



HARNESSING SCIENCE AND TECHNOLOGICAL INNOVATION FOR YOUTH EMPLOYMENT AND SKILL ACQUISITION IN GHANA

African Technology Policy Studies Network (ATPS)
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The African Technology Policy Studies Network (ATPS) is a transdisciplinary network of researchers, policymakers, private sector actors and the civil society promoting the generation, dissemination, use and mastery of Science, Technology and Innovations (STI) for African development, environmental sustainability and global inclusion. In collaboration with like-minded institutions, ATPS provides platforms for regional and international research and knowledge sharing in order to build Africa’s capabilities in STI policy research, policymaking and implementation for sustainable development.



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Table of Contents

About the Project	iv
About Africa Technology Policy Studies Network (ATPS).....	v
Acknowledgement.....	vi
Key Messages.....	vii
1. Introduction	1
2. Rationale for STI application in Youth Employment	2
3. Methodology	3
4. Key Findings.....	4
4.1 STI Policies and Programmes for Youth Employment in Ghana	4
4.2 STI Institutional Framework for Youth Employment in Ghana	5
4.3 Challenges and Opportunities for Youth Employment in Ghana	6
4.4 Best Practices and Impacts for Youth Employment in Ghana	9
5. Conclusion.....	14
6. Policy Recommendations.....	15
References.....	18
ATPS TechnoPolicy Briefs Series.....	19

About the Project

This project was launched amid Africa’s burgeoning youth population, offering immense potential for productivity and inclusive economic growth. However, a significant portion of this demographic faces unemployment challenges exacerbated by the COVID-19 pandemic, necessitating sustainable solutions through effective policy interventions and institutional strengthening. Focusing on Ethiopia, Ghana, Kenya, Nigeria, Rwanda, Senegal, Uganda, and Zimbabwe, the initiative reviews Science, Technology, and Innovation (STI) policies to understand the current landscape, identify successes and failures, and provide evidence-based insights for decision-making in critical sectors for youth employment and wealth creation. Aligned with continental strategies such as the Agenda 2063 and initiatives such as the Mastercard Foundation’s Young Africa Works strategy and the Afreximbank’s campaign for young people’s participation in the implementation of the African Continental Free Trade Area (AfCFTA) and youth mainstreaming in policy engagements and cross-regional dialogues among others, the project aims to inform policymaking and foster stronger linkages among stakeholders to address youth unemployment, skills development, and entrepreneurship. Through rigorous research and stakeholder engagements, the project is catalyzing evidence-based policy discussions and contributing to the formulation of effective strategies for job creation and youth empowerment across Africa.

About Africa Technology Policy Studies Network (ATPS)

The African Technology Policy Studies Network (ATPS) is a transdisciplinary network of researchers, policymakers, private sector actors and civil society promoting the generation, dissemination, use and mastery of STI for African development, environmental sustainability and global inclusion. ATPS has over 5,000 members and 3,000 stakeholders in over 51 countries in 5 continents with institutional partnerships worldwide. We implement our programs through members in national chapters established in 30 countries (27 in Africa and 3 Diaspora chapters in Australia, the United States of America, and the United Kingdom). In collaboration with like-minded institutions, ATPS provides platforms for regional and international research and knowledge sharing in order to build Africa's capabilities in STI policy research, policymaking and implementation for sustainable development.

Acknowledgement

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Key Messages

- Ghana has developed key policies, strategies, and plans for Science, Technology, and Innovation (STI) to support technological innovation and skills development for youth employment and entrepreneurship. This has had a significant impact on the STI ecosystem, influencing youth employment and the overall performance of Ghana's economy.
- Various initiatives have been launched to foster youth entrepreneurship. For instance, Ghana EXIM Bank's SME Program provides loans and guarantees to small and medium enterprises. The Ghana Climate Innovation Centre (GCIC) and the Ghana Innovation and Research Commercialisation (GIRC) Centre offer incubation and acceleration services to startups and in the translation of research efforts to commercialize products and services. These initiatives aim to create jobs, spur innovation and address environmental challenges. In 2022, the GCIC reported the creation of 184 jobs, 92 of which were occupied by women, and 945 part-time employment opportunities¹.
- Ghana runs a supply driven STI system that does not support increased youth employment, job creation, or entrepreneurship coupled with a lack of strong interlinkages among stakeholders in the STI ecosystem. To enhance the effectiveness of using STI for increased youth employment, a demand-driven STI system in which universities and other research institutions adopt a more demand-driven approach in their research and development endeavours that align with national and regional priorities and aspirations is needed.
- As a policy priority, the government should increase budgetary allocations to STI that support youth employment. This can be achieved through partnering with the private sector, development partners, and other international funding agencies interested in STI development to enhance youth employment.

¹ <https://www.ghanacic.org/>

1. Introduction

Youth unemployment and under-employment are alarming in Ghana, particularly in rural areas, where agriculture is the main source of employment. Despite the decline in the youth unemployment rate from 14.17% in 2015 to 9.16% in 2019 (Ghana Statistical Service, 2020), the World Bank shows that approximately 50% of youth are underemployed in Ghana in 2022. The World Bank report further asserts that youth unemployment and under-employment rates in Ghana are higher than the overall rates in sub-Saharan Africa (SSA), which is 11%. An estimated 1.2 million young people aged 15-24 were unemployed in 2021. With proper training and inclusive economic policies, increases in the youth population could be a powerful engine for development (Baah-Boateng 2021).

The increasing number of unemployed youth shows a failure to effectively utilize the opportunities offered by Science, Technology, and Innovation (STI) in creating and increasing youth employability and entrepreneurship. Although Ghana's economic growth has been impressive, it has not translated enough into productive employment opportunities for its youth population, despite government interventions. The lack of access to relevant skills, limited job opportunities, and weak entrepreneurial ecosystems contribute to this challenge. Leveraging STI is crucial and may aid in creating one million jobs per year in Ghana (National Development Planning Commission [NDPC], 2018).

2. Rationale for STI application in Youth Employment

Ghana's youth unemployment and under-employment problems require innovative and sustainable solutions. STI plays a critical role in this regard. STI policies and their implementation can address skill gaps and create job opportunities through provisions for vocational training, digital skills development, and apprenticeships. By prioritizing STI policies, programmes and their implementation, Ghana can attract foreign investment and create new businesses and industries that will create job opportunities for the youth. Technological innovations can increase productivity and competitiveness, leading to increased exports, economic growth, and improved living standards, particularly for young people. By providing young people with the necessary tools and resources, the country can build a more inclusive and prosperous society, through citizen-led and demand-driven initiatives.

3. Methodology

This policy brief was developed from a comprehensive study that delved into STI policies, institutions, stakeholder mapping, and an analysis of youth employment within the realm of technological innovation, skill enhancement, and entrepreneurship development. The study was conducted across seven Sub-Saharan African (SSA) countries, namely Ethiopia, **Ghana**, Kenya, Nigeria, Rwanda, Senegal, and Uganda. The study adopted a mixed-methods approach, which enabled the collection of both qualitative and quantitative data. The data-gathering process commenced with thorough desk studies of existing literature and secondary data. Subsequently, key informant interviews (KIIs) were conducted, involving 20 carefully selected respondents, to obtain primary data that encompassed both qualitative and quantitative aspects.

To further enrich the dataset and cross-verify information obtained through other methods, focus group discussions (FGD) were carried out. The study engaged participants from a diverse range of stakeholder categories, including government officials and policymakers, representatives from the private sector and industry, members of civil society and non-governmental organizations (NGOs), researchers, development partners, and individuals from the media. Special attention was given to ensuring inclusivity and gender balance in the selection of respondents, with a particular focus on representing the voices of youth and other marginalized groups.

4. Key Findings

This section discusses the key findings of the study on the contribution of STI to youth employment, skill acquisition, and job creation in Ghana. It highlights some best practices, challenges, and opportunities for youth employability, entrepreneurship, and job creation.

4.1 STI Policies and Programmes for Youth Employment in Ghana In Ghana, the promotion of youth employability, entrepreneurship, and job creation through technological innovation is influenced by a range of STI policies and strategies. Ghana's government has developed several STI policies and institutions that directly or indirectly support technological innovation development that supports youth employability, entrepreneurship, and job creation. Some of the key policies include the National Science, Technology, and Innovation Policy of 2017, which aims to provide a broad framework for stimulating innovation in the economy and society. This policy aims to promote innovation and a knowledge-based economy, create jobs, and promote economic growth by developing Ghana's scientific and technological capacity. This Policy provides the foundation for all other programmes and activities related to technological innovation and skill development for job creation in the country.

Another key policy is the National Entrepreneurship and Innovation Plan (NEIP), 2017, which provides incubation services to Ghanaian start-ups and entrepreneurs by offering training, mentorship, and funding to create sustainable businesses and jobs. The primary objective is to provide integrated national support to start-ups and small businesses. NEIP has led to the creation of over 16,000 jobs for young people, with women accounting for 40% of beneficiaries. Additionally, the report notes that the number of women-owned businesses registered with the Registrar General's Department increased from 9% in 2014 to 21% in 2017, indicating a positive impact on women's entrepreneurship. Some selected key STI policies and programme that support youth employment, and job creation in

Ghana is shown in Table 1. To strengthen programmes, some specific interventions should target harnessing youth innovation in Ghana. These include promoting innovation at all levels of the educational system, providing scholarships to promising Science, Technology, Engineering, and Mathematics (STEM) students, initiating mechanisms to identify and mentor young talented scientists, and establishing award schemes that reward innovation among the youth.

4.2 STI Institutional Frameworks for Youth Employment in Ghana

Government institutions, such as the Ministry of Environment, Science, Technology, and Innovation (MESTI), are tasked with promoting STI development in the country and have high power and influence in the STI ecosystem. development that leads to youth employability and job creation through various initiatives. The establishment of Technology Transfer Centres (TTCs) serves as hubs for technology commercialization, innovation, and incubation. The Youth Employment Agency (YEA), established in 2006, creates employment opportunities for Ghanaian youth through the implementation of various job creation programs. These programs have had a significant impact on job creation and skill acquisition for young people in Ghana, with over 107,000 youths employed through YEA's various programs, according to their 2019 annual report (Abisoye, 2021). Our study shows that some private sector actors in businesses, research, and NGOs also play significant roles in supporting youth skill acquisition, thus enabling the creation of jobs, especially for youth. Examples of such organizations are the Innovation Hub (iHub), UNESCO (e.g., UNESCO in collaboration with the Ministry of Communications and the Ghana Investment Fund for Electronic Communications (GIFEC) from 2014 to 2016 to enhance the employability and entrepreneurial skills of young people in rural and underserved areas through ICT training and certification.), Kwame Nkrumah University of Science and Technology (KNUST), and Kumasi Hive among many others. The institutional frameworks in Ghana allow private sector actors, research, and NGOs to work with

the relevant government Ministries, Departments, and Agencies (MDAs) in public-private partnership (PPP) arrangements to enhance skill development and provide infrastructure and funding for innovation development and entrepreneurship. The MESTI wields the highest power and influence among government institutions, whereas government-funded research organizations (e.g., Council for Scientific and Industrial Research (CSIR) and KNUST have the highest power and influence among the research actors. The Association of Ghana Industries was rated the highest in power and influence among private sector actors. In terms of interlinkages among these actors, the study found weak interlinkages to be a dominant problem in driving technological innovation development, while partnerships and collaborations are still very weak in driving and transforming youth employment, skills development, and entrepreneurship. Table 2 presents the key institutions that support STI policy implementation for job creation, especially for youth in Ghana.

4.3 Challenges and Opportunities for Youth Employment in Ghana

The challenges for youth employment in Ghana are multifaceted. For instance, there is a lack of sufficient investments in STI to harness their full potential. Only 0.38% of Ghana's GDP was invested in R&D in 2022 (Sasu, 2023). This is not sufficient compared to the average of 2.7% in 2020 in OECD countries (OECD, 2022) and is exacerbated by the fact that the STI system is supply driven and not focused on Ghana's economic and social priorities. Additionally, there is minimal private sector participation in adopting new technologies and raising productivity, and the STI system is overburdened by the level of resources available.

Education and training institutions do not produce graduates with the required skills to spur technological innovation for economic growth, leading to a skill mismatch in the job market. Furthermore, the absence of a labour market information system hinders policymakers from effectively monitoring employment generation policies, and job seekers rely on their social networks and ad hoc job search strategies.

A study by Boateng et al (2014) revealed that more than 90% of the young job seekers interviewed lacked experience in the positions that they were applying for. They thought that they could not start their own businesses without prior experience in the field. Among the challenges mentioned in the study by Boateng et al. (2014) are corruption by local authorities, lack of capital as the primary obstacle to youth entrepreneurship in rural areas, lack of financial resources among young people in rural areas of Ghana due to a lack of connections, insufficient funds for deposits, lack of knowledge about the available sources of financing, and lack of support from the government in providing much backing for entrepreneurship as a career option for young people.

The barriers and challenges identified in Ghana's youth employment landscape present significant opportunities for technological innovations. These challenges create opportunities for improving youth employment, entrepreneurship, and innovation in private enterprises. Improvements in tertiary education should be part of the national efforts to fight poverty, grow the economy, promote human development, and increase economic competitiveness. The government has established two key institutions, the National Research Foundation, and the Innovation Fund, to oversee competitive research and innovation development in the country. Such funding programmes and institutions could focus on producing graduates with STEM training and problem-solving skills. Additionally, an efficient platform to link job seekers with job openings could be established to reduce youth unemployment.

The lack of experience among young job seekers can be addressed through digital platforms and virtual training programs that provide practical skills and simulated work experience. Technology can enable aspiring entrepreneurs to overcome the barrier of their limited prior experience by providing access to online resources, e-learning platforms, and mentorship networks.

To combat corruption and nepotism, technology can facilitate transparent, merit-based hiring processes. Online job portals with robust verification systems, digital resumes, and automated screening tools can ensure fair selection procedures and reduce the influence of bribery and favouritism. For instance, blockchain technology can enhance transparency and integrity in recruitment and eliminate fraudulent practices.

Inadequate training can be mitigated through e-learning platforms, virtual classrooms, and online certification programmes. Interactive digital tools and mobile applications can provide accessible and affordable training resources, address the skills gap, and equip young people with the competencies demanded by the job market. Technological innovation also presents opportunities for youth entrepreneurship in rural areas to improve access to capital. Digital financial services, such as mobile banking and peer-to-peer lending platforms, can overcome traditional barriers such as collateral requirements and lack of connections. These platforms provide easier access to loans, savings accounts, and investment opportunities, thereby fostering entrepreneurial growth. Moreover, technology can help overcome the challenges posed by an unstable economic climate and inadequate governmental assistance.

Digital platforms can provide real-time market information, enabling young entrepreneurs to make informed decisions, and identify viable business opportunities. Online business support networks, incubators, and crowdfunding platforms can provide alternative avenues for financial and mentorship support, thereby reducing dependence on government assistance.

By leveraging technological innovations, Ghana can harness the potential of its youth population, address identified barriers, and create a more inclusive and vibrant entrepreneurial ecosystem. Technology-driven solutions can empower young people, enhance their employability, and stimulate economic growth and innovation.

4.4 Best Practices and Impacts for Youth Employment in Ghana

Government, private sector actors, and development partners have promoted and supported several initiatives that have positively impacted youth employment, entrepreneurship, and job creation in Ghana. The government has implemented policies such as the Ghana EXIM Bank SME program, and One District One Factory policy to support small and medium-sized enterprises (SMEs) and established new factories, thereby creating job opportunities for young people. The Skill Development Fund and Ghana Climate Innovation Center have also provided funding and incubation support for startups and SMEs. Through sustained public-private partnerships, such as the African Development Bank's Youth Entrepreneurship and Innovation Multi-Donor Trust Fund, resources have been mobilized to achieve shared STI goals for job creation and youth employment. Foreign donors and development partners such as the World Bank, the Mastercard Foundation, and USAID have supported initiatives aimed at reducing youth unemployment and improving skills acquisition. Public and private research institutions have also developed technologies and entrepreneurship programs that have led to the establishment of new industries and expansion of existing ones. Many private sector businesses in Ghana have implemented corporate social responsibility programs aimed at promoting youth employment and entrepreneurship.

The Mastercard Foundation's Young Africa Works strategy, seeking to enable three million young individuals to secure dignified and fulfilling employment opportunities by 2030, was initiated in Ghana as a significant step towards upskilling youth and injecting vibrancy into the job market. Specializing on the empowerment of budding female entrepreneurs, this initiative furnishes them with vital resources, encompassing business development skills, financial assistance, and facilitated access to marketplaces. In addition to these initiatives, the Mastercard Foundation Scholars Program at Ashesi University, co-designed with the participants themselves—the young and women—aims to boost job creation and youth employment rates in Ghana. Inclusion is paramount in this initiative, signaling the commitment to distribute opportunities evenly across societal demographics.

Table 1: A summary of key STI Policies, Programmes, and Initiatives for enhancing youth employment in Ghana

STI Policies and Programmes	Roles in skills development and youth employment	Impact on skills development and youth employment	Remarks
<p>The National Science, Technology, and Innovation Policy of 2017</p>	<ul style="list-style-type: none"> - The policy is the foundation of all programmes and activities related to technological innovations and skill development for job creation in Ghana 	<ul style="list-style-type: none"> - The policy has harnessed opportunities in labour migration and the green economy for the youth, diversifying their income sources and reducing poverty. - It has promoted research and innovation, vocational and technical skills development, and digital skills among the youth, enhancing their employability and adaptability 	<p>There are cross-cutting challenges in the implementation on the policies and programmes which include:</p> <ul style="list-style-type: none"> - lack of adequate funding, - inconsistency in government action due to regime change, - lack of collaboration between various stakeholders (PPP), and - absence of rigorous monitoring and evaluation to access.
<p>The National Entrepreneurship and Innovation Plan (NEIP) of 2017</p>	<ul style="list-style-type: none"> - Promotes an enabling environment by providing business development services; startup incubators and funding for young businesses to enable them to grow and become successful. 	<ul style="list-style-type: none"> - It has promoted equality and rights for the youth, ensuring that they are protected from discrimination and exploitation in the labour market. - Creation of over 16,000 jobs for young people, with women accounting for 40% of the beneficiaries 	<p>The opportunities that are created by these challenges include:</p> <ul style="list-style-type: none"> - Setting up a robust monitoring and evaluation framework - Build a strong collaborative environment with equitable,
<p>Ghana's Industrial Policy of 2011</p>	<ul style="list-style-type: none"> - Expand productive employment in the manufacturing sector; expand technological capacity in the manufacturing sector; and promote agro-based industrial development. 	<ul style="list-style-type: none"> - The policy has fostered innovation and entrepreneurship among the youth, enabling them to start and grow their own businesses and solve local problems. 	<p>The opportunities that are created by these challenges include:</p> <ul style="list-style-type: none"> - Setting up a robust monitoring and evaluation framework - Build a strong collaborative environment with equitable,

	<p>- Promotes the acquisition of skills and technology among Ghanaian youths, leading to job creation and economic development.</p>	<p>- It has stimulated industrial development and competitiveness in key sectors such as agro-processing, manufacturing, and services, creating more jobs and income opportunities for the youth</p>	<p>responsible, and inclusive framework with private sector and development partner.</p> <ul style="list-style-type: none"> - Increase transparency of implementation and disbursement processes.
<p>The Ghana Skills and Technology Development Fund (STDF)</p>		<ul style="list-style-type: none"> - The STDF has provided competitive grants to enterprises for skills development and technology transfer, improving their productivity and competitiveness and creating more jobs for the youth. - Over 4,000 young people have been trained in various skills and technology programs through the fund's support. These skills include welding, fashion design, carpentry, and ICT 	

Table 2: Summary of key STI institutions, their roles and impact on youth employment in Ghana

STI Institutions	Roles in skills development and youth employment	Impacts on skills development and youth employment
<p>Government-Ministries, Departments and Agencies</p> <p>Ministry of Environment, Science, Technology, and Innovation (MESTI)</p>	<ul style="list-style-type: none"> - Promote activities needed to underpin the standards and policies required for planning and implementation of sound scientific and technological development activities. - Ensure the coordination, supervision, monitoring, and evaluation of activities of Environment, STI while fulfilling national benefits-sharing commitments. - Promoting technological innovation, employability, and job creation - Establishment of technology transfer centres (TTCs) across Ghana. 	<ul style="list-style-type: none"> - Over 1,000 entrepreneurs and innovators have been supported through various technical training centres. More funding is needed to upscale benefits.
<p>Ministry of Food and Agriculture (MoFA)</p>	<ul style="list-style-type: none"> - Formulate policy relating to agriculture and backstopping in the decentralized department and monitoring and evaluation. - Application of STI in agricultural development- inputs, seeds, and fertilizers to support youths in agriculture 	<ul style="list-style-type: none"> - The Youth in Agriculture program has trained over 20,000 young people in various agricultural activities. Has established agribusiness incubation centres to provide technical and financial support to young entrepreneurs. As a result, the agricultural sector has become a significant employer of youth in Ghana, with over 50% of the workforce being under the age of 35. Greater opportunities for skills development and technological advancements will boost youth engagement and enhance the competitiveness of the sector.
Private Sector		
<p>Enablis Entrepreneurial Network Ghana</p>	<ul style="list-style-type: none"> - Identification of SME entrepreneurs with high growth potential. 	<ul style="list-style-type: none"> - Has supported over 3,000 entrepreneurs and created more than 10,000 jobs in various sectors, including

	<ul style="list-style-type: none"> - Nurturing their professional and personal development and providing them with networking, coaching, mentoring and skills acquisition. - Regulates the activities of industries in the country. The body also lobbies the government of Ghana on issues that affect industries in the country 	<p>agriculture, technology, and manufacturing, which has impacted directly on youth employment. Public private partnership will build a multiplier effect on youth employment and skills development.</p> <ul style="list-style-type: none"> - An MOU with the Ghana Education Service, it has provided industrial attachment opportunities for senior high school students. - Through its apprenticeship Programme, over 3000 young people have been trained and equipped with technical and vocational skills to improve their employability. Stronger collaborations with government and other key stakeholders will lead to a more sustainable business environment and create more jobs for the youths.
NGOs/CSOs		
Ghana Alliance for Clean Cookstoves	<ul style="list-style-type: none"> - Provides skills training to young people on how to manufacture, distribute and market clean cookstoves, thereby creating job opportunities for the youth. 	<ul style="list-style-type: none"> - Has trained over 2,000 young people in clean cookstove installation and maintenance, created new jobs and skills development opportunities in the clean cookstove sector. Stronger linkages with the public sector will ensure a more viable business that can create sustainable jobs for the youths.
Alliance for a Green Revolution in Africa, Accra (AGRA)	<ul style="list-style-type: none"> - Promotes programs to improve agricultural productivity and promote entrepreneurship among youth; has partnered with organizations and institutions to provide training in various aspects of agriculture, including agribusiness, livestock management, and soil management. - aims to create opportunities for young people to participate in the agricultural sector and contribute to economic growth and development. 	<ul style="list-style-type: none"> - Over 1 million Ghanaian farmers have benefited from AGRA's interventions, leading to a 50% increase in crop yields. - Has also trained over 17,000 youth in modern agricultural techniques and entrepreneurship, creating over 5,000 jobs in the agricultural sector. STI should be leveraged on to ensure that youths are empowered with the skills needed for current and future job markets.

5. Conclusion

This study confirmed that the government of Ghana initiated policies, programs, and institutions to promote STI development in the country. This has consequently resulted in the growth of SMEs, outcome-based education, and tech startups that are creating some opportunities for the youth. However, youth unemployment still remains alarmingly high while skills development and entrepreneurship outcomes still vary across the country especially in the rural communities and among the poor.

Challenges persist, including a supply-driven STI ecosystem heavily reliant on public funding and limited private-sector engagements. Funding allocation often does not align with the priorities of STI providers or end-users. The study highlights the need for a demand driven STI policy that caters for the needs of the target end-users and improve youth employment, competitive mechanisms for funding innovation, greater private sector involvement in STI development, fiscal and legal incentives for local entrepreneurship, and a focus on supporting technological innovation in the private or informal sector. Addressing these challenges is crucial for creating a more inclusive and effective STI ecosystem that supports youth employment and job creation in Ghana. Overall, the government will need to prioritize investments in STI infrastructure, outcome-based education, and policies to accelerate youth employment and entrepreneurship.

6. Policy Recommendations

Based on the key findings from this study, the following policy recommendations are proffered to enhance, youth employment, and job creation in Ghana:

Recommendation 1: Increase funding for STI management to enhance private sector participation: The government should increase funding for STI in order to foster the expansion of SMEs and support innovation in the private sector. Increased budgetary resources to R&D to help relevant agencies is one example. Providing incentives for youth-led businesses and allocating resources to microfinance and loan schemes will empower rural youth entrepreneurs. The government can create a favourable regulatory environment by considering alternative collateral options and flexible repayment terms for small and medium-sized enterprises. Enhancing vocational training programs aligned with market demands and reducing bureaucratic barriers will equip young people with relevant skills. In addition to the government, commercial sector actors, research institutes, and NGOs could seek alternative funding for initiatives aimed at technical advances for improved youth skill development. Using the process of co-creation, the private sector, research institutions, and NGOs should collaboratively seek for domestic and external funding to support the training of youth for skills for the future.

Recommendation 2: There is need to prioritize Public-Private Partnerships (PPP) in STI development: Public-private partnerships should be prioritized to mobilize resources and improve collaboration towards achieving shared STI goals for job creation and youth employment. This can be achieved through the establishment of joint innovation centres, where the government, private sector, and academia can collaborate on research and innovation development. The PPP arrangements should target establishing more Business Incubation Centers to facilitate youth training and skill acquisition. Such centres should provide training, mentoring, and access to finance for entrepreneurs to start and grow their businesses. The

incubation centres should be in proximity to research institutions where there are high concentrations of youth. The government should encourage private sector participation in STI development by creating an enabling environment and making the ease of doing business easier and smarter in the country. Engaging in PPPs with the public sector and civil society to leverage resources, capacities, and expertise for addressing STI challenges and opportunities is critical. This can be achieved through the provision of fiscal and legal incentives for local entrepreneurship and the promotion of innovation in private enterprises.

Recommendation 3: The private sector actors, research institutions, and development partners should promote technology transfer among industries and research institutions: Opportunities for technology transfers among industries and research institutions are limited in Ghana. Most industries import products from foreign companies. In the agricultural sector, most agricultural equipment is imported and not locally designed and fabricated in Ghana. The government working with all stakeholders needs to establish viable platforms that will enhance technology transfer to SMEs such as through technology incubation centres and technology transfer offices in universities and research institutions. This will help to increase the adoption and adaptation of new technologies and innovations by SMEs, leading to more opportunities for the youth and entrepreneurs in the STI sector.

Recommendation 4: Development partners should promote transparency in all interventions by increasing targeted funding and support to the marginalized in society: To address the challenges in youth employment and entrepreneurship, the government must combat corruption and promote fair hiring practices. Funding should be given via competitive processes that take into account the priorities of STI service providers and end users. Civil society actors could play a crucial role in promoting accountability and transparency, advocating for fair practices in hiring and offering entrepreneurship training, mentorship, and networking opportunities. Their efforts contribute

to creating a supportive environment for youth entrepreneurship and employment. Moreover, they can create networking platforms to connect young entrepreneurs with investors and business partners, enabling access to capital and resources for their entrepreneurial growth. Also, development partners should collaborate with local authorities to fight corruption in hiring personnel in the MDAs. They must support transparent recruitment practices, giving young people equal opportunities. Furthermore, financial support and technical assistance should be provided to rural youth entrepreneurship programs. Partnerships with reputable African organizations working directly with the youth and women, will reduce some corrupt practices inherent in high places in governments and be able to directly deliver intervention programs to the youth and marginalized. These initiatives should prioritize skill development, mentorship, and access to capital. By doing so, development partners can empower young individuals, helping them overcome obstacles and thrive as successful entrepreneurs.

Recommendation 5: The public and private research institutions should promote outcome-based education and research through robust curriculum redesign: To address the challenges faced by Ghanaian youth, research institutions should target activities focused on youth unemployment, job creation, and skill acquisition. Their activities will inform evidence-based policymaking, leading to targeted interventions. Collaboration among research institutions, government agencies, and development partners is essential to design effective youth employment programs and assess their impact. Additionally, research institutions can provide data-driven insights on market demands and emerging sectors, guiding the development of vocational training and educational curricula that align with industry requirements. This will better prepare young people for relevant job opportunities and empower them to succeed. For instance, there should be a more robust curriculum redesign to capture training in technological and innovative skills required for the future of work in artificial intelligence, data science, cyber security, agroforestry, agroecology, etc.

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