, to have frank conversations and cross-fertilise each other''.
-Dr Mahamudu Bawumia, Vice President of Ghana.

Of course, building an innovation ecosystem takes time, and there are many opportunities highlighted in this preliminary analysis where international actors such as UNDESA and others can play a contributing role in accelerating that evolution.

Given the vibrant and dynamic nature of the Ghanaian innovation ecosystem, we hope that this report will be a catalyst for deeper research, discussion and partnership with more of the passionate entrepreneurs and ecosystem collaborators who will be the drivers of progress in this space.

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Appendix 2: Stakeholder Consultation List

This project enabled targeted consultation with the stakeholders listed below, whose insights were then combined with those of many other collated through other channels and initiatives, including the IDIA Ecosystem Strengthening Working Group:

Organisation	Designation
Government of Ghana	Permanent Mission of Ghana to the UN
United Nations Economic Commission for Africa (UNECA)	Scientific Affairs Officer
United Nations Department of Economics and Social Affairs (UNDESA)	Sustainable Development Officer
Council of Scientific and Industrial Research (CSIR)	Director of the Science and Technology Policy Research Institute
CSIR-Science and Technology Policy Research Institute (STEPRI)	Head of Department
United Nations Educational, Scientific and Cultural Organisation (UNESCO)	Program Specialist
UNESCO	STI Policy Specialist
Ghana Innovator: Coliba Ghana	Co-founder and CEO
Ghana Innovator: Coliba Ghana	Chief Financial Officer
Ghana Innovator: WeGoInnovate	Co-founder and CEO
Ghana Innovator: Sabre Education	Co-founder and CEO
Ghana Innovator: Sabre Education	Programme Technical Manager
Ghana Innovator: Esoko	CEO
Ghana Innovator: Practical Education Network	Founder and CEO
Ghana Innovator: Practical Education Network	Partnerships and Resource Mobilization Officer
Ghana Innovator: Worldreader	Regional Director